No. of Printed Pages : **2**

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I Semester B.C.A. Examination, December - 2019
(CBCS) (F+R) 2014-15 and Onwards)
COMPUTER SCIENCE
BCA-104 T : Digital Electronics

Time : 3 Hours Max. Marks : 70

Instruction : *Answer* ***all*** *sections.*

SECTION - A

I. Answer **any ten** questions : **10x2=20**

1. State and explain Ohm's law.
2. What is Conductor ? Give examples.
3. Define PN diode. Explain forward bias.
4. Define Peak factor and Form factor.
5. What is NAND gate ? Write truth table and logic symbol for it.
6. Convert $27.52_{(10)}$ to Octal and Hexa-decimal.
7. Find 2's complement of $1110101_{(2)}$.
8. Convert $101101_{(2)}$ to gray code.
9. What is half-adder ? Write its logic circuit.
10. Define shift register. List its modes of operation.
11. What is Combinational Circuit ? Give examples.
12. If two resistors of 5Ω each are connected in parallel, what is the equivalent total resistance ?

P.T.O.

SECTION - B

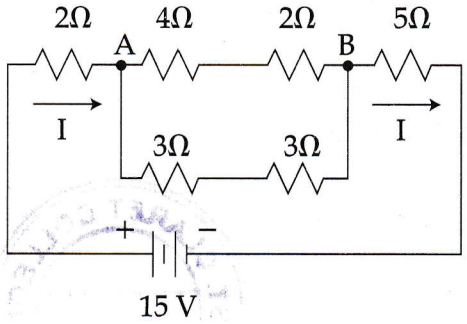
II. Answer **any five** of the following questions. **5x10=50**

13. (a) State and prove De-morgan's Law. **5**

(b) Realize basic gates using NOR gate. **5**

14. (a) Explain Thevenin's theorem in detail. **5**

(b) For the below resistive network, find the current through 5Ω resistor and voltage across node AB. **5**



15. (a) Explain full adder with truth table and logic circuit. **5**

(b) What is data selector ? Explain the 4×1 multiplexer. **5**

16. (a) What is rectifier ? Explain Full-wave rectifier with a neat diagram. **5**

(b) Explain Kirchoff's voltage and current laws. **5**

17. (a) What is energy band ? Explain all the three energy bands. **5**

(b) Differentiate between intrinsic and extrinsic semiconductors. **5**

18. (a) Simplify $AB+A(\overline{B}+C)+B(\overline{B}+\overline{C})$ using boolean algebra and draw logic circuit for simplified equation. **5**

(b) Simplify SOP using 4-variable K-Map **5**
$F(ABCD) = \Sigma m\ (1, 5, 7, 8, 9, 13, 15) + \Sigma d\ (3, 12)$.

19. (a) Explain JK flip-flop with a block diagram. Show how to convert a JK flip-flop to flip-flop. **5**

(b) What is shift register ? Explain modes of operation of registers in brief. **5**

20. (a) Subtract $228_{(10)} - 150_{(10)}$ using the 2's complement method. **5**

(b) Explain 4 bit parallel adder with a neat diagram. **5**

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