Registration No: | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**

RIS7B001

7th Semester Reg/Back Examination: 2025-26

Industrial Safety Engineering

CHEM, CIVIL, CSE, CSEDS, EIE, ELECTRICAL & C.E, IT, MANUTECH, MECH, METTA, MINING, MME, PLASTIC, PT

Time : 3 Hour

Max Marks : 100

Q. Code : U067

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) What is an industrial accident? Mention its major causes and types.

b) What are the primary goals of industrial safety, and why are implementing effective safety practices important for industries?

c) What are safety color codes, and why are they used in industrial safety?

d) What is maintenance cost, and how is it related to replacement economy?

e) What is equipment economy, and how is it related to the service life of equipment?

f) What types of damages occur in industrial processes due to chemical reactions and physical abrasion?

g) What is corrosion and what are the key factors affecting it?

h) What is meant by overhauling of mechanical components, and why is it necessary in maintenance?

i) What is the importance of periodic and preventive maintenance in machine tools?

j) What is the repair cycle and why is it important in maintenance management?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 × 8)**

a) Describe the salient provisions of the Factories Act, 1948 related to worker health and safety.

b) Explain the role of regular maintenance in preventing industrial accidents. Illustrate your answer with suitable examples of common maintenance practices

c) Describe the various types of wear and corrosion commonly encountered in chemical plants. Explain any one effective prevention method used to control corrosion in chemical process equipment.

d) Explain the components of maintenance cost and discuss its relationship with replacement economy. Also describe the factors that determine the service life of equipment.

e) Explain the types, causes, and effects of wear in industrial equipment. Discuss effective wear-reduction methods and conclude with general strategies used to prevent both wear and corrosion.

f) Define fault *tracing and explain its importance*. Discuss the concept and need of decision trees in fault diagnosis, and outline the typical sequence of fault-finding activities.

g) Draw suitable decision trees for identifying common operational problems in (i) machine tools, (ii) pumps, and (iii) air compressors. Explain briefly how these decision trees aid in systematic fault diagnosis.

h) How do the equipments life cycle maximizing operational efficiency? Explain in details with suitable example.

i) Explain the essential steps involved in periodic and preventive maintenance of (i) diesel generating (DG) sets, (ii) pumps, and (iii) air compressors.

j) Discuss the major advantages of preventive maintenance. Explain the repair cycle concept and highlight its importance in effective maintenance planning.

k) Briefly explain the types and applications of lubricants and the common lubrication methods. With neat sketches, describe the construction, working, and applications of splash lubrication.

l) Describe the preventive maintenance requirements of diesel generating (DG) sets and explain how maintenance programs and schedules are prepared for mechanical and electrical equipment. Also state the major advantages of preventive maintenance.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Define maintenance engineering and outline its major aims. Describe the primary and secondary functions of a maintenance department, the different types of maintenance, and the tools commonly used. Discuss how maintenance cost relates to replacement economy and explain the key factors that determine the service life of equipment. **(16)**

Q4 Define fault tracing and explain its importance. Discuss the concept, need, and applications of decision trees in fault diagnosis. Outline the sequence of fault-finding activities and represent it through a decision tree. Draw a decision tree for common faults in internal combustion engine. **(16)**

Q5 Discuss the concept of fault tracing and elaborate the significance of decision trees in organizing the sequence of fault-finding activities in industrial systems. Draw a suitable decision tree illustrating the usual problems encountered in machine tools and other common equipment. Also explain how such decision-tree–based troubleshooting enhances diagnostic accuracy and maintenance efficiency in boilers and electrical motors. **(16)**

Q6 Explain the steps and procedures involved in the periodic and preventive maintenance of (i) machine tools, (ii) pumps, (iii) air compressors, and (iv) diesel generating (DG) sets. Discuss how preventive maintenance programs and schedules are prepared for mechanical and electrical equipment. Highlight the advantages of preventive maintenance and describe the repair cycle concept and its importance in maintenance engineering. **(16)**