C·O·E·P

Electrical Department

B·Tech

Embedded Systems

End Semester Exam – 60 marks

There are 2 sections. Section 1 contains five theory questions of five marks each. Answer **all five**. Section 2 contains Design related questions , 7 questions , five marks each. Answer **any five**.

1. **Theory Section: Answer All five** : 5x5 marks
    1. Discuss the Development Process for an embedded system.
    2. Discuss the SPI peripheral of AVR with timing and block diagrams.
    3. Discuss how inter-task communication happens with Queues in an RTOS.
    4. Discuss FSM and its types with examples.
    5. Discuss how Processor BitSize affects code size. If we double the number of available instructions , how will code size be affected. Discuss with statistics.
2. **Design Section : Answer any five** : 5x7 marks
    1. Design using pseudo-assembly, a Queue of size 100B.
    2. Design using Pseudo-C , a task scheduler using JIT.
    3. Show at a Block Diagram level , the organization of a hierarchical master-slave system.
    4. Design at a Block Diagram Level, the control mechanism for a Mouse/KeyBoard.
    5. Design a system using FSM , a Chewing gum dispenser . Each chewing gum is INR 1 and the machine accepts 10p,20p,25p,and 50 p.
    6. Design a system using FSM a lift controller for 6 floors and 2 lifts. Each floor has a single pushbutton to call the lift. Passengers option is given priority over external requests.
    7. Design at a Block Diagram level , A Sound Card which can stream data from a PC port (say Serial) and convert it to Audio. Sound can be upto 44.1Khz 16 Bit.