

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

Time—Three Hours]

[Maximum Marks—80

1. (A) Fill in the blanks :

2

(i) A solution to LPP is called _____ if objective function maximize (or minimize) and satisfy constraints and non-negative restriction.

(ii) If the player select the same strategy each time then it is referred to as _____ strategy.

(iii) The theory of experiment design was proposed by _____.

(iv) LSD stands for _____.

(B) Choose the correct alternative from the following :

2

(i) The 2ⁿ is called _____ experiment.

(a) CRD

(b) RBD

(c) LST

(d) factorial

(ii) The correction factor expression is _____.

(a) G^2/N

(b) G/N

(c) $\sqrt{G/N}$

(d) $\frac{\sqrt{G}}{N}$

(iii) The time require to process all jobs including idle time is called _____ time.

(a) total processing

(b) total elapsed

(c) total idle

(d) none of these

(iv) _____ test is used in ANOVA.

(a) χ^2

(b) F

(c) t

(d) paired t

(C) Answer in one sentence : 4

(i) What are constraints in LPP ?

13. (P) State the null hypothesis and draw layout of 4×4 LSD. 4

(Q) Obtain various sum of squares in LSD. 4

(R) Explain Yate's method in 2^3 -factorial experiment for factorial effect total. 4

- (Q) Why analysis of variance is a powerful technique for test of significance ? 6
10. (A) Define :
- (i) Experiment
- (ii) Treatment. 4
- (B) Explain CRD and state its advantages and disadvantages. 4
- (C) Explain concept of RBD and give its ANOVA table. 4

OR

11. (P) Explain any two principle of design of experiment. 4
- (Q) Obtain the efficiency of RBD relative to CRD. 4
- (R) Obtain various sum of squares in RBD. 4
12. (A) Explain LSD. State its mathematical model and null hypothesis. 4
- (B) What is factorial experiment ? Give its ANOVA table for 2^2 factorial experiment. 4
- (C) Define contrasts and orthogonal contrasts. Show that main effect of A and B in 2^2 factorial experiment are orthogonal contrasts. 4

OR

- (ii) Which transportation method gives least cost solution ?
- (iii) What is randomization in design of experiment ?
- (iv) ANOVA stands for ?
2. (A) Define :
- (i) Feasible solution
- (ii) Artificial variable. 4
- (B) Explain what is linear programming problem. 4
- (C) Prove that the set of all convex combinations of a finite number of points is a convex set. 4

OR

3. (P) Define :
- (i) Basic feasible solution
- (ii) Degenerate solution. 4
- (Q) Define primal and dual problem of LPP. 4
- (R) Explain the layout representation of LPP. 4
4. (A) Explain transportation problem and give its mathematical formulation. 6

(B) Explain Vogel's approximation method to find initial basic feasible solution and solve the following transportation problem by this method.

6

	D ₁	D ₂	D ₃	D ₄	Available
O ₁	11	13	17	14	250
O ₂	16	18	14	10	300
O ₃	21	24	13	10	400
Demand	200	225	275	250	

OR

5. (P) Explain the existence of feasible solution to transportation problem and non-degenerate basic feasible solution. 6

(Q) Explain the matrix minima method of transportation problem and also obtain initial basic feasible solution to the following T.P. using this method : 6

	D ₁	D ₂	D ₃	D ₄	Capacity
O ₁	1	2	3	4	6
O ₂	4	3	2	0	8
O ₃	0	2	2	1	10
Demand	4	6	8	6	

6. (A) Define :

- (i) Optimal sequence
- (ii) Idle time.

4

(B) Explain strategy in game theory. 4

(C) Explain optimum sequence algorithm of sequencing problem for n jobs 2 machine. 4

OR

7. (P) Define :

- (i) Saddle point
- (ii) Value of game.

4

(Q) Explain Hungarian assignment method. 4

(R) State the assumption of sequencing problem and explain the sequencing problem for n jobs 2 machines. 4

8. (A) Explain analysis of variance technique with assumptions also. State mathematical model and write ANOVA table for one way classification. 6

(B) Derive various sum of squares for two way classification with one observation per cell and write its ANOVA Table. 6

OR

9. (P) Explain two way classification with m observation per cell in detail. 6