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Roll No. .....

PY–101(A)

B. Pharm. (First Semester) EXAMINATION, Dec., 2010

REMEDIAL MATHEMATICS

[PY–101(A)]

Time : Three Hours

Maximum Marks : 70

Note : Attempt any *five* questions. All questions carry equal marks.

1. (i) Solve the equation : 7

$$\sqrt[8]{\frac{x}{x+3}} - \sqrt{\frac{x+3}{x}} = 2$$

(ii) If $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, find k such that $A^2 = kA - 2I$. 7

2. (i) Solve the following equations using matrix method : 7

$$x - y + z = 2,\ 2x - y = 0,\ 2y - z = 1$$

(ii) What are the various measures of central tendency ? State the prequisites for an ideal measure. 7

3. (i) A railway train is travelling on a curve of 1500 mt. radius at the rate of 66 kmph. Through what angle will it turn in 20 seconds ? 7

(ii) Show that $\tan 75° + \cot 75° = 4$. 7

4. (i) Prove that : 7

$$\sqrt{2 + \sqrt{2 + 2\cos 4\theta}} = 2\cos\theta$$

(ii) The bacteria in a culture grows by 7% in the first hour, decreases by 6% in the second hour and again increases by 5% in the third hour. If at the end of third hour, the number of bacteria is 112,70,000, find the original number of bacteria in the sample. 7

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

(ii) Find the equation of the locus of a point which moves so that its distance from (3, 2) is twice its distance from (1, 1). 7

6. (i) A line passes through (3, 4) and the sum of its intercepts on the axes is 14. Find the equation of the line. 7

(ii) Find the equation of the right bisector of the line segment joining (1, 1) and (2, 3). 7

7. (i) Evaluate : 7

$$\lim_{x \to 1} \frac{\sqrt{x^2 - 1} + \sqrt{x - 1}}{\sqrt{x^2 - 1}}$$

(ii) Find $\frac{dy}{dx}$, if $y = u^2 + u + 2$, $u = v^2 + 5$ and $v = 6x + 7$. 7

8. (i) Evaluate : 7

$$\int x^2 e^{-3x}\, dx$$

(ii) Evaluate : 7

$$\int_0^{\pi/2} \frac{\sin x}{\sqrt{\sin x + \cos x}}\, dx$$

