BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – B.Pharm

Course Name - Remedial Mathematics

Course Code - BP106RMT

(Semester – 1)

Time allotted: 1 Hours 30 min　　　　　　　　　　　　　　　　**Full Marks: 35**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group – A

(Short Answer Type Questions)　　　　　　　　5 x 5 = 25

Answer any *five* from the following :

1. If $\dfrac{\log x}{ry - qz} = \dfrac{\log y}{pz - rx} = \dfrac{\log z}{qx - py}$ prove that $x^p y^q z^r = 1$.　　　5

2. Show that the matrix $\dfrac{1}{3}\begin{pmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ -2 & 2 & -1 \end{pmatrix}$ is orthogonal.　　　5

3. Find $\dfrac{dy}{dx}$ if $y = \cos\left(x^3 + \log x\right).$　　　5

4. Solve the following equations by matrix inversion method :
$x + y + z = 2$
$x + 2y + 3z = 1$
$3x + y - 5z = 12$　　　5

5. Find the equation of the straight line passing through the point $(-3, 4)$ and parallel to the straight line $2x - 3y - 5 = 0$.　　　5

6. Resolve the following rational fractions into partial fractions:
$\dfrac{3x - 2}{(x+1)^2 (x+3)}$　　　5

7. Solve the differential equation $\left(\dfrac{1}{y^2} - \dfrac{2}{x} \right) = \dfrac{2x}{y^3} \dfrac{dy}{dx}$.

5

Group – B

(Long Answer Type Questions)   1 x 10 = 10

Answer any *one* from the following :

8. (a) If $A = \begin{pmatrix} 0 & 0 & 1 \\ 3 & 1 & 0 \\ -2 & 1 & 4 \end{pmatrix}$, then show that $A^3 - 5A^2 + 6A - 5I = O$ where I is an

identity matrix and O is a null matrix, Hence find A^{-1} .   7

(b) Evaluate $\lim\limits_{x \to 0} \dfrac{\tan x - \sin x}{x^3}$.   3

9. (a) Solve : $\dfrac{dy}{dx} = \dfrac{2x - 3y}{3x - 2y}$; given that y=1, when x=0 .   5

(b) Find , from definition , the Laplace Transform of the function $f(t)$ defined by

$$f(t) = \begin{cases} 0, & 0 < t \le 1 \\ t, & 1 < t \le 2 , \\ 0, & t > 2 \end{cases}$$

5