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SF—49—2022

FACULTY OF COMPUTER STUDIES

B.Sc. (First Year) (First Semester) EXAMINATION

MAY/JUNE, 2022

(CBCS/Revised Pattern)

COMPUTER SCIENCE

(Fundamentals of Digital Electronics)

(Wednesday, 6-7-2022)

Time : 9.30 a.m. to 1.15 p.m.

Time— 3.45 Hours

Maximum Marks—75

N.B. :— (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if required.

1. Attempt any *five* of the following :

15

- (a) Explain Gray code in detail.
- (b) Explain basic gates (AND, OR, NOT).
- (c) Explain half adder.
- (d) Explain D-Type flip-flop.
- (e) Explain 4 : 1 multiplexer.
- (f) Explain 1's complement with example.
- (g) Explain full adder.

P.T.O.

2. Attempt any *three* of the following :

15

- (a) State and prove De-Morgan's any *one* theorem.
- (b) Explain X-OR and X-NOR gates.
- (c) Explain Encoder (Decimal to BCD).
- (d) Draw logic diagram of the following :

$$\gamma = AB + CD$$

- (e) Why NAND gate is known as universal gate ?

3. Attempt any *three* of the following :

15

- (a) Convert the following :

(i) $(27)_{10} = ()_2$

(ii) $(245)_8 = ()_{10}$

- (b) Solve the following :

(i) $(1010 + 0110)$

(ii) $(1110 - 0101)$

- (c) Explain 2's complement with example.
- (d) Explain SR flip-flop.
- (e) Explain SISO shift register.

4. Attempt any *three* of the following :

15

- (a) Subtract using 1's complement $(1011 - 0010)$.

- (b) Explain 1 : 4 demultiplexer.

- (c) Explain BCD to Decimal decoder.

- (d) Minimize the following using *k*-map $f(A, B, C) = \sum m(0, 1, 4, 6)$

- (e) Explain parity code.

5. Write short notes on any *three* :

15

- (a) Analog to digital converter
- (b) Shift Register
- (c) Asynchronous counter
- (d) K-map
- (e) Parity bit.