*Seat No.:----------* *Enrolment No.:----------*

# UKA TARSADIA UNIVERSITY

## Maliba Pharmacy College

B. Pharm 1st Semester Internal Examination Dec- 2012

**030020105- Elementary (Remedial) Mathematics**

Time: 1:00 a.m. To 4:00 p.m. Max. Marks: **70**

Date: 03/12/2012

**Instructions:**

- Question no. **1 is compulsory.**
- From Q.2 to Q.7 attempt any **four** questions.
- Make suitable assumption whenever necessary.
- Figures to the right indicate full marks.

**Q.1** **(a)** **Answer the following: (any six)** **06**

1 Evaluate : ${}_7P_4$

2 Find the distance between the points (-2,3) and (-8,-4).

3 Solve : ${}_{10}C_3$

4 Write down the formula of General term of binomial expansion.

5 $550^o$ convert degree to radian.

6 Transform the following angels to degree measures : $\frac{5\pi}{6}$

7 Solve the following : $\begin{vmatrix} -2 & -6 \\ -4 & -8 \end{vmatrix}$

8 $\text{Log}_7 49$

**(b)** **Describe in brief: (any four)** **08**

1 Expand D= $\begin{vmatrix} 2 & -1 & 3 \\ 4 & 1 & 2 \\ 1 & -1 & 5 \end{vmatrix}$ by Sarrus Method

2 Solve using Quadratic Equation : $3x^2 - 17x + 20 = 0$

3 Solve using Binomial expansion : $11^5$

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

5 Evaluate : $\cos\frac{3\pi}{2} + \sin\frac{3\pi}{2} + \cos ec\frac{3\pi}{2} + \cot\frac{3\pi}{2}$

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

**Q.2** (a) Solve the following equation : $6\left(x^2 + \frac{1}{x^2}\right) - 35\left(x + \frac{1}{x}\right) + 62 = 0$ **04**

(b) Prove that : $\begin{vmatrix} x^2 & y^2 & z^2 \\ x & y & z \\ 1 & 1 & 1 \end{vmatrix} = -(x-y)(y-z)(z-x)$ **05**

(c) If the 6th term in the expansion of $(1+x)^{10}$ is $\frac{63}{8}$, find the value of $x$. **05**

**Q.3** (a) Prove that : $(1+\tan\theta)^2 + (1+\cot\theta)^2 = (\sec\theta + \cos ec\theta)^2$ **04**

(b) Differentiate: $\frac{x^2 + e^x}{\log x + 10}$ with respect to $x$. **05**

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(c) Evaluate : $\lim_{x\to 4}\frac{\sqrt{x}-2}{x-4}$ **05**

**Q.4** (a) Obtain $\frac{dy}{dx}$, when $x=a(\cos t+\log\tan\frac{t}{2})$, $y=a\sin t$ **04**

(b) Evaluate : $\int(3x-17)^{10}dx$ **05**

If α and β are the roots of $x^2+4x+6=0$. Construct the quadratic equation whose roots are

(c) (i) $\frac{1}{\alpha^2},\frac{1}{\beta^2}$ **05**

(ii) $\frac{\alpha+\beta}{\alpha},\frac{\alpha+\beta}{\beta}$

**Q.5** (a) Solve the following equation : $3^{x+2}+3^{-x}=10$ **04**

(b) Evaluate : $\lim_{x\to 3}2x^2\sqrt{x^2+7}$ **05**

(c) Solve the following using Cramer's rule : $\begin{aligned}x-y+z&=4\\2x+y-3z&=0\\x+y+z&=2\end{aligned}$ **05**

**Q. 6** (a) Let $f(x)=\frac{3x^2+8x-4}{2x^2+4x-5}$, Compute $\lim_{x\to\infty}f(x)$ if it exists. **04**

(b) If $A=\begin{bmatrix}4&1&3\\2&0&5\\1&3&0\end{bmatrix}$ and $B=\begin{bmatrix}2&-1&0\\0&4&3\\2&1&5\end{bmatrix}$, then verify that **05**

$(A+B)'=A'+B'$

$(AB)'=B'A'$

(c) Prove that $\tan 50^\circ=\frac{\cos 10^\circ}{1-\sin 10^\circ}$ **05**

Q.7 (a) Evaluate : $\frac{\log 25-\log 125+\frac{1}{2}\log 625}{3\log 5}$ **04**

(b) Solve : $\int\left(x+\frac{1}{\sqrt{x}}\right)^2dx$ **05**

(c) Solve the following system of equations, using inverse of a matrix : **05**

$\begin{aligned}x+y+z&=3\\x+2y+3z&=6\\3x+y+2z&=6\end{aligned}$