# UKA TARSADIA UNIVERSITY

### B.Pharm. (1st Semester)

**Subject :** 030020105-Elementary (Remedial) Mathematics (OLD)

Time : 10:00 am to 1:00 pm                                    Date : 30/12/2013

**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 equation of $5x^2 - 2x - 4 = 0$.

II) Solve the equation $(x + 3)^2 = 4x - 1$.

III) Tuberculin test reactions of 10 patients then find the mean size of reaction. 3,5,7,7,8,8,9,10,11,12.

IV) From the following data calculate mean deviation from mean 35,40,25,20,30.

V) Find the value of $10P4$.

VI) Find the value of $60P2$.

VII) Find the $12^{th}$ term of the arithmetic progression 2,7,12,17,22,…

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

I) The third term of an arithmetic progression is 10 and its $10^{th}$ term is 31. Find the sum of first 25 terms of this an arithmetic progression.

II) Find the sum of all natural numbers between 200 and 400 which are divisible by 7.

III) Solve; $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{13}{6}$ , $x \neq 0,1$.

IV) Solve; $2x(x - 7) = 3(2 - x)$.

V) Find the value of $(1001)^3$.

VI) The reactions of tuberculin test of 10 males are as follows: 8,3,7,5,8,11,10,9,7,12.

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

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

| Class | 3-5 | 5-7 | 7-9 | 9-11 | 11-13 | 13-15 | 15-17 |
|-------|-----|-----|-----|------|-------|-------|-------|
| Frequency | 5 | 8 | 30 | 82 | 45 | 24 | 6 |

**OR**

A) Solve the following equation $\frac{1}{x+1} + \frac{1}{x+2} = \frac{1}{x+3}$

B) Find $Q_1, Q_2, Q_3$ from the following observation : 29,12,26,19,24,36,21,33,35.

**OR**

B) Find the coefficient of $x^{10}$ in the expansion of $\left(2x^2 - \frac{3}{x}\right)^{11}$

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

A) Find the middle term in the expansion of $\left(x + \frac{1}{x}\right)^{10}$.

B) Solve $\sqrt{4x + 1} + \sqrt{x + 1} = 3$.

C) Find r, if $7P_r = 60 \times 7P_{r-3}$.

<center>SECTION – 2</center>

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

I) Find the distance between the points $(-3,3)$ $and$ $(5,4)$.

II) Integrate $\int 5x^5 dx$.

III) Convert $\frac{3\pi}{2}$ to degree Measure

IV) Find the area of a triangle whose vertices are $(2,3), (2,1), (1,1)$.

V) Convert the following into degree measure:
   (a) $\frac{\pi}{3}$   (b) $\frac{\pi}{2}$

VI) Differentiate $x \log x$ with respect to $x$.

VII) Differentiate $e^{4x}$ with respect to $x$.

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

I) Differentiate $\frac{x-1}{\sqrt{x}}$.

II) Show that $P(4,4), Q(3,5)$ $and$ $R(-1,1)$ are the vertices of right angle.

III) Find the point which divides the joining of A(-1,-5) and B(1,-2) externally in the ratio 4:3

IV) Find $\frac{dy}{dx}$ where $y = e^{ax} \cos(bx + c)$.

V) Evaluate $\int \log x \, dx$.

VI) Find the value of $\cos^2 45° - \sin^2 15°$.

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

A) Integrate $\int \frac{\sin 2x}{\sin^4 x + \cos^4 x} dx$

<center>**OR**</center>

A) Prove that $\frac{\sin\theta + \sin 3\theta + \sin 5\theta + \sin 7\theta}{\cos\theta + \cos 3\theta + \cos 5\theta + \cos 7\theta} = \tan 4\theta$

B) Integrate $\int \frac{\sin x \cos x \, dx}{a^2 \sin^2 x + b^2 \cos^2 x}$

<center>**OR**</center>

B) Prove that $\cos 20° \cos 40° \cos 60° \cos 80° = \frac{1}{16}$

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

A) Prove that $y = x^3 + ax^2 + bx + c$ is the solution of $\frac{d^3y}{dx^3} = 6$.

B) 1) Find the equation of line through the point $(4, -3)$ and $(0,1)$.
   2) Write the equation of straight line with gradient $\frac{-4}{5}$ and intercept 3.

C) Evaluate $\tan \frac{13\pi}{12}$.