5. (a) Show the multiplication process using Booth's algorithm when the following numbers are multiplied : (CO2)

$(-12)^* (-5)$.

OR

(b) Explain instruction cycle with the help of a neat flowchart. (CO2)

H Roll No. .....

TMC–102

M. C. A. (FIRST SEMESTER)

MID SEMESTER

EXAMINATION, 2021-22

COMPUTER ORGANIZATION AND ARCHITECTURE

Time : 1 : 30 Hours

Maximum Marks : 50

Note : (i) Answer all questions.

(ii) Each question carries 10 marks.

1. (a) Explain weighted and non-weighted code with example. (CO1)

(b) Covert the following numbers as indicated : (CO1)

(i) $(BC64)_{16} = (\ )_{10} = (\ )_2$

(ii) $(111011)_2 = (\ )_5$

P. T. O.

OR

(c) Draw a logic diagram that implements the following function : (CO1)

$$F(A, B, C, D) = \Sigma (0, 1, 2, 3, 4, 8, 9, 10, 11, 12)$$

(d) Draw suitable diagram of Half and Full adder. (CO1)

2. (a) Explain the difference between Combinational circuit and Sequential circuit. (CO1)

(b) What is race around condition ? Explain in brief. (CO1)

OR

(c) A certain memory has capacity of 8K × 16. How many bits are there in each word ? How many words are being stored ? (CO1)

(d) Differentiate between truth table, excitation table and state table. (CO1)

3. (a) Design 16 : 1 multiplexer using 4 : 1 multiplexer. (CO1)

(b) Explain Ecoder and Decoder. (CO1)

OR

(c) Minimize the given Boolean function using K-map and implement the simplified function using gates : (CO1)

$$F(A, B, C, D) = \Sigma m (0, 1, 2, 9, 11, 15) + d (8, 10, 14).$$

4. (a) Design a synchronous MOD 5 UP counter using D FFs. (CO2)

(b) Draw and explain the working of universal shift register. (CO2)

OR

(c) Define the BUS arbitration with a suitable diagram. (CO2)

(d) Explain BUS with all its types (with the help of a diagram). (CO2)