

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2019

Course: LSCM2007 Decision Modeling using spreadsheet

Semester: IV

Programme: BBA LM

Time: 03 hrs.

Max. Marks: 100

Instructions: As per sections

SECTION A

S. No.	Attempt all questions	Marks	CO
Q 1	Mark True/False (T/F) for the following	8	
a)	Formulas are entered in the worksheet cell and must begin with a multiplication sign (T/F)	2	5
b)	The output generated from linear programming models provides useful “what if” analysis. (T/F)	2	4
c)	Optimization seeks to render its supply chain efficient, flexible and responsive as possible. (T/F)	2	4
d)	G.B.Dantzig design the “simplex method” for solving linear programming formulations.(T/F)	2	3
Q 2	Fill in the blanks	12	
a)	The full form of VAM is _____	2	3
b)	_____ is a special kind of Linear Programming (LP) problem in which goods are transported from a set of sources to a set of destinations	2	3
c)	There is an overabundance of _____ data for the purposes of managerial decision making.	2	1
d)	Any change in the right hand side of a _____ constraint will change the optimal solution.	2	3
e)	There are two basic types of cell references in Excel: _____ and _____	2	1
f)	_____ algorithm is used to solve the assignment problem	2	4

SECTION B

	Attempt any four questions	20	
Q3	What is a linear programming model? What are its components?	5	2
Q4	What are the various assumptions of linear programming models?	5	2
Q5	What do you understand by infeasibility and unboundness?	5	3
Q6	Formulate the assignment problem? What are the assumptions?	5	4
Q7	What are the various types of What if analysis in spreadsheet?	5	1

SECTION-C

	Attempt all questions	30	
Q8	Use graphical model to solve the following LP problem Minimize $Z = 600x_1 + 400x_2$	10	2

Subject to the constraints

i) $3x_1 + 3x_2 \geq 40$

ii) $3x_1 + x_2 \geq 40$

iii) $2x_1 + 5x_2 \geq 44$

and $x_1, x_2 \geq 0$

Q9 Determine the initial basic feasible solution to the following transportation problem by using a) NWCR, b) LCM and c) VAM. Which method gives best results?

	W1	W2	W3	Supply
F1	16	20	12	200
F2	14	8	18	160
F3	26	24	16	90
Demand	180	120	150	

10

3

Q10 A department of a company has five employees with five jobs to be performed. The time in hours that each man takes to perform each job is given in the effectiveness matrix.

Jobs/Employees	I	II	III	IV	V
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

How should the jobs be allocated, one per employee, so as to minimize the total man hours?

10

5

SECTION-D

Attempt all questions

30

Q11 The table below gives the solution procedure of a transportation problem:

	W1	W2	W3	Supply
F1	16	20	12	200
F2	14	8	18	160

15

3

F3	26	24	16	90	90
Demand	180	120	150		

Answer the following questions:

- a) Is the solution feasible?
- b) Is the solution degenerate?
- c) Is the solution optimum? If not, find the optimum solution using Modi method.

Q12 Omega Leather goods manufactures two types of leather soccer balls X and Y. Each type of ball requires work by two types of employees – semi skilled and skilled. The available time (per week) for manufacturing each type by employee and the time requirement for each type of ball are given below. The cost of an hour of semi-skilled labor is Rs. 5.50 and for skilled labor it is Rs. 8.50. To meet the weekly demand requirements, atleast 15 balls of type X and 10 balls of type Y need to be manufactured.

Type of employee	Manufacturing time requirement (hr)		Time available (hr/week)
	Ball X	Ball Y	
Semi-skilled	2	3	80
Skilled	4	6	150

- a) Formulate a linear programming model to minimize the cost
- b) Solve the above problem using the graphical method

15

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