

SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur– 603203

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK



I SEMESTER

1914101 –Principles of Safety Management

[M.E. INDUSTRIAL SAFETY ENGINEERING]

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1914101 -Principles of Safety Management

UNIT I: CONCEPTS AND TECHNIQUES

History of Safety movement –Evolution of modern safety concept- general concepts of management – planning for safety for optimization of productivity -productivity, quality and safety-line and staff functions for safety-budgeting for safety-safety policy. Incident Recall Technique (IRT), disaster control, job safety analysis, safety survey, safety inspection, safety sampling, evaluation of performance of supervisors on safety.

PART - A (2 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1	Define Safety Engineering	BT1	Remember
2.	Explain the relation between safety and productivity.	BT2	Understand
3.	Define the principles of Organizational Safety.	BT1	Remember
4.	Define safety concept.	BT1	Remember
5.	Define the role of management in safety.	BT5	Evaluate
6.	Define Productivity.	BT1	Remember
7.	Write four points about the need for safety.	BT4	Analyse
8.	List any four potential ways to get employee involvement in safety training programme.	BT2	Understand
9.	Compare the terms hazard and risk.	BT1	Remember
10.	Write various steps in major safety programme.	BT4	Analyse
11.	What is meant by safety publicity?	BT5	Evaluate
12.	List out any four modern safety concepts	BT1	Remember
13.	Why Incident Recall Technique (IRT) is important?	BT4	Analyse
14.	Define job safety analysis.	BT5	Evaluate
15.	Define the term safety inspection.	BT2	Understand
16.	How safety sampling is judged as superior to other techniques?	BT2	Understand
17.	State the objectives of safety management.	BT5	Evaluate

18.	List the general safety training methods.	BT4	Analyse
19.	What is safety survey?	BT5	Evaluate
20.	What is disaster control?	BT5	Evaluate

PART – B (13 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain the principles of management	BT2	Understand
2.	Describe about general safety measures to be adopted.	BT1	Remember
3.	What are the various steps involved in man-made disaster control? Explain with a case study.	BT2	Understand
4.	List the elements of a standard safety policy.	BT4	Analyse
5.	Summarize the events that led to modern safety concept.	BT5	Evaluate
6.	Explain how as a safety engineer you plan and prepare to counter any disaster in a hazardous chemical industry. Indicate the technique followed to counter disaster.	BT5	Evaluate
7.	What is job safety analysis? Explain how job safety analysis is carried out with an example. Write the safety benefits of analysis.	BT1	Remember
8.	Indemnification by employer is ineffective. Justify	BT5	Evaluate
9.	Explain the history of safety management. Also Explain the evolution of modern safety concept.	BT5	Evaluate
10.	Explain the principles of management.	BT2	Understand
11.	Summarize the events that led to modern safety concept	BT5	Evaluate
12.	Explain briefly how you would conduct a plant safety inspection. Prepare a checklist and inspection report format for inspecting a workshop for an engineering factory.	BT1	Remember
13.	Prepare a sample job safety analysis report for a hazardous job in a construction site.	BT4	Analyse
14.	Write in detail about the managerial responsibilities in safety issues.	BT5	Evaluate

PART - C (15 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Why Safety Committees are required in construction sites? Explain the advantages of Safety Committees.	BT6	Create
2.	Discuss briefly about various functions and activities of Safety Engineering department. Highlight any four functions which you feel very important for preventing accidents.	BT6	Create
3.	Explain in detail about safety procedures to be followed while operating wood working machinery	BT5	Evaluate
4.	Explain with a checklist and report format, the procedure to conduct plant safety inspection	BT6	Create

UNIT II: SAFETY AUDIT - INTRODUCTION

Components of safety audit, types of audit, audit methodology, non-conformity reporting (NCR), audit checklist and report – review of inspection, remarks by government agencies, consultants, experts – perusal of accident and safety records, formats – implementation of audit indication - liaison with departments to ensure co-ordination – check list – identification of unsafe acts of workers and unsafe conditions in the shop floor.

PART - A (2 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	What do you understand by scope of the audit?	BT2	Understand
2.	Why unsafe acts are difficult to correct than unsafe conditions?	BT1	Remember
3.	What are the types of safety audit?	BT1	Remember
4.	State any four unsafe acts.	BT1	Remember
5.	What are the key elements of Safety audit?	BT5	Evaluate
6.	What is the role of safety committee?	BT4	Analyse
7.	Mention the roles of lead auditor while conducting occupational health and safety audit.	BT2	Understand
8.	Compare line and staff type safety organization.	BT1	Remember
9.	Mention the principal contents of an audit report as specified in IS 14489:1998	BT1	Remember
10.	When do we use safety audit?	BT1	Remember
11.	What do you understand by scope of the audit?	BT3	Apply
12.	Why unsafe acts are difficult to correct than unsafe conditions?	BT5	Evaluate
13.	State the important characteristics of good Non Conformity Report.	BT1	Remember
14.	How to review an audit?	BT4	Analyse
15.	Mention the roles of lead auditor while conducting occupational health and safety audit.	BT2	Understand
16.	Define Auditing.	BT5	Evaluate
17	State the importance of maintaining safety records.	BT6	Create

18.	Compare first party and third party safety audit?	BT4	Analyse
19.	What are the unsafe conditions in the shop floor?	BT3	Apply
20.	Define safety organization. Give its objectives.	BT1	Remember

PART – B (13 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Prepare a sample job safety analysis report for painting of exterior wall of high rise building.	BT5	Evaluate
2.	Explain in detail the methodology for conducting safety audit	BT2	Understand
3.	List out and explain the responsibilities of auditor. Also mention the requirements to become a competent auditor.	BT1	Remember
4.	Prepare a list of Records to be examined during the safety audit of an engineering company?	BT5	Evaluate
5.	Prepare the list of various unsafe acts committed by workers and unsafe conditions prevailing in the chemical industry that are causing accidents	BT4	Analyse
6.	List out the contents of a safety audit report	BT5	Evaluate
7.	What is meant by non-conformity reporting? Explain how it will evolve during an audit with some examples.	BT3	Apply
8.	Explain the terms unsafe act and unsafe condition with suitable examples.	BT4	Analyse
9.	Explain in detail how do you conduct the safety audit in a hazardous industry	BT5	Evaluate
10.	Write about the importance of maintaining safety records	BT2	Understand
11.	Prepare a check list for safety audit at a spinning mill and explain the need of each one.	BT1	Remember
12.	What is Non Conformity Report? Explain the various types of Non Conformity with examples.	BT6	Create
13.	List out and explain the responsibilities of auditor. Also mention the requirements to become a competent auditor.	BT4	Analyse
14.	Recall the important features of IS 14489: 1998 code of practice on occupational safety and health audit.	BT5	Evaluate

PART - C (15 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	You are a certified auditor for conducting occupational health and safety audit. A chemical manufacturing company has contacted you to conduct a safety audit. Explain in detail how would you plan and prepare for the audit. Also explain the activities to be carried out during on site audit.	BT5	Evaluate
2.	Explain in detail the different types of questions that can applied in safety audit with suitable examples	BT6	Create
3.	Write a Non conformity report for an industry for the deviation of not conducting safety meeting for several months.	BT5	Evaluate
4.	Prepare a detailed checklist for conducting safety audit of a chemical industry.	BT5	Evaluate

UNIT III: ACCIDENT INVESTIGATION AND REPORTING

Concept of an accident, reportable and non-reportable accidents, reporting to statutory authorities – principles of accident prevention – accident investigation and analysis – records for accidents, departmental accident reports, documentation of accidents – unsafe act and condition – domino sequence – supervisory role – role of safety committee – cost of accident.

PART - A (2 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	What do you mean by reportable accident?	BT2	Understand
2.	What is the purpose of accident analysis?	BT4	Analyse
3.	What are the important points to be covered while conducting accident investigation?	BT5	Evaluate
4.	What are the important points to be covered while conducting accident Investigation?	BT1	Remember
5.	Define near miss incident	BT2	Understand
6.	State the hierarchy of hazard control to be followed for prevention of accident.	BT2	Understand
7.	Why accident cost is always referred to tip of the ice berg?	BT2	Understand
8.	What are the important points to be covered while conducting accident investigation?	BT1	Remember
9.	State the reason for estimating accident cost?	BT6	Create
10.	What are the causes of accident?	BT1	Remember
11.	Why documentation needed for an accident analysis?	BT5	Evaluate
12.	How accident indices are calculated?	BT4	Analyse
13.	What are the important points to be covered while conducting accident investigation?	BT1	Remember
14.	What is the supervisory role in accident?	BT1	Remember
15.	What is Domino sequence?	BT5	Evaluate

16.	Why safety committee is formed?	BT1	Remember
17.	Prepare the list of cost of accident.	BT1	Remember
18.	What is the purpose of accident analysis?	BT5	Evaluate
19.	Compare Frequency rate and Severity rate.	BT5	Evaluate
20.	List out the ways of cleaning and finishing of foundry product.	BT1	Remember

PART – B (13 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	What are the various principles of accident prevention? Explain each of them with examples.	BT5	Evaluate
2.	Explain how safety committee will be used to prevent accidents with its roles.	BT5	Evaluate
3.	Explain in detail about various steps involved in an accident investigation as recommended by OSHA.	BT1	Remember
4.	What are the various principles of accident prevention? Explain each of them with examples.	BT5	Evaluate
5.	Explain the duties and responsibilities of safety supervisor.	BT5	Evaluate
6.	Explain the role of safety committee in accident prevention.	BT5	Evaluate
7.	Mention the various causative factors that can be used as a guide for detailed analysis of accidents.	BT5	Evaluate
8.	Explain the role of supervisor in accident prevention.	BT5	Evaluate
9.	Illustrate how the principle of accident prevention is applied.	BT3	Apply
10.	Describe the various roles played by government agencies in creating awareness on accident prevention.	BT1	Remember
11.	Why hidden cost of accidents is important? What are the various hidden cost elements?	BT5	Evaluate
12.	What are the characteristics of good Non Conformity Report? Prepare a Non Conformity Report for not following a legal requirement.	BT2	Understand
13.	Explain in detail, the role of supervisor in accident prevention.	BT2	Understand

14.	Prepare a accident report using the Form 18 of Tamilnadu Factories rules.	BT5	Evaluate
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PART – C (15 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Prepare an accident investigation report and explain how it can be used for accident prevention.	BT6	Create
2.	Explain in detail how to estimate accident cost in an industry for a year.	BT5	Create
3.	Prepare an accident investigation report and analysis with an example in an automobile industry.	BT5	Evaluate
4.	What is the importance of accident report documentation? Explain with an example the distribution of accident reports and investigation reports. Furnish the reasons for such distribution.	BT6	Create

UNIT IV: SAFETY PERFORMANCE MONITORING

ANSI (Z16.1) Recommended practices for compiling and measuring work injury experience – permanent total disabilities, permanent partial disabilities, temporary total disabilities - Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident rate, safety “t” score, safety activity rate – problems.

PART - A (2 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	How accident indices are calculated?	BT2	Understand
2.	What is Lost workday cases incidence rate?	BT1	Remember
3.	What do you understand by the term frequency rate?	BT2	Understand
4.	Define the term frequency rate. State why frequency rate is more measurement than severity rate.	BT1	Remember
5.	Compare Frequency rate and Severity rate.	BT5	Evaluate
6.	What do you understand by restricted work activity?	BT4	Analyse
7.	What is safety activity rate?	BT2	Understand
8.	Suggest various ways to utilize safety committee in accident prevention.	BT5	Evaluate
9.	Define the term frequency rate.	BT2	Understand
10.	What are the standard time charges for the following? a) Permanent total disability. b) Loss of eye sight in one eye.	BT5	Evaluate
11.	What is the role of safety committee?	BT2	Understand
12.	Define safety activity rate.	BT1	Remember
13.	What is the final measure of safety? Explain.	BT1	Remember
14.	Define permanent partial disability.	BT4	Analyse

15.	What is Safety “t” score?	BT5	Evaluate
16.	What is Incident rate?	BT1	Remember
17.	What is accident rate?	BT2	Understand
18.	Define safety activity rate.	BT4	Analyse
19.	What is the reason for assigning 6000 man days lost for fatal accident in severity rate calculations?	BT3	Apply
20.	Compare and list at least two important differences between traditional ANSI Z16.1 and OSHA current record keeping system for safety performance measurement	BT1	Remember

PART - B (13 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain in detail how do you estimate Average Uninsured cost in a established company.	BT4	Analyse
2.	Explain in detail the procedure to conduct perception discrepancy survey?	BT6	Create
3.	Compare number of lost workdays rate and Severity rate.	BT1	Remember
4.	Briefly explain OSHA current record keeping requirement for incidents.	BT2	Understand
5.	Discuss in detail about needs of safety performance monitoring to prevent accidents.	BT5	Evaluate
6.	Explain safety performance indicators in detail with examples.	BT5	Evaluate
7.	During 12-month period, a manufacturing company employing 300 employees has 18 injuries and 4 illnesses requiring medical treatment. In 10 injury cases out of 18 injury cases, the employee lost at least one day from work. Calculate the total injury- illness incidence rate, LWDI and traditional frequency rate. Comment whether the company is a very dangerous one.	BT6	Create
8.	Firm A has 115 workers averaging 40 hours a week each. In nine Months, 3 workers were injured. Firm B has 132 workers averaging 37 hours a week each. In 10 months, 3 workers were injured. Which firm has a better frequency rate?	BT1	Remember
9.	State what departmental safety records are maintained.	BT5	Evaluate

10.	What is safety 't' score? Explain its significance.	BT5	Evaluate
11.	Explain in detail about safety training conducted in the industry for implementing safety activities.	BT5	Evaluate
12.	Explain the role of safety committee in accident prevention.	BT5	Evaluate
13.	Compare traditional Z16.1 and OSHA current record keeping system.	BT6	Create
14.	Explain the steps involved in calculating safety activity rate.	BT5	Evaluate

PART - C (15 MARKS)

Sl.No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Estimate accident cost for a Electrical short circuit which resulted in power failure for five hours in the plant and a small fire in distribution system. There were 100 employees working in the plant. Write Justifications for your estimation.	BT6	Create
2.	a) What is frequency severity incidence and total injury illness incidence? b) Explain the steps involved in calculating safety activity rate.	BT6	Create
3.	Discuss in detail about needs of safety performance monitoring to prevent accidents.	BT6	Create
4.	Firm A has 115 workers averaging 40 hours a week each. In 9 months 3 workers were injured. Firm B has 132 workers averaging 37 hours a week each. In 10 months, 3 workers were injured. Which firm is safe?	BT5	Evaluate

UNIT V: SAFETY EDUCATION AND TRAINING

Importance of training-identification of training needs-training methods – programmes, seminars, conferences, competitions – method of promoting safe practice - motivation – communication - role of government agencies and private consulting agencies in safety training – creating awareness, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safety campaign – Domestic Safety and Training.

PART - A (2 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	What are the needs for safety training?	BT1	Remember
2.	Write a safety slogan for maintaining safety inside a machine shop.	BT2	Understand
3.	What is the final measure of safety? Explain.	BT2	Understand
4.	Distinguish between safety education and training.	BT2	Understand
5.	What is the significance of celebrating safety week?	BT6	Create
6.	Mention any two national safety award schemes operated by DGFASLI.	BT1	Remember
7.	How do you identify training need in an industry?	BT4	Analyse
8.	What are the needs for safety training?	BT1	Remember
9.	Write a safety slogan for maintaining safety inside a machine shop.	BT2	Understand
10.	How to identify the training needs?	BT5	Evaluate
11.	Write the role of government agencies in safety training.	BT1	Remember
12.	State any two national safety award schemes operated by DGFASLI and International Safety awards by British Safety Council.	BT2	Understand
13.	What is the role of National Examination Board for Occupational Safety and Health, UK in safety education?	BT5	Evaluate
14.	List out the training methods to improve safety in Industries.	BT4	Analyse
15.	How do you identify training need in an industry?	BT2	Understanding
16.	How you will motivate the workers?	BT4	Analyse
17	Why communication is important in safety activities?	BT1	Remember
18.	Mention any two international safety award schemes operated by Brit Safety council.	BT1	Remember

19.	State four important activities carried out during safety celebrations.	BT4	Analyse
20.	What is Lost workday cases incidence rate?	BT5	Evaluate

PART - B (13 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain the effectiveness of safety training programme in road transportation	BT2	Understand
2.	Explain in detail about safety training conducted in the industry for implementing safety activities.	BT3	Apply
3.	Explain the various methods of promoting safety practice in an industry.	BT1	Remember
4.	Explain the role of National Safety Council and Occupational Safety and Health administration in safety education and training.	BT6	Create
5.	Describe the various roles played by government agencies in creating awareness on accident prevention.	BT1	Remember
6.	Explain in detail the importance of conducting safety orientation training programme for new employees. Outline various elements of such programme.	BT5	Evaluate
7.	Explain in detail how to develop a need based safety training programme for a target group.	BT5	Evaluate
8.	a) Explain the role of National safety council in safety education and training.(7) b) Explain the role of OSHA and NEBOSH in promoting safety education and Professional certifications.(6)	BT1	Remember
9.	Explain in detail, various steps involved in systematic design of safety training programme.	BT4	Analyse
10.	Explain the various role played by DGFASLI in promoting safety.	BT3	Apply
11.	Brief about safety posters, safety pledge and safety campaign.	BT1	Remember
12.	Distinguish between LWDI of new OSHA record keeping system and frequency rate of traditional system.	BT5	Evaluate
13.	Explain the steps involved in calculating safety activity rate.	BT2	Understand
14.	Compare on the job training and class room training.	BT5	Evaluate

PART - C (15 MARKS)

Sl. No	QUESTIONS	BT LEVEL	COMPETENCE
1.	You are a safety manager in an engineering industry. Explain how you conduct safety celebration in your factory. Prepare a list of activities which can be used for safety celebrations.	BT5	Evaluate
2.	Prepare a plan for celebrating 'National Safety Day'.	BT6	Create
3.	Prepare a list of activities which can be used for safety celebrations.	BT5	Evaluate
4.	Explain briefly the procedure to conduct perception discrepancy survey.	BT6	Create