

GUJARAT TECHNOLOGICAL UNIVERSITY**Pharm D – 1st Year • EXAMINATION – SUMMER - 2018****Subject Code: 818807****Date: 01/06/2018****Subject Name: Remedial mathematics****Time: 10:30am TO 01:30pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Given A(2,4) , B(6,8), C(a+4, 2a + b) and $\overline{CA} \perp BC$, find a. **06**
- (b) Expand by SARRUS RULE $\begin{pmatrix} 3 & 4 & 1 \\ 2 & 0 & 7 \\ 1 & -3 & -2 \end{pmatrix}$ **04**
- (c) If $\cos\theta + \sin\theta = \sqrt{2} \cos\theta$, show that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$ **04**
- Q.2** (a) Solve the following simultaneous equations using cramer's rule. **06**
 $x + y + z = 4$, $2x - 3y + 4z = 33$, $3x - 2y - 2z = 2$.
- (b) Prove that $\frac{\cos 5x + \cos 3x}{\sin 5x - \sin 3x} = \cot x$ **04**
- (c) Show that points (1, 1), (2,3) and (3,5) are collinear. **04**
- Q.3** (a) Using theorems prove that $\begin{bmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ x^3 & y^3 & z^3 \end{bmatrix} = xyz(x-y)(y-z)(z-x)$ **06**
- (b) Evaluate $\lim_{x \rightarrow \infty} \frac{x^2 - x + 3}{2x^3 + 1}$ **04**
- (c) Prove that $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = 1/16$. **04**
- Q.4** (a) Solve the differential equation: **06**
 $xy \frac{dy}{dx} = y + 2$ if $y(1) = 1$.
- (b) Solve $(xy^2 + x) dx + (yx^2 + y) dy = 0$. **04**
- (c) Solve the following differential equation **04**
 $(1 + x^3) dy = x^2 y dx$
- Q.5** (a) If $y = \frac{x - \cos x}{x + \cos x}$, find $\frac{dy}{dx}$. **06**
- (b) Solve: $2xy \frac{dy}{dx} = x^2 + 3y^2$ **04**
- (c) Evaluate $\lim_{x \rightarrow 0} (1 + 2x)^{1/x}$ **04**
- Q.6** (a) Solve the following differential equation: **06**
 $\frac{dy}{dx} = \frac{2x(\log x + 1)}{\sin y + y \cos y}$
- (b) Evaluate: $\int \sin^3 x \cos^4 x dx$ **04**
- (c) Solve : $L^{-1} \left(\frac{s+4}{s^2+4s+8} \right)$ **04**
- Q.7** (a) Evaluate: $\int \frac{2x}{x^2 - 7x + 12} dx$ **06**
- (b) Find the Laplace transform of $\cos^3 2t$. **04**
- (c) Evaluate: $\int_0^{\frac{\pi}{2}} \sin^2 x dx$. **04**