



R20 Regulation

Subject code: 3E8DG

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VIII Semester Supplementary Examinations, November 2025

EMBEDDED REAL TIME OPERATING SYSTEMS (ECE)

Maximum Marks: 70

Date: 27.11.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	Bloom Tx
1	Name some hardware components used in embedded system.	2M	CO1	BT1
2	Compare the characteristics of tasks and process in operating systems.	2M	CO1	BT2
3	What are the scheduling criteria to select the "best" scheduling algorithm for a particular situation and environment?	2M	CO2	BT2
4.	What happens if time quantum is too large in round-robin scheduling?	2M	CO2	BT2
5	Mention some of the ways to avoid deadlock.	2M	CO3	BT1
6	What is the difference between reader writer problem and producer-consumer problem?	2M	CO3	BT2
7	List out the features of Micro C/OS-II.	2M	CO4	BT1
8	What are the bottlenecks faced by Embedded Industry?	2M	CO4	BT1
9	Draw digital camera hardware architecture.	2M	CO5	BT2
10	List out the skills required for an embedded system designer.	2M	CO5	BT1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
11	a) Explain nonfunctional requirements to design a system.	5M	CO1	BT2
	b) Explain the requirements analysis of a GPS moving map.	5M		
OR				
12	a) List the features of RTOS. Describe in detail about multiprocessing and multitasking with example.	5M	CO1	BT2
	b) Summarize about multi task and multi process with respect to embedded systems.	5M		
13	Describe in detail about Non-preemptive scheduling with an example	10M	CO2	BT3
OR				
14	a) Consider the set of 6 processes whose arrival time and burst time are given below	5M	CO2	BT3

Process Id	Arrival time	Burst time
P1	0	4
P2	1	5
P3	2	2
P4	3	1
P5	4	6
P6	6	3

If the CPU scheduling policy is Round Robin with time quantum = 2, calculate the average waiting time and average turnaround time.

b) Explain about Priority Scheduling with advantages and disadvantages.

		5M		
15	Outline in detail how shared memory and message passing mechanisms are used for inter process communication.	10M	CO3	BT3
	OR			
16	a) Summarize different task communication synchronization issues encountered in inter process communication. b) Write about a critical section using semaphores in operating system.	5M 5M	CO3	BT4
17	What are features of VxWorks and explain detail about different functions used in VxWorks RTOS.	10M	CO4	BT3
	OR			
18	Explain the different types of trends in embedded systems	10M	CO4	BT3
19	Give a detailed account about various design process in Automatic Chocolate Vending Machine.	10M	CO5	BT3
	OR			
20	Explain briefly about Sending application layer byte streams on a TCP/IP network.	10M	CO5	BT3