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PY-101(A)

B.Pharm. I Semester

Examination, December 2015

Remedial Mathematics

Time :Three Hours

Maximum Marks : 70

Note: i) Attempt all questions.
ii) All questions carry equal marks.
iii) Internal choices are given.

1. a) Evaluate, the determinant $\begin{vmatrix} 23 & 12 & 11 \\ 36 & 10 & 26 \\ 63 & 26 & 37 \end{vmatrix}$

b) Find inverse of the matrix $\begin{pmatrix} 1 & 2 & 3 \\ 3 & 4 & 5 \\ 2 & 7 & 11 \end{pmatrix}$

OR

c) If roots of the equation $4x^2 - 15x + m = 0$ are equal, then find the value of m. Also, find the sum of the roots of the given equation without actually calculating them.

d) Using matrix method solve the following equations:
$4x - y = 3; \quad -3x + 2y = 4$

2. a) Find arithmetic mean for the following table:

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	8	16	25	30	15	6

b) Find the volume of a right circular cone of radius 3 cm and height 7 cm and also find the surface area of the whole cone.

OR

c) Calculate the median from the following frequency table:

Class	20-30	30-40	40-50	50-60	60-70
Frequency	8	26	30	20	16

d) How many solid spheres of 2 cm diameter can be formed by melting the metal solid cone of height 10 cm and diameter 20 cm.

3. a) Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$.

b) If $\tan\theta = \frac{4}{5}$, find the value of $\frac{2\sin\theta + 3\cos\theta}{4\cos\theta + 3\sin\theta}$

OR

c) If $\tan\theta = \frac{2}{3}$, then find the values of $\sin\theta + \cos\theta$ and $\sec\theta + \operatorname{cosec}\theta$.

d) Prove that $2 \log 20 - \log 4 + 2 \log 10 = 4$

4. a) Find the equation of a line which passes through the points (2, 3) and is perpendicular to the straight line $4x - 3y = 10$.

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b) Find the equation of the line passing through points (2, 3) and (2, –5).

OR

c) Find equation of the line which passes through (3, –5) and which makes the equal intercepts on the axes.

d) Find the equation of the line passing through (3, 1) and is parallel to $2x + 3y - 5 = 0$.

5. a) Evaluate the limits

i) $\lim_{x \to 2} \frac{x^2 - 5x + 6}{x^2 - 4}$ and

ii) $\lim_{x \to 0} \frac{\tan x}{x}$

b) Find derivative of the following functions:

i) $y = \log \cos x$ and

ii) $y = x^x$

OR

c) Integrate the following functions:

i) $\int \frac{1}{x \log x} dx$ and

ii) $\int x e^x dx$

d) If $x^2 + 2xy + y^3 = 42$, find $\frac{dy}{dx}$.

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