'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 1st Semester Examination, 2023

GE1-P1-COMPUTER SCIENCE (14)

Time Allotted: 2 Hours | Full Marks: 60

The figures in the margin indicate full marks.

The question paper contains GE1A and GE1B.
The candidates are required to answer any *one* from *two* courses.
Candidates should mention it clearly on the Answer Book.

GE1A

DIGITAL ELECTRONICS

GROUP-A

Answer any *four* questions 3×4 = 12

1. Differentiate between fixed point and floating point number representation.
2. Design a NOR gate using NAND gate only.
3. Write a short note on BCD code.
4. State De Morgan's Law.
5. SR flip-flop can be considered as mother of all flip-flop —Explain.
6. Write a short note on Firmware.

GROUP-B

Answer any *four* questions 6×4 = 24

7. Discuss any three input devices of a computer system.
8. Discuss basic Boolean Laws in Boolean algebra.
9. Minimize the following Boolean expression using k-map:
   $F(A,B,C,D) = \sum_m (1,3,5,6,7,11,13,14)$
10. State 8×1 multiplexer with proper diagram and truth table.
11. Draw and explain J-K flip-flop. What do you mean by Race around condition?
12. Explain the algorithm to convert a Gray code to its equivalent binary number.

GROUP-C

Answer any two questions 12×2 = 24

13. Draw the circuit diagram of a S-R flip-flop and explain its operation.
14. Explain with example: Sum of Product and Product of Sum and also explain how to convert from one form to another.
15. Discuss Von-Neumann Architecture with proper diagram.
16. Explain 8×3 encoder with proper diagram, truth table and implementation.

GE1B

COMPUTER NETWORKS

GROUP-A

Answer any *four* questions from the following 3×4 = 12

1. What do you mean by data communication and computer networks?
2. Explain different components of data communication.
3. Differentiate between intranet and internet.
4. What is the function of transmission media?
5. What is the difference between a port address, a logical address and physical address?
6. Discuss the application of internet in business.

GROUP-B

Answer any *four* questions from the following 6×4 = 24

7. Discuss the function of transport layer of OSI reference model.
8. Explain different classes of transmissions media.
9. Discuss the advantages and disadvantages of mesh topology.
10. Explain CSMA with collision detection.
11. Differentiate between ALOHA and Slotted ALOHA.
12. Explain DNS protocol.

GROUP-C

Answer any *two* questions from the following 12×2 = 24

13. Explain different layers of TCP/IP reference model.
14. Explain parallel and serial transmission.
15. What is multiplexing? Explain different types of multiplexing techniques.
16. What is flooding? Explain Hamming Code with an example.

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