TECHNOSCRIPTS INTERVIEW QUESTIONS
Basic Embedded Interview Questions

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CAN Interview Questions
Automotive Interview Questions
I2C and SPI Interview Questions
Embedded C Interview Questions
Autosar Interview questions

Here are some frequently asked Embedded Interview Questions:

Q1. What is an embedded system?
Embedded systems can be termed as a combination of hardware and software. Have a CPU that contains memory, timers, peripherals, bus, reset, and on-chip oscillation. Dedicated to a specific task.

Q2. Why embedded systems?
As we all know it's a combination of hardware and software. It helps to achieve a real-time embedded system while considering factors like speed and efficiency.

Q3. Why embedded applications are real-time?
An embedded system is a dedicated electronics design system that is used to control and access data within a given response time to handle critical events. In RTOS time responsiveness is fast and it maintains scalability.

Q4. What is meant by an infinite loop in embedded systems?
It works on real-time embedded systems applications which used to repeatedly monitor/process the status of the program.

Q5. What is the big-endian and little-endian format in embedded systems?
The big-endian means data is stored at the big end first. In multiple bytes, the first byte is the biggest or represents the primary value but in the little-endian format, little-end data is stored first.

Q6. What are commonly found errors in embedded systems?
Wrong addressing of address lines and data lines within a circuit. Transient current and static charges damage memory devices. Illegal memory allocation. Wrong insertion of Memory devices into memory slots. Sometimes control signals are faulty.

Q7. Why I/O Devices are important in embedded systems?
As we know embedded systems are built on a single chip that contains peripherals, memory, and communication protocols like I2C, and SPI CAN. Communicating and interchanging contents with these devices require physical entities. So, to receive and send content on device/computer I/O device functionality can be used by embedded applications.

Q8. What is a microcontroller and why?

A microcontroller is an electronic device that controls I/o devices and has its CPU which contains peripherals, memory, and processor which can be used as embedded systems. The execution time of microcontrollers works in microseconds which gives the output of particular embedded applications in a specific time duration.

Q9. What is the difference between a microprocessor and a microcontroller?
The microprocessor is a device in which memory, peripherals, and I/O devices are connected externally. The microcontroller has I/O, memory, & Peripherals built into it and designed for control.

Q10. In I2C, SPI, and CAN which one is best?
Don't answer the best interviewer. As per industry requirements and project needs all three are best. Every protocol has its unique quality to show performance in an industry project.

Q11. List various timers in embedded systems.
Time Slicing, Time Division, Capture, and Compare Timer. Timer/Counter

Q12. Why Timers?
The timer is not only used to generate delay but used to count pulses. Timers maintain accuracy as per requirement. By using a for loop, we can generate delay but will not get accuracy as per requirement. Timers maintain accuracy and precise value. Timer calculation can be done by an external clock and controller itself.

Q13. Are Smart devices embedded systems?
No, Smart devices are not embedded systems but they contain several embedded systems like WIFI, Bluetooth, and GSM Modules.

Q14. Why interrupts are prioritized?
Interrupts selection is based on two criteria: The execution time of the device driver's interrupts. Maximum interrupt latency requirement. Worked based on timer overflow. Once that cannot be serviced within the time limits specified bus interrupts qualify as off-level interrupts. A device's interrupt priority is picked on two criteria: its maximum interrupt latency requirements and the device driver's interrupt execution time.

Q15. What is the use of model transformation in embedded?
Model transformation is used to obtain different views for embedded project development. It provides a Bottom-up and top-down approach. It helps to construct the iterative model by using library components that involve analysis of the model so that the process can be made automated.

Q16. What is the use of DMA in embedded systems?
DMA means Direct Memory Access controller which handles dynamic memory allocation and allows data to be transferred between devices. I/o Devices data can be detected and communicated automatically. Data transfer between two devices can be done by an interrupt. DMA provides high-quality performance and is used to execute overall execution in the system.

Q17. What are the parameters required to design device drivers?
1: Structure: Synchronous entry and asynchronous entry. Several synchronous entries handle device initialization, queue I/O Requests, state control, and read/write/. and asynchronous entry point handle interrupt

2: OS and driver Communication: -buffers, error codes.

3: Driver operations: Initialize required devices.

4: Interpret commands.

\# Schedule multiple outstanding requests

\# Manage data transfer

\# Accept and process interrupt.

\# Support Functions: Support open, close, read, write, and seek functions.

Q18. What do you mean by reading modify write mechanism?

It is used to access microcontroller ports. All three actions are performed by single instructions. Initially, data is read by the port and again written back to the port.

Q19. Why startup code is required in embedded applications?

It is a prior and basic platform to run applications. It Contains assembly language to run the application. There are some parts needed to execute the startup code:

•Exception handler code

•Reset handler

•Stack declaration

•Vector table allocation.

Q21. What are the steps to measure interrupt latency in embedded systems

Configure one I/O Pin to generate an interrupt and a second, I/O pin for toggling.

Monitor the pin to generate an interrupt.

Monitor the second pin which is toggled at the start of the interrupt service routine.

Once the interrupt is generated a signal of both pins will change.

Q22. Is an Embedded system being IoT?

We can say embedded applications are a subset of IoT. IoT is a network connected with an object which is used to collect and exchange data and that object is nothing but your embedded devices and applications.

Q23. Why embedded is known as Automotive?

Embedded applications or devices a systems which is used to design & control, and access the data in electronics-based systems. These embedded-based applications can be used in automotive cars to access different functionalities like powertrain, infotainment, security, and audio systems. Application is changing according to OEM requirements.

Q24. Why embedded applications are programmed? & How?

The computer understands the machine-level language. Also, an embedded system is a mechanical system with a dedicated role that has a larger no of electrical and mechanical objections, it happens with real-time computing. Embedded devices or systems include hardware and mechanical parts and are used to control many devices in today's world.

Q25. Why is the "c" language mostly preferred over assembly language?
Embedded applications need portability. Writing assembly code doesn't maintain the required portability and accuracy in functions. but writing code in " C " is more scalable, reliable portable, and easy to understand.