

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**
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) $\cos^2 45^\circ - \sin^2 15^\circ$ (ii) $\sin^2 75^\circ - \sin^2 15^\circ$ (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 $\sin t \sin 2t$ (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° and 60° respectively. Find the height of the pillar. (8M)
- b) In a triangle ABC, prove that $\cos^2 \frac{A}{2} + \cos^2 \frac{B}{2} - \cos^2 \frac{C}{2} = 2\cos \frac{A}{2} \cos \frac{B}{2} \sin \frac{C}{2}$ (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 $x = a(t - \sin t)$, $y = a(1 + \cos t)$ find $\frac{dy}{dx}$. (8M)
- b) Compute the following limits (i) $\lim_{x \rightarrow 0} \frac{\sin(ax+bx) - \sin(a-bx)}{x}$ (ii) $\lim_{x \rightarrow a} \frac{\tan x - \tan a}{x - a}$ (8M)
6. a) Evaluate $\int_a^b \sqrt{(x-a)(b-x)} dx$ (8M)
- b) Evaluate $\int \frac{1}{4+5\sin x} dx$ (8M)
7. a) Form the differential equation by eliminating arbitrary constants A, B from the equation $y = A \cos 3x + B \sin 3x$ (8M)
- b) Solve (i) $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$ (ii) $3e^x \tan y dx + (1 - e^x) \sec^2 y dy = 0$ (8M)