CBCS SCHEME

USN ⬜⬜⬜⬜⬜⬜⬜⬜⬜⬜

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_0. **(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, safepush, safepop 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 $2M \times 8$ 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)**

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 compliment 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 Multiplicand = +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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