UKA TARSADIA UNIVERSITY

B. Pharm. (1st Semester)

Subject :030020105-Elementary (Remedial) Mathematics

Duration : 3 Hours **Max. Marks: 70**

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks allocated to that question.
5. Draw diagrams/figures whenever necessary.

SECTION - 1

Q-1 (A) Do as directed. **[07]**

I) Determine the value of $\begin{vmatrix} 4 & -5 \\ 7 & 5 \end{vmatrix}$

II) Give an example of null Matrix.

III) Evaluate: ${}_{10}C_3$

IV) Using binomial expansion, find the values of $(101)^5$

V) Define: Mode.

VI) Find the range for the following data:
130, 140, 130, 120, 110 and 130.

VII) Find the sum up to 10 terms of the series 1, 2, 4, 8, 16….

Q-1 (B) Answer the following in brief. (Any 4) **[08]**

I) Expand Sarrus Rule: $D = \begin{vmatrix} 2 & -1 & 3 \\ 4 & 1 & 2 \\ 1 & -1 & 5 \end{vmatrix}$

II) The reactions of tuberculin test of 10 boys are as follows :8,3,7,5,8,11,10,9,7,12. Find the standard deviation of the data.

III) Find the n terms : ${}_nP_4 = 12 \text{ X } {}_nP_2$

IV) Solve the quadratic equation: $2x(x-7) = 3(2 - x)$

V) Find how many four letter words can be formed out of the letters of the word 'LOGARITHM'.

VI) If a, b ,c, are in G.P., then prove that $\log a^n$, $\log b^n$, $\log c^n$ are in A.P.

Q-2 Answer the following. **[10]**

A) Solve the following simultaneous equations using Cramer's Rule.

$$5x - 7y + z = 11$$
$$6x - 8y - z = 15$$
$$3x + 2y - 6z = 7$$

OR

A) Let $A = \begin{bmatrix} 1 & 9 & 5 \\ 2 & -1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 2 & 1 \\ 3 & 2 & 5 \end{bmatrix}$ Find A', B' and (A+B)' and show that (A+B)'=A'+B'

B) For a G.P. $T_3 = 12$ and $T_6 = 96$ then find T_4 and T_7.

OR

B) The sum of n terms of the series 25, 22, 19, 16,……is 116 find number of terms and the last term.

Q-3 Answer the following in detail. (Any 2) **[10]**

A) Calculate the mean and mean deviation about mean for the following distribution.

X	6	7	8	9	10	11	12
Y	3	6	9	13	8	5	4

B) If α, β are the roots of the equation $x^2 - 7x + 3 = 0$, find the values of the following.

1) $\alpha^2 + \beta^2$ 2) $\alpha^3 + \beta^3$

C) Solve the system of equation by matrix method : $\begin{aligned} x + 5y &= 7 \\ 3x + 15y &= 21 \end{aligned}$

SECTION - 2

Q-4 (A) Do as directed. **[07]**

I) Express in degree and seconds the following angles : $\frac{2\pi^c}{3}$

II) Determine the Median from the following data.

X	5	10	15	20	25	30	35
Y	3	4	5	10	12	9	8

III) Evaluate: $\sin\frac{2\pi}{3} + \cos\frac{7\pi}{6} + \tan\frac{5\pi}{3}$

IV) Solve the equation. $\log x + \log(x-5) = \log 6$

V) What is the slope and intercept of the line 5y=-3?

VI) Write down the derivatives of $\sqrt{x}$

VII) Define: Median

Q-4 (B) Answer the following in brief. (Any 4) **[08]**

I) Evaluate : $\tan^2\frac{\pi}{6} + \tan^2\frac{\pi}{4} + \tan^2\frac{\pi}{3}$

II) Consider a rule f(X) = 2x – 3

III) Evaluate the : $\lim_{x\to -1} 3x^4 - 7x^2 + 2x + 3$

IV) Difference between the implicit and explicit function?

V) What is the slope of the line perpendicular to the line?

VI) Prove that: $\frac{1}{\log_2 6} + \frac{1}{\log_3 6} = 1$

Q-5 Answer the following. **[10]**

A) Prove that : $\cos\theta = \frac{\cos(90^0 + \theta)\sec(270^0 + \theta)\sin(180^0 + \theta)}{\cos ec(-\theta)\sec(270^0 - \theta)\tan(180^0 + \theta)}$

OR

A) Prove that $2\sin(\theta - \frac{\pi}{6}) = \sqrt{3}\sin\theta - \cos\theta$

B) If $\tan x = \frac{5}{6}$ and $\tan y = \frac{1}{11}$, then show that $x + y = \frac{\pi}{4}$.

OR

B) If $\log(\frac{a+b}{2}) = \frac{1}{2}(\log a + \log b)$, then prove that a=b.

Q-6 Answer the following in detail. (Any 2) **[10]**

A) Find $\frac{dy}{dx}$ when $y = \frac{(2x+1)^2(x+1)^3}{(3x+4)}$

B) Evaluate : $\int x^2 \sin x^3 dx$

C) 1) Show that (-1, 3), (4,-7) and (14,-2) are the vertices of an isosceles right angled triangle.

2) Identify the figure obtaining by the points A(1,-1), B(-1,1) and C($-\sqrt{3}$,$-\sqrt{3}$)