

14-1 Turbine engines

Question Number. 1. From where is manifold pressure taken on a supercharged engine?

Option A: between the carburetor and the supercharger

Option B: between the supercharger and the throttle

Option C: between the carburetor and the induction ports

Correct Answer is. Between the carburetor and the induction ports

Explanation. Read up on manifold pressure indication systems (The supercharger bills a red herring)

Question Number. 2. On a gas turbine engine, what is the fan driven by?

Option A: HP turbine

Option B: LP turbine

Option C: IP turbine

Correct Answer is. LP turbine

Explanation. Read up on basic gas turbine engine configurations

Question Number. 3. What is an engine stage?

Option A: One rotor plus one stator

Option B: One IGV and one rotor

Option C: One compressor rotor and one nozzle guide vane

Correct Answer is. One rotor plus one stator

Explanation. Read up on basic gas turbine engine configurations

Question Number. 4. The air data input to the FADEC fails. The result will be

Option A: a lack of flight data

Option B: uncorrected data from hard wired analogue sensors is utilized

Option C: the FADEC reverts to the failsafe mode

Correct Answer is. the FADEC reverts to the failsafe mode

Explanation. Read up on FADEC

Question Number. 5. Torque measurement is taken from the

Option A: free turbine shaft

Option B: reduction gearbox

Option C: prop shaft

Correct Answer is. reduction gearbox

Explanation. Read up on torque indication systems

Question Number. 6. A FADEC system consists of

Option A: HMU, sensors and an EEC

Option B: HMU, ADC and sensors

Option C: EEC, ADC and sensors

Correct Answer is. HMU, sensors and an EEC

Explanation. Read up on FADEC

Question Number. 7. What power supply is required for a thermocouple system to work?

Option A: Direct current

Option B: Alternating current

Option C: Neither of the above

Correct Answer is. Neither of the above

Explanation. Read up on EGT indication systems

Question Number. 8. In a 24 thermocouple system, one thermocouple goes open circuit. What error is detected at the indicator?

Option A: None

Option B: No indication

Option C: Gauge freezes at last known reading

Correct Answer is. None

Explanation. Read up on EGT indication systems

Question Number. 9. In a thermocouple temperature sensing system, what is the purpose of the compensating resistor?

Option A: To standardize the reading for different engine types

Option B: To correct for varying ambient temperatures at the cold junction

Option C: To correct for varying ambient temperatures at the hot junction

Correct Answer is. To correct for varying ambient temperatures at the cold junction

Explanation. Read up on EGT indication systems

Question Number. 10. In a dive, with the throttles fixed, the EPR will

Option A: increase

Option B: decrease

Option C: not change

Correct Answer is. not change

Explanation. Read up ERR indicating systems

Question Number. 11. How is the N1 and N2 measured on a triple spool engine?

Option A: Pulse type speed probes

Option B: Tachometer connected to the external gearbox

Option C: Tachometer connected to the internal gearbox

Correct Answer is. Pulse type speed probes

Explanation. Read up on basic gas turbine engine configurations

Question Number. 12. A twin spool engine has

Option A: one turbine on one shaft

Option B: two turbines on one shaft

Option C: two turbines on two shafts

Correct Answer is. two turbines on two shafts

Explanation. Read up on basic gas turbine engine configurations

Question Number. 13. A free turbine aircraft engine is most likely to be used on a

Option A: high bypass engine

Option B: a direct coupled engine

Option C: a helicopter engine

Correct Answer is. a helicopter engine

Explanation. Read up on basic gas turbine engine configurations-a free turbine allows the rotor to be stopped whilst the engine is running

Question Number. 14. Propeller speed is measured from

Option A: a slip ring pulse probe

Option B: a tachometer on the LP turbine shaft

Option C: a pulse probe at the engine side of the reduction gear

Correct Answer is. a slip ring pulse probe

Explanation. Read up on propeller speed indicating systems

Question Number. 15. Propeller torque is analogous to

Option A: engine RPM

Option B: shaft horsepower

Option C: propeller RPM

Correct Answer is. shaft horsepower

Explanation. Read up on torque indicating systems

Question Number. 16. How is power indicated on a fixed pitch propeller?

Option A: RPM gauge

Option B: Torque gauge

Option C: Horsepower gauge

Correct Answer is. RPM gauge

Explanation. Read up on fixed pitch propeller/engine indicating systems

Question Number. 17. What are the units of manifold pressure on a normally aspirated engine?

Option A: PSI

Option B: Inches of water

Option C: Inches of mercury

Correct Answer is. Inches of mercury

Explanation. Read up on piston/propeller indicating systems

Question Number. 18. In a FADEC what is the result of Channel A failing to receive information from a sensor?

Option A: Channel B will assume control

Option B: Channel A will take the information from channel B

Option C: Channel A will take the information from the backup sensor

Correct Answer is. Channel A will take the information from channel B

Explanation. Read up on FADEC

Question Number. 19. A synchro pressure measuring system requires

Option A: alternating current

Option B: direct current

Option C: either ac or dc

Correct Answer is. Alternating current

Explanation. Read up on synchro systems - see also module A

Question Number. 20. A synchro pressure measuring system works on the principle of changes in pressure related to changes in

Option A: frequency

Option B: voltage

Option C: flux

Correct Answer is. flux

Explanation. Read up on synchro systems - see also module A

Question Number. 21. Pure jet engines use

Option A: stagnation thermocouples

Option B: rapid response

Option C: variable resistance thermocouples

Correct Answer is. stagnation thermocouples

Explanation. When you think of the difference in speeds of the jet efflux -on a pure jet and say, a turbofan engine, then you will Understand why a pure jet needs stagnation thermocouples to slow the gas flow at the sensor

Question Number. 22. Modern oil pressure servo transmitters sense

Option A: differential pressure

Option B: absolute pressure

Option C: HP oil pressure

Correct Answer is. Differential pressure

Explanation. Read up on oil pressure sensors

Question Number. 23. EGT thermocouples are usually made of

Option A: nickel and platinum

Option B: chromel and platinum

Option C: chromel and alumel

Correct Answer is. chromel and alumel

Explanation. Read up on Thermocouples

Question Number. 24. Thrust is generated in a turboprop system by

Option A: moving a small mass of air quickly

Option B: moving a large mass of air quickly

Option C: moving a large mass of air slowly

Correct Answer is. moving a large mass of air slowly

Explanation. Read up on basic propulsion Theory

Question Number. 25. Power is adjusted in a variable pitch turboprop aircraft by

Option A: increasing RPM

Option B: increasing fuel flow

Option C: increasing pitch

Correct Answer is. Increasing fuel flow

Explanation. Increasing fuel flow attempts to increase RPM, but the governor resets the pitch to a higher setting-maintaining RPM but at a higher thrust

Question Number. 26. Thrust in a high bypass engine is measured by measuring

Option A: N3 RPM

Option B: fuel flow

Option C: neither of the above, thrust is not indicated in flight

Correct Answer is. Neither of the above, thrust is not indicated in flight

Explanation. Thrust cannot be measured directly (not in flight anyway), so the fan speed is used as an 'indication' of thrust since it varies approximately linearly with thrust

Question Number. 27. EPR is a ratio of

Option A: P1 to P4

Option B: P1 to P fan

Option C: P1 to P6

Correct Answer is. P1 to P fan

Explanation. ERR is the ratio of output pressure to input pressures of a gas turbine engine unless you know how many stages there are, you cannot say whether it is P1 to P4 or to P6 etc. But a turbofan engine uses the ratio of pressures across the fan

Question Number. 28. The majority of power in a free turbine engine is used to

Option A: drive the gas generator

Option B: drive the free turbine

Option C: expel gases through the exhaust

Correct Answer is. drive the free turbine

Explanation. About 85% of the power in the gas from the gas generator is used to drive the propeller (i.e. via the free turbine)

Question Number. 29. The total power in a turboprop engine is the

Option A: SHP

Option B: ESHP

Option C: BHP

Correct Answer is. ESHP

Explanation. Equivalent Shaft Horsepower (ESHP) is the addition of Shaft Horsepower (the propeller shaft) and the thrust of the exhaust efflux (with a little conversion factor involved)

Question Number. 30. To measure oil temperature, which of the following would most likely be used?

Option A: Resistance temperature measurement

Option b: Thermocouple measurement

Option C: Optical pyrometer

Correct Answer is. Resistance temperature measurement

Explanation. Read up on oil temperature measurement

Question Number. 31. Pure jet engines use

Option A: stagnation thermocouples

Option B: rapid response

Option C: variable resistance thermocouples

Correct Answer is. stagnation thermocouples

Explanation. When you think of the difference in speeds of the jet efflux - on a pure jet and say, a turbofan engine, Then you will understand why a pure jet needs stagnation thermocouples to slow the gas flow at the sensor

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Explanation. Read up on oil pressure sensors

Question Number. 33. E.G.T. thermocouples are usually made of

Option A: nickel and platinum

Option B: chromel and platinum

Option C: chromel and alumel

Correct Answer is. chromel and alumel

Explanation. Read up on Thermocouples

Question Number. 34. Thrust is generated in a turboprop system by

Option A: moving a small mass of air quickly

Option B: moving a large mass of air quickly

Option C: moving a large mass of air slowly

Correct Answer is. moving a large mass of air slowly

Explanation. Read up on basic propulsion Theory

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Option A: N3 RPM

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Option C: neither of the above, thrust is not indicated in flight

Correct Answer is. neither of the above, thrust is not indicated in flight

Explanation. Thrust cannot be measured directly (not in flight anyway), so the fan speed is used as an 'indication' of thrust since it varies approximately linearly with thrust

Question Number. 37. EPR is a ratio of

Option A: P1 to P4

Option B: P1 to P(fan)

Option C: P1 to P6

Correct Answer is. P1 to P(fan)

Explanation. ERR is the ratio of output pressure to input pressures of a gas turbine engine Unless you know how many stages

There are, you cannot say whether it is P1 to P4 or to P6 etc But a turbofan engine uses The ratio of pressures across The fan

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Option A: drive the gas generator

Option B: drive the free turbine

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Explanation. About 85% of the power in the gas from the gas generator is used to drive The propeller (i.e. via The free turbine)

Question Number. 39. The total power in a turboprop engine is the

Option A: SHP

Option B: ESHP

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Correct Answer is. ESHP

Explanation. Equivalent Shaft Horsepower (ESHP) is The addition of Shaft Horsepower (The propeller shaft) and the thrust of the exhaust efflux (with a little conversion factor involved)

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Option A: Resistance temperature measurement

Option B: Thermocouple measurement

Option C: Optical pyrometer

Correct Answer is. Resistance temperature measurement

Explanation. Read up on oil temperature measurement Your total score is 0
Comment A trained chimp could do better ! Best you give up now l

14-2 Engine Indicating Systems

Question Number. 1. The principle of operation of a DC ratio meter is

Option A: one coil moving in a uniform magnetic field

Option B: two coils moving in a uniform magnetic field

Option C: two coils moving in a non-uniform magnetic field

Correct Answer is. two coils moving in a non-uniform magnetic field

Explanation. E 1-1 J Pallet Aircraft Instruments and Integrated Systems page 31 G refers

Question Number. 2. A thermocouple indicator is basically a

Option A: mill voltmeter

Option B: milliohmeter

Option C: milliammeter

Correct Answer is. mill voltmeter

Explanation. E H J Pallet Aircraft Instruments and Integrated Systems page 323 refers

Question Number. 3. If a FADEC loses its ADC input, in the short term it will

Option A: go into soft redundancy

Option B: go into hard redundancy

Option C: go to limit protection mode

Correct Answer is. go into soft redundancy

Explanation. Soft redundancy is also known as the Alternate Mode

Question Number. 4. With an aircraft with a fixed pitch propeller, what indication has the pilot got of the output power? a)

Option A: fuel flow

Option B: oil pressure

Option C: engine speed indicator

Correct Answer is. engine speed indicator

Explanation. RPM or Manifold pressure are The only indications of power in a fixed pitch propeller/engine

Question Number. 5. The primary purpose of an EEC is

Option A: to change analogue inputs into digital format to provide glass cockpit information and reduce flight crew workload

Option B: to change analogue inputs into digital format to reduce flight crew workload and provide maintenance information

Option C: to save fuel. reduce crew workload and reduce maintenance costs

Correct Answer is. to save fuel. reduce crew workload and reduce maintenance costs

Explanation. The FADEC system provides greater operating and maintenance efficiency

Question Number. 6. If a tacho generator indicated in reverse, the probable cause is

Option A: wrong input frequency

Option B: two phases cross connected

Option C: supply and transmitter cross connected

Correct Answer is. two phases cross connected

Explanation. E H J Pallet Aircraft Instruments and Integrated Systems page 348 refers (ills also The same As with an AC motor)

Question Number. 7. A sensing element goes open circuit in a ratio meter. What will be happen?

Option A: Temperature indicates below ambient

Option B: Full scale deflection

Option C: Hairspring takes indicator off scale

Correct Answer is. Full scale deflection

Explanation. E H J Pallet Aircraft Instruments and Integrated Systems page 318 refers

Question Number. 8. A thermocouple is constructed of

Option A: two dissimilar metals welded together

Option B: two dissimilar metals with an air gap between them

Option C: three dissimilar metals welded together

Correct Answer is. two dissimilar metals welded together

Explanation. Commonly Alumel and Chromel in GTE applications

Question Number. 9. A thermocouple indication is taken from the

Option A: hot junction

Option B: cold junction

Option C: difference between the hot junction and the cold junction

Correct Answer is. cold junction

Explanation. E H J Pallet Aircraft Instruments and Integrated Systems page 320 refers

Question Number. 10. On a twin spool engine, the HP compressor is driven by

Option A: ram air over the compressor

Option B: early stages of the turbine

Option C: later stages of the turbine

Correct Answer is. early stages of the turbine

Explanation. The HP Compressor is always driven by the turbine nearest the combustion chamber

Question Number. 11. In a multiple probe thermocouple system, what is the effect if one probe fails?

Option A: No noticeable effect

Option B: Reduction in temp reading

Option C: Increase in temp reading

Correct Answer is. No noticeable effect

Explanation. All thermocouples are connected in parallel therefore the loss of one will not affect the output voltage

Question Number. 12. In a gas turbine if air is tapped from the H.P bleed

Option A: EPR decreases and EGT increases

Option B: EPR stays constant and EGT decreases

Option C: EPR increases and EGT decreases

Correct Answer is. EPR decreases and EGT increases

Explanation. Jeppessen Gas Turbines page 8-7 refers to a shift in EPR Also note that a standard test of bleed valves opening is an increase of EGT is observed

Question Number. 13. The vane on a vane type fuel flow measuring device becomes stuck. What safety backup is available for the engine fuel flow?

Option A: A fuel bleed valve

Option B: A bypass valve

Option C: A differential pressure bypass valve

Correct Answer is. A differential pressure bypass valve

Explanation. EHJ Pallet Aircraft Instruments and Integrated Systems page 3G9 refers

Question Number. 14. In a FADEC engine with a hydro mechanical fuel system,

Option A: how is fuel flow controlled? a) By fuel pressure

Option B: By electro-hydraulic servo valves (EHSVs)

Option C: By oil hydraulics

Correct Answer is. By electro-hydraulic servo valves (EHSVs)

Explanation. All FADEC engines have a hydro-mechanical unit within which are contained EHSVs

Question Number. 15. In the HEIU the discharge resistors

Option A: allows sufficient voltage to be stored to provide relight facilities up to 55,000 ft.

Option B: protects the unit from excessive voltages.

Option C: allows the capacitors to discharge when the unit is switched off.

Correct Answer is. allows the capacitors to discharge when the unit is switched off.

Explanation. Rolls Royce The Jet Engine Page 129 refers

Question Number. 16. A modular constructed gas turbine engine means that

Option A: its major assemblies can be removed and replaced

Option B: all engines have a specific component layout

Option C: the engine is constructed by the vertical assembly technique

Correct Answer is. its major assemblies can be removed and replaced

Explanation. Rolls Royce The Jet Engine page 2G5 refers

Question Number. 17. The purpose of a high bypass ducted fan engine is to

Option A: improve efficiency

Option B: improve thrust

Option C: reduce size

Correct Answer is. improve efficiency

Explanation. Rolls Royce The Jet Engine page 17 refers

Question Number. 18. When using a test set to test an EGT thermocouple circuit

Option A: no compensation for ambient temperature is required

Option B: only consider ambient temperature compensation if the ambient temperature is over 20°C

Option C: always compensate for ambient temperature

Correct Answer is. no compensation for ambient temperature is required

Explanation. All EGT systems have automatic cold junction compensation See EHJ Pallet Aircraft Instruments and Integrated Systems page 322

Question Number. 19. Where is EGT measured?

Option A: In the combustion chamber

Option B: Downstream of the combustion chamber

Option C: Upstream of the combustion chamber

Correct Answer is. Downstream of the combustion chamber

Explanation. EGT is exhaust gas temperature therefore it is after the combustion system

Question Number. 20. How does a boost gauge compensate for altitude changes?

Option A: Spring sealed bellows

Option B: Two bellows against atmospheric pressure

Option C: There is no compensation

Correct Answer is. Spring sealed bellows

Explanation. Read up on the manifold pressure gauge-Pallet Aircraft Instruments and Integrated Systems Pg 35G

Question Number. 21. An EMF is produced by a thermocouple. This is sensed

Option A: at the hot junction

Option B: at the cold junction

Option C: between the hot and cold junctions

Correct Answer is. at the cold junction

Explanation. Read up on The Thermocouple operation

Question Number. 22. Supervisory EEC sends its output to the

Option A: fuel valve

Option B: HMU/FFG

Option C: EGT thermocouple circuit

Correct Answer is. HMU/FFG

Explanation. Read up on EEC

Question Number. 23. Ratio meter pointer movement is achieved by

Option A: one coil providing a torque against a permanent magnet

Option B: two opposing coils providing a torque in a varying magnetic field

Option C: two opposing coils providing a torque in a permanent magnetic field

Correct Answer is. two opposing coils providing a torque in a permanent magnetic field

Explanation. Read up on The ratio meter

Question Number. 24. A fuel flow transmitter requires a motor or a synchronous motor to have a

Option A: constant voltage within small tolerances

Option B: constant frequency within small tolerances

Option C: low EMF as it is immersed in fuel

Correct Answer is. constant frequency within small tolerances

Explanation. Read up on fuel flow transmitters

Question Number. 25. A boost gauge measures

Option A: absolute pressure on the inlet port

Option B: brake mean effective pressure

Option C: gauge pressure at the injector

Correct Answer is. absolute pressure on the inlet port

Explanation. Read up on The boost gauge

Question Number. 26. On a thermocouple circuit on a non FADEC engine, what is the purpose of the ballast resistor?

Option A: To compensate for ambient temperatures

Option B: To standardize both engine's EGT readings

Option C: To compensate for altitude

Correct Answer is. To standardize both engine's EGT readings

Explanation. Read up on The Thermocouple operation

Question Number. 27. Boost pressure is measured in

Option A: inches of Hg

Option B: inches of water

Option C: PSI

Correct Answer is. inches of Hg

Explanation. CAPS leaflet AL/10-3 states that the boost pressure can be measured in in Hg or lbt/in²- leaflet EL/'M Para 13 2 quotes over boost figures in both Also Pallet aircraft Instruments &. Integrated Systems Pg 355-357 mentions both Worth making a comment on the exam answer paper if you get this Question

Question Number. 28. Power is adjusted in a gas turbine engine by

Option A: increasing airflow to the combustion chamber

Option B: increasing air and fuel flow

Option C: increasing fuel flow

Correct Answer is. increasing fuel flow

Explanation. Fuel flow is adjusted, which in turn increases the airflow and hence power output

Question Number. 29. The EPR reading is taken from a ratio of

Option A: jet pipe pressure to compressor inlet pressure

Option B: compressor delivery pressure to compressor inlet pressure

Option C: turbine inlet pressure to compressor delivery pressure

Correct Answer is. jet pipe pressure to compressor inlet pressure

Explanation. Read up on EPR indication systems

Question Number. 30. The basic gas turbine engine cycle is

Option A: induction, compression, combustion, expansion, exhaust

Option B: induction, compression, expansion, combustion, exhaust

Option C: compression, combustion, induction, expansion, exhaust

Correct Answer is. induction, compression, combustion, expansion, exhaust

Explanation. Read up basic gas turbine engine Theory

Question Number. 31. The high bypass duct

Option A: drives a cabin air compressor

Option B: provides engine cooling

Option C: improves propulsive efficiency

Correct Answer is. improves propulsive efficiency

Explanation. Read up on advantage of high bypass ratio

Question Number. 32. If an engines faDEC system loses air data permanently the pilot will

Option A: select alternate pilot static

Option B: switch to alt on the relevant EEC

Option C: turn that EEC off

Correct Answer is. select alternate pilot static

Explanation. This is retelling lo The 7G7 CFG engine This is known as soft reversionary mode Engine uses last known T12 data Pressing The ALTN light switch puts it into hard reversionary mode where it will use ISA conditions (on both engines)

Question Number. 33. An EPR system reads slightly over 1, this would mean

Option A: the transmitter datum point has moved and needs replacing

Option B: no action required this is normal

Option C: the indicator needs re-calibrating back to 1

Correct Answer is. no action required this is normal

Explanation. Engine Pressure Ratio (EPR) is The ratio of turbine output pressure to compressor input pressure It is normal for it to be more than 1

Question Number. 34. Manifold pressure is measured

Option A: at inlet port above and below ambient conditions

Option B: at inlet port above and below standard atmosphere at sea level

Option C: at inlet port indicating boost pressure

Correct Answer is. at inlet port above and below ambient conditions

Explanation. When The engine is not running, The manifold pressure gauge will indicate ambient conditions

Question Number. 35. A temperature indicating system incorporating a resistance bulb on a selected range has pointer movement

Option A: proportional to bulb resistance

Option B: inversely proportional to bulb resistance

Option C: resistance does not affect pointer movement

Correct Answer is. proportional to bulb resistance

Explanation. As the temperature increases, The resistance increases-therefore 'directly proportional'

Question Number. 36. In a ducted fan engine, the fan is driven by the

Option A: accessory gearbox

Option B: turbine

Option C: air passing over the compressor

Correct Answer is. turbine

Explanation. Read up on engine configurations

Question Number. 37. In a FADEC system, active control switchover occurs

Option A: on shutdown

Option B: when channels A and B are healthy

Option C: on engine startup only

Correct Answer is. on shutdown

Explanation. on the CF6 FADEC, each startup uses an alternative channel But the switch over occurs on shutdown of the previous run The reason for it is that a switch over on startup might interrupt the startup sequence

Question Number. 38. Gas turbines work on the

Option A: otto cycle

Option B: brayton cycle

Option C: diesel cycle

Correct Answer is. brayton cycle

Explanation. Gas turbines work on the Brayton Cycle Piston engines work on The Otto cycle

Question Number. 39. Oil systems consists of

Option A: 2 systems

Option B: 3 systems

Option C: 4 systems

Correct Answer is. 3 systems

Explanation. An oil system has 3 sub-systems Suction, Pressure and Scavenge

Question Number. 40. With the EEC in control the throttle levers are always

Option A: in the fully forward position

Option B: in the fully aft position

Option C: anywhere between the fully fwd and fully aft positions

Correct Answer is. anywhere between the fully fwd and fully aft positions

Explanation. The pilot sets the throttle to any position and The EEC controls to that commanded setting

Question Number. 41. Turboprop thermocouple probes are

Option A: rapid response

Option B: stagnation

Option C: surface mounted

Correct Answer is. rapid response

Explanation. Turboprop Thermocouples are rapid response This is because the gas flow is low speed in a turboprop exhaust

Question Number. 42. Propelling nozzle provide

Option A: pressure thrust

Option B: velocity thrust

Option C: pressure and velocity thrust

Correct Answer is. pressure and velocity thrust

Explanation. A propelling nozzle is used where gas flows are at sonic speed, and thus produce pressure thrust as well as Velocity thrust

Question Number. 43. How are the combustion chambers cooled?

Option A: By l.p compressor air

Option B: By h.p compressor air

Option C: By fan pressure air

Correct Answer is. By h.p compressor air

Explanation. About 60% of the air exiting the compressor (HP compressor air) is used for cooling the combustion chamber and dilution of the flame

Question Number. 44. Fan blade speed is measured by

Option A: phonic wheel

Option B: drag cup and tachometer

Option C: eddy currents

Correct Answer is. phonic wheel

Explanation. Since The fan does not normally drive The gearbox", a phonic wheel and an impulse pickup is used to measure the speed

Question Number. 45. Fadecs operate by

Option A: 2 controlling 1 operating

Option B: 1 controlling 1 operating

Option C: 2 units each capable of independent control

Correct Answer is. 2 units each capable of independent control

Explanation. FADECs have 2 independent systems, each capable of controlling The engine

Question Number. 46. When a thermocouple fails, the temperature reading will

Option A: over read

Option B: under read

Option C: stay the same

Correct Answer is. stay the same

Explanation. Thermocouples on a large engine EGT systems are wired in parallel and the indicators a voltmeter Therefore if one Thermocouple fails, the voltage across the indicator will not change However the reading will be less accurate due to a lower sampling of the temperature

Question Number. 47. An aircraft flying at 500mph would typically use

Option A: turbojet

Option B: turbofan

Option C: turboprop

Correct Answer is. turbojet

Explanation. 500mph is supersonic Supersonic aircraft are powered by a turbojet

Question Number. 48. The inlet of a turbo fan is

Option A: divergent

Option B: convergent

Option C: convergent-divergent

Correct Answer is. divergent

Explanation. A turbofan engine has a divergent engine to convert: airspeed into a pressure rise (ram pressure recovery)

Question Number. 49. What is the pressure increase over one stage of a centrifugal compressor?

Option A: 5:1

Option B: 1.2:1

Option C: 8:1

Correct Answer is. 5:1

Explanation. centrifugal compressor has a pressure ratio of About 5:1 (per stage) An axial compressor has a pressure ratio of About 1.2:1 (per stage)

Question Number. 50. The bleed valve on a engine at start up is

Option A: open

Option B: closed

Option C: modulating

Correct Answer is. open

Explanation. Choking of a compressor normally occurs on startup, Therefore The bleed valves are open at this time to prevent choking and subsequent surge

Question Number. 51. EPR is measured between inlet and

Option A: jet pipe

Option B: cold and hot exhaust

Option C: front of turbine

Correct Answer is. jet pipe

Explanation. EPR is the engine pressure ratio of engine inlet to jet pipe pressures

Question Number. 52. One stage of a turbine is

Option A: n.g.v then turbine blade

Option B: turbine blade then n.g.v

Option C: i.g.v then turbine blade

Correct Answer is. n.g.v then turbine blade

Explanation. One stage of a turbine includes one guide vane (stator) + turbine (rotor)

Question Number. 53. In a flow type fuel system, fuel shutoff is done by

Option A: mechanical ball valve

Option B: FCU torque motor

Option C: l.p fuel cock

Correct Answer is. Mechanical ball valve

Explanation. Fuel shut off is done with a valve incorporated with the throttle

Question Number. 54. The fuel flow transmitter is downstream of

Option A: pr sov

Option B: h.p pump

Option C: l.p pump

Correct Answer is. l.p pump

Explanation. Fuel Flow Transmitters downstream of the LP pump but before the HP pump and pressure regulating shut off valve (pr sov) - Ret RR Jet Engine pg

113

Question Number. 55. How is fuel flow varied in a variable displacement pressure type pump?

Option A: Alter the cam plate angle

Option B: Remote servo pressure

Option C: Direct cable to cam plate

Correct Answer is. Alter the cam plate angle

Explanation. Fuel flow is varied by altering The cam-plate angle (greater angle produces a greater stroke lo The pistons) However cam pi ale angle is controlled by The servo pressure, so Question is a little dubious

Question Number. 56. Advantage of flow type over pressure type is

Option A: it has lower pressure so greater reliability

Option B: it can take into account rpm, pressure (ambient) and e.g.t.

Option C: has no need for fly weights and governors

Correct Answer is. it can take into account rpm, pressure (ambient) and e.g.t.

Explanation. The flow type fuel system can take into account rpm ambient pressure, EGT and other variables Ret RR Jet Engine pg. 103

Question Number. 57. When the full authority fuel control unit is changed, the rating plug

Option A: stays with the engine

Option B: stays with the FAFC

Option C: is replaced every time

Correct Answer is. stays with the engine

Explanation. The rating plug provides discrete engine information to he
 EEC Therefore The plug slays with The engine

Question Number. 58. The EEC is powered and able to operate via

Option A: only a dedicated alternators

Option B: the aircraft electrical system

Option C: The EEC is capable of being powered by both independently depending on conditions

Correct Answer is. The EEC is capable of being powered by both independently depending on conditions

Explanation. 28VDC bus is required on start The dedicated generator
 lakes over as N2 or N3 increases (changeover occurs before 20%)

Question Number. 59. The EEC uses

Option A: ARINC 429 formatted data

Option B: ARINC 629 formatted data

Option C: uses neither ARINC 429 or 629 formatted data

Correct Answer is. ARINC 429 formatted data

Explanation. ARINC429 is The standard data bus for all Boeing /airbus
 engine systems

Question Number. 60. The fuel metering unit has direct inputs via

Option A: only the EEC

Option B: the EEC and the fire control handle

Option C: the EEC, fire control handle and the engine master switch

Correct Answer is. the EEC, fire control handle and the engine master switch

Explanation. The pilot must retain control of non normal and fire
 shutdowns

Question Number. 61. The optimum turbine speed is defined as

Option A: the most efficient speed of the turbine

Option B: 100% rpm of the engine

Option C: 95 % rpm of the engine

Correct Answer is. the most efficient speed of the turbine

Explanation. is coned by elimination 100% is not a maximum and whilst 95% might be the most efficient (optimum) RPM for one engine type it will not before another

Question Number. 62. An increase in fuel flow through the impeller type fuel flow transmitter is measured by a)

Option A: drum lags impeller

Option B: impeller lags turbine

Option C: decreasing angle between the two

Correct Answer is. impeller lags turbine

Explanation. Pallet Aircraft Instruments 2nd edition page 334 refers the reference shows the impellor lagging the turbine greater speed gives
 greater lag NB some references use the word rotor instead of impellor

Question Number. 63. No power to EGT is indicated by

Option A: yellow flag in front counter

Option B: bug moves in the x direction

Option C: bug moves in the y direction

Correct Answer is. yellow flag in front counter

Explanation. Pallet Aircraft Instruments 2nd edition page 293 refers

Question Number. 64. Connection to a tach generator

Option A: 3 phase star

Option B: 3 phase delta

Option C: 2 phase star

Correct Answer is. 3 phase star

Explanation. Pallet Aircraft Instruments 2nd edition fig 10 13 el al refers

Question Number. 65. A short circuit in a d.c ratio meter will give

Option A: max scale reading

Option B: zero scale reading

Option C: min scale reading

Correct Answer is. min scale reading

Explanation. Pallet Instruments and Integrated systems Peters Page

318A short will remove all power from both windings and The pointer will go to minimum scale

Question Number. 66. An open circuit in a d.c ratio meter will give

Option A: max scale reading

Option B: zero scale reading

Option C: min scale reading

Correct Answer is. max scale reading

Explanation. CAAIPS (Old edition)AL10-Para11-10 states: An open circuit in the temperature sensing bulb or signal line will be indicated by max scale deflection Also see Pallet Instruments and Integrated systems

Question Number. 67. A compressor shaft rotates on

Option A: sintered bearings

Option B: ball and roller bearings

Option C: plain bearings

Correct Answer is. ball and roller bearings

Explanation. Jeppessen Aircraft gas turbine Power plants Page 5-33

Question Number. 68. The EEC changes power settings by

Option A: changing the throttle lever angle

Option B: changing the fuel flow input

Option C: changing the airflow input

Correct Answer is. changing the fuel flow input

Explanation. Jeppessen Aircraft gas turbine Power plants Page 7-17

Question Number. 69. A torque pressure measuring indicator is fed by

Option A: direct oil pressure

Option B: differential pneumatic pressure

Option C: servo operated

Correct Answer is. direct oil pressure

Explanation. Pallet Instruments and Integrated Systems Page 357

Question Number. 70. The tachogenerator output has:

Option A: A fixed frequency

Option B: A Variable frequency

Option C: A DC Current output

Correct Answer is. A Variable frequency

Explanation. The faster the engine goes The faster The tach generator goes

Question Number. 71. On a fuel flow measuring device located on the engine

Option A: no adjustments can be made

Option B: external adjustments can be made for maximum rate fuel flow

Option C: external adjustments can be made for minimum rate fuel flow

Correct Answer is. no adjustments can be made

Explanation. Pallet Aircraft Instruments and Integrated Systems Page 3G8375 shows no on engine adjustment

Question Number. 72. Where is the hot junction of a EGT thermocouple system found?

Option A: In the indicator

Option B: Upstream of the combustion chamber

Option C: Downstream of the combustion chamber

Correct Answer is. Downstream of the combustion chamber

Explanation. EGT stands for 'exhaust gas temperature 'Pallet Aircraft Instruments and Integrated Systems Page 320 refer

Question Number. 73. The fan on a turbofan engine is turned by

Option A: induction of the air across the fan into the compressor

Option B: the turbine section

Option C: the combustion chamber gases

Correct Answer is. the turbine section

Explanation. See Rolls Royce The Jet Engine Page 5

Question Number. 74. When terminating connections for a EGT sensing system

Option A: ensure that the pins and sockets are correctly crimped and brazed

Option B: ensure that all connections are silver soldered

Option C: ensure that the pins and sockets are of the same material as the leads

Correct Answer is. ensure that the pins and sockets are of the same material as the leads

Explanation. Pallet Aircraft Instruments and Integrated Systems Page 32A refers

Question Number. 75. An EPR gauge indicates '1'. You should

Option A: adjust the indicator back to zero

Option B: replace the indicator, there is no adjustment

Option C: do nothing this is what it should read with the engine shut down.

Correct Answer is. do nothing this is what it should read with the engine shut down.

Explanation. With the engine shutdown pressure at the intake and aft of the turbine is the same

Question Number. 76. A Gas Turbine's propulsion force is produced by

Option A: reaction of the rearward moving gasses

Option B: impingement of the gasses on the surrounding air

Option C: induced airflow into the engine

Correct Answer is. reaction of the rearward moving gasses

Explanation. Newton's Third Law- Every action has an equal and opposite reaction

Question Number. 77. In a single spool gas turbine engine the compressor rev/min is

Option A: more than the turbine speed

Option B: less than the turbine speed

Option C: equal to the turbine speed

Correct Answer is. equal to the turbine speed

Explanation. See Rolls Royce The Jet Engine Page 5 In a single spool engine There is just a single speed for all rotating assemblies

Question Number. 78. A tacho pointer is moved by

Option A: drag cup coupling

Option B: ac servo motor

Option C: synchronous motor

Correct Answer is. drag cup coupling

Explanation. Pallet Aircraft Instruments and Integrated Systems Page 349 refers

Question Number. 79. In a twin spool engine

Option A: the HP turbine drives both LP and HP compressors

Option B: the LP turbine drives the LP compressor and the HP turbine drives the HP compressor

Option C: the HP turbine drives the LP compressor and the LP turbine drives the HP compressor

Correct Answer is. the LP turbine drives the LP compressor and the HP turbine drives the HP compressor

Explanation. See Rolls Royce the Jet Engine Page 5 the HP spool is either side of the combustion chamber

Question Number. 80. Relative permeability of fuel is also known as

Option A: density of the fuel

Option B: weight of the fuel

Option C: dielectric constant of the fuel

Correct Answer is. dielectric constant of the fuel

Explanation. Pallet Aircraft Instruments and Integrated Systems Page 328 refers

Question Number. 81. The cycle of a gas turbine engine is

Option A: completed in one revolution of engine.

Option B: completed in two revolution of the engine.

Option C: continuous

Correct Answer is. continuous

Explanation. The Brayton cycle is a continuous cycle -A major advantage over the Otto Cycle (Piston Engine)

Question Number. 82. Engines having two independent moving systems are

Option A: compound engines

Option B: twin spool engines

Option C: complex engines

Correct Answer is. twin spool engines

Explanation. The 2 spools are known as LP Spool and HP spool

Question Number. 83. Compression ratio of compressor of gas turbine Engine is

Option A: outlet pressure to Inlet pressure.

Option B: measured across all rotor stages of compressor

Option C: mass of airflow to combustion.

Correct Answer is. outlet pressure to Inlet pressure.

Explanation. Rolls Royce The Jet Engine Page 25 refers

Question Number. 84. Torque pressure indication to measure power output of an engine is

Option A: used in all Gas Turbine engines.

Option B: not used in Gas Turbine engines.

Option C: only used when engine output pressure is used for torque not for thrust.

Correct Answer is. only used when engine output pressure is used for torque not for thrust.

Explanation. Torque is used to measure power in turbo prop aircraft

Question Number. 85. Manifold pressure is measured in

Option A: direct absolute pressure in Bars

Option B: differential pressure in mill bars

Option C: direct absolute pressure in inch of Hg

Correct Answer is. direct absolute pressure in inch of Hg

Explanation. EHJ Pallet Aircraft Instruments and Integrated Systems page 355

Question Number. 86. Typically a torque pressure indication system is

Option A: differential pressure type

Option B: remote synchronous type

Option C: direct Oil Pressure sensing type

Correct Answer is. direct Oil Pressure sensing type

Explanation. EHJ Pallet Aircraft Instruments and Integrated Systems page 357

Question Number. 87. A tachometer used to measure Rev/Min in turbine engines

Option A: develops its own power for the system

Option B: 28V dc is required

Option C: 115V ac is required

Correct Answer is. develops its own power for the system

Explanation. It develops an alternating current proportional to the speed of the engine

Question Number. 88. Primary power for electronic engine control

Option A: 115V ac essential bus.

Option B: on side 115V ac bus bar supply.

Option C: Permanent Magnet Alternator

Correct Answer is. Permanent Magnet Alternator

Explanation. Driven by The Engine's High Speed external Gearbox", it provides a discrete power supply for the engine

Question Number. 89. Leads to measure thermocouple temperature are

Option A: calibrated for circuit in used and cannot be shortened

Option B: affected by Magnetic and electrical interference

Option C: insulated by heat legging device to reduce errors in the indication end

Correct Answer is. calibrated for circuit in used and cannot be shortened

Explanation. A&P Power plant Handbook EA-AC-65-12A page 494(4) refers

Question Number. 90. A thermocouple sensing system test set requires

Option A: a serviceable battery

Option B: No power

Option C: 24V dc

Correct Answer is. a serviceable battery

Explanation. A&P Power plant Handbook EA-AC-65-12A page 494 refers

14-3 starting and ignition Systems

Question Number. 1. The HP compressor is powered by

Option A: the first set of turbines

Option B: the last set of turbines

Option C: the intermediate compressor

Correct Answer is. the first set of turbines

Explanation. The HP Compressor spool has the shortest shaft

Question Number. 2. Torque is measured in gas turbine engines

Option A: never

Option B: where there is a free turbine providing the power

Option C: on small pure jet engines

Correct Answer is. where there is a free turbine providing the power

Explanation. A Free turbine always powers a shaft or propeller

Question Number. 3. What is the supply voltage to tacho generators?

Option A: 28vdc

Option B: 115vac

Option C: It has no supply

Correct Answer is. It has no supply

Explanation. The Tacho generates its own voltage

Question Number. 4. A FADEC takes measurements of engine speed,

Option A: temperature and pressure

Option B: temperature

Option C: pressure

Correct Answer is. temperature and pressure

Explanation. All three are need to determine The fuel flow.. and the rate of acceleration

Question Number. 5. The fuel metering valve in the hydro mechanical unit of a FADEC system is operated by

Option A: hydraulic servo pressure

Option B: fuel servo pressure

Option C: electrical servo

Correct Answer is. fuel servo pressure

Explanation. CFG course notes show that fuel is used to drive The FMV

Question Number. 6. Boost pressure is

Option A: atmospheric above ambient

Option B: atmospheric below ambient

Option C: the absolute of the manifold chamber

Correct Answer is. the absolute of the manifold chamber

Explanation. EHJ Pallet Aircraft instruments and Integrated Systems page 356

Question Number. 7. To check/test a temperature indicator you would

Option A: connect a decade box in place of the temperature sensing element

Option B: connect a decade box in series with the temperature sensing element

Option C: connect a decade box in parallel with the temperature sensing element

Correct Answer is. connect a decade box in place of the temperature sensing element

Explanation. By replacing The sensor with a known resistance you can simulate temperature increase See

Question Number. 8. Calibration for a ratio meter type temperature indicator takes into account

Option A: the material of the coils

Option B: the material of the sensing element

Option C: the type of representation on the dial

Correct Answer is. the material of the sensing element

Explanation. RTD's use platinum or nickel wire see EHJ Pallet Integrated Instruments page 409 table 3

Question Number. 9. Reverse thrust can only be selected when the throttle is

Option A: 75% power position.

Option B: open.

Option C: at the idle stop

Correct Answer is. at the idle stop

Explanation. A mechanical interlock on The Throttle stops The reverse thrust lever from moving it fwd. thrust is anything but idle

Question Number. 10. On a FADEC engine the EEC

Option A: has electronic control of the hydro-mechanical fuel control unit in all modes

Option B: has electronic control of the hydro-mechanical fuel control in some modes

Option C: has mechanical control of the hydro-mechanical fuel control system

Correct Answer is. has electronic control of the hydro-mechanical fuel control unit in all modes

Explanation. The HMU is the interlace between The EEC and the fuel distribution system

Question Number. 11. EPR is a measure of

Option A: exhaust pressure compared to compressor inlet pressure

Option B: exhaust pressure compared to combustor pressure

Option C: combustion pressure compared to compressor inlet pressure

Correct Answer is. exhaust pressure compared to compressor inlet pressure

Explanation. EPR is used as a measure of thrust

Question Number. 12. What exactly does a thermocouple measure?

Option A: The difference between the hot and cold junction.

Option B: Hot junction temperature.

Option C: Cold junction temperature.

Correct Answer is. Hot junction temperature.

Explanation. The thermocouples are usually located within the turbine or jet pipe area

Question Number. 13. In a temperature sensing ratio meter what determines the actual temperature?

Option A: The material of the sensor

Option B: The material of the sensing coil

Option C: The material of the balancing coil

Correct Answer is. The material of the sensor

Explanation. Normally a resistive temperature device, it provides The resistance that changes The current Through The Wheatstone bridge arrangement

Question Number. 14. Torque is a useful measure

Option A: on engines where a portion of thrust produces torque

Option B: on engines which only produce thrust

Option C: on all engines

Correct Answer is. on engines where a portion of thrust produces torque

Explanation. Torque sensing engines are turbo-prop or turbo-shaft

Question Number. 15. Boost pressure is a measure of

Option A: manifold pressure

Option B: atmospheric pressure plus turbocharger inlet pressure

Option C: atmospheric pressure less turbocharger inlet pressure

Correct Answer is. atmospheric pressure plus turbocharger inlet pressure

Explanation. boost pressure is The term used when The manifold pressure is increased above atmospheric by a turbocharger

Question Number. 16. The test switch of a continuous loop fire detector gives a

Option A: continuity check

Option B: bonding check

Option C: insulation check

Correct Answer is. continuity check

Explanation. Jeppessen Gas Turbine Power plant Page 13-3 refers

Question Number. 17. What are the types of continuous fire detection system?

Option A: Capacitive and resistive

Option B: Capacitive

Option C: Inductive and capacitive

Correct Answer is. Capacitive and resistive

Explanation. Jeppessen Gas Turbine Power plant Page 13-3 refers

Question Number. 18. during normal running conditions

Option A: combustion is continuously supported by ignition

Option B: combustion is intermittently supported by ignition

Option C: combustion is self-supporting

Correct Answer is. combustion is self-supporting

Explanation. Once The engine reaches self sustaining RPM The starter and ignition cut out

Question Number. 19. What indication does the pilot receive that thrust reversers have deployed?

Option A: A feeling of rapid deceleration

Option B: An audible warning

Option C: A sequence of lights

Correct Answer is. A sequence of lights

Explanation. Normally yellow for unlocked and green for deployed

Question Number. 20. On a fixed pitch propeller single engine aircraft, what is indicated as a measure of power?

Option A: Oil pressure

Option B: Engine speed

Option C: Cylinder head temperature

Correct Answer is. Engine speed

Explanation. The faster the propeller goes the more power it produces