CS – 491

I Semester B.C.A. Degree Examination, March 2023
(Y2K14 – CBCS) (R)
COMPUTER SCIENCE
BCA104T : Digital Electronics

Time : 3 Hours

Max. Marks : 70

Instruction : *Answer **all** the Sections.*

SECTION – A

Answer **any ten** questions : **(2×10=20)**

1. What is semi conductor ? Give example.
2. Define Ohm's law.
3. What are combinational circuits ? Give example.
4. Find 2's complement of 00110011.
5. Write logic symbol and truth table of X-OR gate.
6. Define RMS value.
7. Define term waveform and time period.
8. What is doping ?
9. What is half adder ?
10. What is flip-flop ? Mention types of flip-flop.
11. What is conductor and insulator ?
12. Convert $(BC6.54)_{16}$ to binary.

P.T.O.

SECTION – B

Answer **any five** questions : **(10×5=50)**

13. a) State and explain Kirchhoff's voltage law. **5**

    b) State and explain Nortan's theorem. **5**

14. a) What is rectifier ? Explain full wave rectifier. **5**

    b) Explain forward and reverse bias. **5**

15. a) Mention the differences between intrinsic and extrinsic semiconductor. **5**

    b) State and prove DeMorgan's theorem. **5**

16. a) Convert the following : **5**

    i) $(453.26)_{10} = (\ )_2 = (\ )_8$

    ii) $(1101.110)_2 = (\ )_8 = (\ )_{16}$

    b) Simplify the following minterm using K-map. **5**

    $F = \Sigma\, m(1, 5, 8, 9, 13) + \Sigma\, d(3, 12)$.

17. a) Prove NAND and NOR gates as universal gates. **5**

    b) With a neat diagram, explain working of full adder. **5**

18. a) Explain the working of RS flip-flop with a neat diagram. **5**

    b) Design 4 to 1 multiplexer circuit. **5**

19. a) Explain SISO shift register with a neat diagram. **5**

    b) Explain Master Slave JK flip-flop with a neat diagram. **5**

20. a) What is energy band ? Explain three energy bands. **5**

    b) Write a brief note on application of shift registers. **5**