No. of Printed Pages—2 **1129 (PDCCP)**

[23 HKPD1SNP- 24M]

M.Sc.IT 1st Semester (NEP) Exam. 2023 (W)

M.Sc.IT (DSC)

(Computer Fundamentals and Digital Techniques)

[CA S1-01]

Full Marks : 70

Time : 3 hours

The figures in the right-hand margin indicate marks.

1. Answer any *five* from of the following questions: $10 \times 5 = 50$

   (*a*) Discuss the important features of various generations of computers. Give some examples of the computers of each generation.

   (*b*) Briefly describe different detection mechanism used by antivirus software.

   (*c*) Define hacking. How are the ethical hackers different from crackers ? What is cyber stalking ?

   (*d*) Explain the operation of 3-input AND/OR gate and realize it using NAND/ NOR gates.

   (*e*) Define multiplexer. Using diagram, explain the working of an 8- to -1 multiplexer.

   (*f*) What is the advantage of JK flip-flop over Rs flip-flop ? Write working principle of a JK flip-flop.

   (*g*) What is register ? Explain different types of register.

(*h*) Answer the following questions:

(*i*) Convert the $(765.45)_8$ to its binary equivalent.

(*ii*) Divide 110011 by 110

(*iii*) What is mantisa and exponent of decimal representation ?

(*iv*) Add the two BCD numbers 10000111 and 01010011

(*v*) Prove that $x(y+z) = xy + yz$ using truth tables.

2. Answer any *four* from of the following questions: $5 \times 4 = 20$

(*a*) What is a bus ? List out the main functions performed by buses in a computer system.

(*b*) Define digital forgery. Briefly describe the types of digital forgery.

(*c*) Use truth table and logic diagram to explain the working of a half-adder and full-adder circuit.

(*d*) Simplify the following Boolean function in SOP form:

F (a, b, c, d) = (2, 3, 12, 13, 14, 15)

(*e*) State and prove De Morgan's Theorem.

(*f*) What is RAM ? What are its two types ? Differentiate between them.