I Semester B.C.A. Degree Examination, November/December 2014  
(Y2K14 – CBCS Scheme)  
Computer Science  
BCA 104 T : DIGITAL ELECTRONICS  

Time : 3 Hours  
Max. Marks : 70  

Instruction: Answer all Sections.  

SECTION – A  
(2x10=20)  

1. Define the terms short circuit and open circuit.  
2. What are the different types of network ports?  
3. What is a semiconductor? Give example.  
4. How are solids classified?  
5. Convert B64.53 to binary.  
6. Define minterm and maxterm.  
7. Simplify the following Boolean expressions \( (A + B) + CD \).  
8. What is an X-OR gate? Give the truth table and logic symbol of X-OR gate.  
9. What is a combinational circuit? Give example.  
10. What is an adder? Give the logic diagram of half adder circuit.  
11. Mention the two applications of D Flip-flop.  
12. Define the terms propagation delay and hold time.  

SECTION – B  
(10x5=50)  

1. a) State and explain Superposition theorem.  
1. b) What is series parallel circuit? Explain.  

5  
5  
P.T.O.
2. a) Explain P-N junction with a neat diagram.
   b) Write a note on extrinsic semiconductors.
3. a) Explain the characteristics features of IC family gates.
   b) State and prove De-Morgan’s theorems.
4. a) Convert the following:
   i) \((453.26)_{10} = (\quad)_{2}, (\quad)_{8}, (\quad)_{16}\)
   ii) \((1101.110)_{2} = (\quad)_{8}, (\quad)_{16}\)
   b) Simplify the following into POS using K-Map
      \(F(A \ B \ C \ D) = \Sigma(0, 2, 3, 5, 11, 13) + \Sigma D(1, 7, 10)\).
5. a) Prove NAND and NOR gates as universal gates.
   b) With a logic diagram explain decimal to BCD encoder.
6. a) Write a note on parity checker and parity generator.
   b) With a neat diagram explain 4-bit parallel binary adder.
7. a) Explain the working of J-K flip-flop with a neat diagram.
   b) Differentiate between a latch and a flip-flop.
8. a) Explain SISO shift register with a diagram.
   b) Write a note on applications of shift registers.