

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – DATA SCIENCE

FIRST SEMESTER – NOVEMBER 2019

PDS 1502 – STATISTICS FOR DATA SCIENCE

Date: 01-11-2019

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

PART-A

Answer all Questions: -

10 X 2 = 20

1. List the various methods of Classification.
2. How Histogram are used as a Data analysis technique.
3. Define Correlation and what are the types of correlation?
4. State the properties of Regression coefficient.
5. Write the axioms of Probability.
6. State Addition theorem of probability.
7. Define Random variable.
8. Define Probability density function.
9. Define Binomial Distribution.
10. What are the properties of Normal distribution?

PART-B

5 X 8 = 40

Answer all Questions:-

11. a. Calculate Bowley's coefficient of Skewness for the following:

X	10	15	20	30	35	40	45	60
F	18	22	25	10	16	4	4	4

(Or)

- b. Calculate Mean deviation about median for the following data:

X	10	15	5	9	4	5	11	18
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12. a. Calculate Rank Correlation Coefficient for the following:

X	20	25	19	16	24	30	26	15
Y	10	8	7	6	4	2	1	3

(Or)

b. Fit a Straight line equation by the method of Least Square for the following:

Year	2000	2001	2002	2003	2004	2005	2006
Sales (in 00s)	20	16	15	17	16	18	20

13. a. The personnel department of a company has records which shows the following analysis of its 200 engineers:

Age (Years)	Bachelors Degree Only	Masters Degree
<30	90	10
30-40	20	30
>40	40	10

If one engineer is selected at random, find:

- The probability that he has only Bachelor's degree.
- The probability that he has a Master's Degree given he is over 40.

(Or)

b. A manufacturing firm produces pipes in two plants I and II with daily production of 1500 and 2500 pipes resp., The fraction of defective pipes produced by the two plants are 0.006 and 0.008 resp., If a pipe selected at random is found to be defective, What is the chance that it has come from Plant I?

14. a. Given a probability distribution

X	0	1	2	3	4	5	6	7	
P(X)	0	k	k	2k	2k	3k	2k ²	7k ² +k	

- Find k.
- Evaluate $P(X < 6)$, $P(0 < X < 5)$
- Determine the minimum value of X such that $P(X < x) > 1/2$.

(Or)

b. Let X be a random variable with pdf,
 $f(x) = 6 - x^2, 0 < x < 1$
 $= 0, \text{ otherwise.}$

Find the mean and variance.

15. a. Derive the mean and variance of Exponential distribution.

(or)

b. Define Poisson distribution. State the conditions to be satisfied to use Poisson distribution. Also derive the MGF of Poisson distribution.

PART-C

Answer any TWO Questions: -

2 X 20 = 40

16. (a) State the advantages and disadvantages of various diagrams and graphs.

(b) Calculate Regression Equations for the following.

X	6	2	10	4	8	7	4	5
Y	9	5	8	7	9	9	10	12

1. (a) Fit a exponential curve of the form $y=ae^{bx}$ for the following.

Year	2011	2012	2013	2014	2015	2016	2017
Values (in lakhs)	2	7	5	2	3	9	2

(b) State and prove Baye’s theorem of probability.

2. (a) The customer accounts at a certain Departmental store have an average balance of Rs.480 and a

3. Standard deviation of Rs.160. Assuming that the accounts balance is Normally distributed.

(i) What proportion of the accounts is over Rs.600?

(ii) What proportion of accounts is between Rs.400 and Rs.600?

(b) Derive the MGF of Binomial distribution and hence find its moments.
