I Semester B.C.A. Degree Examination, Nov./Dec. 2016
(CBCS)
(F + R) (2014-15 and Onwards)
COMPUTER SCIENCE
BCA 104 : Digital Electronics

Time : 3 Hours

Max. Marks : 70

Instruction : *Answer all Sections.*

SECTION – A

I. Answer **any ten** questions :

(10×2=20)

1) State and explain Ohm's law.

2) List the applications of superposition theorem.

3) Define the terms waveform and time period.

4) What is a semiconductor ? Give an example.

5) Differentiate between half-wave and full-wave rectifiers.

6) Find the 2's complement of 00110011.

7) Prove that $x(x+y) = x$.

8) Write the logic symbol and truth table for X-NOR gate.

9) What is a multiplexer ? Write the logic symbol for 4-bit multiplexer.

10) What is a sequential circuit ? Explain.

11) What is an half-adder ? Write its truth table.

12) Explain the important characteristics of flip-flops.

P.T.O.

SECTION – B

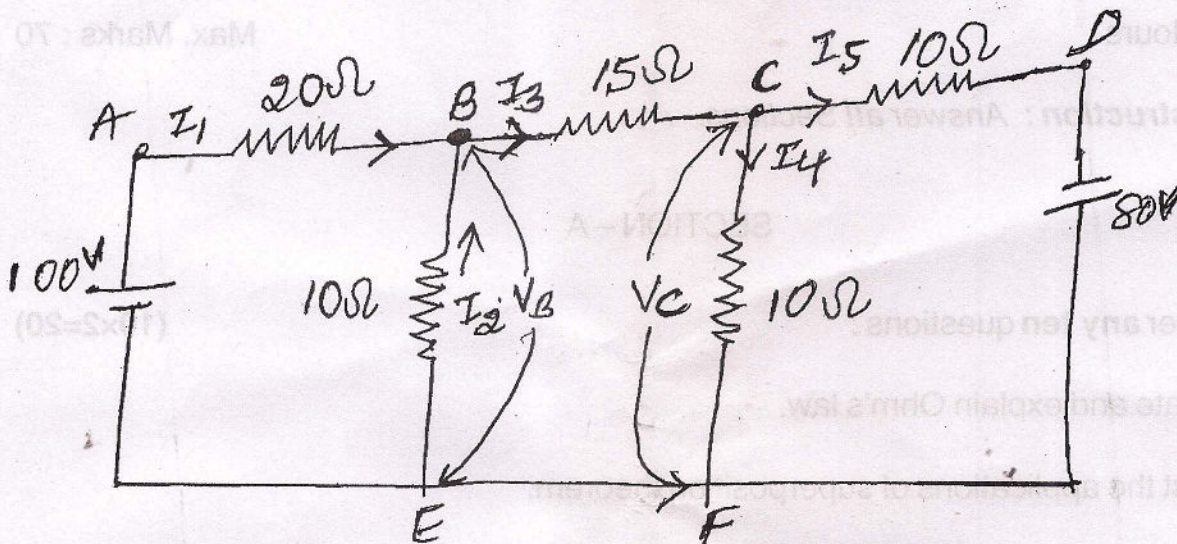II. Answer **any five** questions :   (10×5=50)

13) a) Explain Thevenin's theorem in detail.   5

   b) Find the currents in various branches of the circuit by nodal voltage
       analysis.   5

14) a) Define peak value, rms value, average value, frequency for a time wave.   5

   b) Explain the energy levels and energy bands of orbits in an atom with a
       neat diagram.   5

15) a) Explain p-n junction with a neat diagram.   5

   b) Write a note on TTL and CMOS.   5

16) a) Convert $(4096.3125)_{10} = (?)_2$ and $(36F.ABC)_{16} = (?)_{10}$ 4

   b) What is a self-complementing code ? Prove how weighted code 2421 is a
       self complementing code.   6

17) a) State and prove Demorgan's theorem.   5

   b) Simplify using K-map, $F(A, B, C, D) = \sum (4, 6, 8, 10, 11, 12, 15) + d(3, 5, 7, 9)$.   5

18) a) Realize the basic gates using NAND gate.   3

   b) Explain the working of 4-bit binary adder-subtracter with a neat logic diagram. 7

19) a) Write the logic diagram and truth table for decimal to BCD encoder.   4

   b) Explain the working of JK flip-flop with logic diagram and truth table.   6

20) a) Explain SISO and PIPO shift registers.   7

   b) Write a brief note on applications of shift register.   3

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