WEST BENGAL STATE UNIVERSITY

B.A./B.Sc. Honours 2nd Semester Examination, 2021

CMAACOR04T-COMPUTER APPLICATION (CC4)

COMPUTER SYSTEM ARCHITECTURE

Time Allotted: 2 Hours | Full Marks: 50

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.

1. Answer any ***five*** questions from the following: 2×5 = 10

   (a) Subtract $(1101)_2$ from $(1001)_2$ using 2's complement subtraction method.

   (b) What is the advantage of normalized a floating point number?

   (c) What do you mean by Stored Program Concept?

   (d) What is the function of Program Counter (PC)?

   (e) What do you mean by Register-reference instruction?

   (f) What is the difference between Address Bus and Control Bus?

   (g) What do you mean by the locality of reference?

   (h) What do you mean by the Interrupt-driven I/O?

2. Answer any ***four*** questions from the following: 10×4 = 40

   (a) What do you mean by sum of product and product of sum of a Boolean expression? 2

   (b) Simplify the Boolean function $f(w, x, y, z) = \Sigma m(0, 4, 5, 8, 10, 15) + \Sigma d(2, 7, 9, 13)$ and draw corresponding circuit. 8

3. (a) Using 2's complement method, find the value of $(15)_{10} - (27)_{10}$. 4

   (b) Convert $(2148.87)_{10}$ into the following two bases: 3+3

   (i) Octal (ii) Binary

4. (a) Distinguish between Combinational Circuit and Sequential Circuits. 4

   (b) Explain the instruction cycle of a basic computer with the help of a flowchart. 6

5. (a) What do you mean by instruction format? What are the different types of instructions available with a general purpose computer? 2+2

(b) What is the purpose of Addressing Mode? Explain Direct and Register Indirect addressing mode with examples. 2+4

6. (a) Explain Booth's algorithm. Apply Booth's algorithm to multiply the two numbers $(+3)_{10}$ and $(-3)_{10}$. 2+4

(b) What will happen when a subroutine is called? Why do we prefer to store return address in a stack when a subroutine is called? 3+1

7. (a) What do you mean by Memory Hierarchy in terms of Cost Per Byte, Access Time and Size? 6

(b) Distinguish between CISC and RISC architecture. 4

8. (a) Distinguish between Isolated I/O and Memory-mapped I/O. 4

(b) Explain how I/O data transfer takes place with the help of DMA. What are the advantages of it with other I/O data transfer techniques? 4+2

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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