



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Honours 1st Semester Examination, 2021-22

**CMSACOR02T-COMPUTER SCIENCE (CC2)**

**COMPUTER SYSTEM ARCHITECTURE**

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.*

**Answer Question No. 1 and any *four* questions from the rest**

1. Answer any *four* questions from the following: 2×4 = 8
- (a) What is flip-flops?
  - (b) What do you mean by addressing mode?
  - (c) What is latch?
  - (d) What do you mean by instruction cycle?
  - (e) Draw a Half Adder circuit using NOR gates only.
  - (f) Subtract  $(5C)_{16}$  from  $(3F)_{16}$ .
  - (g) Differentiate between buffer and tri-state buffer.
  - (h) What are the advantages and disadvantages of using a variable length instruction format?
2. (a) Write down the difference between combinational and sequential circuit. 4+4 = 8  
(b) State and prove De Morgan's theorem.
3. (a) Design a BCD to Excess-3 code converter. 4+4 = 8  
(b) Minimize the following logic function and realize using NOR gates:  
$$f(A,B,C,D) = \prod (1, 2, 3, 8, 9, 10, 11, 14)$$
4. Write a program to evaluate the arithmetic statement: 4+4 = 8  
$$X = A * (B + C) + D/E * F + G$$
  - (a) Using a general register computer with three operand instructions.
  - (b) Using a general register computer with two operand instructions.

5. (a) What do you mean by direct and indirect addressing? 4+2+2 = 8  
(b) What is the requirement of common bus System?  
(c) What is interrupt in Computer system architecture?
6. Design a counter with a counting sequence of 0-2-7-5-6-0 ... using all JK flip flop and basic logic gates. 8
7. (a) Define I-O port. Difference between serial port and parallel port. (2+2)+4=8  
(b) Compare between Daisy Chaining and Vector interrupt technique.
8. Write short notes on any *two* of the following topics: 4×2 = 8  
(a) Shift register  
(b) Main memory  
(c) Universal Gate  
(d) Instruction set.

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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