Total No. of Questions : 12]

SEAT No. :

P2822

[Total No. of Pages : 3

[5154]-203

B.E. (Information Technology)

REAL TIME SYSTEMS

(2008 Pattern) (Semester - II) (Elective - III) (414450 A)

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 the classification of real time system with suitable example. What are the issue in real time computing? **[8]**

b) What is performability? Explain with suitable example. In what way it is different than traditional measure of performance? **[8]**

OR

Q2) a) Draw and explain basic model of Digital Control Real Time System? **[8]**

b) Draw block diagram for real time computer. Explain various characteristics of Real Time system? **[8]**

Q3) a) Explain the classification of uniprocessor scheduling algorithm. With the help of suitable example explain the RM scheduling algorithm? **[10]**

b) Describe the priority inheritance protocol. What is the advantages of this protocol over the priority inheritance protocol? **[8]**

OR

P.T.O.

Q4) a) Consider: Task 1 =(p1,e1)=(2,0.9) **[10]**

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

i) Find total processor utilization

ii) find necessary and sufficient condition

b) How does the ceiling priority protocol overcome the problem of deadlock that occurs due to priority inheritance? **[8]**

Q5) a) What are the various benefits of packages? **[6]**

b) Explain use of POSIX programming API in Real Time system. With any eight API? **[10]**

OR

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

b) Describe the skeleton and optimistic algorithm under the two phase approach to improve predictability of a real time transaction? **[6]**

SECTION-II

Q7) a) Describe the timed token protocol. Why this protocol is attractive for RTS? **[8]**

b) Explain the VTCSMA protocol using a suitable example. Draw the VCRC trajectory for this example for n = 2 and n = 4. Discuss the performance of this algorithm? **[10]**

OR

Q8) a) Discuss network architecture issues in real time systems? **[10]**

b) What is Stop - and -Go Multihop protocol? **[8]**

Q9) a) With the help of block diagram explain the capability of RT Linux? **[8]**

b) Describe the following capability of real time operating system **[8]**

i) External-Internal Interrupt Handling

ii) Memory management through virtual memory mapping and memory.

OR

Q10)a) List and explain the capabilities of RTOS? **[10]**

b) State the commonly found features of commercial RTOS? **[6]**

Q11)a) How is hardware redundancy implemented through voting and consensus? Explain the working of formalized majority vote. **[8]**

b) Discuss the causes of the failures and describe the types of faults in RTS? **[8]**

OR

Q12)a) Explain the procedure used to implementation of Time Redundancy for Backward Error Recovery. Why check pointing is expensive in memory and time. How it be modified to overcome the problem? **[8]**

b) Explain the Byzantines algorithm for fault tolerance with an example. Also specify the interactive consistency condition. **[8]**