# WEST BENGAL STATE UNIVERSITY

B.Sc. Honours/Programme 4th Semester Examination, 2020

## CMSHGEC04T/CMSGCOR04T-COMPUTER SCIENCE (GE4/DSC4)

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**

### GROUP-A

1. Answer any ***four*** questions from the following: 2×4 =8

   (a) What are the differences between time-sharing system and multiprogramming system?

   (b) Simplify the given expression using Boolean Algebra

   $$A + AB' + A'B$$

   (c) How does the floating-point number represents in computer system?

   (d) What is the function of DMA?

   (e) What is Peripheral Component Interconnect (PCI)?

   (f) Write down the generic expression to convert (number)$x$ to (number)$y$, where $x$ and $y$ are bases.

   (g) Why MUX is functionally complete?

   (h) What is a modulus counter?

### GROUP-B

**Answer any *four* questions from the following** 8×4 = 32

2. (a) Define a decoder. 2

   (b) Draw the logic diagram of a 3-to-8 decoder. 3

   (c) What is the advantage of 2's complement system over 1's complement? Using 2's complement add $(+38)_{10}$ and $(-22)_{10}$. 3

3. (a) The ALU of an IAS computer contains a Memory Buffer Register (MBR) , an Accumulator (AC) and a Multiplier-Quotient (MQ) and the Program Control Unit (CU) contains a Memory Address Register (MAR), an Instruction Register (IR), and a Program Counter (PC). Explain the functionality of each unit. 6

   (b) Write down the behavior of a tri-state switching device. 2

4. (a) Discuss about different modes of data transfer inside a simple computer system. 5

   (b) What is SCSI? How does SCSI differs from PCI? 3

5. (a) Define flip-flop. 2

   (b) What is SR flip-flop? Draw NAND-based SR flip-flop. 2+2

   (c) Write down the basic applications of flip-flop. 2

6. (a) Design a counter which counts 0, 1, 2, 3, 4, 5, 6, 7 sequentially. 4

   (b) Simplify the following Boolean expression: $f(a, b, c, d) = \Sigma(0,1,2,3,7,11,15)$ in SOP form. 4

7. (a) Explain One and Zero address instructions with suitable example. 4

   (b) Describe Register Indirect and Immediate addressing modes with proper example. 4

8. (a) Simplify the expression $Y = \Sigma m(7,9,10,11,12,13,14,15)$ using the K-map method. 4

   (b) Discuss any two Memory-reference instructions. 4

**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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