KERALA AGRICULTURAL UNIVERSITY

B. Sc. (Hons.) Ag. 2015 Admission

VI Semester Final Examination- July -2018

Stat.3203 **Design and Analysis of Experiments (1+1)** **Marks: 50**

Time: 2 hours

I **Fill in the blanks:** **(10x1=10)**

1 Number of t-tests have to be performed to compare 5 varieties of rice on yield capacities without using design of experiment technique is.....

2 Uniformity trials are used to find out ..... and .....

3 Interaction effect of ABCD in 2^4 factorial experiment (with A,B,C,Das factors) is.....

4 There are 5 varieties of rice to be checked for their yielding capacities in CRD. A wants to have 2 replications for each treatment. B wants to have 4 replications for each treatment. C wants to have 8 replications for each treatment. B has given correct number of replication because .....

5 After the row randomization was done, the layout of LSD is (with 5 treatments namely A, B, C, D and E).

D	E	A	B	C
A	B	C	D	E
B	C	D	E	A
C	D	E	A	B
E	A	B	C	D

For column randomization of LSD the following random numbers were taken from random number table 18, 95, 59, 24 and 85. After column randomization the layout will be .....

6 Total degrees of freedom and error degrees of freedom for LSD when one value is missing are ..... and .....

7 The critical difference for CRD unequal replication is .....

8 The critical difference for RBD one value missing value treatment with the other treatments is .....

9 The two causes for variations in design of experiments are ..... and .....

10 The degrees of freedom for sampling error for multiple observation data in RBD design is.....

II **Write Short notes on ANY FIVE of the following** **(5x2=10)**

1 Basic principles and assumptions of design of experiments.

2 Explain simple effect, main effect and interaction effect in factorial experiment.

3 Illustrate RBD and why this design is mostly used by researchers?

4 Write the combinations of 2^4, 3^2 and 3^3 factorial experiments and name them.

5 Data transformation.

6 Relative efficiency of RBD over CRD and LSD over RBD.

P T O

7 Find one missing values (X) of the following RBD.

BLOCK	I	II	III	IV	V	VI	TOTAL
Trt A	38	42	39	35	41	44	239
Trt B	44	45	52	55	47	49	292
Trt C	64	59	57	63	67	61	371
Trt D	55	X	49	52	47	59	262
Trt E	72	68	67	70	65	66	408
Trt F	51	57	52	48	53	50	311
TOTAL	324	271	316	323	320	329	1833

III **Answer ANY FIVE of the following** **(5x4=20)**

1 A CRD was conducted on three varieties of rice with 6 replications. But three plots were damaged by rodents. The yield (kg/plot) is given below. Prepare an ANOVA and draw conclusions.

Varity 1	35	37	36	33	--	--
Varity 2	31	33	34	30	35	33
Varity 3	33	30	32	31	30	--

Given: Grand total= 520; Total SS=97.3333; Varietal SS= 51.0333 . F(2,12) at 5% =3.89 F(2,12) at 1% =6.93; t_{12}=2.179 at 5% and t_{12}=2.689 at 1%

2 Explain the model, layout, calculation of sum of square and ANOVA table for completely randomized design with equal and unequal replications.

3 Write about one value missing and two values missing in RBD and one value missing in LSD.

4 Explain factorial experiments of symmetrical (of type p^n).

5 Explain 2^3 factorial experiment in detail using Yates approximation method for calculation of sum of squares.

6 Group the treatments using least significant difference for an LSD with 5 treatments for which EMS=4.8987 and the treatment means are A=13.45 B=19.23 C=10.47 D=21.67 E=16.76 (t table value for 12 df is 2.179)

7 Write the ANOVA table of LSD when t=2, t=3, t =4 and t=5. And justify the minimum number of treatments required for LSD.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1 Layout a split plot design with 4 levels in main plot treatment (namely. M) and 3 levels in sub plot treatment (namely. S) with 3 replications. Also explain calculation of sum of squares, ANOVA table and critical differences for main plot, sub plot, sub plot at each level of main plot and main plot at each level of sub plot treatments.

2 Write about strip plot design in detail with an example as 4 levels in factor A and 4 levels in factor B with 4 blocks. And also explain calculation of sum of squares, ANOVA table and critical differences for factor A , for factor B , for factor A at each level of factor B and for factor B at each level of factor B.

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