(1st half.11-AM(m)

Con. 3158-11.

μc Sem VI

(REVISED COURSE)

RK-2673

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any four questions out of remaining six.
(3) Assume suitable data if necessary.

1. Design a microcontroller based system with following specifications :— 20
   (a) CPU – 8051
   (b) 16k × 8 Data RAM
   (c) 16k × 8 Program Memory
   (d) One 8-bit simple I/p port and second 8-bit bi-directional port.
   Draw memory map and interfacing diagram.

2. (a) Explain different modes of Timers in 8051. Explain any two modes in detail. 10
   (b) Explain the features of 8051 micro-controller and explain in detail the banking structure. 10

3. (a) Explain the following instructions of 8051 :— 10
      (i) MOVC A, @DPTR
      (ii) CPL A
      (iii) SWAP A
      (iv) MOV @R;, A
      (v) CJNE A, # data, ref
   (b) Write a program to transfer message "YES" serially at 9600 baud, 8-bit data, 1 stop-bit. Repeat forever. 10

4. (a) Explain the internal block-diagram of 8051 micro-controller with a neat block-diagram. 10
   (b) Explain in brief TCON, TMOD, SCON, IE-register with neat-labelled format. 10

5. (a) Define 'Embedded System'. Draw a neat block-diagram of an embedded system explaining different hardware components. 10
   (b) Explain the concept of "ROM-image" and explain in detail with a neat labelled block-diagram :— 10
      (i) Software in processor specific Assembly language architecture
      (ii) Software in high-level language architecture.

6. (a) Explain the terms w.r.t. Embedded system :— 10
      (i) Array – data structure
      (ii) Circular queue – data structure
      (iii) Queue – data structure
      (iv) List – data structure.
   (b) Differenciate between :— 10
      I2C, CAN and USB busses.

7. Write short notes on the following :— 20
   (a) Power-saving modes of 8051
   (b) Deadline and Interrupt latency
   (c) Bit-addressable area for 8051
   (d) Device-drivers