

B.E. Sixth Semester (Computer Technology) (C.B.S.)  
**Embedded System Design**

P. Pages : 2

Time : Three Hours



KNT/KW/16/7404

Max. Marks :80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.
  10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What are embedded system and explain the challenges encountered during Design. 7
- b) Explain design cycle in the development phase for an embedded system. 6

**OR**

2. a) What are the main components of an embedded system? Give the advantages and application of embedded system. 6
- b) Give difference between microprocessor and microcontroller. 4
- c) What is meant by In-circuit emulator? 3
3. a) Write short note on **any four** of the following: 8

- |                  |            |
|------------------|------------|
| i) Semaphores    | ii) Socket |
| iii) Pipes       | iv) Signal |
| v) Message queue |            |

- b) Give the solution for shared data problem and explain. 5

**OR**

4. a) What is meant by task? Describe different states of task. 7
- b) Explain mailbox functions and give different types of mailbox. 6
5. a) How Real time operating system differs from a Normal operating system? Why RTOS is necessary in embedded system? 7
- b) Explain different memory managing strategy for a system. 7

**OR**

6. a) Explain Real time operating system (RTOS) services in detail. **5**  
b) What are the different common scheduling model used by schedulers? Also explain cyclic and Round Robin with Time slicing scheduling model. **9**
7. a) Explain architecture of 8051 Microcontroller with the help of neat sketch. **9**  
b) Explain Timer/counter of 8051 in detail. **4**

**OR**

8. a) Explain following loop and jump instruction of 8051. **6**  
i) JZ ii) JNC  
iii) LJUMP
- b) Write and explain different addressing modes supported by 8051 microcontroller. **7**
9. a) How is serial data communication achieved in 8051 microcontroller? **7**  
b) Discuss the concept of Interrupt Vs. polling. **6**

**OR**

10. a) Draw and explain external hardware interrupts. **7**  
b) Explain the following register of 8051 used for serial communication. **6**  
i) SBUF ii) SCON.
11. a) Describe how to interface a stepper motor to the 8051. **7**  
b) Describe operation modes of LCD and explain its pins - VCC, VSS, VEE, R/W read/write, RS, register select. **7**

**OR**

12. a) Explain : **6**  
i) INTR  
ii) Vin (+) and Vin (-)  
iii) Vref/2
- b) Explain basic idea of 8051 interfacing the keyboard to 8051 and also draw the flowchart for detection and identification of key activation. **8**

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