

MATH 101, EXAM TWO , FALL 007

DR. AYMAN BADAWI

NAME _____, ID # _____, Score $\overline{70}$

Question 1. (20 points) *Minimize and Maximize* $P = 40x_1 + 10x_2$ *subject to*

$$5x_1 + 2x_2 \leq 800$$

$$2x_1 + x_2 \geq 340$$

$$x_2 \geq 200$$

$$x_1, x_2 \geq 0$$

Question 2. (20 points) *You need to buy 300 Chocolate bars from three different types : A, B, C. For a particular reason, you want the number of the chocolate bars from type B be twice as the number of the chocolate bars from type C. Each chocolate bar from type A costs 2 Dhs, each chocolate bar from type B costs one Dhs, and each chocolate bar from type C cost 2 Dhs. You are willing to pay 500 dhs for ALL the chocolate bars. HOW MANY CHOCOLATE BARS CAN YOU BUY FROM EACH TYPE?*

Question 3. (10 points) *A company manufactures 3 types of papers: A, B, C. In a given working day, the company must produce at most 2000 papers from type A, at most 3000 papers from type B, and at most 1500 papers from type C. It takes 0.001 of an hour to produce one paper from type A, 0.002 of an hour to produce one paper from type B, and 0.003 of an hour to produce one paper from type C. In a given working day, the company operates at most 10 hours. The company makes 0.4 of Dhs on each paper of type A, 0.6 of Dhs on each paper from type B, and 0.55 of Dhs on each paper of type C. In a given working day, how many papers from each type should the company produce in order to maximize its profit? Note that the company closed 21 days every year in addition to the standard holiday from Dec. 22 to Jan. 3. (WRITE THE MATHEMATICAL MODEL TO THE PROBLEM, BUT DO NOT SOLVE IT)*

(Last QUESTION):(20 points) Minimize $C = 40x_1 + 12x_2 + 40x_3$ subject to
 $2x_1 + x_2 + 5.5x_3 \geq 20$
 $4x_1 + x_3 \geq 30$
 $x_1, x_2, x_3 \geq 0$