ADITYA DEGREE COLLEGES: AU REGION

IV SEMESTER – MID – I – EXAMINATIONS

Date: 08.02.2025 **Course: statistics minor** **Max. Marks: 60**
Time: 3 Hours

Subject:Design of analysis of experiments

SECTION - A

Answer any FIVE from the following questions: **5 X4 = 20 M**

1. **Explain Randomization.**
2. **Explain Replication.**
3. **Explain Local Control.**
4. **Explain Experimental error.**
5. **State the assumptions of Experimental designs.**
6. **Explain critical difference.**
7. **Define Treatment and Experimental unit.**
8. **Define Experiment and Block.**

SECTION - B

Answer all the following questions: **4 X10 = 40 M**

9. a) Explain one-way classification in detail with unequal number of observations.

(or)

b) The following table shows the lives (in hours) of four batches of electric lamps:

Batches	Life of Bulbs in Hours							
1	17	16	16	16	17	17	18	
2	15	17	15	17	17			
3	14	15	17	16	16	16	17	18
4	15	15	15	15	16	16		

Perform an analysis of variance one – way of these data and show that a significancetest does not reject their homogeneity. (F (5%, (3,22) df = 3.05))

10. a)Explain ANOVA one-way classification is detail with equal number of observations.

(or)

b) A manufacturing company has purchased three new machines of different makes and wishes to determine whether one of them is faster than the others in producing a certain output. Five hourly production figures are observed at random from each machine and the

results are given in table. Use analysis of variance one – way technique and determine whether the machines are significantly different in their mean speeds. Use α = 5%. (F 5%,(2,12)df=3.89)

	Machine A_1	Machine A_2	Machine A_3
Observations	25	31	24
	30	39	30
	36	38	28
	38	42	25
	31	35	28

11. a) Explain in detail two-way classification.

(or)

b) Three different methods of analysis M_1, M_2, M_3 are used to determine in parts per million the amount of a certain constituent in the sample. Each method is used by five analysts, and the results are given in Table.Do these results indicate a significant variation either between the methods or between the analysts? (F 5%,(4,8) df=6.04 & F5%,(2.8) d.f = 23.27)

		Method		
		M1	**M_2**	**M_3**
Analysts	**1**	7.5	7	7.1
	2	7.4	7.2	6.7
	3	7.3	7	6.9
	4	7.6	7.2	6.8
	5	7.4	7.1	6.9

12. a) Explain Completely Randomized Design in detail.

(or)

b) A set of data involving four "tropical feed stuffs A, B, C, D" tried on 20 chicks is given below. All the twenty chicks are treated alike in all respects except the feeding treatments and each feeding treatment is given to 5 chicks. Analyze the data using CRD and also analyze the critical difference Weight gain of baby chicks fed on different feeding materials composed of tropical feed stuffs is given in table. (t 0.025, 16 df = 2.12) & (F 5%, 3,16 df = 3.06)

Feed	Gain in Weight				
A	55	49	42	21	52
B	61	112	30	89	63
C	42	97	81	95	92
D	169	137	169	85	154