(13)

Total No of Questions: [12] *SEAT NO. :* [ ]

[Total No. of Pages : 2]

T.E. (Electronic Engg.)(Semester-II)Examination, May/June-2014

MICROCONTROLLERS

(2008 Course)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right side indicate full marks.*
4) *Use of Calculator is allowed.*
5) *Assume Suitable data if necessary*

SECTION I

Q1) a) Write difference between Van Newman and Harvard Architecture. [6]

b) Interface 8 K EPROM and 8 KRAM to 8 bit microcontroller using Suitable 3:8 decoder such that, following addresses is generated. [10]

1) EPROM starts from 0000H
2) RAM starts from 4000H

Show all control lines and address map.

OR

Q2) a) Draw and explain the architecture of 8 bit microprocessor [8]

b) Draw and explain Architecture of 8051 microcontroller [8]

Q3) a) Draw and Explain the Pin Diagram of 8051 . [8]

b) Explain internal RAM structure of 8051. [8]

OR

Q4) a) Explain the following instruction of 8051 with suitable example [8]

i. RRA ii. DJNZ iii. XCHD iv. SWAP A

b) A few unsigned integers are stored from the location 31H onwards of the internal data memory area. Arrange this integer in ascending order. The number of terms of the array is available in the location30H. Store the arranged integer from 31H itself. [8]

Q5) a) Draw an interfacing diagram of steeper motor with port 1 of 8051 microcontroller and write an assembly language program to rotate stepper motor for clockwise and anticlockwise 360 degree rotation continuously [9]

b) Draw the interface diagram of 16x2 LCD with 8051. Write a program to interface 16x2 LCD with 8051 and display the name "Mumbai " on second line at first position on LCD [9]

OR

Q6) a) Draw an interfacing diagram to interface 4 x 4 keypad with 8051 and write an ALP to check key pressed with key debounce. [9]

b) Draw an interfacing diagram to interface DAC 0808 with 8051 and write an ALP to generate saw tooth wave continuously. [9]

SECTION II

Q7) a) Explain the CAN Protocol [9]

b) Explain the following buses in detail [9]

i) RS-232 ii) RS-485

OR

Q8) a) State features of I2C bus and explain the following conditions: [9]

i) Start

ii) Stop

iii) ACK.

b) Write an ALP to transfer message serially " UNIVERSITY OF PUNE" at 9600 baud rate, 8 bit data, 1 start and stop bit continuously. Explain how to calculate baud rate [9]

Q9) a) Draw an interface diagram of LED with PORT B of PIC 18FXX and an embedded C program for flashing of LED. [8]

b) Explain in detail program memory and data memory of PIC 18FMicrocontroller [8]

OR

Q10) a) Draw and explain the architecture of ATMEGA 32. [10]

b) Draw and explain the status register of PIC Microcontroller [6]

Q11) a) Explain the working of stepper motor. Draw an hardware interfacing of stepper motor with 8051 microcontroller and write ALP to run the stepper motor in any one direction at alternately slower and faster speeds [10]

b) Explain the following terms. [6]

a) RTD b) Thermocouple c) IC temperature sensor

OR

Q12) a) Design 8051 / PIC microcontroller based system for control of ROBOT in forward , reverse , left and right direction. The direction of ROBOT is controlled by a four different keys one for each i.e. forward, reverse, left and right direction. Draw appropriate interface circuitry, flow chart and write a program of ROBOT to control direction using four different keys one for each direction i.e. forward , reverse , left and right. [16]