

EASTERN UNIVERSITY, SRILANKA

Faculty of Commerce and Management

**Final year First Semester Examination in Bachelor of Commerce Specialization in
Business Economics 2016 | 2017**

Proper

ECN 4053 Quantitative Methods for Business

Answer all five (5) questions

Time: 03 hours

Question (01)

List and discuss the steps of the decision-making process in Business. (06 Marks)

Discuss the different roles played by the qualitative and quantitative approaches to managerial decision making. Why is it important for a manager or decision maker to have a good understanding of both of these approaches to decision making? (06 Marks)

Eastman publishing Company is considering publishing a paperback textbook on spreadsheet application for business. The fixed cost of manuscript preparation, textbook design, and production setup is estimated to be 80,000/=. Variable production and material costs are estimated to be 3/= per book. Demand over the life of the book is estimated to be 4000 copies. The publisher plans to sell the text to college and university bookstores for 20/= each.

- What is the breakeven point?
- What profit or loss can be anticipated with a demand of 4000 copies?
- With a demand of 4000 copies, what is the minimum price per copy that the publisher must charge to breakeven?
- If the publisher believes that the price per copy could be increased to 25.95/= and not affect the anticipated demand of 4000 copies, what action would you recommend? What profit or loss can be anticipated? (4*2= 08 Marks)

(Total 20 Marks)

Question (02)

1. The following payoff table shows profit for a decision analysis problem with two decision alternatives and three states of nature.

Decision Alternative	State of Nature		
	S1	S2	S3
D1	250	100	25
D2	100	100	75

- a. Construct a decision tree for this problem (04 Marks)
 - b. If the decision maker knows nothing about the probabilities of the three states of nature, what is the recommended decision using the optimistic, conservative, and minimax regret approaches? (06 Marks)
 - c. Suppose that the decision maker obtained the probability assessments $P(s_1) = 0.3$, $P(s_2) = 0.15$, and $P(s_3) = 0.20$. Use the expected value approach to determine the optimal decision. (06 Marks)
2. Explain the Uses of Input Output analysis? (04 marks)

(Total 20 Marks)

Question (03)

- 1. Briefly explain the components of Time series? (04 Marks)
- 2. The following data represent 15 quarters of manufacturing capacity utilization (in percentages).

Quarter/Year	Utilization
1/2014	82.5
2/2014	81.3
3/2014	81.3
4/2014	79.0
1/2015	76.6
2/2015	78.0
3/2015	78.4

4/2015	78.0
1/2016	78.8
2/2016	78.7
3/2016	78.4
4/2016	80.0
1/2017	80.7
2/2017	80.7
3/2017	80.8

- a. Compute three- and four- quarter moving averages for this time series. Which moving average provides the better forecast for the fourth quarter of 2017? (06 Marks)
- b. Use smoothing constant of $\alpha = 0.4$ and $\alpha = 0.5$ to develop forecasts for the fourth quarter of 2017. Which smoothing constant provides the better forecast? (06 Marks)
- c. Based on the analyses in parts (a) and (b), which method- moving averages or exponential smoothing- provides the better forecast? Explain. (04 Marks)

(Total 20 Marks)

Question (04)

1. Consider the following linear program:

$$\text{Max. } 1A + 2B$$

Subject to.

$$1A \leq 05$$

$$1B \leq 04$$

$$2A + 2B = 12$$

$$A, B \geq 0$$

- a. Show the feasible region. (04 Marks)
- b. What are the extreme points of the feasible region? (04 Marks)
- c. Find the optimal solution using the graphical procedures. (06 Marks)

2. A company is planning to undertake a project requiring initial investment of 50 million and is expected to generate 10 million in Year 1, 13 million in Year 2, 16 million in Year 3, 19 million in Year 4 and 22 million in Year 5. Calculate the payback value of the project.

(Total 20 Marks)

Question (05)

1. Explain the Influence diagram with Example?
2. A firm has three investment alternatives. Payoffs are in thousands of dollars.

Decision Alternative	Economic Condition		
	Up S1	Stable S2	Down S3
Investment A, d1	100	25	0
Investment B, d2	75	50	25
Investment C, d3	50	50	50
Investment	0.40	0.30	0.30

- a. Using the expected value approach, which decision is preferred?
- b. For the investment having a payoffs of 100,000/= with probability p and 0 with probability $(1-p)$, two decision makers expressed the following indifference probabilities. Find the most preferred decision for each decision maker using the expected utility approach.

Profit	Indifference probability (p)	
	Decision Maker A	Decision Maker B
75	0.80	0.60
50	0.60	0.30
25	0.30	0.15

- c. Why don't decision makers A and B select the same decision alternative?

(Total 20 Marks)