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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; May/June - 2018

Microprocessors and Microcontrollers

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. With a neat block diagram, describe the architecture of 8086 microprocessor. 10

b. Given [BX] = 2520, [DT] = 1130, displacement = 1230 and [DS] = 1000. Determine the effective address and physical address (wherever applicable) for the following addressing modes : 10

(i) Direct (ii) Register indirect using BX (iii) Register relative using BX

(iv) Based-Indexed (v) Based Indexed relative

2 a. Explain the function of following pins of 8086 processor : 10

(i) $\overline{S}_2, \overline{S}_1, \overline{S}_0$ (ii) QS_1, QS_0 (iii) ALE (iv) $\overline{LOCK}$ (v) $\overline{DEN}$

b. Define Memory Segmentation and list its advantages. 5

c. Briefly explain the Stack operation in 8086 processor. 5

UNIT - II

3 a. Describe the following instructions with examples : 12

(i) DAS (ii) BTR (iii) SAR

(iv) IMUL (v) RCR (vi) CMPS

b. Write an ALP to check whether the given data is even/odd, if even display 'EVEN' else display 'ODD'. 8

4 a. Explain the functional units of 80386 processor with the help of a neat block diagram. 10

b. Explain in brief the internal structure of the pentium pro-microprocessor with necessary diagram. 10

UNIT - III

5 a. Write the diagram of PSW register in 8051 microcontroller and explain each flag with example. 10

b. Explain the architectural features of 8051 microcontroller with the help of a neat block diagram. 10

6 a. Explain the various addressing modes of 8051 with example. 10

b. Explain the function of following instructions of 8051 with example : 10

(i) ANL A, direct (ii) DAA (iii) CJNE A, R_r, addr

(iv) SJMP raddr (v) DIV AB

Contd…2

UNIT - IV

7 a. Explain the structure and function of following register of 8051:
(i) TMOD (ii) SCON. 10

b. Develop an ALP to generate the square wave on P1.7 with ON period of 1 ms and OFF period of 2 ms using XTAL = 11.0592 MHz. 10

8 a. Explain all four modes of timer with relevant diagrams. 10

b. Develop an ALP for 8051 which checks whether the given byte is 2-out-of-5 code or not. If yes send 00 on port 0, else send FF on port 0. 10

UNIT - V

9 a. Consider that a switch is connected to P2-3, if status of switch is closed send 'HELLO' serially and if the status is open send 'THERE' serially assuming XTAL = 11.0592 MHz, baud rate of 9600, 8-bit data and one stop bit. 10

b. With the help of timing diagram, explain the mode 0 serial data communication in 8051. 10

10 a. Interface a LCD module to 8051 and write an ALP to display 'HELLO THERE'. 10

b. Sketch and discuss the interface of a 4 x 4 keyboard using I/O port of 8051. 10

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