



WEST BENGAL STATE UNIVERSITY  
B.Sc. Honours 1st Semester Examination, 2022-23

CMSACOR02T-COMPUTER SCIENCE (CC2)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

GROUP-A

1. Answer any four questions from the following: 2×4 = 8
- (a) If  $(1BA59)_{16} = (X)_8$  find the value of X.
- (b) If  $(100)_x = (144)_{10}$ , then find the value of x.
- (c) What do you mean by principle of duality?
- (d) Differentiate between synchronous and asynchronous sequential circuit.
- (e) Add  $(5C)_{16}$  and  $(3F)_{16}$ .
- (f) What do you mean by the addressing mode?
- (g) What do you mean by Machine cycle?
- (h) Why the flip-flop is also called as Bi-Stable multi vibrator?

GROUP-B

Answer any four questions from this group 8×4 = 32

2. (a) Design a Full adder by using two 8-to-1 MUXs and other necessary logic gates. 3+5
- (b) Find out the minimum SOP and POS expressions for the following function:  
 $F(W, X, Y, Z) = (0, 1, 4, 6, 8, 14, 15)$   
 $= \prod (2, 3, 9)$
3. (a) Design a 3-bit Ripple counter using a JK flip-flop. 4+4
- (b) Design and explain cascading comparator circuit with suitable diagram.
4. (a) What is difference between Microinstruction format and microprograms sequence? 4+4
- (b) Draw and explain the logic circuit of 4-bit Left shift register.

5. (a) What is the difference between RISC and SISIC? 4+4  
(b) What is the difference between MISD and MIMD?
6. (a) What is the difference between a direct and an indirect address instruction? 2+6  
(b) Briefly explain Three, Two, One and Zero address instructions with the help of an example.
7. What do you mean by race condition in flip-flop? Design a JK flip-flop and discuss its operation. 2+6
8. Write short notes on any *two* of the following topics: 4×2 = 8  
(a) BCD to Excess-3 code conversion  
(b) Adder-Subtractor circuit  
(c) Booth's Multiplication Algorithm.

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