Total No. of Questions : 10]

SEAT No. :

P2971

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B.E. (Civil)

STATISTICAL ANALYSIS AND COMPUTATIONAL METHODS

(2012 Pattern) (Semester - II) (Elective - IV) (401010 C)

Time :2½ Hours] *[Max. Marks :70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data, if necessary.***
4) ***Use of electronic pocket calculator is allowed in the examination.***
5) ***Use of cell phone is prohibited in the examination hall.***

Q1) a) Explain bisection Method with suitable example. **[4]**

b) Find a root of $x = e^{-x}$ Carry out computations upto 3 iterations by secant method. **[6]**

OR

Q2) a) Explain need and scope of Numerical integration. **[5]**

b) Evaluate $\int_1^5 \frac{1}{x} dx$ by three point Gaussian Quadrature formula. **[5]**

Q3) a) Write short notes on : Simpson's Rule and it's applications. **[3]**

b) Solve the following equation by Gauss seidal Method. Obtain the solution at the end of fourth iteration. **[7]**

$7a + 2b - 5c = -18$

$a + 5b - 3c = -40$

$2a - b - 9c = -26$

OR

Q4) a) Use the trapezoidal rule to numerically integrate **[3]**

$f(x) = 0.2 + 25x$ from $a = 0$ to $b = 2$

P.T.O.

b) Solve by Gauss Elimination Method. **[7]**

$2x + y + z = 10$

$3x + 2y + 3z = 18$

$x + 4y + 9z = 16$

Q5) a) Explain advantages and disadvantages of statistical method. **[3]**

b) From the following data calculate mean, mode and median. **[6]**

X	0-10	10-20	20-30	30-40	40-50
f	14	20	22	27	25

c) The following table gives marks obtained by a group of 80 students in an examination. calculate the variance. **[7]**

Marks obtained	10-14	14-18	18-22	22-26	26-30	30-34	34-38	38-42	42-46	46-50	50-54	54-58
No of students	2	4	4	8	12	16	10	8	4	6	2	4

OR

Q6) a) Explain sampling and methods of sampling. **[3]**

b) The number of employees average wages per employee and variance of the wage per employee for the two different organisations are given below. **[6]**

	Organisation A	Organisation B
No of Employees	100	200
Avg wage/Employee (Rs)	5000	8000
Variance of marks per Employee	6000	10000

Which organisation has more uniform wages?

c) Find mean and standard deviation. **[7]**

Class interval	59.5-62.5	62.5-65.5	65.5-68.5	68.5-71.5	71.5-74.5
No of observation	5	18	42	27	8

Q7) a) There items are drawn at random from a box containing 2 defective and 4 non-defective item. Find the expected number of Non defective items. **[4]**

b) The scores obtained by students of a class follow a uniform distribution with woo as maximum and minimum as 60. find the mean score and standard deviation of scores. if the passing score is set at 70, what percentage of students will pass the examination. **[6]**

c) Frequencies of normal distribution having same mean standard deviation and total frequencies as in.

Observed frequencies	1	5	20	28	42	22	15	5	2
Expected frequencies	1	6	18	25	40	25	18	6	1

Apply the x^2 test of goodness of fit. **[7]**

OR

Q8) a) The marks obtained in statistical method paper in Engineering, followed normal distribution with mean 75 and standard deviation 10. if 250 students appeared at the examination Estimate the number of students scoring.**[7]**

i) Less than 70 marks

ii) More than 90 marks.

b) In 524 times of six face dice, odd points appeared 180 times. would you say that dice is fair 5% level of significance. **[6]**

c) Explain chi square distribution and its applications. **[4]**

Q9) a) An estimate No. of students who get more than 48 but less than 50 Marks from following data **[8]**

Marks upto	45	50	55	60	65
No. of student	447	484	505	511	574

Use Newton's interpolation.

b) The following data (in Rs crores) gives expenditure on advertisement and sales of a particular form. **[9]**

	Advertisement Expenditure (x)	sales(Y)
Mean	10	90
Standard deviation	03	12
Co-relation coefficient	0.8	0.8

i) Calculate the regression equation of y on x.

ii) Estimate the advertisement expenditure required to attain a sales target of Rs. 120 Crores.

OR

Q10)a) Extrapolate business done in 2016 from following data. **[8]**

Year	2011	2012	2013	2014	2015
Business done (Rs Lakh)	160	245	375	535	790

b) The following table gives indices of industrial production of registered unemployed (100 thousand). Calculate value of Co efficient of co-relation. **[9]**

Year	2005	2006	2007	2008	2009	2010	2011	2012
Index of production	100	102	104	107	105	112	103	99
No.of unemployed	15	12	13	11	12	12	19	26