M 11427

Reg. No. : .....

Name : .....

V Semester B.A./B.Sc./B.Com./B.B.A./B.B.A. T.T.M./B.B.M./B.C.A./B.S.W. Degree (CCSS – Regular) Examination, November 2011

CORE COURSE IN STATISTICS

5B09 STA : Statistical Quality Control And Operations Research

Time: 3 Hours

Max. Weightage : 30

Instruction : *Use of calculators and statistical tables are* ***permitted.***

PART – A

Answer **any 10** questions. Weightage **1 each.**

1. What are the advantages of statistical quality control ?
2. Distinguish between assignable causes and chance causes of variation.
3. Give the control limits for the chart for number of defectives.
4. What do you understand by acceptance sampling ?
5. Define producer's risk.
6. Define slack and surplus variables.
7. What are the assumptions of linear programming ?
8. What is a feasible region ?
9. What are unbalanced transportation problems ?
10. What is degeneracy in transportation problems ?
11. What are assignment problems ?

P.T.O.

PART – B

(Answer **any six**). Weightage **2 each**.

12. Distinguish between control chart for variables and control chart for attributes.
13. Explain the construction of R-chart.
14. Define : AQL, LTPD, AOQL.
15. What are characteristics of linear programming problem ?
16. Explain various steps involved in solving LPP by graphical method.
17. Show that transportation problem is a special case of linear programming.
18. Solve graphicaly the following LPP.

    Maximise $Z = 3X_1 + 2X_2$

    Subject to constraints

    $X_1 - X_2 \leq 1$

    $X_1 + X_2 \geq 3$ and $X_1, X_2 \geq 0$.
19. Ten taperecorders were examined for quality control test. The member of defects for each taperecorder are given below :

    2, 4, 3, 1, 2, 1, 5, 3, 6, 7

    Draw an appropriate control chart.
20. Determine an initial basic feasible solution to the following transportation problem using North West corner rule :

	D_1	D_2	D_3	D_4	**Supply**
O_1	6	4	1	5	14
O_2	8	9	2	7	16
O_3	4	3	6	2	5
Demand	6	10	15	4	

PART – C

Answer **any two** questions. Weightage **4 each**.

21. Describe "Double sampling plan'.

22. Explain the significance of control limits and specification limits in statistical quality control.

23. Solve the following assignment problem :

Man \ Job	J_1	J_2	J_3	J_4	J_5
M_1	11	17	8	16	20
M_2	9	7	12	6	15
M_3	13	16	15	12	16
M_4	21	24	17	28	26
M_5	14	10	12	11	13

24. Solve by simplex method.

Minimise $Z = X_1 - 3X_2 + 2X_3$

Subject to constraints

$3X_1 - X_2 + 2X_3 \leq 7$

$-2X_1 + 4X_2 \leq 12$

$-4X_1 + 3X_2 + 8X_3 \leq 10$

and $X_1, X_2, X_3, \geq 0$.