

Top 75+ Mechanical Engineering Interview Questions and Answers

1. What is a heat exchanger? Give some real life applications of heat exchangers?

Answer: Heat exchanger is a system used to transfer heat between two or more fluids. They are commonly used in heating and cooling process. Real life applications of heat exchangers are Refrigerator, AC and Aircraft engines.

2. What are the basic components of refrigeration system?

Answer:

1. Evaporator
2. Compressor
3. Condenser
4. Capillary Tube
5. Air Intake & Outgo valves.

3. What is a manometer? Give one real life example of manometer?

Answer: Manometer is a device used to measure pressure. Classic example of a manometer is sphygmomanometer, which is used in hospitals to measure blood pressure.

4. What are the 3 type of stresses?

Answer:

1. Tensile stress
2. Compressive stress
3. Shear stress.

5. What is mean by triple point in Thermodynamics?

Answer: Triple point of a substance is the temperature and pressure at which the solid, liquid, and vapor phases of a substance can coexist in equilibrium.

6. What are the methods or mode of heat transfer?

Answer:

1. Conduction
2. Convection
3. Radiation.

7. What is resilience?

Answer: The total energy stored in a body is commonly known as resilience.

8. What is meant by Hooke's law and elastic modulus?

Answer: Hooke's law states that when a material is loaded within elastic limit, the stress is proportional to the strain produced by the stress. It means the ratio of these to the corresponding strain is a constant within the elastic limit. This constant is known as Elastic Modulus.

9. What is mean by thermal stress?

Answer: Thermal stresses are the stresses induced in a body due to change in temperature.

10. What is meant by stress?

Answer: The resistance per unit area, offered by a body against deformation is known as

stress. The stress is given by $\sigma = P/A$ where P = External force and A = Cross-sectional area.

11. What is mean by strain?

Answer: The ratio of change of dimension of the body to the original dimension is known as strain.

Interview Questions Based on Engineering Physics

12. What is simple harmonic motion?

Answer: Any motion which repeats itself at regular intervals according to a sinusoidal law is called as harmonic motion.

13. What is mean by oscillation?

Answer: In general, an oscillation is a periodic fluctuation in the value of physical quantity above and below equilibrium value.

14. What is damping in physics?

Answer: The phenomenon of decay in the amplitude of oscillation is known as damping.

15. What are the 4 types of ultrasonic waves?

Answer:

1. Transverse ultrasonic waves or shear waves,
2. Longitudinal or compressional ultrasonic waves
3. Surface or Rayleigh waves, Lamb or plates waves.

16. What is piezoelectric effect?

Answer: If a piezoelectric material is subjected to pressure or squeezing or twisting, the electric charges are developed in the other two faces of the crystal. This phenomenon is called as piezoelectric effect.

17. Give some industrial application of ultrasonic waves?

Answer:

1. Ultrasonic welding which is used to weld parts in aerospace and automobile industry.
2. Ultrasonic waves are used in SONAR (Sound Navigation And Ranging) to navigate, communicate or to detect objects under the surface of water.
3. Ultrasonic waves are used in food industry for sealing milk and juice containers.
4. Ultrasonic waves are using in NDT (Non-destructive testing) for flaw detection of specimens.

Interview Questions Based on Engineering Chemistry

18. What is meant by priming and foaming?

Answer: Formation of wet steam by rapid boiling of the water at the heating surface is called as priming. And the formation of stable bubbles above the surface of water inside the boiler tubes is called as foaming.

19. Define desalination?

Answer: The process of removal of dissolved salts (mostly NaCl) from water is called as desalination or desalting.

20. What is meant by polymerization?

Answer: Polymerization is the change or transition of low molecular weight constituents to

high molecular weight constituents. In simple, it is the process of making polymers from monomers.

21. What is first law of electrolysis or first law of Faraday's electrolysis?

Answer: The amount of a substance deposited or dissolved as a result of passage of an electric current is proportional to the quantity of electricity passed.

22. What is meant by degreasing?

Answer: The process of removing any oil, grease or fatty substances from the surface of any metallic body is called as degreasing.

23. What are the organic solvents used for degreasing process?

Answer: Acetone, Toluene, Xylene, Naphtha, Trichloro ethylene, tetra-chloro ethylene.

Interview Questions Based on Engineering Thermodynamics

24. What is meant by isothermal process?

Answer: The process in which the temperature of the system remains constant is called as isothermal process.

25. Explain zeroth law of thermodynamics?

Answer: The zeroth law of thermodynamics states that if two systems, A and B, are in thermal equilibrium with a third system, C, Then A and B are in thermal equilibrium with each other. In other words, system in same temperature are in thermal equilibrium. If $A=C$ and $B=C$, Then $A=B$.

26. Explain law of conservation of energy?

Answer: Law states that "energy can neither be created nor destroyed, but it can be transformed from one form to another"

27. What is meant by entropy?

Answer: Entropy is the measure of randomness or disorderness of the system.

28. What are thermo plastics?

Answer: Thermoplastics are the materials which melts when heated and hardens when cooled. They retain their plastic properties even after heating. Examples: polyethylene, polystyrene.

Interview Questions Based on Fluid Mechanics

29. What is meant by viscosity?

Answer: Viscosity is defined as the property of a fluid which offers resistance to the movement of one layer of the fluid over another adjacent layer of the fluid.

29. Define buoyancy?

Answer: When a body is immersed in a fluid, an upward force is exerted by the fluid on the body. This upward force is equal to the weight of the fluid displaced by the body and is called as buoyancy.

30. What is meant by notch in fluid mechanics?

Answer: A notch is a device used for measuring the rate of flow of a liquid through a small channel or a tank.

31. What are the five classifications of fluids?

Answer:

1. Ideal fluid
2. Real fluid
3. Newtonian fluid
4. Non-Newtonian fluid
5. Ideal plastic fluid

Ideal fluid: A fluid, which is in-compressible and is having no viscosity is known as an ideal fluid.

Real fluid: A fluid, which possesses viscosity is known as real fluids.

Newtonian fluid: A real fluid, which the shear stress is directly proportional to the rate of shear strain is known as a Newtonian fluid.

Non-newtonian fluid: A real fluid, in which the shear stress is not proportional to the rate of shear strain is known as non-newtonian fluid.

Ideal plastic fluid: A fluid, in which shear stress is more than the yield value and shear stress is proportional to the rate of shear strain is known as ideal plastic fluid.

32. What is meant by capillarity?

Answer: Capillarity is defined as a phenomenon of rise or fall of a liquid surface in a small tube relative to the adjacent general level of liquid when the tube is held vertically in the liquid.

33. Define pascal's law?

Answer: It states that the pressure or intensity of pressure at a point in a static fluid is equal in all directions.

34. What is meant by specific volume of a fluid and how do we find that?

Answer: Specific volume of a fluid is defined as the volume of a fluid occupied by a unit mass or volume per unit mass of a fluid is called as specific volume. Its found by dividing volume of a fluid by its mass. Moreover specific volume is the reciprocal of mass density.

Specific volume = Volume of fluid ÷ Mass of fluid.

35. What is meant specific gravity of a fluid?

Answer: Specific gravity is defined as the ratio of the weight density of a fluid to the weight density of a standard fluid. Standard fluid for fluids is taken as water and air is taken as standard fluid for gases.

36. Define surface tension?

Answer: Surface tension is defined as the tensile force acting on the surface of a liquid in contact with a gas.

37. Which device is used for measuring the rate of flow of fluids through pipes?

Answer: Venturimeter.

38. What is the use of Pitot-Tube?

Answer: It is a device used for measuring the velocity of flow at any point in a pipe or a channel.

Interview Questions Based on Manufacturing Technology

39. What are the major steps involved in manufacturing a product?

Answer:

1. Product design
2. Material selection
3. Process planning
4. Product development
5. Inventory control
6. Quality assurance and marketing.

40. What is the reason behind giving heat treatment to forged parts?

Answer:

1. To relieve internal stresses set up during working and cooling.
2. To normalize the internal structure of the metal.
3. To improve machinability.
4. To improve hardness, strength and other mechanical properties.

41. What are the common industrial methods of repairing and salvaging a defective casting?

Answer: Once we identify the defects of castings, we will adopt repairing methods such as cold welding, hot welding, liquid metal welding, metal spraying depending on the casting. Defects in the casting are repaired with the help of appropriate sealing agents.

42. What you meant by ductility?

Answer: It is the measure of the amount of plastic deformation a material can undergo under tensile forces without fracture and brittleness is the property opposite of ductility.

43. Why do we add alloys into metals in manufacturing process?

Answer: Usually alloys are added to metals when we need additional properties such as strength, ductility, toughness or corrosion resistance. Alloys are also added to improve the abrasion resistance, machinability, electrical and magnetic properties of the metals.

44. What is thermit welding and give some industrial application?

Answer: In thermit welding, two pieces are joined together by the heat provided by a chemical reaction. The heating is provided by a mixture of aluminium and iron oxide. Molten iron which is obtained from the chemical reaction will join the two pieces.

Applications:

1. For joining rail tracks
2. For joining large end to end water pipes
3. For welding propeller shafts etc.

Interview Questions Based on Heat and Mass Transfer

45. What is meant by distillation?

Answer: The method separating components in a liquid mixture by the distribution of substance between a gas and a liquid phase is known as distillation.

46. What is meant by humidification?

Answer: Transfer of a liquid to a gas phase containing one or more components by contacting dry gas with pure liquid is known as humidification.

47. What is transit energy?

Answer: Energy possessed by a system which can cross its boundary is called transit energy. Heat and work are transit energy.

48. What is heat flux?

Answer: The heat flux is the amount of heat transfer per unit area and per unit time.

Interview Questions Based on Dynamics of Machinery

49. What is the difference between displacement and velocity?

Answer: Displacement of a body is its change of position with reference to a certain fixed point. But velocity is the state of change of displacement of a body with respect to time. Moreover, displacement is a vector quantity.

50. What is the difference between linear velocity and angular velocity?

Answer: Linear velocity is the rate of change of velocity of a body along a straight line with respect to time. But angular velocity is the rate of change of angular position of a body with respect to time.

51. What are the basic parts of a reciprocating machine?

Answer: Connecting rod, cylinder, piston, crank-shaft, counter weights, flange, and snout.

52. What are the major components of typical automotive diesel engine?

Answer:

1. Fuel injector
2. Air intake manifold
3. Glow plug
4. Vacuum pump
5. Pump drive belt
6. Diesel injection pump
7. Clutch housing,
8. Fuel filter
9. Swirl combustion chamber
10. Timing belt
11. Vibration damper
12. Oil pump
13. Motor mount
14. Oil pan.

53. What are the basic components of a pneumatic system?

Answer:

1. Air intake valve
2. Filter
3. Compressor
4. Air cooler
5. Electric motor
6. Storage reservoir
7. Pressure switch
8. Control valves.

54. What is meant by torque?

Answer: the term torque is used to define a rotary force. And is simply the product of the force and the effective radius.

Interview Questions Based on Quality Management

55. What is meant by Deming cycle in quality?

Deming cycle is one of the popular QC tool, which is a general problem solving process adopted by many firms for continuous improvement of their product or service quality. It is also called as PDCA cycle which means Plan-Do-Check-Action.

Plan: When a problem is detected in design, manufacture or development, it is analysed, processed and developing a solution is done in planning stage.

Do: In this stage, the developed solution is implemented as a experiment or test.

Check: The implemented solution is observed and evaluated. If the problem still exist, more modifications are done until satisfactory achievement of the target.

Action: Once a perfect solution is developed to solve the problem, It is implemented in real action.

56. What are the basic steps involved in operations management?

Answer:

Step 1: Identification of the customer's needs and translation of them into a statement of explicit forecast.

Step 2: Analysis of forecast and integration of facility for a statement of resource plans.

Step 3: Execution of resource plans by the suppliers either internal or external and generation of the inputs.

Step 4: Movements of inputs into the conversion facility, which produces the output either physical or intangible.

Step 5: Delivering the goods or services to the customers up to their satisfaction with distribution facility.

Interview Questions Based on Theory Of Machines

57. What is mean by addendum and dedendum?

Answer:

Addendum: The height of the tooth above the pitch circle is called as addendum.

Dedendum: The depth of the tooth below the pitch circle is called as dedendum.

Pitch circle: The circumference of a gear measured at the point of contact with the mating gear.

58. What are the type of gears in common use? Give some examples?

Answer:

Parallel Axis Gears

Spur gear

Helical gear

Herringbone gear

Internal gear

Intersecting Axis Gears

Bevel gear

Face gear

Non intersecting and Non Parallel Axis Gear

Worm gear

Crossed helical gear

Hypoid gear

Spiroid gear

59. What are the common gear manufacturing methods used in industries?

Answer:

1. Broaching
2. Grinding
3. Hobbing
4. Honing
5. Lapping
6. Milling
7. Shaping
8. Shaving
9. Skiving

60. What is meant by Scuffing?

Answer: Scuffing is defined as the localized damage occurred between sliding surfaces. It may occur in any sliding and rolling contact where the oil film is not thick enough to separate the surfaces. The symptoms of scuffing are microscopically rough, matte, and torn surfaces.

61. What is meant by amplitude?

Answer: It is the maximum displacement of a body from its mean position.

62. What is meant by periodic time?

Answer: It is the time taken for one complete revolution of the particle.

63. What is meant by frequency?

Answer: It is the number of cycles per second and is the reciprocal of periodic time.

64. What is meant by Hammer blow?

Answer: The maximum magnitude of the unbalanced force along the perpendicular to the line of stroke is known as hammer blow.

65. What is meant by forced vibration?

Answer: When the body vibrates under the influence of external force, then the body is said to be under forced vibration.

66. What is meant by damped vibration?

Answer: When there is a reduction in the amplitude over every cycle of vibration, the motion is said to be damped vibration.

67. What is meant by Critical or Whirling speed?

Answer: The speed at which the shaft runs so that the additional deflection of the shaft from the axis of rotation becomes infinite, is known as critical or whirling speed.

68. What is meant by viscous damping?

Answer: The damping provided by fluid resistance is known as viscous damping.

69. What is meant by isolation factor?

Answer: The ratio of the force transmitted to the force applied is known as the isolation factor. It is also called as transmissibility ratio.

70. What is mean by power?

Answer: It is define as the rate of doing work or work done per unit time.

71. What is mean by efficiency?

Answer: The ratio of the power output to power input is known as efficiency.

Efficiency = Power Output ÷ Power Input

72. What is mean by Potential energy?

Answer: It is the energy possessed by a body, for doing work, by virtue of its position.

73. What is Stiffness?

Answer: It is the ability of a material to resist deformation under stress. The modulus of elasticity is the measure of stiffness.

74. What is meant by Creep?

Answer: When a part is subjected to a constant stress at high temperature for a long period of time, it will undergo a slow and permanent deformation called creep.

75. What is meant by forging?

Answer: It is the process of heating a metal to a desired temperature in order to acquire sufficient plasticity, followed by operations like hammering, bending and pressing etc to give it a desired shape.

76. What is meant by tolerance?

Answer: It is the difference between upper limit and lower limit of a dimension. In other words, it is the maximum permissible variation in a dimension.

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