Yashwantrao Chavan College of Science, Karad

Department of Computer

Science Question Bank,2023-2024

B.Sc. CS.(Entire)-I

Subject: Descriptive statistics II

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1)Define regression. Derive the regression equation Y on X using least square method.
2)Explain the concept of multiple and partial correlation in case of trivariate data. State expressions for all multiple and partial correlation coefficients in terms r_{12}, r_{13} and r_{23}.
3)Define correlation. Describe different types of correlation. State different methods of study correlation.
4)Explain the concept of conditional probability.
5) Explain the concept of multiple and partial correlation in case of trivariate data. State expressions for all multiple and partial correlation coefficients in terms r_{12}, r_{13} and r_{23}.
6)With usual notation derive or obtain equation of regression on plane of x_1 on x_2 & x_3.
7)Define residual $x_{1.23}$ & obtain mean and variance of the residual?
8)Obtain the expression for the acute angle θ between the two regression lines. Interprit the results
If r= +1 or -1
9)Show that the coefficient of correlation r is independent of change of origin and scale
10)Explain the meaning and significance of correlation. Describe the method of scatter diagram for studying correlation.
11)Explain the terms multiple and partial correlation coefficient with an example.
12)From the following data calculate $r_{23.1}$, $R_{1.23}$
r_{12}=0.7, r_{13}=0.5 and r_{23}=0.5
13)State and prove any two properties of regression coefficients.
14)define i) Karl Pearsons coefficient of correlation
ii) Spearman's rank coefficient of correlation
15)Given that: r_{12}=0.4, r_{13}=0.6 and r_{23}=0.5. Find $R_{1.23}$ and $r_{23.1}$
16)calculate Spearman's rank correlation coefficient from the following data.

X	65	70	75	50	60	80	68	55	63	78
Y	40	45	60	48	35	55	38	42	50	58

17)The equation of two lines of regression 4X-5Y+33=0, 20X-9Y-107=0
Find i)Regression coefficient
ii)correlation coefficient
iii)values of X & Y
18) Write a note on scatter diagram.
19) State and prove any two properties of regression coefficients.

20) From 10 Observations on Price X and supply Y of a commodity the following data were obtained

$\sum X=130$, $\sum Y=220$, $\sum X^2=2288$, $\sum XY=3467$

Compute the equation of the line of regression of Y on X and interpret the result. Estimate the supply when price is 16 units.

21) Show that x_1 & $x_{2.1}$ are uncorrelated

22)Show that , $-1 \leq r \leq 1$

23)Calculate the coefficient of correlation for the following data.

x	32	55	49	60	43	37	43	49	10	20
y	40	30	70	20	30	50	72	60	45	25

24) From the following data calculate $b_{12.3}$, $b_{13.2}$

r_{12}=0.7, r_{13}=0.5 and r_{23}=0.5

σ_1=2, σ_2=3 and σ_3=3

25)Derive the formula for $R_{1.23}$ in terms of r_{12}, r_{23} and r_{13}

26)Calculate $r_{12.3}$, $r_{13.2}$ from r_{12}=0.7, r_{13}=0.61 and r_{23}=0.4

27) Define i) Karl Pearsons coefficient of correlation

ii) Spearman's rank coefficient of correlation

iii) Coefficient of variation

28) Write a note on

i) Spearman's rank coefficient of correlation

ii) scatter diagram

29)Compute Spearman's rank correlation coefficient from the following data.

X	1	3	4	5	7	8	10
Y	20	16	14	10	8	6	2

30)Define two regression coefficients b_{yx} , b_{xy}.

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B.Sc. CS.(Entire)-I

Subject: Continuous probability distribution & Testing of hypothesis

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1)Define Binomial distribution State its mean, variance, recurrence relation and additive property.

2)The p.m.f of r.v.X is

P(X=x) =k; x=11, 12, 13, 14, 15

Find i) k ii) E(2X) iii) Var(X) iv) Var(X+5)

3)Define the term i) Random variable

ii)Probability mass function

iii)Sample space

iv)Variance

v)Exhaustive outcomes

4)Define (i)Infinite sample space with illustrations.

(ii)Continuous random variable

(iii)Probability density function (p.d.f)

(iv)Cumulative distribution function (c.d.f)

(v)Properties of c.d.f

5)Define Snedecor's F-distribution. Find its mean and variance.

6)Define (a)Infinite sample space with illustrations.

(b)Continuous random variable

(c)Probability density function (p.d.f)

(d)Cumulative distribution function (c.d.f)

(e)Mean

7)Define Exponential distribution. find its c.d.f, mean and variance.

8)Define uniform distribution (a, b). Find its c.d.f mean and variance.

9)Define Exponential distribution. find its mean and variance.

10)Define (a)Infinite sample space with illustrations.

(b)Continuous random variable

(c)Probability density function (p.d.f)

(d)Cumulative distribution function (c.d.f)

(e)Mean

11)Define chi-square distribution. find its mean and variance.

12)Define student's t- distribution. find its mean and variance.

13)Define student's t- distribution. find its mean.

14)State and prove lack of memory property of exponential distribution.

15)Define chi-square distribution. find its mean.

16) Define exponential distribution. find its mean.

17)suppose random variable x has an exponential distribution with $\theta = 1$.

compute the probability P(x>3)?

18)Let X be continuous r.v with probability distribution

F(x)= $\begin{cases} 6x(1-x) & ;0<x<1 \\ 0 & ;o.w \end{cases}$

Find i) Mean

ii)Variance

19)Define

a) Simple and Composite hypothesis

b) Type I and Type II Error

20)Describe test for population mean $H_0: \mu = \mu_0$

21)Define chi-square distribution. find its mean.

22) Define uniform distribution. find its mean.

23) Let X be continuous r.v with probability distribution

F(x)=x^2 ; 0<x<1

=0 ; o.w

Find a) p.d.f b)Mean c)Variance

24) Define student's t- distribution. find its mean

25)Describe test for population proportion $H_0: P = P_0$

26)Define chi-square distribution. find its mean.

27) Define Snedecor's F-distribution. find its mean.

28) Define

a) One Tailed and Two tailed hypothesis

b) Type I and Type II Error

29) Define

a) Critical Region

b) Level of significance

30)Define t-test for population mean $H_0: \mu = \mu_0$

31)Define F-test for equality of two population variances $H_0: \sigma_1 = \sigma_2$

32)Define Normal distribution. Also find distribution of aX+bY, where X and Y are independent

normal variates.

33)Define Normal distribution. State properties of Normal distribution.

34)Define the general procedure of testing of hypothesis.

35)Define chi-square test for goodness of fit.