

Roll No. 233112310061 Exam Code : M-24

Subject Code—61392

B.Sc. EXAMINATION

(Main/Reappear)

(Batch 2019 Onwards)

(Second Semester)

COMPUTER SCIENCE

CCsL-205

Computer Organisation

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. ~~(a)~~ What do you mean by Truth Table ?
- ~~(b)~~ Explain self-compliment code with the help of an example.

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- (c) How can we obtain POS form expression from SOP form expression ?
- (d) Which code is used to write the labels of cell in a K-Map ? How many cells are there in a K-Map of three variable ?
- (e) Write the truth table for Full-Subtractor.
- (f) Explain XOR Gate with the help of its symbol, Boolean expression and truth table.
- (g) What do you mean by instruction cycle ?
- (h) Write the different instruction formats.

$$2 \times 8 = 16$$

Unit I

2. Do the following conversions : 16

- (a) Convert the decimal number 675.625 into hexadecimal number and binary number.
- (b) Convert the octal number 666.1 into decimal number and binary number.

(e) Convert the hexadecimal number 3A.2F into decimal number and octal number.

(d) Convert the binary number 1011011110.11001010011 into hexadecimal number and octal number.

3. Explain the following :

16

- (a) Excess-3 Code
- (b) Gray Code
- (c) ASCII Code
- (d) Representation of negative numbers using 2's complement.

Unit II

4. (a) What do you mean by Boolean algebra ?
Write different postulates of Boolean Algebra. Prove the following : 12

- (i) $A + B \cdot C = (A + B)(A + C)$
- (ii) $A \cdot B + \bar{A} \cdot C + B \cdot C = A \cdot B + \bar{A} \cdot C$

- (b) Explain duality principle with the help of an example. 4
5. (a) Explain NOR, NAND gates with the help of their symbol, Boolean expression, and truth table. Why are these gates called as universal gates ? 8
- (b) Minimize the following Boolean function using K-Map : 8
- $$F(A, B, C, D) = \sum m(3, 4, 5, 7, 9, 13, 14, 15)$$

Unit III

6. (a) Explain Full-Adder and Decoder. 8
- (b) What is Flip-Flop ? What do you mean by Race Around Condition ? Explain how it can be solved by using Master Slave JK Flip-Flop ? 8

7. (a) Design and explain Mod-16
Asynchronous counter. 8
- (b) Convert D-Type Flip-Flop into JK Flip-
Flop. 8

Unit IV

8. What do you mean by addressing mode ?
Explain various addressing modes with the help
of an example. 16
9. What do you mean by DMA (Direct Memory
Access) ? Why it is required ? Draw the block
diagram of DMA controller and explain its
working. 16