042

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	:	**DMX 5211 Plant Maintenance**
Academic Year	:	2022-2023
Date	:	01 February 2024
Time	:	1330-1630 hrs
Duration	:	3 hours

General instructions

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

Q1.

(a) "Maintenance cannot be treated in isolation from the other function of the organization". Do you agree with the statement? If agree /not agree, justify your answer giving suitable examples.

(4 marks)

(b) Draw a typical Failure Curve (Bath-Tub Curve) for a mechanical component and mark the different phases.

(6 Marks)

(c) Give reasons for failure in each of the phases mentioned in part (b)

(6 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 'Predictive vs corrective maintenance methods.'. (4 Marks)

(b) What is Condition Based Maintenance? (3 Marks)

(c) List down four possible parameters to gauge the state of a piece of equipment. (8 Marks)

(d) Proper planning and avoiding delays increase the resource availability. As a Maintenance Manager, explain the possible action you could take for utilizing resources efficiently. (5 Marks)

Q3.

(a) Draw and explain different lubrication regions (Stribeck curve.) (5 Marks)

(b) You may observe the occurrence of boundary lubrication in practice. List down two such mechanical movements or places where boundary lubrication occur. (4 Marks)

(c) Under what circumstances are lubricating solids preferred? Mention three types of solid lubricants. (5 Marks)

(d) Lubricant application techniques and the frequency of application vary according to the type of lubricant, load, speed, accessibility, cost etc. Explain and mention the usage of the following application techniques.

(i). Oil Bath Lubrication.

(ii). Splash System for Oil Lubrication.

(iii). Drip Lubrication. (6 Marks)

Q4.

(a) What are the common causes for overheating of bearings?

(4 marks)

(b) Internal clearance between rolling elements and the raceway is kept at higher than normal in some instances. Explain two reasons to maintain higher clearance than the designated amount? (4 Marks)

(c) Explain Total Productive Maintenance (TPM) in an organisation. What are the outcomes of implementing TPM within an organization? (6 Marks)

(d). TPM is focused on eliminating causes of wastage of time and resources. Explain three actions you may consider for eliminating these causes. (6 Marks)

Q5. Write short notes on **any four** (4) of the following; (5 Marks each)

(a) Fault tracing techniques.

(b) Users of Computer Based Maintenance Management System in a manufacturing organization.

(c) Air pollution prevention methods in industrial plants.

(d) Maintenance cost and predictive maintenance.

(e). Main activities in maintenance of a plumbing system.