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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 20 ONLY)

23UDA2A1

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY 2024

B.SC. CS WITH DA (SF) MAXIMUM MARKS: 75

SEMESTER: II TIME : 3 HOURS

PART – III

23UDA2A1 STATISTICS AND PROBABILITY

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

MULTIPLE CHOICE QUESTIONS.

1) If E denotes the expectation the variance of a random variable X is denoted as?
   a) $(E(X))^2$ b) $E(X^2)-(E(X))^2$ c) $E(X^2)$ d) 2E(X)
2) The difference between the sample value expected and the estimates value of the parameter is called as?
   a) bias b) error c) contradiction d) difference
3) Which of the following is a subset of population? (K1)
   a) distribution b) sample c) data d) set
4) Who introduced the Latin Square Design?
   a) David Blackwell b) Lawrance D.Brown c) Johana Erust Fabri d) Fisher,Ronald Aylmer
5) A bag contains 6 balls of different colours. A student selects 2 balls at random without replacement. Find all possible combinations of the colours of the selected balls.
   a) 13 b) 14 c) 15 d) 16

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6) Explain the concept of probability.
7) Define Sampling Distribution . **(K2)**
8) Illustrate the use of Chi square-test. **(K2)**
9) Relate the analysis of variance. **(K2)**
10) Write a note on regression. **(K2)**

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11) a) A coin is tossed twice. Find the probability of getting at least one head.
   (OR)
   b) Examine the axioms of probability.

12) a) A random sample of 200 tins of coconut oil gave an average weight of 4.95 kgs with a standard deviation of 0.21kg. Do you accept the hypothesis of net weight 5 kgs per tin at 1 % level? **(OR)**
   b) Evaluate the characteristics of linear regression.

13) a) Summarize the properties of the sampling distributions of t.
   (OR)

(CONT….2)

b) A sample of ten house owners is drawn and the following values of their incomes are obtained . Mean Rs. 6000 standard deviation Rs. 650. Test the hypothesis that the average income of house owners of the town is Rs. 5500.

14) a) Summarize the completely randomize design of classification.

(OR)

b) Illustrate the steps followed in Latin Square design.

15) a) x and y are a pair of correlated variables. Ten observations of their values (x_1, y_1) have the following results.

$\sum x=55$, $\sum xy=350$, $\sum y=55$, $\sum x^2=385$

Predict the value of y when the value of x is 6.**(OR)**

b) Find the line of regression of y on x:

x	1	2	3	4	5	8	10
y	9	8	10	12	14	16	15

SECTION-C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K4 OR K5)

16) a) Three coins are tossed. Find the probability of getting

(i) at least one head, (ii) exactly 2 heads. **(OR)**

b) Find the rth moment about the origin, the mean and the standard deviation of the distribution whose p.d.f is given by

$f(x) = 2(1 - x)$ for $0 < x < 1$ and 0 elsewhere.

17) a) A sample of 400 male students is found to have a mean height of 171.38 cms. Can it be reasonably regarded as a sample from a large population with mean height 171.17 cms and standard deviation 3.30 cms? **(OR)**

b) Assess the importance of Central Limit Theorem.

18) a) A random sample of 10 boys has the following IQ's: 70, 120, 110, 101, 88, 83, 95, 98,107,100. Do these data support the assumption of a population mean IQ of 100? **(OR)**

b) A company keeps records of accidents. During a recent safety review, a random sample of 60 accidents was selected and classified by the day of the week on which they occurred

Day	MON	TUE	WED	THU	FRI
No. of accidents	8	12	9	14	17

Test whether there is any evidence that accidents are more likely on some days than others.

19) a) Compare the difference between one way and two way classification.

(OR)

b)Interpret the 22 Factorial design with an approiate example.

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20) a) Find the correlation coefficients between x and y and write down the equation of the regression lines from the following data.

n=25, $\sum x=125$, $\sum x^2=650$, $\sum xy=508$, $\sum y=100$, $\sum y^2=460$. **(OR)**

b) Find the equation of regression lines for the following data. **(K4)**

x	25	28	35	32	36	36	29	38	34	32
y	43	46	49	41	36	32	31	30	33	39

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ETHICAL PAPER