(20518) Roll No. .....

BCA- IV Sem.

18019

B. C. A. Examination, May 2018

Optimization Techniques

(BCA-404)

(New)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required. 3×5=15

1. Define a linear programming problem.
2. Define money value and present value.
3. Define busy period, idle period and mean arrival rate.
4. Explain travelling salesman problem.
5. Describe holding cost, shortage cost and ordering cost.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required. 7½×2=15

6. Solve the following assignment problem :

		Subordinates			
		I	II	III	IV
Tasks	A	8	26	17	11
	B	13	28	4	26
	C	38	19	18	15
	D	19	26	24	10

7. The cost of an item is 3,000. The salvage value and running cost are given below. Find the most economical replacement age of the item :

Year	Running cost	Salvage cost
1	600	2000
2	700	1333
3	800	1000
4	900	750
5	1000	500
6	1200	300
7	1500	300

8. Find the sequence that minimizes the total elapsed time required to complete the following tasks on two machine :

	A	B	C	D	E	F	G	H	I
Macine - I	2	5	4	9	6	8	7	5	4
Machine - II	6	8	7	4	3	9	3	8	11

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. $15 \times 3 = 45$

9. Solve the following L. P. P. :

Maximize $z = 5x_1 + 3x_2$

s. t. $3x_1 + 5x_2 \le 15$

$5x_1 + 2x_2 \le 10$

$x_1,\ x_2 \ge 0$

10. Solve the following transportation problem :

		To 1	2	3	Supply
From	1	2	7	4	5
	2	3	3	1	8
	3	5	4	7	7
	4	1	6	2	14
Demand		7	9	18	34

11. The cost pattern for two machines A and B when money value is not considered is given as follows :

Year	Cost at the beginning of year in Rs.	
	Machine A	Machine B
1	900	1400
2	600	100
3	700	700
Total	2200	2200

Find the cost pattern for each machine when money worth is 10% per year and hence find which machine is less costly.

12. We have five jobs, each of which must go through the machine A, B and C in the order ABC :

Processing Times in hours

Job No. i	1	2	3	4	5
Machine A(A_i)	5	7	6	9	5
Machine B(B_i)	2	1	4	5	3
Machine C(C_i)	3	7	5	6	7

Determine a sequence for the jobs that will minimize the total elapsed time.

13. Customers arrive at a sales counter manned by a single person according to a Poisson process with a mean rate at 20 per hour. The time required to serve a customer has an expontential distribution with a mean of 100 seconds. Find the average waiting time of a customer and queue length.