# Question block created by wizard

**This exam contains 92 questions.**

**1.** "A body will remain at rest or will continue in uniform motion in a straight line unless acted upon by a force."

Which law is this?

a. Newtons first law.
b. Newtons third law.
c. Newtons second law.

**2.** What is force?

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

**3.** Name the modules (parts) of a jet engine from front to rear .

a. Air compressor, combustion chamber, cylinders and exhaust duct.
b. Turbine wheel, compressor and combustion chamber.
c. Air compressor, combustion chamber, turbine wheel, and exhaust duct.

**4.** 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.

**5.** In what unit is the power measured that a turbo-prop engine delivers to the gearbox?

a. Foot pounds.
b. Shaft Horsepower.
c. Pounds.

**6.** What conditions affect the weight of a given volume of air?

a. Pressure, temperature and humidity.
b. Effect of humidity is more pronounced as the effect of pressure and temperature.
c. Pressure, is its only factor, regardless of weight.

**7.** When all factors are combined, it is found that the jet aircraft performs most efficiently at...

a. high speeds and low altitudes.
b. low speeds and high altitudes.
c. high speeds and high altitudes.

**8.** The bypass ratio of a modern turbofan is....

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

**9.** From Boyle's law you can conclude that if a balloon is compressed to half its volume, the pressure in the balloon will be....

a. doubled.
b. the half.
c. the same.

**10.** What happens to the thrust if the altitude increases?

The trust will....

a. decrease.
b. not change.
c. increase.

**11.** To ensure a steady continuous airflow through a duct, the mass air flow must...

a. be the same at any cross section.
b. decrease as the airflow passes through the duct.

c. increase as the cross section decrease.

**12.** Why are methods like diverter, fence and bleed used?

a. To restrict the amount of airflow at supersonic speeds.
b. To avoid boundary layer effect in the intake.
c. To increase the efficiency of the intake at low (subsonic) speeds.

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

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

**14.** What type of anti-icing system is generally installed on turboprop engines?

a. Hot air anti-ice
b. Pneumatic anti-ice
c. Electrical anti-ice

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

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

**16.** What are the three main parts of a centrifugal compressor?

a. Impeller, diffuser and casing manifold.
b. Stationary impeller, diffuser and casing manifold.
c. Intake, impeller and casing.

**17.** Many aircraft APU's use a centrifugal hardware configuration because of its...

a. compact size.
b. high power development and ability to support varies support system.
c. high overall compression ratio.

**18.** The fan blades can be removed/installed individually (provided the same moment weight blade is available).

Why is this required?

a. Fan balancing benefit.
b. To maintain very close balancing of the high speed shaft.
c. Can be number in sequence.

**19.** What is an advantage of titanium Wide Chord Fan Blade Technology?

a. The appearance is impressive.
b. The longer life of operation.
c. The process generates an internal stiffening structure that greatly increases the strength of the blade.

**20.** What are the audible indications of Stall/Surge ?

a. Vibration.
b. Abnormal noises, rumbles.
c. slow to accelerate from idle.

**21.** Compressor bleed valves are normally...

a. moving from closed to open during acceleration.
b. closed at high power.
c. open at high power.

**22.** CPR compressor pressure ratio is defined as the ratio of the...

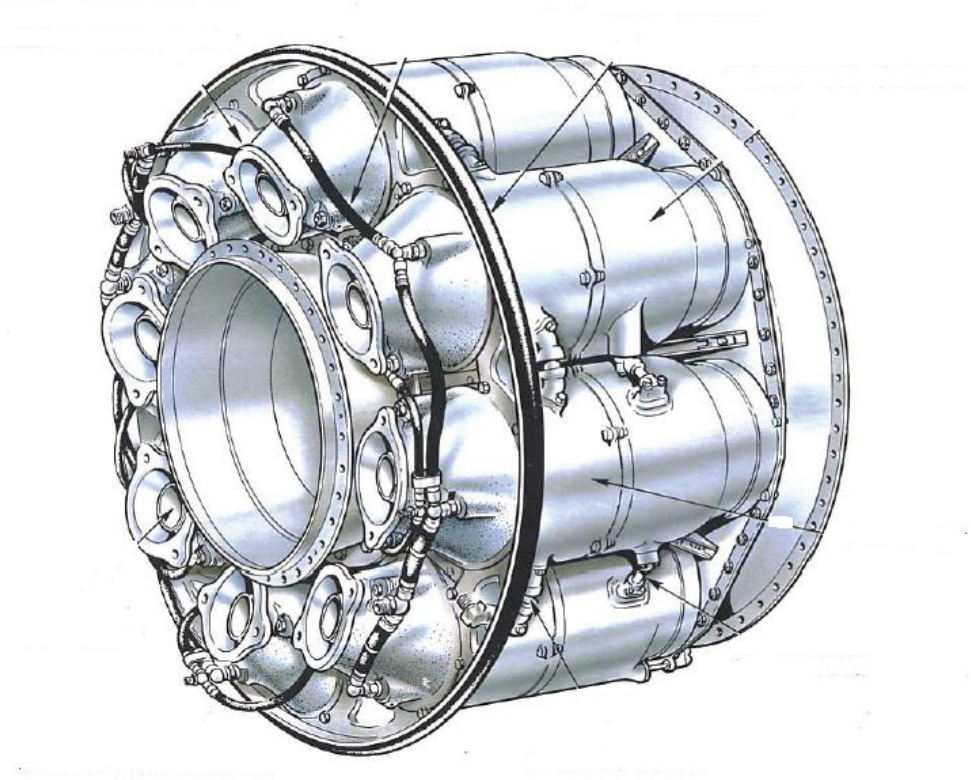
a. pressure as measured at the front and rear turbine.
b. temperature as measured at the front and rear of the engine compressor.
c. pressure as measured at the front and rear of the engine compressor.

**23.** Give the best component name for the statement:

"This gives a smooth stream of uniformly heated gas at all conditions required by the turbine."

a. Combustion chamber.
b. Low pressure turbine.
c. Compressor.

**24.** What kind of combustion system is shown in the picture?



a. Annular combustion chamber.
b. Can type combustion chamber.
c. Multiple combustion chamber.

**25.** What temperature has the primary zone of the combustion chamber?

a. 1500 ºC.
b. 2000 ºC.
c. 2000 ºF.

**26.** What answer mentions three main types of turbine blades?

a. Reaction, converging and diverging.
b. Impulse, vector and impulse-vector.
c. Impulse, reaction and impuls-reaction.

**27.** Which typical attachment method between a turbine blade and a turbine wheel is used in modern axial flow turbines?

a. Fir-tree
b. Shap

c. Dove tail

**28.** How is turbine blade creep at a constant rate called?

a. Secondary creep.
b. Static creep.
c. Tertiary creep.

**29.** "It rotates at high speed and is subjected to large rotational stresses of the turbine blades."

What assembly is this?

a. Idler gear in gear box of the high pressure disc.
b. Compressor disc
c. Turbine disc.

**30.** The main purpose of the exhaust nozzle is to....

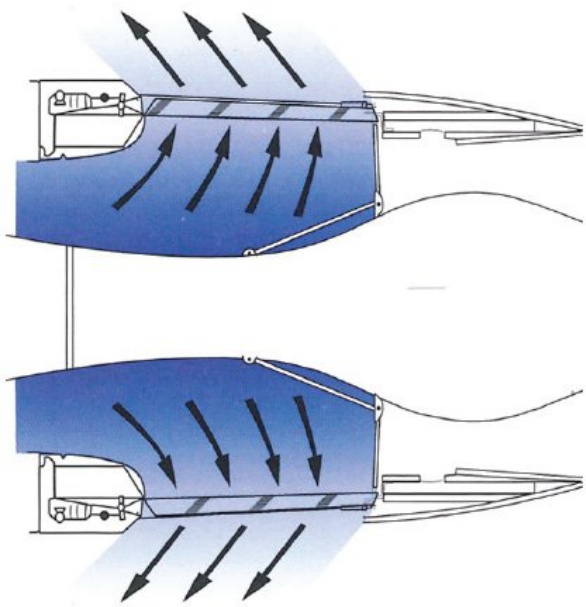
a. reduce noise.
b. provide containment of the hot exhaust gases and streamline the fan airflow.
c. control exhaust gas expansion.

**31.** The nozzle is fitted at the final end of the exhaust duct.

For subsonic aircraft it will be...

a. straight oval pipe in design.
b. restrictive in shape.
c. convergent in shape.

**32.** What type of thrust reverser is shown in the picture?



a. Clamshell door reverser.
b. Cold stream reverser.
c. Bucket door reverser.

**33.** Which type of sealing arrangement does a carbon seal have?

a. Full rest contact against a surface.
b. Full contact with casing.
c. Using air pressure to minimize oil leakage.

**34.** The gas turbine rotors are supported by ball and roller bearings, which are antifriction bearings. Many newer engines use hydraulic bearings, in which the outside race is surrounded by a thin film of oil.

This feature is to...

a. increase life expectance of the bearing, allowing higher temperature of the bearing.
b. reduce vibrations transmitted to the engine.
c. reduce temperature transmitted to the engine cooling systems.

**35.** What determines the number of bearings necessary to support the compressor rotor?

a. The rpm of the compressor.
b. Loads on the compressor rotor.
c. Length and weight of the type of compressor.

**36.** For international operations jet fuel A1 ..... compared to jet fuel A.

a. has a lower freezing point
b. has a higher freezing point
c. is a mixture of gasoline and kerosene

**37.** Metal deactivator 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.

**38.** Tracer A is an additive to detect leaks....

a. in airport fuel systems.
b. in aircraft systems.
c. in engines.

**39.** Fuels with low flashpoints will be used....

a. in Russia and other cold countries.
b. in The Middle East and other hot countries.
c. by the military only.

**40.** For what reason is a pressure relief valve installed in the gear type pressure pump?

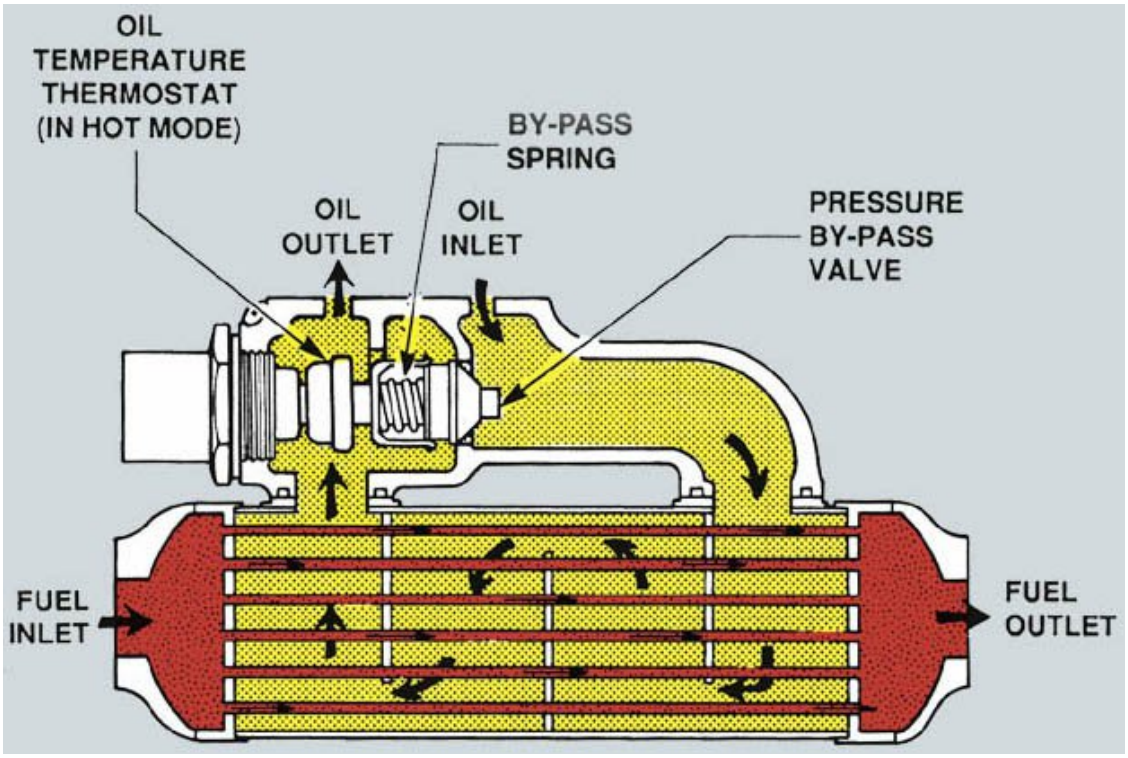
a. To relieve excessive air pressure.
b. To relieve excessive oil pressure.
c. To control the oil flow.

**41.** What is the function of the chip detector in the oil system?

It attracts all of the....

a. different material particles in the pressure oil system.
b. ferro magnetic particles in the pressure oil system.
c. ferro magnetic particles in the scavenge oil system.

**42.** What is the function of the thermostat in the fuel/oil exchanger?




When the oil is....

a. above the operation temperature, the oil flows **not** through the heat exchanger.
b. below operation temperature, the oil flows through the heat exchanger.
c. below operation temperature, the oil flows **not** through the heat exchanger.

**43.** What is the purpose of the air- oil centrifugal breather?

To separate oil from the air mist in the....

a. suction pump.
b. oil tank.
c. gearbox.

**44.** When the pilot moves the fuel control power lever forward, fuel flow is increased. This increase in fuel flow creates increased gas expansion in the combustor chamber.

What is the effect of this gas expansion?

a. It lowers the level of temperature in the combustion chamber of the engine. This increases the thrust.
b. It raises the level of power in the engine, producing more thrust.
c. It raises the level of air flow being metered to the engine by the fuel control unit.

**45.** What is the central component in a FADEC system?

a. Fuel control unit.
b. Engine oil control system.
c. Electronic engine control.

**46.** The full authority digital electronic control (FADEC) system is a computer-based engine control system. Each aircraft engine has its own control system.

What is the main component of the FADEC system?

a. The engine driven fuel pumps.
b. The fuel control unit.
c. The electronic engine control (EEC).

**47.** The fuel pump boost stage is a....

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

**48.** The fuel cooled oil cooler provides...

a. warming of the oil and cooling of the fuel.
b. cooling of the oil only.
c. warming the fuel and cooling the oil.

**49.** Depending on the engine design, the low pressure fuel pump develops pressure to feed the flow to the...

a. fuel nozzles only.
b. high pressure pump which sends fuel at high pressure to the fuel injectors.
c. high pressure pump which sends fuel at high pressure back to the aircraft fuel tank for cooling of the aircraft fuel tanks.

**50.** What is the purpose of the accessory cooling system?

The purpose of the accessory cooling system is...

a. allowing engine components to heat up to operating temperature.
b. to reduce excessive heat on components, thereby extending life and increasing engine efficiency.
c. to avoid that engine oil exceeds 653 degrees celsius.

**51.** The engine external accessories cooling subsystem cools components with...

a. fan air.
b. turbine air.
c. compressor, high pressure.

**52.** What is the position of the engine bleed valve during max power?

a. In transit.
b. Closed.
c. Open.

**53.** What is the most critical information during start up?

a. Fuel flow.
b. Exhaust gas temperature.
c. Engine rpm.

**54.** The engine starting system supplies the force to turn the engine HP compressor on the ground by...

a. rotating the gearbox that is connected to the low speed shaft.
b. rotating the air turbine starter on the accessory gearbox.
c. supplying air to the fan.

**55.** The high tension distribution system conducts the high voltage dc from the ignition exciters to the...

a. condenser.
b. compressor case
c. igniter plugs.

**56.** What should the ignition system be if the engine is dry 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 an open in the ignition cable
b. To prevent a short in the cable.

c. To dissipate the energy stored in the system

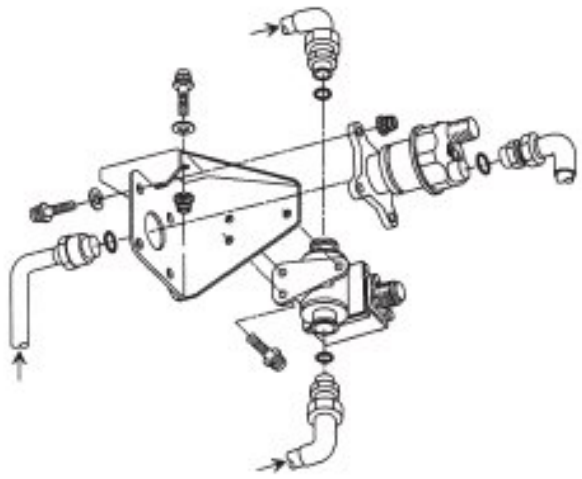
**58.** Each jet axial flow engine has thermocouple probes evenly spaced around the...

a. high pressure compressor assembly. Each probe has two alumel-chromel thermocouple junctions.
b. turbine assembly. Each probe has two alumel-chromel thermocouple junctions.
c. combustion outlet assembly. Each probe has 17 alumel-chromel thermocouple junctions.

**59.** Advancing the power levers causes...

a. actual engine thrust to decrease and EPR indicator to rise.
b. engine thrust and EPR indicator to rise.
c. engine thrust and EPR indicator to stabilize then decrease.

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



a. the ISA parameters.
b. the gear box pressure.
c. the FCOC (Fuel Cooled Oil Cooler).

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

This best describes?

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

**62.** The torque meter on a turboprop measures...

a. torque effect of the propeller system through the use of a speed sensor.
b. the required pressure to resist the axial oil thrust produced by the helical gear.
c. simply the pressure load to the drive shaft.

**63.** How do you compensate the low mass flow rate of air through the engine if there is a low air density?

a. Use a shorter runway.
b. Take off at a lower altitude.
c. Use the water injection system.

**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.** This system is normally only used on turbo-jet to augment the thrust of the engine for short periods.

What is this system?

a. Rocket burner fuel.
b. Afterburner.
c. 100 % methanol.

**66.** "A turboprop engine in which the propeller reduction gears are driven by the same shaft which drives the compressor for the gas generator."

What type turbine is this?

a. Direct coupled turbine.
b. Spliced shaft turbine.
c. Dual shaft turbine.

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

a. Reduction gear with a rack and pinion.
b. Mechanically simple and therefore relatively cheap to manufacture.
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. radial governor.
b. propeller governor.
c. fly weights.

**70.** The most commonly used freewheeling unit on helicopters is the...

a. centrifugal clutch.
b. sprague clutch.
c. wet sink clutch assembly.

**71.** What is a turbo-shaft engine?

a. A turbine that drives a high speed ultra high bypass compressor.
b. A gas turbine engine that delivers power through a rotating shaft.
c. Axial flow compressor with a propeller drive system, used in large commercial aircraft

**72.** The drive shaft and flexible coupling system for a helicopter consist of...

a. a shaft with two flexible couplings attached at each end.
b. a direct shaft that can only withstand heavy loads at low RPM.
c. a direct chain drive with coupling, that can only withstand heavy loads at low RPM.

**73.** The parallel spur gear type and the epicyclic type describe...

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

**74.** The igniter provides the spark to the...

a. fuel nozzle injector during all phases of APU operation.
b. combustor chamber.
c. turbine on APU with a reverse flow combustion chamber.

**75.** The APU fuel system receives fuel from...

a. the airplane wing tanks through a shrouded line.
b. ground support system.
c. external fuel source during operation.

**76.** The auxilliary power unit or APU is a small gas turbine engine fitted to aircraft.

They can provide...

a. electric power and pneumatic duct pressure.
b. hydraulic pressure.
c. electrical power for the inflight entertainment system.

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

They are...

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

**78.** The fan cowl panels open to provide access to components on the...

a. engine combustion chamber
b. inlet cowling
c. engine fan case

**79.** The pylon transmits engine loads to the wing through the...

a. wing spars, front and rear.
b. forward bulkhead and aft mount bulkhead.
c. lower wing surface.

**80.** On very large engines the cowlings and access panels can be so heavy that it will require assistance to open.

How is this performed?

a. It is not required to have access because designers took this into consideration.
b. Hydraulic or mechanical assistance.
c. Simply by the use of more people to raise or lower the section.

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

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

**82.** The fire extinguishing system includes...

a. only protection function
b. a cockpit control switch, fire extinguishing agent containers, and an agent distribution system
c. a cockpit control switch, fire extinguishing agent containers in the flight deck and an agent distribution system at the wing tip.

**83.** Fire is one of the most dangerous threats to an aircraft.

How are the potential fire zones of all multi engine aircraft which are currently produced, protected?

a. by fire funnels.
b. by a fixed fire protection system.
c. by a portable fire protection system.

**84.** This fire detector consists of a sensor and a responder. The sensor tube contains a gas charged core material and helium under pressure.

What system is this?

a. Kidde
b. Fenwall.
c. Systron-Donner

**85.** Extinguishing agent is discharged through a...

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

**86.** What is the proper starting sequence for a turbojet engine?

a. Starter, fuel, ignition.
b. Ignition, starter, fuel.
c. Starter, ignition, fuel.

**87.** When is it allowed to use maximum thrust?

a. Take-off.
b. Maximum cruise.
c. Maximum climb.

**88.** Graphs or curves are used to show trends in changing conditions. The engine manufacturer and/or operator collects data.

This data could include...

a. N1, N2, EGT, fuel flow
b. torque delivered to the high pressure turbine during acceleration
c. N1, N2, EGT, fuel flow and cabin altitude.

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

**90.** The gradual accumulation of dirt and contaminants on the rotor and stator blades will change the shape of and thus reduce the efficiency of each blade affected.

What adverse effect would it have?

a. Engine performance decreases.
b. Low fuel flow.
c. Engine vibration only.

**91.** Which manual describes the correct procedure to install an engine after storage?

a. Engine manual.
b. Flight manual.
c. Maintenance manual.

**92.** When the engine is returned in service after preservation, the engine fuel system should ....

a. be static drained.
b. get a complete engine ground run.
c. be completely flushed by motoring the engine.