D.K.M.COLLEGE FOR WOMEN (AUTONOMOUS
SEMESTER EXAMINATIONS

APRIL–2019   15CBA4C

OPERATIONS RESEARCH

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Time : 3 Hrs.   **Max.M**

SECTION – A(10 x 2 =20)

Answer ALL the questions.

1. What are the various models in operation research?

2. Write down the Mathematical formulation of LPP.

3. Define optimum solution.

4. Define surplus variable.

5. Write down the condition for the non-degenerate of solution for the trans

6. Define balanced transportation problem.

7. What is the objective of the assignment problem?

8. Define unbalanced assignment problem.

9. Define Processing Time.

10. What is known as No passing rule?

SECTION – B(5 x 5 =25)

Answer any FIVE of the following questions.

11. What are the applications of Operations Research?

12. A company has three operational departments (weaving, Processing ar
    Produce three different types of clothes namely suitings, shirtings and
    Rs.2, Rs.4 and Rs.3 per metre respectively. One metre of suiting requ
    minutes in processing and 1 minute in packing. Similarly one metre of s
    weaving, 1 minute in processing and 3 minute in packing. One metre of
    in each department. In a week, total run time of each department is 60,
    Processing and packing respectively. Formulate the linear programing p
    mix to maximize the profit.

14. Obtain an initial basic feasible solution to the following transportation pr
    west corner rule:

	D	E	F	G	Availa
A	11	13	17	14	25
B	16	18	14	10	30
C	21	24	13	10	40
Requirement	200	225	275	250	

15. Obtain an initial basic feasible solution to the following transportation pr
    minima method:

	D1	D2	D3	D4	Capaci
O1	1	2	3	4	6
O2	4	3	2	0	8
O3	0	2	2	1	10
Demand	4	6	8	6	

16. A department head has four subordinates and four task to be performe
    efficiency, and the task differ in their intrinsic difficulty. His estimate of t
    to perform each task is given in the matrix below:

	Men			
Tasks	E	F	G	H
A	18	26	17	11
B	13	28	14	26
C	38	19	18	15
D	19	26	24	10

How should the tasks be allocated, one to a man, so as to minimize the

17. A department head has four task to be performed and three subordinat

18. In a factory there are 6 jobs to perform, each of which should go throu
the order A,B. Determine the sequence for performing the jobs th
elapsed time T. What is the value of T?

Job	J1	J2	J3	J4	J5
Machine A	1	3	8	5	6
Machine B	5	6	3	2	2

SECTION – C(3 x 10 =30)

Answer ALL the questions.

19. (a) A company makes two kinds of leather belts. Belt A is a high quality
quality. The respective profits are Rs.4.00 and Rs.3.00 per belt. Each b
twice as much time as a belt of type B, and if all belts were of type B, co
1000 belts per day. The supply of leather is sufficient for only 800 belts
combined). Belt A requires a fancy buckle and only 400 buckles per day
are only 700 buckles a day available for belt B. Determine the optimal p
graphical method.

(Or)

(b)A manufacture of leather belts makes three types of belts A,B and C
three machinesM_1, M_2 and M_3.Belt A requires 2 hours on machineM_1 an
Belt B requires 3 hours on machineM_1, 2 hours on machineM_2 and 2 ho
and belt C requires 5hours on machineM_2 and 4 hours on machine M_3.
time per day available on machineM_1, 10 hours of time per day availabl
hours of time per day available onmachineM_3.The profit gained from be
from belt B is Rs.5.00 per unit, belt C is Rs.4.00 per unit. What should b
each type of belts so that the profit is maximum by using simplex metho

20. (a)A manufacturing company has four zones A,B,C,D and four sales en
respectivelyfor assignment. Since the Zones are not equally rich in sale

(b)Find the starting solution in the following transportation problem by V
Method also Obtain the optimum solution:

	D1	D2	D3	D4
S1	3	7	6	4
S2	2	4	3	2
S3	4	2	8	5
Demand	3	3	2	2

21. (a)Determine the optimal sequence of jobs that minimizes the total elap
following information processing time on machines is given in hours and

Job	A	B	C	D	E	F
Machine M1	3	8	7	4	9	8
Machine M2	4	3	2	5	1	4
Machine M3	6	7	5	11	5	6

(Or)

(b)A book binder has one printing press, one binding machine, and the
different books. The time required to perform the printing one binding o
shown below. Determine the order in which books should be process
total time required to turn out all the books:

Book	1	2	3	4	5
Printing time(hrs.)	30	120	50	20	90
Binding time(hrs.)	80	100	90	60	30

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