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.

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.