SNS COLLEGE OF ENGINEERING

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AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai

Probability & Statistics

Question Bank

Unit II

Part A:
1. The regression equations are 3x+2y = 26 and 6x +y = 31. Find the mean values of x & y.
2. Let X and Y be two independent R.Vs with Var(X) = 9 and Var(Y) = 3. Find Var(4X – 2Y + 6)
3. What is the angle between two regression lines?
4. If Y = -2X + 3, find Cov (X , Y).
5. Write any two properties of regression coefficient
6. Write the limits of correlation coefficient

Part B
1. The equation of two regression lines obtained by in a correlation analysis is as follows: 3x + 12y = 19 , 3y + 9x =46.
   (i) Calculate the correlation coefficient (ii) Mean value of X &Y
2. Two random variables X & Y have the following joint p.d.f   . Find the probability density function of the random variable
3. Find the coefficient of correlation between industrial production and export using the following data:

Production (X)	55	56	58	59	60	60	62
Export (Y)	35	38	37	39	44	43	44

4. Two random variables X and Y have the joint p.d.f given by
   .
i) Find K
ii) Obtain Marginal p.d.f of X and Y
iii) Find the Correlation Coefficient between X and Y
5. Two random variables have the joint p.d.f $f(x, y) =$ $(x + y)$, $0 \leq x \leq 1$, $0 \leq y \leq 2$.
Find the following, i) correlation coefficient ii) two regression lines iii) two regression curves for the means
6. The equation of two regression lines are $8x − 10y + 66 = 0$ and $40x − 18y − 214 = 0$.
Find the mean values of x and y and the correlation co-efficient between X and Y.

Unit III
PART A

1. Define Type-I and Type-II errors.
2. Define Level of Significance.
3. Define the following: Parameter & Statistic
4. Define null and alternate hypothesis?
5. State the procedure followed in testing of hypothesis.
6. Suppose the sample mean $= 10.05$, the sample standard standard deviation $s = 2.4854$ and the sample size $n = 8$. Test the null hypothesis $H_0 : \mu = 12.5$ against the alternative hypothesis $H_1 : \mu \neq 12.5$ at $\alpha = 0.05$ level of significance

PART B

1. The time taken by workers in performing a job by Method I and Method II is given below:

Method I	20	16	26	27	23	22	
Method II	27	33	42	35	32	34	38

   Do the data show that the variances of time distribution from population fromwhich these samples are drawn do not differ significantly?
2. The means of two large samples of 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of standard deviation 2.5 inches?
3. A sample of 900 members has a mean 3.4 cm and standard deviation 2.61 cm. Is the sample from a large population of mean 3.25 cm and standard deviation of 2.61 cm?
4. A random sample of 10 boys had the following I.Q's:70, 120, 110, 101, 88, 83, 95, 98, 107, 100. Test the population mean I.Q may be 100.
5. The means of two large samples of 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of standard deviation 2.5 inches?
6. The following data gives the number of aircraft accidents that occurred during the various days of a week. Find whether the accidents are uniformly distributed over the week.

Days	Sun	Mon	Tue	Wed	Thu	Fri	Sat
No. of Accidents	14	16	8	12	11	9	14

7. Two independent samples of sixes 9 and 7 from a normal population had the following values of the variables.

Sample 1	18	13	12	15	12	14	16	14	15
Sample 2	16	19	13	16	18	13	15		

   Do the estimates of the population variance differ significantly at 5% level of significance?
8. A group of 10 rats fed on diet A and another group of 8 rats fed on diet B,

recorded the following increase in weight

Diet A	5	6	8	1	12	4	3	9	6	10
Diet B	2	3	6	8	10	1	2	8		

Test the hypothesis that the sampled have same populations with equal variances at 5% level of significance

9. Test whether there is any significant difference between the variances of the population from

which the following samples are taken:

Sample I	20	16	26	27	23	22	
Sample II	27	33	42	35	32	34	38