271554 SDCCA-103

I Semester B.C.A./B.C.A.(DS) Degree Examination,
December / January - 2025/26
(SEP Scheme Fresher+Repeater)
COMPUTER APPLICATIONS
Computational Discrete Mathematics
Paper - CA1T3

NEW HORIZON COLLEGE
LIBRARY
KASTURINAGAR
BANGALORE-43

Time : 3 Hours **Maximum Marks : 80**

Instructions :

Answer all the Sections.

SECTION - A

I. Answer any Ten questions. Each question carries 2 marks. **(10×2=20)**

1. Define set and give an example.
2. Define tautology and contradiction.
3. What is equivalence relation?
4. Define unit matrix and give an example.
5. Solve $8C_5$.
6. What is Quantifier and give an example?
7. Define Generating functions and give an example.
8. Define Linear Recurrence relation.
9. What is reflexive relation give an example?
10. What is the order and size of a graph?
11. Define a planar graph.
12. What is digraph?

SECTION - B

II. Answer any Six questions. Each question carries 5 marks. **(6×5=30)**

13. Explain all operations on sets and give examples. **(5)**

14. Find the Adjoint (A) of a Matrix $A=\begin{bmatrix}1 & 2 & 1\\ 5 & 2 & 3\\ 1 & 1 & 2\end{bmatrix}$. **(5)**

15. If $R=\{(1,2)(3,4)(2,2)\}$ and $S=\{(4,2)(2,5)(3,1)(1,3)\}$ then find RoS and SoR. **(5)**

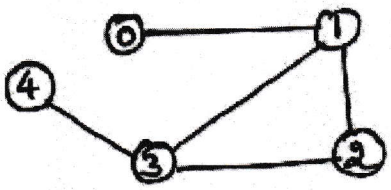
16. Explain the Pigeon hole Principle with example. **(5)**

17. If 8 runners are in race, In how many ways can gold, silver and bronze be awarded? **(5)**

18. Show that the relation R in a set $A=\{1,2,3,4,5\}$ given by $R=\{(1,1)\,(2,2)(3,3)(4,4)(1,2)(2,1)(2,3)(3,2)(4,5)(5,4)(3,4)(3,5)\}$ is an equivalence relation. **(5)**

19. Show that if n is a positive integer, then $1+3+5+.....(2n-1)=n^2$. **(5)**

20. Find the adjacency matrix for this graph. **(5)**



SECTION - C

III. Answer any Three questions. Each question carries 10 marks. **(3×10=30)**

21. Define propositional logic and Explain any four logical connectives with example. **(10)**

22. a) Determine the sequence for $a_n = 2a_{n-1} - a_{n-2}$ up to five terms for the initial conditions $a_0 = 0$ and $a_1 = 5$. **(5)**

    b) Solve the following equations using Cramer's rule

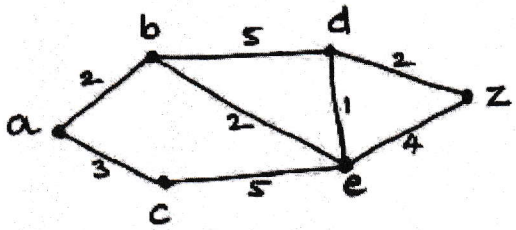
    $2x + 3y - z = 1$,
    $4x + y - 3z = 11$,
    $3x - 2y + 5z = 21$. **(5)**

23. a) Solve A group of 80 people, 42 like Coffee, 60 like Tea and each person like at least one of the two drinks. Find how many people like both Coffee and Tea. **(5)**

    b) Explain the mathematical induction with example. **(5)**

24. a) Write a note Hamiltonian graph and circuit. **(5)**

    b) Find the length of a shortest path between a to z in the weighted graph. **(5)**



NEW HORIZON COLLEGE OF ENGINEERING
LIBRARY
KASTURINAGAR
BANGALORE-43