M.E. Second Semester (Computer Science & Engineering) (F.T.) (CGS)

13150 : Real Time System : 2 RMEF 3 / 4 RME 1

P. Pages : 2

Time : Three Hours

* 1 0 2 5 *

AW - 3679

Max. Marks : 80

Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Which attribute divides the Real time processes in various categories? Explain. **7**

b) Explain. **6**
i) Release time
ii) Deadline.
iii) Response time.

OR

2. a) Compare and contrast soft and hard real time system. **7**

b) Explain. **6**
i) Periodic task.
ii) Aperiodic task.
iii) Sporadic task.

3. a) List the different approaches for scheduling real time system and explain any one of them. **6**

b) Consider a system that has five periodic tasks A, B, C, D, and E and three processor P_1, P_2 and P_3. The periods of A, B and C are 2 and their execution times are equal to 1. The Periods of D and E are 8 and their execution times are 6. The phase of every task is 0. The relative deadline of every task is equal to its Period. **7**
1) Find a feasible schedule of the five tasks on three processors.

OR

4. a) EDF algorithm is not optimal of preemption is not allowed. Justify your answer. **7**

b) Differentiate between dynamic and static systems. **6**

5. a) What is slack stealing? Explain how it improves the average response time of aperiodic jobs. **6**

b) Draw a network flow graph that we can use to find a preemptive cyclic schedule of the periodic tasks $T_1 = (3,1,7)$ $T_2 = (4,1)$ and $T_3 = (6,2,4,8)$. **8**

OR

6. a) Draw and explain the general structure of cyclic schedules. **8**

b) Explain the pros and cons of clock driven schedule. **6**

7. a) **List and explain the different fixed priority scheduling algorithm.** **8**

b) What is the criterion for measuring the performance of the algorithm used to schedule periodic tasks? Explain. **6**

OR

8. a) The periodic task (3, 1) (4, 2) and (6, 1) are scheduled according to RM algorithm. **8**
   a) Draw the time demand functions of the tasks.
   b) Are the task schedulable? Justify your answer.

b) Explain the dynamic priority algorithm. **6**

9. a) What is a simple sporadic server? Explain its operation. **7**

b) List the different ways of scheduling aperiodic jobs and explain the interrupt driven execution with example. **6**

OR

10. a) What is a deferrable server? Explain its operations. **6**

b) A system contains three periodic task : (2.5, 0.5), (3, 1) and (5, 0.5). The system also contains a sporadic server whose period is 4. The server is scheduled with periodic task rate-monotonically. Find maximum execution budget of server so the periodic tasks remain schedulable. **7**

11. a) Explain the different ways of enforcing mutual exclusion and critical section. **7**

b) What is the need of priority inheritance protocol? Explain. **6**

OR

12. a) What is a deadlock? Explain how deadlock can be avoided by means of priority ceiling protocol. **7**

b) What is preemption? Explain non-preemptive critical section. **6**

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