

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. Define Tabulation.
2. State how percentiles are used in data Science.
3. List out the properties of correlation coefficient.
4. Define Regression coefficients.
5. Define Random experiment.
6. State Multiplication theorem of probability.
7. Define Random variable.
8. Define Probability density function.
9. Define Rectangular Distribution.
10. What are the properties of Normal distribution?

PART-B

5 X 8 = 40

Answer all Questions:-

11. a. Calculate Median and mode for the following:

X	20	30	40	50	60	70	80	90
F	8	12	20	10	6	4	4	4

(or)

- b. Calculate Quartiles for the following data:

85	70	15	75	50	8	45	25	40
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12. a. Explain scatter diagram method of studying correlation between two variables.

(Or)

- b. Find Y on X regression equation for the following:

X	40	50	38	60	65	50	35	20
Y	38	60	55	70	60	48	30	30

13. a. A class consists of 80 students, 25 of them are girls and 55 boys, 10 of them are rich and remaining poor, 20 of them are fair complexioned. What is the probability of selecting a fair complexioned rich girl?

(or)

b. Assume that a factory has two machines. Past records show that 30% of the products are produced by machine 1 and 70% by machine 2. Also 3% of the products produced by machine 1 were defective and only 1% produced by machine 2 were defective. If a defective item is drawn at random. What is the probability that the defect item was produced by machine 1 or machine 2?

14. a. State the properties of Moment Generating Function.
(or)

b. Let X be a random variable with pdf,
 $f(x) = 2 - x, 0 < x < 1$
 $= 0$, otherwise.

Find the expected value and variance of x.

15. a. Derive the mean and variance of Binomial 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 Spearman's Rank correlation for the following.

X	50	55	66	50	55	60	50	65
Y	110	110	115	125	140	115	130	120

17.(a) Fit an exponential curve of the form $y=ab^x$ for the following.

Year	2000	2001	2002	2003	2004	2005	2006
Sales	32	47	65	92	132	190	275

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

18. (a) Define Normal distribution and derive the Moment Generating Function of normal distribution.
 (b) Define Exponential distribution and derive its moments.
