CBCS SCHEME

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BEC306C

Third Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024
Computer Organization and Architecture

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the basic operational concepts of a computing system. With a neat diagram.	8	L2	CO1
	b.	Explain the various performance parameters effecting the performance of a computer and also provide the basic performance equation.	8	L2	CO1
	c.	Perform the following using 2's complement arithmetic. Use 5 bit representation. State whether overflow flag is set or not with justification i) -17 + 18 ii) -27 – 30.	4	L3	CO1
		OR			
Q.2	a.	Explain Big-Endian and Little Endian assignments.	6	L2	CO1
	b.	Consider a computer that has a byte addressable memory organized 32-bit words according to a big endian scheme. A program reads ASCII characters entered by a keyboard and store them in successive byte locations starting at location 1000. Show the contents of the two memory words "JOHNSON". Repeat the same of little endian scheme. [NOTE : ASCII code for JOHNSON : 4A, 4F, 48,4E, 53, 4F, 4E.	4	L3	CO1
	c.	Explain the following with illustrations i) Three address instruction ii) Two address instruction iii) One address instruction iv) Zero address instruction	10	L2	CO1
		Module – 2			
Q.3	a.	Define addressing mode. List the various addressing modes.	6	L1	CO2
	b.	Registers R1 and R2 of a computer contain the decimal values 1200 and 1400. What is the effective address of the memory open and in each of the following instructions? i) Load 20(R12), (R5) ii) Move #3000, R5 iii) Store R5, 30(R1, R2) iv) Add – (R2), R5 v) Subtract (R1) + R5.	10	L3	CO2
	c.	Write a short sequence, of machine instructions for the task : "Add the contents of memory location A to those of B and place the answer in location C. Instructions Loads LOC, R_i and store R_i, LOC are available for data transfer and Add instruction is available for addition.	4	L3	CO2
		OR			
Q.4	a.	Explain the concept of stack and Querres with an example.	6	L2	CO2
	b.	What are assembler directives? Explain various assembler directives with an example.	8	L2	CO2

	c.	Write a program to check whether the given byte is odd or even. If add, store a byte '0' in location 1001 and else store a byte '1' in location 1001. Data is available in location 1000.	6	L3	CO2
Module – 3					
Q.5	a.	Define Interrupts. Explain Daisy chain and priority structure methods of handling interrupts from multiple devices.	10	L1,2	CO3
	b.	Explain various ways of accessing I/O devices.	6	L2	CO3
	c.	Differentiate memory mapped I/O and I/O mapped I/O.	4	L1	CO3
OR					
Q.6	a.	Write a program that reads one line from keyboard, stores it in buffer and echos it back to display.	6	L3	CO3
	b.	Explain how vectored interrupts are handled by array processor in general.	6	L2	CO3
	c.	Explain Direct memory access control.	8	L2	CO3
Module – 4					
Q.7	a.	Define : i) Memory Access time ii) Memory cycle time iii) MFC signal iv) Vertual or logical address.	4	L1	CO4
	b.	With a neat diagram, explain the working principle of magnetic disk.	6	L2	CO4
	c.	With a neat diagram, explain internal organization of 16 × 8 memory organization.	10	L2	CO4
OR					
Q.8	a.	Discuss the concept of cache memory.	6	L3	CO4
	b.	With a neat diagrams, explain internal memory organization of a 2m × 8 dynamic memory chip.	8	L2	CO4
	c.	Explain the concept of virtual memory.	6	L2	CO4|"W
Module – 5					
Q.9	a.	With a neat diagram, explain single bus organization of the data path inside a processor.	8	L2	CO5
	b.	Discuss the hard wired control unit.	6	L3	CO5
	c.	With a neat sketch, explain micro-programmed control unit.	6	L2	CO5
OR					
Q.10	a.	Explain three – Bus organization of data path.	8	L2	CO5
	b.	Write and discuss the instruction ADD (R3), R1.	6	L3	CO5
	c.	Discuss the organization of a control unit to allow conditional branching in the microprogram.	6	L3	CO5

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