Code No: B1102/R10 **R10**

I B.Pharmacy I Semester Supplementary Examinations, Feb. 2015
MATHEMATICS-I

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Find the value of $9P_4$, $7P_3$, and $5P_2$.
   (b) . Evaluate $\begin{vmatrix} 2 & 9 & 1 \\ 0 & 3 & 0 \\ 5 & -2 & 2 \end{vmatrix}$ [8+7]

2. (a) Find the terms independent of x in the expansion $\left(3x - \frac{x^3}{6}\right)^7$
   (b) Solve the following equations by using Cramer's Rule x+2y-z=1, 3x+5y-2z=5, 2x+6y+3z=-2 [8+7]

3. (a) If $\alpha$and$\beta$are complementary angles such that $q\sin\alpha = p$, then find the value of $(\sin\alpha\cos\beta - \cos\alpha\sin\beta)$.
   (b) If 3A is not an odd multiple of $\frac{\pi}{2}$, $\tan 3A = \frac{3\tan A - \tan^3 A}{1-3\tan^2 A}$. [8+7]

4. (a) Suppose that x = tan A, y = tan B, z = tan C and none of A – B, B – C, C – A is an odd multiple of $\frac{\pi}{2}$. Then prove that $\sum\left(\frac{x-y}{1+xy}\right) = \prod\left(\frac{x-y}{1+xy}\right)$.
   (b) Prove that $\sin\frac{\pi}{5}.\sin\frac{2\pi}{5}.\sin\frac{3\pi}{5}.\sin\frac{4\pi}{5} = \frac{5}{16}$ [8+7]

5. (a) Find the orthocenter of the triangle with the vertices (-2,-1) (6,-1) and (2,5)
   (b) If θ is the angle between the lines $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{b} + \frac{y}{a} = 1$ then find the value of $sin\theta$ when a>b [8+7]

6. (a) Find the circumcenter of the triangle whose sides are $3x - y - 5 = 0$, $x + 2y - 4 = 0$ and $5x + 3y + 1 = 0$.
   (b) Find the equation of the locus of a point which is at a distance 3 from (-1,3) in a plane. [8+7]

7. (a) Show that $f(x) = [x]\,(x \in R)$ is continuous at only those real numbers that are not integers
   (b) If $X = acos^3t,\ Y = asin^3t$ then find $\frac{dy}{dx}$ [8+7]

8. (a) Is f continuous at X=0 where $f(x) = \begin{cases} \frac{sin2x}{x} & if\ x?0 \\ 1 & if\ x = 0 \end{cases}$
   (b) If $Y = tan^{-1}\sqrt{\frac{1-x}{1+x}}\ (|x| < 1)$ then find $\frac{dy}{dx}$ [8+7]

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