

**I B.Pharmacy I Semester Supplementary Examinations, Feb/Mar 2014
MATHEMATICS-I****Time: 3 hours****Max Marks: 75****Answer any FIVE Questions
All Questions carry equal marks**

1. (a) Find the value of $\sqrt{3\sqrt{3\sqrt{3\sqrt{3\dots\dots to \infty}}}}$.
- (b) Evaluate $\begin{vmatrix} 3 & 2 & 1 \\ 2 & 3 & 0 \\ 5 & -2 & 2 \end{vmatrix}$ [8+7]
2. (a) Find the coefficient of x^7 in the expansion of $(x^2 + \frac{2}{x})^{11}$.
- (b) Evaluate $\begin{vmatrix} 4 & 2 & -8 \\ 2 & -3 & -6 \\ 0 & -2 & 2 \end{vmatrix}$ [8+7]
3. (a) If $\cos \theta = k, 0 < k < 1$ and ' θ ' is not an angle in the first quadrant, find the values of the other trigonometric ratios in terms of k.
- (b) If $A + B = 45^\circ$ and none of A and is an odd multiple of $\frac{\pi}{2}$, prove that $(1 + \tan A)(1 + \tan B) = 2$ and hence deduce that $\tan 22\frac{1}{2}^\circ = \sqrt{2} - 1$. [8+7]
4. (a) If $2A$ is not an integral multiple of π , show that $\cot A + \tan A = 2 \operatorname{cosec} 2A$, $\cot A - \tan A = 2 \cot 2A$ and deduce the values of $\tan 52\frac{1}{2}^\circ$ and $\tan 37\frac{1}{2}^\circ$.
- (b) Show that $\cos 42^\circ + \cos 78^\circ + \cos 162^\circ = 0$. [8+7]
5. (a) Find the perpendicular distance of the point (3,-4) from the line $2x - 5y + 2 = 0$
- (b) Find the equation of the line passing through the point (-4,0) and perpendicular to the line $x = 3$ [8+7]
6. (a) Find the value of P if the lines $3x + 4y = 5$, $2x + 3y = 4$ and $Px + 4y = 6$ are concurrent
- (b) Find the area of the triangle formed by the straight lines $2x - y - 5 = 0$, $x - 5y + 11 = 0$ and $x + y - 1 = 0$ [8+7]
7. (a) If $n \in N, a \in R$ then show that $\lim_{x \rightarrow a} x^n = a^n$
- (b) If $f(x) = xe^x \sin x$ then find $f'(x)$ [8+7]
8. (a) Compute $\lim_{x \rightarrow 0} \left[\frac{\sqrt{1+x} - \sqrt{1+x^2}}{\sqrt{1-x^2} - \sqrt{1-x}} \right]$
- (b) If $Y = x^x (x > 0)$ then find $\frac{dy}{dx}$ [8+7]