Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. – SEMESTER – III • EXAMINATION – WINTER 2014

Subject Code: 730203 **Date: 27/11/2014**

Subject Name: Real Time Systems

Time: 02.30 pm – 05.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Differentiate hard and soft real time system. Divide following real time systems into hard and soft RTS with proper justification. (i) Air traffic control system (ii) Automated car assembly plant (iii) Chemical plant control **07**

(b) Define the following terms. **07**
(i) Phase (ii) Absolute deadline (iii) Sporadic task (iv) Offline scheduling (v) Blocking time (vi) Valid schedule (vii) Hyper period

Q.2 **(a)** (i) Justify the statement - No priority driven algorithm is optimal to schedule preemptable jobs on multiple processors. **07**
(ii) Write three conditions to choose the frame size for clock driven Scheduling and find it for a system contains four periodic tasks as following.
T1 (4, 1) T2(5, 1.8) T3(20, 1) T4(20, 2).

(b) Prove that EDF is job level fixed priority algorithm and LST is job level dynamic priority algorithm with suitable example. **07**

OR

(b) Explain the following with suitable example: (a) Slack stealing (b) Job slicing **07**

Q.3 **(a)** For given Periodic task T1(2,0.9) T2(5,2.3) **07**
i) What is the Total utilization of System?
ii) Construct DM Schedule and show missed deadlines if any.

(b) By the help of suitable example, explain following. **07**
1. What is the effect of priority inversion while accessing common resource among multiple jobs?
2. How NPCS can control it?
3. What are pros and cons of NPCS?

OR

Q.3 **(a)** For given Periodic task T1(5,5,3,10) T2(0,7,1,2) T3(0,13,2,5) **07**
i) What is the Total utilization of System?
ii) Construct EDF Schedule and show missed deadlines if any.

(b) Explain priority inheritance protocol with suitable example. **07**

Q.4 **(a)** For given Periodic task T1(4,1) T2(5,2) T3(20,5) **07**
i) What is the Total utilization of System?
ii) Construct RM Schedule and show missed deadlines if any.

(b) What is RTLinux? Explain important features of it. **07**

OR

Q.4 **(a)** For given Periodic task T1(3,6,1) T2(0,4,2) T3(0,5,3) T4(1,3,1) **07**
i) What is the Total utilization of System?

ii) Construct LST Schedule and show missed deadlines if any.

	(b)	Explain issues related with real time database.	**07**
Q.5	**(a)**	Explain different types of networks in real time communication.	**07**
	(b)	Explain locking based concurrency control protocol in real time databases.	**07**

OR

Q.5	**(a)**	Discuss the issues in Distributed Real ï Time Systems.	**07**
	(b)	Explain in detail: (i) RSVP (ii) RETHER	**07**

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