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AA—37—2019

FACULTY OF SCIENCE AND TECHNOLOGY

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

OCTOBER/NOVEMBER, 2019

(New/CBCS Pattern)

COMPUTER SCIENCE

(Elective)

(BCS-104-B)

(Fundamentals of Digital Electronics)

(Friday, 18-10-2019)

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

Time—Three Hours

Maximum Marks—75

N.B. :— (i) Attempt All questions.

(ii) Assume suitable data, if necessary.

1. Attempt the following (any *five*) : 15
 - (a) Explain Octal and Hexadecimal number systems.
 - (b) Explain AND, OR gates.
 - (c) Explain Half adder.
 - (d) Explain S-R flip-flop.
 - (e) Explain Gray code with example.
 - (f) Explain analog and digital signals.
 - (g) Explain T type flip-flop.
2. Attempt any *three* of the following : 15
 - (a) Explain the complementation methods with example.
 - (b) Do the following :
 - (i) $(3BC)_{16} = (?)_8$
 - (ii) $(4221)_8 = (?)_{10}$
 - (c) State and prove DeMorgan's first theorem.
 - (d) Explain asynchronous counter.
 - (e) Explain PISO shift register.

P.T.O.

3. Attempt any *three* of the following : 15

- What is multiplexer ? Explain 8:1 multiplexer.
- Explain JK flip-flop.
- Explain Hamming code.
- What is K-map ? Explain 2 variable and 3 variable K-map with example.
- Explain decoder.

4. Attempt any *three* of the following : 15

- Do the following :
 - $(111110001)_2 = (?)_{16}$
 - $(239)_{10} = (?)_2$
- Reduce the following using K-map :

$$Y = \bar{A}\bar{B}CD + \bar{A}\bar{B}C\bar{D} + \bar{A}BCD + \bar{A}BC\bar{D} + ABCD + ABC\bar{D} + A\bar{B}CD + A\bar{B}C\bar{D}$$

- Explain analog to digital converter.
- Explain synchronous counter.
- Explain construction of Basic-gates using NAND-gate.

5. Write short notes on (any *three*) : 15

- Excess-3 code
- EX-OR, EX-NOR gate
- Digital to Analog Converter
- Full Adder
- SISO Shift Register.