UNIVERSITY OF RUHUNA

FACULTY OF GRADUATE STUDIES

Degree of Master of Business Management Semester II End Examination
August / September 2022

MBM 12093 - OPERATIONS AND LOGISTICS MANAGEMENT

The question paper consists of seven (07) questions.
Answer five (05) questions only.
Other Instructions:

Non-programmable calculators are permitted. **Duration: Three hours**

01.

i. What are the benefits of operations management for all types of organizations?

(03 marks)

ii. Briefly explain the input–transformation–output process.

(04 marks)

iii. Why is productivity a crucial element of an organization?

(05 marks)

(Total 12 marks)

02.

i. What are the factors determined by a customer in relation to the quality of a product?

(03 Marks)

ii. "Only the Operations Manager is responsible for maintaining 'good quality' of the products of an organization". Do you agree with this statement? Briefly explain.

(04 Marks)

iii. Explain the importance of controlling the cost of quality by a manufacturing company.

(05 Marks)

(Total 12 Marks)

03.

i. What is the 'Time Utility' and 'Place Utility' in a supply chain?

(03 Marks)

ii. Briefly explain, how does a company can generate the income by involving supply chain activities.

(04 Marks)

iii. Explain the importance of measuring supply chain performance.

(05 Marks)

(Total 12 Marks)

04

i. Identify three advantages of being a member of a supply chain by a company.

(03 Marks)

ii. What are the factors to be considered before selecting a location for a business? Briefly explain, how the location affects the success of the business.

(04 Marks)

iii. Develop a supply chain for a small-scale vegetable grower and explain inbound logistics and outbound logistics in the developed supply chain.

(05 Marks)

(Total 12 Marks)

05.

i. ABC owns a fleet of tow trucks that it uses to assist vehicles on the nearby Southern highway who are in need. On Monday, Tuesday, Wednesday, and Thursday, there were 28, 32, 24, and 19, respectively, calls asking for a tow truck. What would be its three-day moving average estimate for Friday?

(03 marks)

ii. A police station had to deploy police officers for emergencies multiple times the last four evenings. The numbers of emergencies for Monday, Tuesday, Wednesday, and Thursday were 10, 6, 8, and 12, respectively. What would be the station's forecast for Friday using an exponential smoothing forecasting approach? Use $\alpha = 0.3$ and a forecast for Monday of 8.

(04 marks)

iii. Which forecasting method, out of the four options: simple moving average, weighted moving average, exponential smoothing, and linear regression analysis, do you think is the most accurate? Why?

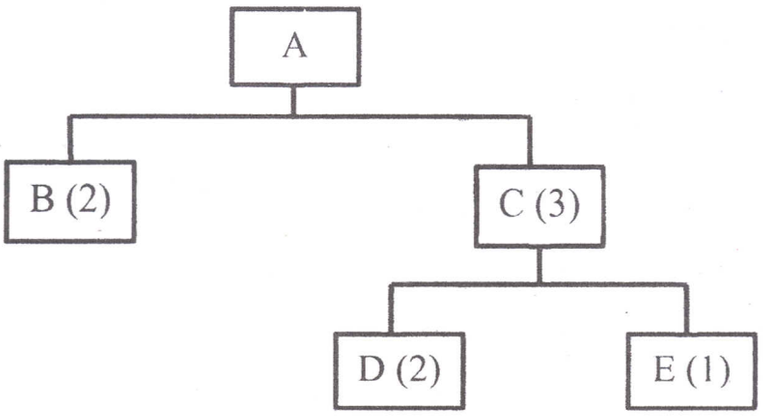
(05 marks)

(Total 12 marks)

06.

You work as the product planner for item A. Amal, the field service manager, just called and requested an increase in quantity for B and C of 8 units each to meet his field repair needs. Given the product structure, inventory status, and other information, develop a Material Requirement Plan (MRP) for the planning horizon of 8 weeks. (Assume that the field service manager wants 8 units of B and C in week 6 and the 15 production units of A in week 8).

Product structure



(Numbers within brackets represent quantities required per immediate upper-level assembly)

Inventory status

Item	Quantity on hand	Lead time (weeks)
A	2	1
B	5	2
C	3	1
D	8	3
E	4	2

Schedule receipts

Item	week							
	1	2	3	4	5	6	7	8
B				4				
C			3					
E		5						

(Total 12 marks)

07.

A country has three major power-generating companies (*L*, *M*, and *N*). During the months of peak demand, the Power Authority authorizes these companies to pool their excess supply and to distribute it to smaller, independent power companies that do not have generators large enough to handle the demand. Excess supply is distributed on the basis of cost per kilowatt hour transmitted. The following table shows the demand and supply in millions of kilowatt hours and the cost per kilowatt hour of transmitting electric power to four small companies in cities *P*, *Q*, R, and S:

From \ To	P	Q	R	S	Excess supply
L	12	4	9	5	**55**
M	8	1	6	6	**45**
N	1	12	4	7	**30**
Unfilled power demand	**40**	**20**	**50**	**20**	

Find the least-cost distribution system.

(Total 12 marks)

List of formulae

$$F_{t+1} = F_t + \alpha (D_t - F_t)$$

i. $b = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$

ii. $a = \bar{y} - b\bar{x}$

iii. $EOQ = \sqrt{\frac{2DS}{H}}$

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