

B.Pharm I Year (R09) Supplementary Examinations December 2017

REMEDIAL MATHEMATICS

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Find the middle terms in the expansion of $\left(\frac{2}{3}x^2 - \frac{3}{2x}\right)^{11}$.
- (b) Solve using Cramer's rule $4x + y = 7; 3y + 4z = 5; 3z + 5x = 2$.
- 2 (a) If $\sin \theta = 3/5$ and θ is acute, find the value of $2 \tan \theta + 3 \sec \theta + 4 \sec \theta \cdot \operatorname{cosec} \theta$.
- (b) A person standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank is 60° ; when he retires 40 feet from the bank he finds the angle to be 30° . Find the height of the tree and breadth of the river.
- 3 (a) Show that the lines $5x - 11y + 1 = 0, 6x + 13y - 25 = 0$ and $x - 2y = 0$ are concurrent. Also find the point of concurrency.
- (b) Write the characteristics of the hyperbolac $\frac{x^2}{25} - \frac{y^2}{16} = 1$.
- 4 (a) Differentiate $\frac{x^2-3x+5}{x^2+3x+5}$ with respect to x.
- (b) If $ax^2 + 2hxy + by^2 = 1$ show that $\frac{d^2y}{dx^2} = \frac{h^2-ab}{(hx+by)^3}$.
- 5 (a) Find the maxima and minima of the function $f(x) = 3x^3 - 9x^2 - 27x + 30$.
- (b) Find $\frac{dy}{dx}$, if $y = x^2 \cdot e^x(\cos x - 4)$.
- 6 (a) Evaluate $\int \frac{dx}{1+\cot x}$.
- (b) Evaluate $\int x^2 \cdot \cos^2 x dx$.
- (c) Find the area bounded by the curve $y = \sin x$, the x-axis and the ordinates $x = 0$ and $x = 2\pi$.
- 7 (a) Solve $(x + 1) \frac{dy}{dx} + 1 = 2e^{-y}$
- (b) Solve $\frac{dy}{dx} + xy = xy^2$, when $y = 4$ and $x = 1$.
- 8 A radioactive substance has half-life of h-days. Find a formula for its mass m interms of t, if the initial mass is m_0 . What are its initial decay rates?
