



# CBCS SCHEME

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17CS34

## Third Semester B.E. Degree Examination, Jan./Feb. 2021 Computer Organization

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. With a neat diagram, explain basic operational concept of computer. List the steps needed to execute the instruction Add LOCA, R<sub>0</sub>. (08 Marks)
- b. What is performance? Explain basic performance equation and overall SPEC rating of computer. (07 Marks)
- c. Explain Big-Endian and Little-Endian methods with examples. (05 Marks)

OR

- 2 a. What is addressing mode? Explain any four addressing mode with example. (08 Marks)
- b. What is stack? Explain how to implement push, pop, safe-push, safe-pop operation with example. (08 Marks)
- c. Write a program that reads line of character and display it. (04 Marks)

### Module-2

- 3 a. What is an interrupt? With supporting diagram, explain the following:  
i) Interrupt Nesting ii) Simultaneous request. (08 Marks)
- b. What is DMA? With supporting diagram, explain different registers used in DMA interface. (07 Marks)
- c. Define BUS arbitration? Explain any one approach of bus arbitration. (05 Marks)

OR

- 4 a. Define Exception. Explain kinds of exception. (06 Marks)
- b. Explain the tree structure of USB. (06 Marks)
- c. Explain keyboard to processor connection in interface circuit. (08 Marks)

### Module-3

- 5 a. What is fast page mode? Explain internal organization of a 2M × 8 dynamic memory chip. (08 Marks)
- b. What is Mapping function? Briefly explain any two mapping functions used in cache memory. (08 Marks)
- c. Explain Hit rate and Miss penalty. (04 Marks)

OR

- 6 a. What is virtual memory technique? Explain virtual memory address translation. (08 Marks)
- b. Explain following:  
i) Memory controller  
ii) Refresh overhead (08 Marks)
- c. Write a short note on Read-Only-Memories. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**Module-4**

- 7 a. Design the 16-bit carry-lookahead adder using 4-bit adder and also give the expression for carry variable  $C_i + 1$  (08 Marks)  
 b. Perform the multiplication for -13 and +9 using Booth's algorithm. (06 Marks)  
 c. Explain IEEE standard for floating point number. (06 Marks)

**OR**

- 8 a. Write algorithm performs restoring division. Perform division using restoring algorithm  
 Dividend =  $(1000)_2$  Divisor =  $(0011)_2$ . (08 Marks)  
 b. Perform the operation on 5-bit signed numbers using  $2^s$  complement system and also indicate whether overflow has occurred.  
 i)  $(-10) + (-13)$     ii)  $(-10) - (-13)$     iii)  $(-2) + (-9)$  (06 Marks)  
 c. Explain Bit-pair recoding of Multipliers by using Multiplier = +13, Multiplier = -6. (06 Marks)

**Module-5**

- 9 a. Explain single-bus organization of the data-path inside a processor with neat diagram. (08 Marks)  
 b. Write the control sequence for execution of the instruction Add  $(R_3), R_1$ . (06 Marks)  
 c. Explain in brief about control unit organization. (06 Marks)

**OR**

- 10 a. Explain Block diagram of Microwave oven. (08 Marks)  
 b. Discuss simplified block diagram of a digital camera. (06 Marks)  
 c. Briefly explain block diagram of an embedded processor. (06 Marks)

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