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WEST BENGAL STATE UNIVERSITY

B.Sc. Honours/Programme 4th Semester Examination, 2022

CMSHGEC04T/CMSGCOR04T-COMPUTER SCIENCE (GE4/DSC4)

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.

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

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

   (a) Define instruction set.

   (b) Why CPU registers are preferred for temporary data storage?

   (c) Define Fan-in of a gate.

   (d) What is byte code?

   (e) Draw an EX-OR gate using only NAND gate.

   (f) Define min-term and max-term of a Boolean function.

   (g) How to define a digital circuit?

   (h) What is PCI?

2. (a) Define a decoder. Design a 3-to-8 decoder using 2-to-4 decoder. 4

   (b) Realize a full subtractor circuit using half subtractor. 4

3. (a) State and prove De Morgan's theorem by using truth table. 4

   (b) Simplify the following expression into SOP using K map 4

   $F(a, b, c, d) = \Sigma m(0, 1, 2, 3, 7, 8, 10)$ + don't care conditions $\Sigma d(5, 6, 11, 15)$.

4. (a) What is SR Flip-Flop? Draw NAND based SR Flip-Flop. 4

   (b) Derive the characteristic equation and excitation table of SR Flip-Flop. 4

5. (a) Convert $(10101.010)_2$ to decimal number. 2

   (b) Perform the subtraction with 2's complement: $(1111)_2 - (1010)_2$ 3

(c) Simplify the following expression using K-map: 3

$F(P, Q, R) = P'Q'R' + P'QR' + PQ'R' + PQR' + PQR$

6. (a) What do you mean by addressing mode? 2

(b) Explain relative and indexed addressing modes with examples. 2+2

(c) What is interrupt? 2

7. Write short notes on (any ***two***): 4×2 = 8

(a) Associative memory

(b) Decoder-demultiplex circuit

(c) Register addressing mode vs. Direct addressing mode

(d) SRAM vs. DRAM.

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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