

**Second Semester B.C.A. Degree Examination, April/May 2019**

*(CBCS Scheme)*

**Computer Science**

**DIGITAL ELECTRONICS**

*Time : 3 Hours]*

*[Max. Marks : 90*

*Instructions to Candidates : Answers ALL the Sections.*

**SECTION – A**

- I. Answer any **TEN** of the following. **(10 × 1 = 10)**
1. Expand DTL.
  2. What is propagation delay?
  3. Convert  $(30)_{10}$  into binary.
  4. Find gray code for 1000.
  5. What is minterm?
  6. Prove  $(a + b) = (b + a)$  using truth table.
  7. Define logic gate.
  8. Write the pin-diagram for IC-7400.
  9. Define Mux.
  10. What is a flipflop?
  11. Give any one example for asynchronous inputs.
  12. What is race around condition?

**SECTION – B**

Answer any **FIVE** of the following. **(5 × 3 = 15)**

13. What is diode? Represent (a) sinewave, (b) square wave.
14. Mention any three types of logical families.
15. Convert  $(372)_8$  to  $(?)_{10}$ .
16. What is parity bit? Find even, odd parity for data 0100.

## Q.P. Code – 68232

17. Define half adder. Draw circuit diagram using basic gates.
18. Write truth table for three input NAND gate.
19. Draw logic circuit diagram using NAND for  $- AB + BC + CA$ .

### SECTION – C

Answer any **SIX** of the following.

(6 × 5 = 30)

20. Explain any five characteristics of logical families.
21. Subtract  $(30)_{10}$  from  $(60)_{10}$  using 2's compliment method.
22. Perform (a)  $1001 \times 100$  (b)  $100100 \div 100$ . (2 + 3)
23. Explain 1:4 demultiplexer with circuit diagram and truth table.
24. State and prove De-Morgan's theorem.
25. Justify NAND and NOR as universal gates.
26. Explain D-flipflop with circuit diagram using NAND gates and its truth table.
27. Define register. Write circuit diagram of 4 bit SISO shift register and its truth table.

### SECTION – D

Answer any **FIVE** of the following.

(5 × 7 = 35)

28. Simplify using K-map  $F(A, B, C, D) = \sum m(7, 9, 10, 12, 13, 14, 15)$ . Draw logic circuit for simplified expression using basic gates.
29. (a) Find minterms for  $AB + C$ ?  
(b) Convert  $(A + \bar{B} + C)(\bar{B} + C + D)(A + \bar{B} + \bar{C} + D)$  into standard POS.
30. Explain FULL adder with block diagram, circuit diagram using basic gates and truth table.
31. Explain 4 bit parallel BCD adder using full adders by taking an example.
32. Explain decimal to BCD encoder with definition, block diagram, circuit diagram and truth table.
33. Explain J-K flipflop with circuit diagram and truth table.
34. Explain SIPO with circuit diagram, truth table, timing diagram. Mention speed of SIPO.