



BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme - Bachelor of Pharmacy

Course Name: Remedial Mathematics

Course Code - BP106RMT

(Semester - 1)

Time allotted: 1 Hour 30 Minutes

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)

 $5 \times 5 = 25$

Answer any five from the following

1. If
$$\frac{\log x}{b-c} = \frac{\log y}{c-a} = \frac{\log z}{a-b}$$
, then prove that $x^{b^2+bc+c^2} \cdot y^{c^2+ac+a^2} \cdot z^{a^2+ab+b^2} = 1$.

Evaluate the limit:
$$\lim_{x\to 1} \frac{x^2-1}{\sqrt{5x-1}-\sqrt{3x+1}}$$
.

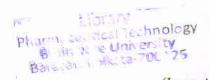
3. Let
$$f(x) = \frac{x^2 - 1}{x^3 - 1}$$
, $x \ne 1$. What should be the value of $f(x)$ at $x=1$ such that $f(x)$ be continuous at $x=1$?

4. If
$$A = \begin{pmatrix} 2 & -3 & -5 \\ -1 & 4 & 5 \\ 1 & -3 & -4 \end{pmatrix}$$
, $B = \begin{pmatrix} -1 & 3 & 5 \\ 1 & -3 & -5 \\ -1 & 3 & 5 \end{pmatrix}$ and $C = \begin{pmatrix} 2 & -2 & 4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{pmatrix}$, verify

$$A+(B-C)=(A+B)-C$$
 5

- 5. Find the equation of the straight line passing through the point (-3,4) and 5 parallel to the straight line 2x-3y-5=0.
- 6. Find the value of $\int \frac{dx}{1-\sin x}$.
- 7. Solve the first order differential equation : $\frac{dy}{dx} + \frac{1}{x}y = \sin x$

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Group - B

(Long Answer Type Questions)

 $1 \times 10 = 10$

Answer any one from the following

- 8. (a) Prove that $\begin{pmatrix} 6 & -2 & -3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{pmatrix}$ is an inverse of the matrix $\begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 3 \\ 1 & 2 & 4 \end{pmatrix}$.
 - (b) Prove that any square matrix can be uniquely expressed as the sum of a symmetric 5 and a skew-symmetric matrix.
- 9. (a) Verify Cayley Hamilton theorem for the matrix $A = \begin{pmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$. Hence find A^{-1} .

(b) Evaluate
$$\lim_{x \to 0} \frac{e^{3x} - e^{-2x}}{x}$$
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