

Learning routes pvt ltd

Question: Can you describe the first thing you ever designed, either as a mechanical engineer or before you started working in this field?

Answer: “I actually began designing things when I was still a child. The first design I can remember was a Rube Goldberg-type device that would dispense a piece of candy after several different mechanical steps. Another device I designed was a robotic machine that would collect a tennis ball and drop it into a basket. I did this while working on a team during a competition in high school. Projects like this fueled my interest in mechanical engineering as a career.”

Question: What are the essential skills an engineer should possess?

Answer: "I believe the most important quality an engineer should have is the ability to innovate. You have to look at things differently, developing new ways to accomplish a task that are more effective and efficient. Other important skills include flexibility, focus, attention to detail, and the ability to communicate complex ideas to nontechnical audiences.”

Question: How do you use a process flow diagram in the field of mechanical engineering?

Answer: “A process flow diagram is an illustration that describes the equipment, product flow, key connections, and the general relationships between various components used to move materials or accomplish a task. It

consists of drawings using symbols to describe the key components within the flow and lines between the symbols illustrating the direction of flow.”

Question: Can you explain the different types of fits used in the United States?

Answer: “There are three categories of fit used here in the U.S. They include clearance, interference, and transition fit. Clearance fit is described as the clearance between two parts. Interference fit describes the size of two parts to be mated where the hole tolerance is less than that of the shaft tolerance. Transition fit is a combination of the previous two where the tolerance of both components overlap.”

Question: Since you mentioned tolerance, can you elaborate on the importance of tolerance in engineering?

Answer: "Tolerances are critical in the field of mechanical engineering. Nothing can be designed without considering tolerances between the materials and components. Not only are tolerances vital to the design, but they can be used during quality inspections to reduce cost and facilitate manufacturing of the components.”

Question: What are some of the computer programs you use in your work as a mechanical engineer?

Answer: “I use several different tools and software in my work. The first is Mathcad which gives me the ability to do math within a document as well as add relevant images and text to explain my work. When I need to perform a more complex numerical analysis, I use MATLAB. I use many different 3D CAD software, including SolidWorks, Unigraphics NX, and Autodesk Inventor. Another tool I like is Finite Element Analysis (FEA) which is useful to any engineer needing to perform structural analysis. The software I probably use the most is Microsoft Excel along with Visual Basic for Applications. VBA is the programming language built into all of the Microsoft Office products and is useful for automating Excel files.”

Question: Can you discuss some of the essential guidelines for designing castings?

Answer: “There were several key guidelines you need to follow when designing castings. These include designing casting while keeping simplicity as the first criteria, keeping the section thickness as uniform as possible, averting sudden changes in thickness, avoiding large flat surfaces as these are difficult to create, and using curved shapes to improve the stress handling of the casting.”

Question: Can you describe a universal coupling and how it is used?

Answer: “Simply stated, a universal coupling consists of a pair of hinges

connected by a cross shaft. It is used to connect two shafts whose axes are inclined to each other. An example of this would be a car where the driveshaft connects to the rear axle through a universal coupling.”

Question: Do you prefer to use pneumatics to control the machinery you design, and if so, why?

Answer: “I prefer to design in pneumatic systems for the devices I engineer whenever possible. Pneumatic systems are usually cheaper than other control systems, such as electromechanical or hydraulic systems. They are also faster, less complex, more efficient, and less messy if they develop a leak.”

Question: Can you explain mechanical refrigeration?

Answer: “Mechanical refrigeration involves removing heat from a specific device or location by utilizing a heat exchange system. Typically, the air is removed from the area and condensed. The heat from the condensed air is exhausted, and the condensed air, which is cooler, is sent back into the area. The refrigeration system can be cyclic, non-cyclic, magnetic, or thermoelectric, depending on how the refrigeration is applied.”

Additional Mechanical Engineer Interview Questions

- What is the difference between metal and non-metal materials?
- What is the relation between strain and stress?
- Imagine you are in a boat, floating in a pool of water. If you throw a large

rock from your pocket into the pool, does the water level in the pool rise, drop, or stay the same?

- How would you handle another engineer disagreeing with your design in front of peers?
- What is your experience with computer-aided design software?
- How would you explain what you do as a mechanical engineer to an 8-year-old child?