



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE

THIRD SEMESTER – NOVEMBER 2016

CS 3204 / CA 3201- STATISTICAL METHODS

Date: 10-11-2016
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

SECTION A

(10 X 2 = 20 Marks)

Answer ALL questions.

1. The average rainfall of a city from Monday to Saturday was 0.3 inches. Due to heavy rainfall on Sunday the average rainfall of the week increased to 0.5 Find the rainfall on Sunday.
2. Define standard deviations.
3. Two dice are tossed .What is the probability that total is divisible by 3 or 4?
4. State any four properties of normal distribution.
5. What is hypothesis?
6. Define conditional probability.
7. Find the binomial distribution if the mean is 12 and the standard deviation is 2.
8. A random variable X has the following probability function

X	0	1	2	3	4
P(X=x)	0	K	2k	3k	5k

Find E(X).

9. What is the chance a leap year selected at random will contain 53 Sundays.
10. Define Poisson distribution.

SECTION B

(5 X 8 = 40 Marks)

Answer any FIVE questions

11. (a) Find the Quartile Deviation and its Coefficient for the following distribution:

Class Interval	0 – 10	10 – 20	20 – 30	30 - 40	40 – 50	50 – 60
Frequency	8	20	25	30	12	5

(OR)

- (b) Find the standard deviation and coefficient of variation for the given data:

Age(Years)	25-30	30-35	35-40	40-45	45-50	50-55
No. of workers	70	51	47	31	29	22

- 12.(a) Find the correlation coefficient between production and sales of a factory from the data given below:

Production (in tonnes)	50	55	63	67	65	60	61
Sales (in thousands)	35	36	42	51	54	53	55

(OR)

	Skilled	Unskilled
Male	40	20
Female	10	30

(b).(a)The following table gives the classification of 100 workers according to sex and the nature of work.

Test whether the nature work is independent of the sex.

13. (a)Students of a class were given an aptitude test. Their marks were found to be normally distributed with mean 45 and standard deviation 10. If 1000 students appeared at the examination, calculate the number of students scoring(i) less than 40 marks and (ii) more than 60 marks.

(OR)

(b)State and prove multiplication theorem on probability.

14.(a) A random variable X has the following probability function.

Value of X	0	1	2	3	4	5	6	7
$p(x)$	0	K	2k	2k	3K	K^2	$2K^2$	$7K^2 + K$

(i) Find k (ii) Evaluate $P(X > 6)$, $P(X > 4)$ (iii) Determine the distribution functions of X.

(OR)

(b) Find p for a binomial variate X, if $n = 6$ and $9P(X = 4) = P(X = 2)$

15. (a) Find moment generating function of the Poisson distribution and hence find its mean and variance.

(OR)

(b)) Find moment generating function of the exponential distribution and hence find its mean and variance.

SECTION C

(2 X 20 = 40 Marks)

Answer any TWO questions

16.(a) Calculate the four moments about mean for the following data.

x	2	3	4	5	6
f	1	3	7	3	1

(b) You are given below the following information about advertising and sales

	Adv .Exp(X) (Rs. Lakhs)	Sales (Y) (Rs. Lakhs)
Mean	20	120
S.D	5	25

Correlation coefficient = 0.8

- Obtain the two regression lines.
- Find the likely sales when advertisement expenditure is Rs.25 lakhs .
- What should be the advertisement expenditure if the company wants to attain sale target of Rs.150. (10 +10)

17.(a) State and prove Baye's theorem.

(b).An insurance company has discovered that only 0.2% of the population is involved in a certain type of accidents each year . If its 10,0000 policy holders were randomly selected from the populations , what is the probability that not more than 10 of its clients are involved in such an accident next year ($e^{-10} = 0.000045$). (10 +10)

18. (a) A number of school-children were examined for the presence or absence of certain defects of which three chief descriptions were noted; A-development defects; B-nerve signs; C low nutrition. Given the following ultimate frequencies, find the frequencies of the classes defined by the presence of the defects.

$$(ABC) = 57; (\alpha BC) = 78; (AB\gamma) = 281; (\alpha B\gamma) = 670$$

$$(A\beta C) = 86; (\alpha\beta C) = 65; (A\beta\gamma) = 453; (\alpha\beta\gamma) = 8310$$

18.(b) Two random variables X And Y have the following joint probability density function

$$f(x,y) = \begin{cases} K(4 - x - y) ; 0 \leq x \leq 2; 0 \leq y \leq 2 \\ 0, \text{ otherwise} \end{cases}$$

Find (a) the constant k (b) marginal density function of X and Y.
 (c) Conditional density function and (d) Var(X), Var(Y), Cov(X,Y)

(10 +10)
