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Total Number of Pages: 02

Course: B.Tech  
Sub\_Code: RIS7B001

7<sup>th</sup> Semester Regular/Back Examination: 2024-25

SUBJECT: INDUSTRIAL SAFETY ENGINEERING

BRANCH(S): CHEM, CIVIL, CSE, ELECTRICAL & C.E, EIE, IT, MANUTECH, MECH, MME,  
METTA, MINING, PT, PLASTIC

Time: 3 Hours

Max Marks: 100

Q.Code: R393

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 are the primary goals of industrial safety? Why is it important for companies to implement effective industrial safety practices?
- b) What is the purpose of a Job Safety Analysis (JSA) in industries?
- c) Which type of fire extinguisher is used for electrical fires?
- d) The term "Lockout/Tag out" refers to which type of maintenance control in industry.
- e) What are the damages encountered due to chemical reactions and physical abrasion in any industrial process?
- f) What is the concept for fault finding activities? How does it help in decision making?
- g) What do you mean by fatigue failures and their causes? What does the term 'Ergonomics' refer to in industrial safety?
- h) What strategy is most commonly employed during the maturity stage of a product's life cycle? Why might a company decide to continue producing a product in the decline stage of its life cycle?
- i) What is your understanding related to a product life cycle? Which stage of the Product Life Cycle is characterized by rapid market acceptance and increasing profits?
- j) What type of maintenance is required for electric motor and Why? Why is regular lubrication important for electric motors?

#### Part-II

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

- a) Discuss the role of regular maintenance in preventing industrial accidents. Provide examples of common maintenance practices.
- b) Identify the key components of an effective safety management system (SMS) in an industrial setting and describe how they help prevent accidents.
- c) What is fire triangle? Explain the different classes of fire with symbols and extinguishers used for them. Draw any four symbols for possible fire hazards.
- d) State and explain different types of tools used for maintenance.

- e) Identify the types of corrosion that can affect stainless steel in a chemical plant. Discuss a coating method used to prevent such corrosion.
- f) Describe how decision trees can aid in predictive maintenance. Draw a decision tree for diagnosing common issues in an electric motor.
- g) Describe the necessity of periodic maintenance & its relation with replacement economy.
- h) How does the Factories Act of 1948 address occupational health and safety in hazardous industries? Provide examples.
- i) Explain the types of corrosion found in industrial equipment and highlight their standard prevention methods.
- j) How do the equipments life cycle maximizing operational efficiency? Explain in details.
- k) A decision tree is helpful for tracing and solving problems in thermal equipments. Explain with some relevant examples.
- l) Describe the steps involved in a typical repair cycle for industrial machinery. Why is each step important?

### Part-III

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

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| Q3 | Discuss the different types of mechanical and electrical hazards that occur during industrial operations. Explain the preventive measures that can be implemented to minimize these risks, and highlight the role of safety training and regular maintenance in reducing workplace accidents. | (16) |
| Q4 | Describe the various types of lubrication techniques used in mechanical systems. Draw and explain the suitability of any four lubrication techniques employed in reducing wear and improving machine efficiency.  | (16) |
| Q5 | Discuss the concept of fault tracing and significance of decision tree in sequence of fault finding activities. Draw a decision tree by showing the usual problems found in machine tools and different equipments. Explain its significance in boiler and electrical motors.                 | (16) |
| Q6 | Describe the various types of maintenance strategies employed in a power plant. Explain the repair cycle and its importance in minimizing downtime and maximizing the life of mechanical and electrical equipment.  | (16) |