BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

GRADUATE SCHOOL OF BUSINESS

MASTERS IN BUSINESS LEADERSHIP

EXECUTIVE MASTERS IN BUSINESS LEADERSHIP

OPERATIONS MANAGEMENT (EMB 504)

EXAMINATION PAPER

MAR 2024

DURATION: 3 HOURS

INSTRUCTIONS AND INFORMATION TO CANDIDATES

1. Answer Question 1 and any THREE(3) questions from Section B.
2. Section A carries 40 marks and each question in Section B carries 20 marks
3. The paper carries five questions.
4. The use of cell phones is not allowed in the examination.

QUESTION 1

(a) TJZ Ltd manufactures metal columns throughout Africa. A regular customer has been ordering 5,000 special design metal columns used in constructing depot shades at the rate of 1,000 per order during 2020. The production cost is USD $12.00 a unit. The cost of materials and labour are USD $8.00 and USD $4.00 respectively for overheads (fixed cost). It costs USD $1,500. 00 to set up for one run of 1,000 columns, and inventory carrying cost is 20%. Since this customer may buy at least 5,000 columns this year, the company would like to avoid making five different production runs.

(i) Calculate the economic order quantity **(5 marks)**

(ii) If the supplier is willing to supply quarterly 1,500 units at a discount of 5%, is it worth accepting? Explain your answer **(5 marks)**

(iii) Find the appropriate re-order level **(3 marks)**

(iv) Calculate the maximum and minimum level of stock that the company can keep

(3 marks)

(v) Find the most economic production run. **(4 marks)**

(b) Compare and contrast the project evaluation and review technique (PERT) with the critical path method (CPM) **(10 marks)**

(c) J Hobs Telecoms is a known information technology company. The company has been contracted to install state-of-the-art vehicle monitoring system. The project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible. The table below is a summary of all the activities involved.

Task	Description	Duration (working days)	Predecessor
A	Requirements analysis	5	
B	Systems designing	15	A
C	Programming	25	B
D	Telecoms	15	B

E	Hardware installation	30	B
F	Integration	10	C,D
G	System testing	10	E,F
H	Training/support	5	G
I	Handover and go-live	5	H

Required:

    (i) Determine the critical path of the project   **(3 marks)**

    (ii) Calculate the planned duration of the project in weeks   **(3 marks)**

    (iii)Identify any non-critical tasks and the float on each   **(4 marks)**

[Total 40 marks]

SECTION B: Answer any three (3) questions from this section.

QUESTION 2

The Prox generates a profit contribution of $50 per unit, and the Max generates a profit contribution of $40 per unit. For next week's production, a maximum of 150 hours of assembly time can be made available. Each unit of the Prox requires 3 hours of assembly time, and each unit of the Max requires 5 hours of assembly time. In addition, Rustech currently has only 20 Max display components in inventory; thus no more than 20 units may be assembled. Finally, only 300 square meters of warehouse space can be made available for new production. Assembly of each Prox requires 8 square meters of warehouse space; similarly, each Max requires 5 square meters.

  (a)   Formulate the linear programming problem   **(10 marks)**

  (b)   Use Simplex method to solve the linear programming problem   **(10 marks)**

[Total 20 marks]

QUESTION 3

Ten per cent of patients with Non Hodgkins lymphoma have a newly discovered variant of the disease that is associated with a life expectancy of five years. Patients with the standard form of Non Hodgkins lymphoma have a life expectancy of seven years. A new drug prolongs life for patients with the variant form of disease from five to six years, but it has no effect on patients with the standard form of disease. The drug costs $10,000 for a course of treatment. It has negligible side effects. A diagnostic test distinguishes patients with the variant form from those with the standard form of the disease. The test costs $200. It has a sensitivity of 0.70 and a specificity of 0.80 for detecting the variant form of the disease. Costs are discounted, and years of life are discounted and have been quality adjusted (so they are QALYs).

You are the medical director of a large private hospital, CARE, and the CEO has asked you to develop a policy for using the new drug for treating patients with Non Hodgkins lymphoma. A lawyer representing the families of patients with Non Hodgkins lymphoma in your CARE argues that all Non Hodgkins lymphoma patients should be given drug treatment because the diagnostic test misses too many people with the variant form of the disease. Your consulting group of clinical experts recommends that treatment be given only to patients with a positive test result. They note that the treatment is expensive and most patients will not benefit if it is given to every patient. The marketing director of your CARE tells you that no one should get the drug. He points out that many positive test results will be falsely positive, that patients with a false-positive test result will not benefit from the drug, and that the cost of providing the drug to patients with a positive test result will force the company either to withhold other treatments from other patients or to raise premiums, which would reduce the company's market share.

(a) Draw a decision tree that describes the problem. Include all the information that an analyst would need to investigate the problem. **(6 marks)**

(b) Calculate the expected cost of each choice in the decision tree. **(3 marks)**

(c) Calculate the expected number of years of life associated with each choice in the decision tree. **(3 marks)**

(d) Calculate the policy-relevant cost-effectiveness ratios of the choices in the decision tree. **(4 marks)**

(e) Which policy would you recommend? Why? **(4 marks)**

[Total: 20 marks]

QUESTION 4

Discuss the concept of Total Quality Control as a manager. **[20 marks]**

QUESTION 5

Critically evaluate why inventory management is of importance in an organisation.

[20 marks]

END OF EXAMINATION PAPER.