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.