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This exam contains 92 questions.

1. Newton's first law states:

a. When a body is acted upon by an external force, the rate change of momentum is proportional to the force and takes place in the direction of the force.
b. To every action there is an opposite and equal reaction.
c. A body will remain at rest or will continue in uniform motion in a straight line unless acted upon by force.

2. What is power?

a. The amount of energy transferred by a force.
b. The cause to accelerate a mass.
c. The rate at which work is performed or energy is transmitted.

3. The difference in operation between a propeller and a jet engine can be summarized as follows:

a. A propeller accelerates a large quantity of air rearwards at a high rate. A jet engine accelerates a small quantity of air rearwards at a low rate.
b. A propeller accelerates a large quantity of air rearwards at a low rate. A jet engine accelerates a small quantity of air rearwards at a high rate.
c. Propeller is pulling while a jet engine is only compressing air.

4. Which engine has a better stall characteristic?

a. Both answers are correct.
b. Multi spool axial flow engine.
c. Single spool axial flow engine.

5. When will the net thrust be the greatest?

a. When the aircraft is not moving.
b. During climb.
c. Just after take-off (start).

6. To precisely calculate the thrust of a turbine engine....

a. air mass flow is important, the mass of fuel is so small it makes no difference.
b. fuel mass is most important, air mass is less important.
c. both air mass and fuel mass must be taken into the calculation.

7. The bypass ratio of a modern turbofan is....

a. around 2 : 1.
b. around 5 : 1.
c. around 8 : 1.

8. The engine data and engine assembly identification plates are attached to the engine.

What data do these plates provide?

a. Aircraft specification as designed by the manufacturer for the engine to be installed.
b. Engine specification as designed by the manufacturer.
c. Engine specification as designed by the manufacturer for the aircraft configuration.

9. A flat rated engine has a power output that....

a. is independent of ambient temperatures.
b. is constant until a certain max. ambient temperature.
c. decreases when ambient temperature increases.

10. What happens to the thrust if the altitude decreases?

a. The thrust will increase.
b. The thrust will not change.
c. The thrust will decrease.

11. During flight, the distribution of static pressure in and around the engine is as follows:

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a. A: Low pressure, B: Low pressure, C: High pressure
b. A: High pressure, B: Low pressure, C: High pressure
c. A: Low Pressure, B: High Pressure, C: Low Pressure

12. What is the most effective intake shape for supersonic speeds?

a. Convergent - divergent duct.
b. Straight duct.
c. Divergent - convergent duct.

13. What shape does a bifurcated intake have?

a. Divergent from front to rear.
b. First divergent, then convergent towards the rear.
c. Convergent from front to rear.

14. How is the hot air anti-ice system activated?

a. Manually from the flightdeck
b. Automatically when ice is detected
c. The system is always on and can not be switched off

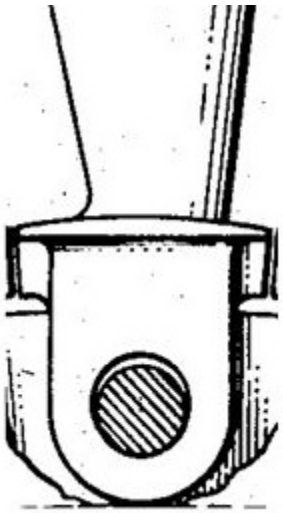
15. On an engine with hot air anti-icing, where does the air come from?

a. From the aircraft air system.
b. From the engine itself.
c. From the opposite engine.

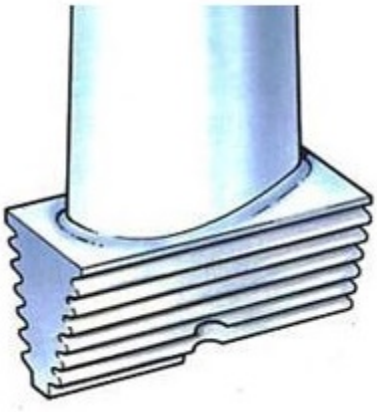
16. What kind of engines do normally make use of an axial flow compressor?

a. Turbo jet and turbo fan engines.
b. Turbo prop and turbo fan engines.
c. Turbo jet and turbo prop engines.

17. Which drawing shows the dove tail fixing type?

a. 

b. 

c. 

18. Fan blades can be removed and replaced, however the replaced blade must be of the....

a. same color code.

b. same moment and weight class.
c. production batch.

19. What is the overall effect of the compressor?

To increase...

a. pressure and volume and to reduce the temperature.
b. volume and temperature and to decrease pressure.
c. pressure and temperature and to reduce volume.

20. What is the correct description of a complete compressor stall?

a. Slow start.
b. Surge.
c. Flame out compressor.

21. For maximum efficiency, the angle of the stator blade should give optimum angle of attack throughout the whole RPM range.

How are the vanes actuated? The vanes are ...

a. pneumatically actuated.
b. electrically actuated.
c. hydraulically actuated.

22. The term "overall pressure ratio" is defined as the ratio of the...

a. pressure at the front and rear of the compressor of a gas turbine engine.
b. stagnation pressure at the combustion chamber.
c. stagnation pressure due to the rotoring speed of the shafts against the compressor inner wall.

23. The compressor outlet delivers compressed air, to a component in front of the combustion section.

How do you call this?

a. Diffuser.
b. The exhaust section of the compressor.
c. Nozzle section.

24. The primary air through the combustion chamber is divided in....

a. 25% for burning mixture and 75% for cooling.
b. 80% for cooling and 20% for mixture burning.
c. 75% for burning mixture and 25% for cooling.

25. What is the importance of a low air speed in the diffuser?

a. Otherwise it could initiate a flame out.
b. The pressure in the diffuser is decreased.
c. The temperature in the combustion section could be to high.

26. What is the result of the twist in the turbine blades, called stagger angle?

a. Relative constant pressure at the tip and higher velocity.
b. Lower gas pressure and higher velocity at the tip.
c. Same amount of work along the whole blade.

27. They are usually hollow and are cooled by passing compressor bleed air through the blade.They are not moving.

These parts are generally refered to as?

a. turbine blades.
b. nozzle guide vanes
c. high pressure compressor vanes

28. Which phase of turbine blade creep marks the end of its useful life?

a. Tertiary.
b. Primary.
c. Secondary.

29. What will happen to the turbine blade when it reaches the tertiary creep stage?

The blade will...

a. become weak.
b. be under a constant rate of extension.
c. eventually break away.

30. What exhaust nozzle style is described?

"This duct converts much of the heat and pressure energy in the gases into kinetic energy. The gases thus leave the nozzle at high velocity."

a. Bellmouth nozzle.
b. Subsonic divergent nozzle.
c. Convergent nozzle.

31. The nozzle is fitted at the final end of the exhaust duct and for subsonic aircraft it will be convergent in shape.

That is why the velocity of the turbine discharge gases is relatively...

a. high but it is decreased before they are discharged.
b. low but it is increased before they are discharged.
c. cool but it is decreased before they are discharged.

32. Blocker door type (cold stream) are mostly used on....

a. supersonic aircraft.
b. high by-pass engines.
c. thrust vectoring nozzles systems.

33. Oil that is exposed to bearing cavities is...

a. cooled by bearing rotation.
b. warmed by cooling air flow in the cavity.
c. returned by oil scavenge pumps.

34. What is the advantage to use hydraulic bearings in newer engines?

a. Increases the lifetime of the bearing.
b. Reduces vibrations transmitted to the engine cooling system.
c. Reduces vibrations transmitted to the engine.

35. The main bearings have the critical function of supporting the main engine rotor.

The number of bearings necessary for proper engine support is, for the most part, determined by...

a. thrust and weight of the engine.
b. length and weight of the engine.
c. life expectance of the engine between overhaul.

36. What is the most widely used fuel for aircraft with jet engines?

a. Jet B
b. Jet A / A1
c. JP 8

37. What is a difference between Jet A and Jet A-1 fuel?

a. Fuel density.
b. Sulfur mass.
c. Freezing point.

38. Static dissipator additive is used to....

a. prevent static charging of fuel systems.
b. prevent corrosion of metal fuel system components.
c. to maintain stability of jet fuel during storage.

39. Increasing the flashpoint would reduce the...

a. quantity of the fuel.
b. weight of the fuel.
c. volatile and low-boiling components of the fuel.

40. What type of pump is the engine driven fuel pressure pump?

a. Vane pump.
b. Gerotor pump.
c. Gear pump.

41. The engine oil tank is a...

a. sump below the engine to return the oil by gravity.
b. reservoir for the engine oil system.
c. unpressurized container.

42. What is the function of the Fuel / Oil Heat Exchanger?

a. Cooling of oil and heating of fuel.
b. Cooling of fuel.
c. Heating of oil.

43. What is the function of the centrifugal breather in the oil tank?

a. To regulate the pressure in the oil tank.
b. Separate the oil from the air.
c. To minimize foaming in the oil tank.

44. What is the purpose of the fuel control?

To maintain a correct....

a. combustion air to fuel mixture ratio.
b. temperature in the combustion chamber.
c. burning cycle in the combustion chamber.

45. The thrust level request on a FADEC engine is transmitted through a....

a. mechanical cable system.
b. TLA resolver.
c. push/pull control rod system.

46. What is the purpose of the fuel flow transmitter?

The purpose of the fuel low transmitter is...

a. to control fuel / air mixture in the combustion chamber.
b. to limit fuel flow to the combustion.
c. to sent a data signal of fuel flow to the indication system.

47. The fuel pump main stage mostly is a....

a. vane type.
b. centrifugal type.
c. gear type.

48. The fuel manifold carries fuel to spray nozzles.

The spray nozzles spray fuel into the...

a. diffuser case.
b. first stage of the turbine vanes.
c. combustion chamber.

49. The HP fuel pump receives its flow from the...

a. fuel tank booster pumps however only in takeoff.
b. fuel nozzles.
c. low pressure system (low pressure pump).

50. What is the function of the accessory cooling system?

a. To remove excess heat and ventilation of the components.
b. Cool the engine components and air intake.
c. Ventilate the engine bleed air, to the atmosphere.

51. What is buffer air used for?

a. To pressurize the bearing housings.
b. To cool #3 bearing seals.
c. To pressurize #3 bearing housing.

52. Compressor Stability Control permits compressor stability...

a. during cruise power only.
b. only during high power settings
c. during starting and engine operation.

53. Which of the following starters is normally used to start the modern turbofan engine?

a. Starter generator.
b. Air starter.
c. Electric starter.

54. An engine fails to accelerate to idle.

This could be a result of....

a. a full open bleed valve.
b. the compression of air is not sufficient.
c. starter cut-off before self sustaining speed.

55. When the aircraft is in bad weather condition, the ignition system is switched to....

a. auto.
b. continous.
c. flight.

56. What should the ignition system be if the engine is wet motored?

a. Switched in auto mode.
b. Switched on.
c. Deactivated.

57. Why is it required to ground the cable terminal of an ignition system after detaching the cable from the igniter plug?

a. To prevent a short in the cable.
b. To prevent an open in the ignition cable
c. To dissipate the energy stored in the system

58. The EGT Harness connects to a terminal block.

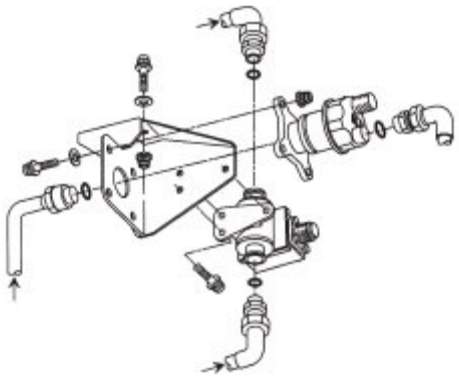
From the terminal block, the EGT signal is sent to a...

a. display.
b. resistor to decrease the actual temperature otherwise it can be too high.
c. voltage generator, to increase the temperature.

59. On a modern turbofan engine, the engine pressure ratio (EPR) indicating system measures the pressure ratio across the...

a. compressor including low pressure.
b. fan.
c. only pressure outlet (exhaust).

60. The oil pressure transmitter senses the difference between pressure pump delivery pressure and...



a. the ISA parameters.
b. the FCOC (Fuel Cooled Oil Cooler).

c. the gear box pressure.

61. The sensors are induction-type tachometers. The tip on each sensor has a permanent magnet with three coil assemblies.

This best describes?

a. AVM (airborn vibration system).
b. Engine tachometer system.
c. Fuel pump pressure indication system.

62. Engine torque is used to indicate...

a. the power that is developed by a turbo fan engine.
b. lateral twist on the engine mouths.
c. the power that is developed by a turbo-propeller engine.

63. The greatest advantage of the water injection system is...

a. the cooling of the turbine.
b. the heating.
c. cooling inlet air.

64. Injection of water into the engine inlet will cool the inlet air and hence its density will...

a. get thinner.
b. increase.
c. decrease.

65. Which system is normally used on turbo-jet engines to augment the thrust of the engine for short periods?

a. Afterburner.
b. In cruise.
c. Pre-ignition.

66. The propeller is allowed to go to its feather position when the engine is shut down. What type of turbine is this?

a. Axial flow turbine.
b. Coupled turbine.
c. Free turbine.

67. Which description is the best for: "Epicyclic Planetary Gear Type Reduction Gear"?

a. Mechanically simple and therefore relatively cheap to manufacture.
b. Reduction gear with a rack and pinion.
c. Gear is composed of a central input (sun) gear driving two or more spider mounted planet gears.

68. On a typical free turbine turboprop engine the propeller control lever is connected to the...

a. propeller governor.
b. constant speed fuel mixing unit.
c. fuel control unit.

69. An turboprop overspeed governor is a backup for the...

a. propeller governor.
b. fly weights.
c. radial governor.

70. A short flexible shaft drive system to deliver power to the transmission.

This system is typically installed in a...

a. fighter turbojet aircraft.
b. turbine helicopter drive system.
c. commercial aircraft fan jet drive system.

71. The parallel spur gear type and the epicyclic type describe...

a. excitation gear systems.
b. reduction gear systems.
c. eccentric gear systems.

72. Drive shaft and flexible coupling, turbine helicopters make use of a short shaft system to deliver power to a:

a. compressor.
b. turbine.
c. transmission.

73. The drive systems are equipped with over running clutches that allow the pilot to perform auto-rotation descent in case of total power loss.

This is true for a...

a. turbo-shaft engine on a helicopter.
b. hydro shaft system.
c. reduction gear system from an axial flow bypass engine.

74. There are two separate APU protective shutdown systems in the ECU.

They are...

a. discrete and digital.
b. analog and digital.
c. analog and discrete.

75. Reverse flow in an APU will...

a. cause a protective shutdown.
b. not cause a shutdown.
c. be automatically corrected by the ECU.

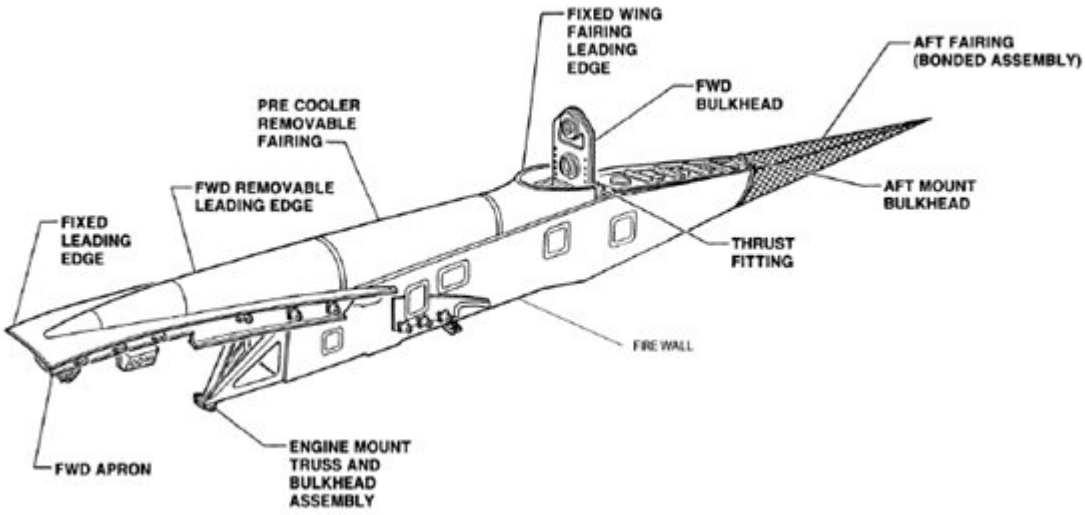
76. What type of compressor and combustion chamber is used in the power section of an APU?

a. Axial flow compressor to save space and annular combustion chamber.
b. Centrifugal compressor with a reverse flow annular combustion chamber.
c. Axial flow compressor to save space and can combustion chamber.

77. The APU control unit (ECU) completely controls...

a. start and acceleration.
b. automatic selection of air source, no pilot interface needed, including start.
c. start and acceleration including automatic selection of air.

78. The forward bulkhead is attached to the wing front spar pylon support fitting.



The forward bulkhead fitting transmits...

a. thrust and provides for engine to grow in length while in operation.
b. vertical, side, and torque loads on the pylons to the wing.
c. only vertical load.

79. What causes the majority of outside noise in a high-bypass engine?

a. Core Engine.
b. HP fan.
c. LP fan.

80. Powerplants are often divided into zones by fireproof bulkheads.

Bulkheads are usually made of...

a. harden steel.
b. aluminum alloy.
c. stainless steel, titanium.

81. The aft engine mount transfers...

a. thrust loads to the wing
b. torsional, vertical and side loads to the pylon.
c. side loads only however it allows for engine growth.

82. A continuous-loop system, which has two wires imbedded in a special ceramic core within an Inconel tube.

What system is this?

a. Fenwall
b. Graviner continuous fire detectors
c. Kidde

83. Extinguishing agent is discharged through a...

a. pipeline system
b. solid state generator the a pipeline system is too heavy for large airplanes.
c. solid material that melts on heat contact.

84. The fire extinguishing system protects those sections of the airplane...

a. where a fire could initiate. Controls and system status indications related to the cabin are located in FWD Cabin Station. All other controls and systems are located in the cockpit.
b. where a fire could initiate. Controls and system status indications are located in the cockpit.
c. selected by each flight crew before departure.

85. This system operates on the rate-of-temperature-rise principle.

What system is this?

a. Pressure relief system monitoring.
b. Thermal switch system
c. Thermocouple fire detector system

86. When working in the entrance corridor, the engine should....

a. be operated under the self-sustaining speed.
b. not exceed minimum idle.
c. be operated at all engine rpm's.

87. What is the maximum power setting the pilot can use in an emergency situation?

a. Maximum continuous thrust.
b. Maximum cruise.
c. Maximum climb.

88. Trend monitoring is a system of routine comparison of engine performance parameters with a base line of the same parameters.

How is this accomplished?

a. Via downloading the post flight report from the on-board maintenance system.
b. Graphs or curves are used to show trends in changing conditions.
c. Each Pilots log book entry is compared to the baseline.

89. One procedure that has improved efficiency is the built-in provision for inspecting the inside of the engine without disassembling it.

How is this performed?

a. Access ports to visually monitor the engine in service.
b. With borescope or with one of its modern counterparts.
c. Annual inspection.

90. Foreign object damage (FOD) comes from many sources.

What are the most common?

a. Taxi ways.
b. Ice / hail.
c. Birds.

91. When should the MVP envelope be checked for damages?

If the indicator is colored....

a. white.
b. blue.
c. pink.

92. Is it nescessary to protect an aircraft engine for a short period of less than 7 days?

a. Yes.
b. No.
c. Depends on the environmental conditions.