

Code: EC7T4A

**IV B.Tech - I Semester –Regular / Supplementary Examinations  
JANUARY 2022**

**EMBEDDED AND REAL TIME SYSTEMS  
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

**PART – A**

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22 M

1.

- a) What is purpose of embedded System?
- b) List any five sensors and actuators used in embedded system.
- c) Demonstrate the characteristics of embedded system.
- d) List any five hardware software tradeoffs.
- e) Demonstrate the need of ROM and RAM devices in embedded systems.
- f) What are the differences between serial communication and parallel communication?
- g) Draw I2C bus structure and write two applications.
- h) Demonstrate the principle of IrDA communication protocol.
- i) What is significance of class diagram in embedded system design process?
- j) Demonstrate the importance of processors in complex embedded systems.

k) What are the fundamental issues in hardware software co design?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Demonstrate the cores used in embedded system design. 8 M

b) Classify the communication interfaces used in embedded system. Give an example for each category. 8 M

3. a) Explain the computation models used in embedded design. 8 M

b) Demonstrate the quality attributes of Embedded System with example. 8 M

4. a) Draw the interface diagram of RS232 and explain its functionality. 8 M

b) What is timer? How timer performs count operation? Explain. 8 M

5. a) Explain the CAN bus protocol standard with neat sketch. 8 M

- b) Define Internet Embedded system. Differentiate ISA, PCI, UDP and 802.11 protocols with respect to speed, distance and applications. 8 M
6. a) Explain the stages in embedded system design process with an example. 8 M
- b) With neat sketch, explain the hardware and software architecture of adaptive cruise control system in car. 8 M