HEALTH, SAFETY AND ENVIRONMENT

NSQF LEVEL - 3

TRADE PRACTICAL

SECTOR : HEALTHCARE

(As per revised syllabus July 2022 - 1200 hrs)

Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

Sector : **Healthcare**

Duration : **1 - Year**

Trade : **Health, Safety and Environment - Trade Practical - NSQF level - 3 (Revised 2022)**

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FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, by 2020 to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Mentor Councils comprising various stakeholder's viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai has now come up with instructional material to suit the revised curriculum for **Health, Safety and Environment - Trade Practical - NSQF Level - 3 (Revised 2022) in Healthcare Sector under Annual Pattern.** The NSQF Level - 3 (Revised 2022) Trade Practical will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 3 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that with NSQF Level - 3 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

Addl.Secretary/Director General (Training)
Ministry of Skill Development & Entrepreneurship,
Government of India.

New Delhi - 110 001

PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Directorate General of Training, Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of the Federal Republic of Germany. The prime objective of this institute is to develop and provide instructional materials for various trades as per the prescribed syllabi under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

Chennai - 600 032 **EXECUTIVE DIRECTOR**

ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisations to bring out this Instructional Material **(Trade Practical)** for the trade of **Health, Safety and Environment** under **Healthcare** Sector for ITIs.

MEDIA DEVELOPMENT COMMITTEE MEMBERS

Shri. Dr.M. Parthiban	–	Assistant Professor (S.G), PSG College of Technology, Coimbatore - 641 004.

NIMI CO-ORDINATORS

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Shri. V. Gopalakrishnan	–	Manager, NIMI, Chennai - 32.

NIMI records its appreciation for the Data Entry, CAD, DTP operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks the invaluable efforts rendered by all other NIMI staff who have contributed towards the development of this Instructional Material.

NIMI is also grateful to everyone who has directly or indirectly helped in developing this Instructional Material.

INTRODUCTION

TRADE PRACTICAL

The trade practical manual is intented to be used in practical workshop . It consists of a series of practical exercises to be completed by the trainees during the Course of the **Health, Safety and Environment** Trade supplemented and supported by instructions/ informations to assist in performing the exercises. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 3 (Revised 2022) syllabus are covered.

		Hours
Module 1	Hazard Management in Factories	225 Hrs
Module 2	Safety Management in Industry	60 Hrs
Module 3	Factory Act and Laws	45 Hrs
Module 4	Environment Management and Social Welfare	90 Hrs
Module 5	Fire Hazard and Safety	45 Hrs
Module 6	Supply Management Systems for Safety	90 Hrs
Module 7	Personal Protective Suits	105 Hrs
Module 8	Safety Management Systems in Engineering Industry	290 Hrs
Module 9	Electrical Safety in Industry	100 Hrs
Module 10	Storage and Occupational Hazards	150 Hrs
	Total	1200 Hrs

The skill training in the shop floor is planned through a series of practical exercises centred around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI looks forward to the suggestions from the experienced training faculty for improving the manual.

TRADE THEORY

The manual of trade theory consists of theoretical information for the Course of the **Health, Safety and Environment** Trade. The contents are sequenced according to the practical exercise contained in NSQF LEVEL - 3 (Revised 2022) syllabus on Trade practical. Attempt has been made to relate the theoretical aspects with the skill covered in each exercise to the extent possible. This correlation is maintained to help the trainees to develop the perceptional capabilities for performing the skills.

The Trade Theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indications about the corresponding practical exercises are given in every sheet of this manual.

It will be preferable to teach/learn the trade theory connected to each exercise atleast one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not for the purpose of self learning and should be considered as supplementary to class room instruction.

CONTENTS

LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

S.No.	Exercise Outcome	Exercise No
1	Identify accident prone areas and adopt methods for reducing accidents following safety precautions. (NOS: MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	1.1.01 - 1.1.08
2	Identify and apply safety policy in an industry and List out the duties and implement Safety Targets, Objectives, Standards, Practices and Performances. (NOS: MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	1.1.09 - 1.1.12
3	Identify marking and evaluate performance of explosives. (NOS: MIN/N0416, MIN/N0417, MIN0418)	1.1.13 - 1.2.16
4	Prepare profile with an appropriate accuracy as per safety precaution in workshop. (NOS: MIN/N9417)	1.2.17 - 1.2.18
5	Select the construction site for visit, plan and prepare the report. (NOS: MIN/N9418)	1.2.19 - 1.3.22
6	Select, plan, and implement safety and Health objectives, targets and performance standards. (MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	1.3.23 - 1.3.25
7	Identify causes of fire, techniques of fire extinguishing methods and other hazards. (NOS: MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	1.4.26 - 1.4.28
8	Plan and execute hose and hose fittings. (NOS: MIN/N9419)	1.5.29
9	Select and prepare the hydrant and pump system for proper application. (NOS: MIN/N9420)	1.5.30 - 1.5.35
10	Identify & select respiratory personal protective devices & carry out its maintenance. (NOS: MIN/N0901, HSC/N9913, HSC/N9902, HSC/N9903)	1.6.36 - 1.6.40
11	Measure the effect of radiation and control the radiation on human body. (NOS: MIN/N9421)	1.6.41 - 1.6.42
12	Identify parameters governing the safety in construction and its impact on environment. (NOS: MIN/N9422)	1.7.43 - 1.7.49
13	Identify various techniques of earthing standards and earth fault protection. (NOS: MIN/N3102)	1.7.50 - 1.7.53
14	Plan and apply methods of plant design and housekeeping. (NOS: MIN/N9423)	1.8.54 - 1.8.58
15	Check and verify various industrial Hazards in process of melting (Furnaces), Casing and Forging. (NOS: HCS/N2204)	1.8.59
16	Identify various types of water relay management systems. (NOS: MIN/N9424)	1.8.60 - 1.8.63
17	Execute the risk analysis exercise. (NOS: MIN/N9425)	1.8.64 - 1.8.66
18	Select and use PPE, care and maintain the same. (NOS: HCS/N9913, HCS/N9902, HCS/N9903)	1.9.67 - 1.9.69
19	Apply the method of bulk storage system of LPG/CNG. (NOS: MIN/N9426)	1.9.70
20	Prepare case study on major Chemical Disasters. (NOS: MIN/N9428)	1.9.71
21	Practice Bio Medical Waste and E- Management (NOS: MIN/N9428)	1.10.72 - 1.10.76
22	Demonstrate Process to control noise pollution. (NOS: MIN/N1702, MIN/N1703, MIN/N1704,)	1.10.78 - 1.10.79

Familiarization with the institute, documentation of student, issuance of dress, books, hostel accomdation and store

Objectives: At the end of this lesson you shall be able to
- **identify the nature of the institute and documentation of student**
- **familiarize on the issuance of dress, books and store.**

Requirements

Tools/Instrument

- Proper dress code - as reqd.
- Stationaries - as reqd.
- Videos - as reqd.

PROCEDURE

Note: Trainer may take the trainees to familiarize with the institute, documentation of student, issuance of dress, books and store and ask them to record/video through mobile phones to understand the structure of organization.

Task 1: **Prepare an activity chart need to be followed during the induction programme**

Type of department in the institute	Nature of the job	Do's and Don'ts

— — — — — — — —

Task 2**: Prepare the following documentation to maintain student attendance**

1 Track absences in real-time
2 Connect with students via email & messaging.
3 Keep the morale high with good curriculum
4 Boost personalized learning
5 Effective timetable scheduling
6 Give online tests & quizzes
7 Gather feedback on teaching & courses
8 Improve interactions via chat & forum.
9 Implement rewards for positive behaviour
10 Increase parent involvement

— — — — — — — —

Task 3**: Service and work uniform**

1 The students are advised to prepare a video on showcasing the dress codes to be used within the organization.

— — — — — — — —

Task 4**: Store details**

1 The students are advised to prepare a demo on the store particulars available within the organization.

— — — — — — — —

Importance of trade training, equipments used in the trade, types of work done by the trainees in the trade

Objectives: At the end of this exercise you shall be able to
- **identify the tools and equipment's used in the organisation**
- **record the names of tools, do's and don'ts of each tool**
- **record the names of the industries where the workers are employed.**

Requirements

Tools/Instrument

- Tools and Equipments - as reqd.
- Images - as reqd.
- Videos - as reqd.

PROCEDURE

Note: Instructor shall display all the tools and equipment's in the section and brief their names, uses and the safety point to be observed for each tool and equipment

Task 1: **Identify the tools and equipment's used in the organisation**

1 Instructor shall display all the tools and equipment's in the section and brief their names, uses and the safety point to be observed for each tool and equipment.

Note: Trainees will note down all the displayed tools names, uses and the precaution to be observed while working with each tool. Record it in above Table 1 Get it checked by the instructor.

Table 1

S.No	Name of the tool/equipment	Uses	Precautions to be observed

— — — — — — — —

Task 2: **Record the names of the industries where the workers are employed**

1 Instructor shall brief the role of a worker in the industries.

2 Emphasis more on the type and nature of work by the employees by providing the names of the private and public sector industries, where the fitters are largely employed.

3 Ask the trainees to note down the types of work done by the trainees in the trade.

— — — — — — — —

Introduction to safety equipment's and their uses. Introduction to first aid, road safety, operation of electrical mains

Objectives: At the end of this exercise you shall be able to
- **interpret the different types of personal protective devices**
- **identify first aid procedures and training to prevent injuries**
- **demostrate and operate the electrical mains of the industry.**

Requirements			
Tools/Instrument			
• Display of PPE	- as reqd.	• Videos	- as reqd.
• First aid images	- as reqd.		

PROCEDURE

Task 1: **Interpret the different types of personal protective devices**

1 The instructor shall display the different types of personal protective equipments or charts and explain how to identify and select the PPE devices suitable for the work and ask the trainees to note down the hazards and type of protection in the Table 1

Table 1

S.No	Name of the PPE	Hazards	Type of protection

— — — — — — — —

Task 2: **Identify the occupational hazard and the potential harm and record**

Table 2

S.No.	Source or potential harm	Type of occupational hazards
1	Noise	
2	Explosive	
3	Virus	
4	Sickness	
5	Smoking	
6	Non control device	
7	No earthing	
8	Poor house keeping	

— — — — — — — —

Task 3: **Demonstrate the first aid measures and perform the same**

First aid training

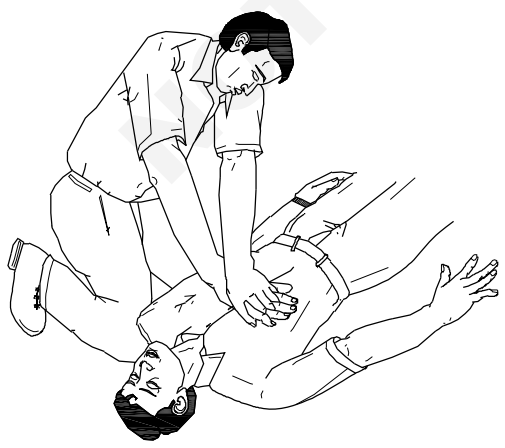
1 Before you begin - Before starting CPR (check)

- Is the environment safe for the person?
- Is the person conscious or unconscious?
- If the person appears unconscious, tap or shake his or her shoulder and ask loudly, “Are you OK?”
- If the person doesn’t respond and two people are available, have one person call 911 or the local emergency number and get the AED, if one is available, and have the other person begin CPR.
- If you are alone and have immediate access to a telephone, call 911 or your local emergency number before beginning CPR. Get the AED, if one is available.
- As soon as an AED is available, deliver one shock if instructed by the device, then begin CPR.

2 Compressions - Restore blood circulation

- Put the person on his or her back on a firm surface.
- Kneel next to the person’s neck and shoulders.
- Place the heel of one hand over the center of the person’s chest, between the nipples. Place your other hand on top of the first hand. Keep your elbows straight and position your shoulders directly above your hands.
- Use your upper body weight (not just your arms) as you push straight down on (compress) the chest at least 2 inches (approximately 5 centimeters) but not greater than 24 inches (approximately 6 centimeters). Push hard at a rate of 100 to 120 compressions a minute.
- If you haven’t been trained in CPR, continue chest compressions until there are signs of movement or until emergency medical personnel take over. If you have been trained in CPR, go on to opening the airway and rescue breathing.

Fig 1

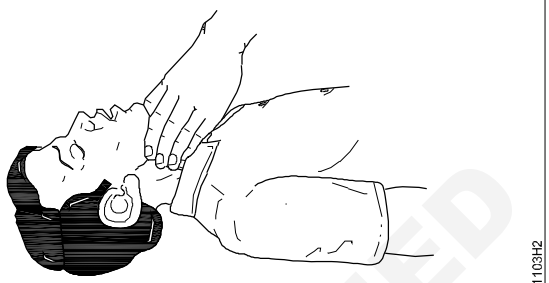


HSN1103H1

3 Airway - Open the airway

- If you’re trained in CPR and you’ve performed 30 chest compressions, open the person’s airway using the head-tilt, chin-lift maneuver. Put your palm on the person’s forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway.

Fig 2



HSN1103H2

4 Breathing - Breathe for the person

- Rescue breathing can be mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or can’t be opened.
- With the airway open (using the head-tilt, chin-lift maneuver), pinch the nostrils shut for mouth-to-mouth breathing and cover the person’s mouth with yours, making a seal.
- Prepare to give two rescue breaths. Give the first rescue breath - lasting one second - and watch to see if the chest rises. If it does rise, give the second breath. If the chest doesn’t rise, repeat the head-tilt, chin-lift maneuver and then give the second breath. Thirty chest compressions followed by two rescue breaths is considered one cycle. Be careful not to provide too many breaths or to breathe with too much force.
- Resume chest compressions to restore circulation.

Fig 3

HSN1103H3

Task 4: **Demonstrate and perform poisoning first and procedures**

1 When to suspect poisoning

- Poisoning signs and symptoms can mimic other conditions, such as seizure, alcohol intoxication, stroke and insulin reaction. Signs and symptoms of poisoning may include:
- Burns or redness around the mouth and lips
- Breath that smells like chemicals, such as gasoline or paint thinner
- Vomiting
- Difficulty breathing
- Drowsiness
- Confusion or other altered mental status
- If you suspect poisoning, be alert for clues such as empty pill bottles or packages, scattered pills, and burns, stains and odors on the person or nearby objects. With a child, consider the possibility that he or she may have applied medicated patches or swallowed a button battery.

2 Take the following actions until help arrives

- Swallowed poison. Remove anything remaining in the person's mouth. If the suspected poison is a household cleaner or other chemical, read the container's label and follow instructions for accidental poisoning.
- Poison on the skin. Remove any contaminated clothing using gloves. Rinse the skin for 15 to 20 minutes in a shower or with a hose.
- Poison in the eye. Gently flush the eye with cool or lukewarm water for 20 minutes or until help arrives.
- Inhaled poison. Get the person into fresh air as soon as possible.
- If the person vomits, turn his or her head to the side to prevent choking.
- Begin CPR if the person shows no signs of life, such as moving, breathing or coughing.

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Task 3: **Demonstrate and perform wound first and procedures**

A wound is any damage or break in the surface of the skin. Applying appropriate first aid to a wound can speed up the healing process and reduce the risk of infection.

Wounds including minor cuts, lacerations, bites and abrasions can be treated with first aid.

1 Control bleeding

- Use a clean towel to apply light pressure to the area until bleeding stops (this may take a few minutes). Be aware that some medicines (e.g. aspirin and warfarin) will affect bleeding, and may need pressure to be applied for a longer period of time.

2 Wash your hands well

- Prior to cleaning or dressing the wound, ensure your hands are washed to prevent contamination and infection of the wound.

3 Rinse the wound

- Gently rinse the wound with clean, lukewarm water to cleanse and remove any fragments of dirt, e.g. gravel, as this will reduce the risk of infection.

4 Dry the wound

- Gently pat dry the surrounding skin with a clean pad or towel.

5 Replace any skin flaps if possible

- If there is a skin flap and it is still attached, gently reposition the skin flap back over the wound as much as possible using moist cotton bud or pad.

6 Cover the wound

- Use a non-stick or gentle dressing and lightly bandage in place; try to avoid using tape on fragile skin to prevent further trauma on dressing removal.

Ask the trainee to demonstrate ad perform the operation of Electrical mains in the industry

All electrical equipment and installations should be maintained to prevent danger.

- This should include an appropriate system of visual inspection and, where necessary, testing. By concentrating on a simple, inexpensive system of looking for visible signs of damage or faults, most of the electrical risks can be controlled.
- It is recommended that fixed installations are inspected and tested periodically by a competent person. The frequency of inspections and any necessary testing will depend on the type of installation, how often it is used, and the environment in which it is used.
- Users can help by reporting any damage or defects they find.
- Ensure that people who are working with electricity are competent to do the job. Even simple tasks such as wiring a plug can lead to danger - ensure that people know what they are doing before they start.

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Knowledge of general safety, occupational health and hygiene

Objectives: At the end of this exercise you shall be able to
- **demonstrate general safety measures prevailing in the industry**
- **demonstrate the occupational health and hygiene conditions to be followed in the industry.**

Requirements

Tools/Instrument

- Sketches/Pencils & A4 sheets - as reqd.
- Self Assessment Questionnaire - as reqd.

PROCEDURE

Note: Trainer may take the trainees to the industry and ask the trainees to observe the safety provision available in the unit and their working condition as well. Ask the trainees to note down the welfare measures taken up by the unit towards employee safety.

Task 1: **Self assessment report preparation by the trainees**

1 Provide a detailed questionnaire related to safety aspects

2 Ask the trainees to prepare a self assessment report based on the questions provided to them

3 Ask them to provide comments/suggestions related to the employee safety and welfare schemes prevailing in the unit

Self Assessment Report

1 Comment on the safety provisions prevailing in the unit

_____
_____
_____

2 Identify the most common areas possible for cause of accidents at work within the unit

_____
_____
_____

3 Please list two names of equipment that you use for work and the methods by which the risks are controlled/reduced

_____
_____
_____

4 Please name a hazardous substance that you will use or encounter in your work and the control measures that you take to minimise the risks

_____
_____
_____

5 Please give a reason as to why you should report incidents and near misses and state how you would go about it.

_____
_____
_____

6 Are you being satisfied with the existing welfare schemes existing for the employee?

_____
_____
_____

7 Suggest any **two** important welfare schemes you find really good in the industry

_____
_____
_____

8 Provide **two** important ILO conventions followed in the unit related to Health and Safety

_____
_____
_____

9 It shall be the duty of every employer to ensure; so far as is reasonably practicable, the health, safety and welfare at work of all his/her employees **(True/ False)**

_____
_____
_____

10 As an employee, what is your responsibility under health and safety law?

_____
_____

11 As a supervisor of the industry, what is your responsibility under health and safety law?

_____
_____
_____

12 As a safety engineer, what is your responsibility under health and safety law?

_____
_____
_____

— — — — — — — —

Task 2**: Demonstrate the necessity, requirements and benefits of Occupational Health and**

Hygiene measures for the industry

1 Necessity for Occupational Health and Hygiene for the Industry

- **Occupational** (location): place where the people work in return of financial gains.
- **Health:** a healthy state of wellbeing.
- **Safety:** The condition of being safe; freedom from danger, risk, or injury.
- **Accident:** Undesired event giving rise to ill health, injury or death.
- **Hazard**: Source or situation having potential to cause injury or ill health.

2 Requirements of Occupational Health and Hygiene for the Industry

- Comply with the national and international regulations.
- Proactive risk assessment and control through hazard identification.
- Define levels of authority and lines of communication in the company during emergency **(?)**
- Implement the corrective and preventive actions required.

3 Benefits of Occupational Health and Hygiene

- Provides sense of responsibility among the employees.
- Reduces work related accidents, ill-health and costs.
- Reinforces a responsible reputation among customers, stakeholders and community.

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Site visit for hazard identification and evaluation

Objectives: At the end of this lesson you shall be able to
- **identify the biological type of hazards and write their names and evaluation**
- **identify the ergonomic hazard and write their names and how to avoid**
- **identify the safety hazard and write their names and how to avoid**
- **identify the chemical hazards and write their names and how to avoid.**

Requirements

Tools/Instrument

- Microscope - 1 No.
- Face mask, gloves - as reqd.

PROCEDURE

Note: Trainer may arrange the nearby suitable site to identify and evaluate the following type of hazards.

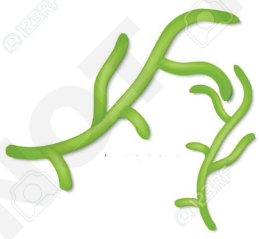
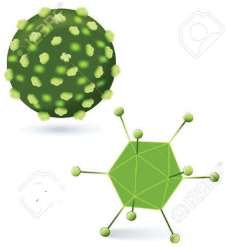
Task 1: **Identification of Biological hazard**

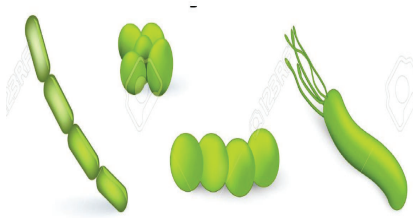
1 See the biological hazard images provided in the Table1.

2 Identify the name of the each hazard.

3 Write the name of the each hazard and how to evaluate it in the appropriate space provided in the Table 1.

Table 1

Sl.No	Biological Hazard images	Name of the Hazard	How/way to evaluate
1			
2			
3			

Sl.No	Biological Hazard images	Name of the Hazard	How/way to evaluate
4			
5			
6			

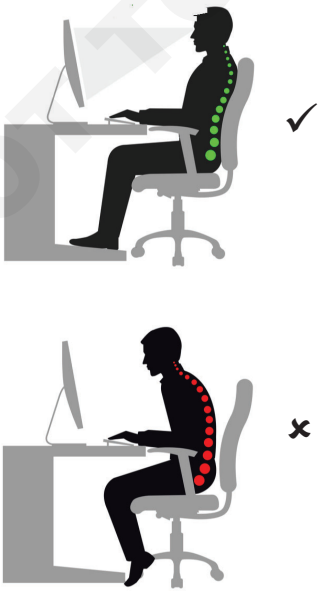
Task 2: **Identification of Ergonomic hazard**

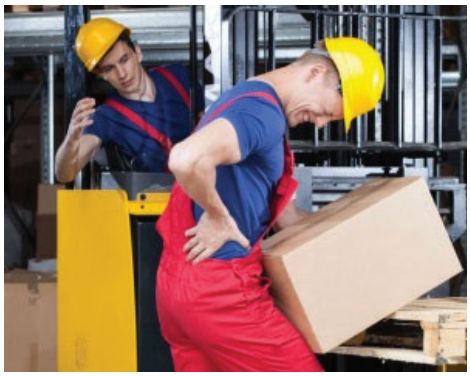
1 See the Ergonomic hazard images provided in the Table-2.

2 Identify the name of the each hazard.

3 Write the name of the each hazard and how to avoid in the appropriate space provided in the Table 2.

Table 2

Sl.No	Ergonomics Hazard images	Name of the Hazard	How to avoid
1			

Sl.No	Ergonomics Hazard images	Name of the Hazard	How to avoid
2			

— — — — — — — —

Task 3: **Identification of safety hazards**

1 See the safety hazard images provided in the Table3

2 Identify the name of the each hazard.

3 Write the name of the each hazard and how to avoid in the appropriate space provided in the Table 3.

Table 3

Sl.No	Ergonomics Hazard images	Name of the Hazard	How to avoid
1			
2			
3			

— — — — — — — —

Task 4: **Identification of Chemical hazards**

1 See the safety hazard images provided in the Table4

2 Identify the name of the each hazard

3 Write the name of the each hazard and how to avoid in the appropriate space provided in the Table 4.

Table 4

Sl.No	Ergonomics hazard images	Name of the hazard	How to avoid
1			
2			

— — — — — — — —

Study of risk at work site and preparation and initiation of reports

Objectives: At the end of this lesson you shall be able to

- **identify the type of risk, the group which is affected, the control measures needed and the risk assessment**
- **identify the ergonomic related risk, the group which is affected, the control measures needed and the risk assessment**
- **identify the safety risks, the group which is affected, the control measures needed and the risk assessment**
- **identify the chemical based risk, the group which is affected, the control measures needed and the risk assessment.**

Refer the Exercise 1.1.05

Emergency response functional drill - viz, medical response, evacuation drill, etc,.

Objectives: At the end of this lesson you shall be able to
- **prepare an observer report for the given emergency evacuation drill**
- **describe the different emergency management exercise types**
- **identify roles and responsibilities and develop an emergency preparedness plan.**

Requirements

Tools/Instrument

• Disposable mask	- as reqd	• Pencil & pen	- as reqd
• Gloves	- 1 pair	• A4 sheet	- as reqd
• Proper dress code	- as reqd	• LCD projector	- as reqd

PROCEDURE

Note: Trainer will show the related videos related to the emergency response functional drill and medical attention required to the employees at the workplace.

Task 1: **Preparation of observer's report for the given emergency evacuation drill**

1 Trainee see the observer's report related to emergency evacuation drill given below and prepare the same.

2 Get it checked with trainer.

Emergency evacuation drill - Observer's report

Drill Date		**Shift**
Type of Drill		
☐ **Fire** ☐ **Spillage** ☐ **Other-Please Specify**	☐ **Fall down** ☐ **Drill Date**	
Drill Start Time:	**Drill End Time**	**Total Time of Drill**
Alarm Worked Property?	**Describe what happen when alarmed?**	
It is there all the areas heaed alarm?	**Specify incase not heard any location**	
Peoples are evacuated properly? Describe situation		
Is there individual peoples are not performed properly?		
Name of the personnel for further training:		
Communication between chain:		
Observer report/ Remarks Note:		
Sign&Date:		

Task 2: **Describe the different emergency management exercise types**

1 Write down the description to the different emergency management exercise types given under the table-1

2 Get it checked with the trainer.

Table 1

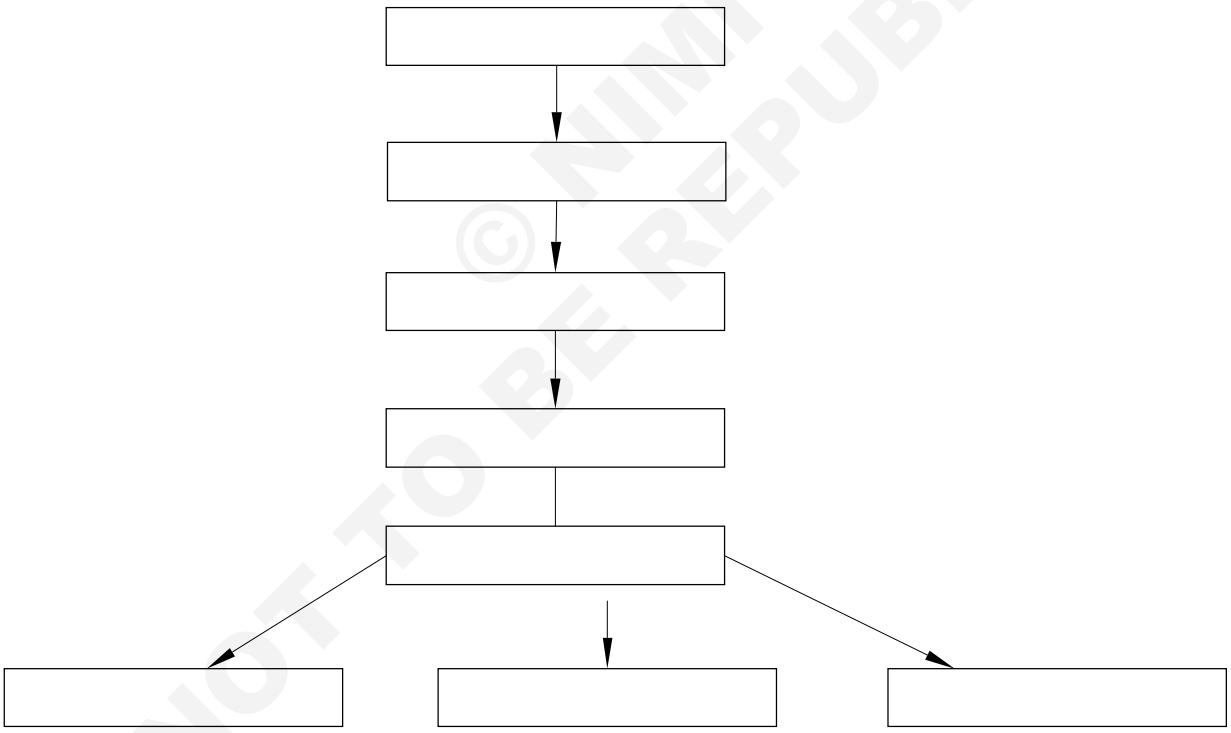
S.No	Exercise type	Description
1	Orientation type	
2	Drill type	
3	Tabletop type	
4	Functional type	
5	Full-scale type	

— — — — — — — —

TASK 3: **Identify roles and responsibilities and develop an emergency preparedness plan**

1 Write the roles and responsibilities and develop an emergency preparedness plan with reference to the flow diagram illustrated below

2 Get it checked with the trainer



— — — — — — — —

Visit to accident prone area Practical usages of Safety belt helmet gloves, and goggles

Objectives: At the end of this lesson you shall be able to
- **identify the preventive measures to avoid accidents at worksite**
- **write the names of the safety equipments used to protect from accidents.**

Requirements

Tools/Instrument

- Gloves - as reqd.
- Goggles - as reqd.
- Helmets - as reqd.
- Face mask - as reqd.
- Safety belts - as reqd.

PROCEDURE

Note: Trainer may inform the trainees to identify the safety devices used to avoid accidents at the work-site. Ask them to write the use of the safety device listed in the table and ask him to identify the appropriate location necessary to use the same.

Task 1:**Identify the safety device and its appropriate use**

1 See the images provided in the in the Table 1.

2 Identify the type of safety device

3 Write the name of the device and the appropriate use of the safety device at proper location to be recorded in the Table 1.

Table 1

Sl.No	Different type of safety devices	Name of the safety device	Nature and write the use of the particular device
1			
2			

Sl.No	Different type of safety devices	Name of the safety device	Nature and write the use of the particular device
3			
4			
5			

— — — — — — — —

Definition, incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc,.

Objectives: At the end of this lesson you shall be able to
- **identify the meaning of industrial accidents and measures to overcome**
- **demonstrate the unsafe acts and conditions leading to danger and hazards in the industry.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the meaning of industrial accidents and measures to overcome the same and also demonstrate the unsafe acts and conditions leading to danger and hazards in the industry.

Task 1: **Identify the meaning of industrial accidents and measures to overcome (Fig 1 to 3)**

1 Identify whether the following accidents shown in the images below are happened without any reason? If not, demonstrate the cause for the accident due to the unsafe act or condition and reason out the same.

Fig 1

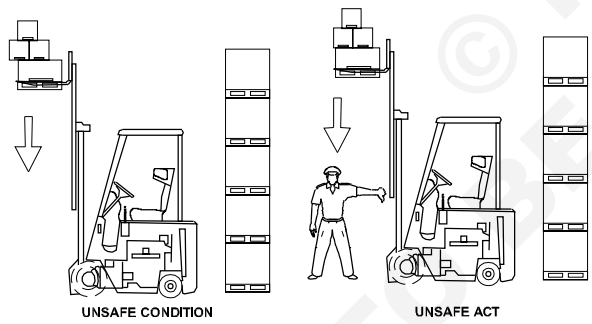
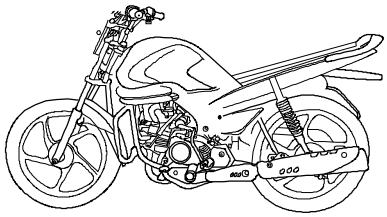


Fig 2

Fig 3

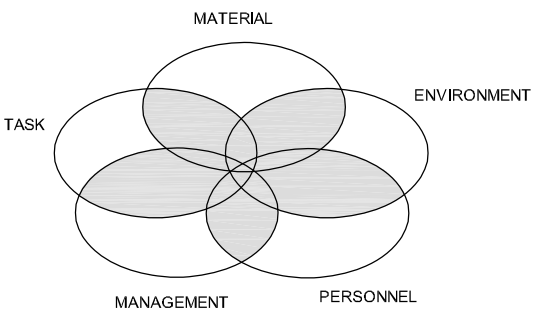


Task 2: **Demonstrate the cause for the accient using the following causation models**

1 Many models of causation have been proposed, ranging from Heinrich's domino theory to the sophisticated Management Oversight and Risk Tree (MORT).

2 The simple model shown in Figure 1 attempts to illustrate that the causes of any incident can be grouped into five categories - task, material, environment, personnel, and management (Fig 1).

Fig 1



Task

- Here the actual work procedure being used at the time of the incident is explored. Members of the investigation team will look for answers to questions such as:
- Was a safe work procedure used?
- Had conditions changed to make the normal procedure unsafe?
- Were the appropriate tools and materials available?
- Were they used?
- Were safety devices working properly?
- Was lockout used when necessary?
- For most of these questions, an important follow-up question is “If not, why not?”

Material

- To seek out possible causes resulting from the equipment and materials used, investigators might ask?
- Was there an equipment failure?
- What caused it to fail?
- Was the machinery poorly designed?
- Were hazardous products involved?
- Were they clearly identified?
- Was a less hazardous alternative product possible and available?
- Was the raw material substandard in some way?
- Should personal protective equipment (PPE) have been used?
- Was the PPE used?
- Were users of PPE properly educated and trained?
- Again, each time the answer reveals an unsafe condition, the investigator must ask why this situation was allowed to exist.

Work environment

- The physical work environment, and especially sudden changes to that environment, are factors that need to be identified.
- The situation at the time of the incident is what is important, not what the “usual” conditions were. For example, investigators may want to know:
- What were the weather conditions?
- Was poor housekeeping a problem?
- Was it too hot or too cold?
- Was noise a problem?
- Was there adequate light?
- Were toxic or hazardous gases, dusts, or fumes present?

Personnel

- The physical and mental condition of those individuals directly involved in the event must be explored, as well as the psychosocial environment they were working within.
- The purpose for investigating the incident is not to establish blame against someone but the inquiry will not be complete unless personal characteristics or psychosocial factors are considered. Some factors will remain essentially constant while others may vary from day to day:
- Did the worker follow the safe operating procedures?
- Were workers experienced in the work being done?
- Had they been adequately educated and trained?
- Can they physically do the work?
- What was the status of their health?
- Were they tired?
- Was fatigue or shiftwork an issue?
- Were they under stress (work or personal)?
- Was there pressure to complete tasks under a deadline, or to by-pass safety procedures?

Management

- Management holds the legal responsibility for the safety of the workplace and therefore the role of supervisors and higher management and the role or presence of management systems must always be considered in an incident investigation.
- These factors may also be called organizational factors. Failures of management systems are often found to be direct or indirect causes. Ask questions such as:
- Were safety rules or safe work procedures communicated to and understood by all employees?
- Were written procedures and orientation available?
- Were the safe work procedures being enforced?
- Was there adequate supervision?
- Were workers educated and trained to do the work?
- Had hazards and risks been previously identified and assessed?
- Had procedures been developed to eliminate the hazards or control the risks?
- Were unsafe conditions corrected?
- Was regular maintenance of equipment carried out?
- Were regular safety inspections carried out?
- Had the condition or concern been reported beforehand?
- Was action taken?

- This model of incident investigation provides a guide for uncovering all possible causes and reduces the likelihood of looking at facts in isolation.
- Some investigators may prefer to place some of the sample questions in different categories; however, the categories are not important, as long as each question is asked.
- Obviously there is considerable overlap between categories; this overlap reflects the situation in real life.
- Again it should be emphasized that the above sample questions do not make up a complete checklist, but are examples only.

— — — — — — — —

Accident prevention, theories / models of accident occurrences, principles of accident prevention

Objectives: At the end of this lesson you shall be able to
- **demonstrate the theories/design of models of accident occurrences**
- **identify the preventive measures to avoid accidents at workplace.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.

PROCEDURE:

The trainer will teach the trainees regarding the design of models of accident occurrences and identify the preventive measures to avoid accidents at workplace.

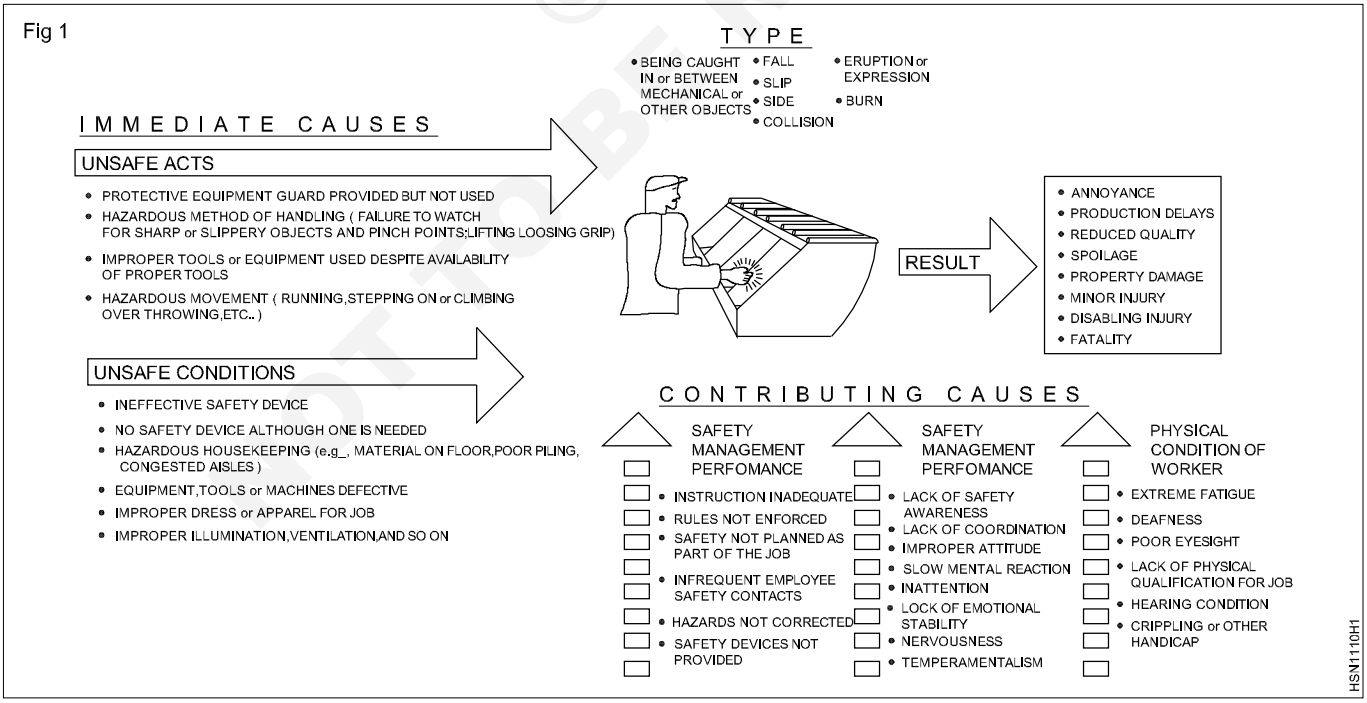
Task 1: **Demonstrate the following design/theories of models of accident occurrences**

1 Domino theory
2 Causation theory
3 Pure chance theory
4 Biased Liability theory
5 Accident proneness theory
6 Energy transfer theory
7 Symptom vs Causes theory

— — — — — — — —

Task 2: **Identify the causes and contributing factors of accidents at your workplace based on the following accident structure**

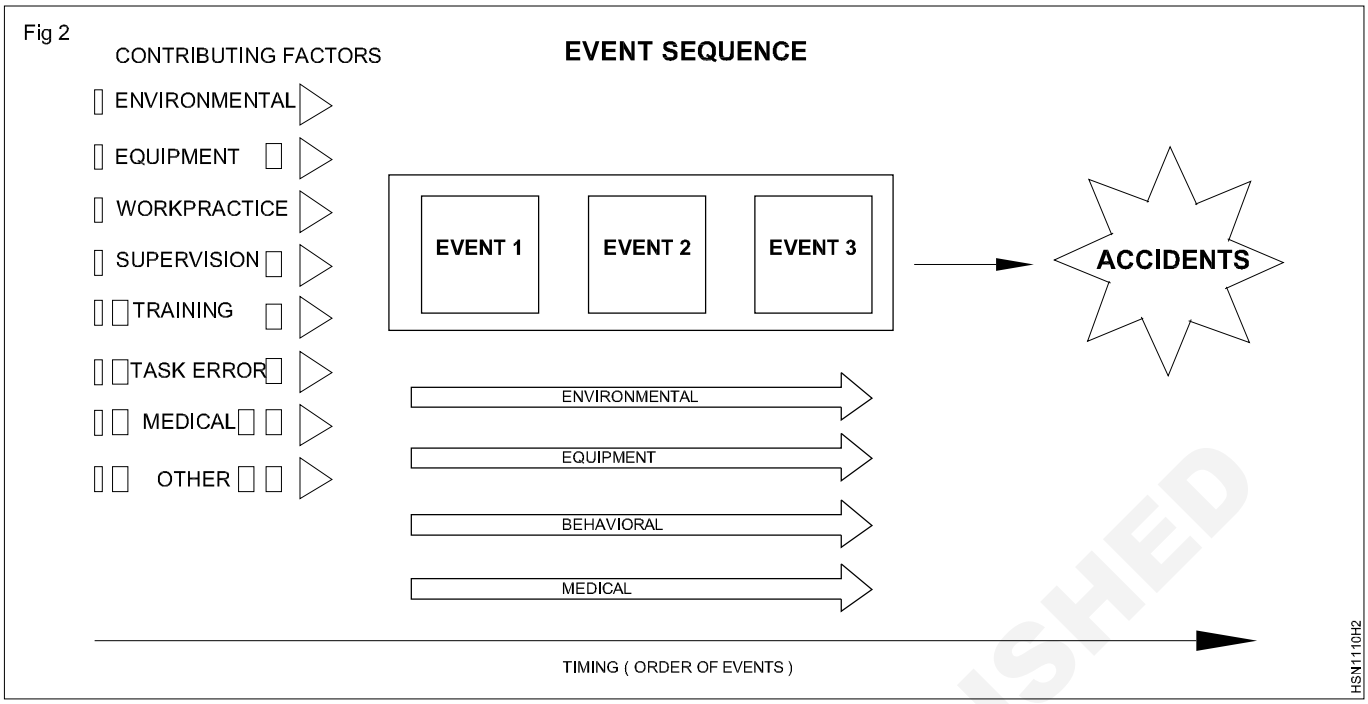
Fig 1



— — — — — — — —

Task 3: **Demonstrate the model of accident causation**

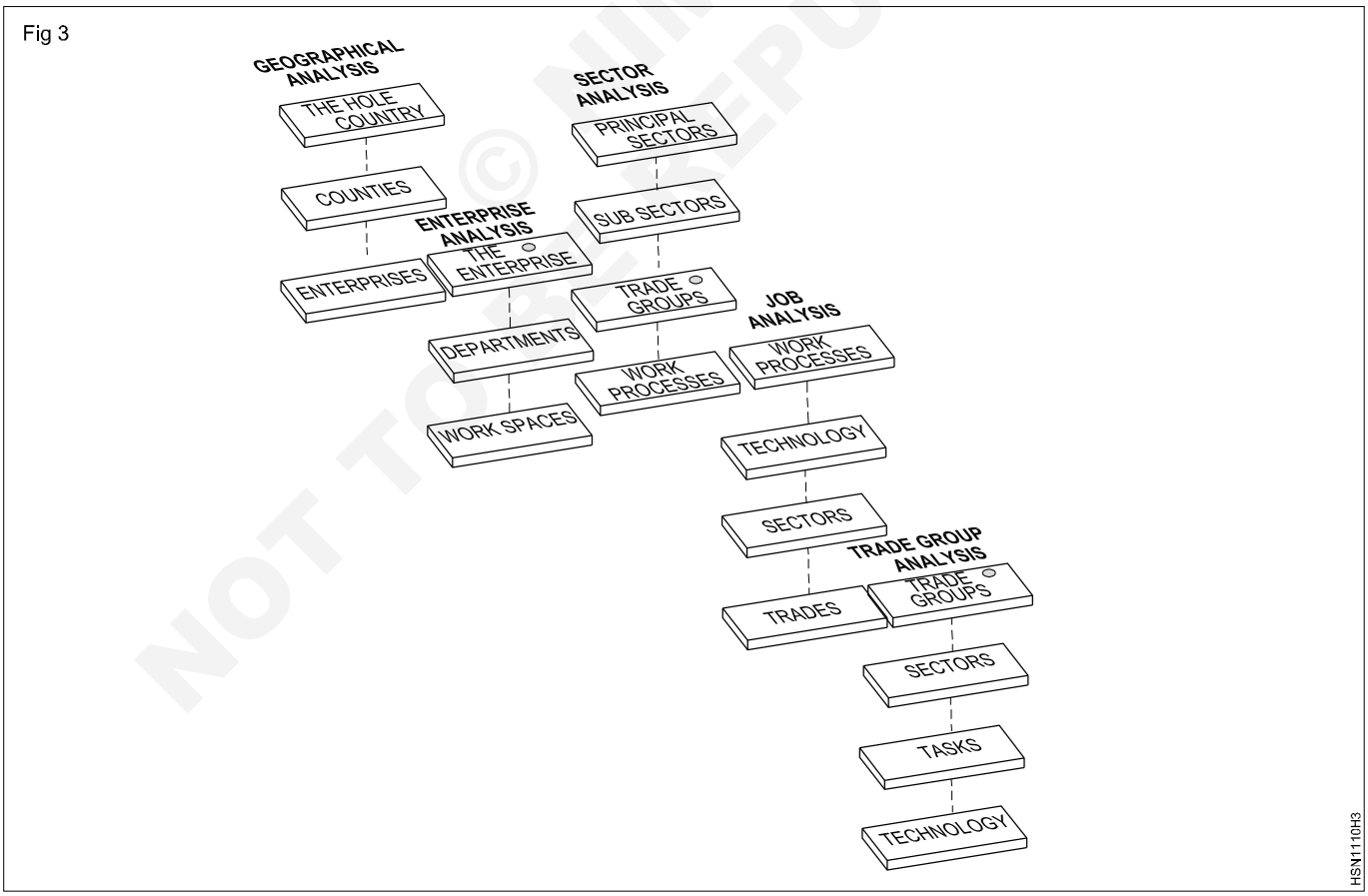
Fig 2



— — — — — — — —

Task 4: **Analyse the preventive measures provided by organisation to prevent accidents and incidents based on the below chart**

Fig 3



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Accident and financial implications, hazard identification and analysis, fault tree analysis, job safety analysis

Objectives: At the end of this lesson you shall be able to
- **identify the hazard and risk of accidents at workplace and job safety measures**
- **assure the safety of employees through proper inspection and validation.**

Requirements

Tools/Instruments

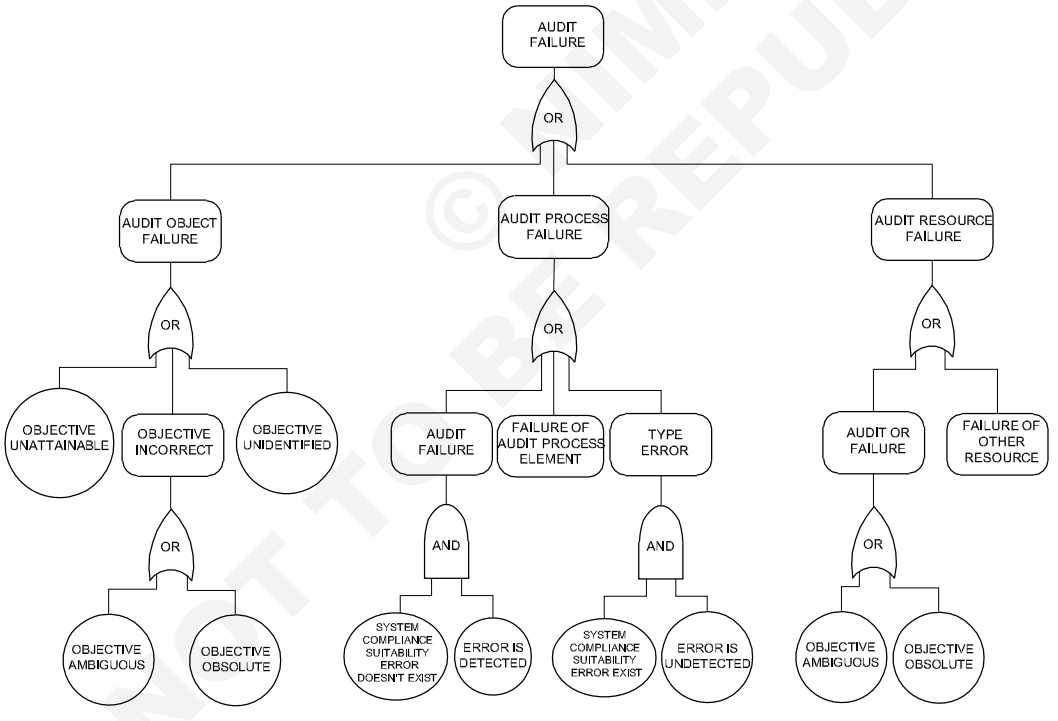
- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the hazard and risk of accidents at workplace and job safety measures also assure the safety procedures adopted in the organization through proper inspection and validation

Task 1: **Identify the hazard and risk using fault tree analysis represnted below**

Fig 1



FAULT TREE DIAGRAM EXAMPLE

— — — — — — — —

Task 2: **Analyse the job safety measures and fill up the same using the worksheet format**

Job safety analysis worksheet

Name of operation:	**SOP/SWP#:**
Completed by:	**Building #:**
Department:	**Section #:**

Steps	Potential hazards	Controls	Responsible person

Prepared by:	**Date:**	**Time:**
Approved by:	**Date:**	**Time:**
Reviewed by:	**Date:**	**Time:**

— — — — — — — —

Task 3: **List the tasks/jobs where injuries can occur or occur at workplace using the following form**

Table 1 - Job hazard analysis form

How People get Hurt	What causes them to get hurt?	What safe practices or PPE are needed?
Ex: Ladders lifting over Lifting heavy objects Slipping on the floor Using the bench grinder		

— — — — — — — — —

Task 4: **Prepare the daily inspection checklist and fill up the details to assess the safety of the plant as shown in the format below**

Job Safety Inspection Form

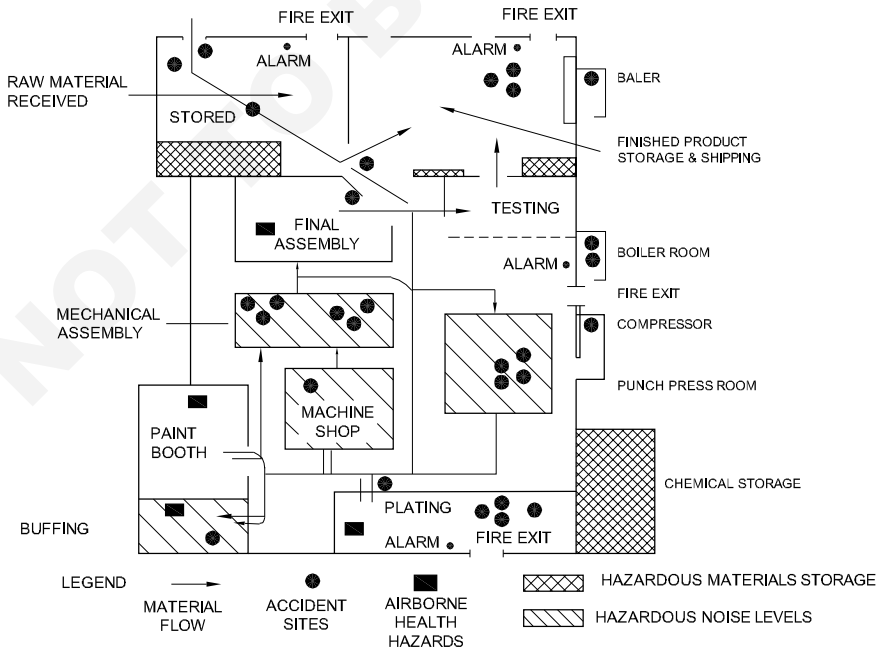
Form No:			Rev No.		Rev Date
Date of Audit	**Area of Audit**	**Department**	**Shift**	**Supervision**	**Inspected**
					PPE and Safety Equipment

S.No	Employee	Safety shoes	Safety helmet	Safety glasses	Hand gloves	Fueme mask	Gas mask	Welding glasses	Special glass for cutting	Safety belt	Safety han essess	Safety clothes	Car pigus	Han it	Arm sleves	Observation / Comments	Employee Signature

Inpaspages.com	Inspected by	
	Signature:	Date:

Task 5: **Assess the risk level of your plant and safety level of employees based on the following standard set-up procedure**

Fig 1



Types and effects of radiation on human body, measurement and detection of radiation intensity

Objectives: At the end of this lesson you shall be able to
- **demonstrate the effects of radiation on human body**
- **measure and detect the radiation intensity.**

Requirements

Tools/Instrument

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety of the employees - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the types and effects of radiation on human body and also the techniques to measure and detect the radiation intensity at workplace.

The trainer need to demonstrate the effects of radiation on human body and also have hands on training on measuring and detecting the radiation intensity at workplace.

Task 1: **Demonstrate the effects of radiation on human body**

1 The trainee should able to distinguish the type of radiation causing at workplace,

2 Provide detailed description regarding the cause of radiation

3 Provide the effect of radiation caused on the workers as given under Table 1

Table 1 - Radiation emergencies with the potential for worker exposure and contamination

Radiation Emergency	Description	Effect on Worker
Accidental release from a nuclear facility; other incidents involving release of radioactive materials. Radiation exposure device (RED) Radiation dispersal device (RDD) Improvised nuclear device (IND)		

— — — — — — — —

Task 2: **Measuring and detecting radiation intensity**

1 Identify the nature and type of exposure that a worker is under risk subjected to radiation emergencies, depending upon the type of incident for the given images given under Table 2 Also rate the hazard scale as per the CDC grading scale as shown in chart.

CDC Radiation Hazard Scale

More Radiation	Category	
↑	5	Death may occur in days to weeks
	4	Increased risk of radiation sickness, but death is not likely
		(Symptoms may appear in hours to days)
	3	Increased risk of cancer later in life
		(Symptoms may take decades to appear)
	2	Above the range of normal, everyday radiation levels, but no health effect expected
Less Radiation ↓	1	Within the range of normal, everyday radiation levels

— — — — — — — —

Table 2 - Type of exposure caused to the worker due to radiation hazard

Radiation exposure	Type of Exposure	Radiation Level (as per grading scale)
		
		

— — — — — — — —

Effects of radiation on human body, measurement - disposal of radioactive waste, control of radiation

Objectives: At the end of this lesson you shall be able to
- **categorise the disposal of radioactive waste at workplace**
- **identify techniques to control radiation at workplace.**

Requirements

Tools/Instrument

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety of the employees - as reqd.

PROCEDURE

The trainee will teach the trainees about the commonly accepted radioactive disposal options in major countries and ask them to categorize in a separate table. Also advice them to suggest techniques to control the radiation at workplace.

Task 1: **Categorize the disposal of radioactive waste at workplace**

1 Note the commonly accepted radioactive disposal options in major countries given under Table 1.

2 Categorize suitable waste types coming under the disposal option.

3 Provide suitable examples.

Table 1 - Commonly accepted disposal options

Disposal Option	Suitable waste type	Examples
Near-surface disposal at ground level, or in caverns below ground level (at depths of tens of meters). Deep geological disposal (at depths between 250m and 1000m for mined repositories, or 2000m to 5000m for boreholes)		

— — — — — — — —

Industrial noise - sources, and its control, effects of noise on the auditory system and health, measurement of noise

Objectives: At the end of this lesson you shall be able to
- **categorise the industrial noise, sources and control measures**
- **demonstrate the effects of noise on the auditory system and health**
- **measure the noise level.**

Requirements

Tools/Instrument

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety of the employees - as reqd.

PROCEDURE

The trainee should be taught regarding the various sources for generation of industrial noise and control ways to overcome the same. He should also be exposed to various effects of noise on the auditory system and health of the workers.The trainee should also be able to select the right instrument for measuring the industrial noise.

Task 1: **Categorize the industrial noise and its related sources**

Table 1 - Ambient Level of Noise in Various Zones

Area Code	Category of area/zone	Noise limit in dB	
		Day time	Night time
A	Industrial Area		
B	Commercial Area		
C	Residential Area		
D	Silence Zone		

Table 2 - Guidelines suggested by OSHA for Industrial Noise Exposure

Level exposure duration (hrs)	Maximum Allowable Level (dB)
8	
6	
4	
3	
2	
15	
1	
0.5	
<0.25	

Task 2: **Effects of noise on the auditory system and health & control**

Table 3 – Effects of noise at different decibel levels

S.No	Range in decibel	Effect
1	Below 65 dB	
2	Below 80 dB	
3	Below 88 dB	
4	Below 110dB	
5	135 dB and above	

— — — — — — — —

Task 3: **Recommended warning limit value and danger limit values for industrial noise generated at various countries**

— — — — — — — —

Task 4: **List the control technologies available for noise pollution**

— — — — — — — —

Task 5: **Selection of instrument for measuring industrial workplace noise**

Type of measurement	Appropriate Instruments (in order of preference)	Result	Comments
Personal noise exposure Noise levels generated by a particular noise Noise survey Impulse noise			

— — — — — — — —

Vibration - effects, measurement and control measures, industrial hygiene

Objectives: At the end of this lesson you shall be able to
- **demonstrate the effects of vibration on human body**
- **measure the vibration and control measures to overcome the same**
- **maintain industrial hygiene at workplace.**

Requirements

Tools/Instrument

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety of the employees - as reqd.

PROCEDURE

The trainee should be taught regarding the various effects of vibration on human body. The trainee should also be able to measure the vibration and suggest control measures to overcome the effect of vibration. The trainee should also be able to maintain industrial hygiene at workplace.

Task 1: **Identify the effect of vibration on human body**

1 Identify the type of vibration and select the type of vibration either it falls under whole body or hand arm vibration (Mark tick in the respective column from the given Table 1)

Table 1 - Effect of vibration on human body

Type of vibration	Whole body vibration	Hand Arm Vibration
Lower back pain		
Motion sickness		
Bone damage		
Stomach problems		
Impairment of vision		
Respiratory issue		
Damage to hand		
Carpet tunnel syndrome		
Sensory nerve damage		
Muscle and joint damage in the hands		

— — — — — — — —

Task 2: **List down the important safe practices followed at your work place to control vibration**

— — — — — — — —

Task 3: **List down the hygiene practices followed at your workplace to overcome major health hazards such as overcoming contaminants, chemical, biological, physical and ergonomic hazards**

— — — — — — — —

Carry out the plant safety inspection with the help of check list

Objectives: At the end of this lesson you shall be able to
- **identify the various type of safety checks to be observed during plant inspection**
- **compare the following common areas data being sought by a safety audit and safety assessment checklist**
- **observe any shortcomings you feel may be present in either type of document and any suggestions for improving the report.**

Requirements

Tools/Instrument

- Sketches/Pencils & A4 sheets - as reqd.
- Check list/safety audit report - as reqd.

PROCEDURE

Note: Trainer may take the trainees to the plant/industry and ask the trainees to observe the safety measures to be identified at the work-site, ask them to prepare a report based on the checklist provided in Table 1.

Task 1: **Identify the safety checks to be observed during plant inspection**

1 Provide a detailed checklist as shown in Table 1

2 Compare the following common areas data being sought by a Safety audit and safety assessment checklist

3 Observe any shortcomings you feel might be present in the document and comment on the same

Table 1 - Safety audit checklist

Safety audit	Safety assessment	Comment
Hazard control		
Accident Reporting		
Training		
Hygiene/Personal Protection		
Documentation		

— — — — — — — —

Visit to industrial unit and review of prevailing safety practices

Objectives: At the end of this lesson you shall be able to
- **identify the types of safety practices followed within the industry**
- **prepare a detailed report on the observations taken on safety and scope for improvement.**

Requirements			
Tools/Instrument			
• Sketches/Pencils & A4 sheets	- as reqd.	• Report Guidelines	- as reqd.

PROCEDURE

Note: Trainer may take the trainees to the industrial unit; make them to observe the safety practices followed in the unit. Ask the trainees to prepare a detailed report based on their observations and provide their suggestions.

Task 1: **Identify the safety practices followed in the industry**

1 Take them to the industrial unit and ask them to observe safety practices followed,

2 Ask them to take down notes/write the key points related to safety aspects

3 Advice them to prepare a detailed industrial report based on the guidelines provided in Table 1

Table 1 - Safety audit guidelines within the industry

Industry Name	Safety Checks	Safety Inspection	Safety Audit
Frequency			
Duration			
Aim			
By Whom • Staff Member • Foreman • Plant Manager • Safety Engineer • Specialist Engineer			
Monitoring Follow up			

— — — — — — — —

Visit to industrial unit to observe prevailing safety provision, their condition, welfare measures include medical facilities, crèches and religious places

Objectives: At the end of this lesson you shall be able to
- **observe the safety provision and their present working condition in the unit**
- **identify the welfare measures taken for the employees working in the industry**
- **prepare a self assessment report on the scope for improvement towards the safety measures.**

Requirements

Tools/Instrument

- Sketches/Pencils & A4 sheets - as reqd.
- Self Assessment Questionnaire - as reqd.

PROCEDURE

Note: Trainer may take the trainees to the industry and ask the trainees to observe the safety provision available in the unit and their working condition as well. Ask the trainees to note down the welfare measures taken up by the unit towards employee safety.

Task 1: **Self assessment report preparation by the trainees**

1 Provide a detailed questionnaire related to safety aspects.

2 Ask the trainees to prepare a self assessment report based on the questions provided to them.

3 Ask them to provide comments/suggestions related to the employee safety and welfare schemes prevailing in the unit.

Self Assessment Report

1 Comment on the safety provisions prevailing in the unit.

_____
_____
_____

2 Identify the most common areas possible for cause of accidents at work within the unit

_____
_____
_____

3 Please list two names of equipment that you use for work and the methods by which the risks are controlled/reduced

_____
_____
_____

4 Please name a hazardous substance that you will use or encounter in your work and the control measures that you take to minimise the risks

_____
_____
_____

5 Please give a reason as to why you should report incidents and near misses and state how you would go about it

_____
_____
_____

6 Are you being satisfied with the existing welfare schemes existing for the employee?

_____
_____
_____

7 Suggest any **two** important welfare schemes you find really good in the industry

_____
_____
_____

8 Provide **two** important ILO conventions followed in the unit related to Health and Safety

_____
_____
_____

9 It shall be the duty of every employer to ensure; so far as is reasonably practicable, the health, safety and welfare at work of all his/her employees **(True/ False)**

10 As an employee, what is your responsibility under health and safety law?

_____
_____
_____

11 As a supervisor of the industry, what is your responsibility under health and safety law?

_____
_____
_____

12 As a safety engineer, what is your responsibility under health and safety law?

_____
_____
_____

— — — — — — — —

Awareness about various compensations and documentation

Objectives: At the end of this lesson you shall be able to be
- **aware of compensation benefits related to worker's compensation in the industry**
- **apply the documentation procedures necessary for claiming the benefits.**

Requirements

Tools/Instrument

• Sketches/Pencils & A4 sheets	- as reqd.	• Claim Forms	- as reqd.

PROCEDURE

Note: Trainer may be given training to file different claim forms and documenting procedures related to their compensation benefits available in the industry

Task 1: **Identify the insurance benefits providing wage replacement and medical benefits to employees**

- See the various types of worker compensation forms provided below
- Document/Fill up the required fields to avail for compensation benefits.

Worker's Compensation Form

Information about you

Name: (Male/Female)

Adderess:

City: State: Pincode:

Phone Number:

Social Security Number: Date of birth:

Marital status: Spouse's Name:

Number of childer under 18

Child's Name: Age: Relationship:

Child's Name: Age: Relationship:

Child's Name: Age: Relationship:

Information about your employement at the time of injury

Name of employer:

Employer address:

City: State: Pincode: Phone Number:

Job description

Number of days before the injured

Employee's First Report of Injury or Fatality

Instructions: Employees shall use this form to report all work related injuries, illnesses, or "near miss" events (which could have caused an injury or illness) – no matter how minor. This helps us to identify and correct hazards before they cause serious injuries. This form shall be completed by employees as soon as possible and given to a supervisor for further action.

I am reporting a work related: ❑ Injury ❑ Illness ❑ Near miss	
Your Name:	
Job title:	
Supervisor:	
Have you told your supervisor about th is injury/near miss? ❑ Yes ❑ No	
Date of injury/near miss:	Time of injury/near miss:
Names of witnesses (if any):	
Where, exactly, did it happen?	
What were you doing at the time?	
Describe step by step what led up to the injury /near miss. (continue on th e back if necessary):	
What could have been done to prevent this injury/near miss?	
What parts of your body were injured? If a near miss, how could you have been hurt?	
Did you see a doctor about this injury/illness? ❑ Yes ❑ No	
If yes, whom did you see?	Doctor's phone number:
Date:	Time:
Has this part of your body been injure d before? ❑ Yes ❑ No	
If yes, when?	Supervisor:
Your signature:	Date:

Worker's Compensation Case Intake Form

Date: _____ Case Accepted: _____

Referred By: _____

CLIENT INFORMATION:

Name:

Address:

City, State, Zip:

Telephone: (Home) (Work)

Alternative Telephone: (friend/relative/neighbor)

Social Security Number: Date of Birth:

Education (Years of School): Height: Weight:

Specialized Training or Degrees:

Sex: Race:

ACCIDENT IINFORMATION:

Date of Accident: _____

Location of Accident: _____

Nature of Injuried: _____

County Where Injured: _____

EMPLOYER INFORMATION:

Name of Employer:

Address:

City, State, Zip:

Other Employment:

Treatment Authorization

Employee Name:	Date:
Date of Injury:	Type of injury:

Employer:	Phone:
Address:	
Authorised by:	Signature

Workers comp carrier:	
Address:	
Phone:	Policy Number:

WORKER'S COMPENSATION FORM

Worker's Name and Address		DOC	
		Claim No.:	
		Date of Birth DD MM YY	Date of Injury
Employer's Name and Address		Personal Health No.	Social Security No.:
		Off Work	Estimated Date of Return to Work
Referral from Dr.	Treatment Date	Fee Schedule Code	Fee Schedule Amount
Diagnosis	DD MM YY		
Treatment or remarks			
	Note: Your account containing complete and legible information will assist the Board in processing your payment.		

	Clinic No.:	
Signature	Doctor No.:	
	Locum No.:	
	Telephone No.:	

Display of explosives, their identification and marking as per explosives act

Objectives: At the end of this lesson you shall be able to
- **identify the various types of explosives found dangerous to operate**
- **display of explosives and marking the hazard nature of the same.**

Requirements

Tools/Instruments

- Images of different types of explosives - as reqd.
- Record the nature of the explosive - as reqd.
- Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

Note: The trainer will take the trainees to the industrial site and show them various types of explosives found to be dangerous to operate at the work area. The trainees need to identify the type of explosive and record the nature of the hazard caused by the particular explosive

Task 1**: Display of explosives**

1 Identify the explosive given in Table1
2 Write the type of the explosive
3 Record the nature of hazard caused by the same

Table 1 - Display of Explosives

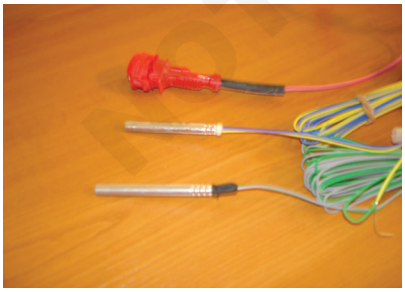
Image of Explosive	Type of explosive	Nature of hazard level
		
		

Image of Explosive	Type of explosive	Nature of hazard level
		
		
		

Hands on experience with hand and power tools

Objectives: At the end of this lesson you shall be able to
- **identify the different types of hand and power tools used in the industry**
- **demonstrate the usage and hands on training of the available tools.**

Requirements

Tools/Instruments

- Images of different types of hand/ power tools - as reqd.
- Sketches/Pencils & A4 sheets - as reqd.
- Hands on training - as reqd.

PROCEDURE

Note: The trainer will expose the trainees to the industrial site and show them various types of hand and power tools used in the industry. The trainer may demonstrate the same and provide hands on training to operate as well.

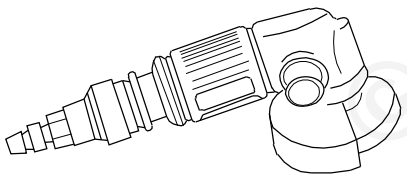
Task 1: **Images of different types of hand and power tools**

1 See the images provided below in Fig 1

2 Try to list the types of tools and record the usage of the same under Table 1

3 Demonstrate the usage of the tools and provide hands on training.

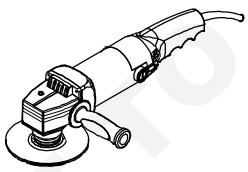
Fig 1



DISC GRINDER

HSN1321H1

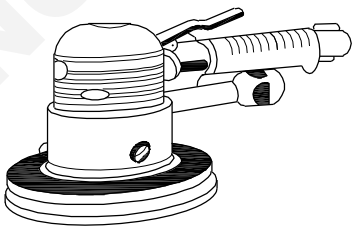
Fig 2



DISC SANDER

HSN1321H2

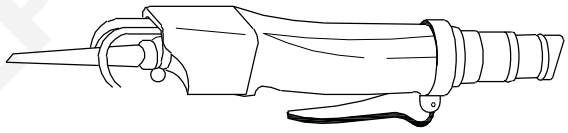
Fig 3



DOUBLE ACTION SANDER

HSN1321H3

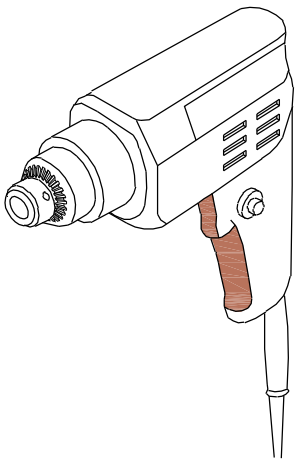
Fig 4



AIR SAW

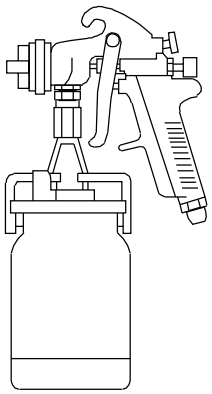
HSN1321H4

Fig 5



HSN1321H5

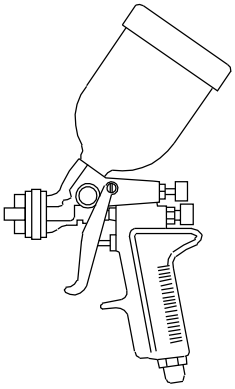
Fig 6



SUCTION FEED GUN WITH ATTACHED CUP

HSN1321H6

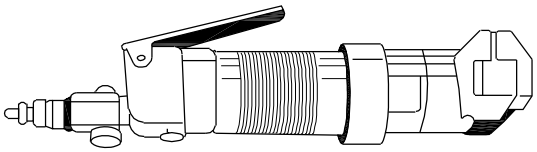
Fig 7



GRAVITY FEED GUN WITH CUP ON TOP

HSN1321H7

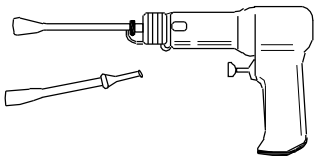
Fig 8



AIR BENCH

HSN1321H8

Fig 9



AIR CHISEL

HSN1321H9

Table 1 List the different types of tools and its application

Tool Name	Type of Tool (Hand/Power)	Record the usage of the tool

— — — — — — — —

Measurement of heat, illumination and noise demonstration

Objectives: At the end of this lesson you shall be able to
- **identify the tools to measure heat, noise and illumination inside the work-site**
- **demonstrate the usage of the tools to measure the same.**

Requirements	
Tools/Instruments	
• Specific Probe/ tools for measuring heat, noise and illumination - as reqd.	• Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

Note: The trainer will expose the trainees to the industrial site and ask them to notice the level of noise, heat and illuminant standards existing in the industry. The trainees will record the levels of noise, heat and illumination and suggest suitable protective measures if standard level is higher than the recommended levels.

Task 1: **Measurement of heat, noise and illumination**

1 Kindly measure the values of standards of heat, illumination and noise levels existing in the worksite

2 Note down the values and record it in the Table1 given below

3 Suggest for suitable protective measures if standard level is higher than the recommended levels.

Table 1 - Heat, noise and illuminant levels existing in the industry

Activity	Standard Level	Recommended Level	Suggestion for protection
Work area Illumination requirements Temperature ranges existing in work area Typical sound levels existing in the work area			

— — — — — — — —

Determination of related electrical experiments

Objectives: At the end of this lesson you shall be able to
- **identify the tools to measure electrical related checks at industry**
- **demonstrate the usage of the tools to measure the same.**

Requirements

Tools/Instruments

- Tools for measuring electrical related tests - as reqd.
- Electrical tools & instruments for measuring - as reqd.
- Sketches, A4 sheets & Pencils - as reqd.

PROCEDURE

Note: The trainer will expose the trainees to the industrial site and ask them to notice the basic equipments used to determine the electrical related studies. The trainees will be provided with the basic equipments and guidelines for measurement as well. They have to demonstrate the procedure for measurement.

Task 1: **Identify the safety checks to be observed during electrical measurement**

1 Provide the list of basic equipments used for electrical checks as shown below

2 Observe the guidelines for the measurement using the listed equipments and ask the trainees to demonstrate the same.

List of Basic Equipment: Demonstration of Electronic and Measurement Equipment

1 Function Generator
2 DC Power Supply
3 Oscilloscope
4 Multimeter
5 Power Supply

Construction site visit practices of good housekeeping and study of egress and safe access

Objectives: At the end of this lesson you shall be able to
- **identify the good practices happening in the site towards housekeeping**
- **demonstrate the direct safe and legal access and egress for employers in the site.**

Requirements

Tools/Instrument

- Identification of the house keeping practices to be followed at construction site
- Record the good practices and direct safe and legal access routes
- Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

Note: The trainer will take the trainees to the store and construction site and ask them to observe the house-keeping practices adopted in the particular site. The trainee could be asked to list down the same and demonstrate the direct safe and legal access and egress for employers during emergency.

Task 1: **Identify the good practices happening in the site towards housekeeping**

1 List down the good house-keeping practices to be adopted at construction site

_____
_____
_____-

2 Summarise the general hazards existing at construction site due to poor house-keeping

_____
_____
_____

3 Demonstrate the legal safe access routes available for the workers in the site during emergency

_____
_____
_____-

4 Demonstrate the egress routes available for the workers in the site during emergency

_____
_____
_____-

— — — — — — — —

Construction site visit and identifying of causes of accident during material handling

Objectives: At the end of this lesson you shall be able to
- **identify the causes of accidents at construction site during material handling**
- **provide the preventive measures and safety tools to avoid accidents.**

Requirements

Tools/Instrument

- Identification for the cause of accidents at construction site
- Record the preventive measures and safety tools to avoid accidents
- Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

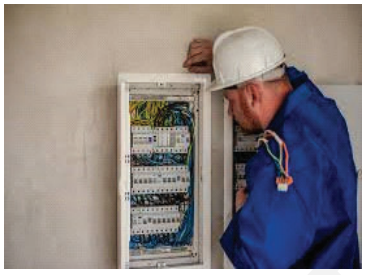
Note: The trainer will take the trainees to the construction site and ask them to observe the causes for accidents during material handling. The trainee could be asked to record and report the preventive measures to overcome the same.

Task 1: **Identify the causes of accidents at construction site during material handling**

1 Identify the cause for the accident provided below Table 1

2 Suggest suitable safety measures to avoid such accidents

Table 1 - Type of accidents

Images	Cause for the accident	Safety tips
		
		

Images	Cause for the accident	Safety tips
		
		
		

Construction site visit, pitching of ladders, proper use of safety belt and preparation of work permit

Objectives: At the end of this lesson you shall be able to
- **demonstrate the proper use of safety belts and preparation of work permit**
- **illustrate the OSHA standards for pitching of ladders at construction site.**

Requirements

Tools/Instrument

- Demonstrate the proper use of safety belts and preparation of work permit
- Illustrate the OSHA standards for pitching of ladders at construction site

PROCEDURE

Note: The trainer will take the trainees to the construction site and ask them to observe the proper use of safety belts and preparation of work permit. The trainee must be able to illustrate/sketch the standards for pitching up of ladder at construction site

Task 1: **Demonstrate the proper use of safety belts and preparation of work permit**

1 What do employer should consider while selecting ladder for working at height?

_____
_____
_____-

2 When does a employer could use a ladder?

_____
_____
_____

3 Demonstrate the safety tips to be followed while pitching up of ladder at construction site

_____
_____
_____

4 Demonstrate the use of safety belts at construction site

_____
_____
_____

5 Summarize the key steps involved in maintenance work using a permit

_____
_____
_____

— — — — — — — —

Visit to excavation site, identification and discussion with site engineer about safety precaution taken

Objectives: At the end of this lesson you shall be able to
- **identify the safety prevention to be take care at archeological site**
- **demonstrate the safety procedures to be done during emergency through the help of site engineer.**

Requirements

Tools/Instrument

- Identification of the potential hazards possible at excavation site
- Record the safety measures to prevent hazards at excavation site
- Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

Note: The trainer will take the trainees to the excavation site and ask them to observe the danger in the work area and also the safety measures to adopt. The trainee could be asked to identify the safety prevention routes to be taken care at the archeological site.

Task 1: **Identify the safety prevention to be take care at archeological site**

Exercise

1 Provide 10 important safety tips to prevent individual at excavation site

_____
_____
_____

2 Hazards at excavation area:

Hazards	Reason	Preventive measure
Electrocution		
Explosion		
Gas escape		
Flooding		
Ingress of water causing flooding		

3 State True or False for the following statements:

a Vehicles working too close to the side of the trench or rubble piled on the slides may cause collapse.

b Vehicles tipping into the excavation must use stop blocks.

4 Fill up the blanks:

a All excavations deeper than _____ must be shored or battered.

b Excavations deeper than _____ must have a guard rail or barrier.

Awareness and competence

Objectives: At the end of this lesson you shall be able to
- **describe about the topics for awareness**
- **outline the awareness on PPE equipment's.**

PROCEDURE

Task 1: **Describe about the topics for awareness**

1 Identify the topics for awareness

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	Awarness Topics	Precautions and Measures
1	Mental health and wellbeing	
2	Fire safety	
3	Snake safety	
4	Lighting safety	
5	Hazard-specific awareness	

— — — — — — — —

Task 2: **Outline the awareness on PPE equipment's**

1 Identify the PPE equipment and usage

2 Record the same it in the appropriate space provided in the Table 2.

Table 2

S.No	Name	Hazards	PPE used
1	For eg: Eyes	Chemical or metal splash, dust, projectiles, gas and vapour, radiation	Safety spectacles, goggles, face screens, faceshields, visors
2	Head and Neck		
3	Ears		
4	Hand and arms		
5	Feet and leg		
6	Lungs		
7	Whole body		

— — — — — — — —

Communication- Information flow within and outside the organization

Objectives: At the end of this lesson you shall be able to
- **discuss about the Communication-Information coming into the organization**
- **outline the information flow within the organization.**

PROCEDURE

Task 1: **Discuss about the Communication-Information coming into the organization**

1 Identify the sources of external communication and who is responsible for it.

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	Sources of Communication	Person In-charge of it	Responsibilities
1	**Eg:** Vendor or suppliers of gas or chemicals or PPE equipments	Purchase manager	Purchase of gas or chemicals.Issues related to purchase will be communicated to the vendor or supplier Maintaining database of it.
2			

— — — — — — — —

Task 2: **Outline the information flow within the organization**

1 Identify the different forms of information flow within the organization

2 Then, understand the organization structure and according to that draw the flow chart

3 Record the same it in the appropriate space.

Table 2

Downward communication (first understand the organization structure and draw the flowchart)

Table 3

Upward communication (first understand the organization structure and draw the flowchart)

Table 4

Horizontal flow communication (first understand the organization structure and draw the flowchart)

Communication- information flow within and outside the organization

Objectives: At the end of this lesson you shall be able to
- **discuss about the Communication-Information coming into the organization**
- **outline the information flow within the organization.**

Refer the exercise 1.4.29

Document control - safety and health system records

Objectives: At the end of this lesson you shall be able to
- **discuss about the risk assessment reports**
- **outline the Hazard management checklist**
- **brief about the general checklist and register needed for safety and health records.**

PROCEDURE

Task 1: **Discuss about the risk assessment report**

1 The document need for risk assessment is Basic workplace inspection checklist

2 Record the necessary items in the appropriate space provided in the Table 1.

Table - 1

Workplace Inspection Checklist

	Item	Yes	No	N/A
1	**Fire** - Extinguishers are in place - Are clearly marked - Have been serviced in the past 6 months - Area around extinguisher is clear for a 1 meter radius - Fire exit signs are in working order - Exit doors are not blocked - Exit doors can easily be opened - Fire alarm is in working order - Emergency plan is displayed - Emergency drill caried out within the last 6 months			
2	**Electrical** - No broken plugs, sockets or switches - No frayed or damaged leads - Portable power tools in good condition - No temporary leads on the floor - Testing and tagging of electrical items has been attended within the last 12 months			
3	**General Lighting** - There is adequate illumination in working areas - There is good natural lighting - There is no direct or reflected glare			

	Item	Yes	No	N/A
	- Light fittings are in good working condition and are clean - Emergency lighting is operational			
4	**Walkways** - No oil or grease - Walkways are clearly marked - Walkways are clear of obstructions - There is unobstructed vision at intersections - Stairs not blocked and are in good condition			
5	**Rubbish** - Bins are located at suitable points - Bins are not overflowing - Bins are emptied regularly			
6	**Work Benches** - Clear of rubbush - Tools are stored properly - Adequate work height - No sharp edges			
7	**Storage** - Materials stored in racks in a safe manner - Pallets are in good condition (no broken wood) - Floor around racking is clear of rubbish or obstacles - Racking is in good condition, no damaged uprights, beams etc			
8	**Chemicals** - SDS for all chemicals - SDS Register is available and up to date - Containers are clearly and accurately labelled - All chemicals are stored in accordance with the SDS			
9	**First Aid** - First aid kits and contents clean and orderly - First aid kit is adequately stocked (as per the Schedule in the kit) - Easy access to first aid kits - All employees are aware of location of first aid kits - At least one worker on site with current Senior First Aid cert			
10	**Floors** - Even surface with no large cracks, holes or trip hazards - Floors are not obstructed - Floors are free from grease,oil, etc			

	Item	Yes	No	N/A
11	**Office** - No exposed leads - Air conditioning working adequately - Filing cabinets are stable and in good repair - Workers' chairs at correct height (knees at right angles, feet flat) - Workers' monitors correct distance (arms length away when seated) - Workers' monitors correct height (eyes in line with top of screen) - Workers' mouse located beside keyboard (allows relaxed arms and wrists) - Workers' keyboard located near edge of desk (allows relaxed arms)			
12	**Machines** - Power equipment maintenance carried out - Power equipment clean - All guarding in place and interlocks working			
13	**Display Material** - WHS policy statement signed by Managing Director and displayed on notice boards - Return to work program signed by Managing Director and displayed on notice boards - "No smoking" signs are displayed - "Staff only" or "Restricted area" signs are displayed in relevant areas - "Report that Hazard" poster displayed - "Manual Handling" poster is displayed in warehouse area - Safety noticeboard is available and up to date			
14	**WHS Information** - WHS Manual available to workers - Incident report form available - Hazard report forms available - Emergency evacuation plan displayed - Training records up to date			
Additional comments or actions required:				
Signed: Date: Copies sent to:				

— — — — — — — —

Task 2: **Outline the Hazard management checklist**

1 The various hazard management checklist are Basic hazard register, chemical register and hazard report form

2 Record the necessary items in the appropriate space provided in the Table - 2,3 and 4.

Table 2

HAZARD CONTROL REGISTER									
Date	**Site**	**Identified Hazard**	**Control**	**Action Required**	**Action Taken**	**Completion Due Date**	**Quarterly Review Date**	**Annual Review Date**	**Comments**

Table 3

Chemical Register

Company Name

Company Address

Chemical Name	DG/GHS class	Poisons Schedule	Hazchem Code	Manufacturer	Uses	Total Quantity	SDS Expiry Date	**RA is n/a;n/r; Req.

— — — — — — — —

Task 3: **Brief about the general checklist and register needed for safety and health records**

1 The various hazard management checklist are PPE register for employees, basic induction checklist, contractor/visitor attendance record, employee qualification and site record, record of OHS meeting, safety harness checklist, signage audit tool and trainees attendance record

2 Record the necessary items in the appropriate space provided in the Table – 4 to 11

Table 4

Personal Protective Equipment (PPE) Issue Register

Employee Name: _____ Employee No. _____

Department: _____ Site Location: _____

Date of Employment: _____

PPE Item	Date of Issue/Replacement	Signature of Recipient *

* The signature indicates confirmation that the employee has received the listed PPE with appropriate instructions and training in its correct use.

Table 5

BASIC INDUCTION CHECKLIST

Name: _____ Site: _____

Employee Number: _____ Date of Induction:_____

Person conducting induction: _____

	Please tick	Yes	No	Comments
1	Introduction			
2	Organisational overview and site tour			
3	Outline of site rules (provide copy)			
4	Discuss OHS manual			
5	Emergency Procedures			
6	Incident Reporting			
7	Hazard Reporting			
8	First Aid			
9	Use of PPE			
10	Security and Access Arrangements			
11	Copy Qualifications/Licences			
12	Discuss Training Schedule			

This information has been provided to me:

_____ _____

Name and Signature of employee Dated

_____ _____

Name and Signature of witness Dated

Table 6

CONTRACTORS / VISITORS ATTENDANCE LOG

IN			CONTRACTOR OR VISITOR DETAILS						OUT		
DATE	**TIME**		**NAME**	**COMPANY REPRESENTED**	**PASS NO.**	**PERSON VISITED (or purpose of visit if Supplier or Contractor)**	**Safety Rules ISSUED**	**Mngr Or S/V Initial**	**TIME**	**Mngr Or S/V Initial**	
		am pm am pm am pm am pm am pm am pm am pm								am pm am pm am pm am pm am pm am pm am pm	

Table 7

Qualification and Licence Record

Name of employee: _____

Employee number: _____

Competency	Licence or Certificate	Date Attained	Expiry Date	Course Name
Eg. Forklift Operator	Forklift ticket	November 2007	November 2012	Forklift Operation

Table 8

Record of OHS Meetings

Chaired by: _____ Date: _____

Time meeting commenced: _____Time meeting concluded: _____

Attendees:

Apologies:

Agenda Items:
1. Workplace Inspection Report:
2. Review of objectives:
3. Hazard management and controls:
4. New hazards reported:
5. Accidents and investigations since last meeting:
6. General:

Corrective Action:	Action By:	Action Completed Date:	Action Sign Off

Reviewed by Managing Director: _____ (Signature)

_____ (Date)

Table 9

Harness Inspection Checklist

Item Description:

Model #

In Service Date:

Location:

Serial #

Date of Manufacture

Impact Indicator (where applicable)			
	Yes	No	Comment
Damaged Missing Deployed Reserve lifeline deployed if applicable			
Buckles			
	Yes	No	Comment
Cracked Poor function Missing Parts Corroded Burrs/sharp edges Bent/distorted Damaged			
Labels			
	Yes	No	Comment
Present and attached Legible			
D-Rings			
	Yes	No	Comment
Cracked Welded Bent/distorted Corroded Sharp Edges			

Labels			
	Yes	No	Comment
Present and attached Legible			
Connectors			
	Yes	No	Comment
Cracked Sharp edges Missing Parts Corroded Labelled / marked Bent / distorted Sticky Gates Stays open / Wont lock Excess dirt / grease Closes but doesn't lock Single Action (no lock on gate)			
Plastic Keepers			
	Yes	No	Comment
Missing Damaged			
D-Ring Plate (Back Pad)			
	Yes	No	Comment
Missing Damaged			
Stitching			
	Yes	No	Comment
Cut Broken Pulled Missing stitch patterns Burned			
Rope			
	Yes	No	Comment
Splice loose/ coming out Thimble loose / missing Inner core damage – voids Fraying			

showing through sheath			
Cuts / pulls in fibres			
Burns			
Knots			
Heat damage / glazing			
Bird caging			
Discolouration			
Dirt / grease			
Stretched /kinked			
5 full tucks on rope splice			
Paint / rust staining			
Wire Rope			
	Yes	No	Comment
Heat Damage			
Kinked			
Missing / Damaged thimble			
Loose termination			
Corrosion			
Distortion			
Broken Wires			
Separation of strands			
Abraded wires			
Birdcaging			
Webbing			
	Yes	No	Comment
Cuts/ tears / holes			
Burns			
Frays			
Knots			
UV Damage			
Grease/Grime			
Paint			
Discolouration			
Mould			
Missing / Damaged stitch pattern			
Heat damage / glazing			
Abrasion			

Additional comments:

Final appraisal (select one only)		**Overall Pass or Fail**
☐ % Clean and reinspect	☐ % Return to Service	☐ % Pass
☐ % Return to manufacturer	☐ % Remove from Service	☐ % Fail

Inspected By:	
Signature:	Date:

Table 10

Signage Audit Tool

Department: _____

Conducted by:_____

Date:_____

Purpose: The purpose of this signage audit tool is to assess the signage requirements for each Department and determine if the required signs are missing.

	YES	**NO**
Are the restricted access locations signed?		
Are the emergency exists clearly signed?		
Is the first-aid box clearly signed?		
Is the emergency shower and eye-wash properly signed?		
Is the fire fighting equipment correctly identified and signed?		
Does each fire extinguisher have a fire extinguisher sign?		
If so, is the sign 2 meters above the ground?		
Is there a sign immediately above each extinguisher denoting type of fires extinguisher can safely be used on?		
List what PPE is required in this Department?		
Comments:		
Is there signage outlining all of the PPE requirements?		
If no, what PPE signage is missing?		
Comments:		
Are there identified hazards that require appropriate signage? (refer to SOP's, injury statistics) eg danger signs, caution signs		
Comments:		

YES	NO	
Are there dangerous goods and are they signed? Are there any damaged signs that need replacing? Comments: Are there any confined spaces that require signage? Is there adequate signage for fire blankets? Are there any 'hand written signs' that need replacing? Comments:		

Has the Supervisor been advised of the signage requirements? **YES** **NO**

Name of Supervisor: _____

Date Advised: _____

Table 11

Training Attendance Record

Training Course: _____

Trainer: _____

Description of Course (or attach copy of training course) _____

_____

_____

_____

Date: _____

Trainer Signature: _____

Attendees Name **Signature**

Causes and classification of fire

Objectives: At the end of this lesson you shall be able to
- **discuss about the general causes and classification of fire.**
- **brief about the detection of fire**
- **outline about the extinguishing methods and firefighting installation with or without water.**

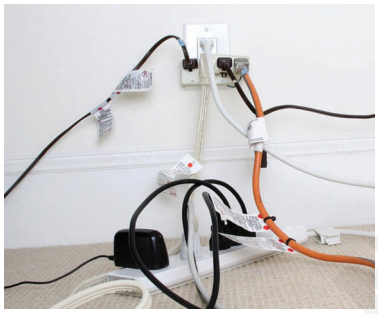
PROCEDURE

Task 1: **Discuss about the general causes and classification of fire**

1 Identify the general causes and classification of fire

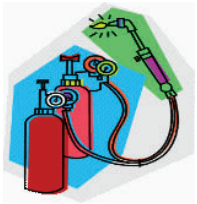
2 Record the same it in the appropriate space provided in the Table 1 and 2

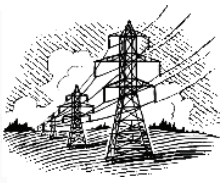
Table 1

S.No	General Causes of fire	Description
1	Eg. 	Faulty electrical appliances
2		
3		

S.No	General Causes of fire	Description
4		
5		

Table 2

S.No	Classification of fire	Items under the class
1	**CLASS A**    	
2	**CLASS B**    	

S.No	Classification of fire	Items under the class
3	**CLASS C**   	
4	**CLASS D** 	
5	**CLASS K** 	

— — — — — — — —

Task 2**: Brief about the detection of fire**

1 Identify the different fire detection devices and give the description about the devices

2 Record the same it in the appropriate space Table 3.

Table 3

S.No	Devices	Description
1	Eg: Thermal Detector 	• Fixed temperature detectors Has a defined value of temperature at which the internal sensing element must be heated before acting; • Thermo-velocimetric detectors This type of detector goes into alarm if the ambient temperature increases by 10° on every 5 minutes.

S.No	Devices	Description
2		
3		
4		
5		

— — — — — — — —

Task 3: **Outline about the extinguishing methods and firefighting installation with or without water**

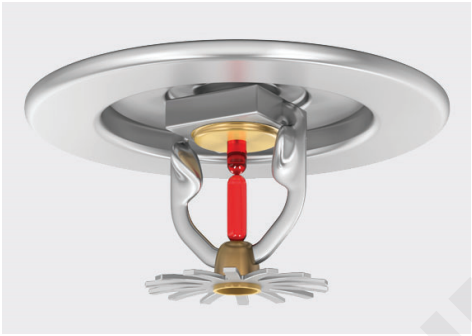
1 Identify the different fire extinguishing methods and firefighting installation with or without water

2 Record the same it in the appropriate space Table 4 and 5.

Table 4

S.No	Extinguishing method	Description
1	Cooling	
2	Starving	
3	Smothering	

Table 5

S.No	Types of Sprinkler system	Description
1	Wet pipe systems 	Wet pipe sprinklers are constantly filled with water. This allows them to quickly react should a fire occur. They are also the most commonly installed type of sprinkler in buildings.
2	Dry Pipe Fire Sprinkler System 	
3	Pre-Action Fire Sprinkler System 	
4	Deluge Fire Sprinkler System 	

Machine guards and its types, automation

Objectives: At the end of this lesson you shall be able to
- **identify the hazards caused by the machinery to the workers**
- **brief about the types of safeguarding**
- **outline about the types of guards and devices.**

PROCEDURE

Task 1: **Identify the hazards caused by the machinery to the workers**

1 Identify the hazards caused by the machinery to the workers

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	Hazardous Mechanical Motions and Actions	Description
1	Motions	
2	Rotating (including in-running nip points)	
3	Reciprocating	
4	Transversing Actions	
5	Cutting	
6	Punching	
7	Shearing	
8	Bending	

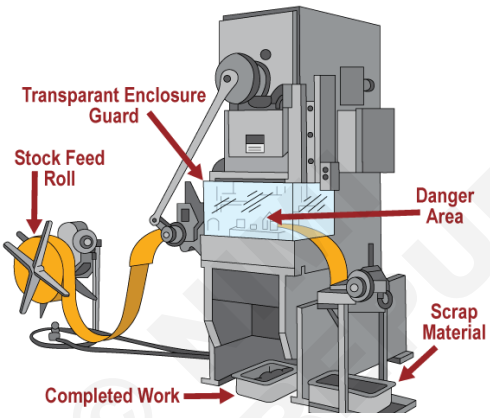
Task 2: **Brief about the types of safeguarding**

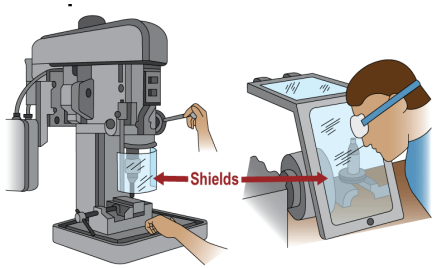
1 Identify the different types of safeguarding

2 Record the same it in the appropriate space Table 2.

Table 2

S.No	Safeguards	Description
1	Guards 	

S.No	Safeguards	Description
2	Devices 	
3	Machine Safeguarding by Location and Distance This dangerous equipment is located far above employees  **Power press with automatic feed**	
4	Feeding and Ejection Methods 	

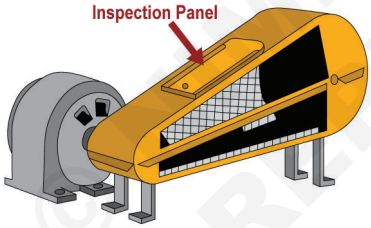
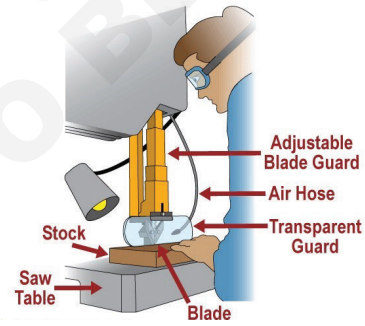
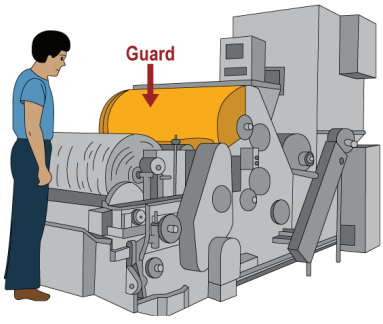
S.No	Safeguards	Description
5	Miscellaneous Aids  **Transparent shields on drill and lathe**	

Task 3: **Outline about the types of guards and devices**

1 Identify the types of guards and devices.

2 Record the same it in the appropriate space Table 3.

Table 3

S.No	Types of Guards	Description
1	**Fixed Guard Enclosing Belt & Pulleys** 	
2	**Adjustable Guard On Band Saw** 	
3	**Interlocked Guard On Picker Machine** 	

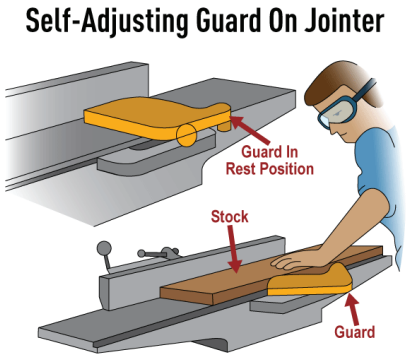
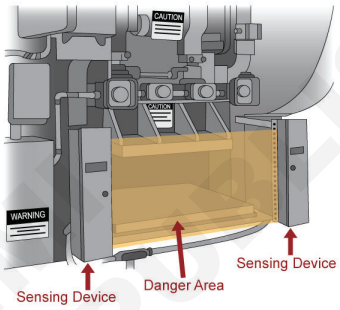
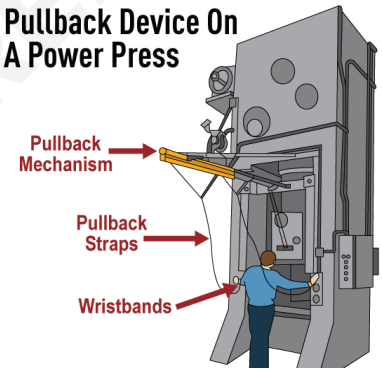
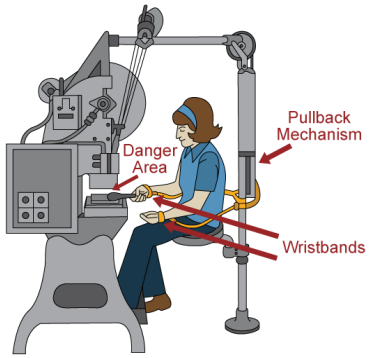
S.No	Types of Guards	Description
4		

Table 4

S.No	Types of devices	Description
1	Presence-Sensing Devices 	
2	Photo electric sensing 	
3	Restraint device 	

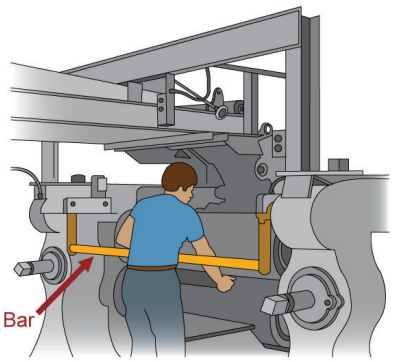
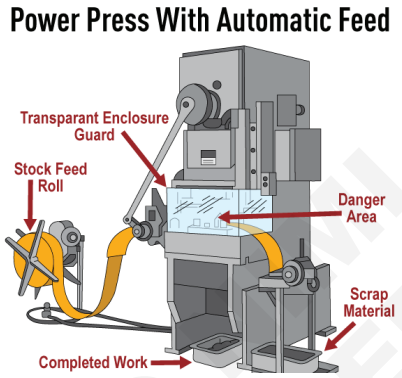
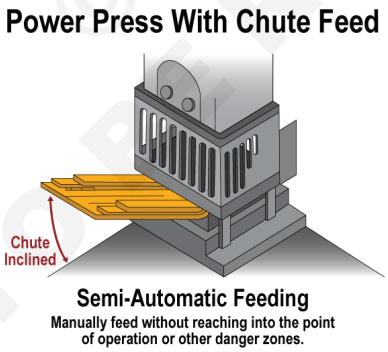
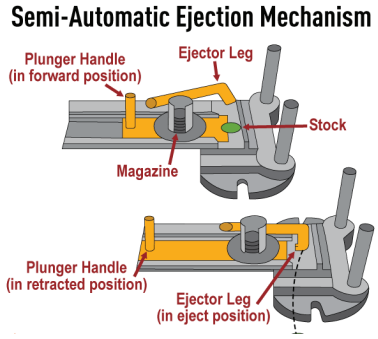
S.No	Types of devices	Description
4	Safety trip controls 	

Table 5

S.No	Types of feeding and ejection methods	Description
1		
2		
3		

High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and non-destructive testing, hazards and control in mines

Objectives: At the end of this lesson you shall be able to
- **identify the high pressure hazard areas**
- **brief about the inspection for pressure testing and repairing in hydraulic system**
- **outline about the Non-destructive testing methods**
- **discuss about the hazards and controls in mine.**

PROCEDURE

Task 1: **Identify the high pressure hazard areas**

1 Identify the high pressure hazard areas

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	High pressure hazard areas	Preventive measures
1	Eg: Gases trapped in body cavities	• Proper storage • Training & testing of personnel • Periodic inspections

— — — — — — — —

Task 2: **Brief about the inspection for pressure testing and repairing**

1 Identify the areas for pressure testing and repairing

2 Record the same it in the appropriate space Table 2 and Table 3.

Table 2

S. No	Description	Yes	No	N/A	Comments
1	Has the correct test pressure been identified?				
2	Is the design/working pressure of the vessel clearly known to all?				
3	If the test is pneumatic, was it impracticable to perform a hydraulic test? If so why?				
4	Is a competent person in charge of pressure testing?				
5	Has the correct Permit to Work been raised?				
6	Are there two independent methods of identifying the test pressure?				
7	Is the test pressure being applied gradually in 10% increments?				
8	Is proper leak detection being performed i.e. visually, soap test?				

S. No	Description	Yes	No	N/A	Comments
9	Is the test pressure being held at the correct pressure for one hour?				
10	What are the acceptance criteria for leaks e.g. usually less than1% loss in pressure over 1 hour?				
11	Have barriers and signs been installed at the correct location? For pneumatic testing this is 15m (for pressure <20 bar) and at25m (pressure>20 bar).				
12	Are all fittings protected with a shield to prevent injury to personnel in case of failure?				
13	For pneumatic tests has the pressure been reduced slightly (by 5%) before inspecting for leaks?				
14	Are appropriate safety / relief valves in position, calibrated andoperational?				

Table 3

S.No	Hydraulic system parts	Description	Repair actions for the parts
1	The reservoir		
2	Filters		
3	Coolers		
4	The pump		
5	Valves		
6	Actuators		
7	Pressure gauge		

— — — — — — — —

Task 3: **Outline about the Non-destructive testing methods**

1 Identify the Non-destructive testing methods 2 Record the same it in the appropriate space Table 4.

Table 4

S.No	Non- destructive testing methods	Description
1	Eg: Liquid Penetrant Testing	Liquid penetrant testing is one of the simpler methods used to detect defects in material. When a liquid dye penetrant is applied to a surface, it is drawn into any surface cracks or voids, thereby highlighting visible breaks in the structure.
2	Electromagnetic Testing	
3	Magnetic Particle Testing	
4	Ultrasonic Testing	
5	Thermal Infrared Testing	

— — — — — — — —

Task 4: **Discuss about the hazards and controls in mine**

1 Identify the Non-destructive testing methods

2 Record the same it in the appropriate space Table - 5

Table 5

S.No	Hazards	Control measures
1	Eg: Coal dust	• Mining companies need to develop a dust control plan, and supervisors should ensure that dust control systems are working properly for every production shift. • Mine workers should be trained on the hazards of over-exposure to coal mine dust. • Respiratory protection should be used when dust control protection is being installed, maintained or repaired. Medical screening and surveillance is also essential.
2	Noise	
3	Whole body vibration	
4	UV Exposure	
5	Musculoskeletal disorders	
6	Thermal stress	
7	Chemical hazards	

Identify training objectives, methods, deliver training

Objectives: At the end of this lesson you shall be able to
- **identify the different types of extinguishers**
- **identify the extinguisher types according to the fire.**

PROCEDURE

Task 1: **Identify the different types of extinguishers**

1 Identify the different types of extinguishers.

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	Type of Extinguisher	Description about the Extinguisher
1	Eg: Water Fire Extinguisher	The water released from the fire extinguisher soaks the burning materials, cooling them down and completely putting out the fire.
2	Foam Fire Extinguisher	
3	Carbon Dioxide Extinguisher	
4	Dry ChemicalExtinguisher	
5	Wet Chemical Extinguisher	
6	Dry Powder Extinguisher	
7	Clean Agent Extinguisher	

— — — — — — —

Task 2: **Identify the extinguisher types according to the fire**

1 Identify the extinguisher types according to the fire.

2 Record the same it in the appropriate space Table 2 and Table 3.

Table 2

S.No	Type of Extinguisher	Used for the class of fire	Dangerous if used for the class
1	Eg: Water Fire Extinguisher	Class A	they should not be used on Class B or C fires
2	Foam Fire Extinguisher		
3	Carbon Dioxide Extinguisher		
4	Dry ChemicalExtinguisher		
5	Wet Chemical Extinguisher		
6	Dry Powder Extinguisher		
7	Clean Agent Extinguisher		

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Evaluation and feedback, specialist advice & access to specialist advice and services

Objectives: At the end of this lesson you shall be able to
- **evaluation and feedback of fire assessment**
- **access to specialist advice and services.**

PROCEDURE

Task 1: **Evaluation and feedback of fire assessment**

1 Identify the criteria for fire risk assessment

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	Criteria	Description
1	Identify all fire hazards	Include: • sources of ignition • sources of fuel • sources of oxygen.
2	Identify people at risk	
3	Evaluate the risk and decide if existing fire safety measures are adequate - then remove, reduce and protect people from the risk wherever possible.	
4	Record, plan, inform, instruct and train	
5	Review	

— — — — — — — —

Task 2: **Access to specialist advice and services**

1 Identify the different specialist help in fire and safety services.

2 Record the same it in the appropriate space Table 2.

Table 2

S.No	Specialist	Description of Expertise
1	Ergonomists	Example: • Field of vision, sight lines • Manual handling/repetitive tasks • Workspace layout • Body size • Aspects of guarding and containment • Demands of tasks/equipment on people

S.No	Specialist	Description of Expertise
		• The equipment used and whether it is appropriate for the task • Effects of the physical environment, including lighting, temperature and humidity on people • Issues of fatigue and opportunities/defences for human failure.
2	Microbiologists	
3	Noise and vibration specialists	
4	Radiation protection advisers	
5	Specialist engineers	
6	Occupational hygienists	

— — — — — — — —

Relationships within the organization, relationships outside the organization, external specialist safety and safety support

Objectives: At the end of this lesson you shall be able to
- **outline of the organization structure in fire service department**
- **discuss about the relationship outside the organization of the fire service department.**

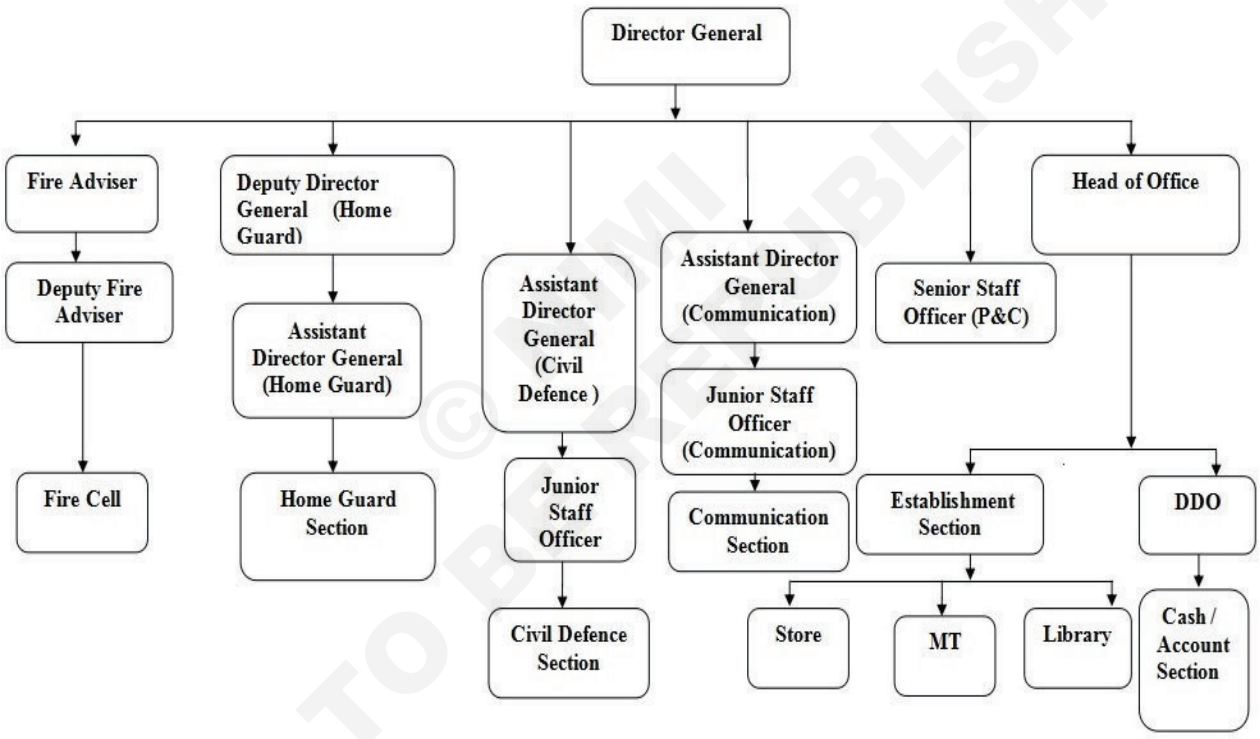
PROCEDURE

Task 1: **Outline of the organization structure in fire service department**

1 Identify the roles and responsibilities of the employees working in fire service department

2 Record the same it in the appropriate space provided in the Table 1.

Fig 1



ORGANIZATION CHART OF FIRE SERVICE DEPARTMENT

Table 1

S.No	Role	Responsibilities

Task 2: **Discuss about the relationship outside the organization of the fire service department**

1 Identify the wide range of bodies and individuals that have relation outside the organization of fire service department

2 Record the same it in the appropriate space Table -2

Table 2

S.No	Specialist	Description of Expertise
1	Local-authority Environmental Health Officers and licensing officials	
2	Contractors, architects, and design consultant	
3	Equipment suppliers	
4	Insurance companies	
5	Clients, customers, and the public	
6	General medical practitioners and occupational health physicians	
7	Occupational health specialists and services	

— — — — — — — —

Hose drill - hose pickup/hose laying/hose joining & hose replacement at different positions

Objectives: At the end of this lesson you shall be able to
- **identify the procedure for hose drilling**
- **perfume the hose drilling as per the procedure available from the video link.**

Requirements

Tools/Instrument

• Fire hose and hose fittings	- as reqd.	• Plan and execution of hose and hose fittings	- as reqd.

PROCEDURE

Note: Ask the trainees to analyse the detailed procedure for hose drilling as per the given links/video provided. Take the trainees to the industrial site nearby and ask the trainees are able to record/observe the same from the given video and perform it.

1 Capture the Video link: https://www.youtube.com/watch?v=1QR2oFoJGC0

2 Capture the video link: https://www.youtube.com/watch?v=E4FVmr8pvtM

3 Capture the video link : https://www.youtube.com/watch?v=uMpZee9-n10

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Risk assessment records, hazards and their remedial measures, Insurance policies for plant, demonstration of hydrant and its associated equipment, practical pump operation

Objectives: At the end of this lesson you shall be able to
- **identify the appropriate action.**
- **outline the risk assessment records and controls**
- **identify the hazards and their remedial measures**
- **enumerate about the insurance policies for plant**
- **demonstration of hydrant and its associated equipment**
- **explain about the operation of pump**
- **explain about ladders in fire operation.**

PROCEDURE

Task 1: **Identify the appropriate action**

1 Identify the types of hydrants

2 Record the same it in the appropriate space provided in the Table 1.

Table 1

S.No	Type of hydrant	Description
1	Sluice valve hydrant	
2	Screw down hydrant	

— — — — — — —

Task 2: **Outline the risk assessment records and controls**

1 Identify the risk assessment records and controls

2 Record the same it in the appropriate space Table - 2

Table 2

S.No	Risk assessment	Control measures

— — — — — — — —

Task 3: **Identify the hazards and their remedial measures**

1 Identify the hazards and their remedial measures.

2 Record the same it in the appropriate space Table 2.

Table 3

S.No	Type of hazard	Remedial measures

Task 4: **Enumerate about the insurance policies for plant**

1 Identify the types of insurance policies. 2 Record the same it in the appropriate space Table 4.

Table 4

S.No	Type of fire Insurance policies	Description
1	Valued Policy	
2	Specific Policy	
3	Average Policy	
4	Floating Policy	
5	Consequential Loss Policy	
6	Comprehensive Policy	
7	Replacement Policy	

— — — — — — — —

Task 5: **Demonstration of hydrant and its associated equipment**

1 Identify the hydrant and its associated parts. 2 Record the same it in the appropriate space Table 5.

Table 5

S.No	Hydrant gear parts	Characteristics
1	Frost valves	
2	False spindles	
3	Direction of opening	
4	Outlets	
5	Small gear	
6	Hydrant pit and cover	

— — — — — — — —

Task 6: **Explain about the pump operation**

1 Identify the sequence of pump operation. 2 Record the same it in the appropriate space Table - 6

Table 6

S.No	Pump operation	Characteristics
1	Getting to work from hydrant	
2	Getting to work from water	
3	Cooling systems	
4	Instrumentation (pressure and compound gauges, tachometers, water contents gauge, oil pressure gauge, fuel tank contents, engine coolant temperature, flowmeters)	
5	Estimation of required pump pressures	
6	Identification of faults	
7	Maintenance and testing	

— — — — — — — —

Task 7: **Explain about ladders in fire operation**

1 Identify the types of ladder

2 Record the same it in the appropriate space Table 7

Table 7

S.No	Types of ladder	Characteristics
1	Baby ladder	
2	Roof ladder	
3	Folding ladder	
4	Extension ladder	

— — — — — — — —

Risk assessment records, hazards and their remedial measures, Insurance policies for plant, demonstration of hydrant and its associated equipment, practical pump operation

Objectives: At the end of this lesson you shall be able to
- **identify the appropriate action.**
- **outline the risk assessment records and controls**
- **identify the hazards and their remedial measures**
- **enumerate about the insurance policies for plant**
- **demonstration of hydrant and its associated equipment**
- **explain about the operation of pump**
- **explain about ladders in fire operation.**

Refer the exercise 1.6.39

Maintenance of ladders and trolleys

Objectives: At the end of this lesson you shall be able to
- **identify the safe limits of operating ladders and trolleys**
- **identify the maintenance and care while operating ladders and trolleys.**

Requirements

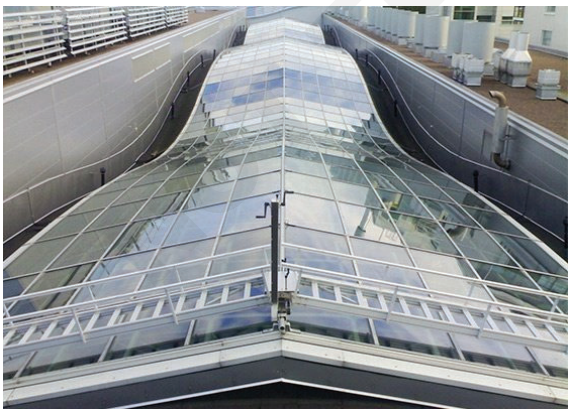
Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Electrical power distribution data - as reqd.

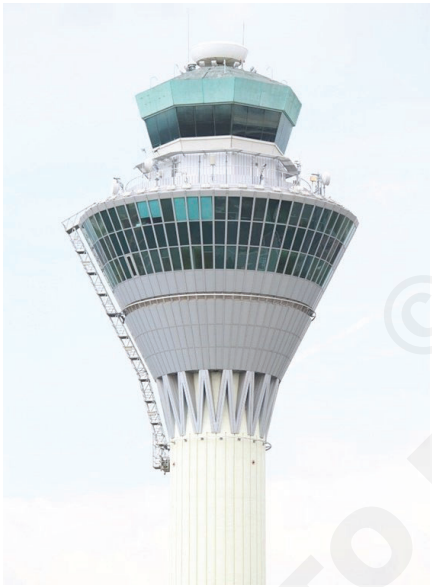
PROCEDURE

The trainer will teach the trainees regarding the safe limits of operating ladders and trolleys and also the maintenance and care while operating ladders and trolleys.

Task 1: **Identify the type of ladders used in the industry, demonstrate its safe limits and care to be taken towards its maintenance from the given table below**

S.No	Image of ladder	Type of ladder	safe limits	care of ladder
1				
2				

S.No	Image of ladder	Type of ladder	safe limits	care of ladder
3				
4				
5				

S.No	Image of ladder	Type of ladder	safe limits	care of ladder
6				
7				
8				

Design of turntable ladders, water tender and special equipment

Objectives: At the end of this lesson you shall be able to
- **design of turntable ladders, water tender and special equipment**
- **identify the precautions to be taken care for operating turntable ladders.**

Requirements

Tools/Instruments

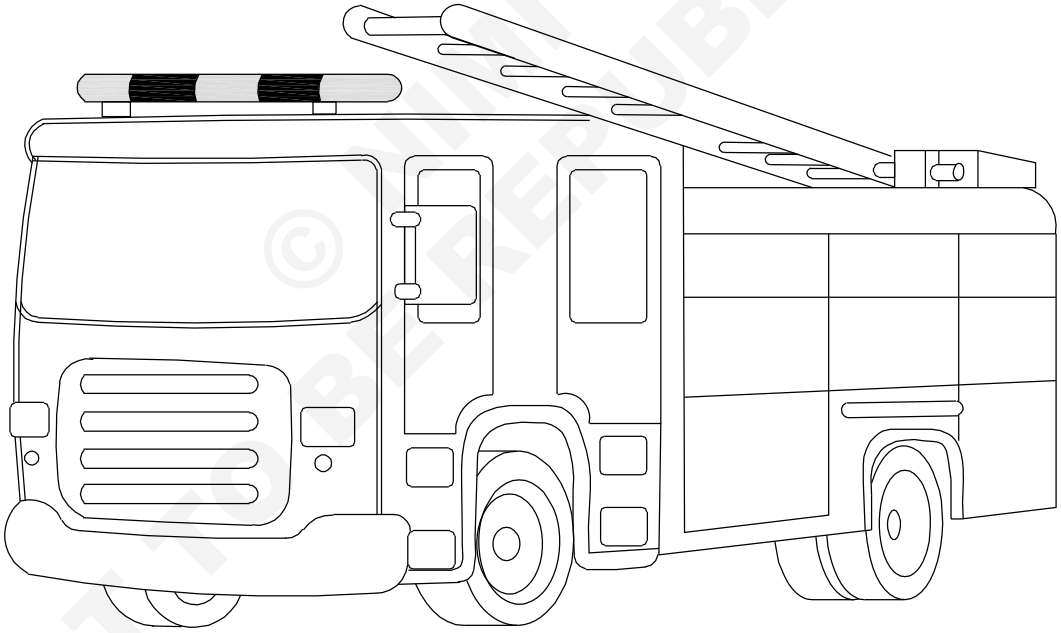
- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Electrical power distribution data - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the design of turntable ladders, water tender and special equipment and precautions to be taken care for operating turntable ladders

Task 1: **Demonstrate the design of turntable ladder used in the vehicle from the given below image**

Fig 1



TURNTABLE LADDER DESIGN VEHICLE

HSN1642H1

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Task 2: **List the precautions to be taken care for operating turntable ladders**

— — — — — — — —

Identify types of water relay system

Objectives: At the end of this lesson you shall be able to
- **identify the types of water relay system**
- **identify the preventive measures to be taken care in using water relay system.**

Requirements			
Tools/Instruments			
• Charts, A4 Sheets, Pencils, Paper	- as reqd.	• Electrical power distribution data	- as reqd.
• Safety measures	- as reqd.		

PROCEDURE

The trainer will teach the trainees regarding the types of water relay system and preventive measures to be taken care in using water relay system.

Task 1: **complete the inspection form of water tender system and provide your recommendations**

TABLE 1 – Inspection Form

Minimum Requirements	Pass	Fail
Agreement (One complete copy) (D.8) Check-In Process Completed (D.6.5.3) Equipment VIN/Serial # matches Resource Order (Schedule of Items) (D.6.3.1) RT-130 Fire Line Refresher including Fire Shelter (current):Completed Date: (D.3.1.1) OF-296 Vehicle/Heavy Equipment Pre-use Inspection Checklist completed (D.17) Equipment arrived at incident washed: (Debris and noxious weeds free) (D.15) Staffing / Personnel: Minimum of 2 crew members. All crew members have valid & current qualification cards and government pictured I.D. (D.3.1) (D.3.1.2) (Exhibit N) (Exhibit O) FFT1 (Name):_____		
FFT1 / FFT2 (Name):_____ Additional Personnel; see remarks (D.3.1.2) Brakes on all axles (D.2.1.2) All vehicles 36,000 GVWR or greater shall be ice brakes (i.e., engine retarder, transmission retarder, driveline retarder, or exhaust retarder) Company Name, Equipment I.D. # and DOT #: Affixed to both sides of truck cab (D.2.2.3) Programmable Radios: Minimum One Handheld. Also has two battery clamshells Fire Extinguisher: 2A 10BC, securely mounted to the vehicle, accessible to the operator and with current annual inspection tag (D.2.1.2) Wheel Chocks: 2 Each (Exhibit M) Audible reverse warning device (backup alarm)		

Minimum Requirements	Pass	Fail
First Aid Kit, 5 person minimum: 1 each (D.2.1.2) Flashlight (D.2.1.2) Seat Belts (D.2.1.2) Line Gear (I.A. Gear / Day Pack): Minimum of one per crew member (D.2.1.2) PPE: Boots Hard Hat Gloves Eye Protection Hearing Protection Headlamp with batteries (D.2.1.2) Flame Resistant Clothing: A minimum of two full sets of flame resistant shirt and pants certified to NFPA 1977 standard. (D.2.1) Tank: shall be firmly attached to chassis frame or structurally sound flat bed (D.2.1.2)		
Equipment Inventory: Permanently marked with vendor/company identification. Markings should be etched or engraved, painting or marking with permanent markers is not acceptable, in addition the vendor is to maintain a complete inventory list. (D.2.1.2) Live Hose reel 100' non-collapsible w/3/4" inside diameter Nozzle, combination Fog/Straight Stream, 1 ½ NH female Nozzle, Class A Foam, 1 ½" NH Female, min. 20 GPM at 100 PSI Spanner Wrench, combination 1 inch to 1 ½ inch Adjustable Hydrant wrench Adapters, 1 ½ inch NH female to 1 ½ inch NPSH male Adapters, 1 ½ inch NPSH female to 1 ½ inch NH male Reducers, 2 ½ inch NH female to 1 ½ inch NH male Reducer, 1 ½ inch NH female to 1" inch NPSH male Double Male 1 ½" NH Double Female 1 ½" NH Gate Y 1 ½" NH Fire Hose Clamp 2 ½" 1 ½" cotton/synthetic hose NH thread 2 ½" cotton/synthetic hose NH thread Fu see's (Fire starter) All Pumps shall have a discharge pressure gauge (D.2.1.2) Pump: Pump Type Auxiliary or Power Take Off		
Suction Hose, with strainer or screened foot valve Foam Proportioner System: (D.2.1.2.2) Foam: Minimum 5 gallons		
Spray Bar head(s) operational: (D.2.1.2) (Exhibit J) (Exhibit M) Spray Bar Configuration: Front Rear Both Gravity Pressure 47 1 – 2 ½" Discharge outlet NH thread 48 2 – 1 ½" Discharge outlet NH thread 49 4" Gravity Dump valve on rear of tank (D.2.1.2.2) 50 2 ½" Valve at bottom of tank with NH threads		

Task 2: **List down the preventive measures to be taken care in using water relay system**

1 5

2 6

3 7

4 _ _ _ _ _ _ _ _

Arrangements of water relay system

Objectives: At the end of this lesson you shall be able to
- **identify the safe limits of water relay system**
- **identify the arrangements of water relay system.**

Requirements	
Tools/Instruments	
• Charts, A4 Sheets, Pencils, Paper - as reqd. • Safety measures - as reqd.	• Electrical power distribution data - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the safe limits and arrangements of water relay system

Task 1: **List down the safety limits to operate water relay system**

1
2
3
4
5
6
7
8
9
10

— — — — — — — —

Task 2: **Identify the setup/arrangement of water relay system through different process under the table 1**

There are two types of water relays commonly referred to and used:

1 Closed-circuit water relay, in which the water is pumped through hose direct from one pump to the next.

2 Open-circuit water relay, in which water is pumped through hoses through portable dams placed between pumps.

Table 1 - Types of water relay system

Closed circuit water relay	Open circuit water relay
Eg: the water is pumped through hose direct from one pump to the next.	Eg: water is pumped through hoses through portable dams placed between pumps.

— — — — — — — —

Stages in plant life and unsafe condition in factories

Objectives: At the end of this lesson you shall be able to
- **sketch the stages existing in plant life and**
- **categorise the unsafe condition in factories for employees.**

Requirements			
Tools/Instrument			
• Charts, A4 Sheets, Pencils, Paper	- as reqd.	• Safety of the employees	- as reqd.

PROCEDURE

Task 1: **The trainee might take the trainers to the industrial site and ask them to observe the various classes of the plant equipment**

1 Illustrate the various classifications of the plant equipment using a suitable chart

2 Illustrate the classification of plant protection equipments using a suitable chart

— — — — — — — —

Task 2: **Unsafe working conditions in factories**

1 The trainee will identify the reason/cause for the unsafe working conditions existing in factories and able to provide suitable measures to overcome the same.

Unsafe working conditions	Reason	Suitable measure
Defective equipment		
Inadequate guards		
Fire hazards		
Workplace congestion		
Hazardous air conditions		
Lack of cleaning		
Poor house-keeping		

— — — — — — — —

Maintenance & safety, basics safety programming, safety department, rules and regulation of safety department

Objectives: At the end of this lesson you shall be able to
- **identify the necessary maintenance provided in an organization for employee safety**
- **demonstrate the rules and regulations of safety department and safety programming.**

PROCEDURE

Task 1: **Identify the necessary maintenance provided in an organization for employee safety**

1 The trainer need to identify the safe maintenance in practice followed to ensure employee safety in an organization.

2 Ask the trainee to provide the details pertaining to the subject area as show in the table shown below.

Table 1 - Safe maintenance in practice sheet at work

Subject	Organization name and address	Safety Intitiatives	Result	Success Factor
Safety and Health Management Prevention by design Remote controlled maintenance management system Risk assessment Code of good practice Working at height Training Information Chemical hazards Asbestos Stress Prevention by design				

— — — — — — — —

Task 2: **Demonstrate the major five responsibilities/activities as described by OSHA for safety**

1 Provide a workplace that is free from serious safety and health hazards

2 Monitor the workplace to ensure employees follow safety in manufacturing

3 Getting The Safety Responsibility Done

4 Improve safety in Manufacturing Facilities with Good Signage

5 Note Safety Violations with Clear Tags

— — — — — — — —

Responsibility of management for safety in plant, safe guards the public

Objectives: At the end of this lesson you shall be able to
- **demonstrate the responsibilities of a management for ensuring safety in plant**
- **provide the necessary measures towards safe-guarding the public.**

PROCEDURE

Task 1: **Demonstrate the responsibilities of a management for ensuring safety in plant**

TABLE 1 – Safety Management Sheet

Key Elements	Responsibility	Role Of The Job	Results/Implementation
Policy Setup			
Organising Staff			
Setting Standards			
Performance Measure			
Review/Actions If Any			

— — — — — — — —

Task 2: **List down the monitoring measures taken by the management to ensure safety of the public**

1 Active Monitoring

_____
_____
_____-

2 Reactive Monitoring

_____
_____
_____

— — — — — — — —

Responsibility of government, social organization and public authorities

Objectives: At the end of this lesson you shall be able to
- **demonstrate the responsibilities of a government towards the safety of the workers**
- **provide the necessary steps to be governed by the social organization and public authorities.**

PROCEDURE

Task 1: **Demonstrate the responsibilities of a government towards the safety of the workers**

1 The responsibility that OSHA imposes on employers for their workers' safety depends on the employment relationship between the two. Different employment relationships bring different responsibilities.

2 The trainee needs to identify and demonstrate the necessary steps imposed by the government for employee safety.

TABLE 1

Work place safety measures taken by govt for different employees

Employee Type	Safety Measures Applicable	Implementation	Benefits
Loaned Employee Leased equipment and operators Temporary employees Independent contractors Partners			

Visit to work-shop and steel furniture houses to witness various processes during production and safety

Objectives: At the end of this lesson you shall be able to
- **identify the type of safety measures to be adopted during production at workshop and steel industry**
- **demonstrate the various preventive measures followed towards the safety of the workers.**

Requirements

Tools/Instrument

- Identification of the safety tools to be practiced in workshop and steel furniture houses
- Record the preventive measures to be used for safety
- Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

Note: The trainer will take the trainees to the workshop and steel furniture house and show them various types of safety measures required at the work area. The trainees need to identify preventive measures to overcome the injury at work-area and record the same

Task 1: **Identify the most common causes of safety incidents and preventive measures**

1 Identify the cause for the incident listed below

2 Reason out the nature of cause

3 Record the preventive measures to be taken care under given Table 1.

Table 1 Safety incidents and preventive measures

Common Cause	Reason for the cause	Preventive measures
Moving machinery		
Falling from height		
Falling objects		
Onsite-traffic		
Process safety incident		
Lifting		
Lighting		
Violence		
Trips/Falls		
Stress		
Fatigue		
Lack of preparation		
Poor Housekeeping		
Mental Distractions		
Shortcuts		

Visit to construction site to witness and safety precaution observed

Objectives: At the end of this lesson you shall be able to
- **identify the type of safety measures to be witnessed at construction site**
- **demonstrate the various preventive measures followed towards the safety of the workers.**

Requirements

Tools/Instrument

- Identification of the safety tools to be practiced in construction site
- Record the preventive measures to be used for safety
- Sketches/Pencils & A4 sheets - as reqd.

PROCEDURE

Note: The trainer will take the trainees to the construction site and show them various types of various types of safety measures required at the work area. The trainees need to identify preventive measures to overcome the injury at work-area and record the same

Task 1: **Identify the most common causes of safety incidents and preventive measures**

1 Identify the cause for the incident listed below

2 Reason out the nature of cause

3 Record the preventive measures to be taken care under given Table 1

Table 1 -Safety incidents and preventive measures

Common Cause	Reason for the cause	Preventive measures
Falls (from heights) Trench collapse Scaffold collapse Electric shock and arc flash/arc blast Failure to use proper personal protective equipment Repetitive motion injuries Improper Scaffolding Fall from greater height Improper Excavations Strips, trips and falls Crane malfunction Improper hazard Communication Forklifts Head injury		

Earthing standards and earth fault protection, protection against voltage fluctuations

Objectives: At the end of this lesson you shall be able to
- **identify the body structure and functions and accidents caused by electricity**
- **demonstrate the position, rescue and transport of causality.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the body structure and functions and accidents caused by electricity and also ask the trainee to demonstrate the position, rescue and transport to causality.

Task 1: **Identify the use of PPE that may be needed for a variety of tasks that have potential hazards as per the given format below Table 1 and fill up the same**

Table 1 – Selection of PPE for laboratory, shop and maintenance worker

Task	Potential Hazard	Controls	PPE
Ex: Working with low hazard chemicals when a low probability of splash exists	Skin and eye irritation	Fume hood, local exhaust, good general ventilation, enclose process	Safety glasses Light Lab coat, closed shoes, long pants, long skirt or equivalent leg covering (no shorts)
Working with small volumes of human blood, body fluids or other potentially infectious materials (OPIM) as defined in the UW Blood borne Pathogen Exposure Control procedures.	Potentially infected with infectious disease (BBP) Potential spread of infectious disease	Biological safety cabinet (BSC)	Safety glasses Disposable nitrile gloves Lab coat, closed shoes, long pants, long skirt or equivalent leg covering (no shorts)
Working with radioactive chemicals (corrosives, solvents, toxics, etc.)			
Working with cryogenic liquids			
Working with very cold materials and equipment (freezers, dry ice)			
Working with acutely toxic hazardous powders.			

Task	Potential Hazard	Controls	PPE
Working with Ultraviolet Radiation Working in Industrial lab with potential injury from falling equipment or tools (ex. Earthquake lab, Structural Engineering lab, etc.) Power Plant Work Torch Soldering			

— — — — — — — —

TASK 2: **Demonstrate the position, rescue and transport of causality**

1 PPE selection should be based on a job hazard analysis (JHA), which includes evaluation of hazards, specific tasks, procedures and work practices, in consultation with area supervision and EH&S as needed.

2 Please fill the specific type, characteristics and applications of PPE represented below in Table 2.

Table 2 – Type, characteristic and application of PPE

PPE	Specific type	Characteristics	Applications
Ex: Disposable sleeves		Disposable clothing and skin protection, protection from particulates Some sleeve materials are coated for chemical resistance.	Working with particulates or potent compounds
Safety (visibility) vest		Colorful and/or reflective	Construction sites, traffic hazard areas, emergency response.
Cooling vest Flame resistant coveralls Reflective clothing Aprons Leather apron, jacket,coveralls and sleeves Lab coats (knee length) Cooling vest Tyvek gown/ coveralls Disposable gowns Scrubs			

Cardiac massage, poisoning, wounds

Objectives: At the end of this lesson you shall be able to
- **demonstrate the cardiac massage and seriousness of poisoning**
- **identify the type of wounds and safety measures to overcome the same.**

Refer the exercise 1.1.03

Criteria in their selection, installation, maintenance

Objectives: At the end of this lesson you shall be able to
- **identify the need, selection, use, care and maintenance of personal protection**
- **apply the PPE for head, ear, face, eye, foot, knee and body protection & respiratory issues.**

Requirements			
Tools/Instruments			
• Charts, A4 Sheets, Pencils, Paper	- as reqd.	• Safety measures	- as reqd.

PROCEDURE

The trainer will teach the trainees regarding the need, selection, use, care and maintenance of personal protection and apply the PPE for the workers.

Task 1: **Identify the application of ppe according to the body part and hazards in the below table 1**

Table 1 – Type of Body part, its hazard and PPE required

Body Part	Hazard	PPE necessary
Head		
Eye		
Ear		
Nose		
Face		
Hand		
Body		
Foot/Leg		
Overall		

— — — — — — — —

Task 2: **Selection and use of eye and face protective equipment -fill the details represented in the table 2 below**

Table 2 – Eye and Face Personal Protective Equipment (PPE)

Source	Type of Hazard	Safety Glasses	Safety Goggles	Welding	Laser	Face shied

— — — — — — — —

Task 3: **Fill the following table 3 representing the protection, source and typical occupations**

Table 3

PPE requirement for various protection

Protection	Source(s)	Typical Occupations

— — — — — — — —

Plant layout, design and safe distance, ventilation and heat stress, significance of ventilation, natural ventilation

Objectives: At the end of this lesson you shall be able to
- **demonstrate the plant layout; design and safe distance**
- **provide the measures for setting up ventilation in the work area.**

Requirements

Tools/Instruments

• Charts, A4 Sheets, Pencils, Paper	- as reqd.	• Plant layout plan	- as reqd.
• Safety measures	- as reqd.	• Housekeeping procedures	- as reqd.

PROCEDURE

The trainer will teach the trainees regarding the plant layout designing and safe distance, ventilation and heat stress at workplace area and the trainee should able to demonstrate the same.

Task 1: **Observe the images provided below and demonstrate the ventilation setup in work area (Fig 1 to 3)**

Fig 1

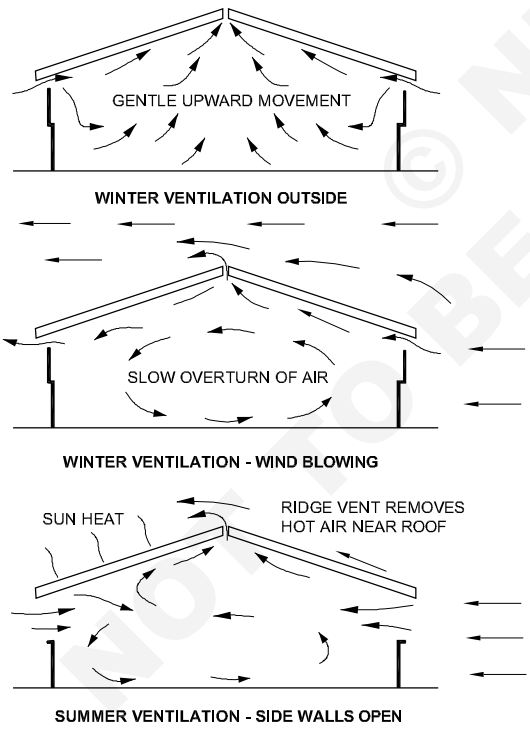


Fig 2

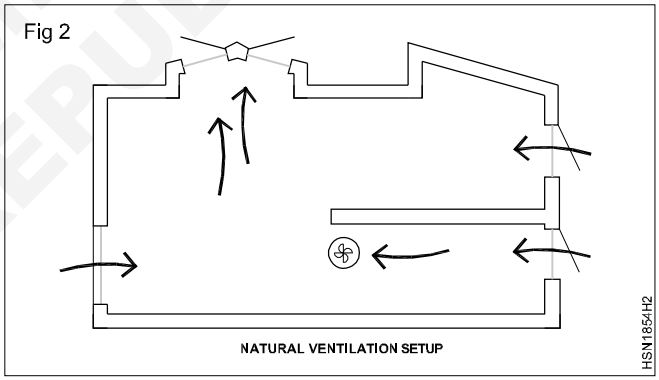
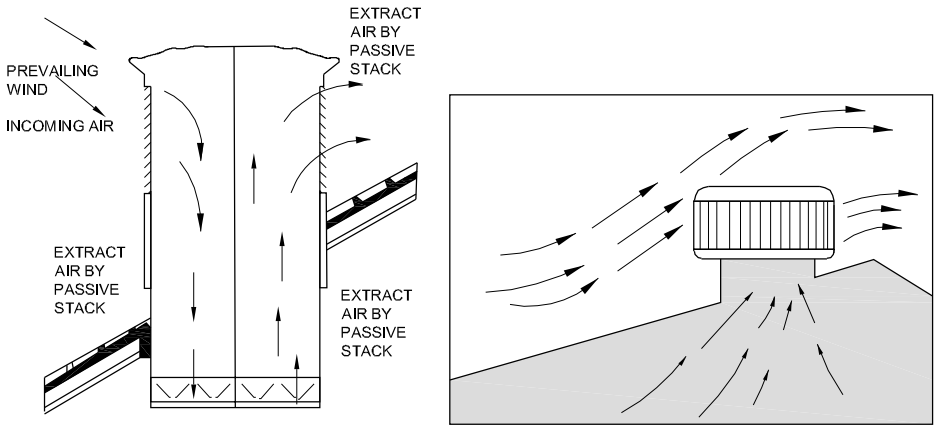


Fig 3



FUNDAMENTAL SETUP OF VENTILATION IN WORK AREA

— — — — — — — —

Task 2: **Provide the guidelines for Plant Design Setup as per the given table below**

Table 1 Examples of plant functions and limits

Plant function	Examples
Use Space Time Environment Interface	

Table 2 Things to identify plant hazards

Hazards	
Suitability	
Access	
Location	
Systems of work	
Unusual situations	

Table 3 Examples of plant hazards and phases of the plant lifecycle

Potential Hazards	Phases of the plant lifecycle

— — — — — — — —

Mechanical ventilation and air conditioning

Objectives: At the end of this lesson you shall be able to
- **demonstrate the measures for mechanical ventilation**
- **provide the measures for setting up air conditioning.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Air conditioning guidelines - as reqd.
- Mechanical ventilation procedure - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the measures for mechanical ventilation and provide the measures for setting up air conditioning.

Task 1: **Demonstrate the measures for mechanical ventilation**

1 List down the mechanical ventilation systems available for plant and provide the safety measures to operate the same

_ _ _ _ _ _ _ _ _

Task 2: **Provide the measures for setting up air conditioning**

1 List down the guidelines for setting up air-conditioning in the plant and provide the safety measures to operate the same

_ _ _ _ _ _ _ _ _

Safety and good housekeeping, disposal of scrap and other trade wastes

Objectives: At the end of this lesson you shall be able to
- **demonstrate the safety measures and good housekeeping**
- **provide the measures for disposal of scrap and other trade wastes.**

Requirements

Tools/Instruments

• Charts, A4 Sheets, Pencils, Paper	- as reqd.	• Scrap waste	- as reqd.
• Safety measures	- as reqd.	• Trade wastes	- as reqd.

PROCEDURE

The trainer will teach the trainees regarding the safety measures and good housekeeping activities and also provide the measures for disposal of scrap and other trade wastes

Task 1: **Demonstrate the safety measures and good housekeeping**

1 Check off your housekeeping programme against this checklist. Better still, make a more comprehensive list of your own.
   - Buildings
   - Floors
   - Aisles
   - Machinery and Equipment
   - Stock and Material

— — — — — — — —

Task 2: **Provide the measures for disposal of scrap and other trade wastes**

1 List down the guidelines for disposal of scrap and other trade waste and overall waste management strategies to be followed in the plant

2 The following aspects/streams could be considered for disposal of wastes in work area
   - Prevention
   - Preparation for reuse
   - Recycling
   - Other recovery
   - Disposal
   - General refuse
   - Paper
   - Production scrap
   - Construction waste
   - Special wastes

— — — — — — — —

Spillage prevention, use of colour as an aid of housekeeping, cleaning methods

Objectives: At the end of this lesson you shall be able to
- **demonstrate the prevention of spills**
- **use of color as an aid of housekeeping and provide methods for cleaning.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Scrap waste - as reqd.
- Trade wastes - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the spillage prevention and also usage of color as an aid of housekeeping and also should able to teach use of color as an aid of housekeeping and provide methods for cleaning.

Task 1: **Demonstrate the prevention of spills**

1 Prepare a report any oil spill that cannot be completely contained and cleaned up, regardless of amount, if it discharges into a storm drain, culvert, creek, bay, the ocean, or any outdoor soil or paved surface by contacting.

— — — — — — — —

Task 2: **Use of color as an aid of housekeeping and provide methods for cleaning**

1 Identify the range of colors used for cleaning different departments in executing particular job namely,

- Red
- Yellow
- Green &
- Blue
- Pink
- Orange
- Purple
- Grey
- Black and
- White

— — — — — — — —

Task 3: **Clean methods for good housekeeping**

1 List down the cleaning methods adopted for good housekeeping in a work area department under the Table 1.

Table 1 Cleaning methods for good housekeeping

Manual Cleaning methods	Mechanised Cleaning methods

— — — — — — — —

Inspection and checklists, advantages of good houses

Objectives: At the end of this lesson you shall be able to
- **demonstrate the inspection to be carried out for good house keeping**
- **provide the merits of good housekeeping.**

Requirements

Tools/Instruments

• Charts, A4 Sheets, Pencils, Paper	- as reqd.	• Scrap waste	- as reqd.
• Safety measures	- as reqd.	• Trade wastes	- as reqd.

PROCEDURE

The trainer will teach the trainees regarding the safety measures and good housekeeping activities and also provide the measures for disposal of scrap and other trade wastes.

Task 1: **Demonstrate the inspection to be carried out for good house keeping**

1 Provide the inspection checklist to be carried out for good house – keeping activities

— — — — — — — —

Task 2: **Provide the merits of good housekeeping**

1 List the mertis of good house-keeping practices in a department

— — — — — — — —

Demonstration of prevailing condition in industry about drinking water, sanitary & washing, cloakrooms facilities for food & drink shelters & living accommodation

Objectives: At the end of this lesson you shall be able to
- **demonstrate the prevailing conditions in industry about drinking water**
- **demonstrate the sanitary and washing, cloakroom facilities for food and drink shelters**
- **demonstrate the living accommodation.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety of the employees - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the prevailing conditions in industry about drinking water and demonstrate the sanitary and washing, cloakroom facilities for food and drink shelters and living accommodation

Task 1: **Identify the drinking water standards provided for workers based on the following standards**

1 The Central Water Commission provides a classification of the tolerance limits for inland surface waters for the various classes of water use.

2 As per ISI-IS: 2296-1982, the tolerance limits of parameters are specified as per classified use of water depending on various uses of water.

3 The following classifications have been adopted in India –

- Class A: Drinking water source without conventional treatment but after disinfection
- Class B: Outdoor bathing
- Class C: Drinking water source with conventional treatment followed by disinfection.
- Class D: Fish culture and wild life propagation
- Class E: Irrigation, industrial cooling or controlled waste disposal

— — — — — — — —

Task 2: **Identify the sanitary and washing and cloakroom facilities in industry and fill up the details under Table 1**

TABLE 1 - sanitary and washing

No of employees at work	No of men at work	No of urinals	No of toilets	Minimum no of water closets	No of wash basins
1-15					
16-35					
36-55					
56-80					
81-110					
111-150					
Over 150					

— — — — — — — —

Task 3: **Demonstrate the living accommodation facilities for workers based on the below recommendations in industry**

1 All temporary accommodation made available to workers must satisfy the following minimum quality standards

- The room must measure at least 10 - 12 square metres. If a room is smaller than this, a shared living room is usually available or a lower rental fee will apply.
- The room must be furnished and contains at least one bed (including a duvet and a pillow), a cupboard, a desk, a chair and curtains. Bed linen must be included, it may be necessary to pay a separate fee to the housing agency for this facility.
- Shared facilities must include at least a kitchen, a shower/bathroom, a toilet and a washing machine. In some cases, an additional fee is charged fot use of the washing machine.
- Access to the Internet must be available (not necessarily wireless).
- The distance from the accommodation to the Fontys campus must be no further than a 30-minute bicycle ride.
- The rental fee must include access to the Internet and average usage of energy and water.

2 All Permanent accommodation buildings must satisfy minimum building permit standards and meet other amenity requirements, including (For example)

- Durability of external and internal construction materials sufficient for the life of the accommodation without requiring major repair or reconstruction
- Structural soundness sufficient to satisfy the intended building loadings
- Protection from fire with the provision of adequate fire safety standards such as smoke alarms and emergency exits
- Defined living standards such as minimum space per bed, ventilation, air-conditioning, power points, storage lockers, and a minimum number of facilities such as toilets, bathrooms, kitchens and laundries
- Amenities and services for residents such as medical aid, indoor and outdoor recreational facilities, television rooms, internet facilities, and access to shops for personal needs

— — — — — — — —

Disaster management floods, earth-quake, cyclone and slides, role of individual in prevention of pollution

Objectives: At the end of this lesson you shall be able to
- **demonstrate the safety measures for disaster management, floods and earthquake**
- **demonstrate the safety measures for cyclone and slides**
- **demonstrate the role of individual in prevention of pollution.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety of the employees - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the safety measures for disaster management, floods and earthquake and the safety measures to be adopted during cyclone and slides and also teach the role of individual prevention of pollution.

Task 1: **Develop an emergency action plan for workers during earthquake**

1 When to evacuate

- If emergency response authorities indicate specifically to do so.
- If emergency response authorities indicate there is time to do so.
- If you can reach a safe location before an event is expected to occur.
- When environmental conditions would not expose evacuees to a dangerous environment.

2 Evacuation plans should include

- Conditions under which evacuation would be necessary (considering the above information);
- When sheltering in place may be a better alternative;
- A clear chain of command and designation of the person in workplace authorized to order an evacuation;§Specific evacuation procedures, including routes and exits;
- Specific procedures for employers and workers in high-rise buildings (if applicable);
- Procedures for assisting visitors and workers in evacuating, particularly those with disabilities or who do not speak English;
- Designation of which, if any, workers will remain after an evacuation alarm to shutdown critical operations or perform other duties before evacuating; and
- Special equipment for workers, including personal protective equipment and respiratory protection (e.g., escape respirators), if needed.

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Task 2: **Develop an emergency action plan for workers during floods based on the following standards**

1 Having an evacuation plan in place before a flood (or any emergency) occurs can help avoid confusion and prevent injuries and property damage. A thorough evacuation plan should include:

- Conditions that will activate the plan.
- Chain of command.
- Emergency functions and who will perform them.
- Specific evacuation procedures, including routes and exits.
- Procedures for accounting for personnel, customers and visitors.
- Equipment for personnel.
- A review of the plan with workers.

— — — — — — — —

Task 3: **Develop an emergency action plan for workers during cyclone and slides**

1 BEFORE THE CYCLONE SEASON

- Check with your local council or your building control authority to see if your home has been built to cyclone standards.
- Check that the walls, roof and eaves of your home are secure.
- Trim treetops and branches well clear of your home (get council permission).
- Preferably fit shutters, or at least metal screens, to all glass areas.
- Clear your property of loose material that could blow about and possibly cause injury or damage during extreme winds.
- In case of a storm surge/tide warning, or other flooding, know your nearest safe high ground and the safest access route to it.
- Prepare an emergency kit containing:
  - a portable battery radio, torch and spare batteries;
  - water containers, dried or canned food and a can opener;
  - matches, fuel lamp, portable stove, cooking gear, eating utensils; and
  - a first aid kit and manual, masking tape for windows and waterproof bags.
- Keep a list of emergency phone numbers on display.
- Check neighbours, especially if recent arrivals, to make sure they are prepared.

2 WHEN A CYCLONE WATCH IS ISSUED

- Re-check your property for any loose material and tie down (or fill with water) all large, relatively light items such as boats and rubbish bins.
- Fill vehicles' fuel tanks. Check your emergency kit and fill water containers.
- Ensure household members know which the strongest part of the house is and what to do in the event of a cyclone warning or an evacuation.
- Tune to your local radio/TV for further information and warnings.
- Check that neighbours are aware of the situation and are preparing.

3 WHEN A CYCLONE WARNING IS ISSUED

1 Depending on official advice provided by your local authorities as the event evolves; the following actions may be warranted.

- If requested by local authorities, collect children from school or childcare centre and go home.
- Park vehicles under solid shelter (hand brake on and in gear).
- Put wooden or plastic outdoor furniture in your pool or inside with other loose items.
- Close shutters or board-up or heavily tape all windows. Draw curtains and lock doors.
- Pack an evacuation kit of warm clothes, essential medications, baby formula, nappies, valuables, important papers, photos and mementos in waterproof bags to be taken with your emergency kit. Large/heavy valuables could be protected in a strong cupboard.
- Remain indoors (with your pets). Stay tuned to your local radio/TV for further information.

4 ON WARNING OF LOCAL EVACUATION

1 Based on predicted wind speeds and storm surge heights, evacuation may be necessary.

2 Official advice will be given on local radio/TV regarding safe routes and when to move.

- Wear strong shoes (not thongs) and tough clothing for protection.
- Lock doors; turn off power, gas, and water; take your evacuation and emergency kits.
- If evacuating inland (out of town), take pets and leave early to avoid heavy traffic, flooding and wind hazards.
- If evacuating to a public shelter or higher location, follow police and State/Territory Emergency Services directions.
- If going to a public shelter, take bedding needs and books or games for children.
- Leave pets protected and with food and water.

5 WHEN THE CYCLONE STRIKES

- Disconnect all electrical appliances. Listen to your battery radio for updates.
- Stay inside and shelter {well clear of windows) in the strongest part of the building, i.e. cellar, internal hallway or bathroom. Keep evacuation and emergency kits with you.
- If the building starts to break up, protect yourself with mattresses, rugs or blankets under a strong table or bench or hold onto a solid fixture, e.g. a water pipe.
- Beware the calm 'eye'. If the wind drops, don't assume the cyclone is over; violent winds will soon resume from another direction. Wait for the official 'all clear'.
- If driving, stop (handbrake on and in gear) - but well away from the sea and clear of trees, power lines and streams. Stay in the vehicle.

6 AFTER THE CYCLONE

- Don't go outside until officially advised it is safe.
- Check for gas leaks. Don't use electric appliances if wet.
- Listen to local radio for official warnings and advice.
- If you have to evacuate, or did so earlier, don't return until advised. Use a recommended route and don't rush.
- Beware of damaged power lines, bridges, buildings, trees, and don't enter floodwaters.
- Heed all warnings and don't go sightseeing. Check/ help neighbours instead.
- Don't make unnecessary telephone calls.

— — — — — — — —

Task 4: **Demonstrate the ways in which an individual can help in prevention of pollution**

1 Individuals can make considerable contribution by using mass transport (buses, trains, etc) instead of using personal vehicles.

2 When going to workplace, colleagues from nearby localities should pool vehicles instead of going in individual personal vehicles.

3 Taking personal vehicles for periodic pollution checks at centres approved by authorities.

4 Individuals should reuse items whenever possible.

5 Products that are made of recycled material should be given preference.

6 Use gunny bags made of jute instead of plastic bags.

7 Take part in environment conservation drives such as tree planting drives.

8 Use water resources efficiently.

9 Use renewable resources by installing equipment such as solar heaters and using solar cookers.

10 Dispose potentially harmful products such as cells, batteries, pesticide containers, etc properly.

11 Use of refrigerators should be minimised wherever possible as they are main source of CFC, which is responsible for Ozone layer depletion.

12 Follow and promote family planning, as more population means more resources utilized and more resources utilized imply more pollution.

13 Avoid making noise producing activities such as listening to loud music.

14 Use handkerchiefs instead of paper tissues.

15 Organize drives to clean streets and clean drains with help of other people of locality.

16 Spread awareness and inspire other people to prevent pollution. Individuals should be encouraged to acquire information and innovations from world over and implement them locally.

— — — — — — — —

Scope and importance, need for public awareness about our environment, economic and social security, environment impact of transportation

Objectives: At the end of this lesson you shall be able to
- **identify the scope and importance of environment**
- **outline the need for public awareness about our environment**
- **enumerate about the economic and social security**
- **explain about the environmental impact of transportation.**

PROCEDURE

Task 1: **Identify the scope and importance of environment**

1 Identify the scope of environment and elements of enviornment.

2 Record the same it in the appropriate space provided in the Table 1 and Table 2

Table 1

S.No	Scope of environment	Description
1	Four segments of earth	
2	Conservation of natural resources	
3	Ecological aspects	
4	Pollution of the surrounding natural resources	
5	Social issues connected to it	
6	Impacts of human population on the environment.	

Table 2

S.No	Elements of Environment	Description
1	Physical elements	
2	Biological elements	
3	Cultural elements	

— — — — — — — —

Task 2: **Outline the need for public awareness about our environment**

1 Identify the major issues in the environment and the ways in which the public awareness can be created for that

2 Record the same it in the appropriate space Table -3

Table 3

S.No	Major issues in the environment	Control measures

— — — — — — — —

Task 3: **Enumerate about the economic and social security**

1 Identify the economic and social security problems pertaining to environment and ways to eradicate it.

2 Record the same it in the appropriate space Table - 4

Table 4

S.No	Economic and social security problems	Control measures

— — — — — — — —

Task 4: **Explain about the environmental impact of transportation**

1 Identify the areas of environmental impact of transportation.

2 Record the same it in the appropriate space Table 5.

Table 5

S.No	Environmental impact of transportation	Description
1	Climate change	
2	Air quality	
3	Noise	
4	Water quality	
5	Soil quality	
6	Biodiversity	
7	Land take	

— — — — — — — —

Scope and importance, need for public awareness about our environment, economic and social security, environment impact of transportation

Objectives: At the end of this lesson you shall be able to
- **identify the scope and importance of environment**
- **outline the need for public awareness about our environment**
- **enumerate about the economic and social security**
- **explain about the environmental impact of transportation.**

Refer the exercise 1.8.61

Environmental impact assessment (EIA) - purpose, procedure and benefits of EIA, biodiversity and its conservation

Objectives: At the end of this lesson you shall be able to
- **outline the process of EIA**
- **list the benefits of EIA**
- **explain about the types of biodiversity**
- **identify the conservation methods.**

PROCEDURE

Task 1: **Outline the process of EIA**

1 Identify the process flow of EIA and describe about the each step.

2 Record the same it in the appropriate space provided in the Table 1.

Fig 1

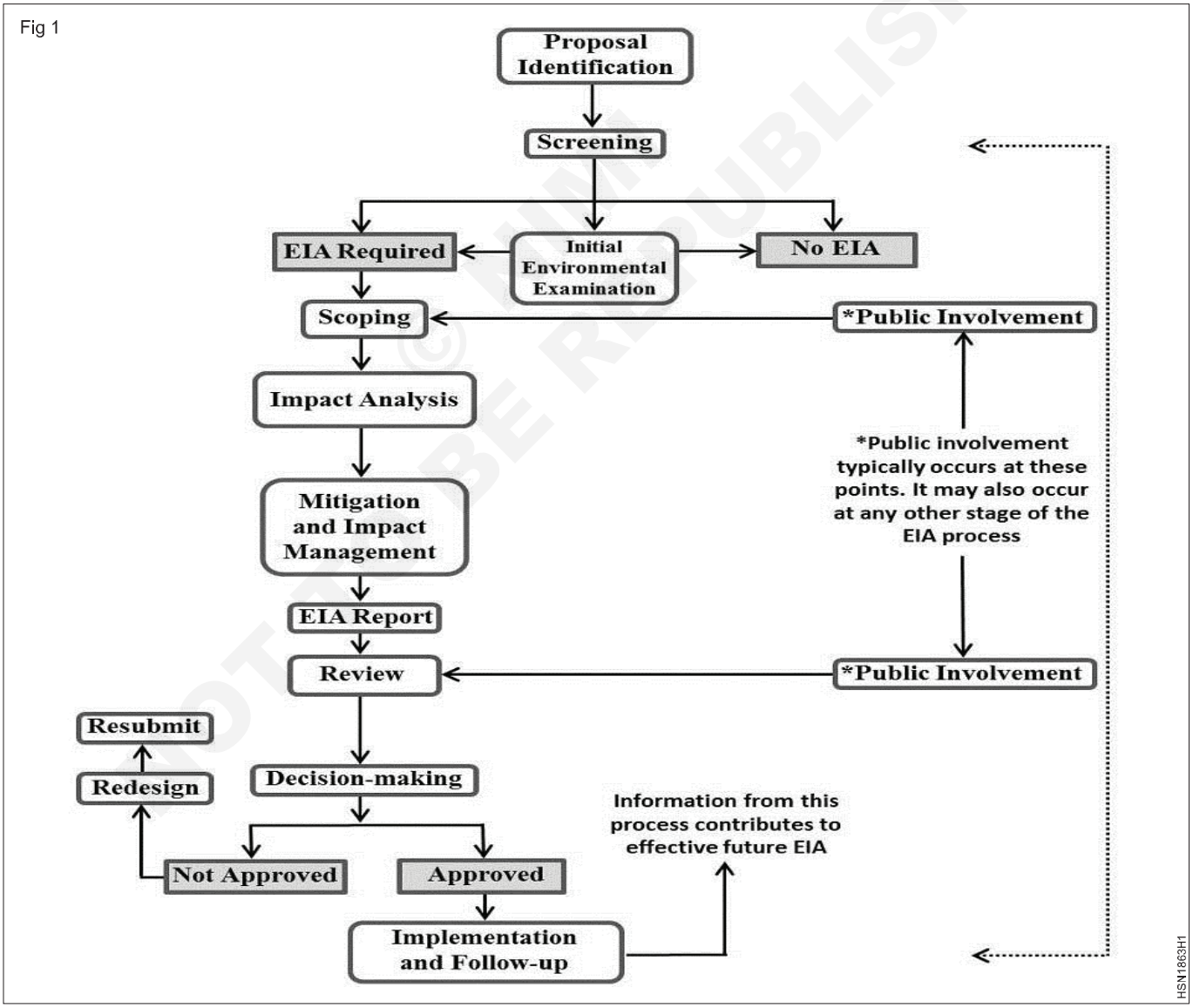


Table 1

S.No	Process of EIA	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

— — — — — — — —

Task 2: **List the benefits of EIA**

1 Identify the benefits of EIA

2 Record the same it in the appropriate space Table - 2

Table 2

S.No	Benefits of EIA

— — — — — — — —

Task 3: **Explain about the types of biodiversity**

1 Identify the types of biodiversity.

2 Record the same it in the appropriate space Table 3.

Table 3

S.No	Types of Bio diversity	Description
1	Genetic diversity	
2	Species diversity	
3	Ecosystem diversity	
4	Global diversity	

— — — — — — — —

Task 4: **Identify the conservation methods**

1 Identify the conservation methods

2 Record the same it in the appropriate space Table - 4

Table 4

S.No	Conservation methods	Description
1	In-situ Conservation	
2	Ex-situ Conservation	

— — — — — — — —

Global warming and greenhouse effect, acid rain and demonstration of health and environment effect through chart

Objectives: At the end of this lesson you shall be able to
- **identify the causes for global warming and list the control measures**
- **identify the causes for greenhouse effect and list the control measures**
- **identify the effect for acid rain and list the control measures**
- **demonstration of health and environment effect through chart.**

PROCEDURE

Task 1: **Identify the causes for global warming and list the control measures**

1 Identify the causes for global warming and list the control measures

2 Record the same it in the appropriate space provided in the Table -1

Table 1

S.No	Causes for Global warming	Control measures
1		
2		
3		
4		
5		
6		

— — — — — — — —

Task 2: **Identify the causes for greenhouse effect and list the control measures**

1 Identify the causes for greenhouse effect and list the control measures Record the same it in the appropriate space Table - 2

Table 2

S.No	Causes for Greenhouse	Control measures

— — — — — — — —

Task 3: **Identify the effect for acid rain and list the control measures**

1 Identify the effect for acid rain and list the control measures

2 Record the same it in the appropriate space Table - 3

Table 3

S.No	Effect of acid rain	Control measures

— — — — — — — —

Task 4: **Demonstration of health and environment effect through chart**

1 Draw a flowchart demonstrating the health and environment effect and describe the elements of the same

2 Record the same it in the appropriate space Table - 4 and Table- 5

Table 4

Draw a flowchart demonstrating the health and environment effect

Table 5

S.No	Elements affecting the health and environment	Description

— — — — — — — —

Global warming and greenhouse effect, acid rain and demonstration of health and environment effect through chart

Objectives: At the end of this lesson you shall be able to
- **identify the causes for global warming and list the control measures**
- **identify the causes for greenhouse effect and list the control measures**
- **identify the effect for acid rain and list the control measures**
- **demonstration of health and environment effect through chart.**

Refer the exercise 1.8.64

Population explosion, family welfare programmers-HIV/AIDS, women and child welfare

Objectives: At the end of this lesson you shall be able to
- **outline the problems due to population explosion and ways to control it**
- **discuss about the family welfare programmes – HIV/AIDS**
- **discuss about the problems faced by the women's in the society and ways to eliminate it.**

PROCEDURE

Task 1: **Outline the problems due to population explosion and ways to control it**

1 Identify the problems due to population explosion and ways to control it.

2 Record the same it in the appropriate space provided in the Table -1 and Table 2

Table 1

S.No	Problems due to population explosion	Description
1		
2		
3		
4		
5		
6		

Table 2

S.No	Solutions to overcome the problems due to population explosion

— — — — — — — — —

Task 2: **Discuss about the family welfare programmes - HIV/AIDS**

1 Identify the sypmtoms of HIV/AIDS and list the control and preventive measures of aids

2 Record the same it in the appropriate space Table -3 and Table-4

Table 3

S.No	SYPMTOMS OF HIV/AIDS

Table 4

S.No	Control and preventive measures for HIV/AIDS

— — — — — — — —

Task 3: **Discuss about the problems faced by the womens in the society and ways to eliminate it**

1 Identify the problems faced by the women's in the society and ways to eliminate it.

2 Record the same it in the appropriate space Table -5

Table 5

S.No	Problems faced by the women's in the society	Control measures

To do Task

1 Visit the nearby locality or area where the chances of HIV/AIDS will be more and create awareness to the people. Also submit the report based on that.

2 Conduct an awareness program me on Women and Child welfare to the women's community in your locality and submit a report based on the event.

— — — — — — — —

Environmental pollution - causes, effects and control measures of air pollution, water pollution, soil pollution

Objectives: At the end of this lesson you shall be able to
- **identify the causes and control measures of air pollution**
- **identify the causes and control measures of water pollution**
- **identify the causes and control measures of soil pollution.**

PROCEDURE

Task 1: **Identify the causes and control measures of air pollution**

1 Identify the causes and control measures of air pollution

2 Record the same it in the appropriate space provided in the Table -1

Table 1

S.No	Causes for Air pollution	Control measures
1		
2		
3		
4		
5		
6		

— — — — — — — —

Task 2: **Identify the causes and control measures of water pollution**

1 Identify the causes and control measures of water pollution

2 Record the same it in the appropriate space Table -2

Table 2

S.No	Causes for Water pollution	Control measures

— — — — — — — — —

Task 3: **Identify the causes and control measures of Soil pollution**

1 Identify the causes and control measures of soil pollution.

2 Record the same it in the appropriate space Table 3.

Table 3

S.No	Causes for soil pollution	Control measures

— — — — — — — —

Safe limits of amperages, voltages, distance from lines, etc,. Joints and connections, overload and short circuit protection

Objectives: At the end of this lesson you shall be able to
- **identify the safe limits of amperages, voltage and distance from lines**
- **identify the Hazard level due to overload and short circuit preparation.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Electrical power distribution data - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the safety limits of amperages, voltage and distance from lines and also control measures to overload and short circuit preparation

Task 1: **Identify the effect due to exceed of safe limits of amperages, voltage & distance from lines**

Table 1 Voltage supply levels vs Effect on human

Voltage Source	Typical Voltage	Ability to deliver current	Effects
Lightning	100 x 10^6	very high	
Static electricity	50,000	very low	
Mains electricity	240V AC	high, eg 10A	
Car battery	12.5-14V DC	very high, eg 120A	
AA battery	1.5V	low, eg 0.5A	
Button battery	3V	very low, eg 100mA	
trans-membrane potential	-70mV	extremely low	
ECG	1-2mV	extremely low	
EEG	30-100uV	extremely low	

— — — — — — — —

Task 2: **Identify the hazard level due to effect of 50 Hz electricity on muscle given under Table 2**

Table 2 Effect of electricity vs Hazard level

Effect	Hazard Level
Micro shock Fibrillation	
Threshold of sensation	
Painful Sensation	
Muscle Spasm	
Ventricular Fibrillation	
Muscle Burns	

— — — — — — — —

Earthing standards and earth fault protection, protection against voltage fluctuations, effects of shock on human body hazards from borrowed neutrals

Objectives: At the end of this lesson you shall be able to
- **identify the effect on human body due to earthing faults**
- **identify the effect of shock on human body hazards from borrowed neutrals.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Electrical power distribution data - as reqd.

PROCEDURE

The trainer will teach the trainees regarding earthing fault preparation and standards for earthing. The trainee should also able to analyse and control the effects of shock on human body hazards from borrowed neutrals

Task 1: **Identify the effect on human body due to earthing faults**

Type of patient circuit	Max current thro' pt (ìA)	Max leak in Patient circuit (ìA)	Max leak in Patient Circuit (ìA)	Effects
Class CF (A)	50	10	50	
Class BF (B)	5000	100	500	
Class B (Z)	Unlimited	100	500	

— — — — — — — —

Task 2: **Identify the effect due to the type of patient circuit Earth Leak (max)**

Maximum current level	Effect
Class CF Class BF Class B	

— — — — — — — —

Electrical equipment in hazardous atmosphere

Objectives: At the end of this lesson you shall be able to
- **locate the different zonal level/categories of hazardous area**
- **identify the temperature for different hazardous areas.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Electrical power distribution data - as reqd.

PROCEDURE

The trainer will teach the trainees regarding the different technical means (protection concepts) of building equipment to the different categories. The trainee should able to identify the hazardous temperature of the gas or vapour caused by the equipment.

Task 1: **Classification of the hazardous area (as in zones shown in the table 1 below)**

Table 1: Identify the zones of hazardous area

Zone 0	Zone 1	Zone 2
Category 1	Category 2	Category 3

— — — — — — — —

Task 2: **Temperature class or ignition temperature of the gas or vapour**

Table 2: Identify the temperature class for different hazardous areas

Temperature classification	Maximum surface temp (^{o}C)	Ignition temperature of gas/vapour (^{o}C)

— — — — — — — —

Criteria in their selection, installation, maintenance

Objectives: At the end of this lesson you shall be able to

- **list some electrical safety tips to be adhered by all workers in their work area**
- **describe the potential accidents and hazards associated with electrical equipment.**

Requirements

Tools/Instruments

- Charts, A4 Sheets, Pencils, Paper - as reqd.
- Safety measures - as reqd.
- Electrical power distribution data - as reqd.

PROCEDURE

The trainer will teach the trainees regarding electrical safety tips that all workers must adhere to when working and able to describe potential accidents and hazards associated with the following equipment or components

Task 1: **List some electrical safety tips that all workers must adhere to when working with any of the following:**

1 Power Tools
2 Extension Cords
3 Molded Case Circuit Breakers
4 Downed Power Lines
Ladders

_ _ _ _ _ _ _ _ _

Task 2: **Describe potential accidents and hazards associated with the following equipment or components.**

1 Portable Generators
2 Battery Banks
3 Battery Chargers

_ _ _ _ _ _ _ _ _

Techniques of segregation, packaging, storage, transport of infectious waste

Objectives: At the end of this lesson you shall be able to
- **identify the methods of disposal of bio-medical waste and their segregation**
- **identify the suitable containers, waste category and treatment options with reference to color coding**
- **identify the labels for biomedical waste containers**
- **demonstrate the steps and precautions to be taken during transport.**

Requirements

Tools/Instruments

• Computer with internet	- as reqd	• A4 sheet	- as reqd
• Pencil & pen	- as reqd	• LCD projector	- 1 No.

PROCEDURE

Note: Trainer will teach the trainee regarding the techniques of biomedical waste management using PPT and suitable demonstrations.

Task 1: **Identification of the disposal methods of bio-medical waste and their segregation**

1 Write down the types of biomedical waste and treatment and disposal methods with respect to the waste category as given in below table-1

2 Get it checked with the trainer

Table 1

S.No	Waste category	Type of waste	Treatment and disposal method
1	Category No 1		
2	Category No 2		
3	Category No 3		
4	Category No 4		
5	Category No 5		
6	Category No 6		
7	Category No 7		
8	Category No 8		
9	Category No 9		
10	Category No 10		

— — — — — — — —

Task 2: **Identify the suitable containers, waste category and treatment options with reference to color coding**

1 Write down the type of containers used, waste category and treatment options for different color coding as listed in table -2

2 Get it checked with the trainer

Table 2

S.No	Color coding	Type of containers	Waste category	Treatment options
1				
2				
3				
4				

— — — — — — — —

Task 3: **Identification of the labels for biomedical waste containers and bags**

1 Write down the labels for biomedical waste containers for the given symbol as per the table-3 given below

2 Get it checked with the trainer.

Table 3

S.No	Labels	Type of hazards
1		
2		

— — — — — — —

Task 4: **Demonstration of steps and precautions to be taken during transport**

1 Write down the steps and precautions to be taken care during transport as per the given table-4 given below

2 Get it checked with the trainer

Table 4

S.No	Steps involved	Precautions
1		
2		
3		
4		
5		

— — — — — — — —

Techniques of Bio-medical waste management

Objectives: At the end of this lesson you shall be able to
- **identify the steps involved in biomedical waste management**
- **identify the various disposal method for the given waste category**
- **Demonstrate the suitability of the waste for the given biomedical waste management.**

Requirements

Tools/Instruments

• Computer with internet	- as reqd	• A4 sheet	- as reqd
• Pencil & pen	- as reqd	• LCD projector	- 1 No.

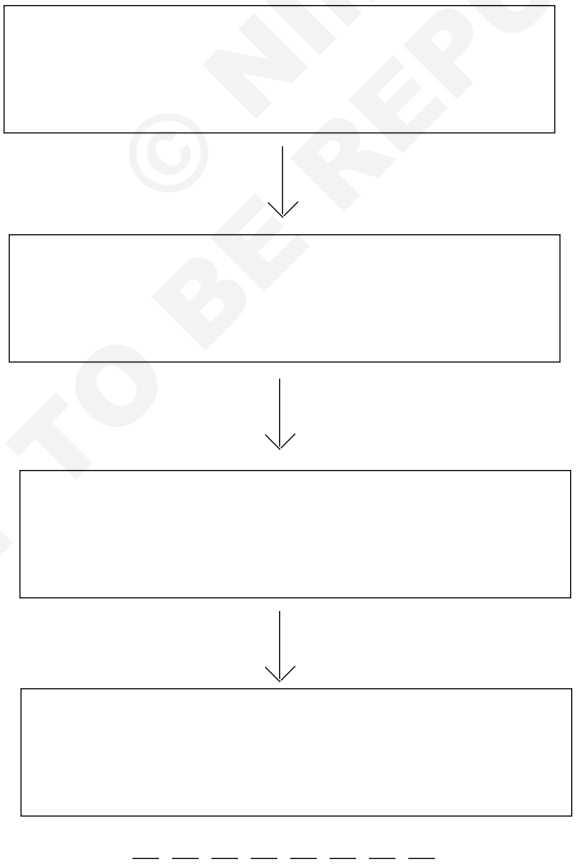
PROCEDURE

Note: Trainer will teach the trainee regarding the techniques of biomedical waste management using PPT and suitable demonstrations.

Task 1: **Identification of the steps involved in biomedical waste management**

1 Sketch a flowchart for the steps involved in biomedical waste management

2 Get it checked with the trainer



Task 2: **Identification of the various disposal method for the given waste category**

1 Write down the various disposal method for the given waste category as per the table-2 given below

2 Get it checked with the trainer.

Table 1

S.No	Waste category	Disposal method
1	Plastic wastes after disinfection and shredding	
2	Disinfected sharps (except syringes)	
	If encapsulated	
	If non-encapsulated	
3	Incineration ash	
4	Other treated solid waste	
5	Oil and grease	
6	Treated waste water	

— — — — — — — —

Task 3: **Demonstration of the techniques used for biomedical waste management**

1 Demonstrate the suitability of the waste for the given biomedical waste management for the given table 4.

2 Get it checked with the trainer.

Table 1

S.No	Techniques	Suitability of the waste
1	Incineration	
2	Autoclave	
3	Microwave radiation	
4	Chemical methods	
5	Plasma pyrolysis	
6	Deep burial	

— — — — — — — —

Treatment method - autoclave, hydro-clave, microwave, chemical disinfection, solidification and stabilization, bioremediation

Objectives: At the end of this lesson you shall be able to
- **identify the steps involved in biomedical waste management**
- **identify the various disposal method for the given waste category**
- **Demonstrate the suitability of the waste for the given biomedical waste management.**

Requirements

Tools/Instruments

• Computer with internet	- as reqd	• A4 sheet	- as reqd
• Pencil & pen	- as reqd	• LCD projector	- 1 No.

PROCEDURE

Note: Trainer will teach the trainee regarding the treatment method: Autoclave, Hydro-clave, Microwave,Chemical Disinfection, Solidification and Stabilization, Bioremediation using PPT and suitable pictorial diagrams

Task 1: **Identification of the different treatment methods for biomedical waste management**

1 Write down the treatment methods for the given images below represented in table -1

2 Get it checked with the trainer.

Table 1

S.No	Images	Treatment Method
1		
2		

S.No	Images	Treatment Method
3		
4		

— — — — — — — —

Task 2: **Demonstrate the significance, advantages and disadvantages of treatment methods**

1 Write down the significance, advantages and disadvantages of different biomedical waste treatment methods as given under table -2

2 Get it checked with the trainer.

Table 1

S.No	Waste category	Significance	Advantages	Disadvantages
1	Auto-clave			
2	Hydro-clave			
3	Microwave			
4	Chemical disinfection			
5	Solidification and stabilization			
6	Bio-remediation			

— — — — — — — —

Task 3: **Demonstration of the precautions to be taken care during treatment process**

1 List down the necessary precautions and personal protective equipment's to be taken care during bio-waste management treatment process

2 Get it checked with the trainer.

— — — — — — — —

Accumulation and storage of hazardous waste

Objectives: At the end of this lesson you shall be able to
- **identify the steps involved in biomedical waste management**
- **identify the various disposal method for the given waste category**
- **Demonstrate the suitability of the waste for the given biomedical waste management.**

Requirements

Tools/Instruments

• Computer with internet	- as reqd	• A4 sheet	- as reqd
• Pencil & pen	- as reqd	• LCD projector	- 1 No.

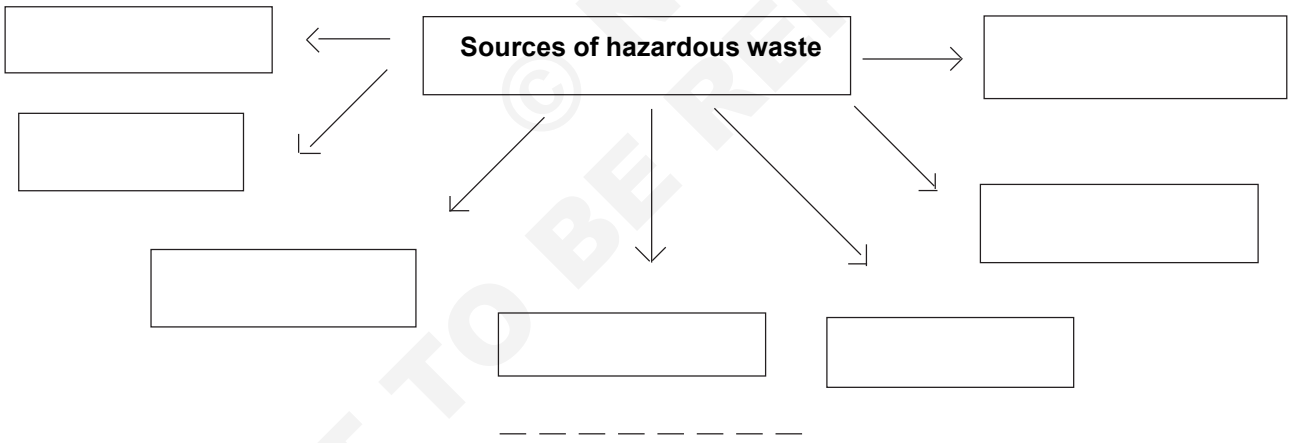
PROCEDURE

Note: Trainer will teach the trainee regarding the accumulation and storage of hazardous waste using PPT and suitable demonstrations

Task 1: **Identification of the different treatment methods for biomedical waste management**

1 Write down the sources of hazardous waste for the given flow diagram

2 Get it checked with the trainer.



— — — — — — — —

Task 2: **Demonstration of guidelines for storage of hazardous waste**

1 List down the necessary precautions and safety measures to be taken care to store bio-medical hazardous waste

2 Get it checked with the trainer.

— — — — — — — —

Task 3: **Identification of the type of waste, color and type of containers used for different waste category**

1 Identify the type of waste, color and type of containers used for different waste category as listed under the table -1

2 Get it checked with the trainer

Table 1

S.No	Waste Category	Types of waste	Color and type of container
1	Yellow		
2	Red		
3	White		
4	Blue		

— — — — — — — — —

Land disposal of hazardous waste

Objectives: At the end of this lesson you shall be able to
- **demonstrate the applicability and limitations of land disposal of hazardous waste**
- **sketch the schematic diagrams of sharp pit and mark its parts for identification**
- **sketch the schematic diagrams of deep burial pit and mark its parts for identification.**

Requirements

Tools/Instruments

• Computer with internet	- as reqd	• Chart paper	- 2 Nos.
• Pencil & pen	- as reqd	• LCD projector	-1 No.
• A4 sheet	- as reqd		

PROCEDURE

Note: Trainer will teach the trainee regarding the land disposal of hazardous waste using PPT and suitable demonstrations

Task 1: **Demonstration of the suitability and limitations of land disposal of hazardous waste**

1 List down the suitability and limitations of land disposal of hazardous waste for various types of disposal methods as given in table-1

2 Get it checked with the trainer

Table 1

S.No	Disposal methods	Applicability	Limitations
1	Landfills		
2	Surface impediment		
3	Underground injection wells		
4	Land forming		

— — — — — — — —

Task 2: **Schematic representation of sharp pit and mark its parts for identification**

1 Sketch the schematic diagram of sharp pit and mark its parts for identification using a chart paper

2 Get it checked with the trainer.

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Task 3: **Schematic representation of deep burial pit and mark its parts for identification**

1 Sketch the schematic diagram of deep burial pit and mark its parts for identification using a chart paper

2 Get it checked with the trainer.

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Determination of related electrical experiments

Objectives: At the end of this lesson you shall be able to
- **identify the tools to measure electrical related checks at industry**
- **demonstrate the usage of the tools to measure the same.**

Refer before the exercise 1.3.23

Measurement of noise pollution

Objectives: At the end of this lesson you shall be able to
- **identify the noise level for various kind of events**
- **illustrate a vector noise decibel scale chart**
- **demonstrate guidelines for instrument selection for measuring noise level.**

PROCEDURE

Task 1: **Identification of the noise level for various kind of events**

1 Write down the noise level for various kind of events as listed in the table -1

2 Get it checked with the trainer.

Table 1

S.No	Events	Noise level
1	Thunder	
2	Volcano eruption	
3	Jet plane	
4	Factory boiler	
5	Car and bike	
6	Public address systems	
7	Whispering	
8	Breathing	
9	Loud conversation	
10	Regular radio sound	

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Task 2: **Illustrate a noise decibel vector scale diagram**

1 Draw a decibel scale chart vector illustration measuring noise pollution as per the parameters given in the table 2.

2 Get it checked with the trainer

Table 2

S.No	Decibel level	Instrument
1	140 db	Fire workd
2	130 db	Jet engine
3	120 db	Siren
4	100 db	Helicopter
5	90 db	Hair dryer
6	80 db	Truck

S.No	Decibel level	Instrument
7	70 db	Car
8	60 db	Conversation
9	50 db	Refrigerator
10	40 db	Rain
11	20 db	Whsiper
12	10 db	Breath

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Task 3: **Demonstration of guidelines for instrument selection for measuring noise level**

1 Write down the appropriate instruments and suggestions for measuring different noise level as per the given table -3

2 Get it checked with the trainer.

Task 3

S.No	Type of measurements	Appropriate Instruments	Suggestions
1	Personal noise exposure		
2	Noise levels generated by a particular source		
3	Noise survey		
4	Impulse noise		

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Process to control noise pollution

Objectives: At the end of this lesson you shall be able to
- **identify the sources of noise pollution, causes for the same**
- **suggest control measures to overcome the noise pollution**
- **suggest ambient air quality standards in respect of noise control.**

Requirements

Tools/Instruments

• Computer with internet	- as reqd	• A4 sheet	- as reqd
• Pencil & pen	- as reqd	• LCD projector	-1 No.

PROCEDURE

Note: Trainer will teach the trainee regarding the various sources of noise pollution and the causes of the same and control measures to overcome the noise pollution using PPT and suitable demonstrations

Task 1: **Identification of the various sources of noise pollution and causes for the same**

1 Write down the causes of the noise pollution for the sources listed under table -1

2 Get it checked with the trainer

Table 1

S.No	Sources of noise pollution	Causes for the occurrence
1	Industrialization	
2	Events	
3	Vehicles	
4	Construction sites	
5	Traffic	
6	Animals	
7	Neighborhood	

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Task 2: **Suggest control measures to overcome the noise pollution**

1 Write down the effective measures to nullify the effect of noise pollution on human health

2 Get it checked with the trainer

Table 2

S.No	Effect of noise pollution on human health	Effective measures to control
1	Hypertension	
2	Hearing loss	
3	Sleeping disorders	
4	Cardiovascular issues	
5	Lack of concentration	
6	Risk to pregnant women	

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Task 3: **Suggest ambient air quality measures in respect of noise control**

1 Write down the noise limits for day and night time with respect to different zonal area and area codes as listed under table-3

2 Get it checked with the trainer

Table 3

Area code	Category of Area/Zone	Limits in dB	
		Day time	Night time
A	Industrial area		
B	Commercial area		
C	Residential area		
D	Silence zone		

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SYLLABUS FOR HEALTH, SAFETY & ENVIRONMENT

Duration	Reference Learning Outcome	Professional Skill (Trade Practical) (With inidcative hour)	Professional Knowledge (Trade Theory)
Professional Skill 70 Hrs; Professional Knowledge 22 Hrs	Identify accident prone areas and adopt methods for reducing accidents following safety precautions. (NOS: MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	1 Familiarisation with the Institute, Documentation of Student, Issuance of Dress, Books, Hostel Accom - modation (If required) and Store. (04 hrs.) 2 Importance of trade training, Equipment used in the trade, types of work done by the trainees in the trade. (8 hrs.) 3 Introduction to safety equipment and their uses. Introduction of first aid, Road safety, operation of Electrical mains. (8 hrs.) 4 Knowledge of General Safety, Occupational health and hygiene. (10 hrs.)	**Incident Command:** Types of Incident. Analyse possible hazards and emergencies. HAZARD: Introduction to Hazard, Causes, Identification, Vulnerability analysis, Risk analysis, Evaluation & Control of Hazard. HAZOP Analysis, Sources for Information on Hazard Evaluation. Preparative work (Obtain basic information, information should be converted into suitable form, Plan the sequence & meeting schedule), Team composition & approach. Methodology, Advantages of HAZOP Study Limitation of HAZOP study.
		5 Site visit for Hazard identification and Evaluation. (10 hrs.) 6 Study of Risk at work site and preparation and initiation of reports. (10 hrs.) 7 Emergency response functional drill - viz. Medical Response, Evacuation drill, etc. (10 hrs.)	**Risk Analysis:** Definition of Risk, Risk Analysis, Introduction to Failure Mode & Effect Analysis (FMEA), Fault Tree Analysis (FTA), Event Tree Analysis (ETA).
		8 Visit to accident prone area Practical usages of Safety belt helmet gloves, and goggles. (10 hrs.)	**Accident:** Definition of Accidents, Classification of Accidents, need for the Analysis of Accidents, Methods Adopted for Reducing Accidents, Investigation of Accidents, Safety Slogans Principles of Accident (Heinrich theory), Accident ratio study, identification of unsafe mechanical/ physical conditions, identification of unsafe acts. Frequency Rate, Prevention Methods. (22 hrs.)
Professional Skill 60 Hrs; Professional Knowledge 16 Hrs	Identify and apply safety policy in an industry and List out the duties and implement. Safety Targets, Objectives, Standards, Practices and Performances. (NOS: MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902,	9 Carry out the plant safety inspection with the help of check list. (15 hrs.) 10 Visit to industrial unit and review of prevailing safety Practices (15 hrs.)	**Preparation & Assessment of Safety Audit:** Introduction to Safety Checklist, Plant Safety Inspection, Safety Precautions adopted in the Plant, Safety Tag System, Safety Audit Report Objective of safety audit, type of audit, Audit team, Elements of safety audit, Method of audit, audit steps, concept and lay out of audit report.

	HSC/N9903)	11 Visit to industrial unit to observe prevailing safety provision, their condition, welfare measures include medical facilities, crèches and religious places. (15 hrs.) 12 Awareness about various compensations and Documentation. (15 hrs.)	**Safety Concept:** Introduction to Safety Management, Safety Policy, Safety Committee, Safety Review, Responsibility of Management, Safety Officers Duties & Responsibilities, Safety Targets, Objectives, Standards, Practices and Performances. Motivation & Communication as part of Safety Programme. Duties & responsibility of an owner, Duties and responsibilities of a worker, Role of a supervisor Role of a safety engineer ILO Convention: Introduction of ILO and Conventions. (16 hrs.)
Professional Skill 40 Hrs; Professional Knowledge 10 Hrs	Identify marking and evaluate performance of explosives. (NOS: MIN/N0416, MIN/N0417, MIN0418)	13 Display of explosives, their identification and marking as per explosives act. (10 hrs.) 14 Hands on experience with Hand and power tools. (10 hrs.) 15 Measurement of Heat, Illumination and Noise Demonstration. (10 hrs.) 16 Determination of related electrical experiments. (10 hrs.)	**Factories Act 1948 (Amended)**: - Health - Cleanness, Disposal of Waste, Ventilation and Temperatures, Dust & Fumes, Drinking Water, Lighting, Latrines & urinals. Safety - Fencing of machineries, Work on or near machinery in motion, Hoists and lifts, Pressure plants, Floors, Stairs and means of escape, Protection against fumes & gases, Safety offers. Welfare - Washing facilities in Dry clothing, Storing, Sitting, First Aid Appliances, Canteen, Shelters for rest & lunch, Creches, Welfare offers, Right & Obligation of workers. (10 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Prepare profile with an appropriate accuracy as per safety precaution in workshop. (NOS: MIN/N9417)	17 Visit to workshop and steel furniture houses to witness various processes during production and safety. Precaution adopted. (10 hrs.) 18 Visit to construction site to witness construction and safety precaution observed. (10 hrs.)	Welfare & Training: General Provision, Drinking Water, Sanitary & Washing, Cloakrooms, Facilities for Food & Drink, Shelters & Living Accommodation, Information & Training. (06 hrs.)
Professional Skill 50 Hrs; Professional Knowledge 18 Hrs	Select the construction site for visit, plan and prepare the report. (NOS: MIN/N9418)	19 Construction Site Visit Practices of good House Keeping and Study of egress and safe access. (10 hrs.) 20 Construction Site Visit and identifying of causes of accident during material handling. (08 hrs.) 21 Construction Site Visit, Pitching of ladders, proper use of safety belt and preparation of work permit. (07 hrs.)	**Environment Protection:** Safety and Protection of existing environment, Principles & Practices in Prevention & Control of Pollution, Water Pollution, **Climate Changes:** Introduction, Green House Gases: an overview, the role of carbon Dioxide, Methen, co2 emissions, carbon cycling, Global Warming. • Components of climate change • Factors effecting climate change • Causes for rising emissions • How to prevent climate change • Harmful impact of climate change • Ways to help environment (18 hrs.)

		22 Visit to excavation Site, identification and discussion with site engineer about safety precaution taken. (15 hrs.)	**Social Security Legislation:** Social Security Legislation, Introduction to Workman's Compensation Act, Contract Labour Regulation Act.
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Select, plan, and implement safety and Health objectives, targets and performance standards. (MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	23 Developing a workplace Safety and Health Policy. (7 hrs.) 24 Planning – safety and Health objectives and Targets, performance standards. (6 hrs.) 25 Implementation and Operation Structure and responsibilities, individual responsibilities, Safety Consultation. (7 hrs.)	Miscellaneous Acts & Rules Explosives Act 1884 and Rules. General provision of Gas Cylinders Rules, The Building and other Construction Worker's Welfare Cess Act & Rules 1996. Environment Protection Legislation: Introduction to Prevention and Control of Pollution Act 1981 and 1982, Environment Protection Act 1986. (6 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 10 Hrs	Identify causes of fire, techniques of fire extinguishing methods and other hazards. (NOS: MIN/N1702, MIN/N1703, MIN/N1704, MIN/N1705, HSC/N9913, HSC/N9902, HSC/N9903)	**Fire and other Hazards:** 26 General causes and classification of fire, Detection of fire, extinguishing methods, firefighting installations with and without water. (7 hrs.) 27 Machine guards and its types, automation. (6 hrs.) 28 High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and non-destructive testing, hazards and control in mines. (7 hrs.)	**Anatomy of Fire:** Definition of Combustion, Elements of Combustion, Products of Combustion, Heat of reaction and calorific value, Flash point, Fire point, Ignition temperature and spontaneous combustion. Fire Triangle, fire tetrahedron, fire pyramid, source of heat, (Chemical, mechanical, Electrical, Nuclear etc.), Classification of fire and method of fire extinguishment, oxygen and its effects on combustion, maintenance, method of operation, Halon and its detrimental effect on environment. Alternatives of Halon. Types of fire extinguishing agents, Rating system for portable fire extinguishers, Limitation of fire extinguishers, inspection requirement. (10 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Plan and execute hose and hose fittings. (NOS: MIN/N9419)	29 Hose drill a hose pick up b hose laying c hose joining d hose replacement at different position (20 hrs.)	Hose & Pumps, Water Tender: Fire Service Hose & Hose Fittings, Fixed Fire Fighting Installations Ropes & lines, Practical Fireman ship, Small & Special Gears, Water Tender. Types of fire hoses, its construction, caused of decay care & maintenance Types of hose fittings, identification and use of hose fittings. Types of FFF installations Testing care & maintenance. (06 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Select and prepare the hydrant and pump system for proper application. (NOS: MIN/N9420)	30 Familiarization and demonstration of Hydrant and its associated equipment. (03 hrs.) 31 Practical pump operation, fault finding of primary failure, method of ladder pitching & climbing Application of Arm Hold and Leg Lock. (04 hrs.) 32 Identify Appropriate Action. (03 hrs.)	**Hydrant, Detectors & Ladders:** Introduction to Hydrant & Hydrant Fittings, Water Supply requirements for firefighting, Introductions to pump & Primers, Detectors & Ladders.(06 hrs.)

		33 Risk assessment records and control. (04 hrs.) 34 A simple Risk estimation example – Hazards, remedial measures. (03 hrs.) 35 Motivation of employees, Insurance coverage of Industrial plant & personnel. (03 hrs.)	
Professional Skill 40 Hrs; Professional Knowledge 10 Hrs	Identify & select respiratory personal protective devices & carry out its maintenance. (NOS: MIN/N0901, HSC/N9913, HSC/N9902, HSC/N9903)	36 First Aid Procedures with Disaster Management (08 hrs.) 37 Stages in plant life and unsafe condition in factories. (08 hrs.) 38 Maintenance & safety, basics safety programming, safety department, Rules and regulation of safety department. (08 hrs.) 39 Responsibility of management for safety in plant, safeguards the public. (08 hrs.) 40 Responsibility of government, Social organization and public authorities. (8 hrs.)	Public Health and Emergency situation Management - Basic Introduction to Incident Control Systems in public health emergency situations Breathing Sets: Classification of Respiratory Personal Protective Devices, Selection of Respiratory Personal Protective Devices, Instruction & Training in the use, Maintenance and Care of Self Containing Breathing Apparatus. Resuscitation & First Aid: Burns, Fractures, Toxic Ingestion, Bleeding, Wounds and Bandaging, Artificial Respiration, Techniques of Resuscitation.(10 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Measure the effect of radiation and control the radiation on human body. (NOS: MIN/N9421)	**Radiation and Industrial Hazards:** 41 Types and effects of radiation on human body, Measurement and detection of radiation intensity. (10 hrs.) 42 Effects of radiation on human body, Measurement – disposal of radioactive waste, Control of radiation. (10 hrs.)	Introduction to Radiation and Industrial Hazards. (6 hrs.)
Professional Skill 60 Hrs; Professional Knowledge 16 Hrs	Identify parameters governing the safety in construction and its impact on environment. (NOS: MIN/N9422)	43 Scope and Importance; need for public awareness about our environment. (8 hrs.) 44 Economic and social security; Environment impact of transportation. (8 hrs.) 45 Environmental impact assessment (EIA) — purpose, procedure and benefits of EIA; Biodiversity and its conservation. (8 hrs.) 46 Global warming and greenhouse effect, urbanization, acid rain. (8hrs.) 47 Demonstration of health and environment effect through chart. (10 hrs.)	**Basic Philosophy of Safety:** Peculiarities & Parameters governing the safety in construction e.g. Site Planning, Layout, Safe Access / Egress. Construction Industry: General safety precautions related to construction industry, Safety in the use of Construction Machinery. Industrial Lighting: Introduction to Lighting, Ventilation, Heat Stress, Cold Stress, Noise & Vibration. (16 hrs.)

		48 Case studies, population explosion, family welfare programmers-HI V/ AIDS, women and child welfare. (10 hrs.) 49 Environmental pollution - causes, Effects and control measures of air pollution, water pollution, soil pollution. (8 hrs.)	
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Identify various techniques of earthing standards and earth fault protection. (NOS: MIN/N3102)	**Electrical Hazards and Hazards in Construction Industry:** 50 Safe limits of amperages, voltages, distance from lines, etc., Joints and connections, Overload and Short circuit protection. (06 hrs.) 51 Earthing standards and earth fault protection, Protection against voltage fluctuations, Effects of shock on human body Hazards from Borrowed neutrals. (05 hrs.) 52 Electrical equipment in hazardous atmosphere. (05 hrs.) 53 Criteria in their selection. Installation, maintenance. (04 hrs.)	**Electrical Safety:** Electrical Hazards, Static Electricity. Identification and Zoning of Hazardous area, Classification of products. (06 hrs.)
Professional Skill 45 Hrs; Professional Knowledge 10 Hrs	Plan and apply methods of plant design and house keeping. (NOS: MIN/ N9423)	**Plant design and Housekeeping:** 54 Plant layout, design and safe distance, Ventilation and heat stress, Significance of ventilation, Natural ventilation. (10 hrs.) 55 Mechanical ventilation Air conditioning. (09 hrs.) 56 Safety and good housekeeping, Disposal of scrap and other trade wastes. (10 hrs.) 57 Spillage prevention, Use of colour as an aid of housekeeping, Cleaning methods. (08 hrs.) 58 Inspection and Checklists, Advantages of good houses. (08 hrs.)	**Excavations, Demolitions & Structural Frames:** Safety related to Excavation, Demolitions Framework & Concrete Work, Pile Driving and Work over Water (10 hrs.)
Professional Skill 45 Hrs; Professional Knowledge 12 Hrs	Check and verify various industrial Hazards in process of melting (Furnaces), Casing and Forging. (NOS: HCS/N2204)	59 Demonstration of prevailing condition in industry about Drinking Water Sanitary & Washing, Cloakrooms Facilities for Food & Drink Shelters & Living Accommodation. (22 hrs.) Disaster management floods, earthquake, cyclone, and slides, role of individual in prevention of pollution. (23 hrs.)	Safety in Melting, Boilers: Hazards in process of melting (Furnaces), Casing, and Forging. Automatic Manufacturing Activity - Machining, Chipping, Grinding, Safety Precautions in use of Boilers. Precautions in Processes: Precautions in processes and operations involving Explosive, Toxic Substances, Dusts, Gases, Vapour Clouds Formation and Combating, Workplace Exposure Limit, Control Measures. (12 hrs.)

Professional Skill 45 Hrs; Professional Knowledge 10 Hrs	Identify various types of water relay management systems. (NOS: MIN/N9424)	60 Maintenance of ladders and trolleys. (12 hrs.) 61 Design of turntable ladders, water tender and special equipment. (12hrs.) 62 Identify Types of water relay system. (09 hrs.) 63 Arrangements of water relay system. (12 hrs.)	**Safety in The Engineering Industry:** Introduction to Machine Operations & Guarding, Safety in the use of Machines, Safety precautions while using Hand Tools & Power Tools, Selection, Maintenance & Care of Hand and power tool. (10 hrs.)
Professional Skill 65 Hrs; Professional Knowledge 18 Hrs	Execute the risk analysis exercise. (NOS: MIN/N9425)	**Principles of accidents prevention:** 64 Definition: Incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc. (20 hrs.) 65 Accident Prevention: Theories / Models of accident occurrences, Principles of accident prevention. (23 hrs.) 66 Accident and Financial implications, Hazard identification and analysis, fault tree analysis, Job safety analysis, examples, Plant safety inspection objectives and types check procedure inspection. (22 hrs.)	**Chemical Compatibility & Transportation:** Chemicals Compatibility considerations, Transportation of Chemicals, Toxic / Flammable / Explosive / Radioactive Substances by all modes - safety precautions, Use of material Safety Data Sheets. (18 hrs.)
Professional Skill 50 Hrs; Professional Knowledge 12 Hrs	Select and use PPE, care and maintain the same. (NOS: HCS/N9913, HCS/N9902, HCS/N9903)	67 Body structure and Functions, Position of causality, the unconscious casualty, fracture and dislocation, Injuries in muscles and joints, Bleeding, Burns, Scalds and accidents caused by electricity, Respiratory problems, Rescue and Transport of Casualty. (18 hrs.) 68 Cardiac massage, poisoning, wounds. (18 hrs.) 69 Personal Protective Equipment: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices. (14 hrs.)	**Personal Protective Equipment:** Need for Personal Protection Equipment, Selection, Use, Care & Maintenance of Respiratory and Non-respiratory Personal Protective Equipment, Non-respiratory Protective Devices- Head Protection, Ear Protection, Face and Eye Protection, Hand Protection, Foot Protection, Body Protection. (12 hrs.)
Professional Skill 30 Hrs; Professional Knowledge 06 Hrs	Apply the method of bulk storage system of LPG/ CNG. (NOS: MIN/ N9426)	70 Visit to LPG/ CNG storage Site. (20 hrs.)	**Bulk Storage:** General Consideration, Types of Storage, Layout of storages with specific reference to LPG, CNG, Chlorine, Ammonia. (06 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 10 Hrs	Prepare case study on major Chemical Disasters. (NOS: MIN/ N9428)	71 Preparation of Case study of Major Chemical Disasters. (20 hrs.)	**Occupational Hazards & Dangerous Chemicals:** Introduction to Occupational Health Hazards & Dangerous Properties of Chemicals, Dust, Gases, Fumes, Mist, Vapours, Smoke and Aerosols, Concepts of Threshold Limit Values, Classification of Hazards Chemicals Accident

			Prevention & major Case Studies: Major Industrial Accidents due to Chemicals (Bhopal Gas Tragedy) Emergency Planning, Major Industrial Disaster Case Studies. (10 hrs.)
Professional Skill 80 Hrs; Professional Knowledge 20 Hrs	Practice Bio Medical Waste and E-Management (NOS: MIN/ N9428)	**Bio Medical Waste and E-Management** 72 Techniques of segregation, packaging, storage, transport of infectious waste. (20 hrs.) 73 Techniques of Biomedical waste management. (15 hrs.) 74 Treatment method- Autoclave, Hydroclave, Microwave, Chemical Disinfection, Solidification and stabilization, Bioremediation, (18 hrs.) 75 Accumulation and storage of hazardous waste, (12 hrs.) 76 Land disposal of hazardous waste, (13 hrs.)	Bio Medical Waste and E- Management (a)Introduction: various aspects of hazardous waste, biomedical waste and E-waste e.g. collection, segregation, recovery, labeling requirements, storage areas, treatment and disposal facilities. (b)Sources, Composition and characteristic of hazardous waste, Hazardous Waste (Management and Handling) Rules, 1989 and amendments, Federal Hazardous Waste Regulations under RCRA, Superfund, CERCLA and SARA. Toxicology, public health impact, Protocols, issues and challenges in transportation of hazardous waste. (c) Characterization of medical waste- Bio-medical wastes (Management and Handling) Rules, 1998, Amendments and guidelines, segregation, packaging, storage, transport of infectious waste. Techniques of Biomedical waste management. Health and safety rules. Protocols, issues and challenges in transportation of Biomedical waste. (d) Treatment method- Autoclave, Hydroclave, Microwave, Chemical Disinfection, Solidification and stabilization, Bioremediation, Thermal Conversion Technologies, accumulation and storage of hazardous waste, land disposal of hazardous waste, other treatment and disposal method. Common Hazardous Waste Treatment facilities (TSDF) (e) E-waste: Introduction, toxicity due to hazardous substances in e-waste and their impacts, domestic e-waste disposal, e-waste management, technologies for recovery of resource from electronic waste, guidelines for environmentally sound management of e-waste, occupational and environmental health perspectives of recycling e-waste in India. (20 hrs.)
Professional Skill 20 Hrs; Professional Knowledge 04 Hrs	Demonstrate Process to control noise pollution (NOS:MIN/N1702, MIN/N1703, MIN/ N1704,)	78 Practice Measurement of noise (12 hrs.) 79 Process to control noise pollution (08 hrs.)	**Noise Pollution:** Its causes, types, sources, effects on Human health, how to control noise pollution. (04 hrs.)
Project work/ Industrial visit			