Module 15, GAS TURBINE ENGINE.

15.1 GAS TURBINE ENGINE Fundamentals.

Q. 1. On an axial flow, dual compressor forward fan engine, the fan turns the same speed as the.

A. low pressure turbine.
B. high pressure compressor.
C. forward turbine wheel.
Ans.- low pressure turbine.
Explanation. Rolls Royce The Jet engine Page 6 refers.

Q. 2. A turbo jet engine gives.
A. large acceleration to a small mass of air.
B. large acceleration to a large weight of air.
C. small acceleration to a large mass of air.
Ans.- large acceleration to a small mass of air.
Explanation. Rolls Royce The Jet engine Page 2/3 refer.

Q. 3. The basic gas turbine engine is divided into two main sections: the cold section and the hot section.

A. The cold section includes the engine inlet, compressor, and turbine sections.
B. The hot section includes the combustor, diffuser, and exhaust.
C. The hot section includes the combustor, turbine, and exhaust.
Ans.- The hot section includes the combustor, turbine, and exhaust.
Explanation. NIL.

Q. 4. A jet engine derives its thrust by.
A. drawing air into the compressor.
B. impingement of the propelling gases on the outside air.
C. reaction of the propelling gases.
Ans.- reaction of the propelling gases.
Explanation. Newtons third law applies- Rolls Royce The Jet engine Page 2/3 refers.

Q. 5. Which of the following might be used to identify turbine discharge pressure?.
A. Pt7.
B. Pt2.
C. Tt7.
Ans.- Pt7.
Explanation. Jeppesen A&P Powerplant Textbook 3-5.

Q. 6. In a free turbine.
A. there is a clutch between compressor and power output shaft.
B. there is a direct drive with a free-wheel unit.
C. there is no mechanical connection with the compressor.
Ans.- there is no mechanical connection with the compressor.
Explanation. Rolls Royce The Jet engine Page 5 refers.

Q. 7. Bernoulli's Theorem states that at any point in a flow of gas.
A. the static pressure and dynamic pressure are equal.

B. the static pressure is less than the dynamic pressure.

C. the total energy remains constant.
Ans.- the total energy remains constant.
Explanation. See Chapter 2 of Rolls Royce The Jet Engine.

Q. 8. The working fluid of a gas turbine engine is.

A. gasoline.
B. kerosene.
C. air.
Ans.- air.
Explanation. Kerosene provides the energy to drive the air.

Q. 9. Which statements are true regarding aircraft engine propulsion?.
A. Turbojet and turbofan engines impart a relatively large amount of acceleration to a smaller mass of air.
B. In modern turboprop engines, nearly 50 percent of the exhaust gas energy is extracted by turbines to drive the propeller and compressor with the rest providing exhaust thrust.
C. An engine driven propeller imparts a relatively small amount of acceleration to a large mass of air.
Ans.- An engine driven propeller imparts a relatively small amount of acceleration to a large mass of air.
Explanation. Jeppesen A&P Powerplant Textbook 3-43.

Q. 10. As subsonic air flows through a convergent nozzle the velocity.
A. decreases.
B. increases.
C. remains constant.
Ans.- increases.
Explanation. Bernoulli's Theorem again.

Q. 11. In a twin spool compressor system, the first stage turbine drives the.
A. N2 compressor.
B. N1 and N2 compressors.
C. N1 compressor.
Ans.- N2 compressor.
Explanation. Jeppesen A&P Powerplant Textbook 3-18.

Q. 12. At what point in an axial flow turbojet engine will the highest gas pressures occur?.
A. At the compressor outlet.
B. At the turbine entrance.
C. Within the burner section.
Ans.- At the compressor outlet.
Explanation. Jeppesen A&P Powerplant Textbook 3-20.

Q. 13. Which of the following units are generally used to measure aircraft noise?.
A. Effective perceived noise decibels (E P N d B).
B. Decibels (dB).
C. Sound pressure.
Ans.- Effective perceived noise decibels (E P N dB).
Explanation. Rolls Royce The jet engine page 199 refers.

Q. 14. The diffuser section is located between.

A. the burner section and the turbine section.
B. station No. 7 and station No. 8.
C. the compressor section and the burner section.
Ans.- the compressor section and the burner section.
Explanation. Jeppesen A&P Powerplant Textbook 3-20.

Q. 15. If the LP shaft shears.
A. turbine runaway occurs.
B. compressor overspeed occurs.
C. compressor underspeed occurs.
Ans.- turbine runaway occurs.
Explanation. The turbine drives the LP compressor or fan.

Q. 16. The term Pt7 means.
A. pressure and temperature at station No. 7.
B. the total pressure at station No. 7.
C. the total inlet pressure.
Ans.- the total pressure at station No. 7.
Explanation. NIL.

Q. 17. What section provides proper mixing of the fuel and efficient burning of the gases?.
A. Diffuser section and combustion section.
B. Combustion section and compressor section.
C. Combustion section only.
Ans.- Combustion section only.
Explanation. Jeppesen A&P Powerplant Textbook 3-21.

Q. 18. Of the following, which engine type would most likely have a noise suppression unit installed?.

A. Turboprop.
B. Turbojet.
C. Turboshaft.
Ans.- Turbojet.
Explanation. Jepperson Gas Turbine Powerplants Page 3-57 refers.

Q. 19. The pressure of supersonic air as it flows through a divergent nozzle.
A. decreases.
B. increases.
C. is inversely proportional to the temperature.
Ans.- decreases.
Explanation. A&P Airframe Textbook Page 2-31 and 2-32.

Q. 20. The symbol for designating the speed of a LP compressor in a twin spool engine is.
A. N.
B. NG.
C. N1.
Ans.- N1.
Explanation. Jepperson Gas Turbine Powerplants Page 12-13 refers to N1 for LP N2 for H P.

Q. 21. A turbojet engine is smoother running than a piston engine because.
A. the lubrication is better.
B. it runs at a lower temperature.
C. it has no reciprocating parts.

Ans.- it has no reciprocating parts.
Explanation. NIL.

Q. 22. A gas turbine engine comprises which three main sections?.
A. Compressor, diffuser, and stator.
B. Turbine, compressor, and combustion.
C. Turbine, combustion, and stator.
Ans.- Turbine, compressor, and combustion.
Explanation. NIL.

Q. 23. When a volume of air is compressed.

A. heat is gained.
B. no heat is lost or gained.
C. heat is lost.
Ans.- no heat is lost or gained.
Explanation. Jepperson Gas Turbine Powerplants Page 2-18 refers - assuming adiabatic.

Q. 24. The pressure of subsonic air as it flows through a convergent nozzle.
A. increases.
B. remains constant.
C. decreases.
Ans.- decreases.
Explanation. NIL.

Q. 25. If a volume of a mass of air is 546 cubic feet at 273K, at 274K it will be.
A. 2 cubic feet greater.
B. 1/273 less by weight.
C. 2 cubic feet smaller.
Ans.- 2 cubic feet greater.
Explanation. NIL.

Q. 26. In what section of a turbojet engine is the jet nozzle located?.
A. Exhaust.
B. Turbine.
C. Combustion.
Ans.- Exhaust.
Explanation. NIL.

Q. 27. Newton's First Law of Motion, generally termed the Law of Inertia, states:.
A. To every action there is an equal and opposite reaction.
B. Force is proportional to the product of mass and acceleration.
C. Every body persists in its state of rest, or of motion in a straight line, unless acted upon by some outside force.

Ans.- Every body persists in its state of rest, or of motion in a straight line, unless acted upon by some outside force.
Explanation. NIL.

Q. 28. A high bypass engine results in.
A. overall slower airflow and greater propulsive efficiency.
B. overall faster airflow.
C. greater propulsive efficiency.
Ans.- overall slower airflow and greater propulsive efficiency.
Explanation. Jepperson Gas Turbine Powerplants Page 2-29 refers.

Q. 29. Bernoulli's Theorem states that at any point in a flow of gas.
A. the static pressure and dynamic pressure are equal.

B. the static pressure is less than the dynamic pressure.

C. the total energy remains constant.
Ans.- the total energy remains constant.
Explanation. NIL.

Q. 30. The Brayton cycle is known as the constant.

A. temperature cycle.
B. mass cycle.
C. pressure cycle.
Ans.- pressure cycle.
Explanation. NIL.

Q. 31. In a choked nozzle, velocity increases, and.

A. density decreases.
B. pressure decreases.
C. pressure increases.
Ans.- pressure increases.
Explanation. Jepperson Gas Turbine Powerplant Page 2-23. As the nozzle goes sonic the pressure starts to increase as a result of the shock wave.

Q. 32. Using standard atmospheric conditions, the standard sea level temperature is.
A. 29°C.
B. 59°F.
C. 59°C.

Ans.- 59°F.
Explanation. NIL.

Q. 33. Standard sea level pressure is.
A. 29.92 inches Hg.
B. 29.29 inches Hg.
C. 29.00 inches Hg.
Ans.- 29.92 inches Hg.
Explanation. NIL.

Q. 34. The highest pressure in a gas turbine is.

A. at the nozzle exit.
B. at the burner exit.
C. just after the last compressor stage but before the burner.
Ans.- just after the last compressor stage but before the burner.
Explanation. Rolls Royce The Jet Engine Page 15 refers.

Q. 35. The velocity of subsonic air as it flows through a convergent nozzle.
A. remains constant.
B. increases.
C. decreases.
Ans.- increases.
Explanation. NIL.

Q. 36. A turboprop engine derives its thrust by.

A. impingement of the prop-wash on the outside air.
B. reaction of the prop-wash.
C. reaction of the propulsion gases.
Ans.- reaction of the prop-wash.
Explanation. Newtons Third Law.

Q. 37. Adiabatic compression is.
A. an isothermal process.
B. one where there is an increase in kinetic energy.
C. one where there is no loss or gain of heat.
Ans.- one where there is no loss or gain of heat.
Explanation. Sherwin and Horsley Thermodynamics Page 144 refers.

Q. 38. In a ducted fan engine, the fan is driven by the.

A. turbine.
B. air passing over the compressor.
C. accessory gearbox.
Ans.- turbine.
Explanation. Jeppesen Aircraft Powerplant Page 2-9.

Q. 39. A modular constructed gas turbine engine means that.
A. all engines have a specific component layout.
B. the engine is constructed by the vertical assembly technique.
C. its major components can be removed and replaced without disturbing the rest of the engine.
Ans.- its major components can be removed and replaced without disturbing the rest of the engine.
Explanation. The Dictionary of Aircraft Terms by Dale Crane has this definition.

Q. 40. The accessory gearbox of a high bypass engine is.
A. on the HP Compressor housing.
B. in the forward bearing housing.
C. attached to the turbine casing.
Ans.- on the HP Compressor housing.
Explanation. Jeppesen Aircraft Powerplant Page 3-9.

Q. 41. On a gas turbine engine, what is the fan driven by?.
A. I P turbine.
B. LP turbine.
C. H P turbine.
Ans.- LP turbine.
Explanation. Rolls Royce The Jet Engine Page 6 refers.

Q. 42. Which law relates to the kinetic, pressure, and potential energy in a fluid
flow?.
A. Bernoulli's theorem.
B. Newton's laws.
C. Charles's law.
Ans.- Bernoulli's theorem.
Explanation. The sum of the energies in a system is constant. so if one decreases another will increase.

Q. 43. The density of gas may be expressed as.

A. volume/weight.
B. weight/volume.
C. pressure/volume.
Ans.- weight/volume.
Explanation. Basic Physics this one.

Q. 44. E S HP is.
A. Horsepower/efficiency.
B. Shaft horse power + exhaust efflux.
C. Power available at the turbine less the power required to drive the.
Ans.- Shaft horse power + exhaust efflux.
Explanation. Effective Shaft Horse Power is the measure of total power of a turbo prop engine.

Q. 45. A divergent duct will cause subsonic flow to decrease in.
A. velocity, increase pressure.
B. velocity, pressure remains constant.
C. pressure, increase velocity.
Ans.- velocity, increase pressure.
Explanation. Rolls Royce The Jet Engine page 13 fig 2-3 refers.

Q. 46. The Brayton cycle is.
A. the name given to the intermittent cycling of an electrical de-icing system.
B. the continuous combustion cycle taking place in a gas turbine engine.
C. the constant velocity cycle taking place in a gas turbine engine.
Ans.- the continuous combustion cycle taking place in a gas turbine engine.
Explanation. The Brayton Cycle is also known as the constant pressure cycle.

Q. 47. The purpose of a diffuser is to.
A. increase the kinetic energy of the air.
B. induce a swirl to the air prior to combustion.
C. increase the static pressure of the air.
Ans.- increase the static pressure of the air.
Explanation. Diffusers are always static divergent ducts.

Q. 48. On a triple spool engine, the first stage of turbines drive.
A. the LP compressor.
B. the HP compressor.
C. the I P compressor.
Ans.- the HP compressor.
Explanation. Rolls Royce The Jet Engine Fig 2-5-2 refers.

Q. 49. Ram effect is.
A. the increase of dynamic pressure at the face of the compressor.
B. conversion of static pressure to kinetic pressure at the face of the compressor.
C. conversion of kinetic energy to pressure energy at the face of the compressor.
Ans.- conversion of kinetic energy to pressure energy at the face of the compressor.
Explanation. The greater the ram effect the greater the efficiency of the propulsion system.

Q. 50. Which of the following statements is true on a high bypass ratio
turbofan?.
A. Both the compressor and combustion system are larger than their turbojet equivalent.
B. The compressor assembly is larger and combustion chamber smaller than their turbojet equivalent.
C. Both the compressor and combustion chamber are smaller than the turbojet equivalent.
Ans.- Both the compressor and combustion chamber are smaller than their turbojet equivalent.
Explanation. Smaller compressors and combustion chambers can be used on high bypass fans as they are more efficient than turbo jets.

Q. 51. In the dual axial flow or twin spool compressor system with a free power turbine, Nf would be an indication of.
A. turbine thrust indication.
B. first stage compressor speed.
C. free power turbine speed.
Ans.- free power turbine speed.
Explanation. The free turbine drives the prop-shaft only.

Q. 52. A waisted drive shaft is primarily to.

A. achieve dynamic balance.
B. reduce weight.
C. provide a fuse if the driven component is overloaded.

Ans.- provide a fuse if the driven component is overloaded.
Explanation. An example of this type of drive shaft is fitted between a gearbox and an I D G .

Q. 53. The 'core engine' or 'gas generator' is made up of the following components:.
A. Inlet, compressor, combustion chamber, turbine, exhaust.
B. Turbine, combustion chamber, compressor.

C. Compressor, turbine, exhaust, propelling nozzle.
Ans.- Turbine, combustion chamber, compressor.
Explanation. The core engine is that which the primary airflow passes(the air that passes through the combustion chamber.The inlet is not included as the air is normally split down the bypass duct at the entrance to the compressor system.

Q. 54. The principle of jet propulsion is.
A. the calorific value of fuel burnt is equal to aircraft.
B. the interaction of fluids and gases.
C. every action has a equal and opposite reaction.
Ans.- every action has a equal and opposite reaction.
Explanation. This is Newtons Third Law.

Q. 55. Boyle's law states that, at constant temperature, if a gas is compressed.
A. its absolute pressure is proportional to its volume.
B. its absolute temperature is proportional to it's volume.
C. its absolute pressure is inversely proportional to its volume.
Ans.- its absolute pressure is inversely proportional to its volume.
Explanation. If the volume is reduced the pressure goes up.

Q. 56. What part of a jet engine has the most potential energy?.
A. Immediately after the combustion chamber.
B. Just before the combustion chamber.
C. Immediately after the HP compressor.
Ans.- Just before the combustion chamber.
Explanation. Where the fuel (unburned) is pumped in.

15.2 Engine Performance.

Q. 1. Ram effect' due to aircraft forward speed will cause the efficiency of the engine to.
A. remain constant.
B. decrease.
C. increase.
Ans.- increase.
Explanation. Ram effect improves compression ratio which improves thrust without using extra fuel Rolls Royce The Jet engine Page 219 refers.

Q. 2. The efficiency of a gas turbine engine at altitude.
A. decreases.
B. remains constant.
C. increases.
Ans.- increases.
Explanation. The compressor performs better at lower air temperatures(see Jeppersen Gas Turbines Page 2-33) thus improving thermal efficiency. Also lower air temperatures up to the tropopause assist in maintaining Propulsive Efficiency(whilst accepting that decreasing density decreases mass flow). Also note that operators fly at the tropopause whenever possible even for short flights for the best SFC.

Q. 3. Which statement is true regarding jet engines?.

A. At the higher engine speeds, thrust increases rapidly with small increases in RPM.
B. At the lower engine speeds, thrust increases rapidly with small increases in RPM.
C. The thrust delivered per pound of air consumed is less at high altitude.
Ans.- At the higher engine speeds, thrust increases rapidly with small increases in RPM.
Explanation. Jeppesen A&P Powerplant Textbook 3-43.

Q. 4. Some turboprop and turbojet engines are equipped with two spool or split compressors. When these engines are operated at high altitudes, the.

A. low pressure rotor will increase in speed as the compressor load decreases in the lower density air.
B. low pressure rotor will decrease in speed as the compressor load decreases in the lower density air.
C. throttle must be retarded to prevent overspeeding of the high pressure rotor due to the lower density air.
Ans.- low pressure rotor will increase in speed as the compressor load decreases in the lower density air.
Explanation. Jeppesen A&P Powerplant Textbook 3-18.

Q. 5. Ram effect' due to aircraft forward speed will cause the thrust of the engine to.
A. remain constant.
B. decrease.
C. increase.
Ans.- remain constant.
Explanation. Thrust is constant, but efficiency will increase.

Q. 6. With a fixed throttle, and with increased massairflow, what happens to EPR?.
A. EPR goes up.
B. EPR remains constant.
C. EPR goes down.
Ans.- EPR goes down.
Explanation. With increasing mass airflow with throttles fixed Ram pressure (Pt2) increases but the P7 pressure remains the same. Jeppesen Aircraft Gas Turbines page 12-18 refers.

Q. 7. At what stage in a gas turbine engine are gas pressures the greatest?
A. Compressor outlet.
B. Turbine outlet.
C. Compressor inlet.
Ans.- Compressor outlet.
Explanation. NIL.

Q. 8. Increasing ram effect with increased speed.

A. reduces thrust due to reduced compressor efficiency.

B. increases thrust due to increased maximum airflow.

C. reduces thrust due to reduced turbine temperature.

Ans.- increases thrust due to increased maximum airflow.
Explanation. Jepperson Gas Turbine Powerplants Page 2-35 refers.

Q. 9. The highest heat to metal contact in a jet engine is the.
A. burner cans.
B. turbine inlet guide vanes.
C. turbine blades.
Ans.- turbine inlet guide vanes.
Explanation. NIL.

Q. 10. Which compressor type gives the greatest advantages for both starting flexibility and improved high altitude performance?.
A. Single spool, axial flow.
B. Dual stage, centrifugal flow.
C. Split spool, axial flow.
Ans.- Split spool, axial flow.
Explanation. NIL.

Q. 11. Which of the following is the ultimate limiting factor of turbine engine operation?.
A. Compressor inlet air temperature.
B. Burner can pressure.
C. Turbine inlet temperature.
Ans.- Turbine inlet temperature.
Explanation. NIL.

Q. 12. At altitude, idling RPM is.
A. same as at sea level.
B. higher than at sea level.
C. lower than at sea level.
Ans.- higher than at sea level.
Explanation. Due to decreased density there is less resistance to rotation.

Q. 13. Thrust.
A. increases with high temperature.
B. increases with low temperature.
C. decreases with low temperature.
Ans.- increases with low temperature.
Explanation. Jeppesen Gas Turbine Powerplants Page 2-33 Refers.

Q. 14. Which of the following variables affect the inlet air density of a turbine engine?.
A. Altitude of the aircraft, Ambient temperature.
B. Compression ratio, Turbine inlet temperature, Altitude of the aircraft, Ambient temperature.
C. Speed of the aircraft, Compression ratio, Turbine inlet temperature,Altitude of the aircraft.
Ans.- Altitude of the aircraft, Ambient temperature.
Explanation. NIL.

Q. 15. The propulsive efficiency is.
A. low, with a low mass flow acceleration.
B. high, with a low mass flow acceleration.
C. high, with a high mass flow acceleration.
Ans.- high, with a low mass flow acceleration.
Explanation. Jeppesen Gas Turbine Powerplants Page 2-37 Refers - a large mass of air moved slowly!.

Q. 16. The RPM for maximum power would be.

A. lower on a colder day.
B. lower on a hotter day.
C. greater on a colder day.
Ans.- lower on a colder day.
Explanation. Jeppesen Gas Turbine Powerplant Page 3-16 refers.

Q. 17. How does engine thrust vary with temperature?.
A. Increase in temperature gives greater thrust because of low friction in compressors.
B. Low temperatures give low thrust.
C. Low temperature gives greater mass flow and therefore greater thrust.
Ans.- Low temperature gives greater mass flow and therefore greater thrust.
Explanation. Jeppesen Aircraft Gas Turbine Power plant Page 2-33 Refers.

Q. 18. A method of comparing engine efficiencies is by comparing.
A. fuel consumption.
B. thrust to weight ratio.
C. specific fuel consumption.
Ans.- specific fuel consumption.
Explanation. Jeppesen Aircraft Gas Turbine Power plant Page7-3 Refers.

Q. 19. With a fixed throttle in a climb.
A. RPM will increase.
B. RPM will remain constant.
C. RPM will decrease.
Ans.- RPM will increase.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-15 refers.

Q. 20. The point of maximum velocity in the engine is in the.
A. exhaust exit nozzle.
B. combustion chamber.
C. nozzle guide vanes.
Ans.- exhaust exit nozzle.
Explanation. Rolls Royce The Jet Engine page 15 refers.

Q. 21. At constant RPM, the pressure ratio of the compressor and the temperature rise across the compressor.
A. increases with height.
B. remains constant irrespective of height.
C. decrease with height.
Ans.- remains constant irrespective of height.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 3-20 refers.

Q. 22. With the aircraft stationary, propulsive efficiency.
A. depends on RPM.
B. is minimum.
C. is maximum.
Ans.- is minimum.
Explanation. Jeppesen Gas Turbine Powerplants Page 2-29 refers.

Q. 23. The efficiency of conversion of kinetic energy into propulsive work is a measure of.
A. mechanical efficiency.
B. propulsive efficiency.
C. thermal efficiency.
Ans.- propulsive efficiency.
Explanation. Jeppesen Gas Turbine Powerplants Page 2-29 refers.

Q. 24. What effect does high atmospheric humidity have on the operation of a jet engine?.
A. Decreases compressor and turbine RPM.
B. Decreases engine pressure ratio.
C. Has little or no effect.
Ans.- Has little or no effect.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-70.

Q. 25. Power is adjusted in a gas turbine engine by.

A. increasing fuel flow.
B. increasing air and fuel flow.
C. increasing airflow to the combustion chamber.
Ans.- increasing air and fuel flow.
Explanation. You cannot have extra fuel without extra air.

Q. 26. The engine rating plug.
A. is permanently connected to the E E C.
B. is connected to the EPR transmitter.
C. is permanently connected to the Engine casing.
Ans.- is permanently connected to the Engine casing.
Explanation. Jeppesen Aircraft Powerplant Page 7-21.

Q. 27. Flat Rated thrust is defined as.
A. the thrust at the ambient temperature point above which thrust drops below 100%.
B. that power achieved at idle RPM.
C. that power achieved at maximum EGT.
Ans.- the thrust at the ambient temperature point above which thrust drops below 100%.
Explanation. Jeppesen Aircraft Powerplant Page 7-34.

Q. 28. Thrust rating on an FADEC controlled engine can be changed by.
A. varying the ballast resistor in the EGT system.
B. changing the engine rating plug.
C. varying the EPR datum plug.
Ans.- changing the engine rating plug.
Explanation. Jeppesen Aircraft Powerplant Page 7-21 refers.

Q. 29. Propeller torque is analogous to.
A. engine RPM.
B. shaft horsepower.
C. propeller RPM.
Ans.- shaft horsepower.
Explanation. Propeller torque is equal and opposite to SHP under steady state conditions.

Q. 30. The total power in a turboprop engine is the.

A. SHP.
B. BHP.
C. E S HP .
Ans.- E S HP .
Explanation. E S HP = shaft horse power plus residual gas exhaust thrust.

Q. 31. In a dive, with the throttles fixed, the EPR will.

A. not change.
B. increase.
C. decrease.
Ans.- decrease.
Explanation. Jeppesen Aircraft Gas Turbines page 12-18 refers.

Q. 32. With an increase in forward speed, the engine thrust.
A. decreases slightly but recover due to ram effect.
B. increases.
C. decreases.
Ans.- decreases slightly but recover due to ram effect.

Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 2-35 refers.

Q. 33. The main factor considered when designing an engine is.
A. maximum fuel consumption.
B. maximum turbine temperature.
C. maximum tip speed.
Ans.- maximum turbine temperature.
Explanation. The turbine is the most highly stressed component in the engine.

Q. 34. To ensure an engine maintains self sustaining speed.
A. idle remains same for any density.
B. idle increases with density decrease.
C. idle increases with density increase.
Ans.- idle increases with density decrease.
Explanation. Rolls Royce The Jet Engine page 103 para 15 refers.

Q. 35. A factor that limits EGT is the.
A. jet pipe.
B. compressors.
C. turbine.
Ans.- turbine.
Explanation. Rolls Royce the Jet Engine Page 13 refers.

Q. 36. Thrust will.
A. increase at high temperatures.
B. decrease at low temperatures.
C. increase at low temperatures.
Ans.- increase at low temperatures.
Explanation. Higher density gives higher mass flow hence higher thrust.

Q. 37. Across the turbines, there is.
A. a general temperature rise.
B. a general temperature drop.
C. an isometric expansion.
Ans.- a general temperature drop.
Explanation. Rolls Royce the Jet Engine Page 15 shows a temperature decrease across the turbines due to energy extraction.

Q. 38. If the throttle position remains constant.

A. with increasing OAT, RPM and TGT will increase.
B. with decreasing OAT, RPM will increase.
C. with increasing OAT, TGT will increase.
Ans.- with increasing OAT, RPM and TGT will increase.

Explanation. As OAT increases the air is thinner RPM increases but thrust decreases due to the thin air. Extra fuel is required to increase thrust therefore TGT increases.

Q. 39. If an aircraft climbs with a fixed throttle position.
A. thrust decreases and RPM increases.
B. thrust and RPM remain the same.
C. thrust increases and RPM remains the same.
Ans.- thrust decreases and RPM increases.
Explanation. Thinner air causes thrust to decrease and the compressor to speed up.

Q. 40. Ram pressure recovery will generally take effect at aircraft speeds of.
A. mach 1.
B. mach 0.1 - 0.2.
C. only when the aircraft is stationary with engines running.
Ans.- mach 0.1 - 0.2.
Explanation. Jeppesen Gas turbine Powerplant page 3-2 refers. With the aircraft stationary and engines running intake pressure is negative. As the aircraft begins its take off run the pressure recovers to above ambient (ram recovery.

Q. 41. As the air is passed through the turbine, due to the convergent shape formed between adjacent blades.

A. pressure decreases, velocity increases, temperature increases.
B. pressure increases, velocity increases, temperature constant.
C. pressure decreases, velocity increases, temperature decreases.
Ans.- pressure decreases, velocity increases, temperature decreases.
Explanation. Rolls Royce The Jet Engine Fig 2-5-1 refers.

Q. 42. The hottest component in a gas turbine engine is.
A. the nozzle guide vanes.
B. the turbines.
C. the combustion chamber.
Ans.- the combustion chamber.
Explanation. Combustors have to withstand flame temperatures of 2000 degrees C.

Q. 43. The basic equation for thrust is.
A. thrust = force * acceleration.
B. thrust = mass * velocity.
C. thrust = mass * acceleration.
Ans.- thrust = mass * acceleration.
Explanation. Newtons second Law.

Q. 44. To maintain the selected RPM of a gas turbine at altitude.
A. the pilot will have to throttle back.
B. more fuel will automatically be added.
C. the fuel will automatically be reduced as the aircraft climbs.
Ans.- the fuel will automatically be reduced as the aircraft climbs.
Explanation. In a hydro mechanical engine the P1 capsule will sense increasing altitude and trim off the fuel.

Q. 45. The term Pb means.
A. burner pressure measured at the diffuser case.
B. burner pressure measured at the NGV.
C. burner pressure measured at the combustion chamber.
Ans.- burner pressure measured at the combustion chamber.
Explanation. Burner pressure is the static pressure in the combustor can, used in some systems to regulate fuel flow.

Q. 46. Which of the following is not an engine rating?.

A. Maximum Continuous.
B. Idle.
C. Maximum Take Off.
Ans.- Idle.
Explanation. NIL.

Q. 47. At higher then standard day ambient temperatures, compressor speed will be.
A. lower than standard day speed.
B. no different.
C. higher than standard day speed.
Ans.- higher than standard day speed.
Explanation. The air is thinner at higher temperatures, therefore the compressor has less load to work against and goes faster. RR Jet Engine Fig 2-18 refers. Note that due to the max allowable EGT the engine will reach a limiting 'corner-point thrust' and fuel will be trimmed off to prevent any over boost or over temperature

Q. 48. Ram Recovery' is a measure of.
A. intake efficiency.
B. net thrust.
C. forward air speed.
Ans.- intake efficiency.

Explanation. Ram Recovery is the ability of an intake to convert kinetic energy into useful pressure energy.

Q. 49. most likely parameter limiting the height at which a jet engine powered aircraft can operate would be insufficient.
A. lift to support the aircraft weight.
B. mass airflow to maintain 15:1 air/fuel ratio.
C. oxygen to support combustion.
Ans.- oxygen to support combustion.
Explanation. The engine will flame out with insufficient oxygen.

Q. 50. With increasing ram effect.
A. turbine temperatures decreases.
B. propulsive efficiency decreases.
C. propulsive efficiency increases.
Ans.- propulsive efficiency increases.
Explanation. Increasing Ram Effect increases the overall system pressure ratio, hence increasing propulsive efficiency.

Q. 51. Full reverse power is approximately.

A. 95% of forward thrust.
B. 75% of forward thrust.
C. 50% of forward thrust.
Ans.- 50% of forward thrust.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants page 3-52 refers.

Q. 52. The efficiency of a gas turbine would be greatest at.
A. cold temperatures.
B. low pressure.
C. hot temperatures
Ans.- cold temperatures
Explanation. Maximum thermal efficiency is achieved at the tropopause due to that being the coldest ambient temperature achievable.

Q. 53. In a gas turbine engine, turbine section.

A. temperature decreases along with pressure and velocity.
B. velocity decreases and pressure increases.
C. velocity increases and pressure decreases.
Ans.- velocity increases and pressure decreases.
Explanation. Pressure and temperature always go down in the turbine as velocity goes up.

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C. velocity increases and pressure decreases.
Ans.- velocity increases and pressure decreases.
Explanation. Pressure and temperature always go down in the turbine as velocity goes up.

Q. 54. As air density changes the RPM of a gas turbine engine will change. How is RPM kept at a constant speed?.
A. It is not.
B. Automatically by a simple engine device.
C. Manually by the pilot.
Ans.- It is not.
Explanation. Whilst maximum RPM's are limited by various devices RPM is free to wander with changing density. eg As you climb higher minimum idle will increase.

Q. 55. With fixed throttle and increasing altitude, the fan on a high by-pass engine will.
A. decrease RPM.
B. increase RPM.
C. stay the same RPM.
Ans.- increase RPM.
Explanation. NIL.

Q. 56. Through turbine rotor blades, the pressure.

A. increases, temperature increases, velocity decreases.

B. decreases, temperature and velocity decreases.
C. remains constant, temperature increases.
Ans.- decreases, temperature and velocity decreases.

Explanation. RR The Jet Engine (4th edition) fig 2-5-1 page 15 (working cycle and airflow).

Q. 57. Temperature of the mass airflow through a Gas Turbine Engine.
A. increases from the inlet, through the compressor and the diffuser into the burner, and decreases through the turbine into the exhaust.
B. increases from the inlet, through the compressor and remains constant through the diffuser and increases at the burner, and decreases through the turbine into the exhaust.

C. remains constant at the inlet, increases from the compressor and the diffuser into the burner, and decreases through the turbine into the exhaust.

Ans.- increases from the inlet, through the compressor and the diffuser into the burner, and decreases through.

Explanation. NIL.

15.3 Engine Inlet.

Q. 1. If an electrical de-icing system is operating, thrust will.
A. decrease.
B. remain constant.
C. increase.
Ans.- remain constant.
Explanation. Hot air anti icing will reduce thrust, not electrical.

Q. 2. A bellmouth compressor inlet is used on.

A. helicopters.
B. supersonic aircraft.
C. aircraft with low ground clearance.
Ans.- helicopters.
Explanation. Jepperson Gas Turbine Powerplant Page 3-5 refers.

Q. 3. Electrical de-icing operates.
A. continuously and intermittently.
B. cyclically independent of ambient air temperature.

C. cyclically dependent on ambient air temperature.
Ans.- continuously and intermittently.
Explanation. Rolls Royce The Jet Engine page 150 refers.

Q. 4. The inlet door on a variable geometry intake is open at.
A. idle speed.
B. supersonic speeds.
C. subsonic speeds.
Ans.- subsonic speeds.
Explanation. Rolls Royce The Jet Engine fig 23.9 refers.

Q. 5. Anti-ice is recommended during.
A. OAT +10°Centigrade and visible moisture.
B. thunderstorms.
C. OAT below 10°Centigrade .
Ans.- OAT +10°Centigrade and visible moisture.
Explanation. Jepperson Gas Turbine Powerplants Page 9-2 Refers.

Q. 6. A pitot intake is divergent from front to rear because it.
A. reduces ram compression.
B. produces the maximum amount of ram compression.

C. speeds up the air before it hits the compressor face.

Ans.- produces the maximum amount of ram compression.
Explanation. NIL.

Q. 7. Anti icing of jet engine air inlets is commonly accomplished by.
A. electrical heating elements located within the engine air inlet cowling.
B. electrical heating elements inside the inlet guide vanes.
C. engine bleed air ducted through the critical areas.
Ans.- engine bleed air ducted through the critical areas.

Explanation. NIL.

Q. 8. The term 'Ram Ratio' in regard to air intakes is the relationship between.
A. ambient pressure and ambient temperature.
B. ambient temperature and compressor inlet temperature.
C. ambient pressure and compressor inlet pressure.
Ans.- ambient pressure and compressor inlet pressure.

Explanation. NIL.

Q. 9. An increase in the Ram Ratio of an intake will.

A. have no effect upon the temperature of the air.
B. increase the temperature of the air.
C. decrease the temperature of the air.
Ans.- decrease the temperature of the air.
Explanation. NIL.

Q. 10. As an aircraft approaches the transonic range, the aerodynamic efficiency of a Pitot type intake.

A. increases due to the ram effect.
B. decreases due to the shock wave.

C. is not effected by forward speed.
Ans.- decreases due to the shock wave.
Explanation. NIL.

Q. 11. Inlet guide vanes are anti-iced with.

A. rubber boots.
B. thermal blankets.
C. engine bleed air.
Ans.- engine bleed air.
Explanation. Jeppesen Gas Turbine Powerplants Page 9-1 Refers.

Q. 12. Intake air turbulence.
A. decreases the efficiency of the compressor.
B. increases the efficiency of the compressor.
C. has little effect on the efficiency of the compressor.

Ans.- decreases the efficiency of the compressor.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-1 Refers.

Q. 13. What will be the effect of operating the intake anti-icing system of a gas turbine engine?.
A. A decrease in power.
B. Increased power at altitude.
C. Increased power for take off.
Ans.- A decrease in power.
Explanation. Bleeding off air from the compressor must reduce power.

Q. 14. A Pitot intake is divergent from front to rear because it.
A. produces the maximum amount of ram compression.

B. reduces ram compression and turbulence.
C. speeds up the air before it hits the compressor face.

Ans.- produces the maximum amount of ram compression.
Explanation. Rolls Royce Jet Engine Page 245 refers.

Q. 15. With an electrical ice protection system, the heating elements operate.
A. continuously.
B. part continuous - part intermittent.
C. intermittently.
Ans.- part continuous - part intermittent.
Explanation. Rolls Royce The Jet Engine Page 150 refers.

Q. 16. The purpose of a bellmouth compressor inlet is to.
A. provide an increased ram air effect at low airspeeds.

B. maximize the aerodynamic efficiency of the inlet.
C. provide an increased pressure drop in the inlet.
Ans.- maximize the aerodynamic efficiency of the inlet.

Explanation. Jeppesen A&P Technician Propulsion Textbook 5-20.

Q. 17. The vortex dissipators installed on some turbine-powered aircraft to prevent engine FOD utilize.

A. variable geometry inlet ducts.
B. variable inlet guide vanes (IGV) and/or variable first stage fan blades.
C. a stream of engine bleed air blown toward the ground ahead of the engine.
Ans.- a stream of engine bleed air blown toward the ground ahead of the engine.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-12.

Q. 18. Variable Ramp Intakes restrict airflow by.

A. diverting the airflow around the intake.
B. reducing the area of the intake.
C. creating shock-waves in the intake.
Ans.- creating shock-waves in the intake.
Explanation. Jeppesen Aircraft Powerplant Page 3-5.

Q. 19. The inlet door of a variable geometry intake at supersonic speeds will be.
A. closed.
B. open.
C. mid-Position.
Ans.- closed.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 3-5 refers.

Q. 20. When operating an engine in icing conditions, care should be taken when the.
A. temperature is below +10°Centigrade with visible moisture.
B. temperature is below 10°Centigrade.
C. temperature is below 0°Centigrade.
Ans.- temperature is below +10°Centigrade with visible moisture.

Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 9-1 refers.

Q. 21. Anti-icing for a turboprop is achieved by.

A. bleed air supply from compressor.
B. electric bonded heater mats.
C. hot oil supply from lubrication system.
Ans.- electric bonded heater mats.
Explanation. Jeppesen Aircraft Gas Turbines Powerplant Page 9-14 and RR Page 130 Fig.13-4 refers.

Q. 22. A divergent intake is.
A. divergent from front to rear.
B. convergent/divergent from front to rear.
C. divergent/convergent from front to rear.
Ans.- divergent from front to rear.
Explanation. Jeppesen Aircraft Gas Turbines Powerplant Page 3-2 refers.

Q. 23. What purpose does the nose cone serve on the(N1) fan on a high bypass engine?.
A. Streamlined fairing.
B. Reduce and straighten any turbulent air.
C. Assist in diffusing airflow.
Ans.- Streamlined fairing.
Explanation. The nose cone is fitted to the N1 fan disc streamlining the airflow into the fan.

Q. 24. A variable geometry intake at subsonic speeds.

A. jet pipe area is increased.
B. throat area is decreased.
C. throat area is increased.
Ans.- throat area is increased.
Explanation. The inlet is only reduced at mach 1.0 or above.

Q. 25. Electrical anti-ice.
A. heats oil which is distributed around engine.
B. heats elements, placed under mats around engine.

C. heats air which is distributed around engine.
Ans.- heats elements, placed under mats around engine.

Explanation. Rolls Royce The Jet Engine page 150 refers.

Q. 26. The cycling speed of the electrical de-icing mat.

A. comes in 4 speeds.
B. is not affected by weather conditions.
C. is affected by weather conditions.
Ans.- is affected by weather conditions.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 9-4 refers.

Q. 27. The variable inlet guide vanes are operated.

A. by fuel pressure.
B. electrically from cockpit.
C. using N1 fan speed.
Ans.- by fuel pressure.
Explanation. IGV's have traditionally been electrically controlled and fuel operated, within an IGV actuator.

Q. 28. The intake of a gas turbine engine is designed to.
A. protect compressor from FOD .
B. provide turbulent free air.
C. provide streamlined fairing for aircraft.
Ans.- provide turbulent free air.
Explanation. Rolls Royce The Jet engine Page 245 refers.

Q. 29. The velocity of air on entry to compressor inlet on an aircraft flying supersonic speed would be controlled at.
A. Mach 2.2.
B. Mach 1.
C. Mach 0.4.
Ans.- Mach 0.4.
Explanation. The variable ramp causes a normal shock wave to form in the intake thus Mach 1 is the maximum speed through it; however it is further slowed by diffusion in the divergent portion of the intake duct. Jeppesen a+p Technician Powerplant Textbook page 5-18.

Q. 30. If an inlet is choked then the velocity.

A. increases and pressure decreases.
B. increases and pressure increases.
C. decreases and pressure increases.
Ans.- decreases and pressure increases.
Explanation. A choked nozzle will occur as the air reaches Mach 1; hence it is forming a shock-wave in the intake.

Q. 31. In an aircraft flying at supersonic speed, to reduce the air velocity at the compressor, the variable intake.
A. exhaust jet cone area increased.
B. throat area is decreased.
C. throat area is increased.
Ans.- throat area is decreased.
Explanation. Rolls Royce The Jet Engine Page 247 refers.

Q. 32. A well designed intake will take advantage of forward speed by.
A. converting kinetic energy into pressure energy.
B. converting velocity energy into kinetic energy.
C. converting pressure energy of the air into kinetic energy.
Ans.- converting kinetic energy into pressure energy.
Explanation. This is known as Ram effect.

Q. 33. In subsonic multi-engine aircraft, a normal inlet duct will.
A. decrease and then increase in size, front to rear, along length of the duct.
B. increase in size, front to rear, along length of the duct.
C. increase and then decrease in size, front to rear, along length of the duct.
Ans.- increase in size, front to rear, along length of the duct.
Explanation. Page 3-2 Jeppesen Aircraft Gas Turbine Powerplants refers.

Q. 34. What type of intake is one that decreases gradually in area and then increases?.
A. Convergent.
B. Convergent / Divergent.
C. Divergent.
Ans.- Convergent / Divergent.
Explanation. The fixed plug supersonic intake is a con/di shaped intake.

Q. 35. In an electrical de-icing system, the main elements will be on.
A. intermittently, 8 times a minute, dependant on OAT .

B. intermittently, 4 times a minute, dependant on OAT .

C. continuously and intermittently.
Ans.- continuously and intermittently.
Explanation. Rolls Royce the Jet Engine Page 150 refers.

Q. 36. Intakes are designed to.
A. decrease the intake air pressure.
B. decelerate the free air stream flow.
C. accelerate the free air stream flow.
Ans.- decelerate the free air stream flow.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 3-2 refers.

Q. 37. The air intake for a gas turbine powered subsonic aircraft would be of.
A. convergent form.
B. divergent form.
C. convergent/divergent form.
Ans.- divergent form.
Explanation. Jeppesen Aircraft gas turbine Powerplant page 3-2 refers.

Q. 38. turboprop engine inlet anti-ice system operates.
A. continuously.
B. cyclically dependant on weather conditions.
C. cyclically independent on weather conditions.
Ans.- continuously.
Explanation. Whilst the blades may be intermittent the intake mat is on continuously.

Q. 39. What is true for a bellmouth intake?.

A. Pressure increases and velocity decreases.
B. Velocity increases and pressure decreases.
C. Pressure and velocity decrease.
Ans.- Velocity increases and pressure decreases.
Explanation. A bellmouth intake is only used on helicopters or static test beds to improve aerodynamic efficiency. It is a convergent duct therefore pressure decreases and velocity increases.

Q. 40. What is the system that breaks up ice formations on a turboprop engine nose cowl called?.

A. Nose cowl heating.
B. De-icing.
C. Anti-icing.
Ans.- De-icing.
Explanation. Whilst the nose cowl is heated (by air or oil) the question is about removing ice after it has formed so deicing is correct.

Q. 41. In a variable geometry intake, the velocity of the air on the engine compressor face is controlled by.

A. ramp and spill doors.
B. intake augmentation doors.
C. shock-wave pattern, ramp and spill doors.
Ans.- shock-wave pattern, ramp and spill doors.
Explanation. Rolls Royce The Jet Engine page 247 para 12 fig 23-9.

Module 15, GAS TURBINE ENGINE.

15.4 Engine Compressors.

Q. 1. A bypass engine LP compressor.
A. supplies less air than is required for combusti15.4 Compressors
B. supplies more air than is required for combustion.
C. supplies only the required quantity for combustion.

Ans.- supplies more air than is required for combustion.

Explanation. By definition the bypass duct sends air around the combustion chamber.

Q. 2. How does a dual axial flow compressor improve the efficiency of a turbojet engine?.

A. The velocity of the air entering the combustion chamber is increased.
B. More turbine wheels can be used.
C. Higher compression ratios can be obtained.
Ans.- Higher compression ratios can be obtained.
Explanation. Jeppesen A&P Powerplant Textbook 3-13.

Q. 3. In a reverse flow system, the last stage of an axial flow compressor is often centrifugal. This is to.

A. provide initial turning of the airflow.
B. prevent compressor surge.
C. increase the temperature rise.
Ans.- provide initial turning of the airflow.
Explanation. Rolls Royce The Jet engine Page 5 refers.

Q. 4. What are the two main functional components in a centrifugal compressor?.
A. Bucket and expander.
B. Impeller and diffuser.
C. Turbine and compressor.
Ans.- Impeller and diffuser.
Explanation. Jeppesen A&P Powerplant Textbook 3-13.

Q. 5. A bypass ratio of 5:1 indicates that the bypass flow is.
A. equal to 1/5 of the hot stream.
B. five times the hot stream.
C. five times the cold stream.
Ans.- five times the hot stream.
Explanation. Rolls Royce The Jet Engine page 16/17 refers.

Q. 6. The stator vanes in an axial-flow compressor.

A. direct air into the first stage rotor vanes at the proper angle.
B. convert velocity energy into pressure energy.
C. convert pressure energy onto velocity energy.
Ans.- convert velocity energy into pressure energy.
Explanation. Rolls Royce The Jet Engine page 25 refers.

Q. 7. What units in a gas turbine engine aid in stabilisation of the compressor during low thrust engine operations?.
A. Bleed air valves.
B. Stator vanes.
C. Inlet guide vanes.
Ans.- Bleed air valves.
Explanation. Rolls Royce The Jet Engine page 31 refers.

Q. 8. What purpose do the diffuser vanes of a centrifugal compressor serve?.
A. To convert pressure energy into kinetic energy.
B. To increase the air velocity.
C. To convert kinetic energy into pressure energy.
Ans.- To convert kinetic energy into pressure energy.
Explanation. NIL.

Q. 9. During the high RPM range on an axial flow gas turbine engine, in what position are the variable intake guide vanes and bleed valves?.
A. At maximum swirl position, bleed valves open.
B. At minimum swirl position, bleed valves closed.
C. At maximum swirl position, bleed valves closed.
Ans.- At minimum swirl position, bleed valves closed.
Explanation. Rolls Royce The Jet Engine page 29-31 refers.

Q. 10. What is the purpose of the diffuser section in a turbine engine?.
A. To convert pressure to velocity.
B. To reduce pressure and increase velocity.
C. To increase pressure and reduce velocity.
Ans.- To increase pressure and reduce velocity.

Explanation. Jeppesen A&P Powerplant Textbook 3-20.

Q. 11. The fan speed of a twin spool axial compressor engine is the same as the.
A. low pressure compressor.
B. forward turbine wheel.
C. high pressure compressor.
Ans.- low pressure compressor.
Explanation. Jeppesen A&P Powerplant Textbook 3-18.

Q. 12. Bleed valves are normally spring loaded to the.

A. closed position.
B. open position.
C. mid-position.
Ans.- open position.
Explanation. Rolls Royce The Jet Engine Page 31 refers.

Q. 13. What is the function of the stator vane assembly at the discharge end of a typical axial flow compressor?.
A. To increase air swirling motion into the combustion chambers.
B. To direct the flow of gases into the combustion chambers.
C. To straighten airflow to eliminate turbulence.
Ans.- To straighten airflow to eliminate turbulence.
Explanation. Jeppesen A&P Powerplant Textbook 3-17.

Q. 14. In a turbine engine with a dual spool compressor, the low speed compressor.
A. always turns at the same speed as the high speed compressor.
B. seeks its own best operating speed.
C. is connected directly to the high speed compressor.

Ans.- seeks its own best operating speed.
Explanation. NIL.

Q. 15. What units in a gas turbine engine aid in guiding the airflow during low thrust engine operations?.
A. Stator vanes.
B. Bleed air valves.
C. Inlet guide vanes.
Ans.- Inlet guide vanes.
Explanation. NIL.

Q. 16. What is one purpose of the stator blades in the compressor section?.
A. Increase the velocity of the airflow.
B. Stabilize the pressure of the airflow.
C. Control the direction of the airflow.
Ans.- Control the direction of the airflow.
Explanation. Jeppesen A&P Powerplant Textbook 3-17.

Q. 17. Compressor stall is caused by.
A. a low angle of attack airflow through the first stages of compression.
B. rapid engine deceleration.
C. a high angle of attack airflow through the first stages of compression.
Ans.- a high angle of attack airflow through the first stages of compression.
Explanation. NIL.

Q. 18. What is used to aid in stabilization of compressor airflow?.
A. Variable guide vanes and/or compressor bleed valves.
B. Pressurization and dump valves.
C. Stator vanes and rotor vanes.
Ans.- Variable guide vanes and/or compressor bleed valves.
Explanation. NIL.

Q. 19. What is the primary factor which controls the pressure ratio of an axial flow compressor?.
A. Compressor inlet temperature.
B. Compressor inlet pressure.
C. Number of stages in compressor.
Ans.- Number of stages in compressor.
Explanation. NIL.

Q. 20. The non-rotating axial-flow compressor airfoils in an aircraft gas turbine are known as.
A. stator vanes.
B. bleed vanes.
C. pressurization vanes.
Ans.- stator vanes.
Explanation. NIL.

Q. 21. The purpose of a bleed valve, located in the beginning stages of the compressor is to.

A. vent some of the air overboard to prevent a compressor stall.
B. control excessively high RPM to prevent a compressor stall.
C. vent high ram air pressure overboard to prevent a compressor stall.
Ans.- vent some of the air overboard to prevent a compressor stall.
Explanation. NIL.

Q. 22. During the low RPM range on an axial flow gas turbine engine, in what position are the variable intake guide vanes and bleed valves?.
A. At maximum swirl position, bleed valves open.
B. At maximum swirl position, bleed valves closed.
C. At minimum swirl position, bleed valves closed.
Ans.- At maximum swirl position, bleed valves open.
Explanation. NIL.

Q. 23. The energy changes that take place in the impeller of a centrifugal compressor are.
A. pressure decrease, velocity decrease, temperature increase.
B. pressure increase, velocity decrease, temperature increase.
C. pressure increase, velocity increase, temperature increase.
Ans.- pressure increase, velocity increase, temperature increase.
Explanation. rolls royce book page 21.

Q. 24. What is the primary advantage of an axial flow compressor over a centrifugal compressor?.
A. High frontal area.
B. Greater pressure ratio.
C. Less expensive.
Ans.- Greater pressure ratio.
Explanation. NIL.

Q. 25. Compression occurs.
A. across stators and rotors.
B. across rotors.
C. across stators.
Ans.- across stators and rotors.
Explanation. Jepperson Gas Turbine Powerplants Page 3-24 refers.

Q. 26. Which of the following can cause fan blade shingling in a turbofan engine?.
A. Large, rapid throttle movements and FOD.
B. Engine over temperature, large, rapid throttle movements and FOD.
C. Engine overspeed and large, rapid throttle movements.
Ans.- Large, rapid throttle movements and FOD.
Explanation. NIL.

Q. 27. Severe rubbing of turbine engine compressor blades will usually cause.
A. cracking.
B. bowing.
C. galling.
Ans.- galling.
Explanation. Jeppesen A&P Powerplant Textbook 4-25.

Q. 28. Which two elements make up the axial flow compressor assembly?.
A. Rotor and stator.
B. Stator and diffuser.
C. Compressor and manifold.
Ans.- Rotor and stator.
Explanation. NIL.

Q. 29. If the RPM of an axial flow compressor remains constant, the angle of attack of the rotor blades can be changed by.
A. changing the compressor diameter.
B. changing the velocity of the airflow.
C. increasing the pressure ratio.
Ans.- changing the velocity of the airflow.
Explanation. NIL.

Q. 30. The gas turbine Compressor Pressure Ratio is.

A. Compressor inlet pressure divided by Compressor discharge pressure.
B. Mass of air bypassing the combustion system divided by Mass of air going through the combustion system.
C. Compressor discharge pressure divided by Compressor inlet pressure.
Ans.- Compressor discharge pressure divided by Compressor inlet pressure.
Explanation. NIL.

Q. 31. An advantage of the centrifugal flow compressor is its high.
A. ram efficiency.
B. pressure rise per stage.
C. peak efficiency.

Ans.- peak efficiency.
Explanation. NIL.

Q. 32. The compression ratio of an axial flow compressor is a function of the.
A. number of compressor stages.
B. air inlet velocity.
C. rotor diameter.
Ans.- number of compressor stages.
Explanation. NIL.

Q. 33. Jet engine turbine blades removed for detailed inspection must be reinstalled in.
A. the same slot.
B. a specified slot 180°away.
C. a specified slot 90°away in the direction of rotation.

Ans.- the same slot.
Explanation. Jeppesen A&P Powerplant Textbook 4-25.

Q. 34. The procedure for removing the accumulation of dirt deposits on compressor blades is called.

A. the purging process.
B. the soak method.
C. field cleaning.
Ans.- field cleaning.
Explanation. NIL.

Q. 35. The two types of centrifugal compressor impellers are.
A. impeller and diffuser.
B. single entry and double entry.
C. rotor and stator.
Ans.- single entry and double entry.
Explanation. NIL.

Q. 36. Between each row of rotating blades in a compressor, there is a row of stationary blades which act to diffuse the air. These stationary blades are called.

A. stators.
B. rotors.
C. buckets.
Ans.- stators.
Explanation. NIL.

Q. 37. Bleed valves are.
A. closed at low RPM.
B. always slightly open.
C. closed at high RPM.
Ans.- closed at high RPM.
Explanation. Jeppesen Gas Turbine Powerplants Page 8-7 Refers.

Q. 38. Compressor field cleaning on turbine engines is performed primarily in order to.
A. prevent engine oil contamination and subsequent engine bearing wear or damage.
B. prevent engine performance degradation, increased fuel costs, and damage or corrosion to gas path surfaces.
C. facilitate flight line inspection of engine inlet and compressor areas for defects or FOD.
Ans.- prevent engine performance degradation, increased fuel costs, and damage or corrosion to gas path surfaces.
Explanation. NIL.

Q. 39. If the LP compressor shaft severed.
A. the LP turbine will speed up and the LP compressor will slow down.
B. the LP compressor of cruise thrust.
C. the HP compressor will slow down.
Ans.- the LP turbine will speed up and the LP compressor will slow down.
Explanation. The LP Turbine is attached to the LP compressor.

Q. 40. An advantage of a centrifugal compressor is.

A. it is dynamically balanced.
B. it is unaffected by turbulence.
C. it is robust and can stand some shock from icing-up.

Ans.- it is robust and can stand some shock from icing-up.
Explanation. Rolls Royce The Jet Engine Page 19 Refers.

Q. 41. Variable inlet guide vanes prevent.
A. compressor runaway.
B. engine flame out at high speed.
C. compressor stalling.
Ans.- compressor stalling.
Explanation. Jeppesen Gas Turbine Powerplant Page 8-1 Refers.

Q. 42. An axial flow compressor surges when.

A. later stages are stalled.
B. all stages are stalled.
C. early stages are stalled.
Ans.- all stages are stalled.
Explanation. The definition of a surge is when all stages are stalled and flow reversal occurs.

Q. 43. As a consequence of tapping air from the compressor, the TGT will.
A. fall.
B. remain constant.
C. rise.
Ans.- rise.
Explanation. When a bleed valve opens it is always accompanied by a rise in TGT of 15-30 degrees.

Q. 44. Compressor air bleeds promote the flow of air through the early stages by.
A. opening to allow air in.
B. closing.
C. opening to allow air out.
Ans.- opening to allow air out.
Explanation. Jeppesen Gas Turbine Powerplant Page 8-7 refers.

Q. 45. .Compressor blades have a reduced angle of attack at the tips.
A. to prevent turbine stall.
B. to increase the velocity.
C. to allow uniform axial velocity.
Ans.- to allow uniform axial velocity.
Explanation. Jeppesen Gas Turbine Powerplant Page 3-16 refers.

Q. 46. Compressor surge is caused by.
A. over fuelling.
B. rapid closing of the throttle.
C. prolonged engine running at high RPM.
Ans.- over fuelling.
Explanation. Jeppesen Gas Turbine Powerplant Page 3-26 refers to fuel system malfunction - over fuelling.

Q. 47. Pressure rise across a single spool axial flow compressor is in the order of.
A. four to one.
B. two to one.
C. up to fifteen to one.
Ans.- up to fifteen to one.
Explanation. Rolls Royce The Jet Engine page 15 refers.

Q. 48. What purpose do the diffuser vanes of a centrifugal compressor serve?.
A. To convert pressure energy into kinetic energy.
B. To increase the air velocity.
C. To convert kinetic energy into pressure energy.
Ans.- To convert kinetic energy into pressure energy.
Explanation. NIL.

Q. 49. The purpose of the rotating guide vanes on a centrifugal compressor is to.
A. direct the air smoothly into the impeller.
B. provide initial diffusing of the air.
C. prevent damage by solid objects.
Ans.- provide initial diffusing of the air.
Explanation. Rolls Royce The Jet Engine page 21 refers.

Q. 50. What is the surge margin of an axial flow compressor?.
A. The margin between the compressor working line and the surge line.
B. The margin between minimum and maximum pressure ratio obtained at constant RPM.
C. The margin between the stall condition and the surge condition.
Ans.- The margin between the compressor working line and the surge line.
Explanation. Rolls Royce The Jet Engine figure 3-14 refers. (See the 'safety margin').

Q. 51. The compression ratio of a jet engine is.

A. the compressor outlet pressure divided by the number of compressor stages.
B. the ratio between turbine pressure and compressor outlet pressure.
C. the ratio between compressor outlet pressure and compressor inlet pressure.
Ans.- the ratio between compressor outlet pressure and compressor inlet pressure.
Explanation. The higher the ratio the more efficient the engine.

Q. 52. Variable inlet guide vanes help to prevent.

A. compressor runaway.
B. ice build up on compressor blades.
C. compressor stalling.
Ans.- compressor stalling.
Explanation. Rolls Royce The Jet Engine page 28 refers.

Q. 53. Air through the compressor, before entering the combustion chamber, passes.
A. through divergent passage to increase the pressure.

B. through nozzles to increase the velocity.
C. through divergent passage to decrease the pressure.

Ans.- through divergent passage to increase the pressure.
Explanation. All compressor blades and stators are divergent, and all increase pressure.

Q. 54. Low mass airflow through a compressor will produce.
A. stalling of rear stages.
B. stalling of early stages.
C. no effect.
Ans.- stalling of early stages.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 3-25 refers.

Q. 55. A bleed valve.
A. relieves compressor choking at low RPM.
B. controls air intake pressure.
C. bleeds air from compressor for intake deicing.
Ans.- relieves compressor choking at low RPM.
Explanation. Rolls Royce The Jet Engine Page 29 refers.

Q. 56. If a compressor has a compression ratio of 9:1 and an intake compression of 2:1, what is the overall compression ratio?.
A. 9:1 intake compression does not add to the overall compression ratio of the system.
B. 18:1.
C. 11:1.
Ans.- 18:1.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 3-20 refers.

Q. 57. A compressor stage stalls when.
A. adiabatic temperature rise is too high.
B. compression ratio is too high.
C. smooth airflow is disrupted.
Ans.- smooth airflow is disrupted.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 3-25 refers.

Q. 58. Inlet guide vanes are fitted to.
A. control the quantity of air entering the intake.
B. guide the airflow onto the turbine rotor first stage.

C. control the angle of airflow into the compressor.
Ans.- control the angle of airflow into the compressor.

Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 3-24 refers.

Q. 59. Why, in an axial flow compressor is the cross sectional area of the compressor air duct reduced at each stage?.
A. To decrease the velocity of the air rising under pressure.
B. To maintain the velocity of the air under rising pressure.
C. To permit stronger, shorter blades to be used in the later stages.
Ans.- To maintain the velocity of the air under rising pressure.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 3-24 refers.

Q. 60. An abradable lining around the fan is to.

A. provide less leakage for anti-icing.
B. prevent fan blade tip rub.
C. strengthen the EPR value.
Ans.- strengthen the EPR value.
Explanation. Prevents fan blade tip losses.

Q. 61. Allowable damage on the first stage compressor blade is restricted to.
A. middle third of the blade to the outer edge.
B. outer third of the blade to the outer edge.
C. root end of the blade.
Ans.- middle third of the blade to the outer edge.
Explanation. Jeppesen Gas Turbine Powerplants Page 5-20 refers.

Q. 62. Tip speed of a centrifugal compressor can reach.
A. Mach 1.3.
B. Mach 1.0.

C. Mach 0.8.
Ans.- Mach 1.3.
Explanation. Jeppesen Aircraft Gas turbine Powerplant Page 3-11.

Q. 63. What is the profile of a compressor blade?.

A. A cutout that reduces blade tip thickness.
B. The leading edge of the blade.
C. The curvature of the blade root.
Ans.- A cutout that reduces blade tip thickness.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-16.

Q. 64. The resultant velocity of air exiting an axial compressor stage depends upon.
A. aircraft forward speed.
B. compressor RPM.
C. Both of the above.
Ans.- Both of the above.
Explanation. Jeppesen Aircraft Powerplant Page 3-23 Refers.

Q. 65. What is a compressor stage?.
A. One compressor rotor and one nozzle guide vane.
B. One rotor plus one stator.
C. One Nozzle Guide Vane and one rotor.
Ans.- One rotor plus one stator.
Explanation. Rolls Royce The Jet Engine Page 25 refers.

Q. 66. If the bypass ratio is 0.7:1, the 0.7 pounds of air is.
A. fed into H.P compressor compared to 1 pound fed around it.
B. fed around the engine to 1 pound fed into H.P. compressor.
C. bypassed for every 1 pound at the intake.
Ans.- fed around the engine to 1 pound fed into H.P. compressor.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 2-9 refers.

Q. 67. Advantage of an axial flow over a centrifugal flow gas turbine engine.
A. power required for starting is less.
B. low weight.
C. high peak efficiencies.
Ans.- high peak efficiencies.
Explanation. Rolls Royce The Jet engine page 21 shows how higher compression ratios (axial flow compressors) give lower SFC. Which means higher efficiency.

Q. 68. Compressor blades reduce in length.

A. from tip to root to maintain uniform velocity in compressor.
B. from L.P to H.P section to maintain uniform velocity in compressor.
C. from root to tip to maintain correct angle of attack.

Ans.- from L.P to H.P section to maintain uniform velocity in compressor.
Explanation. Rolls Royce The Jet Engine Page 22 refers.

Q. 69. Deposit build-up on compressor blades.

A. airflow is too fast for deposits to build up.
B. will not decrease efficiency but may cause corrosion.

C. can decrease compressor efficiency and cause corrosion.
Ans.- can decrease compressor efficiency and cause corrosion.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 5-4 refers.

Q. 70. The diffuser after the compressor, before the combustion chamber.
A. increases velocity, decreases pressure.
B. decreases velocity, pressure increases.
C. increases velocity, pressure remains constant.
Ans.- decreases velocity, pressure increases.
Explanation. Assuming this refers to a centrifugal compressor see figure 3-6 Rolls Royce The Jet Engine.

Q. 71. In a compressor, diffusion action takes place across.
A. rotors.
B. rotors and stators.
C. stators.
Ans.- rotors and stators.
Explanation. Stators and rotors in compressors both form divergent ducts hence they both diffuse.

Q. 72. The ring of fixed blades at the intake of an axial flow compressor are called.

A. inlet guide vanes.
B. first stage stator blades.
C. first stage diffuser blades.
Ans.- inlet guide vanes.
Explanation. The fixed IGV's precede the 1st stage rotor which is in front of the 1st stage stator.

Q. 73. What is the purpose of pressure balance seal?.

A. To ensure the location bearing is adequately loaded throughout the engine thrust range.
B. To ensure LP compressor is statically balanced.
C. To ensure HP compressor is dynamically balanced.
Ans.- To ensure the location bearing is adequately loaded throughout the engine thrust range.
Explanation. Pressure balance seals oppose the tendency of compressors to move forward.

Q. 74. The optimum air speed for entrance into the compressor is approximately.
A. same as aircraft speed.
B. Mach 0.4.
C. Mach 1.
Ans.- Mach 0.4.
Explanation. Diffusion in the intake reduces the speed to 500ft/second (about mach 0.4).

Q. 75. What is the acceptable damage on stator blades that have been blended?.
A. One third along from root to tip.
B. One third from tip to root.
C. One third chord wise.
Ans.- One third from tip to root.
Explanation. The root of the blade has tighter tolerance than the tip, and chord wise indentations are also critical so our best guess is from tip to root

Q. 76. With regard to compressor blades, which of the following is true? No damage is permissible on.

A. a shroud fillet area.
B. the lip of a blade.
C. the last third of the outboard leading edge.
Ans.- a shroud fillet area.
Explanation. Shroud fillets are critical areas whereas the outer third of the blade is less so. Unshrouded tips are also less critical than shroud fillets.

Q. 77. Identify a function of the cascade vanes in a turbojet engine compressor section.

A. To remove air swirl before the combustion chamber.

B. To direct the flow of air to strike the turbine blades at a desired angle.
C. To decrease the velocity of air to the combustor.
Ans.- To remove air swirl before the combustion chamber.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants page 3-23 describe the axial flow compressor as 'containing sets of airfoils in cascade'. It further says that the last stage of stationary vanes, called exit guide vanes turn the airflow back to an axial direction on its way to the combustor.

Q. 78. The pressure ratio can be influenced by.

A. compressor inlet temperature.
B. number of stages in compressor.
C. compressor inlet pressure.
Ans.- number of stages in compressor.
Explanation. Compressors are rated by their pressure ratio, the more stages the greater the pressure ratio.

Q. 79. Air bleed valves are.
A. closed at low RPM.
B. open at high RPM.
C. open at low RPM.
Ans.- open at low RPM.
Explanation. Air bleed valves reduce the pressure developed in a compressor until the speed is increased towards the blade design speed.

Q. 80. The compressor case annulus is.
A. convergent.
B. divergent.
C. parallel.
Ans.- convergent.
Explanation. All axial flow compressor case annulus are convergent to maintain a constant axial velocity through the compressor.

Q. 81. If the tip clearance in a centrifugal compressor is too small.
A. there would be pressure losses through leakage.
B. there is danger of seizure.
C. aerodynamic buffeting would cause vibration.
Ans.- aerodynamic buffeting would cause vibration.
Explanation. Rolls Royce The Jet Engine page 22 para 12 refers to too small a clearance setting up aerodynamic buffet.

Q. 82. A 1st stage LP compressor blade is able to continue in service if the damage is within limits, and within the.
A. middle third of blade chord-wise.
B. outer third only.
C. root section only.
Ans.- outer third only.
Explanation. Repairs across the chord or at the root are normally prohibited, outer third is the only safe answer.

Q. 83. What is meant by a compressor stage?.

A. One rotor and one stator assembly.
B. All rotors and stators.
C. One rotor and one guide vane assembly.
Ans.- One rotor and one stator assembly.
Explanation. Para 13 page 22 of Rolls Royce the Jet Engine refers.

Q. 84. What is the normal pressure rise across each compressor stage of an axial flow compressor?.

A. 1.5:1.
B. 1.2:1.
C. 5:1.
Ans.- 1.2:1.
Explanation. Para 20 page 25 of Rolls Royce the Jet Engine refers.

Q. 85. Where does compression take place as air passes through an axial flow compressor?.
A. Rotor blades.
B. Stator Blades.
C. Rotor and Stator blades.
Ans.- Rotor and Stator blades.
Explanation. Compression occurs through all stages figure 3.9 page 25 of Rolls Royce the Jet Engine refers.

Q. 86. Nozzle Guide Vane bow is an indication of.

A. engine overspeed.
B. engine overheat.
C. engine shock loading.
Ans.- engine overheat.
Explanation. Early turbines, both blades and NGV were susceptible to 'creep' -- prolonged exposure to excessive heat.

Q. 87. A build up of foreign objects and dirt on compressor blades.
A. has a large effect on compressor efficiency and may cause corrosion.
B. has no effect on the efficiency of the compressor but may cause corrosion.
C. has no effect on compressor efficiency due to the speed of rotation.
Ans.- has a large effect on compressor efficiency and may cause corrosion.
Explanation. Compressor washes are used to reduce this problem.

Q. 88. What is the purpose of the stator vanes in the compressor section of a gas turbine engine?.

A. Increase the velocity of the airflow.
B. Control direction of the airflow.
C. Prevent compressor surge.
Ans.- Control direction of the airflow.
Explanation. Rolls Royce The Jet Engine page 22 para 13.

Q. 89. In a twin spool compressor, the LP section runs at.
A. a lower RPM than the HP spool.
B. a higher RPM than the HP spool.
C. the same RPM than the HP spool.
Ans.- a lower RPM than the HP spool.
Explanation. NIL.

15.5 Combustion Section.

Q. 1. In a turbojet engine, combustion occurs at.

A. constant velocity.
B. constant volume.
C. constant pressure.
Ans.- constant pressure.
Explanation. Jepperson Gas Turbine Powerplants page 2-18 refers.

Q. 2. A tubo-annular gas turbine combustion systemconsists of.
A. a number of flame tubes in an annular air casing.
B. a number of flame tubes each with its own air casing.

C. an annular flame tube in an annular air casing.

Ans.- a number of flame tubes in an annular air casing.

Explanation. Rolls Royce book page 40 para 18.

Q. 3. In which type of turbine engine combustion chamber is the case and liner removed and installed as one unit during routine maintenance?.
A. Cannular.
B. Annular.
C. Can.
Ans.- Can.
Explanation. Jeppesen A&P Powerplant Textbook 3-23.

Q. 4. In a turboprop engine, combustion takes place at constant.
A. pressure.
B. density.
C. volume.
Ans.- pressure.
Explanation. Jeppesen A&P Powerplant Textbook 3-29.

Q. 5. The air passing through the combustion chamber is.
A. entirely combined with fuel and burned.
B. used to support combustion and to cool the engine.
C. speeded up and heated by the action of the turbines.
Ans.- used to support combustion and to cool the engine.
Explanation. NIL.

Q. 6. The air used for combustion is.
A. Primary and secondary.
B. Primary.
C. Secondary.
Ans.- Primary.
Explanation. Air through the core engine is defined as primary air.

Q. 7. Combustion chamber flame temperature is in the order of.
A. 2000°Centigrade.
B. 2000°Fahrenheit.
C. 2000°K.
Ans.- 2000°Centigrade.
Explanation. NIL.

Q. 8. Hot spots in the combustion section of a turbojet engine are possible.
A. dirty compressor blades.
B. malfunctioning fuel nozzles.
C. faulty igniter plugs.
Ans.- malfunctioning fuel nozzles.
Explanation. NIL.

Q. 9. Another name for a cannular combustion chamber is.
A. turbo-annular.
B. multiple can.
C. can-annular.
Ans.- can-annular.
Explanation. NIL.

Q. 10. Another name for a cannular combustion chamber is.
A. annular.
B. tubo-annular.
C. multiple can.
Ans.- tubo-annular.
Explanation. NIL.

Q. 11. The approximate percentage of the mass airflow taken in by the flame tube snout is.
A. 82%.
B. 8%.
C. 18%.
Ans.- 18%.
Explanation. Rolls Royce book page 36 para 6.

Q. 12. What component creates a vortex in a gas turbine flame tube?.
A. Tertiary hole.
B. Swirl vanes.
C. Cascade vanes.
Ans.- Swirl vanes.
Explanation. NIL.

Q. 13. In the combustion chamber.
A. static pressure and volume remains constant.
B. static pressure decreases slightly and volume increases.
C. static pressure and volume decreases.
Ans.- static pressure decreases slightly and volume increases.
Explanation. Jepperson Gas Turbine Powerplants Page 2-18 refers.

Q. 14. Which of the following types of combustion sections are used in aircraft turbine engines?.

A. Annular, variable, and cascade vane.
B. Multiple can, annular, and can-annular.
C. Can, multiple can, and variable.
Ans.- Multiple can, annular, and can-annular.
Explanation. NIL.

Q. 15. Secondary air in the combustion chamber is used for.
A. increasing axial velocity of gases.
B. combustion.
C. cooling.
Ans.- cooling.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-31 Refers.

Q. 16. Duplex burners have.
A. two calibrated outlets.
B. variable orifices.
C. a spring.
Ans.- two calibrated outlets.
Explanation. Rolls Royce The Jet Engine Page 116 Refers.

Q. 17. The overall air/fuel ratio of a combustion chamber can vary between.
A. 45:1 and 130:1.
B. 130:1 and 200:1.
C. 10:1 and 45:1.
Ans.- 45:1 and 130:1.
Explanation. Rolls Royce The Jet Engine page 36 refers.

Q. 18. When light-up takes place.
A. the nozzle guide vanes spread the heat to adjacent flame tubes.
B. interconnectors spread the heat to adjacent flame tubes.
C. each flame tube is isolated from its neighbours.
Ans.- interconnectors spread the heat to adjacent flame tubes.
Explanation. Rolls Royce The Jet Engine page 39 refers.

Q. 19. Why do the holes in the body of the duple burner provide air to the shroud around the burner head?.
A. To assist atomisation of the fuel at slow running.
B. To reduce burner temperature.
C. To minimise carbon formation on the burner face.
Ans.- To minimise carbon formation on the burner face.

Explanation. Rolls Royce The Jet Engine figure 10.18 refers.

Q. 20. The air passing through the combustion chamber of a jet engine is.
A. entirely combined with fuel and burned.
B. used to support combustion and to cool the engine.

C. speeded up and heated by the action of the turbines.

Ans.- used to support combustion and to cool the engine.
Explanation. Rolls Royce The Jet Engine page 37 refers.

Q. 21. A toroidal vortex is.
A. a vapour trail visible in moist air conditions.
B. a region in the combustion chamber of low velocity re-circulation.
C. a bull-nosed cowling for deflecting air from the static.

Ans.- a region in the combustion chamber of low velocity re-circulation.
Explanation. Rolls Royce The Jet Engine page 36 refers.

Q. 22. Why is it necessary to have a combustion drain system?.
A. To prevent pressure build up in the combustion chamber.
B. To prevent initial over-fuelling on start up or hot start.
C. To allow water in the combustor to drain away.
Ans.- To prevent initial over-fuelling on start up or hot start.
Explanation. Excess fuel is drained on shutdown to avoid a subsequent hot start.

Q. 23. What is a cannular combustion system?.

A. One common flame tube closed in a common air casing.

B. A set of flame tubes, each mounted in a separate air casing.
C. A set of flame tubes, enclosed in a common air casing.
Ans.- A set of flame tubes, enclosed in a common air casing.
Explanation. Also known as tubo-annular see Rolls Royce The Jet Engine page 41.

Q. 24. The flame temperature is approximately.

A. 1400°Centigrade.
B. 2000°Centigrade.
C. 500°Centigrade.
Ans.- 2000°Centigrade.
Explanation. Rolls Royce The Jet Engine page 37 refers.

Q. 25. Fuel entering the combustion chamber from an atomizer spray nozzle enters as.
A. fuel in air pulses.
B. a fuel/air mixture.
C. fuel continuously.
Ans.- a fuel/air mixture.
Explanation. Rolls Royce The Jet Engine page 117 refers.

Q. 26. An advantage of an annular combustion system is.
A. unrestricted airflow at maximum RPM.
B. diameter of engine is reduced due to the cans being smaller.
C. decrease in combustor length compared to a tubo-annular combustor of the same output.
Ans.- decrease in combustor length compared to a tubo-annular combustor of the same output.
Explanation. Rolls Royce The Jet Engine Page 40 refers.

Q. 27. How is the combustion chamber drain valve closed?.
A. By 12th stage compressor air pressure.
B. By a return spring.
C. By combustion chamber gas pressure.
Ans.- By combustion chamber gas pressure.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 7-59 refers.

Q. 28. Which statement is true regarding the air passing through the combustion section of a jet engine?.
A. Most is used for engine cooling.
B. Most is used to support combustion.
C. A small percentage is frequently bled off at this point to be used for air-conditioning and/or other pneumatic powered systems.
Ans.- Most is used for engine cooling.
Explanation. NIL.

Q. 29. How are combustion liner walls cooled in a gas turbine engine?.
A. By secondary air flowing through the combustion chamber.
B. By bleed air vented from the engine air inlet.
C. By the pattern of holes and louvers cut in the diffuser section.
Ans.- By secondary air flowing through the combustion chamber.
Explanation. NIL.

Q. 30. Dilution air is placed.
A. in the dilution zone of the combustion chamber after the primary zone.
B. in the primary zone of the combustion chamber.
C. in the swirl vanes of the combustor.
Ans.- in the dilution zone of the combustion chamber after the primary zone.
Explanation. The air cools and adds to the mass flow.

Q. 31. A Duplex burner uses.
A. small burner at low RPM and both burner at hi RPM.

B. small burner at low RPM and large burner at hi RPM.

C. both burners at low and hi RPM.
Ans.- small burner at low RPM and both burner at hi RPM.
Explanation. Jeppesen A and P Technician Powerplant Textbook 7-66.

Q. 32. The approximate percentage of the mass airflow which bypasses the flame tube snout is.

A. 8%.
B. 82%.
C. 18%.
Ans.- 82%.

Explanation. Rolls Royce The Jet Engine page 36 shows 20%.

Q. 33. Flame stabilization in a combustion chamber is achieved by.
A. the correct burner pressure.
B. the airflow pattern.
C. the correct air/fuel ratio.
Ans.- the airflow pattern.
Explanation. Rolls Royce The Jet Engine page 36 refers.

Q. 34. Fuel nozzles are cleaned.
A. with a rag and solvent.
B. in-situ with carbon solution.
C. in-situ with detergent solution.
Ans.- in-situ with detergent solution.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants page 7-54 refers.

Q. 35. When heat is added to the combustion chamber.
A. pressure increases rapidly volume remains constant.

B. pressure changes slightly and volume increases.
C. pressure rises at chamber outlet.
Ans.- pressure changes slightly and volume.
Explanation. Rolls Royce The Jet Engine page 12 figure 2-2 refers.

Q. 36. A shroud placed around fuel nozzles.

A. flakes the carbon to minimise accumulations.
B. prevents carbon build up.
C. builds up carbon deposits to assist atomisation.
Ans.- prevents carbon build up.
Explanation. Jeppesen Aircraft Gas turbine Powerplants page 7-54 refers.

Q. 37. Carbon forming on fuel spray nozzles will have the effect of.
A. increasing the combustion chamber pressure ratio.

B. producing turbulent air flow.
C. changing the fuel spray angle.
Ans.- changing the fuel spray angle.
Explanation. Carbon on the fuel nozzles will distort fuel spray flow and direction. This can cause hot spots within the combustion chamber.

Q. 38. Combustor air that is not used to support combustion.
A. will film cool the liner and dilute combustion chamber exit temperature.
B. is by-pass air.
C. is considered as the total air flow.
Ans.- will film cool the liner and dilute combustion chamber exit temperature.
Explanation. This air is known as secondary or tertiary combustor air.

Q. 39. At high rotational speed at sea level, a duple burner would be passing fuel via the.
A. main nozzle.
B. primary nozzle.
C. primary and the main nozzle.
Ans.- primary and the main nozzle.
Explanation. The duple nozzle is also called the duplex nozzle. RR the Jet Engine page 116 refers.

Q. 40. The fabricated liner of a flame tube is achieved mainly by.
A. argon arc process.
B. electric resistance welding.
C. oxyacetylene welding.
Ans.- argon arc process.
Explanation. an argon arc (T.I.G) welding is used to repair combustion liners, it is assumed that this is also the manufacturing process. can anyone confirm this with a reference.

Q. 41. Why is it necessary to have a combustion chamber drain?.
A. To allow unburnt fuel to drain away.
B. To prevent pressure build-up in the combustion chamber.
C. To allow fuel to return to LP when H.P cock is closed.

Ans.- To allow unburnt fuel to drain away.
Explanation. The residual fuel must be drained off to prevent subsequent wet starts.

Q. 42. The purpose of the swirl vanes in the combustion chamber is to produce.
A. flame re-circulation.
B. gas re-circulation.
C. adequate mixing of fuel and air.
Ans.- gas re-circulation.
Explanation. Rolls Royce The Jet Engine page 36 paragraph 7 refers to recirculating gases.

Q. 43. A vaporising burner injects fuel vapour.

A. with the airflow.
B. across the airflow.
C. against the airflow.
Ans.- against the airflow.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants page 7-55 refers.

Q. 44. A duplex burner in a gas turbine engine has 2 orifices.
A. one for water injection and one for fuel flow.
B. one for low speed conditions the second used for high speed conditions.
C. one for normal flow conditions and the 2nd one to increase the normalmaximum flow.
Ans.- one for low speed conditions the second used for high speed conditions.
Explanation. This is a most right answer. Primary flow only normally occurs only during start (low flow)

Q. 45. A combustion chamber has a.
A. convergent inlet, divergent outlet.
B. convergent inlet, convergent outlet.
C. divergent inlet, convergent outlet.
Ans.- divergent inlet, convergent outlet.
Explanation. Rolls Royce - The Jet Engine (4th edition) figure 4-1, 4-3, 4-5, 4-9, pgs 36 - 42.

15.6 Turbine Section.

Q. 1. The three main types of turbine blades are.

A. impulse, vector, and impulse-vector.
B. reaction, converging, and diverging.
C. impulse, reaction, and impulse-reaction.
Ans.- impulse, reaction, and impulse-reaction.
Explanation. Jeppesen A&P Powerplant Textbook 3-27.

Q. 2. What are the two main basic components of the turbine section in a gas turbine engine?.
A. Stator and rotor.
B. Hot and cold.
C. Impeller and diffuser.
Ans.- Stator and rotor.
Explanation. Jeppesen A&P Powerplant Textbook 3-25.

Q. 3. Turbine impulse blading forms a.
A. constant area duct.
B. divergent duct.
C. convergent duct.
Ans.- constant area duct.
Explanation. Rolls Royce - The Jet Engine (New) Page 135 diagram.

Q. 4. The turbine section.
A. increases air velocity to create thrust.
B. uses heat energy to expand and accelerate the gas flow.
C. drives the compressor section.
Ans.- drives the compressor section.
Explanation. Jeppesen A&P Powerplant Textbook 3-25.

Q. 5. Where do stress rupture cracks usually appear on turbine blades?.
A. Across the blade root, parallel to the fir tree.
B. Across the leading or trailing edge at a right angle to the edge.
C. Along the leading edge, parallel to the edge.
Ans.- Across the leading or trailing edge at a right angle to the edge.
Explanation. Jeppesen A&P Powerplant Textbook 4-25.

Q. 6. What is meant by a shrouded turbine?.

A. The turbine blades are shaped so that their ends form a band or shroud.
B. The turbine wheel has a shroud or duct which provides cooling air to the turbine blades.
C. The turbine wheel is enclosed by a protective shroud to contain the blades in case of failure.
Ans.- The turbine blades are shaped so that their ends form a band or shroud.
Explanation. Jeppesen A&P Powerplant Textbook 3-28.

Q. 7. Turbine nozzle diaphragms located on the upstream side of each turbine wheel, are used to.

A. decrease the velocity of the heated gases flowing past this point.

B. direct the flow of gases parallel to the vertical line of the turbine blades.
C. increase the velocity of the heated gases flowing past this point.
Ans.- direct the flow of gases parallel to the vertical line of the turbine blades.
Explanation. Jeppesen A&P Powerplant Textbook 3-25.

Q. 8. Reduced blade vibration and improved airflow characteristics in turbines are brought by.
A. shrouded turbine rotor blades.
B. impulse type blades.
C. fir tree blade attachment.
Ans.- shrouded turbine rotor blades.
Explanation. NIL.

Q. 9. What term is used to describe a permanent and cumulative deformation of turbine blades?.

A. Stretch.
B. Creep.
C. Distortion.
Ans.- Creep.
Explanation. NIL.

Q. 10. What is the major function of the turbine assembly in a turbojet engine?.
A. Directs the gases in the proper direction to the tailpipe.
B. Supplies the power to turn the compressor.
C. Increases the temperature of the exhaust gases.
Ans.- Supplies the power to turn the compressor.
Explanation. NIL.

Q. 11. Gas pressure through the turbine section will generally.
A. increase.
B. remain the same.
C. decrease.
Ans.- decrease.
Explanation. NIL.

Q. 12. A condition known as 'hot streaking' in turbine engines is caused by
A. a partially clogged fuel nozzle.
B. excessive fuel flow.
C. a misaligned combustion liner.
Ans.- a partially clogged fuel nozzle.
Explanation. NIL.

Q. 13. Temperature through the turbine stages generally.
A. remains the same.
B. decreases.
C. increases.
Ans.- decreases.
Explanation. NIL.

Q. 14. Shrouded blades allow.
A. smaller inlets to be used.
B. higher turbine inlet temperatures.
C. thinner more efficient blade sections to be used.
Ans.- thinner more efficient blade sections to be used.

Explanation. Jepperson Gas Turbine Powerplants Page 3-42 refers.

Q. 15. Continued and/or excessive heat and centrifugal force on turbine engine rotor blades is likely to cause.
A. galling.
B. creep.
C. profile.
Ans.- creep.
Explanation. Jeppesen A&P Powerplant Textbook 4-22.

Q. 16. N.G.V's form.
A. convergent ducts.
B. parallel ducts.
C. divergent ducts.
Ans.- convergent ducts.
Explanation. Jepperson Gas Turbine Powerplants Page 3-38 refers.

Q. 17. Dirt particles in the air going into the compressor of a turbine engine will form a coating on all but which of the following?.
A. Turbine blades.
B. Casings.
C. Inlet guide vanes.
Ans.- Turbine blades.
Explanation. NIL.

Q. 18. Reduced blade vibration and improved airflow characteristics in gas turbines are brought about by.

A. shrouded turbine rotor blades.

B. fir tree blade attachment.
C. impulse type blades.
Ans.- shrouded turbine rotor blades.
Explanation. NIL.

Q. 19. A purpose of the shrouds on the turbine blades of an axial flow engine is to.
A. reduce air entrance.
B. increase tip speed.
C. reduce vibration.
Ans.- reduce vibration.
Explanation. NIL.

Q. 20. Hot section inspections for many modern turbine engines are required.
A. on a time or cycle basis.
B. only when an over temperature or overspeed has occurred.
C. only at engine overhaul.
Ans.- on a time or cycle basis.
Explanation. NIL.

Q. 21. Why do some turbine engines have more than one turbine wheel attached to a single shaft?.

A. To facilitate balancing of the turbine assembly.
B. To extract more power from the exhaust gases than a single wheel can absorb.
C. To help stabilize the pressure between the compressor and the turbine.
Ans.- To extract more power from the exhaust gases than a single wheel can absorb.
Explanation. NIL.

Q. 22. When aircraft turbine blades are subjected to excessive heat stress, what type of failures would you expect?.
A. Bending and torsion.
B. Stress rupture.
C. Torsion and tension.
Ans.- Stress rupture.
Explanation. NIL.

Q. 23. Which of the following conditions is usually not acceptable to any extent in turbine blades?.
A. Cracks.
B. Dents.
C. Pits.
Ans.- Cracks.
Explanation. NIL.

Q. 24. The forces driving a turbine round are due to.

A. impulse only.
B. reaction only.
C. impulse and reaction.
Ans.- impulse and reaction.
Explanation. Rolls Royce The Jet Engine Page 50 Refers.

Q. 25. Nozzle guide vanes give a.
A. pressure increase, velocity decrease.
B. pressure increase, velocity increase.
C. pressure decrease, velocity increase.
Ans.- pressure decrease, velocity increase.
Explanation. Jeppesen Gas Turbine Powerplant Page 3-35 refers.

Q. 26. Shrouding of stator blade tips is to.
A. minimise vibration.
B. ensure adequate cooling.
C. prevent tip turbulence.
Ans.- minimise vibration.
Explanation. Jeppesen Gas Turbine Powerplant Page 3-43 refers.

Q. 27. Why are two or more turbine wheels coupled?.

A. To keep turbine rotor diameter small.
B. So power output is doubled.
C. To simplify dynamic balancing.
Ans.- So power output is doubled.
Explanation. Rolls Royce The Jet Engine page 45 refers.

Q. 28. Running clearance on a turbine disk is kept to a minimum to reduce.
A. temperature loss.
B. aerodynamic buffeting.
C. tip losses.
Ans.- tip losses.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-18 refers.

Q. 29. Two basic types of turbine blades are.

A. impulse and vector.
B. reaction and impulse.
C. tangential and reaction.

Ans.- reaction and impulse.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-40 refers.

Q. 30. Why are nozzle guide vanes fitted?.

A. To decrease velocity of the gas flow.
B. To increase velocity of the gas flow.
C. To increase velocity of the air flow.
Ans.- To increase velocity of the gas flow.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-38 refers.

Q. 31. A turbine disk is.
A. a disk at the core of the engine that the blades are attached to.
B. a segmented or complete shroud on blade tips that reduces leakage.
C. a shroud around the stators of the turbine.
Ans.- a disk at the core of the engine that the blades are attached to.
Explanation. The turbine blades are mounted to the disc which absorbs the centrifugal force.

Q. 32. .When carrying out a borescope the damage on turbine blades that would indicate a failure is.

A. speckling.
B. tip curl.
C. colour changes.
Ans.- tip curl.
Explanation. Jeppesen Gas Turbine Powerplants figure 5-23 page 178 and figure 5-26 page 185 refers.

Q. 33. The active clearance control system aids turbine engine efficiency by.
A. automatically adjusting engine speed to maintain a desired EPR.
B. adjusting stator vane position according to operating conditions and power requirements.
C. ensuring turbine blade to engine case clearances are kept to a minimum by controlling case temperatures.

Ans.- ensuring turbine blade to engine case clearances are kept to a minimum by controlling case temperatures.
Explanation. NIL.

Q. 34. Turbine rear struts.
A. straighten the gas flow.
B. increase the velocity of the gas flow.
C. increase the pressure of the gas flow.
Ans.- straighten the gas flow.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 3-34 refers.

Q. 35. Bowing of turbine blades indicates an.

A. over-temperature condition.
B. over-speed condition.
C. under-temperature condition.
Ans.- over-temperature condition.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 5-30 refers to bowing as part of the ageing process. Over temp is the only answer relevant to aging (temperature creep).

Q. 36. On an impulse-reaction turbine blade it is.

A. impulse at the root and reaction at the tip.
B. reaction at the root and impulse at the tip.
C. impulse and reaction all the away along the blade.
Ans.- impulse at the root and reaction at the tip.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 3-40 refers. Rolls Royce pg.50 para.10 and figure5.6 stagger angle.

Q. 37. Turbine creep effects.
A. turbine blades.
B. turbine disks.
C. N.G.Vs.
Ans.- turbine blades.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 5-28 refers.

Q. 38. Creep is.
A. not found in turbines.
B. a temporary deformation of turbine.
C. a permanent deformation of turbine.
Ans.- a permanent deformation of turbine.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 5-28 refers.

Q. 39. Creep, overall.
A. has no effect on turbine diameter.
B. increases turbine diameter.
C. decreases turbine diameter.
Ans.- increases turbine diameter.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 5-28 refers.

15.4 Compressors 15.5 Combustion Section 15.6 Turbine Section 15.7 Exhaust

Q. 40. How are turbine disks attached to the shaft in gas turbine engine?.
A. Splined.
B. Curvic couplings.
C. Bolted.
Ans.- Bolted.
Explanation. Jeppesen Aircraft gas Turbine Powerplant page 3-41 refers.

Q. 41. Fir tree turbine blade attachment locates the blade.
A. allows slight movement.
B. radially.
C. axially.
Ans.- allows slight movement.
Explanation. Rolls Royce The Jet Engine page 52 Para 19 refers.

Q. 42. Creep may occur to turbine blades due to.

A. prolonged low RPM use.
B. over-temp with excessive centrifugal loads.
C. high back pressures.
Ans.- over-temp with excessive centrifugal loads.
Explanation. Creep is irreversible Rolls Royce the Jet Engine Page 56 refers.

Q. 43. Creep may occur to turbine blades due to.

A. prolonged low RPM use.
B. over-temp with excessive centrifugal loads.
C. high back pressures.
Ans.- over-temp with excessive centrifugal loads.
Explanation. Creep is irreversible Rolls Royce the Jet Engine Page 56 refers.

Q. 44. Forces driving the turbine are due to.

A. aerodynamic lift imposing impulse on blades.
B. momentum and directional acceleration of gases.
C. expansion of gases.
Ans.- momentum and directional acceleration of gases.

Explanation. Rolls Royce The Jet Engine Page 49-50 refers.

Q. 45. Impulse turbine blades run cooler than reaction blades because.
A. impulse spin faster radially.
B. temperature drop across N.G.V is greater.
C. converging rotors increase velocity.
Ans.- temperature drop across N.G.V is greater.
Explanation. Impulse blades have total pressure drop in N.G.V's hence air is colder as it enters turbine RR Page51 refers.

Q. 46. An increase in turbine diameter is caused by.

A. prolonged high temperatures and centrifugal loads.

B. products of combustion.
C. over speed.
Ans.- prolonged high temperatures and centrifugal loads.
Explanation. This is known as creep.

Q. 47. Which of the following is most likely to occur in the turbine section of a gas turbine engine?.
A. Pitting.
B. Galling.
C. Cracking.
Ans.- Cracking.
Explanation. A turbine bearing is under great heat stress, cracking is the only possible choice here.

Q. 48. Aluminium deposits on the turbine show up as.

A. white or silver speckles.
B. white powder traces.
C. black stains.
Ans.- white or silver speckles.
Explanation. CAIPs E L/3-10 refers. It also says titanium speckles are blue or gold.

Q. 49. An impulse/reaction turbine is designed to ensure.
A. greater axial velocity at the blade root.
B. uniform axial velocity from blade root to tip.
C. greater axial velocity at the blade tip.
Ans.- uniform axial velocity from blade root to tip.
Explanation. Jeppesen Gas turbine Powerplant page 3-40 refers.

Q. 50. Excessive turbine temperatures can lead to.

A. turbine blade creep and an increase in the diameter of the turbine.
B. not a serious problem as long as engine oil pressure is within limits.
C. a serious fire risk in the engine.
Ans.- turbine blade creep and an increase in the diameter of the turbine.
Explanation. Jeppesen gas turbine Powerplant Page 5-28 discusses the causes of creep.

Q. 51. What are blue and golden deposits evidence of, on a turbine blade?.
A. Titanium.
B. Aluminium.
C. Magnesium.
Ans.- Titanium.
Explanation. Aluminium and magnesium leave white powder deposits so by elimination the answer is titanium.

Q. 52. Necking and mottling of turbine blades.

A. is due to thermal stress.
B. is formed during manufacture.
C. is due to bending when the gas hits the blades.
Ans.- is due to thermal stress.
Explanation. Necking could occur due to creep which is a function of thermal stress and centrifugal loads, and turbine blades do show signs of discolouration after use, the latter is not normally a defect.

Q. 53. Impulse blades operate cooler than reaction blades because.
A. impulse blades rotate at higher speeds.
B. the N.G.V's cool the air.
C. the airflow has a higher velocity through a impulse turbine N.G.V.
Ans.- the airflow has a higher velocity through a impulse turbine N.G.V.
Explanation. Impulse turbine N.G.Vs accelerate gases faster than their reaction counterparts therefore the pressure and temperature is reduced more in the impulse turbine.

Q. 54. During a borescope check of the H.P turbine blades.
A. dry motor the engine at minimum speed.
B. hand turn the turbine wheel.
C. attach a device to the accessory gearbox and rotate slowly.
Ans.- attach a device to the accessory gearbox and rotate slowly.
Explanation. All large GTE have a hand turning tool adaptor fitted to the accessory or high speed gearbox.

Q. 55. The turbine section of a jet engine.
A. converts dynamic pressure into mechanical energy.

B. circulates air to cool the engine.
C. extracts heat energy to drive the compressor.
Ans.- converts dynamic pressure into mechanical energy.
Explanation. The shape and size of the turbine blades determines the amount of energy extracted from the dynamic pressure of the airflow.

Q. 56. The temperature and centrifugal loads which the turbine is subjected to during normal engine operation causes.
A. fatigue failure.
B. elastic stretching.
C. creep loading.
Ans.- creep loading.
Explanation. Creep is a permanent deformation caused by high centrifugal loads at continuous high temperature.

Q. 57. Impulse-reaction turbine blades form.

A. tip half reaction, root half Impulse.
B. 1 stage impulse, 1 stage reaction.
C. tip half Impulse, root half reaction.
Ans.- tip half reaction, root half Impulse.
Explanation. Turbine blades move from impulse at the root to reaction at the tip.

Q. 58. A fir tree root.
A. allows compressor cooling air to alleviate thermal stress.
B. attaches turbine blades to the turbine disk.
C. allows individual turbine blades to be changed without engine disassembly.
Ans.- attaches turbine blades to the turbine disk.
Explanation. Rolls Royce the Jet Engine Page 52 para 19 refers.

Q. 59. The passage between adjacent nozzle guide vanes forms a.
A. convergent duct.
B. divergent duct.

C. parallel duct.
Ans.- convergent duct.
Explanation. Rolls Royce The Jet Engine page 51 paragraph 13 refers.

Q. 60. As the hot gasses flow through an impulse turbine blading, the velocity.
A. will decrease.
B. remains constant.
C. will increase.
Ans.- remains constant.
Explanation. In an 'Impulse bladed turbine' the turbine blades form parallel ducts therefore the velocity will remain constant figure 5-5 of RR the Jet Engine shows the contour of impulse turbine blades.

Q. 61. What is the normal range of turbine efficiency?.
A. 90% - 95%.
B. 70% - 85%.
C. 30% - 40%.
Ans.- 90% - 95%.
Explanation. Rolls Royce The Jet Engine page 51 Para 11 refers to 92%.

Q. 62. Turbine engine components are never manufactured by.
A. electrical resistance welding.
B. argon arc welding.
C. gas welding.
Ans.- gas welding.
Explanation. Both Argon arc and Electron beam welding are referred to in RR the Jet Engine so we assume gas welding is not used, this is probably due to carburisation of the weld.

Q. 63. How is a radial turbine driven?.
A. By impulse.
B. By change of momentum and angle of airflow.
C. By reaction.
Ans.- By change of momentum and angle of airflow.
Explanation. Radial turbines are effectively reversed centrifugal compressors.

Q. 64. Turbine disk growth is due to.
A. a permanent change in disk diameter.
B. an overall increase in blade length.
C. a build up of carbon deposits.
Ans.- a permanent change in disk diameter.
Explanation. The turbine disc does not include the blades.

Q. 65. A nozzle guide vane is.
A. hollow in construction to allow for thermal expansion.
B. hollow in construction to allow for flow of cooling air.
C. solid in construction to support the guide vane.
Ans.- hollow in construction to allow for flow of cooling air.
Explanation. Air is tapped from the H.P compressor and passed through the N.G.V to cool it.

Q. 66. A slow constant growth in a turbine blade is known as.
A. primary creep.
B. secondary creep.
C. tertiary creep.
Ans.- secondary creep.
Explanation. NIL.

15.7 Engine Exhaust.

Q. 1. The function of the exhaust cone assembly of a turbine engine is to.
A. swirl and collect the exhaust gases into a single exhaust jet.
B. collect the exhaust gases and act as a noise suppressor.
C. straighten and collect the exhaust gases into a solid exhaust jet.
Ans.- straighten and collect the exhaust gases into a solid exhaust jet.
Explanation. Jeppesen A&P Powerplant Textbook 3-20.

Q. 2. A nozzle is 'choked' when the gas flow or air flow at the throat is.
A. sonic.
B. subsonic.
C. supersonic.
Ans.- sonic.
Explanation. Rolls Royce The Jet Engine page 14; refers.

Q. 3. The struts on the exhaust cone.
A. straighten the gas flow only.

B. support the exhaust cone and straighten the gas flow.

C. support the exhaust cone only.
Ans.- support the exhaust cone and straighten the gas flow.
Explanation. NIL.

Q. 4. A nozzle is 'choked' when the engine inlet airflow is.
A. subsonic.
B. supersonic.
C. subsonic or supersonic.
Ans.- subsonic or supersonic.
Explanation. NIL.

Q. 5. What is the maximum practical angle through which the gas flow can be turned during thrust reversal?.
A. 180°.
B. 50°.
C. 135°.
Ans.- 135°.
Explanation. Rolls Royce The Jet Engine page 160 refers.

Q. 6. A supersonic duct is.
A. convergent then divergent along its length.
B. divergent then convergent along its length.
C. a convergent duct that is choked at the largest end at mach 1.
Ans.- convergent then divergent along its length.
Explanation. Visualise the exhaust nozzle of the space shuttle booster rockets.

Q. 7. Noise from the jet wake when untreated by suppression is.
A. high frequency, high decibel.
B. low frequency, low decibel.
C. low frequency, high decibel.
Ans.- low frequency, high decibel.
Explanation. Jepperson Gas Turbine Powerplants Page 3-57 refers.

Q. 8. Hot spots on the tail cone of a turbine engine are possible indicators of a malfunctioning fuel nozzle or.
A. a faulty igniter plug.
B. an improperly positioned tail cone.
C. a faulty combustion chamber.
Ans.- a faulty combustion chamber.
Explanation. NIL.

Q. 9. An exhaust cone placed aft of the turbine in a jet engine will cause the pressure in the first part of the exhaust duct to.
A. increase and the velocity to decrease.
B. decrease and the velocity to increase.
C. increase and the velocity to increase.
Ans.- increase and the velocity to decrease.
Explanation. Jeppesen A&P Powerplant Textbook 3-30.

Q. 10. A convergent-divergent nozzle.
A. requires the aircraft to be travelling at supersonic speeds.
B. makes maximum use of pressure thrust.
C. produces a type of thrust known as kinetic thrust.
Ans.- makes maximum use of pressure thrust.
Explanation. NIL.

Q. 11. The velocity of supersonic air as it flows through a divergent nozzle.
A. decreases.
B. increases.
C. is inversely proportional to the temperature.
Ans.- increases.
Explanation. NIL.

Q. 12. The Jet Pipe of a gas turbine engine.

A. protects the airframe from heat damage.
B. has an inner cone to protect the rear turbine disc.
C. is convergent in shape to increase the velocity as much as possible.
Ans.- protects the airframe from heat damage.
Explanation. NIL.

Q. 13. For what purpose is the propelling nozzle of a gas turbine engine designed?.
A. To increase the velocity and decrease the pressure of the gas stream leaving the nozzle.
B. To decrease the velocity and increase the pressure of the gas stream leaving the nozzle.
C. To increase the velocity and pressure of the gas stream leaving the nozzle.
Ans.- To increase the velocity and decrease the pressure of the gas stream leaving the nozzle.
Explanation. NIL.

Q. 14. If the exit area of the nozzle was too large, the effect is.
A. exit velocity lower causing loss of thrust.
B. will choke at a lower gas temperature.
C. exit velocity lower, negligible effect on thrust.
Ans.- exit velocity lower causing loss of thrust.
Explanation. NIL.

Q. 15. A choked nozzle.
A. increases thrust.
B. decreases thrust.
C. has no effect on the thrust.
Ans.- increases thrust.
Explanation. NIL.

Q. 16. The exhaust section is designed to.
A. increase temperature, therefore increasing velocity.

B. decrease temperature, therefore decreasing pressure.
C. impart a high exit velocity to the exhaust gases.
Ans.- impart a high exit velocity to the exhaust gases.
Explanation. NIL.

Q. 17. Reverse thrust can only be selected when the throttle is.
A. closed.
B. 75% power position.
C. open.
Ans.- closed.
Explanation. Rolls Royce The Jet Engine page 160 refers.

Q. 18. A Convergent-Divergent nozzle.
A. makes maximum use of Pressure thrust.
B. produces a type of thrust known as kinetic thrust.
C. requires the aircraft to be travelling at supersonic speeds.
Ans.- makes maximum use of Pressure thrust.
Explanation. Jeppesen Gas Turbine Powerplants Page 3-49 refers.

Q. 19. On front fan engines, to obtain thrust reversal, the.
A. hot and cold streams are reversed.
B. hot stream is reversed.
C. cold stream is reversed.
Ans.- cold stream is reversed.
Explanation. Rolls Royce The Jet Engine page 159 refers.

Q. 20. Exhaust noise can be reduced by.
A. lowering the vibration frequency.
B. increasing the mixing rate.
C. increasing the jet velocity.
Ans.- increasing the mixing rate.
Explanation. Rolls Royce The Jet Engine page 201 refers.

Q. 21. Operating thrust reversers at low ground speeds can sometimes cause.
A. sand or other foreign object ingestion, hot gas re-ingestion.
B. hot gas re-ingestion, compressor stalls.
C. sand or other foreign object ingestion, hot gas re-ingestion, compressor stalls.
Ans.- sand or other foreign object ingestion, hot gas re-ingestion, compressor stalls.
Explanation. Jeppesen A&P Technician Propulsion Textbook 6-10.

Q. 22. Thrust reversers utilizing a pneumatic actuating system, usually receive operating pressure from.

A. the engine bleed air system.
B. high pressure air reservoirs.
C. an on-board hydraulic or electrical powered compressor.
Ans.- sand or other foreign object ingestion, hot gas re-ingestion, compressor stalls.
Explanation. NIL.

Q. 23. The purpose of cascade vanes in a thrust reversing system is to.
A. turn the exhaust gases forward just after exiting the exhaust nozzle.
B. form a solid blocking door in the jet exhaust path.
C. turn to a forward direction the fan and/or hot exhaust gases that have been blocked from exiting through the exhaust nozzle.
Ans.- turn to a forward direction the fan and/or hot exhaust gases that have been blocked from exiting through the exhaust nozzle.
Explanation. NIL.

Q. 24. A convergent exhaust nozzle produces mainly.

A. momentum and pressure thrust.
B. momentum thrust.
C. pressure thrust.

Ans.- momentum thrust.
Explanation. Rolls Royce The Jet Engine Page 218.

Q. 25. The rearward thrust capability of an engine with the thrust reverser system deployed is.
A. equal to or less than its forward capability, depending on ambient conditions and system design.
B. less than its forward capability.
C. equal to its forward capability.
Ans.- less than its forward capability.
Explanation. Jeppesen A&P Technician Propulsion Textbook 6-10.

Q. 26. Which statement is generally true regarding thrust reverser systems?.
A. Engine thrust reversers on the same aircraft usually will not operate independently of each other (must all be simultaneously).
B. It is possible to move some aircraft backward on the ground using reverse thrust.
C. Mechanical blockage system design permits a deployment position aft of the exhaust nozzle only.
Ans.- It is possible to move some aircraft backward on the ground using reverse thrust.
Explanation. Jeppesen A&P Technician Propulsion Textbook 6-9.

Q. 27. What is the proper operating sequence when using thrust reversers to slow an aircraft after landing?.

A. Advance thrust levers up to takeoff position as conditions require, select thrust reverse, de-select thrust reverser, retard thrust levers to ground idle.
B. Retard thrust levers to ground idle, raise thrust reverser levers as required, and retard thrust reverser levers to ground idle.
C. Select thrust reverse, advance thrust reverser levers no higher than 75% N1, and retard thrust reverser levers to idle at approximately normal taxi speed.
Ans.- Retard thrust levers to ground idle, raise thrust reverser levers as required, and retard thrust reverser levers to ground idle.
Explanation. Jeppesen A&P Technician Propulsion Textbook 6-9.

Q. 28. Most exhaust system failures result from thermal fatigue cracking in the areas of stress concentration. This condition is usually caused by.

A. the high temperatures at which the exhaust system operates.
B. improper welding techniques during manufacture.
C. the drastic temperature change which is encountered at altitude.
Ans.- the high temperatures at which the exhaust system operates.
Explanation. NIL.

Q. 29. Thrust reversal on a high bypass engine is achieved by.
A. blocker doors.
B. clamshell configuration.
C. bucket type doors.
Ans.- blocker doors.
Explanation. RR Page 160 figure.15-2 refers but see also Jeppesen Aircraft Gas Turbine Powerplant Page 3-50.

Q. 30. If damage is found to the reverse thrust cascade vanes and they need replacing, you can.

A. replace damaged vanes with 45 degree vanes.
B. only replace vanes with new ones that have the correct part as the originals removed.
C. interchange the cascade vanes as they are interchangeable.
Ans.- only replace vanes with new ones that have the correct part as the originals removed.
Explanation. Cascade vane segments are NOT interchangeable, they all direct air at different angles.

Q. 31. When should thrust reversers be used?.

A. At low RPM and low forward speed.
B. At high RPM and high forward speed.
C. At high RPM and low forward speed.
Ans.- At low RPM and low forward speed.
Explanation. Thrust reversers cannot be actuated if the throttles are set above idle and they can only be used on the ground.

Q. 32. If the area of the nozzle was too large the effect is.
A. will 'choke' at mach 1.
B. exit velocity lower causing loss of the thrust.
C. exit velocity lower, negligible effect on thrust.
Ans.- exit velocity lower causing loss of the thrust.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 2-20 and others.

Q. 33. Lobe type exhaust noise suppressors are made from.
A. heat resistant alloy.
B. composite Material.
C. steel.
Ans.- heat resistant alloy.
Explanation. Rolls Royce The Jet Engine Page 205 refers.

Q. 34. What indication does the pilot receive that thrust reversers have deployed?.
A. An audible warning.
B. A sequence of lights.
C. A feeling of rapid deceleration.
Ans.- A sequence of lights.
Explanation. Boeing 757/767 use the word 'rev' in amber for unlocked and green for deployed on the upper EICAS screen.

Q. 35. What angle are the exhaust gasses turned through in a clamshell type thrust reverser?.

A. 180 degrees.
B. 135 degrees.
C. 45 degrees.
Ans.- 135 degrees.
Explanation. Turned through 135 degrees is 45 degrees forward, the maximum a thrust reverser of any sort turns the air forward.

Q. 36. The purpose of a propelling nozzle is to.

A. increase the velocity of the air and increase thrust.

B. decrease the velocity of the exhaust to increase static pressure.
C. direct the air onto the turbines.
Ans.- increase the velocity of the air and increase thrust.

Explanation. The convergence of the propelling nozzle in a subsonic pure jet engine is set so that max speed is just below Mach 1.

Q. 37. If a thrust reverser is deployed at lower than normal landing speed.
A. exhaust gases can be ingested into the engine.
B. the thrust reverser will be ineffective.
C. if the EGT gets too high the thrust reverser will automatically restow.
Ans.- exhaust gases can be ingested into the engine.
Explanation. Exhaust gas ingestion is a problem for thrust reverser systems when stationary or very slow.

Q. 38. The size of the exhaust section is dictated by.

A. cone or diffuser size and location.
B. size of engine only.
C. size and location of the engine.
Ans.- size and location of the engine.
Explanation. The exhaust section is of a certain diameter and can be of different lengths depending on the location of the engine within the fuselage or wing root (IE English Electric Lightning).

Q. 39. On a Clamshell door type thrust reverser. The Clamshell doors redirect the exhaust gas stream.

A. 0 degrees to the thrust line.
B. 45 degrees to the thrust line.
C. 90 degrees to the thrust line.
Ans.- 45 degrees to the thrust line.
Explanation. 45 degrees to the thrust line is an alternative to 'turned through 135 degrees'.

Q. 40. Normal gas turbine engine's exhaust duct is.

A. divergent.
B. convergent/divergent.
C. convergent.
Ans.- convergent.
Explanation. The exhaust nozzle consists of a parallel duct then the propelling nozzle which is always convergent.

Q. 41. As the air flows out at the outflow of a choked nozzle.
A. velocity increases and pressure decreases.
B. velocity and pressure decrease.
C. velocity decreases and pressure increases.
Ans.- velocity decreases and pressure increases.
Explanation. A choked nozzle has a shock wave in it and air is at Mach 1. After the shock the air must be decreased in speed and pressure is rising.

Module 15, GAS TURBINE ENGINE.

15.8 Bearings and Seals.

Q. 1. Main bearing oil seals used with turbine engines are usually what type(s)?.
A. Teflon and synthetic rubber.
B. Labyrinth and/or carbon rubbing.
C. Labyrinth and/or silicone rubber.
Ans.- Labyrinth and/or carbon rubbing.
Explanation. Jeppesen A&P Powerplant Textbook 3-5.

Q. 2. If, during inspection at engine overhaul, ball or roller bearings are found to have magnetism but otherwise have no defects, they.
A. are in an acceptable service condition.
B. cannot be used again.
C. must be degaussed before use.
Ans.- must be degaussed before use.
Explanation. Jeppesen A&P Powerplant Textbook 4-26.

Q. 3. A carbon seal has which type of sealing arrangement?.
A. Full contact with race.
B. Full contact with casing.
C. Full contact with labyrinth.
Ans.- Full contact with race.
Explanation. Rolls Royce The Jet engine page 92 refers.

Q. 4. The highest turbine bearing temperature takes place.
A. all the time.
B. at start-up.
C. at shut-down.
Ans.- at shut-down.
Explanation. On shut down the bearing looses its cooling so for short periods it may actually heat up. Can anyone confirm this with a reference?.

Q. 5. Indentations on bearing races caused by high static loads are known as.
A. fretting.
B. galling.
C. brinelling.
Ans.- brinelling.
Explanation. NIL.

Q. 6. The function of a labyrinth seal is to create.

A. a restricted leakage of air between fixed and rotating components.
B. an airtight seal between fixed and rotation components.
C. an airtight seal between fixed adjacent casing surfaces.
Ans.- a restricted leakage of air between fixed and rotating components.
Explanation. Jeppesen Gas Turbine Powerplants Page 5-36 Refers.

Q. 7. The bearings of a compressor rotor are usually.

A. ball and roller.
B. plain.
C. sintered.
Ans.- ball and roller.
Explanation. Jeppesen Gas Turbine Powerplant Page 4-49/50 refers.

Q. 8. Bearing seal failure would most probably cause.
A. high oil temperature.
B. high oil consumption.
C. low oil pressure.
Ans.- high oil consumption.
Explanation. Jeppesen Gas Turbine Powerplants Page 5-36 refers.

Q. 9. Why are oil seals pressurised?.
A. To ensure minimum oil loss.
B. To ensure oil is forced into the bearings.
C. To ensure that the oil is prevented from leaving the bearing housing.
Ans.- To ensure minimum oil loss.
Explanation. Pressurised labyrinth seals stop oil leaking out of the bearing housing between rotating shafts and stationary casing. Note that oil is always scavenged out of theses housings therefore answer c must be wrong.

Q. 10. What bearing is used to take axial loads on a main rotation shaft of a gas turbine engine?
A. Plain bearing.
B. Roller bearing.
C. Ball bearing.
Ans.- Ball bearing.

Explanation. Ball bearings absorb force in all directions. The others only do so radially.

Q. 11. Seals on a gas turbine engine restrict leakage of oil by.
A. spring pressure.
B. closely tolerated contacting components.
C. air pressure.
Ans.- air pressure.
Explanation. NIL.

Q. 12. An abradable lining in the fan case.
A. prevents fan blade tip rub.
B. produces less leakage at tips for anti-ice.
C. provides acoustic medium.
Ans.- provides acoustic medium.
Explanation. The prime purpose is to optimise fan performance, but it is also an acoustic lining.

Q. 13. Squeeze film bearings are usually found on.

A. H.P compressor section.
B. the turbine section.
C. LP compressor section.
Ans.- LP compressor section.
Explanation. Squeeze film bearings utilise the oil film to dampen radial out of balance. The largest rotor is normally going to have the largest out of balance. hence L.P compressor section is our best guess. No reference can be found.

Q. 14. Taper roller bearings accept loads in which direction?.
A. Axial loads only.
B. Radial and axial in both directions.
C. Radial and axial in one direction only.
Ans.- Radial and axial in one direction only.
Explanation. Taper rollers are only used when the axial load is low. I.E thrust bearings are not taper rollers, but ball bearings.

Q. 15. Some labyrinth seals.
A. control the outflow of air at the turbine.
B. are self lubricating.
C. are spring loaded.
Ans.- control the outflow of air at the turbine.
Explanation. Labyrinth seals can be air seals as well as oil seals.

Q. 16. The purpose of 'squeeze film' type bearing is to.
A. increase the flow of oil to the rolling element.
B. minimise the effect of vibration.
C. improve outer race cooling.
Ans.- minimise the effect of vibration.
Explanation. The film of oil acts as a buffer between the outer race and the casing.

Q. 17. In a jet engine the rotating assembly oil seals are maintained oil tight by means of.
A. a garter seal.
B. an annular expander ring.
C. air pressure.
Ans.- air pressure.
Explanation. Air pressure acts across a labyrinth seal to hold the oil in the bearing chamber.

15.9 Lubricants and Fuels.

Q. 1. Kerosene will burn effectively at an air/fuel ratio of.
A. 150:1.
B. 15:1.
C. 45:1.
Ans.- 15:1.
Explanation. NIL.

Q. 2. When using Prist or Biopor.
A. it is left and burnt with the fuel.
B. it is diluted with water to a 3-1 mix.
C. it is flushed out immediately.
Ans.- it is left and burnt with the fuel.
Explanation. Jepperson Gas Turbine Powerplants Page 7-2 refers.

Q. 3. What is D.E.R.D 2494?.
A. Oil.
B. Wide cut gasoline.
C. Kerosene.
Ans.- Kerosene.
Explanation. Jeppesen Aircraft Gas Turbine Power plant page 7-1 refers.

Q. 4. A high viscosity index means the oil viscosity.

A. will vary greatly with temperature change.
B. has a large index number.

C. will not vary greatly with temperature change.
Ans.- will not vary greatly with temperature change.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 6-2 Refers.

Q. 5. A fuel system icing inhibitor is a fuel additive which.
A. prevents both the water and the fuel freezing.
B. prevents the fuel from freezing.
C. prevents the water in the fuel freezing.
Ans.- prevents the water in the fuel freezing.
Explanation. Jeppesen Gas Turbine Powerplants Page 7-2 refers.

Q. 6. What will be the result of operating an engine in extremely high temperatures using a lubricant recommended by the manufacturer for a much lower temperature?.
A. The oil pressure will be lower than normal.
B. The oil temperature and oil pressure will be higher than normal.
C. The oil pressure will be higher than normal.
Ans.- The oil pressure will be lower than normal.
Explanation. NIL.

Q. 7. The time in seconds required for exactly 60 cubic centimeters of oil to flow through an accurately calibrated orifice at a specific temperature is recorded as a measurement of the oil's.

A. specific gravity.
B. flash point.
C. viscosity.
Ans.- viscosity.
Explanation. NIL.

Q. 8. Upon what quality or characteristic of a lubricating oil is its viscosity index based?.
A. Its rate of flow through an orifice at a standard temperature.
B. Its rate of change in viscosity with temperature change.
C. Its resistance to flow at a standard temperature as compared to high grade paraffin base oil at the same temperature.
Ans.- Its rate of change in viscosity with temperature change.
Explanation. NIL.

Q. 9. Compared to reciprocating engine oils, the types of oils used in turbine engines.
A. are required to carry and disperse a higher level of combustion by-products.
B. have less tendency to produce lacquer or coke.
C. may permit a somewhat higher level of carbon formation in the engine.
Ans.- have less tendency to produce lacquer or coke.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-25.

Q. 10. If all other requirements can be met, what type of oil
should be used to achieve theoretically perfect engine lubrication?.
A. An oil that combines high viscosity and low demulsibility.
B. The thinnest oil that will stay in place and maintain a reasonable film strength.
C. An oil that combines a low viscosity index and a high neutralization number.
Ans.- The thinnest oil that will stay in place and maintain a reasonable film strength.
Explanation. NIL.

Q. 11. In addition to lubricating (reducing friction between moving parts), engine oil performs what functions?.
A. Cools, seals, prevents corrosion.
B. Cools, seals, prevents corrosion, cushions shock loads.
C. Cools and seals.
Ans.- Cools, seals, prevents corrosion, cushions shock loads.
Explanation. NIL.

Q. 12. The viscosity of a liquid is a measure of its.

A. weight, or density.
B. rate of change of internal friction with change in temperature.
C. resistance to flow.
Ans.- resistance to flow.
Explanation. NIL.

Q. 13. Which of the following factors helps determine the proper grade of oil to use in a particular engine?.

A. Adequate lubrication in various attitudes of flight.
B. Operating speeds of bearings.
C. Positive introduction of oil to the bearings.

Ans.- Operating speeds of bearings.
Explanation. NIL.

Q. 14. Specific gravity is a comparison of the weight of a substance to the weight of an equal volume of.

A. oil at a specific temperature.
B. mercury at a specific temperature.
C. distilled water at a specific temperature.
Ans.- distilled water at a specific temperature.
Explanation. NIL.

Q. 15. What advantage do mineral base lubricants have over vegetable oil base lubricants when used in aircraft engines?.
A. Cooling ability.
B. Chemical stability.
C. Friction resistance.
Ans.- Chemical stability.
Explanation. NIL.

Q. 16. High tooth pressures and high rubbing velocities, such as occur with spur type gears, require the use of.
A. an E.P lubricant.
B. metallic ash detergent oil.
C. straight mineral oil.
Ans.- an E.P lubricant.
Explanation. NIL.

Q. 17. Which of these characteristics is desirable in turbine engine oil?.
A. High volatility.
B. High flash point.
C. Low flash point.
Ans.- High flash point.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-25.

Q. 18. What action is taken to protect integral fuel tanks from corrosion due to micro biological contamination?.
A. Rubber liners are installed in the tank.
B. A biocidal additive is added to the fuel.
C. The inside of the tank is coated with yellow chromate.
Ans.- A biocidal additive is added to the fuel.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 7-2 refers.

Q. 19. What should be checked/changed to ensure the validity of a turbine engine performance check if an alternate fuel is to be used?.
A. Maximum RPM adjustment.
B. Fuel specific gravity setting.
C. EPR gauge calibration.
Ans.- Fuel specific gravity setting.
Explanation. NIL.

Q. 20. Kerosene is used as turbine engine fuel because.
A. kerosene has more heat energy per gallon and lubricates fuel system components.
B. kerosene has very high volatility which aids in ignition and lubrication.
C. kerosene does not contain any water.
Ans.- kerosene has more heat energy per gallon and lubricates fuel system components.
Explanation. NIL.

Q. 21. Calorific value is the.
A. amount of heat or energy in one pound of fuel.
B. vaporisation point of fuel.
C. fuel boiling temperature.
Ans.- amount of heat or energy in one pound of fuel.
Explanation. Measured in M.J/Kg or BTU/Lb.

Q. 22. The specific gravity of fuel affects.
A. thrust rating.
B. aircraft range.
C. engine efficiency.
Ans.- aircraft range.
Explanation. Greater Density for a fixed volume equals greater weight of fuel - hence greater range.

Q. 23. Oil used in a gas turbine engine is usually.

A. mineral.
B. natural.
C. synthetic.
Ans.- synthetic.
Explanation. Rolls Royce the Jet Engine Page 83 refers.

Q. 24. An oil spectroscope measures.
A. contaminants suspended in the oil.
B. S.G. of the oil.
C. contaminants in the surface of the oil.
Ans.- contaminants suspended in the oil.

Explanation. See Jeppesen Aircraft Gas Turbines Page 6-2 for oil sampling by spectrometer analysis.

Q. 25. Ignition of fuel depends upon.
A. volatility.
B. atomisation.
C. both volatility and atomisation.
Ans.- both volatility and atomisation.
Explanation. A volatile fuel will vapourise more easily. if it is a low volatility fuel (Jet-A1 etc)then the fuel is atomised through spray nozzles into the combustion chamber.

Q. 26. Kerosene is used instead of gasoline because.

A. kerosene is highly volatile and has good lubrication qualities.
B. Kerosene is less volatile and has good lubrication properties.
C. kerosene has a higher volatility than gasoline and has good lubrication abilities.
Ans.- Kerosene is less volatile and has good lubrication properties.
Explanation. Kerosene is a more stable fuel for storage and handling.

Q. 27. If the specific gravity of a fuel is increased, the weight of a tank of fuel will.
A. decrease.
B. remain the same.
C. increase.
Ans.- increase.
Explanation. SG = Weight of fuel relative to water.

Q. 28. Reid vapour pressure, is the vapour pressure exerted by a fuel when heated to.
A. 38°C.
B. 48°C.
C. 15°C.
Ans.- 38°C.
Explanation. Rolls Royce The Jet Engine page 118 para 113.

15.10 Lubrication Systems.

Q. 1. The oil pressure in the cooler is.
A. same as the fuel pressure.
B. lower than the fuel pressure.
C. higher than the fuel pressure.
Ans.- higher than the fuel pressure.
Explanation. NIL.

Q. 2. When rotating, the gear type oil pump.

A. draws oil into the pump and carries it round between the gear teeth and casing.
B. draws oil into the pump and through the intermeshing gears to the outlet.
C. draws oil into the pump, half being carried around between pump and casing, the other half passing between the gears to the outlet.
Ans.- draws oil into the pump and carries it round between the gear teeth and casing.
Explanation. NIL.

Q. 3. A scavenge filter is incorporated in a gas turbine lubrication system to.
A. protect the scavenge pump.
B. protect the oil cooler.
C. protect the pressure pump.
Ans.- protect the pressure pump.
Explanation. RR The Jet Engine (New Edition) Page 181.

Q. 4. The working fluid of a constant speed drive (C.S.D) is.
A. from separate tank.
B. within the unit.
C. taken from the engine lubrication system.
Ans.- within the unit.
Explanation. C.S.Ds and I.D.Gs have their own self contained oil system.

Q. 5. What is the possible cause when a turbine engine indicates no change in power setting parameters, but oil temperature is high?.
A. High scavenge pump oil flow.
B. Turbine damage and/or loss of turbine efficiency.
C. Engine main bearing distress.
Ans.- Engine main bearing distress.
Explanation. NIL.

Q. 6. How is engine oil usually cooled?.
A. By a fuel/oil cooler.
B. By ram air.
C. By bleed air.
Ans.- By a fuel/oil cooler.
Explanation. Jeppesen Gas Turbine Powerplants Page 6-25 Refers.

Q. 7. What filters are used to protect oil pressure spray jets?.
A. Felt/paper filters.
B. In-line thread filters.
C. Micronic filters.
Ans.- In-line thread filters.
Explanation. RR book page 82 states that thread type filters are used as last chance filters.

Q. 8. The chip detector in the oil system is a.

A. window in the pump casing.
B. window in the oil pump.
C. magnetic plug in the return line.
Ans.- magnetic plug in the return line.
Explanation. Jeppesen Gas Turbine Powerplant Page 6-26 refers.

Q. 9. When rotating, the gyroter type oil pump.

A. oil is drawn into the pump and through the intermeshing gears to the outlet.
B. oil is drawn into the pump, half being carried around between pump and casing, the other half passing between the gears to the outlet.
C. draws oil into the pump and carries it round between the gear teeth and casing.
Ans.- draws oil into the pump and carries it round between the gear teeth and casing.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 6-14 Refers.

Q. 10. Oil picks up the most heat from which of the following turbine engine components?.
A. Compressor bearing.
B. Rotor coupling.
C. Turbine bearing.
Ans.- Turbine bearing.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-31.

Q. 11. In a jet engine which uses a fuel oil heat exchanger, the oil temperature is controlled by a thermostatic valve that regulates the flow of.

A. both fuel and oil through the heat exchanger.
B. oil through the heat exchanger.
C. fuel through the heat exchanger.
Ans.- oil through the heat exchanger.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-32.

Q. 12. What is the purpose of the last chance oil filters?.
A. To filter the oil immediately before it enters the main bearings.
B. To assure a clean supply of oil to the lubrication system.
C. To prevent damage to the oil spray nozzle.
Ans.- To prevent damage to the oil spray nozzle.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-30.

Q. 13. Which of the following is a function of the fuel oil heat exchanger on a turbojet engine?.
A. Aerates the fuel.
B. Emulsifies the oil.
C. Increases fuel temperature.
Ans.- Increases fuel temperature.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-32.

Q. 14. At cruise RPM, some oil will flow through the relief valve of a gear type engine oil pump. This is normal as the relief valve is set at a pressure which is.

A. higher than pressure pump capabilities.
B. lower than the pressure pump capabilities.
C. lower than the pump inlet pressure.
Ans.- lower than the pressure pump capabilities.
Explanation. NIL.

Q. 15. What will happen to the return oil if the oil line between the scavenger pump and the oil cooler separates?.
A. Oil will accumulate in the engine.
B. The scavenger return line check valve will close and force the oil to bypass directly to the intake side of the pressure pump.
C. The return oil will be pumped overboard.
Ans.- The scavenger return line check valve will close and force the oil to bypass directly to the intake side of the pressure pump.
Explanation. NIL.

Q. 16. The oil dampened main bearing utilized in some turbine engines is used to.
A. dampen surges in oil pressure to the bearings.

B. provide lubrication of bearings from the beginning of starting rotation until normal oil pressure is established.

C. provide an oil film between the outer race and the bearing housing in order to reduce vibration tendencies in the rotor system, and to allow for slight misalignment.
Ans.- provide an oil film between the outer race and the bearing housing in order to reduce vibration tendencies in the rotor system, and to allow for slight misalignment.
Explanation. NIL.

Q. 17. After making a welded repair to a pressurized type turbine engine oil tank, the tank should be pressure checked to.
A. not less than 5 PSI plus the maximum operating pressure of the tank.
B. not less than 5 PSI plus the average operating pressure of the tank.
C. 5 PSI.
Ans.- not less than 5 PSI plus the maximum operating pressure of the tank.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-37.

Q. 18. Possible failure related ferrous metal particles in turbine engine oil cause an (electrical) indicating type magnetic chip detector to indicate their presence by.

A. bridging the gap between the detector center (positive) electrode and the ground electrode.
B. generating a small electric current that is caused by the particles being in contact with the dissimilar metal of the detector tip.
C. disturbing the magnetic lines of flux around the detector tip.
Ans.- bridging the gap between the detector center (positive) electrode and the ground electrode.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-33.

Q. 19. What would be the probable result if the oil system pressure relief valve should stick in the open position on a turbine engine?.
A. Increased oil pressure.
B. Decreased oil temperature.
C. Insufficient lubrication.
Ans.- Decreased oil temperature.
Explanation. NIL.

Q. 20. What is the primary purpose of the oil to fuel heat exchanger?.
A. De aerate the oil.
B. Cool the oil.
C. Cool the fuel.
Ans.- Cool the oil.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-32.

Q. 21. Low oil pressure can be detrimental to the internal engine components. However, high oil pressure.
A. has a negligible effect.
B. will not occur because of pressure losses around the bearings.
C. should be limited to the engine manufacturer's recommendations.
Ans.- should be limited to the engine manufacturer's recommendations.
Explanation. NIL.

Q. 22. What is the primary purpose of the oil breather pressurization system that is used on turbine engines?.

A. Prevents foaming of the oil.
B. Allows aeration of the oil for better lubrication because of the air/oil mist.
C. Provides a proper oil spray pattern from the main bearing oil jets.
Ans.- Prevents foaming of the oil.
Explanation. NIL.

Q. 23. What type of oil system is usually found on turbine engines?.
A. Dry sump, dip, and splash.
B. Dry sump, pressure, and spray.
C. Wet sump, spray, and splash.
Ans.- Dry sump, pressure, and spray.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-26.

Q. 24. How are the teeth of the gears in the accessory section of an engine normally lubricated?.
A. By surrounding the load bearing portions with baffles or housings within which oil pressure can be maintained.
B. By splashed or sprayed oil.
C. By submerging the load bearing portions in oil.
Ans.- By splashed or sprayed oil.
Explanation. NIL.

Q. 25. Manufacturers normally require turbine engine oil servicing within a short time after engine shutdown primarily to.
A. prevent over servicing.
B. help dilute and neutralize any contaminants that may already be present in the engine's oil system.
C. provide a better indication of any oil leaks in the system.
Ans.- prevent over servicing.
Explanation. Jeppersen A&P Technician Powerplant Book Page 9-36.

Q. 26. In order to relieve excessive pump pressure in an engine's internal oil system, most engines are equipped with a.
A. vent.
B. relief valve.
C. bypass valve.
Ans.- relief valve.
Explanation. NIL.

Q. 27. The type of oil pumps most commonly used on turbine engines are classified as.
A. positive displacement.
B. constant speed.
C. variable displacement.
Ans.- positive displacement.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-28.

Q. 28. If the oil in the oil cooler core and annular jacket becomes congealed, what unit prevents damage to the cooler?.
A. Oil pressure relief valve.
B. Airflow control valve.
C. Surge protection valve.
Ans.- Oil pressure relief valve.
Explanation. NIL.

Q. 29. What will result if an oil filter becomes completely blocked?.
A. Oil flow to the engine will stop.
B. Oil will flow at the normal rate through the system.

C. Oil will flow at a reduced rate through the system.
Ans.- Oil will flow at the normal rate through the system.
Explanation. NIL.

Q. 30. A turbine engine dry sump lubrication system of the self contained, high pressure design.
A. stores oil in the engine crankcase.
B. has no heat exchanger.
C. consists of pressure, breather, and scavenge subsystems.
Ans.- consists of pressure, breather, and scavenge subsystems.
Explanation. NIL.

Q. 31. What is the primary purpose of the hopper located in the oil supply tank of some dry sump engine installations?.
A. To reduce the time required to warm the oil to operating temperatures.
B. To impart a centrifugal motion to the oil entering the tank so that the foreign particles in the oil will separate more readily.
C. To reduce surface aeration of the hot oil and thus reduce oxidation and the formation of sludge and varnish.
Ans.- To reduce the time required to warm the oil to operating temperatures.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-11.

Q. 32. What determines the minimum particle size which will be excluded or filtered by a cuno type (stacked disc, edge filtration) filter?.
A. Both the number and thickness of the discs in the assembly.
B. The spacer thickness.
C. The disc thickness.
Ans.- The spacer thickness.
Explanation. Jeppesen A&P Technician Propulsion Textbook 9-17.

Q. 33. A full flow oil system has.
A. a single fixed minimum oil pressure.
B. a variable oil pressure dependant upon throttle setting.
C. a hot and cold oil pressure limit.
Ans.- a variable oil pressure dependant upon throttle setting.
Explanation. This system does not have a pressure regulating valve, only a max pressure relief valve for safety purposes.

Q. 34. A felt filter in an oil lubrication system should be.
A. removed and cleaned in M.E.K.

B. removed and replaced with a new filter element.
C. removed and cleaned in a container of lead free petrol.
Ans.- removed and replaced with a new filter element.

Explanation. Jeppesen Aircraft Gas Turbines Powerplant page 6-14 refers.

Q. 35. What filter is used in a oil scavenge pump in the inlet side of the pump?.
A. Wire wound filter.
B. Threaded filter.
C. Wire mesh filter.
Ans.- Wire mesh filter.
Explanation. Rolls Royce The Jet engine page 82 refers to a coarse strainer fatted to the inlet of oil pumps. Wire mesh is considered to be the same thing.

Q. 36. A vane type oil pump output is controlled by.

A. outlet pressure against spring pressure.
B. outlet pressure controlling servo.
C. output pressure controlling plate angle.
Ans.- outlet pressure against spring pressure.
Explanation. Jeppesen Aircraft gas Turbine Powerplants page 6-10 refers.

Q. 37. The sump in a dry sump oil system.
A. is used as a collecting point only.
B. houses all the engine oil.
C. provides lubrication for the main bearings.
Ans.- is used as a collecting point only.
Explanation. Dry sumps are scavenged back to the reservoir.

Q. 38. A jet engine gear box breather is prevented from leaking oil to atmosphere by the action of.

A. air or oil valve.
B. oil thrower ring and centrifugal force.
C. impeller and centrifugal force.
Ans.- impeller and centrifugal force.
Explanation. Refer to page 81 Rolls Royce The Jet Engine for a diagram of a gearbox centrifugal breather.

Q. 39. The air-cooled-oil-cooler has an anti-surge valve in order to.
A. protect the cooler.
B. restrict the engine max oil pressure.
C. stop oil draining from the system when the cooler is removed.
Ans.- protect the cooler.
Explanation. The term anti surge valve is unusual, an oil pressure relief bypass valve is a better description.

Q. 40. A thread type oil seal in a lubrication system.

A. screws oil back into the bearing sump when the shaft rotates
B. has a thread on a stationary portion to prevent fluid leaks.
C. only seals when stationary.
Ans.- has a thread on a stationary portion to prevent fluid leaks.
Explanation. This is a type of labyrinth seal, see page 92 of The Jet Engine.

Q. 41. The oil system generally used on most modern turboprop engines is.
A. dry sump type.
B. wet sump type.
C. A low pressure system.
Ans.- dry sump type.
Explanation. The oil is contained in a separate oil tank.

Q. 42. A spur gear pump operating in a lubrication system promotes.
A. high flow at low pressure.
B. low flow at low pressure.
C. low flow at high pressure.
Ans.- low flow at high pressure.
Explanation. NIL.

Q. 43. Last chance' filters in a lubrication system are serviced during.
A. line maintenance.
B. routine oil change.
C. engine overhaul.
Ans.- engine overhaul.
Explanation. NIL.

Q. 44. The identification of a lubrication fluid line is the word 'lubrication'.
A. followed by a caution.
B. followed by squares.
C. followed by circles.

Ans.- followed by squares.
Explanation. NIL.

15.11 Fuel Systems.

Q. 1. If the swash plate of a positive displacement swash plate pump is perpendicular to the axis of the pump, the flow will be.
A. reversed.
B. zero.
C. maximum.
Ans.- zero.
Explanation. NIL.

Q. 2. What moves the swash plate away from the minimum stroke position?.
A. Reduced inlet pressure.
B. A spring.
C. Increased servo pressure.
Ans.- A spring.
Explanation. NIL.

Q. 3. The burner fuel flow is at maximum at.

A. 10°Centigrade above I.S.A. sea level.
B. I.S.A. sea level.
C. altitude.
Ans.- I.S.A. sea level.
Explanation. NIL.

Q. 4. How is servo pressure, which is used to control fuel pump 'Swash Plate' angle obtained?.
A. From pump delivery pressure through variable restrictions.
B. From pump delivery pressure through fixed restrictions.
C. From pump inlet pressure through fixed restrictions.

Ans.- From pump delivery pressure through variable restrictions.
Explanation. NIL.

Q. 5. What would be the effect on the engine if the B.P.C half ball valve in the servo line sticks open?.

A. A reduction of fuel flow, therefore a decrease in RPM .
B. The B.P.C would be ineffective at sea level only.
C. An increase of fuel flow, therefore an increase in RPM .
Ans.- An increase of fuel flow, therefore an increase in RPM .
Explanation. NIL.

Q. 6. Why is an A.C.U fitted to a gas turbine engine?.

A. It increases the rate of acceleration of the engine.
B. It controls the operation of the metering block during sudden acceleration.
C. It limits the rate of increase in fuel flow during sudden acceleration.
Ans.- It limits the rate of increase in fuel flow during sudden acceleration.
Explanation. NIL.

Q. 7. If fuel pump servo pressure is reduced, pump output will.
A. increase.
B. decrease.
C. remain constant.
Ans.- decrease.
Explanation. Old RR book Page 100 figure.10-5.

Q. 8. Why is the B.P.C fitted in a gas turbine engine fuel system?.
A. To vary pressure pump output in relation to the pressure variation at the intake.
B. To proportion the fuel flow between primary and main burner lines.
C. To decrease the fuel flow to the burners with increased air intake pressure.
Ans.- To vary pressure pump output in relation to the pressure variation at the intake.
Explanation. NIL.

Q. 9. What must be done after the fuel control unit has been replaced on an aircraft gas turbine engine?.

A. You must recalibrate the fuel nozzles.
B. You must retrim the engine.
C. You must perform a full power engine run to check fuel flow.
Ans.- You must retrim the engine.
Explanation. Jeppesen A&P Powerplant Textbook 4-12.

Q. 10. A kinetic valve is a device used to control H.P pump output. This is achieved by movement of a.

A. needle valve.
B. diaphragm and half ball valve.
C. knife blade.
Ans.- knife blade.
Explanation. NIL.

Q. 11. Specific fuel consumption at altitude will.

A. decrease.
B. remain constant.
C. increase.
Ans.- increase.
Explanation. NIL.

Q. 12. During any stabilised running condition, the spill or half ball valve is.
A. lightly seated.
B. closed fully.
C. open fully.
Ans.- lightly seated.
Explanation. NIL.

Q. 13. What is the purpose of the attenuator fitted between the H.P fuel pump and the B.P.C in a fuel system?.
A. It restricts the pressure feed top the B.P.C.
B. It ensures a supply of fuel free from foreign matter to the BC half ball valve.
C. It damps out pulsations in the fuel delivery to the B.P.C.
Ans.- It damps out pulsations in the fuel delivery to the B.P.C.
Explanation. NIL.

Q. 14. Why is the hydromechanical governor fitted to a gas turbine engine fuel pump?.
A. To enable the engine to operate over a wide range of fuel SGs.
B. To enable efficient control of fuel flow to be maintained at altitude.
C. To enable the engine to operate over a wide range of fuel flow.
Ans.- To enable the engine to operate over a wide range of fuel SGs.
Explanation. NIL.

Q. 15. A barometric Pressure Controller controls.

A. barometric pressure.
B. fuel flow to suit atmospheric pressure changes.
C. fuel tank pressure at altitude.
Ans.- fuel flow to suit atmospheric pressure changes.
Explanation. NIL.

Q. 16. Kinetic valves are used because.
A. they are less likely to leak.
B. they are more sensitive.
C. they are not subjected to wear.
Ans.- they are more sensitive.
Explanation. NIL.

Q. 17. When considering a centrifugal type engine speed governor, an increase in fuel S.G. will cause.

A. no change in maximum RPM .
B. an increase in maximum RPM .
C. a reduction in maximum RPM .
Ans.- a reduction in maximum RPM .
Explanation. NIL.

Q. 18. On a FADEC engine.
A. A channel uses control alternator and B channel uses aircraft bus power.
B. A channel uses a separate winding of the control alternator to B channel.
C. A and B channel use the same phases of the motor.

Ans.- A channel uses a separate winding of the control alternator to B channel.
Explanation. Jepperson Gas Turbine Powerplant Page 7-22 refers.

Q. 19. Normal fuel/air ratio for successful combustion is.
A. 15:1.
B. 25:1.
C. 10:1.
Ans.- 15:1.
Explanation. Jepperson Gas Turbine Powerplants Page 3-32.

Q. 20. Which of the following influences the operation of an automatic fuel control unit on a turbojet engine?.
A. Exhaust gas temperature.
B. Mixture control position.

C. Burner pressure.
Ans.- Burner pressure.
Explanation. Jeppesen A&P Powerplant Textbook 7-63.

Q. 21. What is the purpose of the L.P. pump?.

A. To ensure rapid acceleration when the throttle is opened.
B. To prevent cavitation of the H.P Fuel pump.
C. To ensure the engine will continue to run if the H.P. fuel pump fails.
Ans.- To prevent cavitation of the H.P Fuel pump.
Explanation. NIL.

Q. 22. The fuel pump plungers are lubricated by.

A. synthetic anti-freeze oil.
B. grease packed bearings.
C. the Fuel.
Ans.- the Fuel.
Explanation. NIL.

Q. 23. Which forces control the maximum RPM governor in a non-hydromechanical swashplate type of pump?.
A. Rotor centrifugal pressure opposed to tension spring loading.
B. Rotor centrifugal pressure plus tension spring loading opposed to pump delivery pressure.
C. Rotor centrifugal pressure plus tension spring loading opposed to pump inlet pressure.
Ans.- Rotor centrifugal pressure opposed to tension spring loading.
Explanation. NIL.

Q. 24. Why do the holes in the body of the duple burner provide air to the shroud around the burner head?.
A. To reduce burner temperature.
B. To assist atomisation of the fuel at slow running.
C. To minimise carbon formation on the burner face.
Ans.- To minimise carbon formation on the burner face.

Explanation. NIL.

Q. 25. A fuel heater prevents.
A. Neither.
B. LP filter icing.
C. H.P filter icing.
Ans.- LP filter icing.
Explanation. Jepperson Gas Turbine Powerplants Page 7-45 refers.

Q. 26. On a FADEC engine the E.E.C.
A. has electronic control of the hydro-mechanical fuel control in some modes.
B. has mechanical control of the hydro-mechanical fuel control system.
C. has electronic control of the hydro-mechanical fuel control unit in all modes.
Ans.- has electronic control of the hydro-mechanical fuel control unit in all modes.
Explanation. Jepperson Gas Turbine Powerplants Page 7-20 refers.

Q. 27. During normal running conditions, combustion is.
A. continuously supported by ignition.
B. self supporting.
C. intermittently supported by ignition.
Ans.- self supporting.
Explanation. NIL.

Q. 28. On a FADEC engine, the channel reset.

A. always selects A channel.
B. selects B channel.
C. selects standby which becomes active on the next start.
Ans.- selects standby which becomes active on the next start.
Explanation. CF6-80 C2 FADEC Engine Course notes refer.

Q. 29. With a decrease in fuel SG, what is the result when the engine is fitted with an uncompensated fuel governor?.
A. No effect.
B. Maximum RPM decrease.
C. Maximum RPM increase.
Ans.- Maximum RPM increase.
Explanation. Rolls Royce Para 103 Page 116 refers.

Q. 30. The maximum RPM of a turbine engine is limited by.
A. a temperature sensitive device which reduces the fuel pump speed.
B. diversion of some of the fuel pump outlet flow by a spill valve sensitive to burner fuel pressure.

C. reduction of the fuel pump stroke by a spill valve sensitive to centrifugally generated fuel pressure.
Ans.- reduction of the fuel pump stroke by a spill valve sensitive to centrifugally generated fuel pressure.
Explanation. Rolls Royce The Jet Engine Page 103 Para 23 Refers.

Q. 31. To what condition does the fuel flow respond during aircraft acceleration?.
A. Mass airflow rate through the engine.
B. The effect of 'ram-air' at altitude.
C. The change in pressure at the compressor intake.
Ans.- Mass airflow rate through the engine.
Explanation. Jeppesen Gas Turbine Powerplants Page 7-6 Refers. This refers to the parameters that make mass airflow- T2 and N2 in particular.

Q. 32. During acceleration, the fuel flow is increased at a controlled rate in order to.
A. prevent fuel pump damage.
B. increase s.f.c.
C. prevent surge and the risk of flame-out.
Ans.- prevent surge and the risk of flame-out.
Explanation. Over fuelling during acceleration is a prime cause of surge.

Q. 33. The B.P.C controls the F.C.U by.
A. pressure sensing.
B. temperature sensing.
C. density sensing.
Ans.- pressure sensing.
Explanation. BPC is the Barometric Pressure Control.

Q. 34. If the swash plate of a positive displacement swash plate pump is perpendicular to the axis of the pump, the flow will be.
A. zero.
B. reversed.
C. maximum.
Ans.- zero.
Explanation. Rolls Royce Jet Engine Page 98-99 refers.

Q. 35. The burner fuel flow is at maximum at.

A. altitude.
B. 10°Centigrade above I.S.A. sea level.
C. I.S.A. sea level.
Ans.- I.S.A. sea level.
Explanation. Cold dense air requires more fuel than hot warm air to maintain the air-fuel ratio.

Q. 36. The type of fuel control unit most commonly used in modern jet engines is.
A. mechanical.
B. hydro-mechanical.
C. electrical.
Ans.- hydro-mechanical.
Explanation. Rolls Royce Jet Engine Page 99 refers.

Q. 37. How is servo pressure, which is used to control fuel pump swash plate angle, obtained?.
A. From pump inlet pressure through fixed restrictions.

B. From pump delivery pressure through fixed restrictions.
C. From pump delivery pressure through variable restrictions.
Ans.- From pump delivery pressure through variable restrictions.
Explanation. Servo pressure is initially supplied through a fixed restrictor, then modified by half ball valve and kinetic knives Rolls Royce The Jet Engine page 98-101 refers.

Q. 38. Why is the Barometric Pressure Control fitted in a turboshaft engine fuel system?.
A. To proportion the fuel flow between primary and main burner lines.
B. To vary pressure pump output in relation to the pressure variation at the intake.
C. To decrease the fuel flow to the burners with increased air intake pressure.
Ans.- To vary pressure pump output in relation to the pressure variation at the intake.
Explanation. Barometric Pressure Control is an old name for Altitude (and hence air density) Sensing Unit see Rolls Royce The Jet Engine figure 10-12 or 10-7.

Q. 39. During any stabilised running condition, the spill or half ball valve is.
A. always varying between fully closed and fully seated.

B. lightly seated.
C. open fully.
Ans.- lightly seated.
Explanation. Rolls Royce The Jet Engine page 98 refers.

Q. 40. The swash plate in a fuel pump, when static is.

A. at some intermediate position.
B. in the minimum position.
C. in the maximum position.
Ans.- in the maximum position.
Explanation. Rolls Royce The Jet Engine page 98 refers.

Q. 41. A kinetic valve is a device used to control H.P pump output. This is achieved by movement of a.

A. diaphragm and half ball valve.
B. knife blade.
C. needle valve.
Ans.- knife blade.
Explanation. Rolls Royce The Jet Engine page 103 refers.

Q. 42. Why is it necessary to control fuel supply to the engine during rapid acceleration?.
A. To prevent compressor stall above cruise RPM .
B. To control maximum RPM .
C. To prevent excessively high EGT and possible compressor surge.
Ans.- To prevent excessively high EGT and possible compressor surge.
Explanation. Rolls Royce The Jet Engine Page 104 refers.

Q. 43. Which component corrects for air density effects on fuel/air mixture in a gas turbine engine?.

A. The barometric pressure control unit.
B. The adjustable throttle valve.
C. The pressurising valve.
Ans.- The barometric pressure control unit.
Explanation. Barometric pressure senses density changes.

Q. 44. Why is the high pressure fuel pump fitted in a gas turbine engine aircraft?.
A. To maintain a vapour free pressure from the aircraft fuel tanks to the LP fuel pump.
B. As an emergency in case of failure of the LP pump.
C. To provide the majority of the fuel pressure to the engine.
Ans.- To provide the majority of the fuel pressure to the engine.
Explanation. Rolls Royce The Jet Engine Page 112 refers.

Q. 45. What are the positions of the pressurization valve and the dump valve in a jet engine fuel system when the engine is shut down?.
A. Pressurization valve open, dump valve open.
B. Pressurization valve closed, dump valve open.
C. Pressurization valve closed, dump valve closed.
Ans.- Pressurization valve open, dump valve open.
Explanation. NIL.

Q. 46. The density of air is very important when mixing fuel and air to obtain a correct fuel to air ratio. Which of the following weighs the most?.
A. 75 parts of dry air and 25 parts of water vapor.
B. 100 parts of dry air.
C. 50 parts of dry air and 50 parts of water vapor.
Ans.- 100 parts of dry air.
Explanation. NIL.

Q. 47. A mixture ratio of 11:1 normally refers to.

A. 1 part air to 11 parts fuel.
B. a stoichiometric mixture.
C. 1 part fuel to 11 parts air.
Ans.- 1 part fuel to 11 parts air.
Explanation. NIL.

Q. 48. For what primary purpose is a turbine engine fuel control unit trimmed?.
A. To obtain maximum thrust output when desired.
B. To properly position the power levers.
C. To adjust the idle RPM .
Ans.- To obtain maximum thrust output when desired.

Explanation. Jeppesen A&P Technician Propulsion Textbook 7-69.

Q. 49. Which type of fuel control is used on most of today's turbine engines?.
A. Hydromechanical or electronic.
B. Mechanical.
C. Electronic.
Ans.- Hydromechanical or electronic.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-60.

Q. 50. Under which of the following conditions will the trimming of a turbine engine be most accurate?.

A. No wind and low moisture.
B. High moisture and low wind.
C. High wind and high moisture.
Ans.- No wind and low moisture.
Explanation. NIL.

Q. 51. An H.M.U receives its signals from.
A. E.E.C.
B. ADC.
C. thrust lever resolvers.
Ans.- E.E.C.
Explanation. Jeppesen Aircraft Powerplant Page 7-20.

Q. 52. In order to stabilize cams, springs, and linkages within the fuel control, manufacturers generally recommend that all final turbine engine trim adjustments be made in the.
A. decrease direction.
B. increase direction.
C. decrease direction after over-adjustment.
Ans.- increase direction.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-70.

Q. 53. When trimming a turbine engine, the fuel control is adjusted to.
A. set idle RPM and maximum speed or E.P.R.
B. produce as much power as the engine is capable of producing.
C. allow the engine to produce maximum RPM without regard to power output.
Ans.- set idle RPM and maximum speed or E.P.R.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-69.

Q. 54. A supervisory electronic engine control (E.E.C) is a system that receives engine operating information and.
A. controls engine operation according to ambient temperature, pressure, and humidity.
B. adjusts a standard hydromechanical fuel control unit to obtain the most effective engine operation.
C. develops the commands to various actuators to control engine parameters.
Ans.- adjusts a standard hydromechanical fuel control unit to obtain the most effective engine operation.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-64.

Q. 55. In a FADEC system, active control switchover occurs.
A. when channels A and B are healthy.
B. on shutdown.
C. on engine start up only.
Ans.- on engine start up only.
Explanation. Jeppesen Aircraft Powerplant Page 7-20.

Q. 56. What causes the fuel divider valve to open in a turbine engine duplex fuel nozzle?.
A. An electrically operated solenoid.
B. Bleed air after the engine reaches idle RPM .
C. Fuel pressure.
Ans.- Fuel pressure.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-66.

Q. 57. The valve on a vane type fuel flow measuring device becomes stuck. What safety backup is available for the engine fuel flow?.
A. A differential pressure bypass valve.
B. A bypass valve.
C. A fuel bleed valve.
Ans.- A differential pressure bypass valve.
Explanation. Pallett Aircraft Instruments and integrated systems page 369 refers. Note the valve opens against spring pressure.

Q. 58. What are the principal advantages of the duplex fuel nozzle used in many turbine engines?

A. Allows a wider range of fuels and filters to be used.

B. Restricts the amount of fuel flow to a level where more efficient and complete burning of the fuel is achieved.
C. Provides better atomization and uniform flow pattern.
Ans.- Provides better atomization and uniform flow pattern.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-66.

Q. 59. What is the purpose of the flow divider in a turbine engine duplex fuel nozzle?.
A. Allows an alternate flow of fuel if the primary flow clogs or is restricted.
B. Provides a flow path for bleed air which aids in the atomization of fuel.
C. Creates the primary and secondary fuel supplies.

Ans.- Creates the primary and secondary fuel supplies.

Explanation. Jeppesen A&P Technician Propulsion Textbook 7-66.

Q. 60. Which of the following turbine fuel filters has the greatest filtering action?.
A. Stacked charcoal.
B. Small wire mesh.
C. Micron.
Ans.- Micron.
Explanation. NIL.

Q. 61. Where is the engine fuel shutoff valve usually located?.
A. Aft of the firewall.
B. Adjacent to the fuel pump.
C. Downstream of the engine driven fuel pump.
Ans.- Downstream of the engine driven fuel pump.
Explanation. Jeppesen A&P Technician Propulsion Textbook 7-63.

Q. 62. Supervisory E.E.C sends its output to the.

A. fuel valve.
B. H.M.U/F.F.G.
C. EGT thermocouple circuit.
Ans.- H.M.U/F.F.G.
Explanation. RB211-535 has this system - the trim signal is passed to the F.F.G. a FADEC engine would receive trim signals at the H.M.U.

Q. 63. If a FADEC loses its ADC input. In the short term it will.
A. go to limit protection mode.
B. go into hard reversion.
C. go into soft reversion.
Ans.- go into soft reversion.
Explanation. Sometimes known as the Alternate mode. CF-6 FADEC engine has this facility.

Q. 64. The primary purpose of an E.E.C is.
A. to change analogue inputs into digital format to provide glass cockpit information and reduce flight crew workload.
B. to save fuel, reduce crew workload and reduce maintenance costs.
C. to change analogue inputs into digital format to reduce flight crew workload and provide maintenance information.
Ans.- to save fuel, reduce crew workload and reduce maintenance costs.
Explanation. Inputs and outputs to the FADEC are both digital and analogue, hence a and b are both wrong. Optimised performance is the reason FADEC was introduced

Q. 65. When both FADEC channels are healthy they will alternate.
A. as selected on the flight deck.
B. when one channel fails.
C. on each engine start.
Ans.- on each engine start.
Explanation. Jeppesen Aircraft Powerplant Page 7-20.

Q. 66. The purpose of the LP fuel pump is to.

A. ensure the H.P fuel pump does not cavitate.
B. pump fuel from the aircraft fuel tanks to the engine.

C. ensure the fuel flow governor gets enough fuel.
Ans.- ensure the H.P fuel pump does not cavitate.
Explanation. Maintains about 40 psi to the inlet of the H.P Pump.

Q. 67. In a FADEC system, what is the result of Channel A failing to receive information from a sensor?.

A. Channel A will take the information from the backup sensor.
B. Channel A will take the information from channel B.

C. Channel B will assume control.
Ans.- Channel A will take the information from channel B.
Explanation. This assumes that channel A is still capable of full control and that channel B is receiving a good sensor signal.

Q. 68. In a FADEC engine with a hydromechanical fuel system, how is fuel flow controlled?.
A. By oil hydraulics.
B. By fuel pressure.
C. By electro-hydraulic servo valves (E.H.S.Vs).
Ans.- By electro-hydraulic servo valves (E.H.S.Vs).
Explanation. Jeppesen Gas Turbine Powerplants Page 7-20 refers.`

Q. 69. On the approach.

A. RPM should be above the minimum idle for maximum acceleration.
B. RPM should be high.
C. RPM should be lower than minimum for maximum acceleration.
Ans.- RPM should be above the minimum idle for maximum acceleration.
Explanation. A high (or flight) idle setting is used for maximum acceleration in the event of overshoot.

Q. 70. The air data inputs to the FADEC E.C.U fails. The result will be:.
A. a lack of flight data.
B. the E.C.U reverts to the fail-safe mode.
C. uncorrected data from hard wired analogue sensors is utilised.
Ans.- the E.C.U reverts to the fail-safe mode.
Explanation. If all air data input fails then the E.C.U reverts to an alternate (Fail-safe) mode.

Q. 71. A FADEC system consists of.
A. H.M.U, A.D.C and sensors.
B. E.E.C, A.D.C and sensors.
C. H.M.U, sensors and an E.E.C.
Ans.- H.M.U, sensors and an E.E.C.
Explanation. Jeppesen Aircraft Gas Turbines Page 7-62 refers.

Q. 72. A fuel heater prevents.
A. entrained water in fuel freezing.
B. LP fuel filter icing.
C. pipelines freezing.
Ans.- entrained water in fuel freezing.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 7-45 refers. Whilst the LP fuel filter may block as a result of freezing it is the entrained water that froze first.

Q. 73. When re-light is required in flight on a FADEC engine, the pilot selects.
A. one igniter.
B. igniter selected automatically.
C. both igniters.
Ans.- igniter selected automatically.
Explanation. The FADEC chooses whichever igniter it wants.

Q. 74. The position of fuel heater in fuel system is.
A. between the fuel control unit and the burner manifold.
B. after the LP fuel filter and before the H.P pump.
C. before the LP fuel filter.
Ans.- before the LP fuel filter.
Explanation. This position ensures the fuel will not freeze in the fuel filter. RR The Jet Engine Page 116 Para 100 refers.

Q. 75. The E.E.C receives its primary power from.
A. 115V AC emergency BUS.
B. separate permanent magnet alternator.
C. 115V AC main BUS.
Ans.- separate permanent magnet alternator.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 7-22 refers. note that answers a and b are back up power supplies.

Q. 76. The fuel trimmer on a turbo-prop engine isoperated.
A. manually, to prevent high EGT due to altitude increase.
B. automatically controlled in conjunction with FCU.
C. manually to prevent excessive RPM at high altitude.

Ans.- automatically controlled in conjunction with FCU.

Explanation. No Turbo-prop aircraft has a manual fuel trimmer as far as we are aware. Jeppesen Page 7-12 sub para d further refers.

Q. 77. The main advantage of FADEC is.
A. it has electrical control of hydro mechanical unit in all modes.
B. efficiency is always maximum.
C. it changes T.L.A to most efficient E.P.R rating.
Ans.- efficiency is always maximum.
Explanation. Reduced pilot workload and maximum efficiency of performance is the greatest advantage of F.A.D.E.C.

Q. 78. Inlet side of a fuel pump has a.
A. threaded micron filter.
B. wire mesh filter.
C. wire wound filter.
Ans.- wire mesh filter.
Explanation. Jeppesen aircraft gas turbine Powerplants Page 7-48 refers.

Q. 79. When a throttle is selected to increase power, the pressure drop across the Fuel Control Unit throttle orifice.
A. increases then decreases due to decreasing pump output.
B. drops then increases due to increasing pump output.

C. remains the same.
Ans.- drops then increases due to increasing pump output.
Explanation. On selection the pressure drop across the throttle decreases then recovers as the pump increases the flow of fuel.

Q. 80. When the E.E.C supervisory circuit senses a fault on the engine, the fault annunciator
light will be on and the E.E.C will.
A. remove fuel, down trimming signal only when E.E.C switch selected off.
B. remove fuel, down trimming signal immediately.
C. remove fuel, down trimming signal only after landing.

Ans.- remove fuel, down trimming signal immediately.

Explanation. The E.E.C referred to here is that discussed in Rolls Royce the Jet Engine page 112. It is fitted to an RB211-535E4.

Q. 81. In-Flight the engine E.E.C controls.
A. EGT.
B. throttle position.
C. fuel flow.
Ans.- fuel flow.
Explanation. Throttle position is controlled by the crew or auto throttle. EGT is a function of fuel flow.

Q. 82. A FADEC does not have which of the following?.
A. Control of thrust reverser operation.
B. An automatic starting capability.
C. Automatic control of engine fire bottles.
Ans.- Automatic control of engine fire bottles.
Explanation. Fire extinguishers are always operated from the flight deck.

Q. 83. A FADEC consists of.
A. Electronic controls, sensors and an H.M.U.
B. Electronic control and throttle position transmitter.

C. Electronic control only.
Ans.- Electronic controls, sensors and an H.M.U.
Explanation. A FADEC is the full system of sensors and control unit. Sometimes the Hydro mechanical Unit (H.M.U) is also included as part of the system.

Q. 84. During aerobatic manoeuvres, what prevents fuel from
spilling out of fuel tank vents?.
A. Booster pump differential pressure.
B. Baffle plates in tanks.
C. Float operated valves.
Ans.- Float operated valves.
Explanation. Float operated valves allow the vent lines to vent both ways if there is no fuel on the float, but will `shut when the float is lifted by fuel.

Q. 85. After a bag tank replacement, where would you disconnect the system to carry out the flow checks?.
A. At the engine.
B. At tank outlet.
C. Tank isolation cock.
Ans.- At the engine.
Explanation. CAIPs AL/3-17 states that for any aircraft fuel flow test after major system interruption connect the flow rig at the engine bulkhead.

Q. 86. What is the purpose of a silver strip on a fuel filter?.
A. To detect excess metal.
B. To detect sulphur in fuel.
C. To strain oil for contamination.
Ans.- To detect sulphur in fuel.
Explanation. Rolls Royce The Jet Engine Page 254 refers.

Q. 87. The basic concept of an H.P fuel control is.

A. automatic adjustment of the fuel control unit by preventing excess fuel reaching the burners.
B. the bleeding of excess fuel back to the input of the H.P pump swash plate piston.
C. constant adjustment of the swash plate angle of the H.P fuel pump.
Ans.- constant adjustment of the swash plate angle of the H.P fuel pump.
Explanation. Rolls Royce the Jet Engine Pages 98 - 102 refer.

15.8 Bearings and Seals 15.9 Lubricants and Fuels 15.10 Lubrication Systems 15.11 Fuel Systems

Q. 88. To prevent compressor surge and overheating of the combustion chamber due to over fuelling.

A. a barometric unit is fitted.
B. a throttle unit is fitted.
C. an acceleration control unit is fitted.
Ans.- an acceleration control unit is fitted.
Explanation. The acceleration unit automatically limits the rate of increase of fuel flow until sufficient air is passing through the engine.

Q. 89. When FADEC is in normal mode.
A. channel A or B will be in command.
B. channel A will be in command.
C. channel B will be in command.
Ans.- channel A or B will be in command.
Explanation. Both channels are operating but either one can be in control if they are both healthy.

Q. 90. Out of the following thrust lever resolver angles, which one is the forward idle setting?.

A. 5 degrees.
B. 85 degrees.
C. 40 degrees.
Ans.- 40 degrees.
Explanation. All FADEC engines will have reverse thrust settings therefore the T.L.A of 0 degrees will be max reverse, and 85 will be max forward therefore 40 is the idle figureure.

Q. 91. Trimming is a term applied to adjusting the.

A. idle speed and maximum thrust.
B. fuel specific gravity.
C. part trim stop.
Ans.- idle speed and maximum thrust.
Explanation. Dale Crane Dictionary of Aeronautical Terms 3rd edition Refers.

Q. 92. Fuel boost pumps are cooled using.
A. ram air.
B. Fuel pumps do not require cooling.
C. fuel.
Ans.- fuel.
Explanation. Fuel pumps, of any type usually use the fuel they are pumping to cool the bearings.

Q. 93. A fuel trimmer unit is adjusted at altitude.
A. automatically, via a fuel trim unit.
B. manually to compensate for propeller torque.
C. manually to compensate for EGT change.
Ans.- automatically, via a fuel trim unit.
Explanation. We assume here that the fuel trim at altitude is due to decreasing air density& pressure. The Fuel flow governor (fuel trimmer) does this automatically.

Q. 94. Baffles in a rigid fuel tank.
A. help prevent micro-biological corrosion.
B. strengthen the tank structure.
C. prevent surge.
Ans.- prevent surge.
Explanation. This question was definitely asked in module 15- it should be in module 11!!.

Q. 95. In a FADEC system, what does the E.E.C measure along with RPM ?.
A. Pressure and Temperature.
B. Pressure.
C. Temperature.
Ans.- Pressure and Temperature.
Explanation. Normally the E.E.C reads as a minimum To Po Ps3 and T25.

Q. 96. In a FADEC system, how are the power supply windings for channel A and Channel B wound?.

A. Two independent generators.
B. On one generator with 2 separate windings.
C. One generator and one winding.
Ans.- On one generator with 2 separate windings.
Explanation. The engine alternator is a permanent magnet alternator with 2 windings within the stator housing. There may also be a third winding that is used to indicate H.P RPM (H.P tachometer) within the same housing.

Q. 97. If an Engine FADEC system loses air-data permanently, the pilot will.
A. turn that E.E.C Off.
B. select alternate pitot static.
C. switch to Alt on the relevant E.E.C.
Ans.- switch to Alt on the relevant E.E.C.
Explanation. By switching to Alternate mode manually the E.E.C uses cornerstone Pamb and Tamb.

Q. 98. A FADEC system takes measurements from Engine Speed,.

A. Temperature and Pressure.
B. and Temperature.
C. and Pressure.
Ans.- Temperature and Pressure.
Explanation. T-ambient, P-ambient and P s3 as a minimum.

Q. 99. Main purpose of the fuel boost pumps is to provide.
A. emergency dump jettison.
B. cross-feed fuel from one tank to another.
C. fuel pressure to both engine pumps.
Ans.- fuel pressure to both engine pumps.
Explanation. Supply of fuel to the engines is the primary purpose although the other two answers may also be options.

Q. 100. The swash plate in the fuel pump of an axial flow gas turbine engine is controlled by.
A. servo hydraulic pressure.
B. electrical servo control.
C. servo fuel pressure.
Ans.- servo fuel pressure.
Explanation. Rolls Royce the Jet Engine Page 99 et al refers.

Q. 101. The end fittings on a fuel non-return valve are normally of different sizes to.
A. prevent incorrect installation.
B. facilitate bleeding the system.
C. allow a full fuel flow through the valve.
Ans.- prevent incorrect installation.
Explanation. Also known as check valves, NRV's have different end fittings and sometimes an arrow showing direction of flow embossed on the casing.

Q. 102. E.E.C receives signals from RPM sensor and.

A. pressure sensors.
B. pressure and temperature sensors.
C. temperature sensors.
Ans.- pressure and temperature sensors.
Explanation. Modern FADEC systems receive all three types of sensor but quite often do not use the EGT signals for control.

Q. 103. When does E.E.C channel change over occur?.

A. On engine start up.
B. On engine shut down.
C. On fault.
Ans.- On engine start up.
Explanation. The E.E.C prepares for the changeover by resetting the E.E.C on shut down, but does not actually do it until the next start. A simple single fault (compared to a complete channel failure) will not cause a change over.

Q. 104. The possible combined output from all the scavenge pumps in a lubrication system will be.

A. greater than the pressure pump output.
B. less than the pressure pump output.
C. the same as the pressure pump output.
Ans.- greater than the pressure pump output.
Explanation. NIL.

Q. 105. If the knife-edge blade in a kinetic valve is fully in.
A. pump pressure is constant.
B. servo pressure is being bled off.
C. servo pressure is increasing.
Ans.- servo pressure is being bled off.
Explanation. Rolls Royce The Jet Engine page 103 para 31 figure 10-8.

Module 15, GAS TURBINE ENGINE.

15.12 Air Systems.

Q. 1. Engine anti-ice is taken from the.
A. turbine.
B. H.P compressor.
C. LP compressor.
Ans.- H.P compressor.
Explanation. Jepperson Gas Turbine Powerplants Page 9-2 refers.

Q. 2. In an axial flow turbine engine, compressor bleed air is sometimes used to aid in cooling the.

A. inlet guide vanes.
B. turbine, vanes, blades, and bearings.
C. fuel.
Ans.- turbine, vanes, blades, and bearings.
Explanation. NIL.

Q. 3. If air is taken from the compressor for air conditioning or anti-icing.
A. thrust will increase EGT will increase.
B. thrust will decrease EGT will increase.
C. thrust will decrease EGT will decrease.
Ans.- thrust will decrease EGT will increase.
Explanation. Air is taken from the H.P compressor hence there is less mass flow.

Q. 4. Turbine case cooling utilizes.
A. LP compressor air.
B. fan air.
C. H.P compressor air.
Ans.- fan air.
Explanation. Fan air is the coldest in the engine.

Q. 5. Air for anti-icing is taken from the.
A. accessory Gearbox.
B. LP compressor.
C. H.P compressor.
Ans.- H.P compressor.
Explanation. LP air would not be hot enough.

Q. 6. As air is bled off the engine, EGT will.

A. remain constant.
B. decrease.
C. increase.
Ans.- increase.
Explanation. Less air, but same fuel equals higher EGT.

Q. 7. The heat absorbed by internal components can be detrimental to thrust and is prevented by.

A. reducing fuel flow to reduce internal temperature.
B. bleeding air off the compressor to heat the components.
C. bleeding air off the compressor to cool the components.
Ans.- bleeding air off the compressor to cool the components.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 4-53 refers.

Q. 8. On a gas turbine engine, thermal wing de-icing system derives air.
A. via air from the H.P turbine.
B. through a pressure regulating shut-off valve (P.R.S.O.V).
C. through a pressure relief system.
Ans.- through a pressure regulating shut-off valve (P.R.S.O.V).
Explanation. Rolls Royce The Jet Engine Page 150 Refers.

Q. 9. Inlet for cooling air for the first stage turbine blades is fed via the.
A. blade root.
B. grill holes.
C. leading edge of the blade.
Ans.- blade root.
Explanation. The cooling air is ducted through the turbine disc to the blade root then out into the airstream through holes in the leading and trailing edges.

Q. 10. Air bleed for an anti-ice system is.
A. tapped directly off the compressor.
B. sent through a pressure regulator.
C. sent through the air conditioning.
Ans.- tapped directly off the compressor.
Explanation. With this method if the engine is running then anti-ice air is always available.

Q. 11. With bleed valves open for anti-ice.

A. thrust is unaffected.
B. thrust decreases, fuel consumption decreases.
C. thrust decreases, fuel consumption increases.
Ans.- thrust decreases, fuel consumption decreases.
Explanation. NIL.

15.13, Starting and Ignition Systems.

Q. 1. In the H.E.I.U. the discharge resistors.

A. allows the capacitors to discharge when the unit is switched off.
B. allows sufficient voltage to be stored to provide relight facilities up to 55,000 ft.
C. protects the unit from excessive voltages.
Ans.- allows the capacitors to discharge when the unit is switched off.
Explanation. NIL.

Q. 2. In the H.E.I.U. the choke.
A. prolongs the life of the plug.
B. protects the unit from excessive high voltages.
C. prolongs the discharge.
Ans.- prolongs the discharge.
Explanation. NIL.

Q. 3. In an electrical starting system, the slow start resistor is short circuited by the.
A. centrifugal Switch.
B. time switch.
C. overspeed switch.
Ans.- centrifugal Switch.
Explanation. NIL.

Q. 4. The advantage of an air starter system is.

A. it provides a more rapid start.
B. it is light, simple and economical.
C. there is no risk of engine fire during starting.
Ans.- it is light, simple and economical.
Explanation. Jeppesen A&P Technician Powerplant Book Page 8-49 'Air starters weigh about one-fifth the wieght of a comparable electric starter. This gives air turbine starters a high power-to-wieght ratio. because of this, pneumatic starters are used almost exclusively on commercial jet aircraft.

Q. 5. An advantage of a gas turbine starter is.

A. it provide high power for low weight.
B. it does not require external connections.
C. it uses a low volatile fuel.
Ans.- it provide high power for low weight.
Explanation. NIL.

Q. 6. If the engine fails to light-up, the starter cycle is canceled by.
A. a centrifugal switch.
B. a low pressure relay.
C. a time switch.
Ans.- a time switch.
Explanation. NIL.

Q. 7. For starting the engine, the H.P cock should be initially.
A. in a position which depends on the fuel system.
B. open.
C. closed.
Ans.- closed.
Explanation. NIL.

Q. 8. On light up, the gas temperature will.

A. rise slowly.
B. rise rapidly, then fall as RPM increases to idle.
C. rise rapidly.
Ans.- rise rapidly, then fall as RPM increases to idle.
Explanation. NIL.

Q. 9. Self sustaining RPM means that.
A. The engine can accelerate to full power in under 5 seconds.
B. There is sufficient power for ground maneuvering.
C. The engine will run independently of external help.

Ans.- The engine will run independently of external help.
Explanation. NIL.

Q. 10. A 'hot start' with excessive temperatures may be caused by.
A. wrong grade of fuel.
B. throttle partly open.
C. high electrical power supply.
Ans.- throttle partly open.
Explanation. NIL.

Q. 11. A dry motoring cycle would be required to.

A. clear the engine after a wet start.
B. check engine run down time.
C. check the operation of the igniters.
Ans.- clear the engine after a wet start.
Explanation. NIL.

Q. 12. What type of turbine blade is most commonly used in air starter motors?.
A. Reaction.
B. Impulse.
C. Impulse-reaction.
Ans.- Impulse.
Explanation. NIL.

Q. 13. Ignitor plugs are cleaned by.
A. compressed air and brushing lightly with soft brush.

B. light sand blasting.
C. steel wool.
Ans.- compressed air and brushing lightly with soft brush.
Explanation. Jepperson Gas Turbine Powerplants Page 11-11 refers.

Q. 14. An H.E.I.U works by.
A. a discharging capacitor.
B. ac busbar.
C. a contact breaker.
Ans.- a discharging capacitor.
Explanation. Jepperson Gas Turbine Powerplants Page 11-5 refers.

Q. 15. When is ignition used?.
A. For relight and start up.
B. For continuous relight.
C. At high altitudes.
Ans.- For relight and start up.
Explanation. Rolls Royce The Jet Engine Page 127 Refers.

Q. 16. An ignitor plug for a large gas turbine takes the form of a.
A. glow' plug.
B. sparking plug.
C. surface discharge plug.
Ans.- surface discharge plug.
Explanation. Rolls Royce The Jet Engine Page 131 Refers.

Q. 17. The spark in the High Energy igniter is supplied by.
A. a capacitor.
B. a contact circuit breaker.
C. the AC busbar.
Ans.- a capacitor.
Explanation. Jeppesen Gas Turbine Powerplant Page11-4 refers.

Q. 18. Self sustaining speed is.
A. V1 speed.
B. the RPM at which the engine continues without external assistance.
C. take off velocity.
Ans.- the RPM at which the engine continues without external assistance.
Explanation. After the starter has cut out and the RPM and TGT have stabilised.

Q. 19. During normal running conditions.
A. combustion is intermittently supported by ignition.

B. combustion is self supporting
C. combustion is continuously supported by ignition.
Ans.- combustion is self supporting
Explanation. Rolls Royce The Jet Engine page 37 refers.

Q. 20. High energy ignition is required because of the.

A. high flash point of the fuel.
B. absorbed moisture content.
C. low flash point of the fuel.
Ans.- high flash point of the fuel.
Explanation. Jeppesen Gas Turbine Powerplants Page 7-1 refers.

Q. 21. In the H.E.I.U. the discharge resistors.

A. allow sufficient voltage to be stored to provide relight facilities up to 55,000 ft.
B. allow the capacitors to discharge when the unit is switched off.
C. protect the unit from excessive voltages.
Ans.- allow the capacitors to discharge when the unit is switched off.

Explanation. Rolls Royce The Jet Engine page 129 refers

Q. 22. The rate of discharge of a H.E.I.U. is.

A. 4 discharges per revolution.
B. 60 - 100 per second.
C. 60 - 100 per minute.
Ans.- 60 - 100 per minute.
Explanation. NIL.

Q. 23. Why do turbine engine ignition systems require high energy?.
A. Because the applied voltage is much greater.
B. To ignite the fuel under conditions of high altitude and high temperatures.
C. To ignite the fuel under conditions of high altitude and low temperatures.
Ans.- To ignite the fuel under conditions of high altitude and low temperatures.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-102.

Q. 24. The type of ignition system used on most turbine aircraft engines is.
A. low tension.
B. capacitor discharge.
C. high resistance.
Ans.- capacitor discharge.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-102.

Q. 25. A safety feature usually employed in pneumatic starters that is used to prevent the starter from reaching burst speed if inlet air does not terminate on schedule is the.
A. stator nozzle design that chokes airflow and stabilizes turbine wheel speed.
B. drive shaft shear point.
C. spring coupling release.
Ans.- stator nozzle design that chokes airflow and stabilizes turbine wheel speed.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-49.

Q. 26. A safety feature usually employed in pneumatic starters that is used if the clutch does not release from the engine drive at the proper time during start is the.
A. spring coupling release.
B. drive shaft shear point.
C. flyweight cutout switch.
Ans.- flyweight cutout switch.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-49.

Q. 27. Airflow to the pneumatic starter from a ground unit is normally prevented from causing starter overspeed during engine start by.
A. a preset timed cutoff of the airflow at the source.
B. stator nozzle design that chokes airflow and stabilizes turbine wheel speed speed.
C. activation of a flyweight cutout switch.
Ans.- activation of a flyweight cutout switch.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-49.

Q. 28. Air turbine starters are generally designed so that reduction gear distress or damage may be detected by.
A. inspection of a magnetic chip detector.
B. characteristic sounds from the starter assembly during engine start.
C. breakage of a shear section on the starter drive shaft.

Ans.- inspection of a magnetic chip detector.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-51.

Q. 29. Inspection of pneumatic starters by maintenance technicians usually includes checking the.

A. stator and rotor blades for FOD.
B. oil level and magnetic drain plug condition.
C. rotor alignment.
Ans.- oil level and magnetic drain plug condition.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-51.

Q. 30. Pneumatic starters are usually designed with what types of airflow impingement systems?.

A. Radial inward flow turbine and axial-flow turbine.
B. Centrifugal compressor and axial-flow compressor.

C. Double entry centrifugal outward flow and axial-flow turbines.
Ans.- Radial inward flow turbine and axial-flow turbine.

Explanation. Jeppesen A&P Technician Propulsion Textbook 8-49.

Q. 31. A clicking sound heard at engine coast-down in a pneumatic starter incorporating a sprag clutch ratchet assembly is an indication of.
A. gear tooth and/or pawl damage.
B. one or more broken pawl springs.
C. the pawls re-contacting and riding on the ratchet gear.
Ans.- the pawls re-contacting and riding on the ratchet gear.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-50.

Q. 32. The primary advantage of pneumatic (air turbine) starters over comparable electric starters for turbine engines is.
A. high power-to-weight ratio.
B. reduction gearing not required.
C. a decreased fire hazard.
Ans.- high power-to-weight ratio.
Explanation. NIL.

Q. 33. The purpose of an under current relay in a starter-generator system is to.
A. keep current flow to the starter-generator under the circuit capacity maximum.
B. disconnect power from the starter-generator and ignition when sufficient engine speed is reached.
C. provide a backup for the starter relay.
Ans.- disconnect power from the starter-generator and ignition when sufficient engine speed is reached.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-46.

Q. 34. How does the ignition system of a gas turbine engine differ from that of a reciprocating engine?.

A. Magneto to engine timing is not critical.
B. One igniter plug is used in each combustion chamber.

C. A high energy spark is required for ignition.
Ans.- A high energy spark is required for ignition.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-102.

Q. 35. In a gas turbine engine D.C capacitor discharge ignition system, where are the high voltage pulses formed?.
A. At the rectifier.
B. At the triggering transformer.
C. At the breaker.
Ans.- At the triggering transformer.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-103.

Q. 36. Igniter plugs used in turbine engines are subjected to high intensity spark discharges and yet they have a long service life because they.
A. operate at much lower temperatures.
B. are not placed directly into the combustion chamber.

C. do not require continuous operation.
Ans.- do not require continuous operation.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-105.

Q. 37. Great caution should be exercised in handling damaged hermetically sealed turbine engine igniter transformer units because.
A. some contain toxic chemicals.
B. some contain radioactive material.
C. compounds in the unit may become a fire or explosion hazard when exposed to the air.
Ans.- some contain radioactive material.
Explanation. Jeppesen A&P Technician Propulsion Textbook 8-106.

Q. 38. Generally, when removing a turbine engine igniter plug, in order to eliminate the possibility of the technician receiving a lethal shock, the ignition switch is turned off and.
A. disconnected from the power supply circuit.
B. the transformer exciter input lead is disconnected and the center electrode grounded to the engine after disconnecting the igniter lead from the plug and waiting the prescribed time.
C. the igniter lead is disconnected from the plug and the center electrode grounded to the engine after disconnecting the transformer-exciter input lead and waiting the prescribed time.
Ans.- the igniter lead is disconnected from the plug and the center electrode grounded to the engine after disconnecting the transformer-exciter input lead and waiting the prescribed time.
Explanation. NIL.

Q. 39. What is the first engine instrument indication of a successful start of a turbine engine?.
A. A rise in the engine fuel flow.
B. A rise in oil pressure.
C. A rise in the exhaust gas temperature.

Ans.- A rise in the exhaust gas temperature.
Explanation. NIL.

Q. 40. H.E.I.U ignitor plugs receive their electrical supply from.
A. discharge inductor.
B. starter system electrical circuit.
C. discharge capacitor.
Ans.- discharge capacitor.
Explanation. Rolls Royce The Jet Engine Page 129.

Q. 41. An H.E.I.U is rated in.
A. Joules.
B. Watts.
C. Amps.
Ans.- Joules.
Explanation. Jeppesen Aircraft Gas Turbines Powerplant Page 11-5 to 11-7 refers.

Q. 42. A glow plug operates.
A. manually.
B. by heat action.
C. electrically.
Ans.- by heat action.
Explanation. The extreme heat of the plug ignites the fuel. It is powered by electricity. See Jeppesen Aircraft Gas Turbines page 11-9.

Q. 43. The resistor in a D.C. starter motor.
A. prevents over speed.
B. prevents current surge when motor is at low rpm.
C. used when D.C. motor fails.
Ans.- prevents current surge when motor is at low rpm.

Explanation. Rolls Royce The Jet Engine page 122 refers.

Q. 44. Where does the high voltage type turbine ignition receive its voltage pulse from?.
A. Primary windings.
B. Rectifier.
C. Trigger transformer.
Ans.- Primary windings.
Explanation. Rolls Royce the jet engine Fig 11-12 shows an AC system. this uses a transformer to generate the high voltage at the discharge gap.

Q. 45. On a gas turbine engine DC starting circuit, if there is an open circuit on the contact of the over speed relay.
A. starter motor will stop only when starter switch selected off.
B. starter motor will continue to run for 30 sec and then stop.
C. no power supply is connected to the starter motor.

Ans.- no power supply is connected to the starter motor.
Explanation. Refer Fig 11-3 Rolls Royce The Jet engine. The main relay cannot close if the overspeed relay is open.

Q. 46. The field of the D.C. starter motor used on gas turbine engine
is.
A. series only.
B. shunt or compound.
C. series or compound.
Ans.- series or compound.
Explanation. Aircraft electrical systems E.H.J Pallett 3rd edition page 154 refers.

Q. 47. When 'blow out' is selected on the Gas Turbine Engine starting circuit.
A. the starter motor is stopped when starter switch selected off or when the timer switch cuts out.
B. the over-speed relay will de-energise the starter circuit.
C. ignition is continuously on.
Ans.- the starter motor is stopped when starter switch selected off or when the timer switch cuts out.
Explanation. Refer Fig 11-3 Rolls Royce The Jet Engine. The blow out circuit is used to blow out any jet pipe fire. In this mode there is no ignition or fuel hence the starter cannot overspeed.

Q. 48. After an unsuccessful start of an engine.

A. the engine has to be left for some time before another start.
B. unburnt fuel can be drained from fuel drainage lines.

C. unburnt fuel can be evacuated by motoring the engine with H.P cock closed.
Ans.- unburnt fuel can be evacuated by motoring the engine with H.P cock closed.
Explanation. On normal shutdowns combustors and fuel manifolds are drained through the drain manifold. After an unsuccessful start there will be fuel

throughout the hot section. Hence a dry run is needed to purge the engine.

Q. 49. A glow plug may be used in place of a spark plug on.
A. low temperature engines.
B. large engines.
C. small engines.
Ans.- small engines.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants Page 11-9 refers to the PW PT6 as an example of a smaller engine.

Q. 50. When an engine being started by an air starter reaches self sustaining speed.
A. the motor is disconnected by the flyweight cut out switch.
B. the starter valve is disconnected by the fly weight cut-out switch in the air starter.
C. the motor is disconnected by the pilot.
Ans.- the starter valve is disconnected by the fly weight cut-out switch in the air starter.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants Page 10-9 refers.

Q. 51. When reconnecting a H.E.I.U , which cable must be reconnected first?.
A. It makes no difference.
B. L.T before H.T.
C. H.T before L.T.
Ans.- H.T before L.T.
Explanation. This is the reverse of disconnecting, when L.T is isolated and then disconnected first.

Q. 52. An aircraft flying through heavy rain may use, as a precaution.
A. airframe deicing.
B. engine intake deicing.
C. continuous ignition.
Ans.- continuous ignition.
Explanation. Continuous ignition is used in case of flame out caused by the inclement weather.

Q. 53. The starter light is on during a start cycle (low voltage electrical starter).
A. Indicates electrical power is flowing to the starter.
B. If the light stays on after 30 seconds action is required.
C. This is normal for 30 seconds, take no action.
Ans.- If the light stays on after 30 seconds action is required.
Explanation. See the Rolls Royce Jet engine low voltage starter system on page 123. The indicator light indicates power to the igniter. The Full current time switch cuts out the circuit after a period of time.

Q. 54. A D.C starter motor disconnects due to.

A. current decreasing switching off an overspeed relay.

B. current increasing switching off an overspeed relay.

C. a centrifugal switch that acts like an overspeed relay.

Ans.- current decreasing switching off an overspeed relay.
Explanation. Same starter circuit reference as above. As the starter accelerates drawn current reduces and causes the overspeed relay to drop out.

Q. 55. What is the purpose of the current limiting resistor in a starter circuit?.
A. To prevent the starter from over speeding in the final phase of starting.
B. To provide overall control of the the speed of the starter.
C. To prevent an initial current surge.
Ans.- To prevent an initial current surge.
Explanation. The starter motor is protected from excessive current until the timer shorts out the resistor. See RR the jet engine page 123.

Q. 56. On a low energy dual ignition system (<3 joules), if a relight is necessary.
A. it occurs automatically.
B. the pilot selects both ignitors.
C. the pilot selects one of the two ignitors.
Ans.- the pilot selects both ignitors.
Explanation. Normal low/high systems have a choice of low or high energy ignition with high being used for relight. In these systems the pilot can choose 1, 2 or both.

15.14, Engine Indication Systems.

Q. 1. The compensation device on an E.G.T system must be re-calibrated after.
A. each time a part of the system is replaced.

B. does not need calibration.
C. manufacture and overhaul.
Ans.- does not need calibration.
Explanation. The compensation device is an automatic device Page 140 Rolls Royce book refers.

Q. 2. When testing an E.G.T system.
A. the O.A.T is always taken into consideration.
B. the O.A.T is neglected.
C. O.A.T is only taken into consideration when over20°C.

Ans.- the O.A.T is always taken into consideration.
Explanation. To test the system the test set has to trimmed for ambient temperature, as the system when in operation is adjusted for ambient temperature by the compensating resistor. This is clearly stated in the B 737 AMM.

Q. 3. What is the Engine Pressure Ratio (E.P.R.) used for?.
A. To limit the maximum exhaust gas temperature.
B. To indicate the thrust produced by the engine.
C. As a cross check for minimum acceptable thrust.
Ans.- To indicate the thrust produced by the engine.
Explanation. NIL.

Q. 4. What happens when bulb type thermometer resistive element goes open circuit?.
A. Reads less than ambient.
B. No reading given.
C. Reads more than ambient.
Ans.- Reads more than ambient.
Explanation. NIL.

Q. 5. On an E.G.T thermocouple system, the hot junction.
A. is placed up stream of the combustion chamber.
B. is placed in cockpit.
C. is placed downstream of the combustion chamber.

Ans.- is placed downstream of the combustion chamber.

Explanation. NIL.

Q. 6. On an RPM system using a synchronous generator, the pointer is deflected by.
A. a potentiometer.
B. a Wheatstone bridge.
C. an AC servomotor.
Ans.- an AC servomotor.
Explanation. Jepperson Gas Turbine Powerplants Page 12-13 refers.

Q. 7. Torque pressure is usually read from a.

A. torque meter.
B. direct reading pressure gauge.
C. tension gauge.
Ans.- direct reading pressure gauge.
Explanation. Jepperson Gas Turbine Powerplants Page12-21 refers.

Q. 8. The drag cup in a tacho-generator is balanced by.
A. calibrated hairspring.
B. adjustable counterbalance weights.
C. adjustment screw.
Ans.- calibrated hairspring.
Explanation. Jepperson Gas Turbine Powerplants Page 12-14 refers.

Q. 9. Fuel flow indication is taken from.
A. after the H.P pump.
B. after either H.P Pump or LP Pump.
C. after the LP pump.
Ans.- after either H.P Pump or LP Pump.
Explanation. Vane type flowmeters are usually in the LP Supply. Integrated flowmeters in the H.P supply.

Q. 10. What power is required for E.G.T gauge indication?.
A. No power - it is self generating.
B. 115V AC.
C. 28V DC.
Ans.- No power - it is self generating.
Explanation. Jeppesen Gas Turbine Powerplants Page 12-5 Refers.

Q. 11. A Bourdon tube instrument may be used to indicate.
A. position and quantity.
B. pressure and temperature.
C. pressure, temperature, position and quantity.
Ans.- pressure and temperature.
Explanation. NIL.

Q. 12. What instrument on a gas turbine engine should be monitored to minimize the possibility of a 'hot' start?.

A. RPM indicator.
B. Turbine inlet temperature.
C. Torquemeter.
Ans.- Turbine inlet temperature.
Explanation. Jeppesen A&P Powerplant Textbook 4-5.

Q. 13. oil temperature thermocouples are usually constructed of.
A. iron constantan.
B. alumel constantan.
C. chromel alumel.
Ans.- iron constantan.
Explanation. NIL.

Q. 14. The RPM indication of a synchronous AC motor tachometer is governed by the generator.
A. current.
B. frequency.
C. voltage.
Ans.- frequency.
Explanation. NIL.

Q. 15. Instruments that measure relatively high fluid pressures, such as oil pressure gauges, are usually what type?.
A. Bourdon tube.
B. Vane with calibrated spring.
C. Diaphragm or bellows.
Ans.- Bourdon tube.
Explanation. NIL.

Q. 16. Instruments that provide readings of low or negative pressure, such as manifold pressure gauges, are usually what type?.
A. Diaphragm or bellows.
B. Vane with calibrated spring.
C. Bourdon tube.
Ans.- Diaphragm or bellows.
Explanation. NIL.

Q. 17. In what units are gas turbine engine tachometers calibrated?.
A. Percent of engine pressure ratio.
B. Percent of engine RPM.
C. Actual engine RPM.
Ans.- Percent of engine RPM.
Explanation. Jeppesen A&P Powerplant Textbook 4-2.

Q. 18. In a turbine engine, where is the turbine discharge pressure indicator sensor located?.

A. At a location in the exhaust cone that is determined to be subjected to the highest pressures.
B. Immediately aft of the last turbine stage.
C. At the aft end of the compressor section.
Ans.- Immediately aft of the last turbine stage.
Explanation. NIL.

Q. 19. The exhaust gas temperature (E.G.T) indicator on a gas turbine engine provides a relative indication of the.
A. turbine inlet temperature.
B. temperature of the exhaust gases as they pass the exhaust cone.
C. exhaust temperature.
Ans.- turbine inlet temperature.
Explanation. Jeppesen A&P Powerplant Textbook 4-5.

Q. 20. Engine pressure ratio is determined by.

A. dividing engine inlet total pressure by turbine outlet total pressure.
B. multiplying engine inlet total pressure by turbine outlet total pressure.
C. dividing turbine outlet total pressure by engine inlet total pressure.
Ans.- dividing turbine outlet total pressure by engine inlet total pressure.
Explanation. NIL.

Q. 21. A red triangle, dot, or diamond mark on an engine instrument face or glass indicates.
A. the maximum limit for high transients such as starting.
B. a restricted operating range.
C. the maximum operating limit for all normal operations.
Ans.- the maximum limit for high transients such as starting.
Explanation. Jeppesen A&P Powerplant Textbook 4-5.

Q. 22. What is the primary purpose of the tachometer on an axial compressor turbine engine?.
A. Monitor engine RPM during cruise conditions.
B. Monitor engine RPM during starting and to indicate overspeed conditions.

C. It is the most accurate instrument for establishing thrust settings under all conditions.
Ans.- Monitor engine RPM during starting and to indicate overspeed conditions.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 23. Engine pressure ratio is the total pressure ratio between the.
A. front of the engine inlet and the aft end of the compressor.
B. front of the compressor and the rear of the turbine.

C. aft end of the compressor and the aft end of the turbine.
Ans.- front of the compressor and the rear of the turbine.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 24. On an aircraft turbine engine, operating at a constant power, the application of engine anti-icing will result in.
A. an increase in E.P.R.
B. noticeable shift in E.P.R.
C. a false E.P.R reading.
Ans.- noticeable shift in E.P.R.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 25. The indicator of a tachometer system is responsive to change in.
A. voltage.
B. frequency.
C. current flow.
Ans.- frequency.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 26. The fuel flow indication data sent from motor driven impeller and turbine, and motorless type fuel flow transmitters is a measure of.
A. fuel mass flow.
B. fuel volume flow.
C. engine burner pressure drop.
Ans.- fuel mass flow.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 27. In addition to fuel quantity, a computerized fuel system (C.F.S) with a totalizer indicator provides indication of how many of the following?.
A. Fuel flow rate, Fuel used since reset or initial start up, Fuel time remaining at current power setting.
B. Fuel flow rate, Fuel used since reset or initial start up, Fuel time remaining at current power setting, Fuel temperature.
C. Fuel flow rate, Fuel used since reset or initial start up, Fuel temperature.
Ans.- Fuel flow rate, Fuel used since reset or initial start up, Fuel time remaining at current power setting.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 28. The fuel flow indicator rotor and needle for a motor impeller and turbine indicating system is driven by.
A. direct coupling to the motor shaft.
B. an electrical signal.
C. a mechanical gear train.
Ans.- an electrical signal.
Explanation. Jeppesen A&P Powerplant Textbook 4-4.

Q. 29. Motor driven impeller and turbine fuel flow transmitters are designed to transmit data.
A. using aircraft electrical system power.
B. mechanically.
C. by fuel pressure.
Ans.- using aircraft electrical system power.
Explanation. NIL.

Q. 30. What unit in a tachometer system sends information to the indicator?.
A. The two phase AC generator.
B. The three phase AC generator.
C. The synchronous motor.
Ans.- The three phase AC generator.
Explanation. Jeppesen Aircraft Gas Turbine Powerplants 12-13.

Q. 31. Engine oil temperature gauges indicate the temperature of the oil.
A. entering the oil cooler.
B. entering the engine.
C. in the oil storage tank.
Ans.- entering the oil cooler.
Explanation. Rolls Royce book fig 8-7.

Q. 32. Thermocouple leads.
A. may be repaired using solderless connectors.
B. are designed for a specific installation and may not be altered.
C. may be installed with either lead to either post of the indicator.
Ans.- are designed for a specific installation and may not be altered.
Explanation. NIL.

Q. 33. Why do helicopters require a minimum of two synchronous tachometer systems?.
A. One indicates engine RPM and the other tail rotor RPM.
B. One indicates main rotor RPM and the other tail rotor RPM.
C. One indicates engine RPM and the other main rotor RPM.
Ans.- One indicates engine RPM and the other main rotor RPM.
Explanation. NIL.

Q. 34. If the thermocouple leads were inadvertently crossed at installation, what would the E.G.T gauge pointer indicate?.
A. Moves off scale on the high side of the meter.
B. Moves off scale on the zero side of the meter.
C. Normal temperature for prevailing condition.
Ans.- Moves off scale on the zero side of the meter.
Explanation. NIL.

Q. 35. A common type of electrically operated oil temperature gauge utilizes.
A. either a wheatstone bridge or ratiometer circuit.
B. a thermocouple type circuit.
C. vapour pressure and pressure switches.
Ans.- either a wheatstone bridge or ratiometer circuit.

Explanation. NIL.

Q. 36. The indication on a thermocouple-type E.G.T indicator is produced by.
A. resistance changes in two dissimilar metals.
B. a difference in the voltage between two dissimilar metals.
C. a current generated by the temperature difference between dissimilar metal hot and cold junctions.
Ans.- a current generated by the temperature difference between dissimilar metal hot and cold junctions.
Explanation. NIL.

Q. 37. What is the Engine Pressure Ratio (E.P.R) used to indicate?.
A. The power produced by the engine.
B. The thrust produced by the engine.
C. As a cross check for minimum acceptable thrust.
Ans.- The thrust produced by the engine.
Explanation. Normally used on High Bypass Engines.

Q. 38. Where is Turbine Outlet Temperature (T.O.T) measured?.
A. Upstream of the turbine.
B. Downstream of the turbine.
C. In the combustion chamber.
Ans.- Downstream of the turbine.
Explanation. It can be in the jet pipe or more normally today in between turbine stages or even within NGV's.

Q. 39. A thermocouple indicator is basically a.

A. milliammeter.
B. millivoltmeter.
C. milliohmeter.
Ans.- millivoltmeter.
Explanation. A thermocouple generates an E.M.F between hot and cold junction, hence the gauge is a millivoltmeter.

Q. 40. A thermocouple indicator is connected to the.

A. cold junction.
B. hot junction.
C. difference between the hot junction and the cold junction.
Ans.- cold junction.
Explanation. Pallett Aircraft Instruments and Integrated Systems Page 362 Refers.

Q. 41. Thrust in a high bypass fan engine is indicated by.
A. N3 RPM or P1/P4 ratio.
B. N1 RPM or N3 RPM.
C. N1 RPM or E.P.R.
Ans.- N1 RPM or E.P.R.
Explanation. RR and P&W tend to use E.P.R. GE use N1.

Q. 42. How is the N1 and N2 measured on a triple spool engine?.
A. Tachometer connected to the internal gearbox.
B. Tachometer connected to the external gearbox.
C. Pulse type speed probes.
Ans.- Pulse type speed probes.
Explanation. Jeppesen Gas Turbine Powerplants Page 12-16 refer. Fig 12-10B shows the system used on Rolls Royce triple spool engines.

Q. 43. Modern oil pressure servo transmitters sense.

A. absolute pressure.
B. H.P oil pressure.
C. differential pressure.
Ans.- differential pressure.
Explanation. Jeppesen Gas Turbine Powerplants Page 12-28 refer.

Q. 44. E.G.T thermocouples are usually made of.

A. nickel and platinum.
B. chromel and platinum.
C. chromel and alumel.
Ans.- chromel and alumel.
Explanation. Jeppesen Gas Turbine Powerplants Page 12-4 refer.

Q. 45. Thrust in a high bypass engine is indicated by measuring.
A. N3 RPM.
B. neither of the above, thrust is not indicated in flight.

C. fuel flow.
Ans.- neither of the above, thrust is not indicated in flight.
Explanation. The only indication of power in flight is E.P.R or, for a high bypass engine, N1 RPM.

Q. 46. What power supply is required for a thermocouple system to work?.
A. Alternating current.
B. Direct current.
C. Neither of the above.
Ans.- Neither of the above.
Explanation. Rolls Royce the Jet engine Page 139 refers.

Q. 47. In a thermocouple temperature sensing system, what is the purpose of the compensating resistor?.
A. To correct for varying ambient temperatures at the hot junction.
B. To correct for varying ambient temperatures at the cold junction.
C. To standardise the reading for different engine types.

Ans.- To correct for varying ambient temperatures at the cold junction.
Explanation. Rolls Royce The Jet Engine page 140 refers.

Q. 48. In a tachometer generator.
A. the frequency output is inversely proportional to engine speed.
B. frequency output is proportional to engine speed.
C. the frequency output is constant.
Ans.- frequency output is proportional to engine speed.

Explanation. Pallett Aircraft Instruments and Integrated Systems P348 refers.

Q. 49. Vibration pick-ups are located.
A. on both fan and turbine cases.
B. on the fan/compressor case.
C. on the turbine case.
Ans.- on both fan and turbine cases.
Explanation. Can be on one or both, depending upon the engine.

Q. 50. In a capacitive type fuel quantity indicating system the tank units are connected in.
A. series.
B. parallel.
C. series/parallel.
Ans.- parallel.
Explanation. EHJ Pallett Aircraft Instruments and Integrated Systems page 337 refers.

Q. 51. Torque measurement in a gas turbine engine is.
A. not always reliable.
B. highly reliable.
C. required only when the turbine drives a propeller.
Ans.- required only when the turbine drives a propeller.

Explanation. Rolls Royce The Jet Engine Page 138 refers.

Q. 52. Vibration signals, when picked up,.
A. go straight to indicator.
B. go through half wave rectifier to indicator.
C. the frequencies are filtered to exclude unwanted frequencies.
Ans.- the frequencies are filtered to exclude unwanted frequencies.
Explanation. The filters in the Vibro-meter use rotor speed to identify vibration frequencies.

Q. 53. E.G.T is displayed in.
A. Kelvin.
B. degrees centigrade.
C. degrees Fahrenheit.
Ans.- degrees centigrade.
Explanation. E.G.T is always measured in centigrade.

Q. 54. N2 is taken from.
A. a speed transducer on the fan rear frame.
B. a tachometer attached on the N1 gearbox.
C. a tachometer on the accessory gearbox.
Ans.- a tachometer on the accessory gearbox.
Explanation. The N2 gearbox is driven by the N2 compressor. A single winding of an alternator can be used for the speed signal as an alternative to a.

Q. 55. Engine vibration is monitored using.

A. electromechanical devices.
B. Fenwall type sensors.
C. piezoelectric accelerometer.
Ans.- piezoelectric accelerometer.
Explanation. Piezoelectric devices convert force(from the vibration) to a milli-volt output.

Q. 56. Integrating fuel flow gives.
A. average fuel flow.
B. total fuel consumed.
C. fuel flow and acceleration.
Ans.- total fuel consumed.
Explanation. An Integrator is incorporated in a fuel flow-meter to give a total fuel used figure.

Q. 57. The gauge on a bulb type temperature indicator shows zero. This could be caused by.

A. open circuit in the wiring.
B. temperature bulb going open circuit.
C. two cables shorting together by the sensor.
Ans.- two cables shorting together by the sensor.
Explanation. Pallett Instruments and Integrated systems Page 318 refers. A short will remove all power from both windings and the pointer will go tominimum scale.

Q. 58. In a thermocouple system, the size of the E.M.F that is produced is a result of.
A. the difference between the hot and cold junction.
B. the cold junction only.
C. the hot junction only.
Ans.- the difference between the hot and cold junction.

Explanation. The E.M.F is a result of the difference between the 2 junctions.

Q. 59. A ballast resistor is fitted.
A. in parallel, to give identical readings for all engines.

B. in series, to give identical resistance values for all engines.
C. in series, to give identical resistance values to all airframes.
Ans.- in series, to give identical resistance values to all airframes.
Explanation. NIL.

15.15, Power Augmentation Systems

Q. 1. When reheat is used, E.P.R.
A. is reduced.
B. remains constant.
C. is increased.
Ans.- remains constant.
Explanation. Rolls Royce The jet engine page 175 states that as P6 increases in the jet pipe the nozzles are opened to reduce P6 back to its normal value.

Q. 2. When reheat is selected and in operation, the mass gas flow.
A. decreases.
B. remains the same.
C. increases.
Ans.- remains the same.
Explanation. NIL.

Q. 3. Screech liners in the afterburning jet pipe.

A. prevent unstable combustion.
B. prevent cyclic vibrations of large amplitude.
C. acts as noise suppressors.
Ans.- prevent cyclic vibrations of large amplitude.
Explanation. NIL.

Q. 4. Water methanol for cooling is injected into the.

A. compressor inlet or outlet.
B. engine hot zone.
C. combustion chamber.
Ans.- compressor inlet or outlet.
Explanation. Jepperson Gas Turbine Powerplants Page 7-41 refers.

Q. 5. On an injection system.
A. methanol is injected neat.
B. town water/methanol is injected.
C. demineralized water/methanol is injected.
Ans.- demineralized water/methanol is injected.
Explanation. Jepperson Gas Turbine Powerplants Page 7-41 refers.

Q. 6. When using water methanol in an axial flow compressor, it is injected into the.
A. compressor inlet or burner section.
B. burner.
C. intake.
Ans.- compressor inlet or burner section.
Explanation. Jepperson Gas Turbine Powerplant Fig 7-32.

Q. 7. The main reason for adding methanol to the water is to.
A. temper the cooling effect of the water to prevent distortion.
B. supply the additional heat required.
C. prevent mixture freezing.
Ans.- prevent mixture freezing.
Explanation. Rolls Royce The Jet Engine page 181 refers.

Q. 8. The primary purpose of water injection is to.

A. decrease mass airflow.
B. increase the calorific value of the fuel.
C. cool the turbine.
Ans.- cool the turbine.
Explanation. Notice that the answers did not include 'increase mass airflow'. Cooling the turbine is the primary purpose o=if the water is injected in the combustor outlet manifold.

Q. 9. Water used in a thrust augmentation system should be demineralised to prevent.
A. blocking the jet.
B. carbon formation.
C. fouling the blades and vanes.
Ans.- fouling the blades and vanes.
Explanation. NIL.

Q. 10. The quantity of water usually carried by an aircraft equipped with water injection is enough for.

A. three take-offs.
B. one take-off.
C. two take-offs.
Ans.- one take-off.
Explanation. Jeppesen Gas Turbine Powerplants Page 7-41 refers.

Q. 11. Water methanol injection will increase thrust by up to.
A. 70%.
B. 50%.
C. 30%.
Ans.- 30%.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant page 7-41 shows 10-15% so 30% is nearest.

Q. 12. Injection of water/methanol into compressor inlet causes.
A. increase in power due to the burning of methanol alone.
B. increase in power without the need for burning extra fuel.
C. increased efficiency of the engine due to reduced icing in the airflow.
Ans.- increase in power without the need for burning extra fuel.
Explanation. Jeppesen Aircraft gas Turbine Power plant page 7-41 refers.

Q. 13. Reheat is the term used to describe.

A. adding fuel in the exhaust section.
B. adding of fuel in the turbine section.
C. adding of fuel in the compressor section.

Ans.- adding fuel in the exhaust section.
Explanation. Rolls Royce The Jet Engine Page 169 refers.

Q. 14. Water/methanol is injected.
A. at high temperatures.
B. at high temperature, at high altitudes.
C. at high temperatures or high altitudes.
Ans.- at high temperatures or high altitudes.
Explanation. Jeppesen aircraft gas turbine Powerplants Page 7-39 refers.

Q. 15. The reheat ignition system which incorporates a platinum/rhodium element is known as.
A. catalytic ignition.
B. hot-shot ignition system.
C. spark ignition system.
Ans.- catalytic ignition.
Explanation. fuel sprayed on to the catalytic element heats up and ignites.

Q. 16. Water or water/methanol injected into the combustion chamber inlet increases.
A. mass airflow through the turbine.
B. combustion chamber outlet temperatures.
C. fuel to air ratio by up to 20%.
Ans.- mass airflow through the turbine.
Explanation. Jeppesen Gas turbine Power plant page 7-41 refers.

Q. 17. Methanol is added to water when augmenting thrust in order to.
A. reclaim lost pressure at the compressor.
B. increase the density of air entering the compressor.

C. reclaim lost heat at the turbines.
Ans.- reclaim lost heat at the turbines.
Explanation. Methanol burns, but its heat output is low. It's prime purpose is to act as an antifreeze in the water.

Q. 18. Afterburning is initiated in order to.

A. heat the exhaust to prevent choking at subsonic gas velocities.
B. burn off the fuel that is not combusted in the combustion section.
C. increase the local speed of sound at the jet nozzle.
Ans.- increase the local speed of sound at the jet nozzle.
Explanation. A faster SoS allows for greater momentum thrust at the exhaust nozzle.

Q. 19. How is the flame stabilised in the reheat system of a gas turbine engine?.
A. By creating a greater potential between inlet & jet pipe temperatures.
B. By ensuring that the gas velocity is greater than the flame velocity.
C. By ensuring that the flame velocity is greater than the gas velocity.
Ans.- By ensuring that the gas velocity is greater than the flame velocity.
Explanation. The guttering in the reheat manifolds allows the flame to stabilise at the point.

Q. 20. During operation of the engine equipped with water injection system, the metering of the coolant to the system is.
A. selected by the pilot.
B. due to atmospheric pressure.
C. due to altitude change.
Ans.- selected by the pilot.
Explanation. Water injection is used on take off as required by the pilot.

Q. 21. Water methanol injection is used.
A. at high altitude take off conditions only.
B. at a combination of higher than normal air temperatures and high altitude take off conditions.
C. at higher than normal ambient air temperatures only.

Ans.- at higher than normal ambient air temperatures only.
Explanation. Water Methanol adds to the weight of the air thus compensating for reduced density.

15.16, Turbo-prop Engines

Q. 1. A free turbine is usually found on a.

A. turbo-jet.
B. turbo-fan.
C. turbo prop.
Ans.- turbo prop.
Explanation. NIL.

Q. 2. A free turbine is.

A. not directly connected to the power output shaft.
B. connected directly to the propeller and compressor.

C. connected directly to the power output shaft.
Ans.- connected directly to the power output shaft.
Explanation. Rolls Royce The Jet Engine page 5 refers.

Q. 3. The fuel flow in a turboprop engine within the constant speed range is controlled.
A. automatically.
B. manually.
C. No Control.
Ans.- automatically.
Explanation. Once the power lever has set the gas generator RPM it is controlled automatically to maintain the constant speed.

Q. 4. Torque measurement is taken from the.

A. reduction gearbox.
B. prop shaft.
C. free turbine shaft.
Ans.- reduction gearbox.
Explanation. Rolls Royce The Jet Engine Page 137 refers.

Q. 5. Electrical propeller de-icing pads are.

A. at the root.
B. at the tip.
C. on the trailing edge.
Ans.- at the root.
Explanation. On the leading edge from the root outward.

Q. 6. Fuel trimming on a turboprop engine is.

A. pilot controlled.
B. governor controlled.
C. automatic.
Ans.- governor controlled.
Explanation. Rolls Royce The Jet Engine page 98 refers.

Q. 7. What controls the fuel trimmer on a turboprop engine?.
A. The blade angle.
B. Propeller Control Unit.
C. Engine Speed Governor.
Ans.- Engine Speed Governor.
Explanation. Rolls Royce The Jet Engine page 98 refers.

Q. 8. What is the purpose of the reduction gear on a propeller driven engine?.
A. To maintain a constant propeller blade speed.
B. To enable torque measurement.
C. To prevent the propeller tips reaching the speed of sound.
Ans.- To prevent the propeller tips reaching the speed of sound.
Explanation. Reduction ratios vary between 13.5 :1 and 10:1.

Q. 9. If an E.P.R gauge is installed on turbofans as a measure of power output, what is used on a turboprop?.
A. E.P.R gauge.
B. Torque-meter.
C. Thermocouples.
Ans.- Torque-meter.
Explanation. Torque is used because it is measuring the resistance to rotation of the propeller, which is turned by the power of the engine.

Q. 10. What type of reduction gear is used on most turboprop modern engines?.
A. Helical cut parallel spur gears.
B. Epicyclic reduction gear.
C. Straight cut parallel spur gears.
Ans.- Epicyclic reduction gear.
Explanation. Epicyclic gearing is essential to enable the very large torque to be safely absorbed.

15.17, Turbo-Shaft Engines.

Q. 1. A turbo-shaft engine has.
A. a mechanical connection between compressor and turbine.
B. a power shaft which is not connected to the compressor.
C. none of the above.
Ans.- a power shaft which is not connected to the compressor.
Explanation. Jepperson Gas Turbine Powerplants Page 2-6 refers.

Q. 2. On a twin spool turbo-shaft engine, the free turbine is connected to the.
A. output gearbox.
B. L.P gearbox.
C. H.P gearbox.
Ans.- output gearbox.
Explanation. The output gearbox will normally contain a reduction gear system and torque measuring equipment.

Q. 3. In the majority of helicopters, the thrust generated by the gas generator is absorbed by the.

A. L.P turbine.
B. Free power turbine.
C. H.P turbine.
Ans.- Free power turbine.
Explanation. The power turbine drives a reduction/rotor transmission gearbox.

15.18, Auxiliary Power Units (APUs).

Q. 1. An A.P.U has.
A. automatically controlled thrust and is self contained.

B. variable speed and is self contained.
C. constant speed and is self contained.
Ans.- constant speed and is self contained.
Explanation. Jepperson Gas Turbine Powerplants Page 7-26.

Q. 2. An A.P.U shut down is initiated by.
A. high oil pressure, fire warning, hot oil temperature.

B. low oil pressure, fire warning, hot oil temperature.
C. low oil pressure, fire warning.
Ans.- low oil pressure, fire warning, hot oil temperature.

Explanation. Honeywell 331-200 A.P.U handbook refers.

Q. 3. An A.P.U start cycle is completed at.

A. 100% RPM.
B. 75% RPM.
C. 95% RPM.
Ans.- 95% RPM.
Explanation. Jeppesen Aircraft Powerplant Page 7-25 refers.

Q. 4. An A.P.U power lever is located.
A. behind the throttles.
B. at the Flight Engineer Station.
C. An A.P.U is fully automatic and does not require a power lever.
Ans.- An A.P.U is fully automatic and does not require a power lever.
Explanation. Jeppesen Aircraft Powerplant Page 7-23.

Q. 5. An A.P.U consists of.
A. a power compressor and load compressor.
B. a power compressor and directly connected turbine.

C. a load compressor and free turbine.
Ans.- a power compressor and load compressor.
Explanation. The power compressor generates the pressure to drive the system, the load compressor supplies air to the aircraft pneumatic system.

Q. 6. When necessary, A.P.U engine cooling before shutdown may be accomplished by.
A. closing the bleed air valve.
B. opening the bleed air valve.
C. unloading the generator(s).
Ans.- closing the bleed air valve.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-37.

Q. 7. Frequently, an aircraft's auxiliary power unit (A.P.U) generator.
A. is identical to the engine-driven generators.
B. has a higher load capacity than the engine-driven generators.
C. supplements the aircraft's engine-driven generators during peak loads.
Ans.- is identical to the engine-driven generators.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-36.

Q. 8. Fuel scheduling during A.P.U start and under varying pneumatic bleed and electrical loads is maintained.
A. automatically by the A.P.U fuel control system.
B. manually through power control lever position.
C. Jeppesen A&P Technician Propulsion Textbook 3-37.

Ans.- automatically by the A.P.U fuel control system.
Explanation. NIL.

Q. 9. An A.P.U is usually rotated during start by.

A. a pneumatic starter.
B. a turbine impingement system.
C. an electric starter.
Ans.- an electric starter.
Explanation. NIL.

Q. 10. Usually, most of the load placed on an A.P.U occurs when.
A. the bleed air valve is opened.
B. an electrical load is placed on the generator(s).
C. the bleed air valve is closed.
Ans.- the bleed air valve is opened.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-37.

Q. 11. The function of an A.P.U air inlet plenum is to.

A. stabilize the pressure of the air before it enters the compressor.
B. increase the velocity of the air before entering the compressor.
C. decrease the pressure of the air before entering the compressor. .
Ans.- stabilize the pressure of the air before it enters the compressor.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-37.

Q. 12. In a large commercial passenger transport aircraft the A.P.U supplies.
A. pneumatics and electrics.
B. electrics.
C. pneumatics.
Ans.- pneumatics and electrics.
Explanation. Jeppesen Aircraft Powerplant Page 7-25.

Q. 13. When in operation, the speed of an A.P.U.

A. remains at or near rated speed regardless of the load condition.
B. remains at idle and automatically accelerates to rated speed when placed under load.
C. is controlled by a cockpit power lever.
Ans.- remains at or near rated speed regardless of the load condition.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-37.

Q. 14. Generally, when maximum A.P.U shaft output power is being used in conjunction with pneumatic power.
A. electrical loading will be automatically modulated to maintain a safe E.G.T.
B. temperature limits and loads must be carefully monitored by the operator to maintain a safe E.G.T.
C. pneumatic loading will be automatically modulated to maintain a safe E.G.T.
Ans.- pneumatic loading will be automatically modulated to maintain a safe E.G.T.
Explanation. Jeppesen A&P Technician Propulsion Textbook 3-37.

Q. 15. For an A.P.U to run 'unmanned' it must be equipped with.
A. an automatic fire extinguishing system.
B. both an audible fire warning and an automatic fire extinguishing system.
C. an audible fire warning.
Ans.- both an audible fire warning and an automatic fire extinguishing system.
Explanation. The audible warning is external and internal and auto fire extinguishing (when the engines are not running) is normal.

Q. 16. An A.P.U is.
A. a self contained constant speed gas turbine engine.

B. a reserved engine in case of a main engine failure.
C. a self contained variable speed gas turbine engine.
Ans.- a self contained constant speed gas turbine engine.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 7-24 refers.

Q. 17. When the A.P.U is running and pneumatics are on.
A. bleed valve is closed, surge valve is open.
B. bleed valve is open, surge valve is closed.
C. bleed valve is open, surge valve is modulating.
Ans.- bleed valve is open, surge valve is closed.
Explanation. NIL.

Q. 18. When is the A.P.U at its greatest load?.

A. With generator loads on line.

B. With bleeds closed.
C. With bleeds open and with generator loads on line.

Ans.- With bleeds open and with generator loads on line.
Explanation. Modern A.P.U's supply pneumatics and electrical power.

Q. 19. Auxiliary power units provide.
A. hydraulic and electrical power.
B. pneumatic and electrical power.
C. hydraulic and pneumatic power.
Ans.- pneumatic and electrical power.
Explanation. Electrical power is normally available up to the service ceiling with pneumatics up to about 17000 ft (Boeing B-757/767).

Q. 20. When starting an A.P.U what would the normal duty cycle be on a
modern aircraft?.
A. 6 attempted starts per half hour with 5 minutes between attempts.
B. 3 attempted starts per hour with 5 minutes between each attempt.
C. 6 attempted starts per hour with 5 minutes between attempts.
Ans.- 3 attempted starts per hour with 5 minutes between each attempt.
Explanation. Honeywell A.P.Us recommend 3 continuous start attempts per hour. Boeing 757/767 notes add that a 60 minute cool-down period should be allowed before further start attempts are made.

Q. 21. From where does the A.P.U receive a fire signal?.
A. It has its own system.
B. It is dependent on the airframe system.
C. It is dependent on the engine fire system.
Ans.- It has its own system.
Explanation. The A.P.U compartment has its own firewires sending a discrete signal to the A.P.U fire controller.

Q. 22. What are the two most important signals when monitoring an A.P.U?.
A. E.G.T and RPM.
B. Oil Pressure and Inlet Pressure.
C. E.G.T and Oil Pressure.
Ans.- E.G.T and RPM.
Explanation. E.G.T and RPM are monitored on the A.P.U page of EICAS /ECAM systems.

Q. 23. One of the accessories driven from the A.P.U gearbox in a centrifugal switch, the purpose of which is to.
A. arm the governed speed indication circuits and max. RPM governor.
B. cancel the ignition circuits and arm the overspeed protection circuits.
C. control starting and automatic extinguishing circuits.

Ans.- cancel the ignition circuits and arm the overspeed protection circuits.
Explanation. NIL.

Q. 24. What iniates A.P.U shutdown?.
A. Fire detection, low oil pressure, high oil temperature.

B. Overspeed, fire detection, low oil quantity.
C. Low oil pressure, low oil pressure, high oil temperature.
Ans.- Fire detection, low oil pressure, high oil temperature.
Explanation. Honeywell 331-200 A.P.U handbook refers.

C. On fault.
Ans.- On engine start up.
Explanation. The E.E.C prepares for the changeover by resetting the E.E.C on shut down, but does not actually do it until the next start. A simple single fault (compared to a complete channel failure) will not cause a change over.

Q. 104. The possible combined output from all the scavenge pumps in a lubrication system will be.

A. greater than the pressure pump output.
B. less than the pressure pump output.
C. the same as the pressure pump output.
Ans.- greater than the pressure pump output.
Explanation. NIL.

Q. 105. If the knife-edge blade in a kinetic valve is fully in.
A. pump pressure is constant.
B. servo pressure is being bled off.
C. servo pressure is increasing.
Ans.- servo pressure is being bled off.
Explanation. Rolls Royce The Jet Engine page 103 para 31 figure 10-8.

Module 15, GAS TURBINE ENGINE.

15.19, Powerplant Installation.

Q. 1. Pipes, electrical cables and associated components of a fire-detection system should be.

A. fire resistant.
B. fire proof.
C. fire retardant.
Ans.- fire resistant.
Explanation. Sensors are set to actuate at a temperature below melting point of the detector and its associated cables.

Q. 2. The minimum bend radius for a continuous loop type fire wire is.
A. 1/2 inch.
B. 1/8 inch.
C. 1 inch.
Ans.- 1 inch.
Explanation. NIL.

Q. 3. Acoustic linings made from composite materials are used in what section of the engine?

A. Not used to suppress noise.
B. Hot section & Cold Section.
C. Cold section only.
Ans.- Cold section only.
Explanation. RR Page 205 Para 18 refers, but see also Jeppesen Aircraft Gas Turbine Powerplant Page 3-5.

Q. 4. Vibration mounts are used for.
A. stopping vibrations entering the engines.
B. preventing engine vibration loads being transmitted to the airframe structure.
C. damping out vibration stresses on engine when being transported on an engine stand.
Ans.- preventing engine vibration loads being transmitted to the airframe structure.
Explanation. Small GTE's such as the A.P.U in Boeing 757 and 767 use anti vibration mounts.

Q. 5. An aircraft has a heavy landing and on inspection of the engine mounting bolts the bolts torque loading has reduced, you should.
A. add washers to take up any gap or slackness and re-torque to correct value.
B. remove bolt and carry out inspection as the bolt may have increased in length due to heavy landing.
C. re-torque bolt up to correct torque value.
Ans.- remove bolt and carry out inspection as the bolt may have increased in length due to heavy landing.
Explanation. If the bolt has stretched answers a or b will not return the bolts to the original strength!!.

Q. 6. Forward engine mounts take which loads?.

A. Thrust, vertical and shear loads.
B. Centrifugal, thrust and axial.
C. Thrust, vertical and impact.
Ans.- Thrust, vertical and shear loads.
Explanation. This question is referring to pylon mounted engine mounts.

Q. 7. Forward engine mounts take which form?.

A. Castings.
B. Forgings.
C. Fabricated sheet steel.
Ans.- Forgings.
Explanation. Forgings are the strongest form of manufacture for substantial structure.

Q. 8. Pipes around engines are.
A. aluminium.
B. mild seamless steel.
C. stainless steel.
Ans.- stainless steel.
Explanation. Stainless Steel is best for corrosion and heat resistance.

Q. 9. Fibrous metallic lining for noise suppression is used.
A. for lobe type noise suppressors.
B. in cold area.
C. in hot area.
Ans.- in hot area.
Explanation. Rolls Royce The Jet engine Page 205 refers.

Q. 10. Noise lining in the fan area is made from.

A. layers of bonded resin.
B. porous type Honeycomb and backing sheet.
C. felt with aluminium sheet.
Ans.- porous type Honeycomb and backing sheet.
Explanation. Rolls Royce The Jet engine Page 205 refers.

Q. 11. A powerplant consists of.
A. a basic engine plus E.C.U.
B. a basic engine plus thrust reverser, exhaust system and gear box with accessories.
C. the complete engine as it would be found on aircraft including all connections, controls, cowlings, intake etc.

Ans.- the complete engine as it would be found on aircraft including all connections, controls, cowlings, intake etc.
Explanation. Rolls Royce the Jet Engine Page 243 para 1 refers.

Q. 12. Acoustic blankets are installed to.
A. reduce noise levels.
B. increase thermal efficiency.
C. aid the streamlining of the engine.
Ans.- reduce noise levels.
Explanation. Acoustic blankets are used in both hot and cold sections. The material depends on the temperature.

Q. 13. When checking the effect of inertia on the engine after heavy landing you would first check the.

A. thrust line.
B. compressor shaft for distortion.
C. module alignment.
Ans.- module alignment.
Explanation. We assume that 'the module' means the powerplant, an initial check will always be the general visual of the powerplant and its cowlings.

Q. 14. Following the reports of a heavy landing you would.
A. carry out a complete visual examination of the power plant.
B. examine the engine mountings and borescope the nozzle guide vanes and turbine.
C. examine the engine mountings and fuse pins.
Ans.- carry out a complete visual examination of the power plant.
Explanation. C.A.A.I.Ps Leaflet 6-3 refers to inspection of pylons, mounts and cowlings. As all of these form part of the Powerplant then answer b is most correct.

Q. 15. The purpose of spring back and cushion on an engine power lever is.
A. used when friction builds up in a system.
B. used to prevent the controls hitting the fuel control stops.
C. used when full travel is used but slight movement is still required on the fuel control unit.
Ans.- used when full travel is used but slight movement is still required on the fuel control unit.
Explanation. See the dash-pot throttle in RR The Jet Engine page 101.

Q. 16. What are sometimes installed in an engine mounting system to tune out the worst engine vibrations?.
A. Spring cushioned mounting pads.
B. Vibration absorbers of calibrated weight.
C. Rubber encased wire-mesh vibration isolators.
Ans.- Rubber encased wire-mesh vibration isolators.
Explanation. A.P.U's use this sort of engine mount.

Q. 17. Where are the lifting points on a high bypass turbine engine?.
A. On the fan and compressor casing.
B. On the fan, turbine and compressor casing.
C. On the fan and turbine casing.
Ans.- On the fan and turbine casing.
Explanation. Assuming this means lifting with a typical bootstrap kit forward and aft mounts attach to the winches.

Q. 18. Rubber anti-vibration pads are fitted to engine.

A. components to prevent fatigue.
B. cradles to prevent damage during transportation.
C. pylons to prevent vibration through the airframe.
Ans.- pylons to prevent vibration through the airframe.

Explanation. Quite often used in conjunction with cone bolt mountings.

Q. 19. Engine thrust is transmitted through mountings that.
A. are designed to transmit eng thrust equally through front and rear supports.
B. are designed to prevent the thrust line of the engine varying.
C. allow for radial and axial expansion.
Ans.- allow for radial and axial expansion.
Explanation. NIL.

Q. 20. If you reduced the length of bellcrank (2) what would happen to the input to the F.C.U?.
A. remain the same.

B. reduce.
C. increase.
Ans.- increase.
Explanation. Reducing the arm from points 1 to 2 would decrease the arm length from the centre of rotation on the F.C.U to the connection on the belcrank. This would INCREASE the amount of rotary movement into the F.C.U.

15.20 Fire Protection Systems

Q. 1. A fire wire is installed.
A. to withstand inertia, vibration, etc, encountered during normal operation.
B. vertically.
C. horizontally.
Ans.- to withstand inertia, vibration, etc, encountered during normal operation.
Explanation. Firewires can be any shape or position, retained in rubber clips.

Q. 2. Resistive and capacitive type firewires are tested with.
A. megger/voltmeter.
B. megger/ohmmeter.
C. multimeter.
Ans.- megger/ohmmeter.
Explanation. Jepperson A&P Powerplant Page 11-11 refers.

Q. 3. Fire wire clips have rubber in them to.

A. stop heat transfer to the element.
B. insulate the fire wire electrically.
C. support the wire.
Ans.- support the wire.
Explanation. Jepperson A&P Powerplant Page 11-9 refers.

Q. 4. Fire extinguishers work by.
A. combining with remaining oxygen to get rid of it.
B. creating more oxygen.
C. reducing oxygen.
Ans.- combining with remaining oxygen to get rid of it.

Explanation. Jepperson Gas Turbine Powerplants Page 13-6 refers (Halon 1211).

Q. 5. Fire detection systems which are routed through another zone.
A. must be protected by the use of heat sinks.
B. must be protected from heat sources in the zone.
C. are not allowed.
Ans.- must be protected from heat sources in the zone.

Explanation. JAR 25.1203 states that a fire detection device must not pass through another zone unless it is protected from the heat of that zone.

Q. 6. The test switch of a continuous loop detector gives a.
A. continuity check.
B. insulation check.
C. bonding check.
Ans.- continuity check.
Explanation. Jepperson Gas Turbine Powerplant Page 13-3.

Q. 7. What are the types of continuous fire detection system?.
A. Capacitance.
B. Capacitance and resistance.
C. Inductance and capacitance.
Ans.- Capacitance and resistance.
Explanation. Jepperson Gas Turbine Powerplant Page 13-3.

Q. 8. What is the operating principle of the spot detector sensor in a fire detection system?.
A. A conventional thermocouple that produces a current flow.
B. A bimetallic thermoswitch that closes when heatedto a high temperature.
C. Resistant core material that prevents current flow at normal temperatures.
Ans.- A bimetallic thermoswitch that closes when heatedto a high temperature.
Explanation. Jeppesen A&P Powerplant Textbook 11-2.

Q. 9. In a fixed fire-extinguishing system, there are two small lines running from the system and exiting overboard. These line exit ports are covered with a blowout type indicator disc. Which of the following statements is true?.
A. When the red indicator disc is missing, it indicates the fire extinguishing system has been normally discharged.

B. When the green indicator disc is missing, it indicates the fire extinguishing system has had a thermal discharge.

C. When the yellow indicator disc is missing, it indicates the fire extinguishing system has been normally discharged.
Ans.- When the yellow indicator disc is missing, it indicates the fire extinguishing system has been normally discharged.
Explanation. NIL.

Q. 10. Two continuous-loop fire detection systems that will not test due to a broken detector element are the.
A. thermocouple system and the Lindberg system.
B. Kidde system and the Fenwal system.
C. Kidde system and the Lindberg system.
Ans.- Kidde system and the Fenwal system.
Explanation. Jeppesen A&P Powerplant Textbook 16-15.

Q. 11. Which of the following fire detection systems measures temperature rise compared to a reference temperature?.
A. Lindberg continuous element.
B. Thermocouple.
C. Thermal switch.
Ans.- Thermocouple.
Explanation. Jeppesen A&P Powerplant Textbook 11-4.

Q. 12. A fire involving energized electrical equipment is defined as a.
A. class B fire.
B. class D fire.
C. class C fire.
Ans.- class C fire.
Explanation. NIL.

Q. 13. How are most aircraft turbine engine fire extinguishing systems activated?.
A. Manual remote control valve.
B. Pushrod assembly.
C. Electrically discharged cartridges.
Ans.- Electrically discharged cartridges.
Explanation. NIL.

Q. 14. A fire detection system that operates on the rate of temperature rise is a.
A. thermocouple system.
B. thermal switch system.
C. continuous loop system.
Ans.- thermocouple system.
Explanation. NIL.

Q. 15. Why does one type of Fenwal fire detection system use spot detectors wired in parallel between two separate circuits?.
A. So that a single fault may exist in the system without sounding a false alarm.
B. To provide an installation that is equal to two separate systems: a primary system and a secondary, or back-up system.
C. So that a double fault may exist in the system without sounding a false alarm.
Ans.- So that a single fault may exist in the system without sounding a false alarm.
Explanation. NIL.

Q. 16. How does carbon dioxide (CO2) extinguish an aircraft engine fire?.
A. By lowering the temperature to a point where combustion will not take place.
B. The high pressure spray lowers the temperature and blows out the fire.
C. Contact with the air converts the liquid into snow and gas which smothers the flame.
Ans.- Contact with the air converts the liquid into snow and gas which smothers the flame.
Explanation. NIL.

Q. 17. A fuel or oil fire is defined as a.
A. class B fire.
B. class C fire.
C. class A fire.
Ans.- class B fire.
Explanation. NIL.

Q. 18. Which of the following is the safest fire extinguishing agent to use from a standpoint of toxicity and corrosion hazards?
A. Bromotrifluoromethane (Halon 1301).
B. Bromochlorodifluoromethane (Halon 1211).
C. Dibromodifluoromethane (Halon 1202).
Ans.- Bromotrifluoromethane (Halon 1301).
Explanation. NIL.

Q. 19. The explosive cartridge in the discharge valve of a fire extinguisher container is.
A. not a life dated unit.
B. a life dated unit.
C. mechanically fired.
Ans.- a life dated unit.
Explanation. Jeppesen A&P Technician Airframe Textbook 16-22.

Q. 20. A fire detection system operates on the principle of a buildup of gas pressure within a tube proportional to temperature. Which of the following systems does this statement define?.
A. Thermal switch system.
B. Lindberg continuous element system.
C. Kidde continuous loop system.
Ans.- Lindberg continuous element system.
Explanation. Jeppesen A&P Technician Powerplant Textbook 11-16.

Q. 21. The most satisfactory extinguishing agent for an intake fire is.
A. methyl bromide.
B. dry chemical.
C. carbon dioxide.
Ans.- dry chemical.
Explanation. Jeppesen A&P Technician Propulsion Textbook 16-22.

Q. 22. How is the fire extinguishing agent distributed in the engine section?.
A. Spray nozzles and perforated tubing.
B. Spray nozzles and fluid pumps.
C. Nitrogen pressure and slinger rings.
Ans.- Spray nozzles and perforated tubing.
Explanation. Jeppesen A&P Technician Propulsion Textbook 16-22.

Q. 23. What is the principle of operation of the continuous loop fire
detector system sensor?.
A. Core resistance material which prevents current flow at normal temperatures.
B. A bimetallic thermoswitch which closes when heated to a high temperature.
C. Fuse material which melts at high temperatures.
Ans.- Core resistance material which prevents current flow at normal temperatures.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 24. The fire detection system that uses a single wire surrounded by a continuous string of ceramic beads in a tube is the.
A. Kidde system.
B. thermocouple system.
C. Fenwal system.
Ans.- Fenwal system.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 25. The fire detection system that uses two wires imbedded in a ceramic core within a tube is the.

A. Lindberg system.
B. Kidde system.
C. Fenwal system.
Ans.- Kidde system.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 26. A continuous loop fire detector is what type of detector?.
A. Rate of temperature rise detector.
B. Spot detector.
C. Overheat detector.
Ans.- Overheat detector.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 27. Which of the following fire detection systems will detect a fire when an element is inoperative but will not test when the test circuit is energized?.
A. The Kidde system and the Fenwal system.
B. The thermocouple system and the Lindberg system.

C. The Kidde system and the thermocouple system.
Ans.- The Kidde system and the Fenwal system.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 28. After a fire is extinguished, or overheat condition removed in aircraft equipped with a Systron-Donner fire detector, the detection system.
A. must be manually reset.
B. automatically resets.
C. sensing component must be replaced.
Ans.- automatically resets.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-7.

Q. 29. For fire detection and extinguishing purposes, aircraft powerplant areas are divided into fire zones based on.
A. the volume and smoothness of the airflow through enginecompartments.
B. engine type and size.
C. hot and cold sections of the engine.
Ans.- hot and cold sections of the engine.

Explanation. NIL.

Q. 30. What is the function of a fire detection system?.
A. To discharge the powerplant fire extinguishing system at the origin of the fire.
B. To activate a warning device in the event of a powerplant fire.
C. To identify the location of a powerplant fire.
Ans.- To activate a warning device in the event of a powerplant fire.
Explanation. NIL.

Q. 31. What retains the nitrogen charge and fire extinguishing agent in a high rate of discharge (HRD) container?.
A. Pressure gauge and cartridge.
B. Breakable disk or fusible disk.
C. Pressure switch and check tee valve.
Ans.- Breakable disk or fusible disk.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-15.

Q. 32. The use of water on class D fires.
A. will cause the fire to burn more violently and can cause explosions.
B. has no effect.
C. is most effective if sprayed in a fine mist.
Ans.- will cause the fire to burn more violently and can cause explosions.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-12.

Q. 33. The pulling out (or down) of an illuminated fire handle in a typical large jet aircraft fire protection system commonly accomplishes what events?.

A. Closes fuel shutoff, closes hydraulic shutoff, disconnects the generator field, and arms the fire extinguishing system.
B. Closes fuel shutoff, closes hydraulic shutoff, closes the oxygen shutoff, disconnects the generator field, and arms the fire-extinguishing system.
C. Closes all firewall shutoff valves, disconnects the generator, and discharges a fire bottle.
Ans.- Closes fuel shutoff, closes hydraulic shutoff, disconnects the generator field, and arms the fire extinguishing system.
Explanation. NIL.

Q. 34. The most satisfactory extinguishing agent for an electrical fire is.
A. carbon tetrachloride.
B. methyl bromide.
C. carbon dioxide.
Ans.- carbon dioxide.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-13

Q. 35. Which of the following fire detectors are commonly used in the power section of an engine nacelle?.
A. Rate of temperature rise detectors.
B. CO detectors.
C. Smoke detectors.
Ans.- Rate of temperature rise detectors.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-3.

Q. 36. Which of the following fire detection systems uses heat in
the normal testing of the system?.
A. The Kidde system and the Fenwal system.
B. The thermocouple system and the Lindberg system.

C. The thermocouple system and the Fenwal system.
Ans.- The thermocouple system and the Lindberg system.
Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 37. How are extinguisher spray rings checked for freedom from obstruction?.
A. Firing the system.
B. Blowing through with compressed air.
C. Pumping water through the system.
Ans.- Blowing through with compressed air.
Explanation. Answer a is the only reasonable answer.

Q. 38. What is used as an extinguishant in fire bottles?.
A. Freon compounds.
B. Halogenated hydrocarbons.
C. Water.
Ans.- Halogenated hydrocarbons.
Explanation. Jeppesen Aircraft Gas Turbines Powerplant Page 13-6 refers, BUT Halogenated Hydrocarbons are Freon compounds. Rolls Royce Page 157 also refers.

Q. 39. The advantage of the two shot fire bottle system is.
A. one bottle can be discharged after certain time delay from the other bottle.
B. both bottles can be used in either of the engines.
C. one bottle can be used twice.
Ans.- both bottles can be used in either of the engines.

Explanation. Jeppesen Gas Turbine Engines 13-6 refers. Note that each bottle can only be discharged once.

Q. 40. To check a fire bottle in situ is serviceable.

A. weigh it, check blow out discs, check pressure.
B. check blow out disc only.
C. check blow out disc, pop up indicators, expiry date and pressure.
Ans.- check blow out disc, pop up indicators, expiry date and pressure.
Explanation. C.A.I.Ps AL3/10 para 4.3 mentions all these things.

Q. 41. Resistive type fire-wires are tested using.

A. megger/ohmmeter.
B. ammeter/ohmmeter.
C. megger/voltmeter.
Ans.- megger/ohmmeter.
Explanation. The megger tests insulation the ohmmeter tests continuity.

Q. 42. When testing an installed fire bottle.

A. a multimeter used.
B. a lamp and 1.5V cell used.
C. a safety ohmmeter is used.
Ans.- a safety ohmmeter is used.
Explanation. Any explosive device requires the use of a safety ohmmeter to limit current flow through the ignitor.

Q. 43. On checking a fault free fire detection system.

A. use megger as per normal.
B. a megger is never to be used.
C. use a megger only for a short while as it can polarise the element.
Ans.- use a megger only for a short while as it can polarise the element.
Explanation. The fault free or continuous loop firewire is capacitive and resistive. Prolonged use of the megger could polarise or charge the firewire, to give a false capacitive reading.

Q. 44. 3 ways to test serviceability of a fixed fire bottle in situ are.
A. weigh, pressure, blow-out disc.
B. weigh, pressure, pop up indicator.
C. pressure, pop up indicator, blow-out disc.
Ans.- pressure, pop up indicator, blow-out disc.
Explanation. A&P Mechanic Handbook EA-AC-65 Page 401 refers(You can't weigh the bottle in situ).

Q. 45. When installing a flow valve on a 'two shot' fire extinguishing system care must be taken to make sure.

A. flow arrow should be in a correct direction.
B. flow valve is pointing towards the respective bottle.

C. priority system must have the bigger flow side.
Ans.- flow arrow should be in a correct direction.
Explanation. Two shot systems do not have any priority. Any flow valve must be fitted in the right direction which is toward the engine not the bottle!.

Q. 46. Omission of crushable washer on engine fire-wire connector will.
A. allow moisture ingress.
B. affect fire wire continuity.
C. affect fire wire capacitance.
Ans.- allow moisture ingress.
Explanation. Jeppesen A&P power plant page 11-10 refers to copper crush washers at the connectors. Answers a and c cannot be right therefore b makes best sense.

Q. 47. Discharge cartridges of the fire bottle have.

A. life time in hours/calendar and replace which ever is longer.
B. life time in hours/or calendar and replace which ever is sooner.
C. no life time it is only replaced when unserviceable.
Ans.- life time in hours/or calendar and replace which ever is sooner.
Explanation. Operators usually change cartridges at planned checks. The cartridge also has a finite manufactures calendar life. This is normally longer.

Q. 48. The Kidde Fault Free Fire detection system has how many internal wires in the sensing element?.

A. 1.
B. 3.
C. 2.
Ans.- 2.
Explanation. Jeppesen Gas Turbine Powerplants Page 12-5 Refers.

Q. 49. When testing a two pin fire bottle connector.

A. continuity test 1 pin then short two together.
B. short two pins together.
C. continuity test 1 pin, then the other, then short two together.
Ans.- short two pins together.
Explanation. C.A.I.Ps EEL/1-7 para 3.6.4 States that to check for insulation short two pins together and check for insulation resistance between body and shorted pins from body.

Q. 50. Gas type fire-wires operate by utilising.

A. the change in the gas pressure.
B. the change in the gas dielectric level.
C. the change in the electrical resistance of the gas.
Ans.- the change in the gas pressure.
Explanation. RR The Jet Engine page 156 Para 16 refers. These gas filled type fire-wires go by the name of 'Systron Donner'.

Q. 51. On a fire bottle, if the indicator pin was protruding, this would indicate.
A. the bottle is under weight.
B. extinguisher had been fired.
C. an over pressure had occurred in the bottle.
Ans.- extinguisher had been fired.
Explanation. C.A.I.P's AL/3-10 describes and shows a discharge indicator pin device.

Q. 52. When testing a squib on a fire bottle, you use a.
A. multimeter (AVO).
B. low current ohmmeter.
C. lamp and 1.5V cell.
Ans.- low current ohmmeter.
Explanation. Rolls Royce the Jet Engine Page 28 refers.

Q. 53. In a two shot fire extinguishing system.

A. extinguishers distributed once to either engine compartment.
B. extinguisher distributed twice to each enginecompartment.
C. one squib can be fired, if that fails then the 2nd squib can be fired.
Ans.- extinguishers distributed once to either engine compartment.
Explanation. One shot from each bottle to either engine or both shots to one engine.

Q. 54. Methyl Bromide fire extinguisher are installed with neck.
A. horizontal.
B. at the bottom.
C. at the top.
Ans.- at the top.
Explanation. The heavier fluid is pushed out of the bottle by the head of gas sitting above the liquid.

Q. 55. In a Fenwall fire detection system.
A. the tube is inconel and wire is nickel.
B. inner electrode is inconel wire.
C. outer electrode is nickel tube.
Ans.- the tube is inconel and wire is nickel.
Explanation. NIL. www.fenwallcontrols.com

Q. 56. When a fire extinguisher is discharged the immediate action is.
A. operate engine to idle.
B. clean with cold water.
C. clean with hot water.
Ans.- clean with hot water.
Explanation. When the extinguishant is introduced into the gas path hot water should be used. Jeppesen Gas Turbine Powerplants Page 13-8 refers.

15.21, Engine Monitoring and Ground Operation.

Q. 1. Who establishes the recommended operating time between overhauls (T.B.O) of a gas turbine engine.

A. The engine manufacturer.
B. The operator (utilizing manufacturer data and trend analysis) working in conjunction with the Airworthiness Authority.
C. The Airworthiness Authority alone.
Ans.- The operator (utilizing manufacturer data and trend analysis) working in conjunction with the Airworthiness Authority.

Explanation. Jeppesen A&P Powerplant Textbook 3-27.

Q. 2. What is the first engine instrument indication of a successful start of a turbine engine?.
A. A rise in oil pressure.
B. A rise in the engine fuel flow.
C. A rise in the exhaust gas temperature.
Ans.- A rise in the exhaust gas temperature.
Explanation. NIL.

Q. 3. A hung start is indicated by the.
A. exhaust gas temperature exceeds specified limits.
B. fails to reach idle RPM.
C. RPM exceeds specified operating speed.
Ans.- fails to reach idle RPM.
Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 4. The blending of blades and vanes in a turbine engine.
A. may sometimes be accomplished with the engine installed, ordinarily using power tools.
B. should be performed parallel to the length of the blade using smooth contours to minimize stress points.

C. is usually accomplished only at engine overhaul.
Ans.- No Answer.
Explanation. NIL.

Q. 5. During inspection, turbine engine components exposed to high temperatures may only be marked with such materials as allowed by the manufacturer. These materials generally include.
A. layout dye, commercial felt tip marker or chalk.
B. layout dye, commercial felt tip marker, wax or grease pencil.
C. layout dye, commercial felt tip marker, wax or grease pencil, chalk or graphite lead pencil.
Ans.- layout dye, commercial felt tip marker or chalk.
Explanation. Jeppesen A&P Powerplant Textbook 4-26.

Q. 6. When the leading edge of a first stage turbine blade is found to have stress rupture cracks, which of the following should be suspected?.
A. Faulty cooling shield.
B. Over speed condition.
C. Over temperature condition.
Ans.- Over temperature condition.
Explanation. Jeppesen A&P Powerplant Textbook 4-25.

Q. 7. A magnetic chip detector inspection should be carried out.
A. within a specified time from shut down.
B. with engine cold.
C. with engine running.
Ans.- within a specified time from shut down.
Explanation. A.L.F 502 and 507 engines on 146/R.J specify that the engine M.C.D be checked after 20mins but before 2 hrs since shut down.

Q. 8. What is the proper starting sequence for a turbojet engine?.
A. Starter, ignition, fuel.
B. Starter, fuel, ignition.
C. Ignition, starter, fuel.
Ans.- Starter, ignition, fuel.
Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 9. Foreign object damage on a compressor, when boroscoping, is indicated by.
A. tip curl.
B. nicks and scores.
C. flats.
Ans.- nicks and scores.
Explanation. Jepperson Gas Turbine Powerplants Page 5-13 refers.

Q. 10. Turbine blades are generally more susceptible to operating damage than compressor blades because of.
A. higher temperature stresses.
B. higher centrifugal loading.
C. high pressure and high velocity gas flow.
Ans.- higher temperature stresses.
Explanation. NIL.

Q. 11. A magnetic chip detector detects.
A. particles held in suspension.
B. particles which are too small for the naked eye.
C. ferrous particles only.
Ans.- ferrous particles only.
Explanation. Jepperson Gas Turbine Powerplants Page 6-26 refers.

Q. 12. A cool-off period prior to shutdown of a turbine engine is done to.

A. prevent vapor lock in the fuel control and/or fuel lines.
B. prevent seizure of the engine bearings.
C. allow the turbine wheel to cool before the case contracts around it.
Ans.- allow the turbine wheel to cool before the case contracts around it.
Explanation. Jeppesen A&P Powerplant Textbook 4-9.

Q. 13. When starting a turbine engine, the starter should be disengaged.
A. only after the engine has reached full idle RPM.
B. when the ignition and fuel system are activated.
C. after the engine has reached self-sustaining speed.

Ans.- after the engine has reached self-sustaining speed.

Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 14. What should be done initially if a turbine engine catches fire when starting?.
A. Continue starting attempt in order to blow out the fire.
B. Continue engine start rotation and discharge a fire extinguisher into the intake.
C. Turn off the fuel and continue engine rotation with the starter.
Ans.- Turn off the fuel and continue engine rotation with the starter.
Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 15. A turbine engine hot section is particularly susceptible to which kind of damage?.
A. Scoring.
B. Galling.
C. Cracking.
Ans.- Cracking.
Explanation. NIL.

Q. 16. If a turbine engine is unable to reach takeoff E.P.R before its E.G.T limit is reached, this is an indication that the.
A. fuel control must be replaced.
B. E.G.T controller is out of adjustment.
C. compressor may be contaminated or damaged.
Ans.- compressor may be contaminated or damaged.
Explanation. NIL.

Q. 17. Which of the following engine variables is the most critical during turbine engine operation?.

A. Compressor RPM.
B. Turbine inlet temperature.
C. Compressor inlet air temperature.
Ans.- Turbine inlet temperature.
Explanation. NIL.

Q. 18. With the engine running at idle, the E.P.R system reads just over 1.
A. The system has failed and needs attention.
B. The system needs re-calibration back to '1'.
C. This is a normal condition and does not need attention.
Ans.- This is a normal condition and does not need attention.
Explanation. E.P.R with the engine shut down should read 1. At idle a very small pressure increase occurs in the jet pipe.

Q. 19. The recurrent ingestion of dust or other fine airborne particulates into an engine can result in.

A. the need for less frequent abrasive grit cleaning of the engine.
B. foreign object damage to the compressor section.
C. erosion damage to the compressor and turbine sections.
Ans.- erosion damage to the compressor and turbine sections.
Explanation. NIL.

Q. 20. When the engine is not running, and engine blanks are installed. The E.P.R gauge shows 1.0, then.

A. the transmitter is faulty.
B. the receiver is faulty.
C. it is normal.
Ans.- it is normal.
Explanation. Jepperson Gas Turbine Powerplant Page 12-17 Figure 12-12A.

Q. 21. Which of the following may be used to accomplish internal inspection of an assembled gas turbine engine?.
A. Ultrasound, and fluorescent penetrant and ultraviolet light.
B. X-ray and a borescope.
C. Infrared photography and fluorescent penetrant and ultraviolet light.
Ans.- X-ray and a borescope.

Explanation. NIL.

Q. 22. Run down time is indicative of.
A. an F.C.U malfunction.
B. compressor malfunction.
C. the freedom of rotation of the compressor.
Ans.- the freedom of rotation of the compressor.
Explanation. Short run down time is indicative of bearing failure.

Q. 23. A hung start or false start is one in which.

A. light up' occurs, but the RPM does not increase.
B. there is no 'light up'.
C. the engine does not rotate.
Ans.- light up' occurs, but the RPM does not increase.

Explanation. Jeppesen Gas Turbine Powerplants Page 10-1 Refers.

Q. 24. What would be the possible cause if a gas turbine engine has high exhaust gas temperature, high fuel flow, and low RPM at all engine power settings?.

A. Fuel control out of adjustment.
B. Loose or corroded thermocouple probes for the E.G.T indicator.
C. Turbine damage or loss of turbine efficiency.
Ans.- Turbine damage or loss of turbine efficiency.
Explanation. Jeppesen A&P Powerplant Textbook 4-5.

Q. 25. In regard to using a turbine engine oil analysis program, which of the following is NOT true?.

A. It is best to start an oil analysis program on an engine when it is new.
B. A successful oil analysis program should be run over an engine's total operating life so that normal trends can be established.
C. Generally, an accurate trend forecast may be made after an engine's first oil sample analysis.
Ans.- Generally, an accurate trend forecast may be made after an engine's first oil sample analysis.
Explanation. NIL.

Q. 26. Which of the following is the least likely indication of a main bearing failure?.
A. High oil consumption.
B. High oil temperature.
C. High oil pressure.
Ans.- High oil pressure.
Explanation. Low oil pressure would indicate bearing failure not High!.

Q. 27. After shutdown, flames are present in the exhaust pipe. The probable cause is.
A. a defective fuel control unit (F.C.U).
B. a defective pressurizing and dump valve.
C. a defective H.P cock.
Ans.- a defective pressurizing and dump valve.
Explanation. Jeppesen Gas Turbine Powerplant Page 7-56 refers.

Q. 28. If the L.P cock is used to shutdown an engine.

A. the F.C.U will continue to function.
B. flames will appear in the exhaust.
C. the H.P fuel pump will run dry.
Ans.- the H.P fuel pump will run dry.
Explanation. The L.P cock is normally aircraft mounted. The engine will run until the H.P fuel pump runs dry.

Q. 29. When accelerating from 'light-up' to ground idling speed, the E.G.T will.
A. remain constant.
B. increase above idle value then decrease to normal.

C. decrease below idle value then increase to normal.

Ans.- increase above idle value then decrease to normal.
Explanation. All Gas Turbines tend to overfuel until the RPM increases sufficiently to supply correct idle air flow.

Q. 30. A gas turbine engine is stopped by closing.

A. L.P cock.
B. H.P cock.
C. throttle valve.
Ans.- H.P cock.
Explanation. Rolls Royce The Jet Engine Page 110 refers.

Q. 31. A 'wet start' is indicated by.
A. no temperature indication.
B. low RPM.
C. a prolonged cranking period.
Ans.- no temperature indication.
Explanation. Due to lack of ignition.

Q. 32. The engine accelerates to idling by.
A. gas flow.
B. combined efforts of starter motor and gas flow.
C. starter motor.
Ans.- combined efforts of starter motor and gas flow.

Explanation. NIL.

Q. 33. An oil emission spectrometer measures.

A. particles in suspension.
B. particles on the surface.
C. specific gravity of the oil.
Ans.- particles in suspension.
Explanation. The colour of the spectrum produced upon burning the oil indicates parts per million of all metallic elements contained in the sample.

Q. 34. A broadband vibration reading indicates.

A. the total vibration sensed by the transducer.
B. the peak allowable vibration.
C. the N1 vibration.
Ans.- the total vibration sensed by the transducer.
Explanation. Broadband is the total of all the vibrations sensed.

Q. 35. Vibration analysers determine which component is vibrating by analysing.
A. voltage.
B. amplitude.
C. frequency.
Ans.- frequency.
Explanation. The faster the compressor shafts rotate the higher the frequency.

Q. 36. High frequency vibration.
A. causes engine components to crack.
B. energises air particles prior to compression.
C. can give an indication of a fluctuating (E.P.R).
Ans.- causes engine components to crack.
Explanation. The more vibration cycles the nearer to failure the component will become.

Q. 37. Engine oil sampling analysis is taken.

A. after engine shut down.
B. at specific time after engine shut down.
C. when oil level is high.
Ans.- at specific time after engine shut down.
Explanation. Jeppesen A&P Powerplant page 9-35 refers.

Q. 38. With external power applied, the engine will not run up to idle after reaching starting speed. The likely fault would be with the.
A. Fuel Control Unit.
B. clutch.
C. battery.
Ans.- Fuel Control Unit.
Explanation. Once an engine has reached starter cut out speed the only thing that can stop it accelerating is underfuelling.

Q. 39. When running down an engine.
A. it should be done as slowly as possible to assist thermal stress.
B. it should be done as quickly as possible to stop excess of fuel gathering.
C. it should be done as slowly as possible to reduce thermal stres.
Ans.- it should be done as slowly as possible to reduce thermal stress.
Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 14-2 refers.

Q. 40. What may be an indication of a bleed valve stuck in the closed position?.
A. Over speed.
B. Low E.G.T reading.
C. Compressor stalling at low RPM.
Ans.- Compressor stalling at low RPM.
Explanation. A closed bleed valve at low RPM means the compressor has too much air to handle, hence it may stall or surge.

Q. 41. Excessive E.G.T can.
A. cause N.G.V to creep.
B. cause damage to turbine.
C. cause damage to jet pipe.
Ans.- cause damage to turbine.
Explanation. The turbine is the highest stressed component in the engine.

Q. 42. A jet engine has a high oil temperature but all other power parameters are normal. The probable cause is.
A. a large quantity of oil being returned to tank.
B. gear box leakage.
C. a main bearing in distress.

Ans.- a main bearing in distress.
Explanation. Oil systems cool as well as lubricate.

Q. 43. When cleaning salt from a compressor.

A. use water then manufacturer's cleaning solution.
B. use water at low power then water at high power.
C. never use water, use only the recommended solution.
Ans.- use water at low power then water at high power.

Explanation. Jeppesen Aircraft gas turbine Powerplants Page 5-5 refers to desalination washes using water only.

Q. 44. A hot start refers to.
A. early ignition.
B. high E.G.T before idle RPM is achieved.
C. too much fuel being supplied.
Ans.- high E.G.T before idle RPM is achieved.
Explanation. A hot start is defined as an overtemping of the engine as the engine starts. It may be caused by overfuelling, but not necessarily.

Q. 45. If a compressor surge occurs, it is recognized by.
A. coughing in the compressor and vibration.
B. fluctuating RPM and fuel flow.
C. fluctuating E.G.T and thrust.
Ans.- coughing in the compressor and vibration.
Explanation. Whilst E.G.T and RPM will fluctuate, fuel flow will not and thrust cannot be measured. Therefore coughing and vibration is the correct answer.

Q. 46. Cracks may occur in hot section components of a turbine engine if they are marked during inspection with.
A. a lead pencil.
B. chalk.
C. layout dye.
Ans.- a lead pencil.
Explanation. Graphite based markers can cause intergranular corrosion. See Jeppesen Gas Turbine Powerplants Page 5-31.

Q. 47. What must not be used during an engine compressor wash?.
A. Chlorine.
B. Desalinization solution.
C. Crushed almond.
Ans.- Chlorine.
Explanation. By elimination b is correct. Crushed almond and desalination solutions are accepted compressor wash applications.

Q. 48. Trend monitoring of spectrometric oil analysis is carried out how often?.
A. During each scheduled maintenance period.
B. At set periods once the rate of wear has been established.
C. After every repair or modification.
Ans.- At set periods once the rate of wear has been established.
Explanation. New components always wear more than when they are run in. SOAP monitoring periods depend on the component not on the aircraft servicing cycle.

Q. 49. Starting an engine with a bleed valve stuck closed would cause:.
A. low E.G.T.
B. possible stalling of the engine.
C. high E.G.T.
Ans.- possible stalling of the engine.
Explanation. Bleed valves are normally open on start to prevent stalling.

Q. 50. Galling is a condition caused by excessive.

A. chafing.
B. scoring.
C. temperatures.
Ans.- chafing.
Explanation. See Dale Crane - Dictionary of Aircraft Terms.

Q. 51. If a burner was down, in a multi-can system, the engine would tend to.
A. hang up.
B. run up.
C. surge.
Ans.- surge.
Explanation. If a combustor tube fails to ignite there will be a pressure build up at the entrance to that burner can.

Q. 52. If the rundown time is less than the minimum stated for a given engine.
A. unacceptable wear is occurring at the main bearings.

B. the rotating assembly is free.
C. the rotating assembly is being restricted.

Ans.- the rotating assembly is being restricted.
Explanation. Failure to allow the engine to stabilise at idle after high power runs may cause the rotor to rub on the casing in older engines.

Q. 53. When running an engine the following lights should be on:.
A. anti-collision and nav-lights (if fitted).
B. nav-lights (if fitted).
C. anti-collision (if fitted).
Ans.- anti-collision and nav-lights (if fitted).
Explanation. An anti-collision light is always fitted and turned on for ground running. If there are nav lights it makes sense to have them on as well.

Q. 54. With spectral oil analysis program (S.O.A.P), samples are taken.
A. when the oil tank is full.
B. at a specified interval.
C. when the oil is warm.
Ans.- at a specified interval.
Explanation. SOAP samples are taken at routine servicing intervals as part of a preventative maintenance system.

Q. 55. During start, if a bleed valve is stuck closed.

A. E.G.T is unaffected.
B. E.G.T will be higher than normal.
C. E.G.T will be lower than normal.
Ans.- E.G.T will be lower than normal.
Explanation. More air is passing through the engine than it should therefore it will be cooler.

Q. 56. Dynamic balance testing locates unbalance in.

A. all planes.
B. two planes.
C. one plane.
Ans.- two planes.
Explanation. Dynamic balance is caused when the masses that are rotating are not equal and when the component parts, for example, propeller blades, are not tracking in the same plane.

Q. 57. On a gas turbine engine with baked oil deposits, how would you carry out grit blast cleaning With the engine at?.
A. stationary.
B. idle speed (low).
C. high speed.
Ans.- idle speed (low).
Explanation. Compressor cleaning is done with the engine running using a variety if grits in a water solution.

Q. 58. A rotation pad on an accessory drive gear box is provided for.
A. N2 rotation.
B. both are correct.
C. alternate tachogenerator fitment.
Ans.- N2 rotation.
Explanation. The rotation of the H.P compressor is required during borescope inspection.

Q. 59. What would be indicative of a hung start?.

A. Starter would fail to disengage.
B. High E.G.T.
C. Engine would fail to reach self sustaining speed.
Ans.- Engine would fail to reach self sustaining speed.

Explanation. In a hung start the engine normally stagnates at or near the starter cut out and any attempt to accelerate the engine will result in a hot start.

Module 15, GAS TURBINE ENGINE.

15.22, Engine Storage and Preservation.

Q. 1. Fuel system inhibiting oil is.
A. mineral oil.
B. light anti-freeze oil.
C. kerosene.
Ans.- mineral oil.
Explanation. C.A.I.Ps EL/3-14 refers to mineral oil.

Q. 2. After placing an engine in an M.V.P envelope.

A. check humidity indicator after 12 hours.
B. check humidity indicator after 24 hours.
C. check humidity indicator after 48 hours.
Ans.- check humidity indicator after 24 hours.
Explanation. Old C.A.I.Ps leaflet EL/3-14 refers.

Q. 3. On a vapour proof cocoon, there is a.

A. temperature indicator.
B. moisture indicator.
C. humidifier.
Ans.- moisture indicator.
Explanation. C.A.I.Ps EL/3-14 refers.

Q. 4. When an installed engine is not to be used for a period of up to 7 days.
A. it is necessary to inhibit the engine.
B. it is only necessary to blank off all apertures.
C. run the engine as prescribed in the Flight Manual.
Ans.- it is only necessary to blank off all apertures.
Explanation. C.A.I.Ps EL/3-14.

Q. 5. Installed engines must be re-preserved after preservation at least every.
A. six weeks.
B. six days.
C. six months.
Ans.- six months.
Explanation. C.A.I.Ps EL/3-14.

Q. 6. On storage of an engine, the desiccant is.

A. looked at within 24 hrs if its blue its OK.
B. looked at 24 hrs later if its blue its OK.
C. looked at 24 hrs later if blue it should be replaced.
Ans.- looked at 24 hrs later if its blue its OK.
Explanation. C.A.I.P's EL/3-14 (Engine Storage) refers. Note that answer a is partly correct, but you must also inspect the MVP envelope for damage or deterioration.

Q. 7. After placing an engine into storage, details would be recorded in.
A. Technical Log.
B. Engine log book.
C. Aircraft log book.
Ans.- Engine log book.
Explanation. All engines have a log book.

Q. 8. When storing an engine the fuel system is to be inhibited. How is this done?.
A. Remove plugs rotate engine then add oil.
B. Rotate engine whilst adding oil then remove plugs.

C. Add oil leaving plugs in.
Ans.- Remove plugs rotate engine then add oil.
Explanation. C.A.I.P's EL 3-14 (Engine storage)refers. This is a piston engine question but has been reported as being in a module 15 exam.

Q. 9. An engine in storage for 7 days should.

A. have storage oil placed in engine.
B. be run twice in that week.
C. be fitted with covers and blanks and apertures covered.
Ans.- be fitted with covers and blanks and apertures covered.
Explanation. Old C.A.I.P's EL/3-4 refers.

Q. 10. On a (VP) cocoon bag, if the humidity indicator turns pink/lilac.
A. desiccant is effective and does not need changing.
B. desiccant is ineffective and needs changing.
C. desiccant is changed weekly.
Ans.- desiccant is ineffective and needs changing.
Explanation. C.A.I.P's EL/3-4 refers.

Q. 11. To inhibit the fuel system of an installed engine.
A. pump oil into the engine when stationary.
B. dry motor the engine.
C. remove the ignitor plugs.
Ans.- dry motor the engine.

Explanation. C.A.I.P's EL 3-10 details this procedure. It is done by dry motoring the engine with a header tank of inhibiting oil connected to the inlet of the L.P fuel pump.

Q. 12. When is the humidity indicator checked on a preserved engine?.
A. 1 Month.
B. 1 Year.
C. 6 Months.
Ans.- 1 Month.
Explanation. C.A.A.I.Ps leaflet 7-4 states 'approximately monthly intervals'. If the desiccant is pink the envelope must be opened, the desiccant replaced and the envelope resealed.

Q. 13. With an engine in storage, desiccant is used.

A. as an insecticide.
B. as a corrosion inhibitor.
C. to remove moisture from the air.
Ans.- to remove moisture from the air.
Explanation. A&C Mechanics Handbook EA-AC65 page 389 refers.

Q. 14. Small cuts in a M.V.P. engine storage bag can be repaired.
A. with adhesive PVC tape.
B. by vulcanising.
C. by replacing M.V.P.
Ans.- with adhesive PVC tape.
Explanation. NIL.

Q. 15. When removing an engine for long-term storage, bleed valves should be.
A. removed.
B. locked closed.
C. open but blanked.
Ans.- open but blanked.
Explanation. NIL.

15.23.

Q. 1. The types of water present in aviation fuel are.

A. free and entrained both harmful.
B. free that is harmful and entrained that is harmless.
C. free that is harmless and entrained that is harmful.

Ans.- free and entrained both harmful.
Explanation. NIL.

Q. 2. Oil pressure and scavenge pumps are usually.

A. spur gear pumps.
B. multi-plunger pumps.
C. diaphragm pumps.
Ans.- spur gear pumps.
Explanation. NIL.

Q. 3. The purpose of a pressure filter in a lubrication system is to.
A. protect the pressure pump.
B. protect the oil jets.
C. protect the scavenge pumps.
Ans.- protect the oil jets.
Explanation. NIL.

Q. 4. a curvic coupling.
A. converts rotary motion to reciprocating motion.
B. absorbs misalignment between the driving and driven shafts.
C. accurately aligns the driving and the driven shafts.
Ans.- accurately aligns the driving and the driven shafts.

Explanation. NIL.

Q. 5. Feeders are.
A. conduits used to carry electrical cable.
B. fluid supply hoses.
C. heavy duty electrical generator cables.
Ans.- heavy duty electrical generator cables.
Explanation. NIL.

Q. 6. High air humidity will.
A. have no affect on thrust.
B. reduce the thrust output.
C. increase the thrust output.
Ans.- reduce the thrust output.
Explanation. NIL.

Q. 7. C.I.T sensor is made up of.
A. Iron-constantan.
B. Chromel-alumel.
C. Platinum-rhodium.
Ans.- Platinum-rhodium.

Explanation. NIL.
http://www.megatron.co.il/Thermocouple.htm
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Q. 8. What is the maximum value of pressure with reference to a jet engine?.
A. 1 Bar.
B. 1 Kg/cm.
C. 1 Atmospheric Pressure.
Ans.- 1 Atmospheric Pressure.
Explanation. 1 Atm. = 1.013 Bar.

Q. 9. The hottest casing is the.
A. H.PT.
B. combustion chamber.
C. L.PT.
Ans.- H.PT.
Explanation. NIL.

Q. 10. Centrifugal compressor maximum tip speed is.

A. 0.8 Mach.
B. 1.2 Mach.
C. 0.5 Mach.
Ans.- 1.2 Mach.
Explanation. NIL.

Q. 11. What type of oil is used in a gas turbine engine?.
A. Synthetic.
B. Phosphate Ester.
C. Mineral.
Ans.- Synthetic.
Explanation. Synthetic.