

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



Study Programme : Bachelor of Science Honors in Engineering  
 Name of the Examination : Final Examination  
**Course Code and Title : DMX5211 Plant Maintenance**  
 Academic Year : 2023-2024  
 Date : 01 March 2025  
 Time : ~~1400-1700 hrs~~ 13:30 - 16:30 hrs  
 Duration : 3 hours

**General instructions**

1. Read all the instructions carefully before answering the questions.
2. This question paper consists of **05 questions**. All questions carry equal marks.
3. Answer **all 05 questions**.

Q1.

- (a) Mention three factors to be considered when developing the Maintenance programme for a large plant. (6 Marks)
- (b) Draw a typical Failure Curve (Bath-Tub Curve) for a mechanical component and mark the different phases. (4 Marks)
- (c) Give examples of possible defects in each phase. (4 Marks)
- (d) As the maintenance engineer, suggest possible strategies for avoiding risk of failure at each of those stages mentioned above. (4 Marks)

Q2.

- (a). Distinguish between 'Scheduled Maintenance Policy vs Condition Based Maintenance policy.' (8 Marks)
- (b) List down four possible parameters to gauge the state of a piece of equipment. (6 Marks)
- (c) Explain the condition-based maintenance activities practiced in the factory you visited for field visit with examples. (6 Marks)

Q3.

- (a) Pollution control is a task of the maintenance department in many organizations. Name and explain three types of air pollution controllers used in industries. (6 Marks)
- (b) Discuss the methods available for "Disposal of Solid Wastes" explaining advantage and disadvantage of those methods (At least two methods). (4 Marks)
- (c) Consideration should be given when designing and constructing buildings to prevent the spread of fire. Explain three factors that affect the spread of a fire in a building. (6 Marks)
- (d) What is meant by spontaneous risk in relation to industrial fire hazards? (4 Marks)

Q4.

- (a) Under what circumstances are lubricating solids preferred? Mention three types of solid lubricants. (6 Marks)
- (b) Explain and compare Boundary lubrication and Hydrodynamic lubrication. (4 Marks)
- (c) List down three properties of bearing material and explain the importance of the mentioned properties in the case of sliding bearings. (6 Marks)
- (d) Overheating of bearings is one of the main reasons for failure of bearings. Explain at least two causes of overheating. (4 Marks)

Q5.

- (a) Explain advantages and disadvantages of practicing Total Productive Maintenance (TPM) in an organization. (4 Marks)
- (b) List down "big six wastes" which are eliminated by a TPM system. (6 Marks)
- (c) "Computer Managed Maintenance Systems (CMMS) is an essential element of an efficient maintenance management System". Justify the statement. (5 Marks)
- (d) Digital transformation of management systems is inevitable. Explain the concept of "Digital Twin" in plant maintenance. (5 Marks)