Code No: B13102 **R13** SET - 1

I B. Pharmacy I Semester Supplementary Examinations, Jan/Feb - 2018
REMEDIAL MATHEMATICS-I

Time: 3 hours Max. Marks: 70

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

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PART –A

1. a) If $A=\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ then show that A(A-3I)(A-15I)=0 (4M)

   b) Find the value of (i) $cos^2 45 - sin^2 15$ (ii) $sin^2 75 - sin^2 15$ (4M)

   c) Find the value of p if the lines $3x + 4y = 5, 2x + 3y = 4, px + 4y = 6$ are concurrent (4M)

   d) Find right and left derivatives of the function $f(x) = \begin{cases} \frac{x}{1+e^{1/x}}, & x \neq 0 \\ 0, & x = 0 \end{cases}$ at zero (4M)

   e) Evaluate $\int_0^a (a^2 x - x^3) dx$ (3M)

   f) Find Laplace transform of $sint\ sin2t$ (3M)

PART –B

2. a) Resolve $\frac{2x+3}{5(x+2)(2x+1)}$ into partial fractions. (8M)

   b) Show that $\begin{vmatrix} 1 & a^2 & a^3 \\ 1 & b^2 & b^3 \\ 1 & c^2 & c^3 \end{vmatrix} = (a-b)(b-c)(c-a)(ab+bc+ca)$. (8M)

3. a) From the top of the hill 200 meters high, the angle of depression of the top and bottom of a pillar on the level ground are 30^o and 60^o respectively. Find the height of the pillar. (8M)

   b) In a triangle ABC, prove that $cos^2 \frac{A}{2} + cos^2 \frac{B}{2} - cos^2 \frac{C}{2} = 2cos\frac{A}{2}\ cos\frac{B}{2} sin\frac{C}{2}$ (8M)

4. a) Find the transformed equation of $x^2 + 2\sqrt{3}xy - y^2 = 2a^2$ when the axes rotated through an angle $\frac{\pi}{6}$. (8M)

   b) Find the equation of the straight line passing through the intersection of the lines $x + y + 1 = 0$ and $2x - y + 5 = 0$ and through the point $(5, -2)$. (8M)

5. a) If $x = a(t - sint), y = a(1 + cost)$ find $\frac{dy}{dx}$. (8M)

   b) Compute the following limits $(i) \underset{x \to 0}{Lt} \frac{\sin(a+bx) - \sin(a-bx)}{x}$ (ii) $\underset{x \to a}{Lt} \frac{tanx - tana}{x-a}$ (8M)

6. a) Evaluate $\int_a^b \sqrt{(x-a)(b-x)}\, dx$ (8M)

   b) Evaluate $\int \frac{1}{4+5sinx}\, dx$ (8M)

7. a) Form the differential equation by eliminating arbitrary constants A, B from the equation $y = A\ cos3x + Bsin3x$ (8M)

   b) Solve (i) $\frac{dy}{dx} + \frac{y}{\sqrt{1-x^2}} = 0$ (ii) $sec^2 x\ tany dx + (1 - e^x) sec^2 y\ dy = 0$ (8M)
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