

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) When the real roots of a quadratic equation are not exist?
- II) Evaluate $\begin{vmatrix} 2 & -1 & 0 \\ -3 & 1 & 2 \\ 4 & 2 & -1 \end{vmatrix}$
- III) Explain Symmetric Matrix.
- IV) From mean median and mode which will give the best average value? Why?
- V) Give the classical definition of probability.
- VI) Evaluate ${}^7P_3 \times {}^5P_2$
- VII) If $\cos A = 15/17$, find $\sin A$ and $\tan A$.

Q-1 (B) Do as Directed (Any Four) [08]

- I) Solve the following simulation of equations
 $x^2 + y^2 = 185$, $x + y = 19$
- II) If $A = \begin{bmatrix} 2 & -3 \\ 1 & -5 \end{bmatrix}$ then find $A^2 - 3A + 2I$.
- III) Compute the arithmetic and geometric mean from the following data:
3, 6, 7, 10, 12, 18, 20, 23
- IV) Find the value of n for ${}^nC_4 : {}^nC_3 = 7 : 4$
- V) Two cards are drawn from well shuffled pack of 52 playing cards find the probability that they are king and red card.
- VI) Prove that $\cos 105^\circ + \cos 15^\circ = \sin 75^\circ - \sin 15^\circ$

Q - 2 Answer the following.

- (A) Solve the following equations using cramer's rule [05]
 $x + y - 2z = 3$, $2x - y + z = 2$, $3x + y - z = 8$

OR

- (A) The following distribution shows the days of confinement after delivery for 25 patients.

Days of confinement	6	7	8	9	10
No. of patients	7	6	5	4	3

Find mean, median and mode of the distribution.

- (B) There are 64 beds in a garden and 5 seeds of particular variety are sown in each bed. The probability that seed will germinate is $\frac{3}{4}$. Find the number of beds in which (i) all seeds have germinated (ii) at least 3 seeds have germinated. [05]

OR

- (B) Prove that $\sin^2 \pi/4 + \sin^2 3\pi/4 + \sin^2 5\pi/4 + \sin^2 7\pi/4 = 2$

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

- (A) Solve the following system of equation using inverse of matrix.
 $x + 2y + 3z = 1$, $2x + 3y + 2z = 2$, $3x + 3y + 4z = 1$
- (B) Find the value of $(\sqrt{18} - \sqrt{8} + 1)^4 + (\sqrt{18} - \sqrt{8} - 1)^4$
- (C) Prove that, $\sec 2\theta + \tan 2\theta = \tan (\pi/4 + \theta)$

Section-2

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

- I) What is the relation between slopes when two straight lines are parallel?
- II) What is the equation of line when they are making intercepts on both axes?
- III) If $y = x^e e^x$ then find dy/dx
- IV) Find, $\lim_{x \rightarrow 3} \frac{x^2-9}{x-3}$
- V) If $f(x) = \cot x$ then what is the value of $f'(x)$?
- VI) Evaluate $\int \frac{5-4\sin x}{\cos^2 x} dx$.
- VII) Form the differential equation from the equation $y^2 = 4a(x+a)$.

Q-4 (B) Do as Directed (Any Four) **[08]**

- I) Find the equation of line which intercepts on axis are -2 and -3.
- II) Find the slope of line $3x + 2y = 5$.
- III) Obtain dy/dx , If $x = at^2, y = 2at$
- IV) Find, $\lim_{n \rightarrow \infty} \frac{1+2+3+\dots+n}{(n+3)(n+4)}$
- V) Evaluate $\int_0^{\pi} \frac{\sin x}{\sin x + \cos x} dx$.
- VI) Find differential equation for $y = a \cos x + \sin x$

Q - 5 Answer the following.

- (A) Find the equation of line passing through the point of intersection of two lines $4x-3y = 1$ and $y = 3x - 5$ and perpendicular to the line $2x + 3y = 12$. **[05]**

OR

- (A) Find the n^{th} derivative of $e^{3x} \cos^2 x$

- (B) Evaluate $\int \frac{x^2+1}{(x-1)(x-2)(x-3)} dx$ **[05]**

OR

- (B) Solve the following differential equation
 $y^2 + x^2 dy/dx = (xy) dy/dx$

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

- (A) If A (-5,-5) and B(-3,-5) and C(10,5) are the three vertices of a parallelogram, find its fourth vertex opposite to B.
- (B) Find the n^{th} derivative of $\sin x \cdot \sin 2x \cdot \sin 3x$
- (C) Solve the differential equation $\sin x \cos x dy/dx = y + \sin x$