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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Third Semester, B.E. - Computer Science and Engineering
Semester End Examination; March - 2021
Computer Organization

Time: 3 hrs   *Max. Marks: 100*

Course Outcomes

The Students will be able to:
CO1: Understand and analyze the machine instructions and program execution.
CO2: Understand and explain the I/O organisation.
CO3: Understand and explain the memory system.
CO4: Apply the algorithms used for performing various arithmetic operations.
CO5: Understand and Explain the Concept of Basic Input/Output.

<u>*Note:*</u> *I) PART - A is compulsory. **Two** marks for each question.*
*II) PART - B: Answer any <u>**Two**</u> sub questions (from a, b, c) for Maximum of **18 marks** from each unit.*

Q. No.	Questions	Marks	BLs	COs	POs
	I : PART - A	**10**			
I a.	What is a compiler?	2		CO1	
b.	List four types of operations that the computer instructions must be capable of performing.	2		CO2	
c.	What is source program and object program?	2		CO3	
d.	Define Micro-programmed control.	2		CO4	
e.	What is the need for cache memory?	2		CO5	
	II : PART - B	**90**			
	UNIT - I	**18**			
1 a.	Define system software. Mention various functions performed by it.	9		CO1	
b.	Write a diagram showing the basic functional units of a computer and explain the control unit in detail.	9		CO1	
c.	Consider two processor *A* and *B* with the following parameters: Processor *A*: Length of one clock cycle = 0.8 nano seconds Processor *B*: Length of one clock cycle = 1.25 nano seconds i) What is the clock rate of processor *A*? ii) What is the clock rate of processor *B*? iii) If a program has 250 million instruction to be executed and each instruction takes 4 clock cycles to execute on processor *A*, calculate the total program execution time on processor *A*.	9		CO1	
	UNIT - II	**18**			
2 a.	Illustrate the concept of Byte addressability, Big Endian and Little Endian assignments.	9		CO2	

b.	What do you mean by addressing mode? Explain various types of addressing modes with suitable examples.	9	CO2
c.	Mention the general syntax of three-address and two-address instruction. Illustrate how the three-address instruction *Add A, B, C* can be implemented using two-address instructions.	9	CO2

UNIT - III		**18**	
3 a.	Consider the following instruction *Add (R_3), R_1*. Explain how this instruction is executed by mentioning the action performed for execution in detail.	9	CO3
b.	What are the operations performed by the 'call' instruction? Illustrate the process of subroutine linkage using a link register.	9	CO3
c.	Illustrate various types of Shift and Rotate instructions with suitable example.	9	CO3

UNIT - IV		**18**	
4 a.	Explain single-bus organization of the data path inside a processor with an aid of diagram.	9	CO4
b.	Give differences between Hardwired control unit and Micro-programmed control unit.	9	CO4
c.	Define Bus master. Explain various types of Bus arbitration in detail.	9	CO4

UNIT - V		**18**	
5 a.	Describe the following types of ROM: i) PROM ii) EPROM iii) EEPROM	9	CO5
b.	What are different cache mapping functions? Explain them.	9	CO5
c.	Illustrate Booth algorithm for signed operand multiplication.	9	CO5

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