

I B.Pharmacy I Semester Supplementary Examinations, Oct/Nov 2013
MATHEMATICS-I

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Find the sum of all numbers between 100 and 1000 which are divisible by 13.
(b) Resolve $\frac{2x+3}{x^2-2x-3}$ into partial fractions [8+7]
2. (a) Find the coefficient of $x^6 \cdot y^3$ in the expansion of $(2x - \frac{y}{3})^9$.
(b) Evaluate $\begin{vmatrix} 3 & 2 & 1 \\ 2 & 4 & 9 \\ 5 & -2 & 2 \end{vmatrix}$ [8+7]
3. (a) If $\sec \theta = x + \frac{1}{4x}$, prove that $\tan \theta + \sec \theta = 2x$.
(b) Prove that $\sum \frac{\cos(B+C)}{\cos B \cos C} = 2$ if A, B, C are positive. [8+7]
4. (a) Suppose that $A + B = 135^\circ$ and neither A nor B is an integral multiple of 180° . Then prove that $(1 + \cot A)(1 + \cot B) = 2$ and hence deduce that $\cot 67\frac{1}{2}^\circ = \sqrt{2} - 1$.
(b) Prove that $\cos \frac{\pi}{11} \cdot \cos \frac{2\pi}{11} \cdot \cos \frac{3\pi}{11} \cdot \cos \frac{4\pi}{11} \cdot \cos \frac{5\pi}{11} = \frac{1}{32}$ [8+7]
5. (a) Find the equation of the locus of a point which is at a distance 5 from A(4,-3)
(b) Find the equation of the locus of P, if the ratio of the distance from P to A(5,-4) and B(7,6) is 2:3 [8+7]
6. (a) Find the distance between the points $(a \cos \alpha, a \sin \alpha)$, $(a \cos \beta, a \sin \beta)$
(b) Find the value of 'a' if the distance between the points (a,2), (3,4) is $2\sqrt{2}$ [8+7]
7. (a) Compute $\lim_{x \rightarrow 0} \left[\frac{\cos ax - \cos bx}{x^2} \right]$
(b) If $X = \frac{3at}{1+t^3}$, $Y = \frac{3at^2}{1+t^3}$ then find $\frac{dy}{dx}$ [8+7]
8. (a) If $f : R \rightarrow R$ is defined by $f(x) = \begin{cases} 2x - 1 & \text{if } x < 3 \\ 5 & \text{if } x = 3 \end{cases}$ find $\lim_{x \rightarrow 3} f(x)$
(b) If $Y^x = x^{\sin y}$ then find $\frac{dy}{dx}$ [8+7]
