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1129 (PDCCP)

[24-HKPD1SN-24J (M2)]

M.Sc.IT 1st Semester (NEP) Exam. 2024 (S2)

(*Computer Fundamental and Digital Techniques*)

[PGCA, S1-01]

Full Marks : 70

Time : 3 hours

The figures in the right-hand margin indicate marks.

1. Answer any *five* from the following questions (each in around 400 words) : $10 \times 5 = 50$

(*a*) List out the key hardware technologies used in building computer of each of the five generations. Mention the characteristics of stored program architecture of computer.

(*b*) What is computer virus ? Write the working principle of a computer virus.

(*c*) What is the main reason of using computer code ? Discuss about BCD Code and Gray Code with example.

(*d*) Why the digital circuits are more frequently constructed with NAND or NOR gates ? Explain the operation of 2 input XOR gate and realise it using NOR gate.

(*e*) Perform the following by 2's complement method

(*i*) 10101-11011

(*ii*) 11000-1111

(*f*) What is Duality principle ? How do you prove the De Morgan's theorem using two variables ? Explain with truth table.

(*g*) Define counter. Discuss the fundamental categories of counter.

(*h*) Differentiate between combinational and sequential circuits. Draw and explain the operation of a 4-bit parallel adder.

2. Answer any *four* from the following questions (each in around 200 words) : $5 \times 4 = 20$

(*a*) Define cyber stalking. How is the crime of cyber stalking performed ? Which section of IT Act includes cyber stalking ?

(*b*) Mention the important features of Random Access Memory. What are the specific differences between DRAM and SRAM ?

(*c*) Convert the following as directed

(*i*) $(A4B.7B)_{16}$ to decimal

(*ii*) $(111001.101)_2$ to hexadecimal

(*d*) What is decoder ? Draw and explain the working of a 3 to 8 decoder circuit.

(*e*) Discuss floating point number with suitable example. How can we normalise a floating point number ?

(*f*) Define minterm and maxterm. Explain the Boolean function $xy + xz' + y'$ in a sum of minterms.