18 SEP 2019

Code:21864

B.Sc.Semester-VI,Exam.

Paper-STAT-CC- 604

(Designs of Experiments)

Time : $2\frac{1}{2}$ Hours] [Total Marks: 70

Instructions: 1) There are 5 compulsory questions in this question paper.
2) All questions carry equal marks.
3) Use of Scientific calculator is allowed.
4) Graph paper will be provided on request.

Q-1 a) Distinguish between fixed effect model and random effect model in the analysis of variance. 6

b) Define the following terms 8

(i)Treatments (ii) Complete blocks

(iii) Experimental Error (iv) Extraneous factors

OR

Q-1 a) Describe the fixed effect mathematical model for ANOVA testing in one way classification. Stating clearly- 8

(i) The assumptions (ii) The hypothesis to be tested

(iii) The test statistics to be used and (iv) ANOVA Table

b) What are the three basic principle of design of experiment.Explain in brief. 6

Q-2 a) Give the complete analysis of RBD. Explain the situation when it is used. 8

b) Describe Missing plot technique in the design of experiment. State its advantages, is missing plot technique applicable in CRD? why? 6

OR

Q-2 a) Outline the various steps in carrying out the ANOVA of Randomized Block Design. State its Merits and demerits. 8

b) Asset of data involving four tropical feed stuffs A,B,C,,D tried on 20 chicks are treated alike in all respects except the feeding treatments and each feeding treatment is given to 5 chicks. Analyse the data. 6

{Given: [$F_{(3,12)}$ =3.49, $F_{(12,3)}$ =8.74, $F_{(4,12)}$ =3.26, $F_{(12,4)}$ =5.91]}

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

Q-3 a) What is a Latin Square Design? Obtain the formula for estimating one missing yield in Latin Square Design. Also state the ANOVA of such design. 8

b) For the following data, identify the design, estimate the missing yield and analyze the data completely. 6

{Given:[$F_{T\ ab(2,1)}$= 200, $F_{Tab\ (1,2)}$=18.51 For Rows,Columns and Treatments]}

B 23	A 17	C 29
A 16	C (x)	B 16
C 24	B 18	A 12

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OR

Q-3 a) Give layout plan of R. B. D. with 5 treatments are replicated 4 times. If the yield of one plot is missing in RBD. Explain the missing plot technique for estimating the missing yield. Give analysis of such design. 8

b) Distinguish between C.R.D. and R.B.D. 6

Q-4 a) Define the following terms,give example of each 6

i) Treatment contrast ii) Orthogonal Treatment contrast

b) What do you mean by the factorial experiment? Explain in brief. State advantages of factorial Experiments. 8

OR

Q-4 a) In a certain 2^2 factorial experiment, there are 2 factors- N and K. write down all treatment combinations. Derive the formula for estimating- 8

i) Main effect of N & K, and ii) Interaction of NK.

b) Explain Yate's Method for 2^3 factorial experiments. 6

Q-5 a) Explain what is meant by main effects and interactions in factorial experiment. A complete 2^3 experiment is replicated r times. Describe the procedure for testing the presence of different main effects and interactions.State its ANOVA also 10

b) Identify the confounded interactions in each case for the following 2^3 Factorial Experiment. 4

Replicate I			
(1)	nk	np	pk
npk	n	P	k

Replicate II			
(1)	k	np	npk
n	p	nk	pk

Replicate III			
(1)	n	pk	npk
p	k	np	nk

Replicate IV			
(1)	p	nk	npk
n	k	np	pk

OR

Q-5 a) What is confounding? Define total and partial confounding. Giving illustration of each. 6

b) What is Incomplete Block Design? Define BIBD,give its example. State any two parametric relationship of BIBD. 8

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