R22 Regulation *Subject code: 4P8DC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VIII Semester Regular Examinations, May 2026

Embedded C

(ECE)

Maximum Marks: 60 Date:04.05.2026 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	BTL
1.a)	Define an embedded system.	1	1	1
b)	Explain the role of operating system in embedded systems.	1	1	2
c)	State switch bounce.	1	2	1
d)	Mention the purpose of reading switches in embedded systems.	1	2	1
e)	Describe MAIN.H.	1	3	1
f)	State modular programming.	1	3	1
g)	Name the modes available in the TMOD register.	1	4	1
h)	State the need for real-time systems.	1	4	1
i)	What is an intruder alarm system.	1	5	1
j)	Explain the role of sensor in embedded system.	1	5	2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Describe the architecture of 8051 with a neat diagram and explain its components. b) Examine the selection of a processor, programming language, and operating system for embedded systems	5M 5M	1	2
	OR			
3	a) Explain the memory organization of 8051 using a suitable diagram. b) Construct a simple Super Loop program for an embedded application.	5M 5M	1	2
4	a) Illustrate switch interfacing circuit with pull-up resistor and describe its operation. b) Develop a program for reading and writing bits using bitwise operators.	5M 5M	2	2
	OR			
5	a) Describe various techniques for reading bits from port pins. b) What is switch bounce and explain it with an example.	5M 5M	2	2
6	a) Interpret role of header files (MAIN.H, PORT.H) in structuring code. b) Describe the key components typically included in a MAIN.H file.	5M 5M	3	2

	OR			
7	a) Demonstrate the use of header files in reconstructed Hello World example with a program. b) Examine advantages of structured programming in Embedded C.	5M 5M	3	3
8	a) Differentiate hardware delay with software delay, highlighting advantages of hardware delay. b) Explain the purpose and working of THx and TLx registers in timer operations.	5M 5M	4	2
	OR			
9	a) Evaluate timeout mechanism in embedded systems. b) Distinguish loop timeout and hardware timeout mechanisms.	5M 5M	4	2
10	a) Discuss software architecture of intruder alarm system with diagram. b) Develop the sequence of operations in an intruder alarm system from detection to alarm activation.	5M 5M	5	2
	OR			
11	a) Analyze the key software and hardware components used in the intruder alarm system case study. b) Evaluate the steps involved in running and testing the intruder alarm program.	5M 5M	5	3