5. a) Define Null hypothesis and alternative hypothesis.

   b) What is standard error? Write the formula for standard error of sample mean.

   c) Write a short note on ANOVA.

   d) In a survey it was found that 6000 out of 10,000 people watch T.V. programmes How government claims that T.V. services are available to 75% population. Is the claim true?

   OR

   Find the student's t for the following variable values in a sample of eight.

   –4, –2, –2, 0, 2, 2, 3, 3

   Taking the mean of the universe to be zero.

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Total No. of Questions :5] *[Total No. of Printed Pages :4*

Roll No .....

PY - 201

B.Pharmacy II Semester

Examination, June 2015

Advanced 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 the solution of $\frac{dy}{dx} = \frac{x}{y}$.

   b) Find integrating factor of the linear differential equation $\frac{dy}{dx} + y = e^{-x}$.

   c) Form a differential equation by eliminating constants a and b from the following equation.

   $y = a\cos x + b\sin x$

d) Solve the differential equation.

$$\left(D^2 + D + 1\right) y = \sin x$$

OR

Find the general solution of the simultaneous equations

$$\frac{dx}{dt} + 4x + 3y = t$$

$$\frac{dy}{dt} + 2x + 5y = e^t$$

2. a) Use definition to find L{1}

b) Find L{t e^{3t}}

c) Find the Laplace transform of $\frac{e^{-t} \sin t}{t}$

d) Find inverse Laplace transform of $\frac{s}{(s-1)(s-2)}$.

OR

Using Laplace transform, solve $(D^2+1)y = 0$ under the condition that $y = 1, \frac{dy}{dt} = 0 \; when \; t = 0$

3. a) Round off the following numbers to four significant digits.

i) 0.0003745

ii) 0.66667

iii) 3.1416

b) Calculate mean deviation from the mean from the following data 7, 4, 10, 15, 9, 12, 7, 9, 7.

c) Find the standard deviation of 16, 13, 17, 22.

d) The mean and standard deviation of a group of 200 items are 60 and 20 respectively. If at the time of calculations two items 13 and 17 were wrongly copied as 3 and 67. find the correct mean and standard deviation.

OR

Calculate the median for the following table:

Wages in Rs	11-15	16-20	21-25	26-30	31-35	36-40
No .of persons	3	5	6	9	10	7

4. a) A bag contains 9 black and 12 white balls. One ball is drawn at random. What is the probability that the ball drawn is black?

b) Two dice are thrown. Find the probability that sum of faces is 7 or 8.

c) A pair of dice thrown 10 times. If getting a doublet is considered a success. Find the probability of 4 successes.

d) 100 tablets are found to be defective in a lot of 5000 tablets. Find the probability that at most 3 tablets are defective in a box of 100 tablets.

OR

A speaks truth in 60% and B in 75% of cases. In what percentage of cases are they likely to contradict each other in stating the same fact.