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

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

3. Find $\frac{dy}{dx}$ 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:
$\frac{3x-2}{(x+1)^2(x+3)}$ 5

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7. Solve the differential equation $\left(\frac{1}{y^2}-\frac{2}{x}\right)=\frac{2x}{y^3}\frac{dy}{dx}$. 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 $\lim_{x\to 0}\frac{\tan x-\sin x}{x^3}$. 3

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

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

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

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