II Semester M.Com. Examination, June 2015
(CBCS)
COMMERCE
Paper – 2.5 : Operations Research and Quantitative Techniques

Time : 3 Hours   Max. Marks : 70

Instruction : *Answer to **all** the questions.*

SECTION – A

1. Answer **any seven** questions out of ten. **Each** question carries **two** marks.   **(7×2=14)**

   a) What do you mean by Linear Programming ?

   b) What is an equally likely event ?

   c) What is Degeneracy ?

   d) Define Cycling Error.

   e) What is Probability ?

   f) What do you mean by earliest starting time ?

   g) What is meant by Crashing ?

   h) What do you mean by Successor activity ?

   i) What do you mean by Buffer inventories ?

   j) What is Simulation ?

SECTION – B

Answer **any four** questions out of six. **Each** question carries **five** marks.   **(4×5=20)**

2. What are inventory models ? Enumerate the various types of inventory models.

3. Explain Branch and Bound technique for feasible solution.

4. Give the mathematical representation of the assignment model.

P.T.O.

5. A computer centre has brought 3 expert programmers. The centre needs 3 application programmes to be developed. The head of the computer centre, after studying carefully the programmes to be developed, estimates in a computer time (in minutes) required by the experts to the application programmes as follows :

Programmes		A	B	C
Programmer	1	120	100	80
	2	80	90	110
	3	110	140	120

Assign programmers to the programmes in such a way that the total computer time is least and compare the result with all other possible combinations.

6. A factory requires 1500 units of an item per month, each costing Rs. 27. The cost per order is Rs. 150 and the inventory carrying charges working out to 20 percent of the average inventory. Find the economic order quantity and the number of orders per year. Would you accept a 2 percent discount on a minimum supply quantity of 1200 units ? Compare the total costs in both the cases.

7. A sample of 100 dry battery cells tested to find the length of life produced the following results : Mean = 12 hours, S.D = 3 hours.

   Assuming the data to be normally distributed, what percentage of battery cells are expected to have life :

   i) More than 15 hours

   ii) Less than 6 hours

   iii) Between 10 and 14 hours.

SECTION – C

Answer **any three** questions out of five. **Each** question carries **twelve** marks. **(3×12=36)**

8. Describe the steps involved in the process of decision making.

9. Solve the following LPP using Graphic Method :

   Minimise $Z = 40x_1 + 24x_2$

   Subject to $\quad 20x_1 + 50x_2 >= 4800$

   $\qquad\qquad 80x_1 + 50x_2 >= 7200$

   $\qquad\qquad x_1, x_2 >= 0$

10. With the help of quantity cost curve explain the significance of EOQ. What are the limitations of using the formula for an EOQ ?

11. The following table gives data on normal time and cost and crash time and cost for a project.

Activity	Normal		Crash	
	Time (days)	Cost (Rs.)	Time (days)	Cost (Rs.)
1-2	6	1400	4	1900
1-3	8	2000	5	2800
2-3	4	1100	2	1500
2-4	3	800	2	1400
3-4	Dummy	-	-	-
3-5	6	900	3	1600
4-6	10	2500	6	3500
5-6	3	500	2	800

The indirect cost per day is Rs. 300.

a) Draw the network and identify the critical path.

b) What are the normal project duration and associated cost ?

c) Crash the relevant activities systematically and determine the optimum project completion time and cost.

12. Find the minimum transportation cost :

Source	D1	D2	D3	D4	D5	Available
S1	4	7	3	8	2	4
S2	1	4	7	3	8	7
S3	7	2	4	7	7	9
S4	4	7	2	4	7	2
Requirement	8	3	7	2	2	–

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