CBCS SCHEME

USN | | | | | | | | | | |

18CS34

Third Semester B.E. Degree Examination, Feb./Mar. 2022
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 the different processor registers. **(08 Marks)**

b. Explain the overall SPEC rating for the computer in a program suite. **(04 Marks)**

c. Explain one address , two address and three address instruction with examples. Also, use any of these instructions to carry out C ← [A] + [B]. **(08 Marks)**

OR

2 a. What is an addressing mode? Explain the different addressing modes. With an example for each. **(10 Marks)**

b. Explain shift and rotate operations, with example. **(10 Marks)**

Module-2

3 a. What is direct memory access, when it is used? Explain it with block diagram. **(08 Marks)**

b. Define the terms 'cycle stealing' and 'burst mode with respect to DMA. **(04 Marks)**

c. Define bus arbitration. Explain in detail centralizaed bus arbitration. **(08 Marks)**

OR

4 a. With a block diagram, explain how the keyboard is connected to processor. **(08 Marks)**

b. Explain the use of a PCI bus in a computer system with a neat sketch. **(08 Marks)**

c. What are the design objectives of USB? **(04 Marks)**

Module-3

5 a. Draw a neat block diagram of memory hierarchy in a computer system. Discuss the variation of size, speed and cost per bit in the hierarchy. **(08 Marks)**

b. Explain the working of a single transistor dynamic memory cell and internal organization of a 16 megabit DRAM chip configured as 2M × 8 cells. **(12 Marks)**

OR

6 a. Explain the different mapping functions used in cache memory. **(12 Marks)**

b. What is replacement policy? Explain LRU replacement algorithm. **(04 Marks)**

c. Explain memory interleaving with necessary diagram. **(04 Marks)**

Module-4

7 a. Perform the following operations on the 5-bit signed numbers using 2's complement representation system:

i) (-10) + (-13)
ii) (-10) – (+4)
iii) (-3) + (-8)
iv) (-10) – (+7) **(10 Marks)**

b. In a carry look ahead addition, explain the generate G_i and propagate P_i functions for stage i. Using this design explain 4 bit carry look ahead adder. **(10 Marks)**

OR

8 a. Perform the signed multiplication of numbers +13 and -6 using booth multiplication and bit pair recording method. List the tables used. **(10 Marks)**

b. Perform division of number 9 by 3(9 ÷ 3) using the restoring division algorithm. Write the steps of algorithm used. **(10 Marks)**

Module-5

9 a. Draw and explain multiple bus organization. Explain its advantages. **(10 Marks)**

b. Write and explain the control sequence for execution of an unconditional branch instruction. **(10 Marks)**

OR

10 a. Draw the block diagram of the control unit organization and describe. **(10 Marks)**

b. Explain basic idea of instruction pipelining. **(10 Marks)**

* * * * *