Roll No:

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
REAL TIME SYSTEMS

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.**   **2*10 = 20**

Qno	Questions	CO
(a)	Define real-time system.	1
(b)	Difference between hard and soft Real time systems.	1
(c)	Define priority inheritance and priority inversion.	2
(d)	Compare open system with a close system.	2
(e)	Define Byzantine failures.	3
(f)	Explain how to overcome the blocking of lower priority by higher priority task?	3
(g)	Give the reasons for the message delay in real time communication.	4
(h)	Explain sporadic jobs in real time scheduling,	4
(i)	Distinguish traffic shaping and policing.	5
(j)	List the features of UNIX real time operating system.	5

SECTION B

2. **Attempt any *three* of the following:**   **10*3 = 30**

Qno	Questions	CO
(a)	Differentiate between real time operating system and general purpose operating system. Explain the working of any real time operating system.	1
(b)	Differentiate between fixed priority and dynamic priority algorithms. State and prove the optimality of Least Slack Time(LST) First algorithm.	2
(c)	Compare priority inheritance protocol with priority ceiling protocol. Discuss the pros and cons of each protocol.	3
(d)	In reference to the real time communication explain Virtual Time Carrier Sensed Multiple Access Protocol (VTCSMA) with suitable example.	4
(e)	Discuss which category of concurrency protocol is best suited under what circumstances.	5

SECTION C

3. **Attempt any *one* part of the following:**   **10*1 = 10**

Qno	Questions	CO
(a)	Explain why predictability is an important requirement of a real time systems? Discuss different techniques to enforce this requirement.	1
(b)	What are the characteristics of real time system? Also explain the timing constrains of real time system.	1

PAPER ID-420520
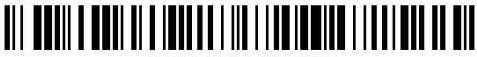
Roll No: | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
REAL TIME SYSTEMS

4. **Attempt any *one* part of the following:** **10 *1 = 10**

Qno	Questions	CO
(a)	Can we consider Earliest Deadline First (EDF) as a dynamic priority scheduling algorithm for real time task? Justify your answer.	2
(b)	Explain the characteristics of periodic, aperiodic and sporadic real time tasks.	2

5. **Attempt any *one* part of the following:** **10*1 = 10**

Qno	Questions	CO
(a)	Explain important features and governing rules of Preemption Ceiling Protocol and differentiate it with Priority Ceiling Protocol.	3
(b)	Compare Priority Inheritance protocol with priority ceiling protocol. Discuss the pros and cons of each protocol.	3

6. **Attempt any *one* part of the following:** **10*1 = 10**

Qno	Questions	CO
(a)	Discuss various network architecture issues in real time communications.	4
(b)	What are the different types of issues that a resource reservation protocol must deal with in a multicast environment? Explain.	4

7. **Attempt any *one* part of the following:** **10*1 = 10**

Qno	Questions	CO
(a)	Define temporal parameter of real time workload. Explain different types of temporal parameters of a job.	5
(b)	Explain the data structure of a real time kernel.	5