1. What are the advantages & disadvantages of Assembly language?

Advantages

- The symbolic programming of Assembly Language is easier to understand and saves a lot of time and effort of the programmer.
- It is easier to correct errors and modify program instructions.
- Assembly Language has the same efficiency of execution as the machine level language. Because this is one-to-one translator between assembly language program and its corresponding machine language program.

Disadvantages

- One of the major disadvantages is that assembly language is machine dependent. A program written for one computer might not run in other computers with different hardware configuration.

2. **Define context switching.**

- A context switch is the computing process of storing and restoring of a CPU so that execution can be resumed from the same point at a later time.
- The context switching is an essential feature of multitasking operation system.

3. List the OSI layers from lowest to highest level of abstraction.

• The OSI layers from lowest to highest level of abstraction are described below:

i. Physical layer

ii. Data link layer

iii. Network layer

iv. Transport layer

v. Session layer

vi. Presentation layer

vii. Application layer.

4. **What is a distributed embedded architecture?**

 In a distributed embedded system several process single elements are connected by a network that allows them to communicate.
 More than one computer or group of computer and share connected via network that forms distributed embedded systems.

5. Differentiate counter semaphore and binary semaphores.

Counter semaphores	Binary semaphores
(i) Which allows an arbitrary resource count called counting.	(1) Which are restricted to values of 0 and 1 are called binary.
(ii) Synchronization of object that can have arbitrarily large number of states.	(2) Synchronization by two states (a) Not taken (b) Taken.

6. **What do you meant by accelerator/hardware accelerator?**

 An accelerator is one important category of processing element for embedded multiprocessor.
 It is attached to CPU buses to quickly execute certain key function.
 It provides large performance for many applications with computational kernels. It provides critical speedups for low-battery I/O functions.

7. What is the use of attached accelerator to CPU?

 The CPU accelerator is attached to the CPU bus. TheCPU is also called the host. The CPU talks to the accelerator through the data and control registers in the accelerator.
 Control register allow the CPU to monitor the accelerator's operation and to give the accelerator commands.
 The CPU and accelerator will communicate via shared memory. The accelerator perform read and write operation directly.
 An accelerator interface is functionally equal to an I/O device but it does not perform input or output. CPUs and accelerators perform computations for specification.

8. What is a PDA?

PDA (Personal Digital Assistant) is a device that can be used to receive, display and transcribe information. PDA can run a wide variety of applications.

9. Write short notes on H/W and S/W co-design.

Embedded systems architecture design is the task of selecting and programming a suitable configuration of components for a required system application. Building an embedded system is not an easy task. Every embedded system consist of an embedded hardware and embedded software.
So software and hardware plays a main role in design of embedded system architecture.
Need For Co-Design :
 Co-design refers to parallel or concurrent development of hardware and software for an embedded system.
 Co-design reduces the overall design and development cycle of the embedded system.
 It helps the designer to find the bugs at early stage.
 It also reduces the number of errors, particularly at the hardware-software interface level.

10. What are FOSS tools for embedded systems?

GNU Compiler Collection (GCC) and GNU debugger (GDB) are the most popular FOSS (Free and open source) tools used in embedded systems.

11. What is a set-top box or STB or STU?

A set top box (STB) or set top unit (STU) is an information appliance device that generally contains a tuner and connects to a television set and an external source of signal, turning the source signal into content in a form that can then be displayed on the television screen or other display device.
USES :
a) Cable television and satellite television system.

12. Define software MODEM.

A software modem is a low-cost alternative to a standard hardware-based modem. While hardware modems contain all the parts necessary to connect to the internet, the software version transfers some of that work to the computer's processor.

Big Question

1. Explain the strategies of power optimization for processes.

2. Explain the stages of the design flow in the context of developing a software application from concept to release

3. Discuss about the key components and characteristics of a distributed embedded architecture.

4. With neat diagram Design an Alarm clock. Also Explain it in detail.

5. How can you design a modern telephone answering machine that combines advanced voice recognition technology with user-friendly features to enhance communication and make message management more efficient?

6. What are the key inter-process communication mechanisms, and how do they facilitate communication between processes in a computer system?

7. Design a data compressor.