

**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 **FOUR** Questions from **Part-B**

**PART -A**

1. a) Find x if  $\begin{bmatrix} 1 & 2 & x \\ 5 & 7 & 9 \\ 1 & 2 & 3 \end{bmatrix}$  is a singular matrix. (2M)
- b) Find the value of  $\cos^2 45^\circ - \sin^2 15^\circ$ . (2M)
- c) Find the distance between parallel straight lines  $3x+4y-3=0$  and  $6x+8y-1=0$ . (2M)
- d) Find  $\lim_{x \rightarrow 0} \left( \frac{\sqrt{1+x}-1}{x} \right)$  (2M)
- e) Show that  $\int_0^\pi x f(\sin x) dx = \frac{\pi}{2} \int_0^\pi f(\sin x) dx$  (2M)
- f) Find Laplace transformation of  $\sin(\omega t + \alpha)$  (2M)
- g) If  $A = \begin{bmatrix} 2 & 0 \\ 3 & -5 \end{bmatrix}$  then show that  $A^2 - 4A - I = 0$  (2M)

**PART -B**

2. a) Solve the following equation  $x+y+4z = 6$ ,  $3x+2y-2z=9$ ,  $5x+y+2z=13$  by using Cramer's Rule. (7M)
- b) Resolve  $\frac{1}{(x-1)(x-2)(x-3)}$  into partial fractions. (7M)
3. a) If  $A+B+C=180^\circ$ , prove that the following  $\sum \tan \frac{A}{2} \tan \frac{B}{2} = 1$  if A, B, C are positive. (7M)
- b) From the top of a hill 200meters high, the angles of depression of the top and bottom of a pillar on the level ground are  $30^\circ$  and  $60^\circ$  respectively. Find the height of the pillar. (7M)
4. a) A (2,3) and B(-3,4) be two given points. Find the equation of the locus of 'p' so that the area of the triangle PAB is 8.5 sq.units. (7M)
- b) Transform the equation  $5x-2y-7=0$  into (i) slope- intercept form (ii) intercept form and (iii) normal form. (7M)

5. a) If  $x = a(t - \sin t)$ ,  $y = a(1 + \cos t)$  find  $\frac{dy}{dx}$  (7M)
- b) If  $f(x) = \frac{1}{x^2 + 1}$  ( $x \in \mathbb{R}$ ), prove that 'f' is differentiable on  $\mathbb{R}$  and find  $f'(x)$  (7M)
6. a) Evaluate  $\int_0^{\pi/2} \log(\sin \theta) \cos \theta d\theta$ . (7M)
- b) Evaluate  $\int (x(\sin x \cos x) + (x^2 e^{2x})) dx$  (7M)
7. a) Find the differential equations of the following family of curve is  
 $y = ae^x + be^{2x} + ce^{-3x}$  (7M)
- b) Solve  $x^2 y dx - (x^3 + y^3) dy = 0$  (7M)

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