

Code No: B13102

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**

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 $\tan\left(\frac{\pi}{4} + A\right)$ and $\cot\left(\frac{\pi}{4} + A\right)$ in terms of $\tan A$ and $\cot A$. (4M)
- c) Find the angle between the lines $2x + y + 4 = 0$ and $y - 3x = 7$. (4M)
- d) Find the value of $\lim_{x \rightarrow a} \frac{x \sin a - a \sin x}{x - a}$ (4M)
- e) Evaluate $\int \cos x \sec x dx$ (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 $\frac{1}{(1-x)(1-2x)(1-3x)}$ into partial fractions (8M)
3. a) If $A+B+C=180^\circ$, prove that $\sin\left(\frac{A}{2}\right) + \cos\left(\frac{B-C}{2}\right) = 2 \cos\left(\frac{B}{2}\right) \cos\left(\frac{C}{2}\right)$ (8M)
- b) Show that $\sin^4\left(\frac{\pi}{8}\right) + \sin^4\left(\frac{3\pi}{8}\right) + \sin^4\left(\frac{5\pi}{8}\right) + \sin^4\left(\frac{7\pi}{8}\right) = \frac{3}{2}$ (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 straight lines and the coordinate axes. (8M)
(i) $2x - 4y - 7 = 0$, (ii) $2x - 5y + 6 = 0$

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5. a) If $y = \tan^{-1} \left(\frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}} \right)$ for $0 < |x| < 1$ find $\frac{dy}{dx}$ (8M)
- b) If $ax^2 + 2hxy + by^2 = 1$ then $\frac{d^2y}{dx^2} = \frac{h^2 - ab}{(hx + by)^3}$ (8M)
6. a) Prove that $\int_0^{\pi/2} \frac{\sin^n x}{\sin^n x + \cos^n x} dx = \frac{\pi}{4}$ (8M)
- b) Evaluate $\int_0^{2a} x^{7/2} (2a - x)^{-1/2} dx$ (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)