M.E. First Semester (Information Technology) (Full Time) (C.G.S.)

# 13421 : Real Time Embedded System Design : 1 NMEF 4

P. Pages : 2 | **AW - 3744**

Time : Three Hours | Max. Marks : 80

Notes : 1. Assume suitable data wherever necessary.
2. Use of pen Blue/Black ink/refill only for writing the answer book.

**1.** a) What do you mean by task scheduling ? Explain diff$^{n}$ task scheduling algorithms. 7

b) Explain : 7
i) Message Queue ii) Mutex

**OR**

**2.** a) Explain the architecture of the Kernel for embedded operating system. 7

b) What is a semaphore ? Explain its role in synchronization. 7

**3.** a) Explain the PIC 7
i) WREG register ii) FILE register

b) What is a directive ? Explain the assembler directive of PIC. 6

**OR**

**4.** a) Explain the PIC 18 status register. 7

b) Describe the steps for executing an interrupt in PIC. 6

**5.** a) Write a PIC 18 program to get a byte of data from Port C. If it is less than 100 send it to Port B, otherwise send it to Port D. 7

b) Explain the following instructions 6
i) BNZ ii) BCF iii) RCALL

**OR**

**6.** a) List the different register of Timer O of PIC 18. Explain the TOCON register. 6

b) Write a program to transfer the letter 'G' serially at 9600 baud continuously. Use 8bit data and 1 stop bit. Assume XTAL = 10 MHz 7

**7.** a) Explain the general structure of cyclic schedules. 7

b) Write the algorithm for constructing static schedule. 7

**OR**

| | | | |
|---|---|---|---|
| **8.** | a) | What is slack stealing ? Explain how the average response time of operiodic jobs can be improved by this technique. | **8** |
| | b) | Explain the pros and cons of clock driven scheduling. | 6 |
| **9.** | a) | Explain the RM algorithm for assigning fixed priority. | 7 |
| | b) | Compare and contrast fixed priority and dynamic priority algorithm. | 6 |

**OR**

| | | | |
|---|---|---|---|
| **10.** | a) | Explain the schedulability test for fixed priority tasks with short response time. | 7 |
| | b) | Explain the LST dynamic priority algorithm. | 6 |
| **11.** | a) | Explain schedulability of fixed priority systems containing deferrable server. | 7 |
| | b) | Explain constant utilization server algorithm. | 6 |

**OR**

| | | | |
|---|---|---|---|
| **12.** | a) | What are sporadic jobs ? Explain schedulability of sporadic jobs in deadline driven system. | 7 |
| | b) | Explain the total bandwidth server algorithm. | 6 |

**********