

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. Pharm. – SEMESTER – I • EXAMINATION – SUMMER 2017**

**Subject Code: 210006**

**Date: 06/06/2017**

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

**Time: 02:30 PM to 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 Quadratic equation:  $3\left(x^2 + \frac{1}{x^2}\right) + 16\left(x + \frac{1}{x}\right) + 26 = 0$  **06**

(b) Prove that: 
$$\begin{vmatrix} b+c & c+a & a+b \\ q+r & r+p & p+q \\ y+z & z+x & x+y \end{vmatrix} = 2 \begin{vmatrix} a & b & c \\ p & q & r \\ x & y & z \end{vmatrix}$$
 **05**

(c) If  $A = \begin{bmatrix} 5 & 3 \\ 2 & 2 \end{bmatrix}$  and  $B = \begin{bmatrix} 7 & 5 \\ 4 & 3 \end{bmatrix}$  then prove that  $(AB)^{-1} = B^{-1}A^{-1}$  **05**

- Q.2** (a) Find the sum of the first n terms of the following series: **06**
- i)  $1+3+5+7+\dots$
  - ii)  $2+4+6+8+\dots$
  - iii)  $1+3+7+15+\dots$

(b) Find the area of the quadrilateral whose vertices are (2,1), (6,0), (5,-2) and (-3,-1). **05**

(c) Evaluate the :  $\lim_{x \rightarrow 3} 2x^3 \sqrt{x^2 + 7}$  **05**

- Q.3** (a) Find the coefficient of  $x^{-2}$  in the following expansion of **06**

$$\left(2x - \frac{1}{\sqrt{3}}x^{-2}\right)^{10}$$

- (b) Find the standard deviation of the following distribution: **05**

Age	20-25	25-30	30-35	35-40	40-45	45-50
No. of person	170	110	80	45	40	35

(c) Prove that :  $\frac{1}{\log_6 24} + \frac{1}{\log_{12} 24} + \frac{1}{\log_8 24} = 2$  **05**

**Q.4** (a) Prove that :  $\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = \sec \theta \operatorname{cosec} \theta + 1$  **06**

- (b) The sum of  $n$  terms of the series 25, 22, 19, 16,.....is 116. Find the number of terms and the last number. **05**
- (c) Solve the following equations by Cramer's rule: **05**  
 $3x + 4y = 6xy$   
 $2x + 5y = 5xy$
- Q.5** (a) Solve the following system of equations using matrix method: **06**  
 $3x - 2y + z = 2$   
 $x + 3y - 2z = 2$   
 $2x - y + z = 2$
- (b) Simplify:  $\log_3 84 - \log_3 28 + \log_3 27$  **05**
- (c) If  $f : R \rightarrow R; f(x) = 2x + 1$  and  $g : R \rightarrow R, g(x) = 3x - 2$  find fog, gof, fof and gog exists. **05**
- Q.6** (a) Evaluate :  $\int \frac{\sin 2x}{(\sin^4 x + \cos^4 x)} dx$  **06**
- (b) Find  $\frac{dy}{dx}$ , if  $x = a(\theta + \sin \theta), y = a(1 - \cos \theta)$  **05**
- (c) Find 'r' if,  ${}_7P_r = 60 \times {}_7P_{r-3}$  **05**
- Q.7** (a) If  $y = 3e^{2x} + 2e^{3x}$ , then prove that  $\frac{d^2 y}{dx^2} - 5 \frac{dy}{dx} + 6y = 0$  **06**
- (b) Find the sum of the following series. **05**  
 $72 + 70 + 68 + \dots + 40.$
- (c) Evaluate  $\lim_{x \rightarrow 0} \frac{(x+4)^{\frac{3}{2}} - 8}{x}$  **05**

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