

**Total No of Questions: [12]**

**SEAT NO. :**

**[Total No. of Pages : 2 ]**

**B.E. 2008 (Real Time Systems):414450**

**(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)	What are the various factors that are to be considered while estimating the program run-time in RTS? Describe analysis of source code, drive lower bounds and upper bounds with suitable example	[8]
	b)	Explain different issues in real time computing. Draw block diagram for real time computer.	[8]
		OR	
Q2)	a)	Consider a traffic light controller system. A traffic light will be normally green for G Seconds, yellow for Y seconds, and red for R seconds. During night for certain period of time the intersection will automatically suspend normal services and it will flash yellow. Consider intersection for two way streets i) Find accomplishment level ii) Find hierarchical view performance	[8]
	b)	Describe in brief the effect of following in estimation of run time in a program. 1. Source code 2. Use of cache	[8]
Q3)	a)	Describe the priority inheritance protocol. What are the advantages of this protocol?	[6]
	b)	Why priority inversion mechanism is not suited for real time applications. Write appropriate solution for this problem.	[6]
	c)	How does the priority ceiling protocol overcome the problem of deadlock that occurs due to priority inheritance.	[6]
		OR	
Q4)	a)	State the assumptions made for the implementation of the rate monotonic scheduling algorithm. What is the easy schedulability test for this algorithm?	[6]
	b)	Consider : Task 1 = ( p1,e1)=(2,0.9) Task 2 = (p2,e2)=(5,2.3) i) Find total processor utilization ii) Find necessary and sufficient condition.	[8]
	c)	Explain the classification of Real Time Scheduling with example.	[4]
Q5)	a)	What are the various benefits of packages?	[8]
	b)	What is optimistic concurrency control? Describe the following policies related to the optimistic algorithm in the presence of transaction priorities: i. Sacrifices Policy ii. Wait Policy	[8]

		<b>OR</b>	
Q6)	a)	Explain following policies with respect to task scheduling: a. Task Dispatching policy b. Entry queuing policy	[8]
	b)	Write short notes (any two) a. Hard Real Time Databases b. Disk Scheduling Algorithms c. Maintaining serialization consistency	[8]
		<b>SECTION II</b>	
Q7)	a)	Discuss the various communication medium used in real time networking.	[5]
	b)	Explain different methods of sending messages in real time network	[5]
	c)	Write a short note on any two: 1. Wormhole routing 2. Polled bus protocol 3. Wavelength Division multiplexing Network	[8]
		<b>OR</b>	
Q8)	a)	Write short notes on any two: 1. Timed token protocol 2. Deadline based protocol 3. Hierarchical round robin protocol	[10]
	b)	Explain VTCSMA algorithm with flow chart	[8]
Q9)	a)	List and explain the capabilities of RTOS	[6]
	b)	Explain in detail what is interrupt latency	[4]
	c)	Explain in detail timer function support system in RT Linux	[6]
		<b>OR</b>	
Q10)	a)	Explain in detail capabilities of VXWorks along with specific API for time services	[8]
	b)	Describe which scheduling algorithm is used in RT Linux as against standard Linux	[4]
	c)	Write short note on split interrupt handling.	[4]
Q11)	a)	What do you mean by fault latency? Discuss the causes of failures in real time systems?	[6]
	b)	How the fault types are classified? Discuss output behavior classification.	[10]
		<b>OR</b>	
Q12)	a)	Describe the following structure for hardware redundancy : Any two 1. Static pairing 2. N-modular redundancy 3. Information redundancy	[10]
	b)	Explain exponential distributed fault latency with example	[6]