PY–101(A)

B. Pharm. (First Semester)
EXAMINATION, Dec., 2013
(Grading/Non-Grading)
REMEDIAL MATHEMATICS
[PY – 101(A)]

Time : Three Hours

Maximum Marks : 70

Note : Attempt any *two* parts from each question. All questions carry equal marks.

1. (a) Solve the following equation : 7

$$8 + 9\sqrt{(3x-1)(x-2)} = 3x^2 - 7x$$

(b) Solve the following linear equations by using Cramer's rule : 7

$$x - 3y + z = 2$$
$$3x + y + z = 6$$
$$5x + y + 3z = 3$$

(c) If : 7

$$A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$$

show that $A^2 - 4A - 5I = 0$ and hence evaluate A^{-1}.

2. (a) Find the missing frequency in the following frequency distribution if the mean of distribution is 1·46 : 7

No. of Accidents	Frequency
0	46
1	—
2	—
3	25
4	10
5	5
Total	200

(b) Calculate the median from the following distribution : 7

Marks	Frequency
10 – 25	6
25 – 40	20
40 – 55	44
55 – 70	26
70 – 85	3
85 – 100	1

(c) Find the volume of the capsule having a cylinder of height 5 mm and radius 4 mm, on both sides of cylinder there are hemisphere of radius 4 mm. 7

3. (a) Prove that : 7

$$\sin(A + B)\sin(A - B) = \sin^2 A - \sin^2 B$$
$$= \cos^2 B - \cos^2 A$$

(b) Prove that : 7

$$\sin 20° \sin 40° \sin 60° \sin 80° = \frac{3}{16}$$

(c) The area of a rectangular field is 2·5 hectares and its sides are in the ratio of 3 : 2. Find the perimeter of the field. 7

4. (a) Show that the points (5, 1), (1, − 1), and (11, 4) lie on a straight line. 7

(b) Show that the points A $(b, c + a)$, B $(c, a + b)$ and C $(a, b + c)$ are collinear. 7

(c) Find the slope of the line which is perpendicular to the line $7x + 4y = 11 = 0$. 7

5. (a) Find $\frac{dy}{dx}$ when $y = \sin^2(\log \sec x)$. 7

(b) If : 7

$$x^y = e^{x-y}$$

prove that :

$$\frac{dy}{dx} = \frac{\log x}{(1 + \log x)^2}$$

(c) Evaluate : 7

$$\int \log(1 + x^2)\, dx$$