Total No. of Questions : 12]

SEAT No. :

P2021

[Total No. of Pages : 3

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B.E. (Information Technology)

REAL TIME SYSTEMS (Theory)

(2008 Pattern) (Elective - III) (Semester - II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Answer any three questions from each section.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***
5) ***Use of Calculator is allowed.***
6) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) Describe any specific real time application. Draw neat block diagram of application. **[8]**

b) What are the varies factor, that are to be consider while estimating the program run time. Explain any two in brief. **[8]**

OR

Q2) a) Describe in brief the effect of the following in estimation the run time of a program: **[8]**

i) A pipelined architecture

ii) Use of cache

b) Explain different issues in real time computing. Explain various characteristics of Real Time System. **[8]**

Q3) a) List down the suitable assumption for preemptive Earliest Deadline First Algorithm. In what way preemptive Earliest Deadline First Algorithm is different than Deadline Monotonic Algorithm.. **[10]**

b) Describe the priority inheritance protocol. Give an example to show how this protocol can lead to deadlock. **[8]**

OR

P.T.O.

Q4) a) Consider: Task 1 = (p1,el) = (2,0.9) **[10]**

Task 2 = (p2,e2) = (5,2.3)

i) Find total processor utilization

ii) Find necessary and sufficient condition

b) How are mode change implemented when the priority ceiling protocol is used to handle the access to critical section. **[8]**

Q5) a) List down and explain the different data typing features that could be useful in a real time programming language. **[6]**

b) Describe the skeleton and optimistic algorithm under the two phase approach to improve predictability of real time transaction. **[10]**

OR

Q6) a) Explain how the two phase locking approach used in pessimistic concurrency control is disadvantage to real time system. How can it be modified to overcome the problem? **[10]**

b) State the three properties that mechanisms must have for exception handling at run time in Ada language. **[6]**

SECTION - II

Q7) a) Explain Virtual Time Carrier Sensed Multiple Access (VTCSMA) algorithms with flow chart. **[6]**

b) Explain the features of Polled Bus Protocol. What happens if two nodes A and B are starting arbitration simultaneously? **[8]**

c) What is Timed Token protocol? How it is implemented. **[4]**

OR

Q8) a) Write a short notes on(Any Two) : **[10]**

i) Stop & Go Multihop Protocol.

ii) Disk Scheduling Algorithms

iii) Resources reservation protocol

b) Discuss the various communication medium used in real time networking.**[8]**

Q9) a) List all the capabilities of RTOS and explain any two of them. **[8]**

b) Draw the block diagram of VxWorks real time operating system and describe its functionality. **[8]**

OR

Q10)a) Draw the block diagram of task management services. Explain the functionality of RTOS Kernals. **[10]**

b) Explain in detail and draw the block diagram of RT Linux. **[6]**

Q11)a) Describe the following structure for hardware redundancy: **[8]**

i) Static Pairing

ii) Shift out Redundancy

b) Explain Byzantine's algorithm for fault tolerance with an example. State the interactive consistency condition. **[8]**

OR

Q12)a) Explain reliability model for hardware redundancy. State reliability model require for permanent fault only. **[8]**

b) Define the following term: **[8]**

i) Hardware fault

ii) Fault Latency

iii) Error latency

iv) Backward error require