


<b>Course No: MGNE 3310</b> <b>Course Title:</b> <b>Operations Research</b> <b>Date: 27<sup>th</sup>/May /2018</b> <b>No. of Questions: (5)</b> <b>No. of pages: (8)</b> <b>Time: 2 Hours.</b>	<b>University of Palestine</b>  <b>Final Exam</b> <b>Second Semester 2017/2018</b> <b>Total Grade: (50)</b>	<b>Student Name:-----</b> <b>Student No: -----</b> <b>College Name: Finance &amp; Business</b> <b>Dep. / Specialist:</b> <b>Business Administration / Accounting</b> <b>Instructor Name: Mrs. Rand Alastal</b>
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Question	1	2	3	4	5	Total grade
Marks	/6	/9	/10	/10	/15	/50


**Answer The Following Questions:**

**Q 1: Waiting Line: (6Marks)**

Alquods bank , many of customers they have financial transaction.  $\lambda$  60 average customers arriving to restaurant per hour,  $\mu$  45 the average of customers services per hour.

**Required: Find P, PO, LS, Lq, WS, Wq.**

	$\lambda = \mu =$
1	The utilization factor for the system P
2	The percent idle time, P0
3	The average number of customers or units in the system, Ls
4	The average number of customers in the queue, Lq
5	The average time a customer spends in the system, WS
6	The average time a customer spends waiting in the queue, Wq

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### Q 2: decision analysis:

**(9Marks)**

**Metro supermarket the Annual revenue for is affected by the status of the Gaza Strip. Required: Select the best maximize profit strategy. ( $\alpha=0.6$ )**

A\N	N1	N2	N3	N4	MINIMAX	REALISM	MAXIMIN	MAXIMAX
A1	10	25	15	30				
A2	12	30	18	50				
A3	16	35	25	20				
A4	20	40	30	18				
DECISION								

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.



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**Q 4: Assignment Problem:**

**(10 Marks)**

Bank Of Palestine wish to assignment four staff members. The candidates name:  
(Nader , Nadeem, Waseem, Saleem) to engage four tasks: (Teller, Director, Archiving  
Controller, Customer services) and cost- shown thefollowing table:  
Required: Find the best Max Profit of assignment problem with details?

\	1	2	3	4
Nader	60	30	40	10
Nadeem	40	50	10	40
Waseem	20	30	30	25
Saleem	60	40	20	10
\	1	2	3	4
Nader				
Nadeem				
Waseem				
Saleem				
\	1	2	3	4
Nader				
Nadeem				
Waseem				
Saleem				
\	1	2	3	4
Nader				
Nadeem				
Waseem				
Saleem				
\	1	2	3	4
Nader				
Nadeem				
Waseem				
Saleem				





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**Second Mid Term (15 Marks)**

**Only: For the students who did not have.**

**Q1: Find the best solution of Transportation problem: Use LCM method (6 Marks)**

S \ D	D1	D2	D3	D4	SUPPLY
S1	1	5	7	2	60
S2	12	8	0	7	30
S3	3	2	4	10	50
S4	0	4	2	1	20
DEMAND	80	20	60	50	\

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**Q2: Find the Optimal solution of Linear Programming in Simplex Method: (9 Marks)**

Linear programming form	Standard form
<b>Min <math>Z = 8 X_1 + 10 X_2</math></b> <b>SUB TO: <math>2 X_1 + 2 X_2 \geq 50</math></b> <b><math>4 X_1 + 2 X_2 \geq 80</math></b> <b><math>X_1, X_2 \geq 0</math></b>	

**Time: 2 Hours.**

**Total Grade: (50)**

**Instructor Name: Mrs. Rand Alastal**

[illegible]

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