

Time : 3 Hrs

Marks: 80

**Instructions**

1. Q1 is compulsory.
2. Attempt any three out of the remaining five questions.
3. Assume suitable data.

Q1. Attempt any **FOUR**.

- a) What is watchdog timer, its use and typical application in an embedded system. (20)
- b) Explain I2C in brief.
- c) Explain various types of operating systems.
- d) Differentiate between embedded systems and general computing systems.
- e) Explain pre-emptive scheduling in RTOS.
- f) What is process and various states that a process can lie in an embedded system? (10)

Q2.a) Explain various steps of design of digital camera using microcontroller and CCDPP. (10)

- b) Describe any two wireless communication means for embedded systems. (10)

Q3. a) Describe design metrics and optimization challenges for embedded systems. (10)

- b) What is interprocess communication (IPC) in RTOS? Explain various IPCs. (10)

Q4. a) Define finite state machine (FSM). Draw and explain FSM for automatic chocolate vending machine. (10)

- b) Explain various task scheduling models in RTOS. (10)

Q5. a) Write a note on program models: DFG, FSM, Petri-net, UML. (10)

- b) Compare RISC and CISC architectures along with advantages and disadvantages. (10)

Q6. a) How to choose RTOS for a given embedded system application. (10)

- b) What is CAN protocol. Describe topology and frame formats with significance of fields. (10)

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