Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B. Pharm. Semester - IST Examination –July- 2011

Subject code: 210006
Subject Name: Elementary (Remedial) Mathematics

Date:15/07/2011 **Time: 10:30 am – 01:30 pm**
Total Marks: 80

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Solve the following equations **06**

(i) $(x+3)^2 = 4x - 1$

(ii) $\sqrt{4x+1} + \sqrt{x+1} = 3$

(b) Solve the simultaneous equations **05**

$x + y = 16$ and $x^2 + 10x + y = 8$

(c) The sum of 7 terms of an A.P. is 35 and common difference is 1.2. Determine the first term of the series. **05**

Q.2 **(a)** Define the Sarrus Rule for the Expansion of Third Order Determinant with Expand 'D' by sarrus method. **06**

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

(b) Solve the following simultaneous equations using Cramer's rule. **05**

$a + b + c = 4$; $2a - 3b + 4c = 33$; $3a - 2b - 2c = 2$

(c) Show that A satisfies the equation $A^2 - 4A - 5I = 0$, where I is the identity matrix. **05**

$$A = \begin{pmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{pmatrix}$$

Q.3 **(a)** Find the equations of the medians of the Δ ABC, whose vertices are A (2, 5), B (-4, 9) and C (-2, -1). **06**

(b) A (-1, 3), B (-1, m) and C (4, 3) are vertices of Δ ABC, m∟ 90º. Using distance formula find the value of m **05**

(c) **05**

Let $f(x) = \dfrac{3x^2 + 5x - 7}{2x^2 + x + 1}$

Compute $\lim_{x \to \infty} f(x)$ if it exists.

Q.4 **(a)** Find the mean, median, and Standard deviation of the following data **06**

Protein intake / day	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75	75 – 85
Number of families	30	40	100	110	80	30	10

(b) Two unbiased dice are tossed simultaneously. Find the probability that sum of number on the upper face of dice is 9 or 12. **05**

(c) Find the term independent of x (constant) in the expansion of **05**

$$\left(\frac{x^2}{2} - \frac{2}{x}\right)^9$$

Q.5 **(a)** Do as directed **06**

(i) Cos 210º Find the T – Ratio.
(ii) Find the value of Cos 75º

(b) Prove that $\text{Cos}^4 A - \text{Sin}^4 A = 1 - 2\,\text{Sin}^2 A$ **05**

(c) The bacteria in a culture grows by 7% in the first hour, decreases by 6% in the second hour and again increase by 5% in the third hour. If at the end of third hour the count of bacteria is 11270000, find the original count of bacteria in the sample. **05**

Q. 6 **(a)** Find $\frac{dy}{dx}$ if $y(x + y) = x - y$. **06**

(b) Let $y = \log[\log(\log x)]$ **05**

(c) **05**

Differentiate $\left(\frac{1 + x}{1 - x}\right)$ w.r.t. x.

Q.7 **(a)** Solve $(x + 2y^3)\frac{dy}{dx} = y$ **06**

(b) Solve $\int \tan^3 x$ **05**

05

(c) Out of six boys and four girls in how many ways a committee of five members can be formed in which (i) there are at the most 2 girls (ii) a particular boy is included and a particular girl is excluded.

****