I Semester B.C.A. Degree Examination, November/December 2015
(CBCS) (Y2K14 Scheme)
BCA – 104 T : DIGITAL ELECTRONICS

Time : 3 Hours
Max. Marks : 70

Instruction : Answer all Sections.

SECTION – A

Answer any ten questions :

(10×2 = 20)

1. Find the equivalent resistance of the combination.

2. What is rms value ?

3. State Kirchoff’s current law.

4. What is forbidden energy gap ?

5. What is breakdown voltage in PN junction ?

6. Write the difference between Analog and Digital technologies.

7. Convert 10011 from Gray to Binary.

8. Simplify the Boolean equation \( AB + CD + EF \).

9. What is a combinational circuit ?

10. What is magnitude comparator ?

11. Write applications of Flip Flop.

12. What is a shift register ?
SECTION – B

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

13. a) State and explain the Norton's theorem.
   b) Find delta equivalent of the following circuit.

\[
\begin{align*}
&\text{RA} \\
&\text{RB} \\
&\text{RL}
\end{align*}
\]

14. a) Find the current through \( R_L \) by Thevenin's theorem.
   b) Draw and explain V-I characteristics of PN-junction.

15. a) Explain the working of center tap full wave rectifier.
   b) Discuss the merits and demerits of full wave and half wave rectifier.

16. a) State and prove DeMorgans theorem.
   b) Express the following Boolean expression in terms of sum of minterms
   \[ F = A\overline{B} + C. \]

17. a) What is K-map and explain various types of grouping.
   b) Simplify K-map
   \[ F(ABCD) = \sum m (7, 9, 10, 11, 12, 13, 14, 15). \]

18. a) Draw the logic circuit whose Boolean equation is \( Y = \overline{A} + B + \overline{C}. \)
   b) What are universal gates? Explain universal property of NAND gate.

19. a) Explain Full adder with neat circuit diagram.
   b) With neat circuit diagram explain Master Slave JK flip flop.

20. a) Draw the pin diagram of 7476.
   b) Explain about PISO register.