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
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1. a) The sum of the first and the third terms of a geometric progression is 20 and the sum   (8M)
      of its first three terms is 26. Find the progression.

   b) Resolve into partial fractions $\dfrac{2x^2-1}{(x-1)(2x^2+5x+2)}$ (7M)

2. a) Find the coefficient of x^5 in $\left(x-\dfrac{1}{x}\right)^{11}$.   (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 $\dfrac{\cos A}{1-\tan A}+\dfrac{\sin A}{1-\cot A}=\sin A+\cos A.$ (8M)

   b) Prove that $\cos\dfrac{\pi}{9}\cos\dfrac{2\pi}{9}\cos\dfrac{3\pi}{9}\cos\dfrac{4\pi}{9}=\dfrac{1}{2^4}.$ (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   (8M)
      pillar are 30^0 and 60^0. Find the height of the pillar.

5. a) Find the coordinates of the point which divides internally the line joining the pair of   (8M)
      the points $(5,2)$ and $(7,9)$ in the ratio $2:7$.
   b) Find the locus of the point P whose sum of the distances from the fixed points   (7M)
      $A(-2,0)$ and $B(2,0)$ is 16.

6. a) If $A=(2,-1)$ and $B=(4,7)$ and P moves so that area of the triangle PAB is 9 sq.   (8M)
      Units, then find the locus of P.
   b) Find the equation of the line passing through origin and the point of intersection of   (7M)
      the lines $x+2y=15, 3x-5y=-32.$

7. a) Evaluate $\lim_{x\to\infty}\sqrt{x^2+1}-\sqrt{x^2-1}$.   (8M)

   b) Find left and right derivatives of $f(x)=|x|$ (7M)

8. a) Differentiate $\dfrac{(x+3)^3}{\sqrt{x}}$ with respect to x.   (8M)

   b) Show that $f(x)=\begin{cases}x^2, & x\le 1\\ x^3, & x>1\end{cases}$ is continuous at $x=1$.   (7M)