ESCUELA SUPERIOR POLITECNICA DEL LITORAL

Administración de Operaciones
Examen Parcial
Term. II, 2018

Yo, ……………………………………………………………, al firmar este compromiso, reconozco que el presente examen está diseñado para ser resuelto de manera individual, que puedo usar una calculadora ordinaria para cálculos aritméticos, un lápiz o esferográfico; que sólo puedo comunicarme con la persona responsable de la recepción del examen; y, cualquier instrumento de comunicación que hubiere traído, debo apagarlo y depositarlo en la parte anterior del aula, junto con algún otro material que se encuentre acompañándolo. No debo además, consultar libros, notas, ni apuntes adicionales a las que se entreguen en esta evaluación. Los temas debo desarrollarlos de manera ordenada. Como estudiante de ESPOL me comprometo a combatir la mediocridad y actuar con honestidad, por eso no copio ni dejo copiar. Firmo al pie del presente compromiso, como constancia de haber leído y aceptar la declaración anterior.

Firma: …………………………………….. Nro.Matrícula: ………………………………………………

Paralelo: ………………………....

1.) Complete the sentence by selecting the correct answer from the choices below.
_____ is the degree to which a nation can produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens.
   a. Strategy
   b. Competitiveness
   c. Order Qualifier
   d. Balanced Scorecard

2.) Recall that *positioning* is how a firm chooses to compete. Please write the four key areas in which a firm can choose to compete on the lines below.

   • _____

   • _____

   • _____

   • _____

3.) Juan is considering playing a game in which he must pay $10 to play. In this game, he can spin a wheel that has red and black sections. If it lands on a red section, he gets his $10 back plus an additional $10. If it lands on black, he gets nothing back. Juan says that he will only play the game if there is at least a 30% chance that he will win. Which of the following is Juan?

    a. Risk averse
    b. Risk neutral (indifferent)
    c. Risk loving

4.) Martin is considering investing some money that he inherited. The following payoff table gives the profits that would be realized during the next year for each of three investment alternatives Martin is considering:

Decision Alternative	Good Economy	Poor Economy
Stock Market	$75,000	-30,000
Bonds	$40,000	10,000
CDs	$20,000	$20,000
(Probability)	0.5	0.5

a.) What decision would maximize expected profits? What is the expected profit from this decision? Write your answers on the following line.

_____

b.) What probability of a good economy would make Martin indifferent between investing in the stock market and bonds? Write your answer on the following line.

_____

5.) Clara would like to have a dinner party for her friends, but she doesn't want to spend too much. She wants to make sure to make at least 5 pounds of some meat, 3 pounds of some vegetables, and at least on pound of some dessert. For meats, she is considering making chicken, beef, or pork. Chicken costs $2.50 a pound, beef costs $3 a pound, and pork costs $2.75 a pound. For vegetables, she can choose between spinach salad at $0.50 per pound and tomato salad at $0.40. For dessert, she can choose between pecan pie at $4 per pound and chocolate cake at $3.50 per pound.

Below the following questions is the Excel Solver input and output.

The reduced cost for pie is hidden in the output below. (This hidden value is non-zero.) Explain/interpret what the reduced cost for pie is telling us in the context of this problem.

_____

_____

_____

What is the hidden reduced cost value for pie? (Hint: You do not need to resolve the entire problem to find this number.)

_____

Variables	Chicken	Beef	Pork	Spinach	Tomato	Pie	Cake			
Values to Change	1	1	1	1	1	1	1			
Cost per unit	2,5	3	2,75	0,5	0,4	4	3,5			
	2,5	3	2,75	0,5	0,4	4	3,5			
Total Cost	16,65									
st.										
Total Meat	1	1	1						>=	5
Total Vegetables				1	1				>=	3
Total Dessert						1	1		>=	1
Total Meat	1	1	1	0	0	0	0	3	>=	5
Total Vegetables	0	0	0	1	1	0	0	2	>=	3
Total Dessert	0	0	0	0	0	1	1	2	>=	1

Celdas de variables

Celda	Nombre	Final Valor	Reducido Coste	Objetivo Coeficiente	Permisible Aumentar	Permisible Reducir
B2	Values to Change Chicken	5	0	2,5	0,25	2,5
C2	Values to Change Beef	0	0,5	3	1E+30	0,5
D2	Values to Change Pork	0	0,25	2,75	1E+30	0,25
E2	Values to Change Spinach	0	0,1	0,5	1E+30	0,1
F2	Values to Change Tomato	3	0	0,4	0,1	0,4
G2	Values to Change Pie	0		4	1E+30	0,5
H2	Values to Change Cake	1	0	3,5	0,5	3,5

Restricciones

Celda	Nombre	Final Valor	Sombra Precio	Restricción Lado derecho	Permisible Aumentar	Permisible Reducir
I12	Total Meat	5	2,5	5	1E+30	5
I13	Total Vegetables	3	0,4	3	1E+30	3
I14	Total Dessert	1	3,5	1	1E+30	1

6.) ESPOL would like to conduct a survey of student satisfaction among students in their 1st, 2nd, 3rd, and 4th years here. They would like to do this survey at the lowest possible cost. They have determined that they want to survey at least 200 students. They would also like that 1st year students are not more than 20% of the total number of students surveyed and that the number of 2nd and 3rd year students surveyed (combined) are greater than the number of 1st and 4th year students surveyed (combined). Formulate the linear programming problem, but do not solve. Label all decision variables and constraints.

7.) Graph the following linear programming problem:

$$\max profit = 8X + 2Y$$
$$s.t. \quad 3X + Y \geq 9$$
$$X \leq 2$$
$$Y \leq 7$$
$$X, Y \geq 0$$

Determine if there is no solution, are alternate optimal solutions, or a unique solution. If there is a unique solution, find the solution. Put your answers on the following line.

_____