

# ESCUELA SUPERIOR POLITECNICA DEL LITORAL

Administración de Operaciones

Mejoramiento

Term. II, 2017

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.) A financial advisor has recommended two possible mutual funds for investment: Fund A and Fund B. The return that will be achieved by each of these depends on whether the economy is good, fair, or poor. A payoff table has been constructed to illustrate this situation:

INVESTMENT	STATE OF NATURE		
	GOOD ECONOMY	FAIR ECONOMY	POOR ECONOMY
Fund A	\$10,000	\$2,000	-\$5,000
Fund B	\$6,000	\$4,000	0
Probability	0.2	0.3	0.5

a.) Draw the decision tree to represent this situation.

b.) Perform the necessary calculations to determine which of the two mutual funds is better. Which one should you choose to maximize the expected value?

c.) Suppose there is question about the return of Fund A in a good economy. It could be higher or lower than \$10,000. What value for this would cause a person to be indifferent between Fund A and Fund B (i.e., the EMVs would be the same)?

2.) The Weinberger Electronics Corporation manufactures four highly technical products that it supplies to aerospace firms that hold NASA contracts. Each of the products must pass through the following departments before they are shipped: wiring, drilling, assembly, and inspection. The time requirement in hours for each unit produced and its corresponding profit value are summarized in the following table:

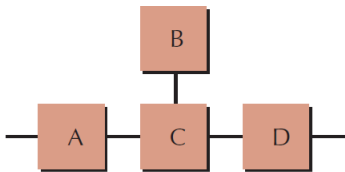
PRODUCT	DEPARTMENT				UNIT PROFIT (\$)
	WIRING	DRILLING	ASSEMBLY	INSPECTION	
XJ201	0.5	0.3	0.2	0.5	9
XM897	1.5	1	4	1	12
TR29	1.5	2	1	0.5	15
BR788	1	3	2	0.5	11

The production available in each department each month, and the minimum monthly production requirement to fulfill contracts, are as follows:

DEPARTMENT	CAPACITY (HOURS)	PRODUCT	MINIMUM PRODUCTION LEVEL
Wiring	15,000	XJ201	150
Drilling	17,000	XM897	100
Assembly	26,000	TR29	300
Inspection	12,000	BR788	400

The production manager has the responsibility of specifying production levels for each product for the coming month. Help him by formulating (that is, setting up the constraints and objective function) Weinberger's problem using LP. **CLEARLY LABEL ALL DECISION VARIABLES AND CONSTRAINTS.** Failing to do this will result in 0 points given.

3.) MagTech assembles tape players from four major components arranged as follows (where B is a backup):



The components can be purchased from three different vendors, who have supplied the following reliability data:

Component	Vendor		
	1	2	3
A	0.94	0.85	0.92
B	0.86	0.88	0.90
C	0.90	0.93	0.95
D	0.93	0.95	0.90

a.) If MagTech has decided to use only one vendor to supply all four components, which vendor should be selected?

b.) Would your decision change if all the components were assembled in series?

