



QP – 451

I Semester B.C.A. Examination, April/May 2021

(Y2K14) (CBCS) (F+R)

COMPUTER SCIENCE

BCA – 104T : Digital Electronics

Time : 3 Hours

Max. Marks : 70

Instructions : 1) Answer **all** Sections.

2) Section – **A** : Answer **any 10** questions.

3) Section – **B** : Answer **any 5** questions.

SECTION – A

I. Answer **any ten** questions :

(10×2=20)

1) What is the total resistance between A and B ?



2) Draw ac sinewave and denote amplitude and time period.

3) Write any two differences between intrinsic and extrinsic semiconductor.

4) Write any two applications of a diode.

5) What is the value of ripple factor of half-wave rectifier and full-wave rectifier ?

6) What is doping ?

7) What are universal gates ? Name them.

8) Draw the pin diagram of IC 7400.

9) Draw the symbol of EXOR gate and write its truth table.

10) What is a sequential circuit ? Give one example.

11) Draw the block diagram of D flip-flop.

12) Name the four types of shift registers.

SECTION – B

II. Answer **any five** of the following questions :

(5×10=50)

13) a) State and explain KVL and KCL.

b) State Thevenin's theorem with suitable circuit. Explain the steps to Thevenise the resistive network.

(4+6)

P.T.O.



- 14) a) State and prove De-Morgan's Theorem. (5+5)
b) Define energy band. Explain all three energy bands.
- 15) a) Draw the symbol of PN junction diode. Explain its working in forward bias and reverse bias mode. (4+6)
b) Define rectifier. Explain half-wave rectifier with necessary circuit diagram and input/output waveforms.
- 16) a) Convert the binary number $11001110_{(2)}$ to decimal number. (3+2+5)
b) Convert the binary code 1111 to Gray code.
c) Subtract $10011_{(2)}$ from $11100_{(2)}$ using 2's complement subtraction method.
- 17) a) Simplify the Boolean expression $A \cdot \bar{B}C + \bar{A}B(BC + \bar{B})$ using boolean laws. Draw logic circuit for simplified expression. (5+5)
b) Simplify the Boolean function $f(A, B, C, D) = \sum m(1, 3, 5, 8, 9, 11, 15)$ using k-map. Draw the logic circuit for simplified expression.
- 18) a) Realize AND, OR and NOT gate using NAND gate. (5+5)
b) Explain half subtractor with logic circuit. Draw its truth table.
- 19) a) With logic circuit and truth table, explain the working of a full-adder. (5+5)
b) Explain the working of RS flip-flop with a block diagram. Draw its truth table.
- 20) a) Differentiate latch and flip-flop. (4+6)
b) What is a register? With necessary diagram, explain the working of a 4 bit SIS0.

SECTION - B

II. Answer any five of the following questions:

- 13) a) State and explain KVL and KCL. (4+6)
b) State Thevenin's theorem with suitable circuit. Explain the steps to
P.T.O.