

Course No:
Course Title: Operations Research
Date: 20/05/2015
No. of Questions: 4
Time: 2 hours
Using Calculator (yes)

University of Palestine



Final Exam
2nd semester 2014/2015
Total Grade: 60%

Instructor Name: Abedelazez J. Safi
Student No.: _____
Student Name: _____
College Name: Faculty of Financial
Management and Business
Dep. / Specialist: _____
Using Dictionary (No)

First Question:

Write (R) in front of the Right answer & (W) in front of the Wrong answer (11 points)

1. () The arc of the network flow consider indicated once adding an arrowhead at the end of the line representing the arc.
2. () American refer to Operations Research terminology , and often shortened to just "OR".
3. () Deterministic models are involve in optimization but not via random variables.
4. () Stochastic models represented uncertain data estimate system performance.
5. () The situation of OR problem solving may not involve current operations or proposed expansions due to expected market shifts.
6. () Mathematical Models Relate decision variables (controllable inputs) with fixed or variable parameters (uncontrollable inputs).
7. () The linear programming problems developed by George Dantzig in 1847.
8. () The simplex method is geometric procedure and it is underlying concept are algebraic.
9. () At network distribution system the lines are called nodes (or vertices); and the points are called arcs (or links or edges or branches).
10. () If flow through an arc is allowed in either direction (e.g., a pipeline that can be used to pump fluid in either direction), the arc is said to be an directed arc.
11. () British, USA, and European refer to OR terms sometimes as “**Industrial Engineering**” ("IE") and “**Decision Science**” ("DS").

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Second Question: Defined the Following Concepts (6 Points)

1. Operations Research & Component
2. Network Optimization Models
3. Simplex Method
4. Mathematical models
5. Model Solution :
6. Stochastic Model :

Third Question: Answer the following question clearly (9 points)

1. Mention and explain the deterministic models and stochastic models of OR?
2. Mention the main steps of Operation Research Study?
3. During the OR Course we have developed new idea of our own software model that can help the local companies to develop their expansion strategy in Gaza decreasing the Transportation problem, costs, increase logistics.... etc? Write and Mention the mechanism of program Modeling that has been explained?

Forth Question: Mention and explain the following question clearly (20 points)

1. "An auctioneer are required to developed a simple mathematical model for deciding the starting bid he will require when auctioning a used automobile Essentially, he sets the starting bid at seventy five percent of what he predicts the final winning bid will (or should) be. He predicts the winning bid by starting with the car's original selling price and making two deductions, one based on the car's age and the other based on the car's mileage. The age deduction is \$ 900 per year and the mileage deduction is \$.067 per mile."

Develop this mathematical model and suppose a 10 years old car with 420,000 miles on the odometer is up for auction. If its original price was \$220,500, what starting bid should the auctioneer require?

2. *You have the following transportation problem of Al-Jindy Company there are a total of 427 truckloads to be shipped. One of the main products of the Al-Jindy*

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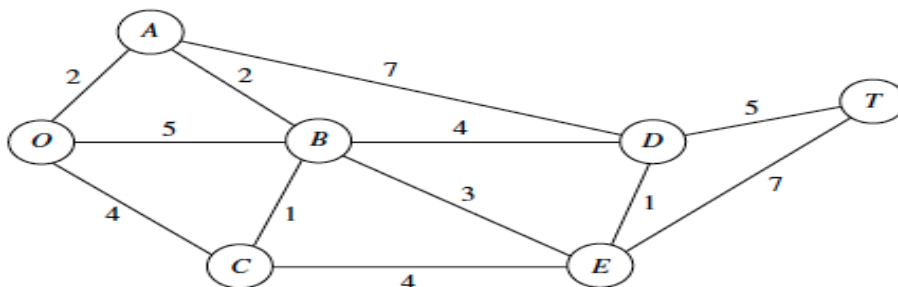


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COMPANY is Yogurt. The cannery yogurt output = (110, 89, 93, 135) prepared at Four canneries (j) (Jerusalem, Nablus; Halil, Jenin) and then shipped by truck to five distributing warehouses (i) in the southern Palestine (North-Gaza, Gaza, El-Wastah, Khan-Younis, Rafah) the Warehouses allocation = (89, 90, 76, 95, 77) The total distribution point Z = $400 \times 11 + 520 \times 12 + 654 \times 13 + 860 \times 14 + 820 \times 15 + 352 \times 21 + 415 \times 22 + 690 \times 23 + 780 \times 24 + 790 \times 25 + 995 \times 31 + 682 \times 32 + 388 \times 33 + 685 \times 34 + 730 \times 35 + 470 \times 41 + 520 \times 42 + 760 \times 43 + 820 \times 44 + 990 \times 45$ Because the shipping costs in dollar of per truck Z are a major expense for the company you are require to

- A. Simplify the transportation problem in tabulation showing the shipping cost (\$) of Per truckload for canneries and warehouses?
 - B. Draw the simple Network representing the Al-Jindy company problem?
 - C. Show the subject to constraint for linear programing and Matrix coefficients?
3. You have the following Network Road System for Google Market Company having the starting points from O Node and the Final Node is T. The numbers on arcs give the distances of these winding roads in miles. The Google Market management currently faces few problems. One is to determine which route from the company entrance to station T has the smallest total distance for the operation of the trams. The question is where the lines should be laid to accomplish this with a minimum total number of miles of line installed in the next figure!



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You are required to do

- A. The SHORTEST-PATH algorithm for Google Market problem from Network optimization?
- B. Afterward use the applied algorithm to draw the shortest Spanning tree problem from Network Optimization mentioning the terms per-day and the used routes defining the final feasible solution?

4. Italian Beach Corporation is a big developer operating of real state in Palestine. It has seven permanent employees whose monthly salaries are given on the table.

Employee	Monthly Salary
President	\$10,000
VP, Development	6,000
VP, Marketing	4,500
Project Manager	5,500
Controller	4,000
Office Manager	3,000
Receptionist	2,000

Italian beach leases a building for \$2,000 per month. The cost of supplies, utilities, and leased equipment runs another \$3,000 per month. Italian Beach builds only one style house in the valley. Land for each house costs \$55,000 and lumber, supplies, etc. run another \$28,000 per house. Total labor costs are figured at \$20,000 per house. The one sales representative of Italian beach is paid a commission of \$2,000 on the sale of each house. The selling price of the house is \$550,000.

- a. Identify all costs and denote the marginal cost and marginal revenue for each house?
- b. Write the monthly cost function $c(x)$, revenue function $r(x)$, and profit function $p(x)$?
- c. What is the breakeven point for monthly sales of the houses?
- d. What is the monthly profit if 33 houses per month are built and sold?
- e. And defined if the models are stochastic or Deterministic?

"With best wishes"