### 1477/II

# B.C.A. (PART-I) 2<sup>nd</sup> 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 andB 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

Briefly explain Universal logic gates

Using K-Map, solve the following

expression:

$$F - \sum_{m} (2,5,7,8)$$

#### Section-A



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.

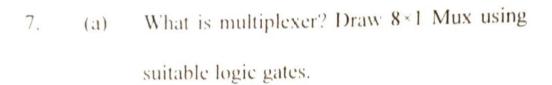


Using K-map find the simplified SOP from of:

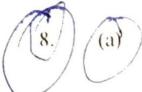
$$F = \sum_{m} (0,3,12,15) + d(7,11)$$

### 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.



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



Convert the following binary number in to equivalent decimal and hexadecimal numbers:

- (i) (101101.111)
- (ii) (11011011.011)<sub>2</sub>
- 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

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