Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B. Pharm. – SEMESTER – I • EXAMINATION – SUMMER 2013**

**Subject Code: 210006 Date: 09-05-2013**

**Subject Name: Elementary (Remedial) Mathematics**

**Time: 02.30 pm - 05.30 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 equation. $\sqrt{(3x+1)} - \sqrt{(x-1)} = 2$ **06**

(b) Solve the equation. **05**

$$x^2 + y^2 = 185$$
$$x + y = 19$$

(c) Solve the following equation. **05**

$$\frac{1}{x+1} + \frac{1}{x+2} = \frac{1}{x+3}$$

**Q.2** (a) Compute the median for the following frequency distribution. **06**

| Size | 1-30 | 31-60 | 61-90 | 91-120 | 121-150 | 151-180 |
|---|---|---|---|---|---|---|
| Frequency | 8 | 13 | 25 | 29 | 18 | 7 |

(b) Find out mode for following data. **05**

| Size | >10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 |
|---|---|---|---|---|---|---|
| Demand | 3 | 15 | 27 | 20 | 3 | 2 |

(c) Find out the the value of n. **05**

1. $840\, n! = 7!$
2. $4({}_nP_3) = 5({}_{n-1}P_3)$

**Q.3** (a) Solve the equation. **06**

$$x\left[\frac{dx}{dy} + y\right] = 1 - y$$

(b) $\frac{dy}{dx} = \frac{2x(\log x + 1)}{(\sin y + y\cos y)}$ **05**

(c) $(1+x^3)dy = x^2\, y\, dy$ **05**

**Q.4** (a) Evaluate: $\int_0^{\pi/2} (3\cos^2 x - 2\sin^2 x)dx$ **06**

(b) Evaluate: $I = \int_0^{\pi/2} (1 + \cot x)^{-1} dx$ **05**

(c) Evaluate: $\int_0^1 \frac{x(\sin^{-1} x)^2}{\sqrt{1-x^2}} dx$ **05**

**Q.5** (a) Show that $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ satisfies the equation $A^2 - 4A - 5I = 0$, where I is the identity matrix. **06**

(b) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, then prove that $A^2 - 5A + 7I = 0$ **05**

(c) Solve by matrix inversion method **05**

$-3x_1 + 6x_2 - 11x_3 = 14$

$3x_1 - 4x_2 + 6x_3 = -5$

$4x_1 - 8x_2 + 13x_3 = -17$

**Q. 6** (a) Solve: $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{13}{6}, x \neq 0,1$ **06**

(b) Solve: $x(x + 5)(x + 7)(x + 12) = -150$ **05**

(c) Evaluate **05**

$$\lim_{x \to \infty} \frac{x^2 - x + 3}{2x^3 + 1}$$

**Q.7** (a) $\cos 3\frac{\pi}{2} + \sin 3\frac{\pi}{2} + \cos ec 3\frac{\pi}{2} + \cot 3\frac{\pi}{2}$ **06**

(b) Prove that $2\cos\frac{\pi}{13}\cos\frac{9\pi}{13} + \cos\frac{3\pi}{13} + \cos\frac{5\pi}{13} = 0$ **05**

(c) **05**

Find the value. $\sin 22\frac{1^\circ}{2}$ And $\tan 22\frac{1^\circ}{2}$

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