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AA—24—2019

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2019

(CBCS Pattern)

COMPUTER SCIENCE

(S1.3)

(Fundamental of Digital Logic)

(Wednesday, 16-10-2019)

Time : 10.00 a.m. to 1.00 p.m.

Time—3 Hours

Maximum Marks—75

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

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if necessary.

1. Solve the following (any five) : 15

(a) Explain the T-flip-flop.

(b) Explain the working of AND-gate.

(c) Explain the working of Encoder.

(d) Explain EX-OR, EX-NOR logic gate.

(e) Explain Encoder.

(f) Explain Half Adder in detail.

(g) Explain 1'S complement and 2'S complement with example.

2. Solve any two of the following : 10

(a) Draw the combinational circuit for the following output :

$$y = AB + BC + \overline{AB}.$$

(b) Describe NAND gate as universal building block.

(c) Explain working of multiplexer.

P.T.O.

3. Solve any *two* of the following : 10
- (a) Explain full adder in detail.
 - (b) Solve the following :
 - (i) $(11011)_2 \times (101) = ?$
 - (ii) $(111010) - (01010) = ?$
 - (c) State and prove De Morgan's Second law.
4. Solve any *two* of the following : 10
- (a) Explain k-map in detail with example (two, three, four variable).
 - (b) Explain don't care condition with simple example in detail.
 - (c) Minimize the following function using k-map :
 $f(A, B, C, D) = \Sigma m(0, 1, 2, 3, 8, 9, 12, 13, 14, 15)$.
5. Solve any *two* of the following : 10
- (a) Explain the working of clocked SR flip-flop.
 - (b) Describe working of 4-bit left shift register
 - (c) Explain clocked JK FF in detail.
6. Solve any *two* of the following : 10
- (a) Explain synchronous counters in detail.
 - (b) Explain Shift Register in detail.
 - (c) (i) $(3241)_8 = (?)_2$
(ii) $(435)_{10} = (?)_{16}$.
7. Solve any *two* of the following : 10
- (a) Explain concept of I/O Buses in detail.
 - (b) Explain Analog to Digital Conversion
 - (c) Explain the working of Up counter.