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PY - 201

B.Pharmacy II Semester

Examination, June 2016

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 questions 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,

1. a) Find the solution of $\frac{dy}{dx} = \frac{y}{x}$
- b) Why is the order and degree of the following differential

$$\text{equation } \left[1 + \left(\frac{dy}{dx} \right)^2 \right]^3 = \left(\frac{d^2y}{dx^2} \right)^2$$

- c) Form a differential equation by eliminating constants $y = Ax + A^2$.
- d) Solve the differential equation $(D^2 + 4)y = \cos 2x$.

OR

$$\frac{dx}{dt} = -wy$$

$$\frac{dy}{dt} = wx$$

2. a) Find Laplace transform of e^t
- b) Find $L\{t\}$.

c) Find the laplace transform of $\frac{\sin 2t}{t}$

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

OR

Using Laplace transform, solve $(D^2 + 1)y = \sin 3t$ under the conditions $y(0) = 0, y'(0) = 0$

3. a) Round off the following numbers of significant digits:
- i) 0.0004835
- ii) 0.77778
- iii) 4.2326
- b) Calculate mean deviation from the mean from the following data 3, 6, 6, 7, 8, 11, 15, 16
- c) Find the standard deviation of 3, 12, 9, 4, 2.
- d) Calculate the mean for the following table

Class	0-10	10-20	20-30	30-40	40-50
Frequency	7	8	20	10	5

OR

The following table gives the population of males in different age-groups according to the 1951 census of India

Age Group (in years)	No. of male (in lakhs)
5-14	447
15-24	307
25-34	279
35-44	220
45-54	157
55-64	91
65-74	39

Calculate this median age.

4. a) A bag contains 10 white and 15 black balls one ball is drawn at random what is the probability that the ball drawn is white?
- b) A die is rolled, find the probability of an even number is obtained.
- c) A card is drawn at random from a deck of cards. Find the probability of getting the king of heart
- d) In a certain factory producing cycle tyres there is a small chance of 1 in 500 tyres to be defective. The tyres are supplied in lots of 10. Using Poisson distribution calculate the approximate number of lots containing no defective, one defective and two defective tyres respectively in a consignment of 10,000 lots.

OR

The overall percentage of failures in a certain examination is 20. If six candidates appear in the examination, what is the probability that at least five pass the examination.

5. a) Write two applications of statistical techniques in pharmaceutical sciences.
- b) Write about ANOVA in fifty words.
- c) Describe test of significance with null and alternative hypothesis.
- d) Ten objects are chosen at random from a population and their heights are found to be in inches 63, 63, 64, 65, 66, 69, 69, 70, 70, 71. Discuss the suggestion that the mean height in the universe is 65 inches, given that for 9 dot the value of t and 5% level of significance is 2.262

OR

Random samples are drawn from two populations and the following results were obtained

Sample X	Sample Y
20	27
16	33
26	42
27	35
23	32
22	34
18	38
24	28
25	41
19	43
	30
	37

Find variance of two populations and test whether the two samples have same variance (Given that $F_{0.05}$ for 11 and 9 dot is 3.112).

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