Week 7

1. In saturation arithmetic if the result is restricted to unsigned 8 bits in binary, then which of the following is correct
    a. 17*17=289
    b. 17*18=256
    c. 17*17=255
    d. 17*18=306

Ans – c. 17*17=255

Explanation

17*17 gives 289 which is 0001 0010 0001 in binary and since it is 8 bit saturation arithmetic and the output is greater than 8 bits therefore the maximum value represented by 8 bits in binary i.e. 1111 1111 which is 255 in decimal, which is the output

2. DSP (Digital Signal processor) has/have
    a. Specific hardware for performing multiplication and addition operations in same cycle
    b. Saturation Arithmetic
    c. Zero Loop Overheard (hardware /Software)
    d. All of the above

Ans – d. All of the Above

Explanation – DSP follows Saturation arithmetic and has special memory architectures that can fetch multiple data or instruction at the same time to reduce the overall execution time and has special hardware for performing multiplication and addition operation in same cycle and has zero loop overhead, thus all these together helps to make DSPs more efficient.

3. Reuse of components helps in reducing time to market and can only be done in Hardware.
    a. True
    b. False

Ans – b. False

Explanation - Reuse of components helps in reducing time to market and can only be both done in Hardware as well as Software.

4. Which of the following data structure falls under the category of Static Data Structure
    a. Arrays
    b. Linked Lists
    c. Trees
    d. Graphs

Ans – a. Arrays

Explanation: Array is classified under static data structure whereas linked list, trees and graphs falls under dynamic data structure.

5. In Standard operating system Application layer can access device drivers
    a. True
    b. False

Ans – b. False

Explanation – In Standard operating system Application Layer has to access device drivers via Operating system whereas in RTOS (Real Time Operating System) supports direct access of device drivers from application layer.

6. RTOS requires files to be contiguous because
    a. Helps in predictable head movements
    b. Helps to manage task scheduling
    c. Helps in disabling interrupt

d. All of the above

Ans – a. it makes system predictable

Explanation – RTOS requires files to be contiguous. If a file is not contiguous it may lead to varying access times due to unpredictable head movements.

7. Total number of semaphore variable required for an unit resource to be accessed in a mutually exclusive fashion by N number of processes
    a. N
    b. 1
    c. N-1
    d. 2

Ans – b. 1

Explanation - Only one Binary Semaphore is sufficient to guarantee mutually exclusive access to a unit resource.

Every process need to follow the following sequence to access resource R

Let the semaphore be named S

1. P(S)
2. Resource
3. V(S)

Where P() and V() are atomic in nature.

8. When several processes access and manipulate same data concurrently and the outcome doesn't depend on the particular order in which access has taken place is known as race condition.
    a. True
    b. False

Ans – b. False

Explanation –Race condition is when multiple processes access and manipulates data concurrently and the output depends on the particular order in which access has taken place.

9. A cyclic dependency of resources among processes will always lead to deadlock.
    a. True
    b. False

Ans – b. False

Explanation – A cyclic dependency of resources may not always lead to deadlock as there may me multiple resources of the same type.

10. Rate Monotonic Scheduling uses which of the following approach(es)
    a. Tasks with shorter period are assigned last
    b. Preemptive
    c. first come first served
    d. last come first served

Ans – b. preemptive

Explanation – rate monotonic scheduling algorithm schedules periodic tasks using static priority along with preemption i.e. it gives higher priority to tasks with smaller time period.