

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2082 Chaitra

Exam.	Regular (New Course)		
Level	BE	Full Marks	60
Programme	BEI	Pass Marks	24
Year / Part	III / I	Time	3 hrs.

Subject: - Embedded System (ENEX 302)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. Define embedded system with its key characteristics. Differentiate between a simulator and an emulator in an embedded system development. [2+4]
2. a) Differentiate between application specific instruction set processor and general purpose processor. [4]
b) List and briefly explain any four operational quality attributes and any four non operational quality attributes of an embedded system. [4]
3. What are the benefits of using Custom Single Purpose Processor (CSPP) over General Purpose Processor (GPP)? Describe the design steps for designing a CSPP with a suitable example. [2+6]
4. a) What are the two different configurations of seven segment display? List the important operational features of 8051 microcontroller. [2+2]
b) Generate a square wave of 50% duty cycle in P 2.5 pin of 8051 microcontroller using assembly language programming. The crystal frequency is 11.0592 MHz. Use timer 0, mode 1 to generate the time delay of 20 ms. [8]
5. a) Define deadlock. What are the Coffman's conditions for deadlock? [2+4]
b) Three processes with process IDs P1, P2, P3 with estimated completion time 10, 5, 7 ms and priorities 1, 3, 2 (0-highest priority, 3-lowest priority) respectively enters the ready queue together. A new process P4 with estimated completion time 6 ms and priority 0 enters the Ready queue after 5 ms of start of execution of P1. Calculate waiting time, turn around time, average waiting time and average turn around time in priority based preemptive scheduling. Assume all the processes contain only CPU operation and no I/O operations are involved. [6]
6. Draw a state diagram for a sequence detector for the sequence 1001 and then write a VHDL code based on the state diagram. [8]
7. Explain the steps involved in manufacturing of an IC. [6]
