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Chapter 1 : Mechanical Engineer interview questions and answers - Interview Penguin

Mechanical Engineering interview questions and answers for freshers and experienced - List of Mechanical Engineering questions with answers that might be asked during an interview.

Some of the points that must be kept in mind during the process of cast designing are as follows: For variations it must be done gradually. What are the points that should be kept in mind during forging design? Some of the points that should be followed while forging design are: Describe briefly the different cold drawing processes. Some of the important cold drawing processes are as follows: In the case of bar drawing the hot drawn bars are at first pickled, washed and coated to prevent oxidation. Once this is done a draw bench is used for the process of cold drawing. In order to make an end possible to enter a drawing die the diameter of the rod is reduced by the swaging operation. This end is fastened by chains to the draw bench and the end is gripped by the jaws of the carriage. In this method a high surface finish and accuracy dimensionally is obtained. The products of this process can be used directly without any further machining. Similar to the above process the bars are first pickled, washed and coated to prevent any oxidation. After this the rods are passed through several dies of decreasing diameter to provide a desired reduction in the size diameter. The dies used for the reduction process is generally made up of carbide materials. This type of drawing is very similar to the bar drawing process and in majority of cases it is accomplished by the use of a draw bench. What are the different theories of failure under static load, explain briefly? The main theories of failure of a member subjected to bi-axial stress are as follows: This theory states that failure occurs at a point in member where the maximum principal or normal stress in a bi-axial system reaches the maximum strength in a simple tension test. This theory states that failure occurs when the biaxial stress reaches a value equal to the shear stress at yield point in a simple tension test. This theory states that failure occurs when bi-axial stress reaches the limiting value of strain. This theory states that failure occurs when strain energy per unit volume of the stress system reaches the limiting strain energy point. This theory states that failure occurs when strain energy per unit volume reaches the limiting distortion energy.

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Chapter 2 : TOP MECHANICAL ENGINEERING Interview Questions and Answers

Mechanical Engineer Interview Questions 7 Mechanical Engineer Interview Questions and Answers Whether you are preparing to interview a candidate or applying for a job, review our list of top Mechanical Engineer interview questions and answers.

What is the difference between isotropic and anisotropic materials? If a material exhibits same mechanical properties regardless of loading direction, it is isotropic, e. Materials lacking this property are anisotropic. What are orthotropic materials? It is a special class of anisotropic materials which can be described by giving their properties in three perpendicular directions e. What is view factor? View factor is dependent upon geometry of the two surfaces exchanging radiation. What properties need to be considered for applications calling for following requirements: Explain the effects of alloying chromium and nickel in stainless steel. Addition of nickel and chromium increases the tensile strength and increase in resistance to corrosion takes place. Mention two types of dislocations. Dislocation refers to a break in the continuity of the lattice. In edge dislocation, one plane of atoms gets squeezed out. In screw dislocation the lattice atoms move from their regular ideal positions. What are the principal constituents of brass? Principal constituents of brass are copper and zinc. What is Curie point? Curie point is the temperature at which ferromagnetic materials can no longer be magnetised by outside forces. Specific strength of materials is very high when they are in fibre size but lower when they are in bar form Why? Crystal structure has ordered, repeating arrangement of atoms. Fibres are liable to maintain this and thus have high specific strength. What is the percentage of carbon in cast iron? Which element is added in steel to increase resistance to corrosion? Whether individual components in composite materials retain their characteristics or not? An elastomer is a polymer when its percentage elongation rate is? Why is it that the maximum value which the residual stress can reach is the elastic limit of the material? A stress in excess of elastic limit, with no external force to oppose it, will relieve itself by plastic deformation until it reaches the value of the yield stress. Why fatigue strength decreases as size of a part increases beyond around 10 mm? Perfection of material conditions is possible at lower sizes and as size increases, it is not possible to attain uniform structure of the material. Distinguish between creep and fatigue. Creep is low and progressive deformation of a material with time under a constant stress at high temperature applications. Fatigue is the reduced tendency of material to offer resistance to applied stress under repeated or fluctuating loading condition. While normal carburising and nitriding surface treatments increase fatigue strength, excessive treatment may decrease the fatigue strength. By excessive treatment the high compressive stresses are introduced but these are balanced by high internal tensile stresses of equal value and the subsurface fatigue cracks may develop in the regions of high tensile stress and lead to early fatigue failure. List at least two factors that promote transition from ductile to brittle fracture. Manner of loading, and the rate of loading promote transition from ductile to brittle fracture. A machine member may have ductile failure under static loading but may fail in brittle fashion when the load is fluctuating. Similarly a material may evidence ductile failure under tensile loading at ordinary testing speed but if load is applied at a high velocity then failure may be brittle. Which theories of failure are used for a ductile materials, and b brittle materials? For ductile materials, theories of failure used are maximum shear stress theory, and maximum energy of distortion theory; while for brittle materials, theory of maximum principal stress, and maximum strain are used. What does thermal diffusivity of metals signify. Thermal diffusivity is associated with the speed of propagation of heat into solids during changes in temperature with time. For conduction of heat, the instantaneous rate of heat flow is product of three factors. Area of the section of the heat flow path, perpendicular to the direction of heat flow. Thermal conductivity of material. How convective heat transfer is effected and on what factors it depends? Convective heat transfer is effected between a solid and fluid by a combination of molecular conduction within the fluid in combination with energy transport resulting from the motion of fluid particles. It depends on boundary layer configuration, fluid properties and temperature

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difference. Which is the common element between brass and bronze? What does following alloy designation indicate FG ? Grey cast iron with tensile strength of MPa. How is ceramic defined? It is a solid formed by combination of metallic and non-metallic elements. What is the name of solid solution of carbon in alpha iron and delta iron? Ferrite and austenite respectively. Explain the difference between pearlite and cementite? Pearlite is eutectoid mixture of ferrite and cementite. Cementite is chemical compound of iron and carbon. Give one example each of the following proportion of materials dimensional, physical, technological and mechanical. Roughness, enthalpy, toughness, and hardness respectively. For which parts the Wahl factor and Lewis form factor used? For springs and gears respectively. How oxygen can be removed from steel during melting? What are fully killed steels? Oxygen can be removed by adding elements such as manganese, silicon or aluminium which, because of their high affinity for oxygen, react with it to form non-metallic oxides which rise into the slag. Hydrogen cannot be removed easily from molten steel. What harm hydrogen has on property of steel? Excessive hydrogen results in the formation of small fissures often described as hairline cracks or flakes in the steel. Large forgings in alloy steel are particularly sensitive to this phenomenon. In what forms of cubic pattern, iron exists? Some elements exist in more than one crystalline form. Iron exists in two forms of cubic pattern, namely body centered cubic bcc and face-centered cubic fee. What is the difference between alpha iron, delta iron and gamma iron? Metals, in general are of low strength and do not possess required physio-chemical and technological properties for a definite purpose. Alloys are therefore more than metals alone. Discuss the arrangement of atoms and structures of alloys. Alloys are produced by melting or sintering two or more metals, or metals and a non-metal, together. Alloys possess typical properties inherent in the metallic state. The chemical elements that make up an alloy are called its components. An alloy can consist of two or more components. The phase and structures of alloys describe the constitution, transformations and properties of metals and alloys. A combination of phases in a state of equilibrium is called a system. A phase is a homogeneous portion of a system having the same composition and the same state of aggregation throughout its volume, and separated from the other portions of the system by interfaces. For instance, a homogeneous pure metal or alloy is a single-phase system. A state in which a liquid alloy or metal coexists with its crystals is a two-phase system. Structure refers to the shape, size or the mutual arrangement of the corresponding phases in metals or alloys. The structural components of an alloy are its individual portions, each having a single structure with its characteristic features. What is the difference between isotropic material and homogeneous material? In homogeneous material the composition is same throughout and in isotropic material the elastic constants are same in all directions. Explain the difference between the points of inflexion and contraflexure. At points of inflexion in a loaded beam the bending moment is zero and at points of contraflexure in loaded beam the bending moment changes sign from increasing to decreasing. What is the difference between proof resilience and modulus of resilience? Proof resilience is the maximum strain energy that can be stored in a material without permanent deformation. Modulus of resilience is the maximum strain energy stored in a material per unit volume. What is the difference between column and strut? Both column and strut carry compressive load. Column is always vertical but strut as member of structure could carry axial compressive load in any direction. Explain the difference between ferrite, austenite and graphite? Ferrite is the solid solution of carbon and other constituents in alpha-iron.

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Chapter 3 : Mechanical Interview Questions updated on Nov

Mechanical Engineering Interview Questions 4 avg. rating (80% score) - 13 votes Do you have a bachelor's degree in mechanical engineering?

What is the difference between scavenging and supercharging? Scavenging is process of flushing out burnt gases from engine cylinder by introducing fresh air in the cylinder before exhaust stroke ends. Supercharging is the process of supplying higher mass of air by compressing the atmospheric air. What are the names given to constant temperature, constant pressure, constant volume, constant internal energy, constant enthalpy, and constant entropy processes. Isothermal, isochoric, isobaric, free expansion, throttling and adiabatic processes respectively. In a Rankine cycle if maximum steam pressure is increased keeping steam temperature and condenser pressure same, what will happen to dryness fraction of steam after expansion? Why entropy change for a reversible adiabatic process is zero? Because there is no heat transfer in this process. What are two essential conditions of perfect gas? It satisfies equation of state and its specific heats are constant. Enthalpy and entropy are functions of one single parameter. Why rate of condensation is higher on a polished surface compared to rusty surface? Polished surface promotes drop wise condensation and does not wet the surface. How much resistance is offered to heat flow by drop wise condensation? What is the relationship between COP of heating and cooling? How much is the work done in isochoric process? When maximum discharge is obtained in nozzle? At the critical pressure ratio. Under what condition the work done in reciprocating compressor will be least? It is least when compression process approaches isothermal. For this purpose, attempts are made to cool the air during compression. What is the difference between stalling and surging in rotary compressions? Stalling is a local phenomenon and it occurs when flow breaks away from the blades. Surging causes complete breakdown of flow and as such it affects the whole machine. Why the electric motor of a fan with backward curved blades is never got overloaded under any condition? For higher flow, power consumption gets lower. Why the work per kg of air flow in axial flow compressor is less compared to centrifugal compressor for same pressure ratio? Isentropic efficiency of axial flow compressor is higher. What is the name given to portion of thermal energy to be necessarily rejected to environment? How it is caused? Non uniform corrosion over the entire metal surface, but occurring only in small pits is called pitting. It is caused by lack of uniformity in metal. What is caustic embrittlement? It is the actual physical change in metal that makes it extremely brittle and filled with minute cracks. It occurs particularly in the seams of rivetted joints and around the rivet holes. Which impurities form hard scale and which impurities soft scale? Sulphates and chlorides of lime and magnesium form hard scale, and carbonates of lime and magnesium form soft scale. What is the difference between hard water and soft water? Hard water contains excess of scale forming impurities and soft water contains very little or no scale forming substances. Acid and oxygen in feed water lead to corrosion. What should be done to prevent a safety valve to stick to its seat? Safety valve should be blown off periodically so that no corrosion can take place on valve and valve seat. Why large boilers are water tube type? Water tube boilers raise steam fast because of large heat transfer area and positive water circulation. Thus they respond faster to fluctuations in demand. Further single tube failure does not lead to catastrophe. What type of boiler does not need a steam drum? Why manholes in vessels are usually elliptical in shape? Elliptical shape has minimum area of opening and thus plate is weakened the least. Further it is very convenient to insert and take out the cover plate from elliptical opening. Low water in boiler drum is unsafe because it may result in overheating of water tubes in furnace. Why it is unsafe to have high water condition in boiler drum? High drum level does not allow steam separation to be effective and some water can be carried over with steam which is not desirable for steam turbine. Why boiler is purged everytime before starting firing of fuel? Purging ensures that any unburnt fuel in furnace is removed, otherwise it may lead to explosion. What is the principle of mechanical refrigeration? A volatile liquid will boil under the proper conditions and in so doing will absorb heat from surrounding objects. Why high latent heat of vaporisation is desirable in a

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refrigerant? A high latent heat of vaporisation of refrigerant results in small amount of refrigerant and thus lesser circulation system of refrigerant for same tonnage. What is the critical temperature of a refrigerant? Critical temperature is the maximum temperature of a refrigerant at which it can be condensed into liquid and beyond this it remains gas irrespective of pressure applied. High temperature in I. Why efficiency of gas turbines is lower compared to I. Further combustion temperature of I. What do you understand by timed cylinder lubrication? For effective lubrication, lub oil needs to be injected between two piston rings when piston is at bottom of stroke so that piston rides in oil during upward movement. This way lot of lub oil can be saved and used properly. HUCR is highest useful compression ratio at which the fuel can be used in a specific test engine, under specified operating conditions, without knocking. In some engines glycerine is used in place of water for cooling of engine. Thus weight of coolant gets reduced and smaller radiator can be used. Why consumption of lubricating oil is more in two-stroke cycle petrol engine than four-stroke cycle petrol engine? In two-stroke engine lub oil is mixed with petrol and thus some lub oil is blown out through the exhaust valves by scavenging and charging air. There is no such wastage in four stroke petrol engine. As compression ratio increases, thermal η increases. How is thermal η affected by weak and rich mixture strength? Thermal η is high for weak mixture and it decreases as mixture strength becomes rich. How engine design needs to be changed to burn lean mixture? Horse power of I. To which countries these standards belong? What is the use of flash chamber in a vapour compression refrigeration cycle to improve the COP of refrigeration cycle? When liquid refrigerant as obtained from condenser is throttled, there are some vapours. These vapours if carried through the evaporator will not contribute to refrigerating effect. Using a flash chamber at some intermediate pressure, the flash vapour at this pressure can be bled off and fed back to the compression process. The throttling process is then carried out in stages. Similarly compression process is also done in two separate compressor stages. Why pistons are usually dished at top? What is the function of thermostat in cooling system of an engine? Thermostat ensures optimum cooling because excessive cooling decreases the overall efficiency. It allows cooling water to go to radiator beyond a predetermined temperature. What are the causes of failure of boiler tubes? Boiler tubes, usually are made from carbon steel and are subject to a high rates of heat transfer, b. Failure may occur due to following reasons: High thermal ratings may lead to rapid failure if the internal fluid flow is reduced for any reason. The resultant overheating leads to a failure by creep, characterised by the bulging of the tube with the eventual development of a longitudinal split. Fatigue cracking due to bending stresses occur. Failure may arise due to overstressing of a reduced section of metal. Sudden failure of the boiler tube due to corrosion arises from embrittlement of the carbon steel due to interaction between atomic hydrogen from the corrosion process and the iron carbide present in the steel. Defects in tube manufacture, although far from being a regular occurrence, can be a cause of serious trouble. Lamination in boiler tubes or score marks arising from the cold drawing of tubes, give rise to premature failure and may promote corrosion at these regions.

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Chapter 4 : + TOP MECHANICAL Engineering Interview Questions & Answers Pdf

3. *Technical questions - assessing your knowledge of the field. Mechanical engineering is a technical field, and the interviewers will ask you at least some technical questions.*

Interview Questions with Answers 1. If the pump casing becomes filled with vapors or gases, the pump impeller becomes gas-bound and incapable of pumping. What is octane number in fuel? What is added in LPG to detect leakage? Application- Hydraulic jacks, Car lifts, Fork Lifts 6. Can you transfer the heat energy from cold body to hot body? What is hogging and sagging? Hogging describes a beam which curves upwards in the middle, and sagging describes a beam which curves downwards. Difference between single acting and double acting pump? The flow is continuous in double acting and in single acting the flow is not continuous unless there is a surge vessel. What is conduction, convection and radiation? Mention flow measuring devices? Classify Carbon Steels on basis of carbon content? Low-carbon steels contain up to 0. The largest category of this class of steel is flat-rolled products sheet or strip, usually in the cold-rolled and annealed condition. The carbon content for these high-formability steels is very low, less than 0. Typical uses are in automobile body panels, tin plate, and wire products. For rolled steel structural plates and sections, the carbon content may be increased to approximately 0. These materials may be used for stampings, forgings, seamless tubes, and boiler plate. Medium-carbon steels are similar to low-carbon steels except that the carbon ranges from 0. Increasing the carbon content to approximately 0. The uses of medium carbon-manganese steels include shafts, axles, gears, crankshafts, couplings and forgings. Steels in the 0. High-carbon steels contain from 0. High-carbon steels are used for spring materials and high-strength wires. Ultrahigh-carbon steels are experimental alloys containing 1. These steels are thermomechanically processed to produce microstructures that consist of ultrafine, equiaxed grains of spherical, discontinuous proeutectoid carbide particles. Draw a possible isometric view for the object that has the following plan and elevation views?

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Chapter 5 : 70 Important Mechanical Engineering Interview Questions and Answers - Engineer Feed

Top 50 + Mechanical Engineering Interview Questions and answers for freshers on design, safety and maintenance. 1) What safety precautions should be observed while working in the workshop? 1) Keep shop floor clean, free from oil and other slippery materials. 2) Wear proper dress and avoid loose.

Answer â€” 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. What is ductile-brittle transition temperature? Answer â€” 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. Which theories of failure are used for ductile materials and B brittle materials? Answer â€” For ductile materials, theories of failure used are maximum shear stress theory, and maximum energy of distortion theory; while for brittle materials, the theory of maximum principal stress, and maximum strain are used. What does thermal diffusivity of metals signify? Answer â€” Thermal diffusivity is associated with the speed of propagation of heat into solids during changes in temperature with time. Answer â€” Enthalpy is the heat content of a chemical system. What is a positive displacement pump? Answer â€” 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. Which parameter remains constant in a throttling process? Answer â€” Enthalpy Q8. Which reactor produces more fissionable material than it consumes? Answer â€” Breeder reactor. Which reactor uses natural uranium as fuel? Answer â€” Gas-cooled reactor. Which reactor uses heavy water as a moderator? Which reactor requires no moderator? Answer â€” Magnetic iron rock Q What is the difference between projectile motion and a rocket motion? An example of a projectile would be a pen that you throw across a room. Answer â€” 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. What is a converter reactor? Answer â€” A reactor plant which is designed to produce more fuel than it consumes. The breeding is obtained by converting fertile material to fissile material. Explain nuclear reactor in brief. Answer â€” A plant which initiates, sustains, controls and maintains nuclear fission chain reaction and provides shielding against radioactive radiation is the nuclear reactor. What is gear ratio? Answer â€” It is the ratio of the number of revolutions of the pinion gear to one revolution of the idler gear. Which heating value is indicated by a calorimeter and why? Answer â€” Gross heating value because steam is condensed and heat of vapour formed is recovered. What is fuel ratio? Answer â€” On ultimate analysis. Which element causes a difference in higher and lower heating values of fuel? What is a uniformly distributed load? Answer â€” 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. How is martensite structure formed in steel? Answer â€” Martensite transformation begins when austenite is cooled below a certain critical temperature, called the martensite start temperature. As we go below the martensite start temperature, more and more martensite forms and complete transformation occurs only at a temperature called martensite finish temperature. Formation of martensite requires that the austenite phase must be cooled rapidly. Which two elements have the same percentage in the proximate and ultimate analysis of coal? Answer â€” Moisture and ash. What is an orthographic drawing? Answer â€” 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

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angle projection and 3rd angle projection. Which reactor has no moderator? Fast breeder reactor Answer â€” Fast breeder reactor Q What is representative elementary volume? Answer â€” Smallest volume over which measurements can be made that will yield a representative of the whole. Ultimate analysis of coal is elementary analysis. What is it concerned with? Answer â€” Carbon, hydrogen, nitrogen, and sulphur in coal on a weight percentage basis. Why are LNG pipes curved? Quantities like pressure, temperature, density, viscosity, etc. What are these called? Answer â€” Intensive properties. What does angular momentum mean? Momentum is the velocity of an object times its mass, or how fast something is moving how much it weighs. What is the effect of inter cooling in gas turbines? Answer â€” It decreases thermal efficiency but increases net output Q Can you use motor oil in a hydraulic system? Answer â€” Hydraulic fluid has to pass a different set of standards than motor oil. Motor oil has tackifiers, lower sulfur content, and other ingredients that could prove harmful to the seals and other components in a hydraulic system. If it is an emergency only should do it. What is the effect of friction on the flow of steam through a nozzle? Answer â€” To decrease both mass flow rate and wetness of steam Q What causes white smoke in two-stroke locomotive engines? Answer â€” That is the engine running too lean lack of fuel. This condition will lead to overheating and failure of the engine. Out of electric heater and heat pump, which is economical in operation? Answer â€” Heat pump. What is the role of nitrogen in welding? Answer â€” 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 gasses are also used for this purpose such as Argon, Helium, Carbon Dioxide, and the gasses are given off when the flux burns away during SMAW stick welding. Which furnace burns low-ash fusion coal and retains most of the coal ash in the slag? Answer â€” Cyclone furnace. What does Greenfield project mean? Answer â€” Greenfield 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. Why is boiler purged every time before starting firing of fuel? Answer â€” Purging ensures that any unburnt fuel in furnace is removed, otherwise it may lead to explosion Is it the stress that, produces strain or strain produces stress? Answer â€” A Force applied to an object will cause a displacement. The 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. What is the principle of mechanical refrigeration? Answer â€” A volatile liquid will boil under the proper conditions and in so doing will absorb heat from surrounding objects.

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Chapter 6 : Mechanical Engineering Interview Questions and Answers - Engineering Hint

Mechanical Engineering questions and answers with explanation for interview, competitive examination and entrance test. Fully solved examples with detailed answer description, explanation are given and it would be easy to understand.

How Does Hydraulics Work? A positive displacement pump gear, vane, or piston pump is driven by a prime mover Electrical Motor or Engine it sucks fluid from reservoir and delivers oil to system. 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. That is the engine running too lean lack of fuel. This condition will lead to overheating and failure of the engine. Both the hydraulic and engine oils are made from base oils with additives mixed in. The additives used change the characteristics of the oils so that they function differently. Generally, hydraulic oils final product including additives are expected to have very low compressibility and very predictable friction and viscosity stability under pressure. Generally engine oils Engine Lubrication Oils anyway are intended to have high resistance to heat degradation including chemical and viscosity due to heat resistance to burning and resistance to absorption of fuels and chemical compounds produced during combustion. Both classes of oils are likely to have additives intended to provide detergency and to reduce foaming. Base oils are most commonly petroleum oil bases due to cost, but other bases oil can be used including mineral oils especially for hydraulic oils and plant oils especially for engine oils and oils from animal sources. Hydraulic fluid has to pass a different set of standards than motor oil. Motor oil has tackifiers, lower sulfur content, and other ingredients that could prove harmful to the seals and other components in a hydraulic system. If it is an emergency only should you do it. 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. The total process of a the refining business starts at the oil field or gas field and runs all the way to the sending of processed hydrocarbon to a final user. Upstream applies to the operation of exploration, drilling, hydrocarbon production, and transmission via truck, rail or ship or pipeline to the refinery intake valve. Downstream includes all work done at the refinery, distillation, cracking, reforming, blending storage, mixing and shipping. The case of heavy oil processing oil sands etc. Most are regarded as upstream operations even though downstream type operations are part of the processes. The production of chemical side products at gas plants e. Additional hydrocarbon production operations such as saddle plants, which remove a component from pipeline gas, are generally lumped with upstream. Rolling offsets are used in the piping and sheet metal ductwork trades, a rolling offset changes the elevation and locaton of the piping or duct usually by using two fittings to offset around obstacles. Rolling offsets are used mostly when you are limited to the size of the fittings in order to change your elevation and location. Thickest paper has the greatest mass and therefore potential energy. Potential energy equals kinetic energy speed. Lift equals a greater flight distance. Thicker planes fly farther. Two pans of equal balances are placed at the end of the beam, one at each end. A long pointer attached at right angles to the beam at the point of support. Zero on a scale indicates the beam is at rest. Galvanic corrosion is an electrochemical process in which one metal corrodes preferentially when in electrical contact with a different type of metal and both metals are immersed in an electrolyte. When two or more different sorts of metal come into contact in the presence of an electrolyte, a galvanic couple is set up as different metals have different electrode potentials. The electrolyte provides a means for ion migration whereby metallic ions can move from the anode to the cathode. This leads to the anodic metal corroding more quickly than it otherwise would; the corrosion of the cathodic metal is retarded even to the point of stopping. The presence of electrolyte and a conducting path between the metals may cause corrosion where otherwise neither metal alone would have corroded. The main feature of corrosion

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of a divalent metal M in an aqueous solution containing oxygen is because of the corrosion process consists of an anodic and a cathodic reaction. The cathodic reaction in the example is reduction of oxygen. It is seen that the process makes an electrical circuit without any accumulation of charges. The electrons released by the anodic reaction are conducted through the metal to the cathodic area where they are consumed in the cathodic reaction. A necessary condition for such a corrosion process is that the environment is a conducting liquid an electrolyte that is in contact with the metal. The electrical circuit is closed by ion conduction through the electrolyte. In accordance with the conditions, this dissolution process is called wet corrosion, and the mechanism is typically electrochemical. How Do Concrete Pumps Work?

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Chapter 7 : Mechanical Engineering Interview Questions and Answers pdf Book

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Conclusion and next steps Favorable situation on the employment market Luckily for you, right now we experience a deficit of mechanical engineers, and companies literally fight for skilled job candidates. In many cases you will be the only person they interview for the job, or you will compete with one or two other people for the position which is nothing compared to managerial positions, or jobs in banks, when one competes against dozens of other job applicants. Still, even if you are alone, you will have to convince us of your readiness for the job, of the right attitude to work and to other people, and of knowledge of mechanical engineering. Personal questions “ first stage of an interview Can you tell me something about yourself? Speak about your experience, background, and your passion for mechanical engineering. You can even talk a bit about your education, and how it prepared you for this role. Mention briefly one or two hobbies from your personal life”this helps to break the ice, and to create a friendlier atmosphere in the room. Why do you want to become a mechanical engineer? Focus on your motivation, passion for this job, and also confidence in your designing and engineering skills. Do not talk about money. Obviously, mechanical engineers earn a lot, and they deserve it. But you should not point out a great salary as a reason for your job choice. What are your career goals? You should simply say that you would like to work as a mechanical engineer and develop your experience in the field, specializing in a certain area of engineering. Tell us something about your education. What subjects did you enjoy the most, and the least? How have your studies prepared you for the work of an engineer? Behavioral questions “ testing your attitudes and motivation What do you consider your biggest achievement? Speak about something unique, not something everyone else has done. Try to talk about designing a machine, or about some interesting improvements you made to a certain design. If you managed to overcome a difficult period in your life”for example a life-threatening illness, you can point it out as well. Describe a situation when you failed to accomplish a task in your job, or a goal. Try to be honest, show us that you are aware of your mistakes and failures. The different between great and average employees is that great people will learn from their mistakes, and will move on quickly, ready for the next challenge, not affected by their recent setbacks. Describe a situation when you were under pressure in work. Tight deadlines, goals that are difficult to meet, and a boss who expect too much from us”all of that can result in a pressure on a workplace. Narrate a situation when you experienced pressure, a situation that had a happy ending. That means a situation when you eventually overcame the pressure, and it did not affect you negatively in your job. Some people crack under pressure. Other work harder, and better. Tell me about a situation when you used your mechanical engineering skills outside of your work. Describe a conflict you had with your boss, or with one of your colleagues. Describe a time you struggled to explain a technical issue to someone without technical background. Behavioral questions represent the trickiest part of this interview. Obviously it is not easy to talk about some situations, such as facing pressure or reaching a goal, especially when you apply for your first ever job. If you find these questions difficult, consider having a look at our Interview Success Package “ it offers multiple great answers to all difficult behavioral questions, including answers for people who apply for their very first job. Knowing these answers will make your life much easier in the interview. Technical questions “ assessing your knowledge of the field Mechanical engineering is a technical field, and the interviewers will ask you at least some technical questions. Their difficulty will depend on the person who leads an interview with you, and their own knowledge of mechanical engineering. It will also depend on the number of people you compete with for the job. To some technical questions belong: What are the different types of fits we use in the United States? What computer programs do you use in your work? What materials would you recommend for shafts manufacturing? Can you describe different types of springs and tell us when we use each type? What is an advantage of hydraulic brake when compared to mechanical break and electric

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brake? What type of bearings do you prefer and why? Can you explain the advantages of Cycloidal and Involute gears? Have you ever worked with a torque? Why we call diesel engine high torque, and petrol engine high speed? Are you able to name the advantages of projectile motion, when compared to rocket motion? Your project is to make a new car. How would you progress from the scratch? Conclusion and next steps

Technical questions can differ a lot from one interview to another, and they depend on the things the company designs. Behavioral and personal questions will be similar every time you interview for a job of a mechanical engineer. While you will not face a tough competition in this interview unless you apply for a job with Google, or with General Electric , you still have to show the hiring managers the value you can bring to their company, and demonstrate your engineering skills. If you feel anxiety, or struggle with answers to personal and behavioral interview questions, have a look at the Interview Success Package. I have designed it exactly for you, to help you relax, and pass the interview with flying colors. Brilliant answers to all tough interview questions, and a guide on how to impress the hiring managers. Made the most out of your golden opportunity in an interview. Who knows when you will get another chance? Thank you for reading, we wish you good luck.

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Chapter 8 : Mechanical Engineering Interview Questions and answers

Mechanical Engineering Interview Questions. After completion the written exam, the recruiters conduct the Interview round. Candidates, who effectively reach final stage and don't want to lose this opportunity, can start their preparation for interview round by the help of Best Mechanical Engineering Interview Questions & Answers given below.

When maximum discharge is obtained in nozzle? At the critical pressure ratio Question Under what condition the work done in reciprocating compressor will be least? It is least when compression process approaches isothermal. For this purpose, attempts are made to cool the air during compression. What is the difference between stalling and surging in rotary compressions? Stalling is a local phenomenon and it occurs when How breaks away from the blades. Surging causes complete breakdown of flow and as such it affects the whole machine. Why the electric motor of a fan with backward curved blades is never got overloaded under any condition? For higher flow, power consumption gets lower. Why the work per kg of air flow in axial flow compressor is less compared to centrifugal compressor for same pressure ratio? Isentropic efficiency of axial flow compressor is higher. What is the name given to portion of thermal energy to be necessarily rejected to environment? How it is caused? Non uniform corrosion over the entire metal surface, but occurring only in small pits is called pitting. It is caused by lack of uniformity in metal. What is caustic embrittlement? It is the actual physical change in metal that makes it extremely brittle and filled with minute cracks. It occurs particularly in the seams of rivetted joints and around the rivet holes. Which impurities form hard scale and which impurities soft scale? Sulphates and chlorides of lime and magnesium form hard scale, and carbonates of lime and magnesium form soft scale. What is the difference between hard water and soft water? Hard water contains excess of scale forming impurities and soft water contains very little or no scale forming substances. Acid and oxygen in feed water lead to corrosion. What should be done to prevent a safety valve to stick to its seat? Safety valve should be blown off periodically so that no corrosion can take place on valve and valve seat. Why large boilers are water tube type? Water tube boilers raise steam fast because of large heat transfer area and positive water circulation. Thus they respond faster to fluctuations in demand. Further single tube failure does not lead to catastrophe. What type of boiler does not need a steam drum? Why manholes in vessels are usually elliptical in shape? Elliptical shape has minimum area of opening and thus plate is weakened the least. Further it is very convenient to insert and take out the cover plate from elliptical opening. Low water in boiler drum is unsafe because it may result in overheating of water tubes in furnace. Why it is unsafe to have high water condition in boiler drum? High drum level does not allow steam separation to be effective and some water can be carried over with steam which is not desirable for steam turbine. Why boiler is purged everytime before starting firing of fuel? Purging ensures that any unburnt fuel in furnace is removed, otherwise it may lead to explosion. What is the principle of mechanical refrigeration? A volatile liquid will boil under the proper conditions and in so doing will absorb heat from surrounding objects. Why high latent heat of vaporisation is desirable in a refrigerant? A high latent heat of vaporisation of refrigerant results in small amount of refrigerant and thus lesser circulation system of refrigerant for same tonnage. What is the critical temperature of a refrigerant? Critical temperature is the maximum temperature of a refrigerant at which it can be condensed into liquid and beyond this it remains gas irrespective of pressure applied. Explain the second law of thermodynamics. The entropy of the universe increases over time and moves towards a maximum value. What kinds of pipes are used for steam lines? 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. What is the difference between shear center flexural center of twist and elastic center? 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. Magnetic

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iron rock Question What is the difference between projectile motion and a rocket motion? An example of a projectile would be pen that you throw across a room. Get Answer of It: What is a cotter joint? 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. What is the alloy of tin and lead? 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. FOF stands for Face of Flange. A flange has either of the two types of faces: Raised face Flat face The F. 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. 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. What is gear ratio? It is the ratio of the number of revolutions of the pinion gear to one revolution of the idler gear. 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 if the material. What is ductile-brittle transition temperature? 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. You May Read This: What is a uniformly distributed load? 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. What are the differences between pneumatics and hydraulics? Pneumatics use air, Hydraulics use Oil Power: Pneumatic power less than hydraulic power Size: P components are smaller than H components Leakage: Leaks in hydraulics cause fluid to be sticking around the components. In pneumatics, air is leaked into the atmosphere. Pneumatics obtain power from an air compressor while hydraulics require a pump Air is compressible, hydraulic oil is not Question Enthalpy is the heat content of a chemical system. What is a positive displacement pump? 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.

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Chapter 9 : Mechanical Engineering interview questions and answers - part 2

While preparing for a mechanical engineer interview, it's important to study core concepts in your field, your work history, and your history with mechanical engineering. Be ready to answer technical questions as well as questions about how you operate in the workplace.

WhatsApp For the placement in the top mechanical engineering companies , it is very necessary to learn and practice for the most important mechanical engineering interview questions and answers. During the interview , the HR team can ask you the mechanical engineering technical questions to examine your knowledge about your subject and field. If you planning to appear in the job interview, these frequently asked mechanical engineering questions and answers will help you. These mechanical engineering interview questions and answers are meant for the purpose of a job interview and getting an idea of interview question. These are common to almost every mechanical engineering job interview. What is Mechanical Engineering? It is the branch of engineering that involves the design, production, and operation of machinery. It is one of the oldest and broadest of the engineering disciplines. The mechanical engineering field requires an understanding of core areas including mechanics, kinematics, thermodynamics, materials science, structural analysis, and electricity. Mechanical engineers use these core principles along with tools like computer-aided design, and product lifecycle management to design and analyze manufacturing plants, industrial equipment and machinery, heating and cooling systems, transport systems, aircraft, watercraft, robotics, medical devices, weapons, and others. What are Sub-disciplines of Mechanical Engineering? This increases the hardness and strength if the material. What is ductile-brittle transition temperature? Below this temperature, the material loses its ductility. It is also called Nil Ductility Temperature. Which theories of failure are used for a ductile materials and B brittle materials? What does thermal diffusivity of metals signify? What is a positive displacement pump? 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. Which parameter remains constant in a throttling process? Which reactor produces more fissionable material than it consumes? Which reactor uses natural uranium as fuel? Which reactor uses heavy water as a moderator? Which reactor requires no moderator? What is the difference between projectile motion and a rocket motion? An example of a projectile would be a pen that you throw across a room. 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. What is a converter reactor? The breeding is obtained by converting fertile material to fissile material. Explain nuclear reactor in brief. What is gear ratio? Which heating value is indicated by a calorimeter and why? What is fuel ratio? Which element causes a difference in higher and lower heating values of fuel? What is a uniformly distributed load? How is martensite structure formed in steel? As we go below the martensite start temperature, more and more martensite forms and complete transformation occurs only at a temperature called martensite finish temperature. Formation of martensite requires that the austenite phase must be cooled rapidly. Which two elements have the same percentage in the proximate and ultimate analysis of coal? What is an orthographic drawing? 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 consisting 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. Which reactor has no moderator? What is representative elementary volume? Ultimate analysis of coal is elementary analysis. What is it concerned with? Why are LNG pipes curved? Quantities like pressure, temperature, density, viscosity, etc. What are these called? What does angular momentum mean? Momentum is the velocity of an object times it is mass, or how fast something is moving how much it weigh. What is the

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effect of inter cooling in gas turbines? Can you use motor oil in a hydraulic system? Motor oil has tackifiers, lower sulphur content, and other ingredients that could prove harmful to the seals and other components in a hydraulic system. If it is an emergency only should do it. What is the effect of friction on the flow of steam through a nozzle? What causes white smoke in two-stroke locomotive engines? This condition will lead to overheating and failure of the engine. Out of electric heater and heat pump, which is economical in operation? What is the role of nitrogen in welding? Other gasses are also used for this purpose such as Argon, Helium, Carbon Dioxide, and the gasses are given off when the flux burns away during SMAW stick welding. Which furnace burns low-ash fusion coal and retains most of the coal ash in the slag? What does Greenfield project mean? These projects are usually of big magnitude. Why is boiler purged every time before starting firing of fuel? Is it the stress that, produces strain or strain produces stress? The 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. What is the principle of mechanical refrigeration? How does iron ore turn into steel? A percentage of Carbon and other trace elements are added back to make steel. Knurling is a machining process normally carried on a centre lathe. The act of Knurling creates a raised crisscross pattern on a smooth round bar that could be used as a handle or something that requires extra grip. What type of boiler does not need a steam drum? What is the mechanical advantage of a double pulley? Why are large boilers water tube type? Thus they respond faster to fluctuations in demand. Further single tube failure does not lead to catastrophe. What is extruded aluminium? Extruded Aluminum is a common form of making small aluminium wire, bars or beams and many varieties of small non-structural, decorative pieces. What is the difference between hard water and soft water? What is a Newtonian fluid? The fluid properties of a Newtonian fluid do not change when any force acts upon it. What is caustic embrittlement? It occurs particularly in the seams of riveted joints and around the rivet holes. What are the points in the stress-strain curve for steel? When is maximum discharge obtained in nozzle? How much is the work done in an isochoric process? A flange has either of the two types of faces: 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. What is the mechanism? Thermodynamics helps study all the systems of mechanical engineering. There are three laws of thermodynamics.