NOV / DEC – 2019

PART – A questions :

1. How traps are handled in ARM processor ?

– Trap is also known as Software interrupt. It is used to enter in supervisor mode. ARM provides the SWI interrupt for software interrupt. This instruction causes the CPU to enter supervisor mode.

2. What are the factors to be considered while designing an embedded system process?

1. development of product Requirements
2. compatibility and Integrity
3. Safety and security Risks.
4. Energy Efficiency
5. complexity Management
6. debugging
7. memory allocation
8. Setting up Realistic schedules.

3. What is the concept of Busy wait I/O ?

– The outer while loop sends the characters ~~at~~ one at a time. Busy waiting also known as spinning, or busy looping is a process synchronization technique in which a process / task waits and constantly checks for a condition to be satisfied before processing with its execution.

4. What are the basic types of memory components that are commonly used in embedded system?

– Types of memory in embedded system generally fall into two categories : 1. volatile Vs.
2. non_volatile.

– within those catogories are various type of RAM and ROM memories.

5. How to compute the cpu utilization of the system?

— This could be expressed by the following mathematical formula.

Total cpu load = simulation of (Task's frequency * Task's worst case execution time).

— cpu utilization represents the amount of work a cpu handles to process resources or manage an opeating system's tasks.

6. difference between multiple process and multiple task.

Multiple task	Multiple process
* It is the extension of multiprogramming. * In this system, the cpu executes multiple jobs by switching among them typically using a small time quantum, and these switches occur so frequently that the users can interact with each program while it is running. * It is classified into two categories: single user & Multiuser.	* Multiple process is a system that has two or more than two processors. * In this, cpus are added for increasing computing speed of the system. Because of Multiprocessing, there are many processes that are executed simulataneously. * It is classified into two categories : symmetric and Asymmetric Multiprocess.

7. what is the significance of CRC card?

* class - Responsibility - collabration card are a brainstroming tool used in the design of Object - oriented software. proposed by ward cward cunningham, they aretypically used when first determining which classes are needed and nowthey will interact.

8. What is the difference between single hop and multihop network?

Single-hop	Multi-hop
* Every sensor communicates directly with the base station.	* sensors serve as relays for other sensor nodes.
* May Require large transmitt powers and may be infeasible in large georaphic areas.	* May Reduce power consumption and allows for larger coverage introduces the problem of routing.

9. What are the inputs on which the engine controller will be working upon to generate a proper control signal?

10. What is the need for a software modem?

* Software modems are capable of a majority of tasks performed by a traditional hardware modem, but use the host computer's processor to carry out the signal processing required to modulate and demodulate data signal.

* This is also known as win modem, soft modem and driver based modem.

NOV / DEC - 2011

1. What is the role of Microprocessor in embedded computing?

Embedded microprocessor are computer chips used inside devices other than computers to provide added functionality, often in the areas of control and monitoring.

2. How traps are handled in ARM processor?

– Traps is also known as software interrupt. It is used to enter in supervisor mode. ARM provides the SWI interrupt for software interrupt. This instruction causes the cpu to enter supervisor mode.

3. List the memory devices used in the design of embedded system.

* Types of memory in embedded system:

1. volatile
2. non_volatile

Here are details on various type of memory those categories:

various type:

RAM and ROM.

4. How power can be optimized at the program level.

power can be optmized at the program level are use registers efficiently, identify and eliminate catce conflicts, moderate loop unrolling eliminates some loop overhead instructions and eliminate pipeline stalls.

5. List the advantages and limitations of priority based process scheduling.

Advantages:

* Good way to ensure processes with higher priorities are handled first

* Good when the resources are limited and priorities for each process are defined beforehand.

disadvantages:

* processes with lower priority may be starved,
* Difficult to objectively decide which processes are given higher priority.
* Low priority processes will be lost if the computer crashes.

6. State the major functions of posix RTOS.

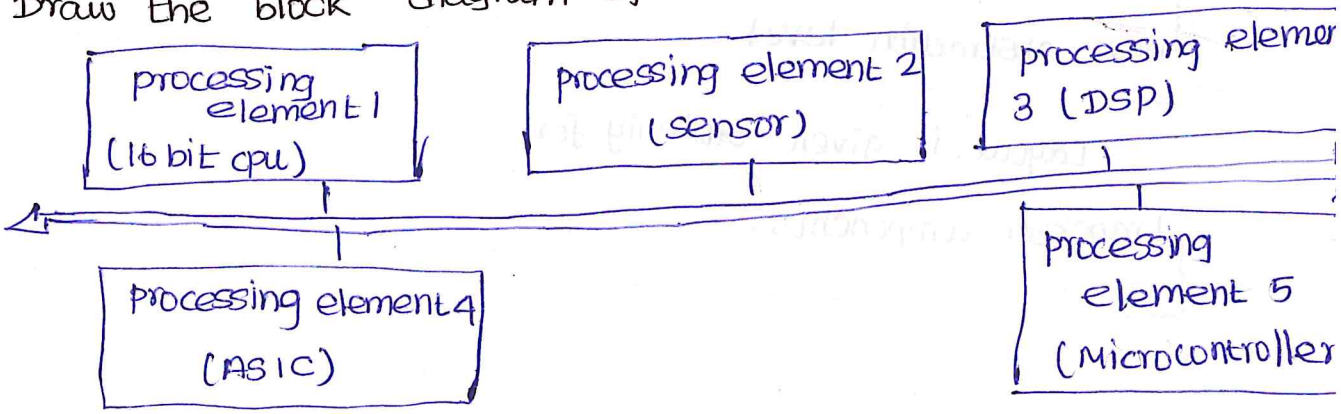
posix defines both the system- and user-level application programming interfaces, along with command line shells and utility interfaces, for software compatibility with variants of unix and other operating systems.

The important function done by RTOS are task management, scheduling, resource allocation and interrupt handling.

7. Give the design flow used in embedded system design

* Requirment
* Architecture
* coding
* Testing
* maintenance.

8. Draw the block diagram of distributed embedded system



9. what are the major components used in the design of alarm clock?

The elements in the PCB is as follows:

* Microcontroller – ATMega644P.
* 5V Regulator – LM7805
* 16MHz Oscillator.
* Buzzer and supporting components.
* Menu and Stop push Buttons.
* DS3231 Real time clock IC.

10. write the main functions performed by video accelerator.

* A video accelerator is a video card with integrated processor and memory to increase the overall capabilities of video graphics.

April / May – 2019

1. difference between top-down and bottom up design.

Top-down design	bottom-up design.
Starts with the toplevel	Start with the bottom level.
Functional description is converted into component list on each level.	Each level generates library for the next higher level.
Each component function is decomposed further on the next abstraction level.	Floor planning and layout on each level.
Layout is given only for transistor components.	

2. list the functions of ARM processor in supervisor mode?

* Memory Management unit is controlled by supervisor mode.
* The supervisor mode has privileges that user modes do not.

3. What is memory map input - output interface?

* Memory map I/O uses the same address space to address both main memory and I/O device. Memory mapped I/O is typically used for controlling hardware peripherals by reading from and writing to registers or memory blocks mapped to the hardware's system memory.

4. What is the need for Bus Arbitration?

* Only one processor (or) controller can be Bus master at the same point in time.
* To resolve these conflicts, the Bus Arbitration procedu is implemented to coordinate the activities of all devices requesting memory Transfers.

5. define process.

* process means a program execution. process is an active entity that requires a set of resources, including a processor, program counter, registers to perform its function.
* Multiple processes may be associated with one progran

6. What is context switching?

A contact switch is the switching of the cpu from one process or thread to another. A context is the content of a cpu's registers and program counter at any point in time.

7. State the need for accelarators?

* A Accelerator is a video card with integrated processor and memory to increase the overall capabilities of video graphics.

* Today most video accelerators are used for computing gaming.

8. difference between fixed priority arbitration and round-robin arbitration?

fixed priority -arbitration	round- robin arbitration
An arbiter in which we set priority to the requesters and requests are serviced according to the priority of requester.	It is a scheduling scheme which gives to each request its share of using a common resource for a limited tim or data elements.

9. write down the need for hardware and software co-desi

This approch assures a certain level of results, regardless of how many possibilities are involved. This same approch can also help if there are abnormalities tha do not fit into a particular pattern because machine learning system can ignore those irregularities.

10. Why are most designers use FOSS tools in embedded systen development?

* decreasing software costs, increasing security an stability, protecting privacy, and giving users more control over their own hardware.

NOV / DEC - 2018

1. write the major steps of Embedded system design proces

* Requirment
* specification

* Architecture
* components
* system integration.

2. What is the significance of supervisor mode of ARM processor?

Supervisor mode is a protected mode for the operatin system. Abort mode is entered after a data or instruction perfetch Abort. System mode is a privileged user mode for operating system.

3. State the requirements for component interfacing in embedde system design.

4. mention the basic compilation techinques.

1. lexical analysis
2. syntax analysis
3. semantic analysis
4. Intermediate code generation
5. code optimization
6. code generation

5. What are the various policies used for process schedulii

* process scheduling policies are utilization, schedul overhead and schedulability.

6. which Inter process communication mechanism is efficient? justify your answer.

Exchange the data between two (or) more seperate, independent process/ threads is possible using IPC. OS provide resources for IPC, such as message queues, semaphores and shared memory.

7. Hardware Accelerator is not a co-processor? - Justify this statement?

8. Mention the networks used for distributed embedded systems.
   - I^2C BUS
   - Ethernet
   - Field bus

9. What is the use of PDA device?

The device provides computing and information storage and retrieval capabilities for personal (or) business use, often for keeping schedules, calendars.

10. draw the block diagram of a data compressor.