Reg. No……. Name…… **18U549**

B. Sc. DEGREE END SEMESTER EXAMINATION OCTOBER/NOVEMBER 2018

SEMESTER –5: STATISTICS FOR B.Sc. COMPUTER APPLICATIONS

COURSE: 15U5CRCST6: STATISTICAL QUALITY CONTROL AND OPERATIONS RESEARCH

(Common for Regular 2016 admission & Supplementary 2015 admission)

Time: Three Hours Max. Marks: 75

Use of Scientific calculators and Statistical table permitted

PART A

*Answer **all** questions. Each question carries **1** mark.*

1. Give an example of a General LPP.
2. What do you mean by degeneracy of a transportation problem?
3. Define triangular basis of a transportation problem.
4. Give any two areas of application of an assignment problem.
5. Why do you need artificial variables?
6. What are chance causes of variability?
7. What is meant by quality of a product?
8. What information is provided by the OC curves of control chart?
9. What is the role of C- Chart in statistical process control?
10. What is a control chart?

PART B

*Each question carries **3** marks. Maximum marks from this part is **15***

11. Prove that dual of the dual is primal.
12. What are the uses of a loop in a transportation problem?
13. Describe an algorithm to solve an assignment problem.
14. Write the Mathematical model of an assignment problem.
15. How do you set the control limits for process average control chart?
16. Describe the construction of P –chart.
17. Distinguish between P- chart and np- chart?

PART C

*Each question carries **5** marks. Maximum marks from this part is **20***

18. Maximize z=6x + 4y subject to x + y≤ 2, -2x + y ≤2, 3x+2y≤9, x,y ≥ 0 .
19. Solve the following transportation problem.

		Destinations			
		1	2	3	Availability
	1	10	6	12	60
Origins	2	11	9	21	30
	3	8	7	10	65
Demand		125	70	100	

20. Explain two-phase method with a suitable example.
21. Distinguish between process control and product control.
22. Explain the construction and working of mean chart and R- chart
23. How will you prepare control charts of fraction defectives?

PART D

*Each question carries **10** marks. Maximum marks from this part is **30***

24. Use the dual simplex method to solve the following problem
    Maximize z = -2x - 3y subject to x + y ≥ 2, 2x + y ≤ 10, x + y ≤ 8 ; x, y ≥ 0.
25. Consider the problem of assigning five operators to five machines, the assignment costs are given below:

Operator	Machine				
	A	B	C	D	E
1	10	3	10	7	7
2	5	9	7	11	9
3	13	18	2	9	10
4	15	3	2	7	4
5	16	6	2	12	12

    Assign the operators to different machines so that the total cost is minimized.
26. What is control chart? Explain the basic principles underlying the control charts. Discuss the role of control charts in manufacturing process.
27. The following is a record of the number of point defects per unit for metal disc equipments painted in dipping:

    19, 16, 27, 11, 15, 12, 17, 11, 20, 15, 13, 10, 22, 7, 23, 22, 14, 6, 13, 6.

    Draw a c-chart and analyze the data. What control limits would you suggest for future use?