TB242368R

Reg. No :.....

Name :.....

BACHELOR'S DEGREE (C.B.C.S) EXAMINATION, MARCH 2024

2023 ADMISSIONS REGULAR

SEMESTER II - B. Voc. Software Development SKILL

MT2B03B23 - Basic Mathematics

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

Part A

I. Answer any Ten questions. Each question carries 2 marks **(10x2=20)**

1. Differentiate between conjunction and disjunction of two propositions.
2. Define a proposition? Illustrate with an example.
3. Draw the truth table of conjunction of p and q.
4. A non-homogeneous system of linear equations may have infinitely many Solution. Justify.
5. Define rank of a matrix with an example.
6. Calculate the rank of $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, using elementary transformation.
7. Explain about i) set builder form ii) roaster form
8. Indicate the elements of the following set by listing method(roaster form)
   i) set of all integers between 0 and 50 , each of which has 3 as its last digit.
   ii) set of all square roots of the number 9.
9. Define complete graph.
10. Define intersection of two graphs.
11. Draw the graph and determine how many edges each has. K2,3
12. Draw a graph having the following matrix as its adjacency matrix

$$\begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 2 \\ 0 & 0 & 1 \end{bmatrix}$$

Part B

II. Answer any Six questions. Each question carries 5 marks **(6x5=30)**

13. Show that the following argument is invalid: ' If I buy stocks , I will lose money. Therefore, if I lose money ,I buy stocks'.
14. Prove that p V (p$\wedge$ q) = p, using truth table.
15. Define identity matrix with example
16. Describe the different steps to find the solution of a homogeneous equation , with the help of an example.
17. Prove that (A$\cup$B)$\cup$C = A$\cup$(B$\cup$C)
18. define symmetric difference also show venn diagram
19. Explain reflexive , antisymmetric and transitive relations with examples.
20. Explain about cut edge and cut vertex with illustrations.

21. Draw a graph having the following matrix as its adjacency matrix

$$\begin{bmatrix} 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix}$$

Part C

III. Answer any Two questions. Each question carries 15 marks **(2x15=30)**

22. Let p be the proposition 'high-speed driving is dangerous' and q the proposition 'Ram was a wise man'. Write down the meaning of the following propositions: (a) $p \wedge q$ (b) $\sim p \vee q$ (c) $\sim (p \vee q)$ (d) $(p \wedge q) \vee (\sim q \wedge \sim q)$

23. Solve the homogeneous equation $2x - y + 3z = 0$

$3x + 2y + z = 0$

$X - 4y + 5z = 0.$

24. Find the solution of $x_1 - x_2 + x_3 = 1$

$x_1 + 2x_2 + x_3 = 0$

$2x_1 + x_2 + 3x_3 = 1..$

25. State and Prove De - Morgan's laws.