2021

Computer Science

[HONOURS]

(CBCS)

(B.Sc. First Semester End Examination-2021)

PAPER-C2T

Full Marks: 40 ***Time: 02 Hrs***

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Group-A

1. Answer any FIVEquestions of the following: 2x5=10

i) For two Boolean variables, total how many distinct Boolean functions can be obtained?

ii) Write two differences between combinational circuit and sequencial circuit.

iii)Find binary equivalent of $(97)_{10}$.

iv) Prove or disprove $x+xy=x$

v) What is the role of instruction register?

vi) Write two differences between CISC and RISC.

vii) What is the function of program counter in CPU?

viii) What do you mean by indirect addresing mode?

Group-B

Answer any FOUR questions of the following: 5x4 = 20

2. Design a full adder circuit.
3. Express the Boolean function $F = \sum(0,2,3,5)$ as product of max-terms.
4. Represent the floating-point number$(3.5)_{10}$ into normalized floating – point representation, in binary. Consider that 1-bit sign, 8-bit mantissa, 7-bit exponent is used. Assume that Excess-64 bit code is used for exponent.
5. What do you mean by instruction execution cycle?
6. For a cache memory, it is given that hit time = 50 micro seconds, miss time = 2 mili seconds, and effective memory access time = 830 micro seconds. Find the hit rate and miss rate for this cache memory.
7. a) What is instruction formate?

   b) Evaluate the expression X=(A-B)*(C-D) using zero and two address instructions only where A,B,C,D,X are CPU registers.

Group –C

Answer any TWO questions of the following: 10x2 = 20

8. a) Design a mod-5 asynchronous counter.

   b) Write a short note on principle of locality. 7+3

9. a) Design a simple 1-bit ALU that can perform addition and subtraction depending on control signal status.

   b) Minimize the following expression using K-map method.

   $(A,B,C,D) = \sum_m(1,5,6,12,13,14) + d\sum(2,4)$ 4+6
