5. a) Evaluate $\lim\limits_{x \to 3} \dfrac{x^2 - 4}{x + 3}$.

b) Find $\int \left(\dfrac{4x^3 + 3x^2 + 2x + 4}{x} \right) dx$

c) If $y = \sqrt{\sin x}$ then evaluate $\dfrac{dy}{dx}$.

d) If $x^y = e^{x-y}$ then prove that

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

Or

Using integration by parts, evaluate $\int x\, e^x\, dx$.

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Roll No ....

PY - 101(A)
B.Pharmacy I Semester
Examination, June 2015
Remedial Mathematics
Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Find values of λ, for which the quadratic equation $2x^2 + 7x + 2 = 0$ has equal roots.

b) If $\begin{vmatrix} 3x & 7 \\ 2 & 4 \end{vmatrix} = 0$, find the value of x.

c) Solve the quadratic equation $x^2 - 7x + 10 = 0$.

d) If $A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \\ 1 & -5 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 3 \\ 2 & -1 \end{bmatrix}$, then find AB does

BA exists?

Or

Using matrix method, solve the equations

$2x-y+3z = 9$

$x+y+z = 6$

$x-y+z = 2$

2. a) The mean of 10 numbers is 20. If 5 is subtracted from every number, what will be the new mean?

b) Find the median of the following data:

78, 56, 22, 34, 45, 54, 39, 68, 54, 84

c) Write uses of

i) Median and

ii) Mode

d) Calculate the mode of the following distribution

Class :	4-8	8-12	12-16	16-20	20-24
Frequency:	10	12	16	14	10

Or

Calculate the arithmetic mean from the following table of marks obtained in a class test:

Marks obtained	11	12	13	14	15
No. of students	2	7	8	5	2

PY-101(A)   PTO

3. a) If $\tan\theta = \dfrac{2}{3}$ then find $\cos\theta$ and $\sin\theta$.

b) Prove that $\sqrt{\dfrac{1+\sin A}{1-\sin A}} = \sec A + \tan A$

c) Show that

$3\log 4 + 2\log 5 - \dfrac{1}{3}\log 64 - \dfrac{1}{2}\log 16 = 2$

d) Prove that

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

Or

Prove that

$\cos 20° \cos 40° \cos 60° \cos 80° = \dfrac{1}{16}$

4. a) Find the distance between $(2, -3)$ and $(1, 1)$.

b) Find equation of a straight line which is parallel to the x-axis and passes through the point $(5, -3)$.

c) Find the angle between $x - \sqrt{3y} = 5$ and $x + \sqrt{3y} = 7$.

d) Find equation of straight line which makes equal intercepts on the axes and passing through the point $(3, -5)$

Or

Find the equation of the line which passes through the point $(2, 3)$ and makes intercepts on the axes which are equal in magnitude but opposite in sign.

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