

27590

B. Sc. EXAMINATION, May 2019

(Second Semester)

COMPUTER SCIENCE

Second Paper

Logical Organisation of Computers

Time : 3 Hours] *[Maximum Marks : 40]*

1 is compulsory. All questions carry equal marks.

1. (a) State and prove Demorgan's law.
- (b) Prove that NAND is a universal gate.
- (c) Differentiate between Synchronous and Asynchronous Counters.
- (d) Make excitation Table of SR Flip-Flop.
- (e) Differentiate between Coding and Conversion.

2. (a) Convert the following :

$$(10.625)_{10} = (?)_6 \quad (70.5)_8 = (?)_{10}$$

$$(AFD3)_{16} = (?)_2 \quad (1234)_5 = (?)_{10}$$

(b) Use 2's complement to solve :

$$\begin{array}{r} -42 \\ +30 \\ \hline \\ \hline \end{array} \quad \begin{array}{r} -45 \\ +60 \\ \hline \\ \hline \end{array}$$

3. (a) Explain Floating Point Representation.

(b) Explain Excess-3 Code.

Unit II

4. (a) Differentiate between Boolean Algebra and Ordinary Algebra.

(b) Solve using Boolean Algebra :

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(b) Solve using Boolean Algebra :

$$(X + Y)(XZ + Z)(\overline{Y + XZ}) = \overline{X}YZ$$

5. (a) Solve using K-map :

$$Z = \sum (0, 1, 3, 5, 9, 11, 15) + \sum_{\phi} (2, 13)$$

(b) What is Canonical form of Boolean Expression ? Explain with example.

Unit III

6. (a) What is Decoder ? Design 5×32 decoder with the help of 3×8 decoders.

(b) Explain 8421 to Cyclic Code Converter.

7. (a) Implement the following Boolean function :

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$$F = B(A + CD) + \bar{B}C$$

- (b) Draw the circuit of Full Adder.

Unit IV

8. What do you mean by Shift Register ? Explain the various types of Shift Register.

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9. Design the 4-bit synchronous Counter by drawing logical diagram.