UKA TARSADIA UNIVERSITY

B.Pharm. (1st Semester)

Subject :030020105-Elementary (Remedial) Mathematics (Old)

Time : **2.30 p**m to **5.30** pm Date : **31/05/**20**14**

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) Solve the system of equation using Cramer's Rule ; **2 x + 5 y = 1 , 3 x + 7 y = 2**

II) If $A = \begin{bmatrix} 3 & 4 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -1 & -1 \\ 3 & 4 \end{bmatrix}$ find A + B

III) Define Null Matrix.

IV) Define Range.

V) State Addition Theorem of Probability.

VI) Find the sum of first six terms of the Geometric Progression 3 , 6, 12, 24, ….

VII) Compute ${}_4P_2$

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

I) Solve : $5x^2 - 2x - 4 = 0$

II) Using the properties of determinant, find the value of $\begin{vmatrix} 3 & 2 & 4 \\ 2 & 3 & 6 \\ 6 & 4 & 8 \end{vmatrix}$

III) Find the value of $(1001)^3$

IV) Solve the equation : ${}_{19}C_{x+2} = {}_{19}C_{2x-1}$

V) Define Continuous Random Variable.

VI) Find the probability of an odd number appears in a single toss of a fair die.

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

A) Solve the following system of linear equation using crammer's rule
$\boldsymbol{x + 2y + 3z = 6 , 2x + 4y + z = 7 , 3x + 2y + 9z = 14}$

OR

A) Find the Standard Deviation of the following distribution.

Age	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50
No .of Persons	170	110	80	45	40	35

B) For Poisson Variable X , if P (X = 3) = P (X = 4) then find P (X = 0)

OR

B) Three numbers are in arithmetic progression. Their sum is 15 and their product is 80. Determine the three numbers.

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

A) For independent events A and B if P(A) = 0.3 and P(A ∪ B) = 0.6 Find P (B).

B) Find the middle term in the expansion $(1+\sqrt{x})^{20}$

C) Let $A=\begin{bmatrix}1 & 2 & 3\\ 1 & 4 & 1\\ 0 & 0 & 1\end{bmatrix}$ and $B=\begin{bmatrix}1 & 3 & 1\\ 2 & 4 & 1\\ 0 & 1 & 0\end{bmatrix}$ then prove that $(\boldsymbol{A}+\boldsymbol{B})^{\boldsymbol{T}} = \boldsymbol{A}^{\boldsymbol{T}} + \boldsymbol{B}^{\boldsymbol{T}}$

SECTION - 2

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

I) Evaluate $\cos 15°$

II) Find the area of triangle whose vertices are (4 , 4) , (3 , -2) and (-3 , 16).

III) Evaluate $\log_3 9$

IV) Define Locus of a point.

V) Differentiate y = log sin x with respect to x

VI) Integrate the function $\frac{1}{x^2+3}$ with respect to x.

VII) In which quadrant does the point (- 3, - 4) lie ?

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

I) Find the distance between the points (2, -1) and (3 , 2)

II) Expand and simplify sin (A - B) -- sin (A + B)

III) Show that the points (1 , 1), (2 , 3) and (3, 5) are collinear.

IV) Convert $60°$ to radian measure.

V) Find $\frac{dy}{dx}$ where $y=\frac{7}{x^3}$

VI) Evaluate $\int x \sin x \, dx$

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

A) Find all t – ratios of $120°$

OR

A) Evaluate $\int_0^{\frac{\pi}{2}} \log \sin x dx$

B) Solve the differential equation (1 + cos x) dy = (1 – cos x) dx

OR

B) Find the equation of locus of a point which moves such that it remains equidistance from the points A (3 , -1) and B (4, 2)

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

A) Solve the equation log (x - 1) + log (x + 1) = 2 log (x + 2)

B) Prove that $2\cos\frac{\pi}{13}\cos\frac{9\pi}{13}+\cos\frac{3\pi}{13}+\cos\frac{5\pi}{13}=0$

C) Find $\frac{dy}{dx}$ where $y=\frac{x-\cos x}{x+\cos x}$