

D 112377

(Pages : 3)

Name.....

Reg. No.....

**FIRST SEMESTER (CUFYUGP) DEGREE EXAMINATION
NOVEMBER 2024**

Computer Application

BCA1CJ103—DISCRETE STRUCTURES FOR COMPUTER APPLICATIONS

(2024 Admission onwards)

Time : Two Hours

Maximum : 70 Marks

Section A*Answer all questions.**Each question carries 3 marks.**(Ceiling 24 marks).*

1. Define simple and compound propositions with examples.
2. Define Universal Quantifier.
3. Show that $\neg(p \leftrightarrow q)$ and $p \wedge \neg q$ are logically equivalent.
4. Define sets. Give any *two* methods for representing sets.
5. What is partition of a set ?
6. Define Bipartite graph.
7. Define the following with example : (a) Path ; and (b) Walk.
8. What is graph colouring ?
9. Define isolated and pendant vertices with examples.
10. Draw a binary tree and write which is the root, internal vertices and leaves.

Turn over

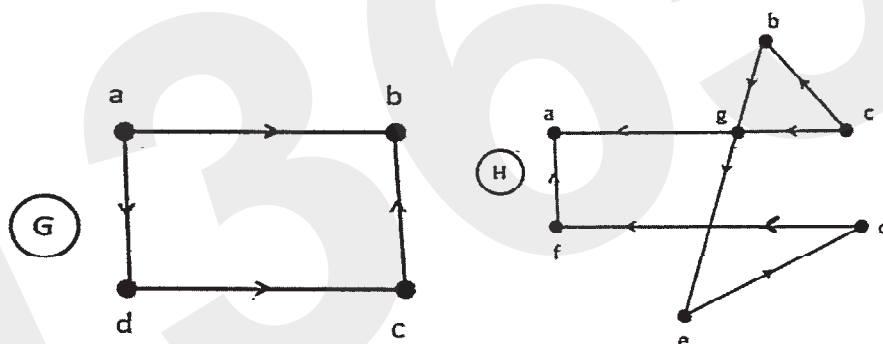
Section A

Answer **all** questions.

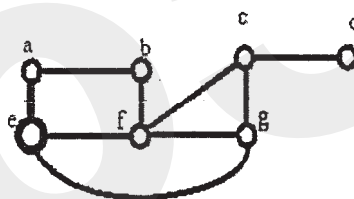
Each question carries 6 marks.

(Ceiling 36 marks).

11. Construct truth table for : (a) $p \oplus q \rightarrow p \oplus \neg q$; and $(p \vee q) \wedge \neg r$.
12. Write a short note on propositional equivalencies.
13. Consider the functions $f(x) = 2x + 3$, $g(x) = 3x + 2$. What is the composition of f and g ? What is the composition of g and f ?
14. Let f be the function from \mathbb{R} to \mathbb{R} with $f(x) = x^2$. Is f invertible ?
15. Which of the directed graphs have Euler Circuit ? Of those that do not. Which have an Euler Path.



16. Explain Travelling Sales Man Problem.
17. Prove that a full m -ary tree with I internal vertices contains $n = mi + 1$ vertices.
18. Define spanning tree of a connected graph. Find the spanning tree of the following graph.

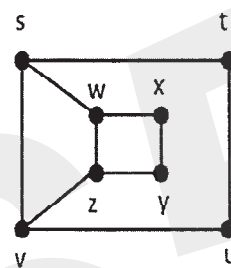
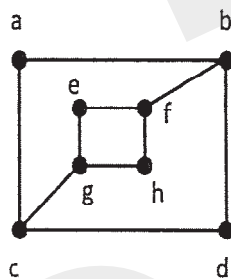


Section C

Answer any **one** question.

The question carries 10 marks.

19. Define bijective function. Give examples.
20. Determine whether the following graph are isomorphic or not ? Explain.



(1 × 10 = 10 marks)