Math 131 Quiz Test II. Ch7.1,7.2,7.3.

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***Abstract*—**
NAME:____
:
I.D.# ____

***Index Terms*— Check or Circle the Right Answer Only.**

I. Linear Programming Problems

*Q.1.$(Marks:5)$. 190Tan Find the **maximum** value of $P = 8x + 6y$ subject to the feasible region (Shaded Region) of a system of inequalities as sketched.

(A) 10 at $(x =$ __________, $y =$ ___________$)$
(B) 15 at $(x =$ __________, $y =$ ___________$)$
(C) 20 at $(x =$ __________, $y =$ ___________$)$
(D) 30 at $(x =$ __________, $y =$ ___________$)$
(E) 50 at $(x =$ __________, $y =$ ___________$)$
(F) 60 at $(x =$ __________, $y =$ ___________$)$
(G) 80 at $(x =$ __________, $y =$ ___________$)$
(H) 90 at $(x =$ __________, $y =$ ___________$)$
(I) 100 at $(x =$ __________, $y =$ ___________$)$
(J) 120 at $(x =$ __________, $y =$ ___________$)$
(K) 150 at $(x =$ __________, $y =$ ___________$)$
(L) 160 at $(x =$ __________, $y =$ ___________$)$
(M) 170 at $(x =$ __________, $y =$ ___________$)$
(N) None of the above choice is correct and the correct answer is equal to : $=$ _______ at $(x =$ __________, $y =$ ___________$)$.

Q.2. $(Marks:5)$. Write the the system of equations presenting the Feasible Region as sketched and shaded in the diagram.

$$(A)\left\{\begin{array}{ccccccc} 2x & + & 3y & \leq & 30 & & \\ y & - & x & \leq & 5 & & \\ x & + & y & \geq & 5 & & \\ & & x & \leq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(B)\left\{\begin{array}{ccccccc} 2x & + & 3y & \geq & 30 & & \\ y & - & x & \leq & 5 & & \\ x & + & y & \geq & 5 & & \\ & & x & \leq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(C)\left\{\begin{array}{ccccccc} 2x & + & 3y & \leq & 30 & & \\ y & - & x & \geq & 5 & & \\ x & + & y & \geq & 5 & & \\ & & x & \leq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(D)\left\{\begin{array}{ccccccc} 2x & + & 3y & \leq & 30 & & \\ y & - & x & \geq & 5 & & \\ x & + & y & \geq & 5 & & \\ & & x & \leq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(E)\left\{\begin{array}{ccccccc} 2x & + & 3y & \leq & 30 & & \\ y & - & x & \geq & 5 & & \\ x & + & y & \geq & 5 & & \\ & & x & \geq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(F)\left\{\begin{array}{ccccccc} 2x & + & 3y & \geq & 30 & & \\ y & - & x & \leq & 5 & & \\ x & + & y & \geq & 5 & & \\ & & x & \leq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(G)\left\{\begin{array}{ccccccc} 2x & + & 3y & \leq & 30 & & \\ y & - & x & \geq & 5 & & \\ x & + & y & \leq & 5 & & \\ & & x & \leq & 10 & & \\ x & \geq & 0 & , & y & \geq & 0 \end{array}\right.$$

$$(N)\left\{\begin{array}{cccccccc} 2x & + & 3y & \leq & 30 & & & \\ x & - & y & \leq & - & 5 & & \\ x & + & y & \leq & 5 & & & \\ & & x & \leq & 10 & & & \\ x & \geq & 0 & , & y & \geq & 0 & \end{array}\right.$$

Q.3. $(Marks: 5)$ .104Tan29. Manufacturing - Production Schedule. A company manufactures two products, A and B, on two machines, I and II. It has been determined that the company will realize a profit of \$ 3 per unit of product A and a profit of \$ 4 per unit of product B.

To manufacture a unit of product A requres 6 minutes on machine I and 5 minutes on machine II.

To manufacture a unit of product B requires 9 minutes on machine I and 4 minutes on machine II.

There are 5 hours of machine time avaiable on machine I and 3 hours of machine time avaiable II in each work shift.

How many units of each product should be produced to each shift to maximize the company's profits?

Set up the linear programming problem without solution.

Answer: Let $x =$ Number of units of product A,

Let $y =$ Number of units of product B.

Maximize Profit $P = Jx + Ky$,

(where $J =$ ________, $K =$ ________)

subject to the constraints:

$$(a)\begin{cases} 5x + 6y \le 300 \\ 4x + 9y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(b)\begin{cases} 6x + 9y \le 5 \\ 5x + 4y \le 3 \\ x , y \ge 0 \end{cases}$$

$$(c)\begin{cases} 6x + 9y \ge 300 \\ 5x + 4y \ge 180 \\ x , y \ge 0 \end{cases}$$

$$(d)\begin{cases} 6x + 5y \le 300 \\ 9x + 4y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(e)\begin{cases} 6x + 5y \le 300 \\ 9x + 4y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(f)\begin{cases} 6x + 9y \le 300 \\ 5x + 4y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(g)\begin{cases} 9x + 5y \le 300 \\ 6x + 4y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(h)\begin{cases} 4x + 9y \ge 300 \\ 5x + 6y \ge 180 \\ x , y \ge 0 \end{cases}$$

$$(i)\begin{cases} 6x + 9y \ge 300 \\ 5x + 4y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(j)\begin{cases} 6x + 9y \le 300 \\ 4x + 5y \le 180 \\ x , y \ge 0 \end{cases}$$

$$(k)\begin{cases} 6x + 5y \le 300 \\ 9x + 4y \le 180 \\ x , y \ge 0 \end{cases}$$

(n) None of the above choice is correct. Write your answer:

$$\begin{cases} \\ x , y \ge 0 \end{cases}$$

Q.4. $(Marks: 10)$. Tan187. Solve the Linear Programming Problem by Geometric Method:

(Sketch the Graph of the Feasible Region and find the corner points of the feasible region and calculate the value of P at each corner point)

Maximize: $P = x + y$

Subject to the constraints:

$$(c)\begin{cases} 2x + y \le 180 \\ x + 3y \le 300 \\ x , y \ge 0 \end{cases}$$

Maximum value of $P =$ ________

at $x =$ ____________, $y =$ ______.