

The Open University of Sri Lanka  
Faculty of Engineering Technology  
Department of Mechanical Engineering



Study Programme	: Bachelor of Science Honours in Engineering/ Bachelor of Science in Software Engineering
Name of the Examination	: Final Examination
<b>Course Code and Title</b>	<b>: DMX6601 / DMM6602 Management for Engineers</b>
Academic Year	: 2023-2024
Date	: 07 February 2025
Time	: 1400-1700 hrs
Duration	: 3 hours

#### General instructions

1. Read all instructions carefully before answering the questions.
2. Answer for each question should commence from a new page.
3. This is a Closed Book Test (CBT).
4. Answers should be in clear handwriting.
5. Do not use Red colour pen.
6. This question paper consists of Part A and Part B. Part A has structured questions and expects short answers.
7. Answer **five questions from Part A** and **all the questions from Part B**.

#### **PART A – Answer five questions, each question carries 4 marks.**

1. Scientific Management theories evolved since the 18th century and still used by managers. State three principles of scientific management theory. (4 Marks)
2. Explain Maslow's hierarchy of needs theory of motivation. (4 Marks)
3. Explain how the effort and time behave in different stages of a project life cycle. (4 Marks)
4. Quality management involves many activities to ensure product quality at the end. What are the two main categories of cost of quality? Give one example each. (4 Marks)
5. Supply Chain Management (CHM) involves the management of three main flows. Mention those three flows. (4 Marks)
6. Mention three main theories discussed under "Behavioral Management" theories. (4 Marks)
7. Explain the advantages and disadvantages of "functional organizational structure" in organizational management. (4 Marks)
8. Briefly explain three productivity improvement techniques that are commonly used in modern organizations. (4 Marks)

**PART B – Answer all 4 Questions. Each question carries 20 marks.**

Q1.

- (a) Describe the components of the iron triangle in project management. (6 Marks)
- (b) Project stakeholder management is an important knowledge area in project management. Discuss the steps involved in project stakeholder management. (4 Marks)
- (c) Work Breakdown Structure is an important component in the Scope Management process. (4 Marks)
- I. Explain the Work Breakdown Structure
  - II. Draw a Work Breakdown Structure you could have used for the mini project you did for this course. (include at least three tiers) (6 Marks)

Q2.

- (a). The inventory management process involves different types of costs. List down four of them. (4 Marks)

A firm requires an item that a supplier offers at the following prices.

Order quantity	1-99	100-199	200 and over
Price per unit	Rs.50	Rs.47.50	Rs.46

The average yearly requirement is 1,000 units, the ordering cost is Rs.60, and the stock holding cost is Rs.10 per unit per year. Find the following:

- I. Economic lot size (6 Marks)
- II. Average yearly cost (6 Marks)
- III. Frequency of placing orders (4 Marks)

Q3.

- (a) Discuss how linear programming can be used in management decision making giving examples. (4 Marks)
- (b) The amounts of production of Rice in Mills A, B, and C are 75, 55, 40 metric tons respectively. The warehouse capacities at W, X, Y, Z are 70, 40, 35, 25 metric tons respectively. The cost for transporting one metric ton is given in table Q3-1

Table Q3-1

	W	X	Y	Z
A	3	1	7	4
B	2	6	5	9
C	8	3	4	2

- I. Find a feasible solution and feasible cost for the transportation problem given. You must state the method you are using. (8 Marks)
- II. Check the degeneracy of the feasible solution. (2 Marks)
- III. Find the optimum solution and minimum transportation cost. (6 Marks)

Q4.

- (a) Discuss the importance of critical path analysis in project resource planning. (5 Marks)
- (b) The following table shows the activities involved in completing a project, the duration of each activity and its dependency.

Table Q4-1

Activity	Immediate Predecessor	Task duration (weeks)
A	-	7
B	A	11
C	B	1
D	A	10
E	C	2
F	C,B,D	5
G	D	3
H	E	2
I	G,F,H	4

- I. Draw the network diagram (5 Marks)
- II. Do forward and backward pass calculations and find the critical path (5 Marks)
- III. What is the total project duration? (2 Marks)
- IV. Mention the activity you may delay most so that it will not affect the total project duration. (3 Marks)

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