



বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY

Question Paper

B.Sc. Honours Examination 2022

(Under CBCS Pattern)

Semester - II

Subject: COMPUTER SCIENCE

Paper: C 4 - T

(Discrete Structures)

Full Marks : 60

Time : 3 Hours

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

The figures in the margin indicate full marks.

Group - A

Answer any *five* questions.

2×5=10

1. What is power set?
2. Write down any two properties of binary relation.
3. What is the difference between weighted graph and unweighted graph?
4. What is binary tree?
5. What is Well Formed Formula?
6. Define Tautology and Contradiction.

P.T.O.

7. What is universal quantifier and existential quantifier?
8. How an undirected graph is different from a directed graph?

Group - B

Answer any *four* questions.

5×4=20

9. Discuss Pigeonhole principle.
10. Describe the principle of inclusion and exclusion.
11. Prove by induction that $3^{2n-1} + 1 = 0 \pmod{4}$ for all $n \geq 1$.
12. What do you understand about Euler and Hamiltonian path?
13. Describe the concept of planar graph.
14. Can a simple graph have 5 vertices and 12 edges? If so, draw it, if not, explain why it is not possible to have such a graph.

Group - C

Answer any *three* questions.

10×3=30

15. Describe recurrence relation. Solve the recurrence relation $F_n = 5F_{n-1} - 6F_{n-2}$ where $F_0 = 1$, and $F_1 = 4$. 4+6
 16. Define power set and Cartesian product with example. Define chromatic graph. Give examples. 6+4
 17. Prove that $A \times (B \cup C) = (A \times B) \cup (A \times C)$. Prove that the statement $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$ is a tautology. 5+5
 18. Prove that the complement of the union of two sets is the intersection of their complements. State and prove De'Morgan's law. 5+5
 19. What is meant by spanning tree? How to obtain minimum spanning tree? — Explain with one example. 3+7
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