

# Design Engineer Job Interview Questions And Answers



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## Design Engineer Interview Questions And Answers Guide.

### Question - 1:

Tell me what does F.O.F. stand for in piping design?

#### Ans:

FOF stands for Face of Flange. A flange has either of the two types of faces:

- a) Raised face
- b) Flat face

The F.O.F is used to know the accurate dimension of the flange in order to avoid the minute errors in measurement in case of vertical or horizontal pipelines.

[View All Answers](#)

### Question - 2:

How do you deal with stress as Design Engineer?

#### Ans:

Every mechanical engineer has to address the concerns of stress on the job. How do they deal with stress? How do they channel negative energy?

[View All Answers](#)

### Question - 3:

Tell me what is the role of nitrogen in welding?

#### Ans:

Nitrogen is used to prevent porosity in the welding member by preventing oxygen and air from entering the molten metal during the welding process. Other gases are also used for this purpose such as Argon, Helium, Carbon Dioxide, and the gases given off when the flux burns away during SMAW (stick) welding.

[View All Answers](#)

### Question - 4:

Tell me why gas containers are mostly in a cylindrical shape?

#### Ans:

The ideal shape would be a sphere. The container must have the capacity to withstand the extremely high pressure of liquefied gas. A spherical shape helps in distributing these forces uniformly.

[View All Answers](#)

### Question - 5:

Do you know why gas containers are mostly cylindrical in shape?

#### Ans:

The most efficient shape for withstanding high pressure is a sphere but that would be costly to manufacture. A cylinder with a domed top and a domed bottom (look underneath, the flat base is actually welded around the outside, the bottom of the gas container is actually domed) is a much cheaper shape to manufacture whilst still having good strength to resist the internal gas pressure.

[View All Answers](#)

### Question - 6:

Explain me what does 8.8 mark on the bolt signify?

#### Ans:

It gives you value of tensile strength and yield strength.

For eg. The tensile strength over here in 8.8 marking bolt would be 800 N/mm<sup>2</sup> and its yield strength is 640 which is 80% of the tensile strength.

[View All Answers](#)

### Question - 7:

Tell me what is annealing?



**Ans:**

It is a process of heating a material above the re-crystallization temperature and cooling after a specific time interval. This increases the hardness and strength of the material.

[View All Answers](#)

**Question - 8:**

Do you know what is torque?

**Ans:**

Torque is the force that causes rotation. It is a measure of how much force is acting on an object making it rotate.

[View All Answers](#)

**Question - 9:**

Tell me what is the ratio of specific heat of air?

**Ans:**

The ratio of specific heat  $\gamma = C_p/C_v$  is a factor in adiabatic engine processes and in determining the speed of sound in gas. This ratio  $\gamma = 1.66$  for an ideal monoatomic gas and  $\gamma = 1.4$  for air, which is predominantly a diatomic gas.

[View All Answers](#)

**Question - 10:**

Tell me where pneumatic system is used?

**Ans:**

Any system needs redundancy in work needs pneumatics, because the compressor of the pneumatic system has periodical operations (intermittent work, not as hydraulic pump). The compressed air could be accumulated in tanks with high pressures and used even if the compressor failed.

[View All Answers](#)

**Question - 11:**

Tell me what are jigs and fixture?

**Ans:**

This question is often asked and it always confuses. So here is a clear answer for difference between jigs and fixture.

- \* Jigs gives direction to cutting tool
- \* We can perform various operations like drilling, reaming, tapping and polishing.
- \* Fixtures are used to hold the workpiece
- \* Fixture are not used to perform any of the operations

[View All Answers](#)

**Question - 12:**

Do you know what kind of pipes are used for steam lines?

**Ans:**

Pressure and temperature are two of the most important factors to be considered before selecting the type of material to be used. Steam is a compressible gas due to which the capacity of the pipe line depends on the size of the pipes and pressure of the steam. Since steam at even low pressure can be dangerous, extra care is to be taken. Galvanized pipes are usually not used for steam. Pipes made of mild steel with welded fittings are instead largely used.

[View All Answers](#)

**Question - 13:**

Tell me what does Green field project mean?

**Ans:**

Green field projects are those projects, which do not create any environmental nuisance (pollution), follows environmental management system and EIA (environment impact assessment). These projects are usually of big magnitude.

[View All Answers](#)

**Question - 14:**

Explain me what is a Process Flow Diagram?

**Ans:**

A Process Flow Diagram (or System Flow Diagram) shows the relationships between the major components in the system. It also has basic information concerning the material balance for the process.

[View All Answers](#)

**Question - 15:**

Tell me what do you understand by the Hooke's Coupling what are its purposes?

**Ans:**

The Hooke's coupling is used to connect two shafts whose axes intersect at a small angle. The two shafts are inclined at an angle and is constant. During motion it varies as the movement is transferred from one shaft to another. One of the major areas of application of this coupling is in gear boxes where the coupling is used to drive the rear wheels of trucks and other vehicles. In such usage scenarios two couplings are used each at the two ends of the coupling shaft. they are also used to transfer power for multiple drilling machines. The Hooke's coupling is also known as the Universal coupling. The torque transmitted by the shafts is given by :



$T = (\pi/16) \times t \times (d)^3$

Where T = torque, t = shear stress for the shaft material and d the diameter of the shaft.

[View All Answers](#)

### Question - 16:

What is the difference between pipe and a tube?

**Ans:**

A pipe is measured based on its inner diameter (ID) whereas a tube is measured based on the outer diameter (OD). Other than the dimensions there is no major difference between the two.

[View All Answers](#)

### Question - 17:

Tell me between steel, copper and brass, which conduct faster heat?

**Ans:**

Copper conducts heat faster than steel or brass. In most cases, material that is good for conducting heat is also good for electricity.

[View All Answers](#)

### Question - 18:

Tell me what are the benefits of GD & T?

**Ans:**

- \* Precision & Accuracy
- \* Reduced rework cost
- \* Reduced Defects
- \* Increased understanding

[View All Answers](#)

### Question - 19:

Explain me what kinds of pipes are used for steam lines?

**Ans:**

Normally galvanized pipes are not used for steam. Mild steel with screwed or welded fittings are the norm. Pressure and temperature are very important factors to be considered in what type of materials to be used. Steam even at low pressures can be extremely dangerous.

[View All Answers](#)

### Question - 20:

Explain why are LNG pipes curved?

**Ans:**

LNG pipes are curved because LNG is condensed gas (-164 deg cel) so it can expand the pipes that is what engineers designed the LNG pipes are curve type.

[View All Answers](#)

### Question - 21:

Explain me what is ductile-brittle transition temperature?

**Ans:**

It is the temperature below which the tendency of a material to fracture increases rather than forming. Below this temperature the material loses its ductility. It is also called Nil Ductility Temperature.

[View All Answers](#)

### Question - 22:

Name different types of fits?

**Ans:**

- \* Clearance fit
- \* Interference fit
- \* Transition fit

[View All Answers](#)

### Question - 23:

Tell me what are the advantages of DTSI over normal engines?

**Ans:**

The cylinder head has two spark plugs, instead of the usual one. When two sparks are generated at either ends of the combustion chamber, the air-fuel mixture is ignited in a way that creates two flame fronts. A higher rate of combustion is achieved leading to higher rise in pressure. The outcome of this is more torque, better fuel efficiency and lower emissions.

[View All Answers](#)

### Question - 24:



What is the formula of heat loss in a pipe?

**Ans:**

In order to find total heat loss through the pipes it is imperative to know the thermal conductivity and the differing thicknesses of each layer. The ground that surrounds the pipe also acts as a layer of insulation. Considering this, the thermal properties of the stoneless sand is included in the heat loss calculation.

[View All Answers](#)

**Question - 25:**

Tell me what is DTSI? Why it is used in motor bikes?

**Ans:**

Digital Twin Spark Ignition. This is used for a better fuel combustion in the cylinder head which helps provide better efficiency and optimum use of fuel.

[View All Answers](#)

**Question - 26:**

Explain me what is a micron?

**Ans:**

A micron is 1000th part of 1mm. That is divide 1mm into 1000 equal parts the value that you would get is 1micron. For example the diameter of human hair is approximately 70 to 80 microns.

[View All Answers](#)

**Question - 27:**

Why are manhole covers usually elliptical?

**Ans:**

Once again, the question brings the focus to the "why" of the design. Force the applicant to hypothesize about possible reasons why ellipses might be more effective than circles to see if their thought process will carry over to your needs.

[View All Answers](#)

**Question - 28:**

Tell me what are the advantages of gear drive?

**Ans:**

In general, gear drive is useful for power transmission between two shafts, which are near to each other (at most at 1m distance). In addition, it has maximum efficiency while transmitting power. It is durable compare to other such as belts chain drives etc. You can change the power to speed ratio.

Advantages: -

- \* It is used to get various speeds in different load conditions.
- \* It increases fuel efficiency.
- \* Increases engine efficiency.
- \* Need less power input when operated manually.

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**Question - 29:**

Tell me how is martensite structure formed in steel?

**Ans:**

Martensite transformation begins when austenite is cooled below a certain critical temperature, called the matrensite start temperature. As we go below the martensite start temperature, more and more martensite forms and complete transformation occurs only at a temperature called martensire finish temperature. Formation of martensite requires that the austenite phase must be cooled rapidly.

[View All Answers](#)

**Question - 30:**

Explain me what is a positive displacement pump?

**Ans:**

A positive displacement pump causes a liquid or gas to move by trapping a fixed amount of fluid or gas and then forcing (displacing) that trapped volume into the discharge pipe. Positive displacement pumps can be further classified as either rotary-type (for example the rotary vane) or lobe pumps similar to oil pumps used in car engines. These pumps give a non-pulsating output or displacement unlike the reciprocating pumps. Hence, they are called positive displacement pumps.

[View All Answers](#)

**Question - 31:**

Tell me what is a cotter joint?

**Ans:**

These types of joints are used to connect two rods, which are under compressive or tensile stress. The ends of the rods are in the manner of a socket and shaft that fit together and the cotter is driven into a slot that is common to both pieces drawing them tightly together. The tensile strength of the steel is proportionate to the strength needed to offset the stress on the material divided by the number of joints employed.

[View All Answers](#)

**Question - 32:**

Explain me what kind of materials should be used for shafts manufacturing?



**Ans:**

Some of the qualities that should be present in materials for shafts are as follows:

- \* > The material should have a high index of strength.
- \* > Also it should have a high level of machinability.
- \* > The material should possess a low notch sensitivity factor.
- \* > The material must also have wear resistant properties.
- \* > Good heat treatment properties should also be present

The common material used to create shafts of high strengths an alloy of steel like nickel is used. The shafts are manufactured by hot rolling processes and then the shaft is finished using drawing or grinding processes.

[View All Answers](#)

**Question - 33:**

Explain what minerals are used in the manufacture of cars?

**Ans:**

Cars are made from many various minerals. The steel body is made from the iron-rich minerals like magnetite and hematite. Door handles and badges are often coated in chromium which comes from chromite. Some of the other minerals used are aluminum, quartz, copper, magnesium, zinc, tin etc.

[View All Answers](#)

**Question - 34:**

Explain me what is a time and motion theory?

**Ans:**

Frederick Taylor was pioneer of the time and motion theory. This technique monitors the amount of time required to complete a task along with observing the steps taken by a worker to complete the given task.

[View All Answers](#)

**Question - 35:**

Explain me what is the difference between torque and power?

**Ans:**

While power determines the speed of a vehicle, torque determines the time in which that speed can be reached. The greater the torque figure, the faster the acceleration. The more torque in the engine, the faster you accelerate. Power is the rate at which work is done, so it is basically the potential of the engine.

[View All Answers](#)

**Question - 36:**

Tell me which is the hardest material on earth?

**Ans:**

Diamond is currently the hardest material, made up of carbon atoms which cannot move. Carbon is the only atom that can have four electrons in the second shell surrounding the carbon nucleus, precisely why making a diamond the hardest material. However, there also are claims by a few to a new rare material called Wurtzite Boron Nitride which has a structure similar to a diamond but has some other atoms in place of carbon.

[View All Answers](#)

**Question - 37:**

Tell me why diesel engine is known as high torque and petrol engine as high speed engine?

**Ans:**

Each power stroke in a petrol engine releases more heat and is converted into mechanical energy due to a higher rate of burning. This is the reason petrol engine has higher power and acceleration.

Diesel engine is a compression ignition engine with higher compression ratio, therefore extreme pressure is high. Since the piston of a diesel engine is larger, more torque is delivered in produced.

[View All Answers](#)

**Question - 38:**

Tell me why is the back wheel of a tractor bigger than the front wheel?

**Ans:**

This is a question that pushes the respondent to think critically about design. There has to be a logical reason why tractors are designed that way. Whether or not they can answer that example correctly, they must understand that there is a specific reason why that design is more effective.

[View All Answers](#)

**Question - 39:**

Explain me what is the difference between projectile motion and a rocket motion?

**Ans:**

A projectile has no motor/rocket on it, so all of its momentum is given to it as it is launched. An example of a projectile would be pen that you throw across a room. A rocket or missile does have a motor/rocket on it so it can accelerate itself while moving and so resist other forces such as gravity.

[View All Answers](#)

**Question - 40:**

Explain me what are the differences between pneumatics and hydraulics?



**Ans:**

- a) Working fluid: Pneumatics use air, Hydraulics use Oil
- b) Power: Pneumatic power less than hydraulic power
- c) Size: P components are smaller than H components
- d) Leakage: Leaks in hydraulics cause fluid to be sticking around the components. In pneumatics, air is leaked into the atmosphere.
- e) Pneumatics obtain power from an air compressor while hydraulics require a pump
- f) Air is compressible, hydraulic oil is not

[View All Answers](#)

**Question - 41:**

Explain me how pipe flanges are electrically insulated?

**Ans:**

Pipe flanges are protected from corrosion by means of electrolysis, with dielectric flanges. The piping system is electrically insulated by what is called a sacrificial anode. A bag of readily corrodible metal is buried in the ground with a wire running from the pipe to the bag so that the sacrificial anode will corrode first. If any electrical current charges the pipe, it also serves as a ground.

[View All Answers](#)

**Question - 42:**

Tell me what causes white smoke in two stroke locomotive engines?

**Ans:**

That is the engine running too lean (lack of fuel). This condition will lead to overheating and failure of the engine.

[View All Answers](#)

**Question - 43:**

Tell me what is extruded aluminum?

**Ans:**

Extrusion is the process where a metal or a metal bar is pulled through a mandrel to elongate it and/or give it a final shape. Extruded Aluminum is a common form of making small aluminum wire, bars or beams and many varieties of small non-structural, decorative pieces.

[View All Answers](#)

**Question - 44:**

Tell me what does angular momentum mean?

**Ans:**

Angular momentum is an expression of an objects mass and rotational speed. Momentum is the velocity of an object times it is mass, or how fast something is moving how much it weigh. Therefore, angular momentum is the objects mass times the angular velocity where angular velocity is how fast something is rotating expressed in terms like revolutions per minute or radians per second or degrees per second.

[View All Answers](#)

**Question - 45:**

What is Otto cycle?

**Ans:**

Otto cycle can be explained by a pressure volume relationship diagram. It shows the functioning cycle of a four stroke engine. The cycle starts with an intake stroke, closing the intake and moving to the compression stroke, starting of combustion, power stroke, heat exchange stroke where heat is rejected and the exhaust stroke. It was designed by Nicolas Otto, a German engineer.

[View All Answers](#)

**Question - 46:**

Tell me what product design encompasses?

**Ans:**

Everything from customer analysis, size and shape, to branding and packaging make up the entire product. A product is the culmination of its design, effectiveness, and branding. You cannot forget the cohesive pieces of the puzzle that need to come together to attract the maximum amount of customers.

[View All Answers](#)

**Question - 47:**

Explain me what are the different types of springs and explain them briefly?

**Ans:**

Springs can be broadly classified into the following types:

- \* > Helical Springs: These springs as their name suggests are in coil form and are in the shape of helix. The primary purpose of such springs are to handle compressive and tensile loads. They can be further classified into two types: compression helical spring and tension helical spring each having their own unique areas of application./
- \* > Conical and volute springs: Both these spring types have specialized areas of usage where springs with adaptable rate according to the load is required. In case of conical springs they are wound so as to have a uniform pitch while on the other hand volute springs are wound in a slight manner of a paraboloid.
- \* > Torsion Springs: The characteristics of such springs is that they tend to wind up by the load. They can be either helical or spiral in shape. These types of springs are used in circuit breaker mechanisms.
- \* > Leaf springs: These types of springs are comprised of metal plates of different lengths held together with the help of bolts and clamps. Commonly seen being used





as suspensions for vehicles.

\* > Disc Springs: As the name suggests such types of springs are comprised of conical discs held together by a bolt or tube.

\* > Special Purpose Springs: These springs are all together made of different materials such as air and water.

[View All Answers](#)

### Question - 48:

Explain me what are the assumptions made in simple theory of bending?

**Ans:**

The assumptions made in the theory of simple bending are:

\* > The material of the beam is homogeneous this implies that it is uniform in density, strength and have isotropic properties meaning possessing same elastic property in all directions.

\* > Even after bending the cross section of the beam remains constant.

\* > During the initial stages the beam is straight and unstressed.

\* > All the stresses in the beam are within the elastic limit of its material.

\* > The layers of the beam are free to contract and expand longitudinally and laterally

\* > On any cross section the perpendicular resultant force of the beam is zero.

\* > Compared to the cross-sectional dimension of the beam the radius of curvature is very large.

[View All Answers](#)

### Question - 49:

Tell us why do heavy vehicles use diesel engine?

**Ans:**

The compression ratio of diesel engine is higher than the petrol engine, the reason for producing higher torque. The efficiency of diesel engine increases with load. Diesel produces slow energy on burning of fuel and the efficiency of the engine increases with load which is why diesel engine is suitable and largely used for heavy vehicles.

[View All Answers](#)

### Question - 50:

Please explain what do you understand by the concept of a 6 stroke engine?

**Ans:**

The six stroke engine is based on the concept of four stroke engine but built with an intention of improvising the efficiency in reducing emission. Every cycle of a four stroke engine involves the upward and downward movement of the piston which happens twice in the chamber, resulting in four total strokes and one of which is the power stroke which provides the torque to move the vehicle. A six stroke engine works similarly except that there are two power strokes.

[View All Answers](#)

### Question - 51:

Tell me what is a process flow diagram?

**Ans:**

A Process Flow Diagram is a user friendly, simplified sketch which illustrates general plant streams, major equipments and key central loops and shows the relationship between major components in the system. By using symbols to identify instruments and vessels it describes the primary flow course. They also provide a detail of mass/energy balance data along with stream composition and physical properties, however do not show minor components.

[View All Answers](#)

### Question - 52:

Do you know what is PS?

**Ans:**

Personal Statement. It is something that gives an informative background about an individual.

[View All Answers](#)

### Question - 53:

Tell me one unit of BTU is how many Joules?

**Ans:**

1 BTU=1055.06 Joules

[View All Answers](#)

### Question - 54:

Tell me which instrument measures speed in a car?

**Ans:**

A speedometer helps measure the speed in the car.

[View All Answers](#)

### Question - 55:

Tell me what is meant by gear ratio?

**Ans:**



A gear ratio is a direct measure of ratio of the rotational speeds of two or more interlocking gears.

[View All Answers](#)

**Question - 56:**

Tell me what is ferrite?

**Ans:**

Magnetic iron rock

[View All Answers](#)

**Question - 57:**

Explain me what is gear ratio?

**Ans:**

It is the ratio of the number of revolutions of the pinion gear to one revolution of the idler gear.

[View All Answers](#)

**Question - 58:**

Tell me what is enthalpy?

**Ans:**

Enthalpy is the heat content of a chemical system.

[View All Answers](#)

**Question - 59:**

Explain what is isometric drawing?

**Ans:**

It is a 3-D drawing used by draftsmen, architects etc

[View All Answers](#)

**Question - 60:**

Tell me what is representative elementary volume?

**Ans:**

Smallest volume over which measurements can be made that will yield a representative of the whole.

[View All Answers](#)

**Question - 61:**

Tell me what is the mechanical advantage of a double pulley?

**Ans:**

It only takes half the effort to move an object but twice the distance.

[View All Answers](#)

**Question - 62:**

Tell me why would you use hydraulics rather than pneumatics?

**Ans:**

Hydraulics is suitable for higher forces & precise motion than pneumatics. This is because hydraulic systems generally run at significantly higher pressures than pneumatics systems. Movements are more precise (repeatable) because hydraulics uses an incompressible liquid to transfer power whilst pneumatics uses gases. Pneumatic systems have some advantages too. They are usually significantly cheaper than hydraulic systems, can move faster (gas much less viscous than oil) and do not leak oil if they develop a leak.

[View All Answers](#)

**Question - 63:**

Tell me what is the difference between shear center flexural center of twist and elastic center?

**Ans:**

The shear center is the centroid of a cross-section. The flexural center is the center of twist, which is the point on a beam that you can add a load without torsion. The elastic center is located at the center of gravity. If the object is homogeneous and symmetrical in both directions of the cross-section then they are all equivalent.

[View All Answers](#)

**Question - 64:**

Tell me cooling is an essential aspect to address in engine design. What are the effects of overcooling?

**Ans:**

Addressing cooling is vital in a product that outputs heat. The issue is that overcooling can reduce capacity and can waste excess energy. A great engineer will take this into account in the design process to ensure that you do the most with the least resources.

[View All Answers](#)



### Question - 65:

Tell me how can two different types of fuel engines with the same capacity have different outputs?

#### Ans:

The goal of this question is to test how the applicant understands the distinctions in productivity between different options. Your product design should be as lean as possible, and a quality mechanical engineer should be able to show their judgement for the best results.

[View All Answers](#)

### Question - 66:

Tell me why should a chain drive be used over a belt or rope driven drive? State pro`s and con`s?

#### Ans:

The advantages of using a chain drives are:

- \* > In a chain drive no slip occurrence takes place.
- \* > The chains take less space as compared to rope or belts as they are made of metal and offer much strength.
- \* > The chain drives can be used at both short and long ranges and they offer a high level of transmission efficiency.
- \* > Chain drives can transmit more load and power as compared to belts.
- \* > A very high speed ratio can be maintained in one step of chain drives.
- \* Some of the cons of using a chain drive are:
  - \* > The cost of producing chain drives is higher as compared to that of belts.
  - \* > The chain drives must be serviced and maintained at regular intervals and henceforth their cost of ownership is high comparatively.

[View All Answers](#)

### Question - 67:

Explain what are the advantage and disadvantage of using LPG in a car?

#### Ans:

\* Advantages:

The high octane rate enables it to blend better with air and to burn completely, generating less carbon. With less carbon buildup, spark plugs often last longer and oil changes are needed less frequently.

Since it burns in the gaseous phase, it results in less corrosion and engine wear.

In case of a spill, LPG evaporates quickly.

\* Disadvantages

The LPG requires servicing at approximately once a year.

Since complete combustion occurs, more heat is liberated which is not advised for a long journey as the engine will get over heated.

Installation of LPG is rather difficult.

[View All Answers](#)

### Question - 68:

Explain the laws of thermodynamics and its importance of in Mechanical Engineering?

#### Ans:

Thermodynamics is a physical science which studies the interrelation between heat, work and the internal energy of any system. Thermodynamics helps study all the systems of mechanical engineering. There are three laws of thermodynamics.

First Law: Energy can be neither created nor destroyed. It can only change forms. In any process in an isolated system, the total energy remains the same.

Eg: turning on a light would seem to produce energy; however, it is electrical energy that is converted.

Second Law: The second law of thermodynamics states that the entropy of any isolated system not in thermal equilibrium almost always increases.

Eg: A car that has run out of gas will not run again until you walk 10 miles to a gas station and refuel the car.

Third Law: As temperature approaches absolute zero, the entropy of a system approaches a minimum.

Eg: Water in gas form has molecules that can move around very freely. Water vapor has very high entropy (randomness). As the gas cools, it becomes liquid which can still move around but not as freely. At this point they have lost some entropy. On cooling further it becomes solid ice where molecules can no longer move freely but can only vibrate within the ice crystals. The entropy is now very low. As the water nears absolute zero, the vibration of the molecules diminishes. If the solid water reaches absolute zero, all molecular motion would stop completely. And at this point the water would have no entropy at all.

[View All Answers](#)

### Question - 69:

Tell me what is a Newtonian fluid?

#### Ans:

A Newtonian fluid possesses a linear stress strain relationship curve and it passes through the origin. The fluid properties of a Newtonian fluid do not change when any force acts upon it.

[View All Answers](#)

### Question - 70:

Tell me how does iron ore turn into steel?

#### Ans:

To make Steel, Iron Ore is refined into iron and all the carbon is burned away using very high heat (Bessemer). A percentage of Carbon (and other trace elements) are added back to make steel. 36. What is knurling?

Knurling is a machining process normally carried out on a centre lathe. The act of Knurling creates a raised criss-cross pattern on a smooth round bar that could be used as a handle or something that requires extra grip.

[View All Answers](#)

### Question - 71:



As you know air is a bad conductor of heat and the sun is always emitting steadily. Why is it hotter in the summer?

**Ans:**

The metaphor here is to get the applicant to think about ALL of the different aspects in a certain phenomenon. The mindset that you are looking for is one that sees the bigger picture and can understand the various influencers in your product.

[View All Answers](#)

**Question - 72:**

Tell me what is the need of GD&T?

**Ans:**

As we all know that its impossible to get a machine which gives you exact physical parts according to the required dimension. There is always some sort of deviation in the part manufactured. The deviations are caused due to following reasons:

- \* 1) Vibration in the machine
- \* 2) Tool Wear and Tear
- \* 3) Friction
- \* 4) Mounting Error
- \* 5) Human Error
- \* 6) Environment conditions.

So to meet the actual condition of machining tolerances and allowances are provided to the dimensions. So we require GD&T.

[View All Answers](#)

**Question - 73:**

Tell me why is stress considered important in a shaft?

**Ans:**

The following types of stresses are prevalent in shafts:

- \* > At the outermost surface of the shaft the max shear stress occurs on the cross-section of the shaft.
- \* > At the surface of the shaft on the longitudinal planes through the axis of the shaft the maximum longitudinal shear stress occurs.
- \* > At 45 degrees to the maximum shearing stress planes at the surface of the shafts the major principal stress occurs. It equals the max shear stress on the cross section of the shaft.
- \* > For certain materials where the tensile and compressive strengths are lower in measure as compared to the shear strength, then the shaft designing should be carried out for the lowest strengths.
- \* > All these stresses are of significance as they play a role in governing the failure of the shaft. All these stresses get generated simultaneously and hence should be considered for designing purposes

[View All Answers](#)

**Question - 74:**

Explain how many types of suspensions are used in automobiles?

**Ans:**

- \* McPherson struts
- \* Leaf spring
- \* Coil spring
- \* Torsion beam
- \* Wishbone
- \* Air Suspension

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**Question - 75:**

What is the types of sensors?

**Ans:**

- (i) Temperature Sensor- This device collects information about the temperature from a source and converts it to a form which is understandable by another device or person. Glass thermometer is the best example where mercury acts as the temperature sensor.
- (ii) IR Sensors- This device detects and/or emits infrared radiation to sense a particular phase in the environment. Mostly thermal radiation is emitted by all the objects in the infrared spectrum. This type of radiation is not visible to the human eye but the infrared sensor detects it.
- (iii) UV Sensors- These sensors measure the intensity of the ultraviolet radiation. This form of electromagnetic radiation has wavelengths which are longer than x-rays yet shorter than visible radiation. UV sensors can discover the exposure of environment to ultraviolet radiation.
- (iv) Touch Sensor- A touch sensor acts as a variable resistor based on the location where it is sensed. Proximity Sensor- A proximity sensor detects the presence of objects that are placed in close proximity without any point of contact.

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**Question - 76:**

Tell me who invented the four stroke engine? According to you which one is more efficient, four stroke engine or a two stroke engine and why?

**Ans:**

Nikolaus Otto invented the four stroke engine. Both, two stroke and four stroke have their own advantages and disadvantages. 4 stroke is more fuel efficient. However, 2 stroke produces more power.

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**Question - 77:**

Explain me what is a bearing? What are the different types of bearings?

**Ans:**



Bearing is a device that helps smoother movement with minimal friction which in turn helps enhances efficiency and speed. Considering two types of loading, radial and thrust, there are different types of bearings which help handle these loads. The basic difference in the types of loads is essentially due to their ability to handle weight and different kinds of loads for various applications. Different types of bearings are:

- \* Ball bearing
- \* Roller bearing
- \* Ball Thrust bearing
- \* Roller thrust bearing
- \* Tapered roller bearing
- \* Magnetic bearings
- \* Giant Roller Bearing

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### Question - 78:

Explain Newton's three laws of Motion?

#### Ans:

- \* The law of inertia: Every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it.
- \* Acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated) the greater the amount of force needed (to accelerate the object). Force=Mass times acceleration.
- \* For every action there is an equal and opposite reaction.

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### Question - 79:

Tell me what are the points in the stress strain curve for steel?

#### Ans:

Proportional limit, elastic limit or yield point, ultimate stress and stress at failure.

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### Question - 80:

Explain me is it the stress that, produces strain or strain produces stress?

#### Ans:

A Force applied to an object will cause a displacement. Strain is effectively a measure of this displacement (change in length divided by original length). Stress is the Force applied divided by the area it is applied. (E.g. pounds per square inch) Therefore, to answer the question, the applied force produces both "Stress and Strain". "Stress and Strain" are linked together by various material properties such as Poisson's ratio and Young's Modulus.

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### Question - 81:

Tell me what is an orthographic drawing?

#### Ans:

Orthographic projections are views of a 3D object, showing 3 faces of it. The 3 drawings are aligned so that if the page were folded, it would create part of the shape. It is also called multiview projections. The 3 faces of an object consist of its plan view, front view and side view. There are 2 types of orthographic projection, which are 1st angle projection and 3rd angle projection.

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### Question - 82:

Tell me which conducts heat faster steel copper or brass?

#### Ans:

Copper conducts heat faster than steel or brass. Any material that is good for conducting heat is also good for electricity in most cases. Wood terrible for transferring heat thus is also insulator for electric.

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### Question - 83:

Tell us what is a uniformly distributed load?

#### Ans:

A UDL or uniformly distributed load is a load, which is spread over a beam in such a way that each unit length is loaded to the same extent.

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### Question - 84:

Tell me what is the alloy of tin and lead?

#### Ans:

A tin and lead alloy is commonly called solder. Usually solder is a wire with a rosin core used for soldering. The rosin core acts as a flux.

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### Question - 85:



Tell me the second law of thermodynamics?

**Ans:**

The entropy of the universe increases over time and moves towards a maximum value.

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**Question - 86:**

Tell me if you are provided a bottle then how will you increase its strength?

**Ans:**

The strength depends on design, material and thickness of the part. So in order to increase strength of the bottle one can provide the ribs and make the bottom of the bottle concave shaped. You can also increase its strength by using a stronger material and increasing its thickness.

[View All Answers](#)

**Question - 87:**

Tell me what is GD&T and Who introduced the concept of GD&T?

**Ans:**

GD&T is Geometric Dimensioning and Tolerancing .Its a language through which Design Engineers communicate.Stanley Parker introduced the concept of Geometric Dimensioning and Tolerancing (GD&T) in 1930's and he was from Scotland.

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**Question - 88:**

Tell me what is the percentage of carbon present in pig iron?

**Ans:**

Carbon content is generally 3.5-4.5%.

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**Question - 89:**

Tell me why re-heater is used in gas turbine?

**Ans:**

The advantage of reheater is that it significantly increases the thrust; which is a prime reason for its use in gas turbines.

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**Question - 90:**

Tell me the difference between projectile motion and rocket motion?

**Ans:**

The major difference is that a projectile has no motor or a rocket on it, due to which the momentum is given to it as it is launched. A pen thrown across a room is a classic example of a projectile motion. On the other hand, a rocket or missile has a motor on it which helps in accelerating while moving. This helps in resisting other forces such as gravity. A projectile does not have any specific shape, it is a point mass, whereas rocket has a particular shape having its center of gravity situated at a particular point on its body. Thus rocket motion comes under kinetics and projectile comes under kinematics.

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**Question - 91:**

Tell me what does a pump develop?

**Ans:**

Pump is a device that is used to transfer fluid from one place to another place which means it develops flow not pressure.

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**Question - 92:**

Tell me what is Hess law?

**Ans:**

According to the Hess law the energy transfer is simply independent of the way being followed. If the reactant and the product of the whole process are the same then same amount of energy will be dissipated or absorbed.

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**Question - 93:**

Tell me what is mechanism?

**Ans:**

A mechanism is an assembly of different parts which perform a complete motion and is often part of a machine.

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