

[illegible]

Total No. of Questions : 09

Paper ID : [C0242]

Max. Marks : 60

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
- 2. SECTION-B consists of FOUR Sub-sections : Units-I, II, III & IV.**
- 3. Each Sub-section contains TWO questions each, carrying TEN marks each.**
- 4. Student has to attempt any ONE question from each Sub-section.**

1. Write briefly :

- c) Evaluate $(a \ b) \begin{pmatrix} c \\ d \end{pmatrix} + (a \ b \ c \ d) \begin{pmatrix} a \\ b \\ c \\ d \end{pmatrix}$.

- e) Differentiate the following function w.r.t. x $(x^2 - 4x + 5)(x^2 - 2)$.

- f) Differentiate x^x w.r.t. x .

- g) Which number is larger $(1.01)^{1000000}$ or 10000?**

- h) Show that $9^{n+1} - 8n - 9$ is divisible by 64 whenever n is a positive integers.

- i) In a student union meeting in a school, 16 students show up. Each shakes hands with each other exactly once. Determine the total number of handshakes.

- j) Define Skew symmetric.

SECTION-B

UNIT-I

2. There are 40 students in a chemistry class and 60 students in a Physics class. Find the number of students which are either in physics class or chemistry class in the following cases :
- i) the two classes meet at the same hour
 - ii) the two classes meet at different hours and 20 students are enrolled in both the subjects.
3. Solve the following for x
- (i) $\log_{10} [(\log_3 3 (\log_4 64))]$
 - (ii) $\log_5 (\log_6 36) = \log_x 4$

UNIT-II

4. If $A = \begin{vmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{vmatrix}$ is a matrix satisfying $A.A' = 9 I_3$, then find the values of a and b .

5. If $A = \begin{vmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{vmatrix}$, find A^{-1} and hence solve the system of linear equations

$$3x + 4y + 7z = 14$$

$$2x - y + 3z = 4$$

$$x + 2y - 3z = 0.$$

UNIT-III

6. Find $\frac{dy}{dx}$, if $y^x + x^y + x^x = a^b$.
7. $Y = \frac{(ax-b)}{(x-1)(x-4)}$ has a turning point at $p(2, -1)$. Find the values of a and b and show that y is maximum at p .

UNIT-IV

8. Find $(a+b)^4 - (a-b)^4$, hence, evaluate $(\sqrt{3} + \sqrt{2})^4 - (\sqrt{3} - \sqrt{2})^4$.
9. If 3^{rd} , 4^{th} , 5^{th} terms in the expansion of $(x+a)^n$ are respectively 84, 280, and 560. Find the values of x , a , n .