



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B. E. - Information Science and Engineering

Semester End Examination; July / Aug. - 2022

AVR Microcontroller

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1 – Compare and contrast Microprocessor and Microcontroller

CO2 - Code simple AVR assembly language instructions.

CO3 - Code assembly language to use the ports for input or output

CO4 - Code c program for time delay, logical and arithmetic operations and fro data serialization.

CO5 - Interfacing the keypad to the AVR using assembly and C.

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks
	PART - A	10
1. a.	Mention the 3 features of AVR.	2
b.	Use of BRNE in AVR.	2
c.	What is Macros?	2
d.	Mention the advantages of High () and Low () functions in AVR.	2
e.	Show the binary & hex for 76.	2
	PART - B	90
	UNIT - I	18
1 a.	With neat diagram, compare and contrast microprocessor system with microcontroller system.	9
b.	Describe briefly the simplified view of an AVR microcontroller with neat diagram.	9
c.	Explain the following Instructions/directives with example:	9
	i) LDS ii) STS iii) IN iv) COM v) EQU vi) SET	
	UNIT - II	18
2 a.	Elucidate lucidly AVR conditional Branch instructions with example.	9
b.	Describe briefly how stacks are accessed in the AVR with an example.	9
c.	Explain the role DDRX, PORTX and PNX in I/O operations.	9
	UNIT - III	18
3 a.	Assume that the data memory location 0x315 has value FD(hex). Write a program to convert it to decimal. Save the digits in locations 0x322, 0x323 and 0x324, where the least-significant digit is in location 0x322.	9
b.	Show how to represent the following numbers in AVR?	9
	i) -128 ii) -34H iii) -5	
c.	Describe briefly the logical operators in AVR.	9

UNIT - IV**18**

- 4 a. i) Elucidate lucidly packed BCD to ASCII conversion. 3
ii) Assume that R20 has packed BCD. Write a program to convert packed BCD to two ASCII numbers and place them in R21 and R22 6
- b. Explain the different types of addressing modes of AVR. 9
- c. What is Macro? How macro is defined in AVR microcontroller? Explain with example. 9

UNIT - V**18**

- 5 a. Mention and elaborate the C data types for the AVRC with an example. 9
- b. Write a 'C' program that finds number of zero's in an 8-bit data and number of one's in an 8-bit data. 9
- c. Why do we use the code space for video game characters and shapes? What are the advantages of using code space for data? 9

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