R13

SET - 1

I B. Pharmacy I Semester Supplementary Examinations, May - 2017
REMEDIAL MATHEMATICS-I

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1. a) Find the values of determinants of the matrices is $\begin{bmatrix} 0 & b & -c \\ -b & 0 & a \\ c & -a & 0 \end{bmatrix}$ (4M)

   b) Find $\tan\left(\dfrac{\pi}{4}+A\right)$ and $\cot\left(\dfrac{\pi}{4}+A\right)$ in terms of tanA and cotA. (4M)

   c) Find the angle between the lines 2x + y + 4 = 0 and y- 3x =7. (4M)

   d) Find the value of $\lim\limits_{x\to a}\dfrac{x\sin a - a\sin x}{x-a}$ (4M)

   e) Evaluate $\int co\sec x\, dx$ (4M)

   f) From the differential equation of simple harmonic motion given by $x = A\cos(nt+\alpha)$ (4M)

PART -B

2. a) Show that $\begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix} = a^3+b^3+c^3-3abc$ (8M)

   b) Resolve $\dfrac{1}{(1-x)(1-2x)(1-3x)}$ into partial fractions (8M)

3. a) If A+B+C=180^0, prove that $\sin\left(\dfrac{A}{2}\right)+\cos\left(\dfrac{B-C}{2}\right)=2\cos\left(\dfrac{B}{2}\right)\cos\left(\dfrac{C}{2}\right)$ (8M)

   b) Show that $\sin^4\left(\dfrac{\pi}{8}\right)+\sin^4\left(\dfrac{3\pi}{8}\right)+\sin^4\left(\dfrac{5\pi}{8}\right)+\sin^4\left(\dfrac{7\pi}{8}\right)=\dfrac{3}{2}$ (8M)

4. a) Find the equation of locus of a point P, if A = (2, 3), B = (2,-3) and PA+AB=8 (8M)

   b) Find the area of the triangle formed by the following staright lines and the coordinate axes.
   $(i)2x-4y-7=0, (ii)2x-5y+6=0$ (8M)

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5. a) If $y = \tan^{-1}\left(\dfrac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}}\right)$ for $0 < |x| < 1$ find $\dfrac{dy}{dx}$ (8M)

    b) If $ax^2 + 2hxy + by^2 = 1$ then $\dfrac{d^2y}{dx^2} = \dfrac{h^2 - ab}{(hx + by)^3}$ (8M)

6. a) Prove that $\displaystyle\int_0^{\pi/2} \dfrac{\sin^n x}{\sin^n x + \cos^n x}\,dx = \dfrac{\pi}{4}$ (8M)

    b) Evaluate $\displaystyle\int_0^{2a} x^{7/2}(2a - x)^{-1/2}\,dx$ (8M)

7. a) Obtain the differential equation of the coaxial circles of the system
   $x^2 + y^2 + 2ax + c^2 = 0$ where c is constant.   (8M)

    b) Solve the D.E $(xy^2 + x)dx + (yx^2 + y)dy = 0$ (8M)