

Total No. of Questions : 12]

SEAT No. :

P1442

[4759]-196

[Total No. of Pages : 3

B.E. (Information Technology)

REAL TIME SYSTEMS

(2008 Course) (Semester-II) (Elective-III) (414450)

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 indicate full marks.*
- 5) Use of Calculator is allowed.*
- 6) Assume suitable data, if necessary.*

SECTION-I

Q1) a) Explain following terms in brief: **[8]**

- i) Periodic and aperiodic tasks.
 - ii) Time constraints in hard and soft RTS.
- b) How can engineers estimate the worst-case run time of a program, given the source code and target architecture? Draw and explain Schematic of a timing estimation system. **[8]**

OR

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

- b) Describe in brief the effect of the following in the estimation of the run-time of the program: **[8]**
- i) Use of Cache.
 - ii) A Pipelined Architecture.

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

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- b) Why Priority inversion mechanism is not suited for real-time applications. Write appropriate solution for this problem. [8]

OR

- Q4)** a) Explain the preemptive Earliest Deadline First(EDF) Algorithm with the help of suitable example. In what way the preemptive EDF is different from RM scheduling algorithm. [10]
- b) Determine which of following tasks is RM schedulable. [8]

Task	Execution Time	Period
1	2	10
2	5	20
3	20	40
4	5	50

- Q5)** a) What are the various benefits of packages? [6]
- b) Explain following policies with respect to task scheduling: [10]
- i) Task Dispatching policy.
 - ii) Entry queuing policy.

OR

- Q6)** a) Describe the Adaptive Earliest Deadline (AED) algorithms used in transaction priorities. State the drawback of AED algorithm. How the Adaptive Earliest Deadline (AEVD) avoid this drawback. [10]
- b) How are timestamps assigned to transaction so that serialization consistency is maintained? Explain with suitable example. [6]

SECTION-II

- Q7)** a) What is the polled Bus Protocol? [8]
- b) Describe the methods of sending messages. [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 locking.

OR

- Q10)** a) List and explain the capabilities of RTOS. [8]
b) State the commonly found features of commercial RTOS. [8]
- Q11)** a) How is redundancy used for fault tolerance? [8]
b) Discuss the causes of the failures and describe the types of faults in RTS. [8]

OR

- Q12)** a) Write short notes on: [8]
i) Time Redundancy.
ii) Information Redundancy.
- b) Describe the following software redundancy methods: [8]
i) N-Version Programming.
ii) Recovery Block Approach.

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