WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 1st Semester Examination, 2020, held in 2021

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 are the differences between Computer Architecture and Computer Organization?

   (b) What do you mean by opcode?

   (c) What is a micro-operation?

   (d) What is the advantage of Gray Code?

   (e) What is Immediate Addressing mode?

   (f) If $(211)_x = (152)_8$, then find the value of x.

   (g) Describe the function of program counter.

2. (a) Draw a flowchart of Booth's Algorithm for two's complement multiplication and give an example.   (3+2)+3

   (b) What are the ranges of positive no. and negative no. that can be represented in the IEEE 754 format?

3. (a) What is pipelined architecture? Compare it with parallel architecture.   (3+3)+2

   (b) Realise a X-OR gate with four 2-input NOR gates only (show only the diagram).

4. (a) To support the branching instruction, which addressing mode is suitable? Explain it with an example.   4+2+2

   (b) What do you mean by locality of reference?

   (c) What is associative memory?

5. (a) Design and explain 4 bit magnitude comparator circuit with suitable diagram.   4+4

   (b) Design a 4 bit binary ring counter with J.K. flip-flop.

6. (a) Draw and explain the logic circuit of 4 bit left shift register.   6+2

   (b) Find out the simplified form of following logical expression using K-map:

$$F(A,B,C,D) = \sum(3,4,5,7,9,12,14,15)$$

7. (a) What do you mean by addressing mode?   2+(2×3)

   (b) Briefly explain the following addressing modes:

     (i)   Immediate mode

     (ii) Register mode

     (iii) Indirect address mode.

8.   Explain the DMA mechanism with suitable Block Diagram.   8

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.*

——×——