21/224-C

B.C.A. (I Semester) Examination, 2021

Paper : Second (102)

(Computer Organisation)

Time : Three Hours] *[Maximum Marks : 70*

Note : Attempt questions from **all** sections as per instructions.

Section-A

(Very Short Answer Type Questions)

Note : Attempt **all** parts of this question. Give the answer of each part in about 50 words. 1.5×10=15

1. (i) Convert decimal 153 to octal.
   (ii) What is a decoder?
   (iii) Define Race condition.
   (iv) Mention any two features of cache memory.
   (v) What is virtual memory?

(vi) Define a flip-flop.

(vii) What is the need of an interface between I/O device and the CPU?

(viii) What is Register Indirect Addressing mode?

(ix) Define Bus Interface.

(x) Define Polling.

Section-B

(Short Answer Type Questions)

Note : Attempt **all** questions. Give answer of each question in about 200 words.

7×5=35

2. (a) Convert the octal number 540 to binary number.

   (b) Express +39 and -39 in 1's complement and 2's complement form.

   (c) Convert the decimal number 2550.312510 into binary number.

OR

Explain ASCII, BCD and Gray Code.

3. Draw a NAND logic diagram that implements the complement of the following function

$$F(w, x, y, z) = \Sigma(0, 1, 2, 3, 4, 8, 9, 12)$$

OR

Simplify the Boolean function $F(w, x, y, z) = \Sigma(0, 2, 8, 9, 10, 11, 14, 15)$ in sum of product and draw the logic diagram.

4. Explain the working of a full adder with a truth table and logic circuit.

OR

What is a multiplexer? Explain with a truth table and logic circuit the design of an 8 to 1 line multiplexer.

5. Analyze the memory hierarchy in terms of speed, size and Cost.

OR

What are handshaking signals? Explain the handshake control of data transfer during input and output operation.

6. Explain the function of DMA.

OR

Define addressing mode and explain any four addressing modes with an example of each.

Section-C

(Long Answer Type Questions)

Note : Attempt any **two** questions. Give answer of each question in about 500 words.

$10 \times 2 = 20$

7. Explain three input NOR gate with truth table and logic circuit.
8. Explain the working of a RS flip-flop with a truth table and logic circuit.
9. Explain programmed I/O and interrupt driven I/O with an example.
10. With a neat sketch explain the working principle of DMA.
11. Discuss single accumulator organization.