TE(ECS) / SEM VI / R-19 / SH-22 / 03-12-24

Paper / Subject Code: 89321 / Embedded Systems and RTOS

QP CODE: 65025

(3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No. 1 is **Compulsory**.
(2) Attempt any **three** questions out of the remaining **five**.
(3) Each question carries 20 marks and sub-question carry equal marks.
(4) Assume suitable data if required.

1. Solve **any 4** **(20)**
   (a) What is need of RTOS in embedded systems? **(5)**
   (b) Compare RS -232 and RS-485 (any four points). **(5)**
   (c) Compare White-Box and Black-Box Testing. **(5)**
   (d) Exmaine the significance of Task Control Block **(5)**
   (e) Define Interprocess Communication. **(5)**

2. (a) Draw and explain waterfall model used in embedded product design life cycle (EDLC) **(10)**
   (b) Analyze the significance of Low Power modes in Cortex-M3 **(10)**

3. (a) Elaborate all the functions of RTOS kernel. **(10)**
   (b) Explain the following terms w.r.t Embedded systems: Code Density, Memory protection, Wake-up Interrupt controller. **(10)**

4. (a) Explain the conditions in which Priority Inversion takes place and explain how this problem can be resolved. **(10)**
   (b) What is an Embedded system? Discuss its classification with example and give characteristics for the same. **(10)**

5 (a) Discuss difference between RISC and CISC cores. Which of them is used in Embedded systems and why? **(10)**
   (b) Design a suitable program model to design seat belt warning system for a four wheeler. **(10)**

6. Write short notes on **(any two):** **(20)**
   a. CAN bus
   b. Rate Monotonic Scheduling
   c. Hardware-Software Co-Design
   d. Zig-bee and Bluetooth

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