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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.

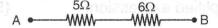
SECTION - A

I. Answer any ten questions:

(10×2=20)

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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 :

 $(5 \times 10 = 50)$

- 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)

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- 14) a) State and prove De-Morgan's Theorem.
 - b) Define energy band. Explain all three energy bands.

(5+5)

- 15) a) Draw the symbol of PN junction diode. Explain its working in forward bias and reverse bias mode.
 - b) Define rectifier. Explain half-wave rectifier with necessary circuit diagram and input/output waveforms. (4+6)
- 16) a) Convert the binary number 11001110, to decimal number.
 - b) Convert the binary code 1111 to Gray code.
 - c) Subtract 10011₍₂₎ from 11100₍₂₎ using 2's complement subtraction method. (3+2+5)
- 17) a) Simplify the Boolean expression $A \cdot \overline{B}C + \overline{A}B(BC + \overline{B})$ using boolean laws. Draw logic circuit for simplified expression.
 - 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. (5+5)
- 18) a) Realize AND, OR and NOT gate using NAND gate.
 - b) Explain half subtractor with logic circuit. Draw its truth table. (5+5)
- 19) a) With logic circuit and truth table, explain the working of a full-adder.
- b) Explain the working of RS flip-flop with a block diagram. Draw its truth table. (5+5)
- 20) a) Differentiate latch and flip-flop.
 - b) What is a register? With necessary diagram, explain the working of a 4 bit SISO. (4+6)