



R22 Regulation

Subject code: 4P7DC

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

**B.Tech VII Semester Regular Examinations, November 2025**

**EMBEDDED SYSTEM DESIGN**

(ECE)

Maximum Marks: 60

Date: 28.11.2025

Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.  
 2. Part A is compulsory which carries 10 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, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BloomTx
1.a)	Define an Embedded System.	1M	1	L1
b)	Write the difference between embedded system and general-purpose system.	1M	1	L2
c)	Differentiate ASIC and PLD.	1M	2	L2
d)	What is the need of an embedded firmware?	1M	2	L1
e)	What are the different development platform trends ?	1M	3	L1
f)	What are onboard communication interfaces ?	1M	3	L1
g)	What is thread?	1M	4	L1
h)	Define deadlock?	1M	4	L1
i)	What are the advantages of RTOS?	1M	5	L1
j)	What is task synchronization?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx
2	Explain the Operational Quality attributes in the embedded system development context.	10M	1	L3
OR				
3	Explain the different classifications of embedded systems.	10M	1	L2
4	Explain Sensors and Actuators in detail with examples.	10M	2	L2
OR				
5	a) Describe the purpose of a Real Time Clock in an embedded system, explain in detail.	5M	2	L2
	b) Explain the function of Watchdog timer in an embedded system.	5M		L2
6	Explain the difference between I2C and SPI communication interface.	10M	3	L2
OR				
7	a) Explain the major trends in processor architecture in embedded development.	5M	3	L2
	b) What are the problems faced by the embedded devices industry?	5M		L1

8	Explain the cooperative scheduling and round robin scheduling with a suitable diagram.	10M	4	L3
OR				
9	List out various problems associated with semaphores. Discuss with suitable examples about priority inversion and dead lock situations.	10M	4	L2
10	Explain about i) Serial port device driver ii) Message passing communication system	5M 5M	5	L2
OR				
11	a) Explain the concept of inter task communication offered by RTOS? b) Define RTOS and explain its need in Embedded Systems.	5M 5M	5 5	L2 L1