28/05/22

1477/II

B.C.A. (PART-I) 2nd Semester Examination-2022

B.C.A.

(Digital Circuit and Logic Design)

Paper : BCA-203

Time : Three Hours] [Maximum Marks : 70

Note: (i) Answer **five** questions in all.

(ii) Question **No. 1** is compulsory.

(iii) Answer two questions from section **A** and **B** each.

(iv) All question carry equal marks.

1. Answer any **four** parts of the following:

(a) $(324)_{10} = (?)_2$

(b) State De Morgan's theorem

(c) Briefly explain Universal logic gates

(d) Using K-Map, solve the following expression:

$F - \sum_m(2,5,7,8)$

Section-A

2. What is full adder? Give its logic realization and truth table.

3. Using Boolean Algebra simplify the following:

$$F = ABCD + ABC + AB + A\bar{B}$$

Implement the simplified function using NAND/ NOR gates.

4. What its J K flip-flop? Draw its logic circuit, truth table and timing diagram. Explain the operation of J K flip-flop with all input combinations.

5. Using K-map find the simplified SOP from of:

$F = \sum_m(0,3,12,15) + d(7,11)$

Section-B

6. (a) Using Boolean Algebra prove the following:

$$A'BC + AB'C + ABC = AB + BC + CA$$

(b) Define a Microprocessor system. Explain its function.

7. (a) What is multiplexer? Draw 8×1 Mux using suitable logic gates.

(b) Draw the diagram of 4-bit parallel adder and explain its working.

8. (a) Convert the following binary number in to equivalent decimal and hexadecimal numbers:

(i) (101101.111)

(ii) $(11011011.011)_2$

(b) What is four variable K-map? Give different simplification rules for it.

9. Write notes on any **two** of the following:

(a) Encoder and Decoder

(b) Architecture of Micro computer

(c) Counter

••••