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

(An Autonomous Institution affiliated to VTU, Belagavi)
Fourth Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; May/June - 2018
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, explain the Harvard architecture.	6
b.	Compare RISC and CISC CPU architecture.	6
c.	Write down the block diagram of 8051 and explain the special function registers.	8
2 a.	Write the difference between microprocessor and microcontroller.	6
b.	Explain serial communication mode supported by 8051.	6
c.	Illustrate the I/O port structure of 8051.	8

UNIT - II

3 a. Explain the operation of following constructions :

   i) MOV A, @R1   ii) MOV DPTR # 1456H   iii) XCH A, @R0   6

   iv) ORL A, 20H   v) CLR A   vi) XRL A, #50H

   b. Write an ALP to transfer a set of three bytes stored starting from 20H onwards to the location starting from #30H.   6

   c. Explain the various bit level logical constructions in 8051.   8

4 a. What is addressing mode? Explain any three addressing mode with example.   6

   b. Explain the function of following constructions with examples :   6

   i) SWAP A   ii) RRC   iii) PUSH B

   c. Write an ALP to exchange the content between memory locations 20H onwards with 30H onwards for four bytes of data.   8

UNIT - III

5 a.	Write an ALP to count number of ones and zeroes in a number.	8
b.	Explain CALL instruction with example.	6

5 c. Explain the operation of following instructions with example :   6

   i) MUL AB   ii) DIV AB   iii) DAA

6 a. Write an ALP to find the maximum number from a given 8-bit ten numbers.   8

   b. Explain the following jump operation :   6

   i) JNC LABEL2   ii) JNB P1.6 LABEL1   iii) DJNZ 40H, LABEL1

   c. Write an ALP to find factorial of a number.   6

UNIT - IV

7 a. Explain various modes of timer operation.   6

b. Explain the steps involved in mode-2 operation of timer.   8

c. Write a program to generate a square wave of 2 kHz on port pin 1.0. Assume crystal frequencies as 11.0592 MHz.   6

8 a. Illustrate content of TMOD register.   6

b. What is difference between timer and counter? Explain with examples.   8

c. Write ALP for 8051 such that LED connected to P1.0 flash at 0.5 s, when P2.0 goes high. Use Jumper 0 for delay.   6

UNIT - V

9 a. Compare synchronous and asynchronous method of serial communication.   6

b. Write an ALP to transfer '*M*' serially at 9600 and baud rate continuously.   8

c. Explain format of SCON register.   6

10 a. Write ALP to glow LED for a fraction of second, when external interrupt INTO is activated.   6

b. With a help of vector table, explain the various interrupts in 8051.   8

c. Explain the different operations modes of serial port and write TCON register format.   6

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