

**Q.P. Code : 15122**

**First Semester B.C.A. Degree Examination,  
November/December 2019**

*(CBCS – Repeaters)*

**Computer Science**

**Paper BCA 104 T – DIGITAL ELECTRONICS**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to Candidates : Answer all the Sections.*

- I. Answer any **TEN** of the following : **(10 × 2 = 20)**
1. Define the terms closed circuit and open circuit.
  2. What do you mean by Wave form and Time period?
  3. What is conduction band and valence band?
  4. What is doping?
  5. Write any two characteristics of rectifier.
  6. Write the 2's complement of  $11010111_{(2)}$
  7. Show that  $(x + y)(x + \bar{y}) = x$ .
  8. Write the logic expression and truth table for X-OR gate.
  9. What is the difference between combinational circuit and sequential circuit?
  10. What are the different triggering modes of Flip Flop?
  11. What is shift register?
  12. Define the terms propagation delay and hold time.
- II. Answer any **FIVE** of the following : **(5 × 10 = 50)**
13. (a) State and explain Kirchoff's current law. **(5)**  
(b) Briefly explain the current divider theorem. **(5)**
  14. (a) Explain P-N Junction with a neat diagram. **(5)**  
(b) Write a note on extrinsic semi-conductor. **(5)**

**Q.P. Code : 15122**

15. (a) Write the difference between forward Gas and Reverse Gas. (5)  
(b) Explain the working of Bridge rectifier. (5)
16. (a) Convert FACE<sub>(16)</sub> to ( )<sub>2</sub> ( )<sub>8</sub> ( )<sub>10</sub>. (5)  
(b) Subtract 23<sub>10</sub> from 16<sub>(10)</sub> using 2's complement method. (5)
17. (a) Realize NAND as universal gate. (5)  
(b) State and prove De-Morgan's theorem. (5)
18. (a) Simplify the given minterm using *k*-map and write the minimized equivalent circuit diagram  $F(a, b, c, d) = \sum m(2,3,4,5,13,15) + \sum d(8,9,11)$ . (6)  
(b) Simplify and realize using NAND gate only  $xyz + yz + \bar{z}$ . (4)
19. (a) With a neat circuit diagram and truth table explain the working of full Adder. (5)  
(b) Explain JK Flip Flop with necessary circuit diagram. (5)
20. (a) Explain SISO and PIPO shift register. (6)  
(b) Write the applications of shift register. (4)