

Code No: B1102

R10
SET - 1

I B. Pharmacy I Semester Supplementary Examinations, February - 2020
MATHEMATICS-I

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

1. a) The sum of the first and the third terms of a geometric progression is 20 and the sum of its first three terms is 26. Find the progression. (8M)
- b) Resolve into partial fractions $\frac{2x^2 - 1}{(x-1)(2x^2 + 5x + 2)}$ (7M)
2. a) Find the coefficient of x^5 in $\left(x - \frac{1}{x}\right)^{11}$. (7M)
- b) Solve the system of equations by using Cramer's rule. (8M)
 $x - y + z = 4, 2x + 3y + 3z = 5, 3x - 2y + z = 7$.
3. a) Prove that $\frac{\cos A}{1 - \tan A} + \frac{\sin A}{1 - \cot A} = \sin A + \cos A$. (8M)
- b) Prove that $\cos \frac{\pi}{9} \cos \frac{2\pi}{9} \cos \frac{3\pi}{9} \cos \frac{4\pi}{9} = \frac{1}{2^4}$. (7M)
4. a) Prove that $\tan \alpha + 2 \tan 2\alpha + 4 \tan 4\alpha + 8 \cot 8\alpha = \cot \alpha$ (7M)
- b) From the top of a hill 300 m high, the angle of depression of top and bottom of a pillar are 30° and 60° . Find the height of the pillar. (8M)
5. a) Find the coordinates of the point which divides internally the line joining the pair of the points (5,2) and (7,9) in the ratio 2 : 7. (8M)
- b) Find the locus of the point P whose sum of the distances from the fixed points $A(-2,0)$ and $B(2,0)$ is 16. (7M)
6. a) If $A = (2,-1)$ and $B = (4,7)$ and P moves so that area of the triangle PAB is 9 sq. Units, then find the locus of P . (8M)
- b) Find the equation of the line passing through origin and the point of intersection of the lines $x + 2y = 15, 3x - 5y = -32$. (7M)
7. a) Evaluate $\lim_{x \rightarrow \infty} \sqrt{x^2 + 1} - \sqrt{x^2 - 1}$. (8M)
- b) Find left and right derivatives of $f(x) = |x|$ (7M)
8. a) Differentiate $\frac{(x+3)^3}{\sqrt{x}}$ with respect to x . (8M)
- b) Show that $f(x) = \begin{cases} x^2, & x \leq 1 \\ x^3, & x > 1 \end{cases}$ is continuous at $x = 1$. (7M)