*R20 Regulation* *Subject code: 3O6DA*

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

**B.Tech VI Semester Supplementary Examinations, April 2026**

## EMBEDDED SYSTEMS

*(CSE(DS))*

*Maximum Marks: 70* Date: 23.04.2026 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, d as sub questions.**

Part-A

| All the following questions carry equal marks (10X2M=20 Marks) | | Marks | CO | BTL |
|---|---|---|---|---|
| 1 | Define an Embedded System. | 2M | 1 | L1 |
| 2 | Classify the embedded systems. | 2M | 1 | L1 |
| 3 | List the components used as the core of an embedded system. | 2M | 2 | L1 |
| 4 | Differentiate microprocessor & microcontroller. | 2M | 2 | L1 |
| 5 | Write about RS232C interface. | 2M | 3 | L1 |
| 6 | What is the bottlenecks in embedded system. | 2M | 3 | L1 |
| 7 | What is the kernel space and user space? | 2M | 4 | L1 |
| 8 | What is process life cycle? | 2M | 4 | L1 |
| 9 | Define message passing. | 2M | 5 | L1 |
| 10 | Define task synchronization. | 2M | 5 | L1 |

Part-B

| Answer All the following questions. (5X10M=50Marks) | | Marks | CO | BTL |
|---|---|---|---|---|
| 11 | Distinguish between General purpose computing systems and embedded systems. | 10M | 1 | L2 |
| | OR | | | |
| 12 | What is the operational quality attribute? Explain the important operational quality attributes to be considered in any embedded system design? | 10M | 1 | L2 |
| 13 | What is embedded firmware? What are the different approaches available for embedded firmware development? | 10M | 2 | L2 |
| | OR | | | |
| 14 | Explain about ASIC, PLDs & COTS in detail. | 10M | 2 | L2 |
| 15 | Explain Development Language Trends in embedded systems. | 10M | 3 | L2 |
| | OR | | | |
| 16 | Describe the processor trends in embedded system. | 10M | 3 | L2 |
| 17 | Explain the Process life cycle in detail with neat diagram. | 10M | 4 | L2 |
| | OR | | | |

| | | | | |
|---|---|---|---|---|
| 18 | Three processes with process IDs P1, P2, P3 with estimated completion time 10,5,7 milliseconds respectively enter the ready queue together in the order of P1, P2, P3(assume only p1 is present in the ready queue when scheduler picks it up& P2, P3 entered ready queue after that). Process P4 with estimated execution completion time 2 milliseconds enters the ready queue after 5 milliseconds of scheduling P1. Calculate waiting time and Turn Around Time (TAT) for each process and the average waiting time and average TAT in the LIFO scheduling(Non-preemptive scheduling). | 10M | 4 | L2 |
| 19 | Explain Race, Deadlock& starvation Conditions in detail, in relation to shared resource access. | 10M | 5 | L2 |
| | OR | | | |
| 20 | What is mutual exclusion in the process synchronizationcontext? Explain the different mechanisms for mutual exclusion. | 10M | 5 | L2 |