B.Sc. (Part—III) Semester—VI Examination

6S : STATISTICS

Time : Three Hours] [Maximum Marks : 80

Note :— All questions are compulsory.

1. (A) Fill in the blanks :

(i) If one or more of basic variable vanish then solution of LPP is called _____.

(ii) Every game result in an outcome is called _____.

(iii) For I.SD of m treatment, there are _____ experimental units.

(iv) L.S.D. in design of experiment stands for _____ . 2

(B) Choose the correct alternative from the following :

(i) _____ is an iterative procedure for solving LPP.

(a) Zero sum game (b) Simplex method

(c) Assignment method (d) Sequencing

(ii) In 2^3 factorial experiment total number of treatments is :

(a) 4 (b) 6

(c) 8 (d) 2

(iii) The time for which a machine does not have a job to process is _____ time.

(a) Processing (b) Elapsed

(c) Idle (d) Sequencing

(iv) The sum of squares divided by its degrees of freedom gives _____.

(a) total sum of square (b) mean sum of square

(c) variance (d) none of these 2

(C) Answer in **one** sentence each :

(i) Define basic variables in LPP.

(ii) Which test is used in ANOVA ?

(iii) What is saddle point ?

(iv) What does CRD stand for in design of experiment ? 4

2. (A) Define :

(i) Slack variable

(ii) Surplus variable. 4

(B) Explain graphical method of solving LPP. 4

(C) Explain the formulation of LPP. 4

OR

3. (P) Define :
   (i) Pivotal element
   (ii) Net evaluation. 4

   (Q) Explain simplex computation procedure of solving LPP. 4

   (R) Define :
   (i) Objective fn.
   (ii) Optimum solution in LPP. 4

4. (A) Define transportation problem and give its formulation with m-origins and n-destinations. 4

   (B) Explain the existence of feasible solution to transportation problem. 4

   (C) Explain the North-West Corner rule to find initial basic solution to T.P. 4

OR

5. (P) Obtain the basic feasible solution of given T.P. by matrix minima method :

	D_1	D_2	D_3	D_4	
O_1	8	10	12	10	28
O_2	11	9	13	14	25
O_3	13	14	11	12	22
O_4	13	10	12	14	30
	28	30	22	25	

4

   (Q) Explain the formulation of T.P. 4

   (R) Explain row minima method to find basic feasible solution to given T.P. 4

6. (A) Define assignment problem and obtain the optimum assignment by Hungarian method for the following :

Persons

Jobs	A	B	C	D
1	4	5	6	7
2	3	4	5	8
3	7	8	6	5
4	5	7	4	3

6

   (B) Explain maximin-minimax principle and find solution to the following :

Player B

Player A	B_1	B_2
A_1	9	2
A_2	8	6
A_3	6	4

6

OR

7. (P) Define the sequencing problem. Define idle time and total elapsed time. Explain the procedure of finding solution of sequencing problem for 2 machines with n jobs. 6

   (Q) Define saddle point and explain two person zero sum game. 6

8. (A) Explain the concept of 'Analysis of variance' with assumptions of validity of F test. 4

   (B) Derive various sum of square in one way classification. 4

   (C) Write mathematical model and null hypothesis for two way classification with 'm' observation per cell. 4

OR

9. (P) Explain why ANOVA is more convenient than using t test and state its advantages. 4

   (Q) State the mathematical model of two way classification with one observation per cell and state its advantages over one way classification. 4

   (R) Explain one way ANOVA and write ANOVA table for one way classification. 4

10. (A) Define :

    (i) Experimental error

    (ii) Efficiency of design. 4

    (B) State the principle of design of experiment and explain 'local control' principle. 4

    (C) Obtain the efficiency of RBD with respect to CRD. 4

OR

11. (P) Define :

    (i) Treatment

    (ii) Experimental unit. 4

    (Q) Explain replication in principle of design of experiment. 4

    (R) Obtain various sum of squares of CRD. 4

12. (A) Explain LSD and also obtain various sum of squares in LSD and give its ANOVA table. 6

    (B) Explain factorial experiment, simple effect, main effect and interaction in 2^2 factorial experiment. 6

OR

13. (P) Give the layout of 5 treatment in LSD and write its ANOVA table. 6

    (Q) Explain factorial experiment with Yate's method for computing factorial effect total in 2^3 factorial experiment. 6