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 quations using cramer's rule. x+ y+z =4, 2x-3y+4z=33, 3x-2y-2z=2.	**06**
	(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 $\lim_{x\to\infty} \frac{x^2-x+3}{2x^3+1}$	**04**
	(c)	Prove that sin10° sin 30° sin50° sin70° = 1/16.	**04**
Q.4	**(a)**	Solve the differential equation: $xy\frac{dy}{dx} = y+2$ if y(1) = 1.	**06**
	(b)	Solve $(xy^2 + x)\,dx + (yx^2+y)\,dy = 0$.	**04**
	(c)	Solve the following differential equation $(1+x^3)\,dy = x^2y\,dx$	**04**
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 $\lim_{x\to 0}(1+2x)^{1/x}$	**04**
Q. 6	**(a)**	Solve the following differential equation: $\frac{dy}{dx} = \frac{2x(\log x+1)}{\sin y + y\cos y}$	**06**
	(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**

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