

D125/P131/CMP501/EE/20240111

Time : 3 Hours

Marks : 80

Instructions :

1. All Questions are Compulsory.
2. Each Sub-question carry 5 marks.
3. Each Sub-question should be answered between 75 to 100 words. Write every questions answer on separate page.
4. Question paper of 80 Marks, it will be converted in to your programme structure marks.

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1. Solve any **four** sub-questions.
 - a) Explain transitive relation with an example. 5
 - b) Explain function subjective and objective with examples and with diagrams. 5
 - c) Convert $(43981)_{10}$ into its hexadecimal equivalent number. 5
 - d) Explain types of vectors with diagram. 5
 - e) Explain symmetric matrix with example. 5
 2. Solve any **four** sub-questions.
 - a) Find the area A and tragal with sides 5 cm, 12 cm and 13 cm. 5
 - b) If the cost of 2 pens and 3 pencils is Rs. 26 and the cost of 3 pens and 2 pencils is Rs. 34, what is cost of one pen and one pencil respectively? 5
 - c) Define the terms with one example each 5
 - i) Conjunction
 - ii) Disjunction
 - d) What will be the Cartesian product of following sets $L = \{C, Pascal, COBOL\}$ is a set of computer languages. 5
 - i) $S = \{Windows, UNIX, dos\}$ is a set of operating system find their product $L \times S$.
 - ii) $A = \{a\}$ and $B = \{a, c, d\}$ are two sets find their product $A \times B$ and $B \times A$.
 - e) Write types of vectors and write 2-3 lines about each. 5

3. Solve any **four** sub-questions.

- a) Explain the terms finite set and infinite set. 5
- b) Verify whether $(P \wedge (P \rightarrow Q) \rightarrow Q)$ is tautology or not. 5
- c) Solve the following examples of surd. 5
- i) $3\sqrt{26}$
- ii) $3\sqrt{54}$
- d) What are the two methods that are commonly used to represent sets. Explain. 5
- e) Find the roots of 5
- $$x^3 - 6x^2 + 9x - 4 = 0$$

4. Solve any **four** sub-questions.

- a) Find the roots of $x^2 - 7x + 10 = 0$. 5
- b) Write the properties of scalar multiplication. What is scalar multiplication of 5
- $$Q = \begin{bmatrix} 3 & 5 & -2 & 1 \\ 7 & 9 & 4 & 5 \end{bmatrix} \text{ and } k = 5.$$
- c) Find the cofactors of the given square matrix. 5
- $$A = \begin{bmatrix} 1 & 1 & -4 \\ 2 & 6 & 2 \\ 1 & 0 & -1 \end{bmatrix}$$
- d) Find the cross product of two vectors $a \times b$. 5
- e) Write some important properties of collinear and coplanar vectors. 5

