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 $p \land \neg q$ 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

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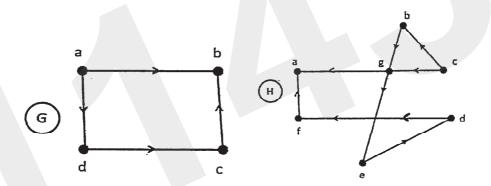
Section A

Answer all questions.

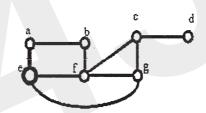
Each question carries 6 marks.

(Ceiling 36 marks).

- 11. Construct truth table for : (a) $p \oplus q \rightarrow p \oplus \neg q$; and $(p \lor q) \land \neg r$.
- 12. Write a short note on prepositional 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 R to 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.



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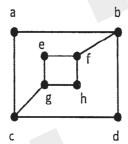
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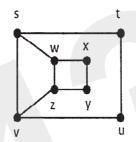
Section C

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.





 $(1 \times 10 = 10 \text{ marks})$