



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.

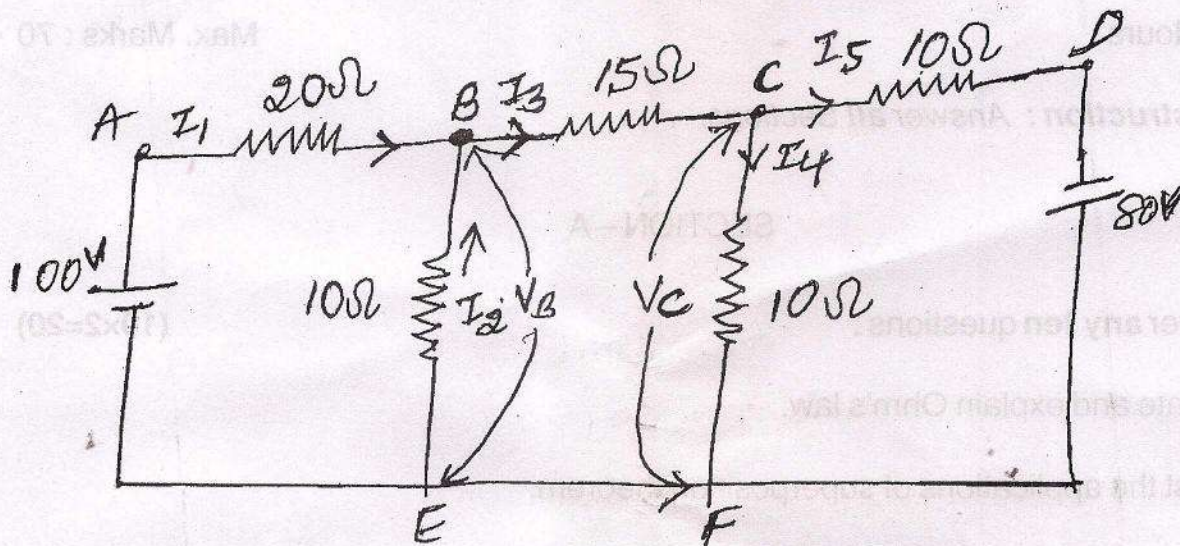


SECTION - B

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.



- 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-subtractor 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