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(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIRST SEMESTER EXAMINATION, MARCH 2021

FIRST YEAR [BATCH 2020-23]

Date : 24/03/2021 **COMPUTER SCIENCE [HONOURS]**

Time : 11.00 am – 1.00 pm **Paper : I [CC 1]** Full Marks : 50

Answer **any five** questions of the following : [5×10]

1. a) What is Cache memory ? Write down the advantages and disadvantages of it.

   b) What is the difference between EEPROM and EPROM ?

   c) Write short notes on the following terms :- [3+2(2.5×2)]

      i) System Software

      ii) CPU

2. a) Find the equivalent Octal number of $(FA.3A)_{16}$. Describe the necessary steps.

   b) What do you mean by self-complementary code? Give an example.

   c) Evaluate the equivalent gray code of the binary number 101101 . Show the necessary steps.

   d) Using 2's complement find the result of $(10110)_2 – (1011)_2$.

   e) Show the necessary steps to find 5's complement of $(105)_6$. [2+2+2+2+2]

3. a) Using Hamming code, detect and correct the single bit error , which is already occurred in the receiving word as 111001100011 containing 7 bit data word, and even parity rule is used here.

   b) Draw the flow chart to find the prime numbers between 10 to 100. [5+5]

4. a) Using Boolean algebra simplify the following Boolean expression

      $w'x (z'+ y'z) + x(w + w'yz)$

   b) State De Morgan's law and prove any one .

   c) Simplify the Boolean function F together with the don't care conditions d as

      $F(A, B, C, D) = \sum(0, 1, 2, 3, 7, 8, 10)$

      $d(A, B, C, D) = \sum(5, 6, 11, 15)$ [3+3+4]

5. a) Check whether the following proposition is tautology or not.

      $[(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)] \rightarrow r$

   b) Use laws of algebra of propositions to test the following equivalency

      $\sim (\sim (q \rightarrow p) \vee (\sim p \wedge \sim q)) \vee (p \wedge q) \equiv p$

c) Show that $t \rightarrow s$ is a valid conclusion from the given premises

$(p \wedge q) \vee (r \rightarrow s)$, $t \rightarrow r$, $\sim(p \wedge q)$ [3+4+3]

6. a) Write the output of the following program and explain:

```
#include<stdio.h>
Int main()
{
        int a=5;
        printf("%d %d",a<<2,a>>2);
}
```

b) Write a C function which will display composite numbers within a given range.

c) Explain the use of pre-increment operator. [4+4+2]

7. a) Write the differences between different storage classes in C with proper coding examples.

b) Differentiate between operator precedence and associativity in C. [8+2]

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