

**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; July / August - 2022****Microcontrollers**

Time: 3 hrs

Max. Marks: 100

Course Outcome*The Students will be able to:**CO1: Explain the various types of microcontrollers with their evolution and compare them based on the architecture.**CO2: Describe the different types of addressing modes used to access the data both from internal and External memory.**CO3: Describe and analyze the various types of instructions sets that are used to perform the data related operations**CO4: Explain and analyze the various conditional and unconditional JUMP and CALL instructions and their relative range of jump.**CO5: Describe and analyze the timer/counter and interrupt access with their basic modes**CO6: Explain and analyze the interfacing circuits in order to serially communicate with external world**CO7: Able to write ALP for data operation, timer/counter, interrupt and interfacing with external world.***Note:** i) **PART-A** is compulsory. One question from each unit for maximum of 2 marks.ii) **PART-B** Answer any **TWO** sub questions (from a, b, c) from each unit for a Maximum of 18 marks.

Q. No.	Questions	Marks
I : PART - A		10
I a.	Compare Von Neumann architecture and Harward architecture with block diagram.	2
b.	Explain SWAP and XCHA, byte instruction with an example.	2
c.	What is the target range address for AJMP and LJMP?	2
d.	Write the bit pattern of TMOD register and how mode can be selected.	2
e.	Explain Half duplex and Full duplex data transfer.	2
II : PART - B		90
UNIT - I		18
1 a.	Mention the feature of 8051 and discuss the microprocessor survey.	9
b.	Explain the organization of internal RAM of 8051, and how it can access?	9
c.	i) Compare RISC and CISC processor.	6
	ii) Compare microprocessor and microcontroller.	3
UNIT - II		18
2 a.	Explain different addressing modes with an example.	9
b.	Explain the following instructions with an example:	5
	i) Data move and logical operations.	4
	ii) Explain rotate operations.	4
c.	Explain how program memory can be access in 8051 with timing diagram	9

UNIT - III**18**

- 3 a. Explain different conditional jump instruction with an example and write the syntax. 9
- b. Explain the following instruction with their target address range and syntax: 9
- i) ACALL, ii) LCALL iii) SJMP
- c. Explain the following instruction with an example 9
- i) INC ii) DCR iii) DAA iv) ADDC

UNIT - IV**18**

- 4 a. What are different timers and explain the significance of TMOD register. 9
- b. Explain the operation of timer with mode1 programming. 9
- c. Explain the operation of timer with mode 2 programming. 9

UNIT - V**18**

- 5 a. Explain different interrupts in 8051 with their vector table. 9
- b. Explain what are the steps to be followed in executing the interrupts, and mention interrupts priority list and how it is enable? 9
- c. What is serial communication? How is this achieved with 8051 using Rs-232 Standard? 9

* * * *