R20 Regulation *Subject code:20THA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2025

EMBEDDED SYSTEMS DESIGN

CSE(DS)

Maximum Marks: 70 Date: 29.05.2025 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.
4. Each question carries 10 marks and may have a, b, c as sub questions.

Part-A

	All the following questions carry equal marks. 10X2M=20 Marks	Marks	CO	BTL
1	What is General purpose computing system?	2M	1	L1
2	Classify the embedded systems.	2M	1	L1
3	What are the components of embedded system?	2M	2	L1
4	Differentiate microprocessor & microcontroller.	2M	2	L1
5	Write the features of RS232C interface.	2M	3	L1
6	Write a short note on Embedded OS Trends.	2M	3	L1
7	Define operating system.	2M	4	L1
8	Define task scheduling.	2M	4	L1
9	What is priority inversion?	2M	5	L1
10	What is context switching?	2M	5	L1

Part-B

	Answer All the following questions. (5X10M=50Marks)	Marks	CO	BTL
11	What is the operational quality attribute? Explain the important operational quality attributes to be considered in any embedded system design?	10M	1	L2
	OR			
12	What is an embedded system? Distinguish between General purpose computing system and embedded system?	10M	1	L2
13	Explain about ASIC, ASSP & COTS in detail?	10M	2	L2
	OR			
14	Explain the components of typical embedded systems in detail with neat diagram?	10M	2	L2
15	Explain the sequence of operation for communicating with SPI bus device with neat diagram	10M	3	L2
	OR			
16	Explain the different on-board communication interfaces in brief.	10M	3	L2
17	Explain different types of preemptive scheduling algorithms. State merits and demerits of each.	10M	4	L2
	OR			
18	What is process control block PCB ? Explain the structure of PCB.	10M	4	L2
19	What is semaphore? Explain the different types of semaphores. Where it is used?	10M	5	L2
	OR			
20	Explain Race Condition in detail, in relation to shared resource access.	10M	5	L2