RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THRID SEMESTER EXAMINATION, MARCH 2022

SECOND YEAR [BATCH 2020-23]

Date : 09/03/2022 **COMPUTER SCIENCE (General)**

Time : 11 am – 1 pm **Paper : III** Full Marks : 50

Answer **any two** questions of the following: [2×10]

1. a) What is CPU ? Write down the role of it.

   b) What is the difference between Von Neumann architecture and Harvard architecture ?

   c) What is Cache memory? Write pros and cons of uses of it.

   d) What is the difference between SRAM an DRAM? [3+2+3+2]

2. a) Write Pseudo code or, draw Flow chart to check whether a given number is prime or not.

   b) What is the difference between Compiler and Interpreter?

   c) What is the structure of Assembly language instruction? Explain with an example.

   d) Write the function of Loader. [5+2+2+1]

3. a) What do you mean by self complementary code? Give an example.

   b) For data word 10110001 , how many parity bits are needed to detect and correct the single bit error ? Also using Hamming code, evaluate the message word .

   c) Find the equivalent binary number of the decimal number 69.625. Show all the necessary steps [2+6+2]

Answer **any three** questions of the following: [3×10]

4. a) Show the necessary steps to find the equivalent product of maxterm form of the boolean expression $ab + bc'$.

   b) Simplify the boolean function F with the don't care conditions d where

   $F(w, x, y, z) = \Sigma(0, 1, 2, 9, 11)$

   and $d(w, x, y, z) = \Sigma(8, 10, 14, 15)$

   c) Which gates are universal gate and why? [3+5+2]

5. a) Design a 3-bit PISO shift register and explain its working.

   b) Design a synchronous counter which counts the following states 0,1,3,5,6. Use J-K flip flop. [5+5]

6. a) Realize a J-K flip flop using D flip flop.

   b) Implement a full adder using two 8:1 multiplexers and explain its working. [5+5]

7. a) Find out the characteristics equation of S-R flip flop.

   b) Realize a 4:16 decoder using two 3:8 decoders and explain its working. [5+5]

8. a) Differentiate between the followings: [4×2]

   i. Half Adder and Full Adder

   ii. Latch and Flip-flop

   iii. Parity Generator and Parity Checker

   iv. Encoder and Decoder

   b) What is the advantage of priority encoder? [2]

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