

Diploma Mechanical Engineering Interview Questions

Here are the top 100 most asked Interview questions and their corresponding answers for the Diploma Mechanical Engineer job interview.

1. What is Mechanical Engineering?

Mechanical engineering involves designing, analyzing, and producing systems and components that use or produce mechanical power.

2. What are the different branches of Mechanical Engineering?

Branches include Thermodynamics, Fluid Mechanics, Heat Transfer, [Mechanics of Materials](#), Manufacturing Processes, and Control Systems.

3. Define stress and strain.

Stress is the force applied per unit area, while strain is the deformation of a material relative to its original size.

4. What is the difference between stress and pressure?

Stress measures force per unit area within a solid material, while pressure measures force per unit area applied on a surface.

5. Explain the First Law of Thermodynamics.

The first law states that energy cannot be created or destroyed, only transformed from one form to another.

6. What is the Second Law of Thermodynamics?

The second law states that the total entropy of an isolated system can never decrease over time.

7. What is the difference between impulse and momentum?

Impulse is the change in momentum of an object when a force is applied for a specific time, while momentum is the product of an object's mass and velocity.

8. What are the different types of gears?

Types include spur gears, helical gears, bevel gears, worm gears, and rack and pinion gears.

9. Explain the working principle of a four-stroke engine.

A four-stroke engine has four distinct phases: intake, compression, power, and exhaust.

10. What is the purpose of a flywheel in an engine?

A flywheel smoothens out fluctuations in power output and stores rotational energy to maintain the engine's momentum.

11. Describe the difference between brazing and soldering. Brazing uses a higher temperature and filler metal to join materials, while soldering uses a lower temperature and a lower melting point filler material.

12. What are the types of welding processes? Processes include MIG welding, TIG welding, arc welding, spot welding, and gas welding.

13. Explain the concept of heat treatment. [Heat treatment](#) is a process used to alter a material's physical and sometimes chemical properties through heating and cooling.

14. What is the purpose of a governor in an engine? A governor regulates the speed of an engine by controlling the amount of fuel or power entering the system.

15. Describe the working principle of a hydraulic system. Hydraulic systems use fluid pressure to generate, control, and transmit power.

16. What is the difference between a bolt and a screw? –

Bolts are typically used with nuts to join two or more components, while screws are used to thread into materials.

17. Define ductility.

Ductility is the ability of a material to deform plastically before fracturing.

18. Explain the difference between hardness and toughness. –

Hardness is a material's resistance to indentation or scratching, while toughness is its ability to absorb energy and deform before fracturing.

19. Describe the working principle of a refrigeration cycle.

The refrigeration cycle involves compression, condensation, expansion, and evaporation to transfer heat from one location to another.

20. What is a cam and follower mechanism?

A cam and follower mechanism converts rotary motion into reciprocating or oscillating motion.

21. Explain the difference between static and dynamic balancing.

Static balancing involves balancing a rotating part around its axis, while dynamic balancing involves balancing it while in motion to minimize vibrations.

22. Define Poisson's ratio.

Poisson's ratio is lateral strain to longitudinal strain when a material is stretched.

23. What is a pneumatic system?

A pneumatic system uses compressed air to transmit and control power.

24. Describe the working principle of a centrifugal pump.

A centrifugal pump converts mechanical energy into kinetic energy and then into potential energy in a fluid.

25. What are the different types of bearings?

Types include ball bearings, roller bearings, plain bearings, and thrust bearings.

26. Explain the concept of thermal expansion.

Thermal expansion is the tendency of a material to change in volume, area, or length in response to a change in temperature.

27. Describe the difference between CNC and conventional machining.

CNC machining uses computer-controlled systems to automate the process, while conventional machining is manually operated.

28. What is the difference between a bolt and a stud?

A bolt has threads on both ends and is used with a nut, while a stud has threads on one end and is screwed into a tapped hole.

29. Explain the purpose of a nozzle in a fluid system. A nozzle increases a fluid's velocity and directs its flow in a particular direction.

30. Describe the difference between a rivet and a bolt. A rivet is a permanent mechanical fastener, while a bolt is removable and typically used with a nut.

31. What is the difference between a brake and a clutch?

A brake stops or slows motion, while a clutch connects and disconnects rotating shafts.

32. Explain the working principle of a gear pump.

A gear pump uses interlocking gears to pump fluid by displacing it between the gear teeth.

33. What is the difference between closed and open loop systems?

In a closed-loop system, feedback is used to adjust the system's behavior, while an open-loop system operates without feedback.

34. Describe the working principle of a turbocharger.

A turbocharger uses exhaust gases to spin a turbine, compressing air before entering the engine to increase power output.

35. What are the different types of brakes?

Types include disc, drum, regenerative, and electromagnetic brakes.

36. Explain the difference between force and torque.

Force is a push or pull acting upon an object, while torque measures the rotational force applied to an object.

37. What is the purpose of a gearbox in a vehicle?

A gearbox is used to change the speed and torque of a vehicle by selecting different gear ratios.

38. Describe the working principle of a scroll compressor.

A scroll compressor uses two interleaving scrolls to compress gas or vapor.

39. What is the difference between a mechanical and a hydraulic press?

A mechanical press uses mechanical force to deform materials, while a hydraulic press uses fluid pressure.

40. Explain the difference between laminar and turbulent flow.

Laminar flow is smooth and orderly, while turbulent flow is chaotic and unpredictable.

41. Describe the working principle of a clutch.

A clutch connects and disconnects the engine from the transmission, enabling gear changes and controlling the vehicle's motion.

42. What is the purpose of a crankshaft in an engine?

A crankshaft converts reciprocating motion into rotational motion and transmits power from the engine to the drivetrain.

43. Explain the difference between fatigue and creep.

Fatigue is the weakening of a material due to repeated loading and unloading, while creep is the gradual deformation of a material under constant stress over time.

44. Describe the working principle of a reciprocating compressor.

A reciprocating compressor uses a piston to compress gas by reciprocating motion within a cylinder.

45. What is the difference between a gear pump and a vane pump?

A gear pump uses interlocking gears, while a vane pump uses sliding vanes to pump fluid.

46. Explain the difference between laminar and turbulent flow.

Laminar flow is smooth and orderly, while turbulent flow is chaotic and unpredictable.

47. Describe the working principle of a heat exchanger.

A heat exchanger transfers thermal energy between two or more fluids at different temperatures.

48. What is the difference between a boiler and a heat exchanger?

A boiler generates steam, while a heat exchanger transfers heat between fluids without phase change.

49. Explain the difference between ductile and brittle materials.

Ductile materials deform plastically before fracturing, while brittle materials fracture with little or no plastic deformation.

50. What is the difference between an impulse and a reaction turbine?

Impulse turbines use the kinetic energy of a fluid jet, while reaction turbines use kinetic and potential energy. Explore the best energy courses and programs [here](#) to learn more about this.

51. Describe the working principle of a differential.

A differential allows wheels to rotate at different speeds while transmitting power from the engine to the wheels.

52. What is the purpose of a safety valve in a pressure vessel?

A safety valve releases excess pressure to prevent the pressure vessel from exceeding its design limits.

53. Explain the difference between a closed and an open loop control system.

A closed-loop control system uses feedback to adjust its output, while an open-loop control system operates without feedback.

54. Describe the working principle of a pneumatic cylinder.

A pneumatic cylinder converts compressed air into linear motion by expanding a piston within a cylinder.

55. What is the difference between an engine and a motor?

An engine converts fuel into mechanical energy, while a motor converts electrical energy into mechanical energy.

56. Explain the difference between static and dynamic friction.

Static friction occurs between stationary surfaces, while dynamic friction occurs between moving surfaces.

57. Describe the working principle of a gas turbine.

A gas turbine converts the energy of combustion gases into mechanical energy by expanding them through a series of turbines.

58. What is the difference between a single-stage and a multistage compressor?

A single-stage compressor compresses gas in one stage, while a multistage compressor compresses it in multiple stages.

59. Explain the working principle of a hydraulic jack.

A hydraulic jack uses fluid pressure to lift heavy loads by applying force to a piston, which in turn lifts the load.

60. What is the difference between journal and thrust bearing? A journal bearing supports radial loads, while a thrust bearing supports axial loads.

61. Describe the working principle of a turbofan engine.

A turbofan engine uses a large fan at the front to compress air and increase thrust efficiency.

62. What is the purpose of a camshaft in an engine?

A camshaft controls the opening and closing of intake and exhaust valves in an engine.

63. Explain the difference between a parallel and a series circuit.

In a parallel circuit, components are connected across multiple paths, while in a series circuit, components are connected in a single path.

64. Describe the working principle of a scroll compressor.

A scroll compressor uses two interleaving scrolls to compress gas or vapor.

65. What is the difference between a pneumatic and a hydraulic system?

A pneumatic system uses compressed air, while a hydraulic system uses fluid pressure.

66. Explain the difference between an open and a closed cycle gas turbine.

An open cycle gas turbine exhausts its working fluid to the atmosphere, while a closed cycle gas turbine recirculates it.

67. Describe the working principle of a bellows seal valve.

A bellows seal valve uses a flexible metal bellows to provide a leaktight seal between the valve stem and the body.

68. What is the difference between a pump and a compressor?

A pump transports fluids, while a compressor compresses gases.

69. Explain the difference between stress and strain.

Stress is the force applied per unit area, while strain is the deformation of a material relative to its original size.

70. Describe the working principle of a gear train.

A gear train transmits motion and power between rotating shafts using interlocking gears.

71. What is the difference between a rack and pinion and a worm gear mechanism?

A rack and pinion converts rotary motion into linear motion, while a worm gear mechanism provides high reduction ratios.

72. Explain the working principle of a hydrostatic transmission.

A hydrostatic transmission uses fluid pressure to transmit power between an engine and a drivetrain.

73. What is the difference between a shaper and a planer?

A shaper cuts metal using a singlepoint cutting tool, while a planer uses multiple cutting tools to remove material.

74. Describe the working principle of a jet engine.

A jet engine uses the reaction principle to generate thrust by expelling highvelocity exhaust gases.

75. What is the purpose of a turbine in a power plant?

A turbine converts the kinetic energy of a fluid or gas into mechanical energy to drive a generator and produce electricity.

76. Explain the difference between laminar and turbulent flow.

Laminar flow is smooth and orderly, while turbulent flow is chaotic and unpredictable.

77. Describe the working principle of a centrifugal clutch.

A centrifugal clutch engages and disengages based on engine speed by using centrifugal force to expand and contract friction shoes.

78. What is the difference between a gasket and a seal?

A gasket is a mechanical seal used to fill the space between two mating surfaces, while a seal prevents fluid or gas leakage between components.

79. Explain the difference between a plain bearing and a rolling bearing.

A plain bearing relies on sliding motion between surfaces, while a rolling bearing uses rolling elements to reduce friction.

80. Describe the working principle of a planetary gearbox.

A planetary gearbox consists of a central sun gear, planet gears, and a ring gear to achieve high gear reduction ratios.

81. What is the difference between a V engine and an inline engine?

A V engine has cylinders arranged in a V configuration, while an inline engine has cylinders arranged in a straight line.

82. Explain the working principle of a solenoid valve.

A solenoid valve uses an electromagnetic coil to actuate a plunger, which controls fluid flow through the valve.

83. What is the difference between a boiler and a heat exchanger?

A boiler generates steam, while a heat exchanger transfers heat between fluids without phase change.

84. Describe the working principle of a vacuum pump.

A vacuum pump removes gas molecules from a sealed volume to create a vacuum.

85. What is the purpose of a condenser in a refrigeration cycle?

A condenser removes heat from the refrigerant vapor and converts it back into a liquid state.

86. Explain the difference between a gear pump and a vane pump.

A gear pump uses interlocking gears, while a vane pump uses sliding vanes to pump fluid.

87. Describe the working principle of a pelton turbine.

A Pelton turbine converts the kinetic energy of high pressure water jets into mechanical energy.

88. What is the difference between a thermostat and a thermocouple?

A thermostat is a temperature-controlled switch, while a thermocouple is a temperature sensor that produces a voltage proportional to temperature.

89. Explain the difference between a synchronous and an asynchronous motor.

A synchronous motor operates at a constant speed synchronized with the power supply frequency, while an asynchronous motor operates at variable speeds.

90. Describe the working principle of a diaphragm pump.

A diaphragm pump uses a flexible diaphragm to create suction and discharge fluid.

91. What is the difference between creep and fatigue?

Creep is the gradual deformation of a material under constant stress over time, while fatigue is the weakening of a material due to repeated loading and unloading.

92. Explain the working principle of a regenerative braking system.

A regenerative braking system converts a moving vehicle's kinetic energy into electrical energy and stores it in a battery for later use.

93. Describe the difference between a boiler and a heat exchanger.

A boiler generates steam, while a heat exchanger transfers heat between fluids without phase change.

94. What is the difference between a thermoplastic and a thermosetting polymer?

A thermoplastic can be melted and reshaped multiple times, while a thermosetting polymer undergoes irreversible chemical changes upon heating and cannot be reshaped.

95. Explain the working principle of a gear pump.

A gear pump uses interlocking gears to pump fluid by displacing it between the gear teeth.

96. Describe the difference between an impulse and a reaction turbine.

An impulse turbine uses the kinetic energy of a fluid jet, while a reaction turbine uses kinetic and potential energy.

97. What is the purpose of a nozzle in a jet engine?

A nozzle accelerates the exhaust gases to increase thrust and control the direction of the jet.

98. Explain the difference between a shock absorber and a strut.

A shock absorber dampens vibrations and shocks, while a strut provides structural support and damping.

99. Describe the working principle of a pneumatic actuator.

A pneumatic actuator uses compressed air to create linear or rotary motion for controlling valves or other mechanical systems.

100. What is the difference between a thermocouple and a resistance temperature detector (RTD)?

A thermocouple produces a voltage proportional to temperature using two dissimilar metals, while an RTD measures resistance changes with temperature using a pure metal wire.

These questions cover a broad range of topics within mechanical engineering and should provide a good basis for assessing the knowledge and understanding of a fresh Mechanical Diploma Engineer.

Other Important Interview Questions and Answers

1. How did you get into engineering?

I've always been fascinated by how things work and the principles behind them. This curiosity led me to pursue a career in engineering, where I could apply my problem-solving skills and creativity to real-world challenges.

2. What are your greatest strengths?

My greatest strengths include analytical thinking, attention to detail, adaptability, effective communication, and a strong work ethic. These qualities enable me to approach tasks with precision, collaborate effectively with team members, and adapt to new situations.

3. What mechanical engineering tasks interest you?

I am particularly interested in tasks related to machine design, product development, and optimization. I enjoy tackling complex problems, conducting analyses, and innovating solutions to improve efficiency and performance.

4. How would your coworkers describe you?

My coworkers would describe me as dependable, collaborative, and dedicated. I strive to maintain open communication, support my team members, and contribute positively to the work environment.

5. Tell me about yourself.

I am a passionate and driven mechanical engineer with a strong academic background and practical experience in various industries. I thrive in dynamic environments and enjoy taking on challenges that allow me to apply my skills and expertise effectively.

6. How does a hydraulic clutch work?

A hydraulic clutch uses fluid pressure to engage and disengage the clutch mechanism. When the clutch pedal is pressed, hydraulic fluid is forced through a series of channels, applying pressure to the clutch release mechanism and separating the clutch plates.

7. Explain the engineering design process.

The engineering design process involves identifying a problem, researching and brainstorming potential solutions, developing prototypes, testing and refining the designs, and ultimately implementing the final product or solution.

8. What is a process flow diagram?

A process flow diagram is a visual representation of the sequence of steps or operations involved in a process. It typically includes symbols and annotations to illustrate the flow of materials, energy, or information through the system.

9. Define pitting.

Pitting is a form of localized corrosion that results in small pits or cavities on the surface of a material, typically caused by chemical reactions, mechanical damage, or exposure to corrosive environments.

10. Explain different types of fits.

Different types of fits in engineering include clearance fit, interference fit, and transition fit. A clearance fit allows for clearance or gap between mating parts, an interference fit results in a tight interference or press fit between parts, and a transition fit provides a compromise between clearance and interference fits.

11. Explain what a bearing is.

A bearing is a mechanical component that supports and reduces friction between moving parts. It typically consists of a rotating or sliding element, such as a ball, roller, or bushing, enclosed within a housing or raceway.

12. How do pneumatics work?

Pneumatics utilize compressed air to generate mechanical motion. Compressed air is directed through pneumatic valves to actuate pneumatic actuators, such as cylinders or rotary actuators, which produce linear or rotary motion to perform various tasks.

13. Why should we hire you?

You should hire me because I combine technical expertise, problem-solving skills, and a strong work ethic. I am committed to delivering high-quality results, collaborating effectively with team members, and contributing to the organization's success.

14. What role does lubrication play in mechanical systems?

Lubrication is essential in mechanical systems to reduce friction between moving parts, minimize wear and tear, dissipate heat, and extend the lifespan of components. Proper lubrication ensures smooth operation, improves efficiency, and prevents premature failure of machinery.

15. Can you explain the concept of stress concentration?

Stress concentration occurs when there is a localized increase in stress within a material, typically due to geometric irregularities, notches, or sharp corners. These areas of high-stress concentration are prone to failure under load and require careful design considerations to mitigate potential issues.