

OR

Q.4 What are flexible applications? What are the various approaches for scheduling of flexible computation? Explain (DCM) algorithm using a suitable example. [16]

UNIT - V

Q.5 (a) Describe "Stack based priority ceiling protocol" for multiple units of resources, with example. [8]

(b) Consider two Jobs J_1 and J_2 . The job J_2 is released at time 1 and job J_1 is released at time 5. Both of the jobs require a mutually exclusive resource. The critical sections of the jobs are as follows: - [8]

$$J_1 = [R; 2]$$

$$J_2 = [R; 5]$$

The priority of job J_1 is higher than J_2 . Show the blocking involved in the schedule of these Jobs.

OR

Q.5 (a) Differentiate between priority ceiling protocol and inheritance protocol. [8]

(b) What is the effect of resource contention? Explain priority inversion problem in critical section. [8]

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Total No of Pages: **4**

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B. Tech. VIII Sem. (Main/Back) Exam., April, 2015
Computer Science & Engineering
8CS4.2 Real Time Systems

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

UNIT - I

Q.1 (a) What is real time system? How it is different from general purpose system. Draw and explain block diagram of RTS. [8]

(b) Explain the working of Radar signal processing system using a suitable diagram. [8]

OR

Q.1 (a) Differentiate between periodic, a periodic and sporadic jobs. Give suitable examples in support of your answer. [8]

(b) Explain the schedulability test for RMS. How would you use it to check whether a given task set is schedulable under RMS or not? Explain with a suitable example. [8]

OR

Q.3 (a) Draw a network flow graph for the task set given below:- [8]

$$T_1 = (4, 1)$$

$$T_2 = (5, 2, 7)$$

$$T_3 = (20, 5)$$

(b) Consider a system of 4 independent periodic tasks - [8]

$$T_1 = (6, 2)$$

$$T_2 = (10, 4)$$

$$T_3 = (12, 3)$$

$$T_4 = (15, 4)$$

(i) Calculate the total utilization of the system.

(ii) Construct an RM schedule for this system in the interval [0, 24] and label any missed deadline.

UNIT - IV

Q.4 Explain the following (in brief):-

(a) Slack Stealing [4]

(b) Deferrable Server [4]

(c) Polling Server [4]

(d) Priority inversion & exchange in server based algorithms. [4]

(b) Explain following terms (in brief):-

(i) Period [1]

(ii) Tardiness [1]

(iii) Release time [1]

(iv) Hyper period [1]

(v) Deadline [1]

(vi) Phase [1]

(vii) Lateness [1]

(viii) Execution time [1]

UNIT - II

Q.2 (a) Explain the reference model of RTS. Differentiate between processors and resources. [8]

(b) What are the functional and interconnection parameters of a job? Explain each one using an appropriate example. [8]

OR

Q.2 (a) What are the different approaches for real time scheduling? Explain precedence graph. [8]

(b) Differentiate between:- [4]

(i) Online Vs offline scheduling [4]

(ii) Dynamic Vs Static system [4]

UNIT - III

Q.3 (a) What are frame size constraints? Give a set of 4 independent periodic tasks. [8]

$$T_1 = (4, 1.0)$$

$$T_2 = (5, 1.8)$$

$$T_3 = (20, 1.0)$$

$$T_4 = (20, 2.0)$$

Find out the appropriate frame size.

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[7000]

(b) Give the schedulability test for RMS. How would you use it to check whether a given task set is schedulable under RMS or not? Explain with a suitable example. [8]

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