Benha Uni	versity	1					Final Term E	xam		
Faculty of Engineering- Shoubra					1		Date: 26 / 5	/ 2013		
Eng. Mathematics & Physics Departme							Operations Re	search		
Qualifying	Studie	es (N	Mathe	ematics)	100	THEFT	Duration: 3	hours		
• Answer	All qu	iesti	ons		• No. of questions: 4					
The Exam consists of one page Total Mark: 200 Marks										
[1](a)Write the general form of mathematical programming problem. Also, classify										20
the mathematical programming problems.										
(b)Write the mathematical model of transportation problem.										10
[2](a) Solve the LP problems:										
(i) minimize $f = -x + 3y - 3z$										30
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5.1 $2x + y - L \ge 4$, $4x - 3y \le 2$, $-3x + 2y + L \ge 3$, $x, y, L \ge 0$ (ii) maximize $f = 2x + x + z$										20
(ii) maximize $1 = 2x + y + z$										30
s.t $x - y + 2z \le 3$, $x + 2y - 2z \le 4$, $x - 2y + 3z \ge 4$, $x, y, z \ge 0$										
(b)Write the dual problem of the LP problem:										20
maximize $f = -2x + 2y$										
s.t $3x + y \le 12$, $-x + y = 6$, $x + y \ge 8$, $x, y \ge 0$										
[3](a)Prove that: Any local solution of a convex programming problem is also global										20
(b) A company makes desk organizers. The standard model requires 2 hours of the										20
outrantime and one hour of the finisher time. The deliver model requires 2 flours of the										
the sector time and 2 hours of the finisher time. The deluxe model requires one nour of										
the cutter time and 2 hours of the finisher time. The cutter has 104 hours of time										
available for this work per month, while the finisher has 76 hours of time available										
for work. The standard model brings a profit of LE 5 per unit, while the deluxe										
model brings a profit of LE 9 per unit. The company wishes to make the most profit.										
How much of each model should be made in each month.										
[4](a)Solve the assignment (b)Solve the transportation problem										20+30
problem	•									
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Job	10	7	10						15	
	10	1	10	7	1	3	5	0		
	8	5	11	7					20	
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Good Luck					Dr. Mohamed Eid					