Chapter 4...  
Safety Management  
Weightage of Marks = 14, Teaching Hours = 08  
Need for Safety Management Measures  
General Safety Norms for an Industrial Unit; Preventive Measures  
Definition of Accident, Types of Industrial Accident; Causes of Accidents  
4.1  
4.2  
4.3  
4.4 Fire Hazards; Fire Drill  
45  
4.6  
   
   
Safety Procedure  
Work Permits  
About This Chapter — .  
After reading this chapter, the students will able to,  
State the general norms required to be taken in the given case.  
Suggest preventive measures of plant activities in the given situation. tocidari  
rocedural steps required to be taken to prevent the given the type of accident.  
Describe the safe p rev  
Prepare a work permit to conduct the given maintenance activity.  
Explain the causes of the specified type of accident in the given situation.  
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e  
e  
e  
° re  
e Prepare the specifications of firefighting equipment required for the given type of fire.  
   
Accident is an unfortunate and sudden mishappening which causes damage or loss of property, material  
or human. Preventions of accidents are expected. Safety management is concentrating on avoiding  
   
   
accidents.  
   
   
External  
|  
Fatal  
:

Safety Management  
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Types of Accidents are mentioned below:  
(A) Based on Severity, Durability and Degree of Inju'  
1. Minor Accidents:  
i t  
e Less harmful in nature to the worker. «than 48 hours fr  
¢ Preventing employees from working, for the period les:  
¢ Not necessary to report to higher management.  
2. Reportable Accidents: ‘od  
e Injuries caused to the worker prevent him from working for the per!  
e Supervisor should do reporting to the higher management.  
¢ Accident is little complicated than the minor accident.  
3. Fatal Accidents  
e It results into death of the employee. .  
\* Its reporting to the top management, legal bodies and police !s must.  
4. Accidents due to dangerous occurrences:  
e Explosion, fire, leakage may be the reasons for such accidents.  
¢° Manas well as property canbe damaged.  
e Extent, if more, it gives greater loss to the industry.  
5. Internal Accidents: internal a  
e Injury without showing external signs (e.g. fractured bone) are called as inte  
6. External Accidents:  
¢ Injury with external signs of it, is called as external accident.  
ry:  
| om the time of accident.  
of 48 hours or more.  
   
ccidents.  
yee is called major  
7. Major Accident: . Pak  
e Accident causing death/permanent/prolonged disability to the injured emplo  
accident.  
8. Temporary Accident:  
bles a worker for a short period/a day/a week.  
e Injury after accident disa  
9. Permanent Accident:  
¢ Injury after accident disables the affected worker forever.  
(B) Based on Place of Accident  
1. Construction accident:  
e Accident occurs at construction site. These accidents are often happening and injuries are  
serious.  
2. Chemical plant accidents:  
° Exposure to chemicals is a real and everyday danger.  
3. Industrial plant accidents:  
Industries busy in manufacturing have machineries and moving parts. Accidents occur may be  
due to mistakes by worker, management or situation.  
4. Mining accidents:  
Mines are seriously dangerous sites. Collapses of soil layers, suffocation, poisonous gases, etc |  
fi s |  
   
are the reasons.

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Accidents are unfortunate, T|  
caused by one or other reasons,  
Lets see few Causes of accidents,  
hey are sudden and not planned by anybody. But accidents definitely are  
Causes of Accidents  
Due to W i  
orkers Due to Management Due to Unsafe Working Conditions Natural Causes  
(a) Causes of Accidents due to Workers:  
Overconfident behaviour at the work place.  
¢ Mischievous behaviour.  
¢ Lack of concentration,  
¢ Stress in work.  
© Overtime work.  
\* Poor knowledge of work.  
\_ © Unnecessary daring.  
e Less work experience.  
e Use of mobile while working.  
e Unstable mental conditions.  
° Fear of accident.  
\* Physical problems like eyesight and hearing inabilities.  
¢ Working without authority. .  
¢ Bad habits like alcoholism, smoking etc.  
e Reckless at work.  
e Lack of confidence.  
e Poor in handling pressure situations.  
¢ Not aware about rules and regulations of that specific work.  
‘e ‘Not following rules-and regulations.  
e Undisciplined nature.  
¢ = Quarrels with colleagues.  
These are few of the reasons, any one of which may cause accident at work place.  
(b) Causes of Accidents due to Management:  
e Provision of unsafe workplace to workers.  
e ~ Bad construction of the plant.  
e Untrained workers.  
e Extra load of work to employees.  
° Poor housekeeping.

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eman ner.  
(c)  
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Arrangement of machines, equipments in accident pron  
Heavy mental pressures on workforce.  
e Lack of safe procedures.  
\* Poor discipline of work at workplace.  
Less control on habits of workers, employees’ behaviour,  
¢ No provision of safety equipments.  
e No plans for plant protection.  
e Bad electrification.  
e Faulty equipments. b  
. ; stive joDS.  
Wrong assignments of work i.e. incorrect person working at sensitive JO  
   
: s etc. s  
their movement j  
e Unguarded moving parts.  
¢ Overcrowding of machines at shop floor.  
Overcrowding of persons near to the work places.  
No alternative arrangements of escape at the time of accidents.  
No arrangement for accident control and dampening.  
¢ Lack of safety awareness. :  
e Careless management approaches.  
Causes of Accidents due to Unsafe Working Conditions:  
© Poor workplace layout.  
¢ Oily surfaces, slippery floor.  
© Poor illumination.  
e Suffocation at work.  
e Bad house keeping.  
Unnecessary slopes and steps on shop floor.  
e Un noticeable turns and crossings.  
¢ Weak machine foundations.  
e Poor electrification.  
¢ Exposure to moving parts.  
¢ Chemical leakages.  
Storage of explosives without proper care.  
e Humidity at workplace.  
No consideration of human factor while designing chairs, tables, 0 i  
. ’ Operating system ines etc.  
So inconvenient working arrangements. 2 8Y Bg machines  
Irregular floor heights, unscientific gangways, galleries and staircases  
Psychological pressures due to bad work culture.  
e No support at work by others.  
e Negative competition, jealousy factor and groupism at work plac  
e. It causes me i Sf  
ntal imbalance %  
many, while working.  
availability of basic facilities near to workplace.

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(d) Natural Causes of Accidents:  
1.  
2.  
3.  
4.  
Effect on Worker:  
(i)  
(ii)  
(iii)  
(iv)  
(v)  
(vi)  
(vii)  
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Earthquake  
Floods  
Cyclones  
Temperature strokes  
Snow falls  
Land slide collapse  
Heavy rains etc,  
   
   
Following are the effects of accidents on various elements of society:  
Effect on worker.  
Effect on industry.  
Effect on family.  
Injury to body.  
Loss of skills.  
Loss of job.  
Leave for recovery.  
In case of fatal accident, loss of life.  
Confidence level gets hampered.  
Growth in career may get affected.  
   
(viii) Financial loss.

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2. Effect on Industry:  
(i) Production stoppage.  
(ii). Bad message to other workers,  
(iii) Reputation is lowered.  
(iv) Financial loss for compensating the affected worker.  
(v) Extra cost on recovery of machine/place/building.  
3. Effect on Management:  
(i) Time to solve the case.  
(ii) Issues related to court, police, hospital and compensation.  
(iii) " Status among competitors is affected,  
(iv) Faith of workers gets disturbed,  
(v) More attentiveness becomes necessary in future.  
4. Effect on Family:  
(i) Loss of earning member.  
(ii) Hospitalisation related time and money losses.  
(iii) Attention to patient needs,  
(iv) Stability of family is disturbed. i i  
(v) Other family members may loose working hours/study hours after accident of their family member,  
(vi) Feeling of insecurity. ,  
These are effects of accidents on nearby society. ae ;  
Example: Mr. Raju got an accident while working on drilling machine. He lost his right hand anger, me  
to this he is hospitalised for 12 days. For him, it is difficult to work like before. Now he is feeling Insecure. His  
confidence is collapsed. His wife was on leave for all the days. His daughter in SSC is feeling tensed while  
caring her father as well as study. Company name was there in newspapers on the next day of accident and  
management is trapped in police, court and compensation related routine work. On that day, the drilling  
machine on which Mr. Raju was working was stopped for all the shift  
   
   
   
4.5.1 Fire Hazards  
   
Examples of Fire Hazards:  
1. Objects that can generate heat.  
2. Overloading power sockets.  
3. Smoking.  
4. .Human error and negligence.  
5. Combustible material being stored on site.  
6. Flammable liquids and vapours.  
7. Dust build-up.  
8. Faulty electrical equipment.  
Harmful Nature of Fire:  
1. Flames burn the things.  
2. Heat and water vapour from combustion can cause severe damage.  
3. Dangenerous effects due to smoke and soot.  
4. Serious effects due to toxic chemicals.  
Types of Fire:  
(a) Fire involving solid materials (wood, paper, textiles etc.)  
(b) Fire involving flammable liquids such as petrol, diesel, oils etc.

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(c) Fires involving gases. I  
(d) Fire involving metals, : I  
(e) Fires involving electrical apparatus.  
How to Prevent Fire Hazards?  
1. Avoid hot work if possible.  
2. Train people.  
Ensure that the area is clear of flammable or combustible materials.  
Use of written permit system.  
Supervise the work, :  
Avoid accumulation of dust to a dangerous level by following a regular housekeeping.  
Keep display of safety information for every liquid that is stored.  
Store flammable liquids properly.  
Control all ignition sources.  
10. Provide personal protective equipment. :  
11. Keep equipments and machinery clean. This cleaning including surrounding areas, avoid the risk due  
to grease or dirt particles.  
12. Prevent overheating of machinery.  
13. Follow maintenance procedures regularly.  
14. Do not overload electrical equipment or circuits.  
15. Don't leave temporary equipment plugged in when it is not in use.  
16. Avoid using extension cords.  
17. Use antistatic equipment where required.  
Effects of Fire:  
1. Fire impacts people, property and the environment.  
2. Many human systems are affected by wildfire smoke.  
3. Fire affects respiratory system.  
4. Burning of skin, organs, fatal nature are dangerous impacts.  
4.5.2 Fire Drill  
Meaning: Fire drill is a method of practicing how a building would be evacuated in the event of a fire.  
Normally, the building's existing fire alarm system is activated and the building is evacuated as if the  
emergency had occurred.  
Steps in Fire Drill:  
1. Communicate with the local chief or Fire Marshall.  
2. Create an in-house safety committee.  
3. Communicate evacuation routes to people.  
4. Suggest alternate routes in case of emergency.  
5. Conduct fire drill regularly.  
During the Fire Drill:  
Supervisory staff are to monitor the fire drill process and note any of the following:  
1. Are individuals closing the doors after exiting rooms.  
2. Are individuals remaining calm and proceeding towards the nearest exit?  
3. Are individuals assembling at the designated muster point?  
4. Are fire wardens ensuring the safe evacuation of all individuals?  
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After the Fire Drill: ; ort.  
1. Record the total evacuation time in the evacuation checklist reP  
2. ‘Silence the alarms, reset the fire alarm system. ‘tion  
3. Ensure the fire alarm system is back to normal operating condition.  
4. Inform individuals that they can re-enter the building.  
5. Keep record of the fire drill.  
Advantages of Fire Drill: w the designated area.  
1. It ensures that, people exit the building in a timely fashion and kno  
2. People know the evacuation routes. ake sure all involved are familiar  
3. Fire drills are ani opportunity to practice evacuation procedures to m  
with them. . ‘effect  
4. Fire drills are also helpful for testing escape routes to evaluate their e  
5. Due to fire drills we can ensure that alarm systems and fire safety .  
condition. .  
6. Everyone is aware of how to get out of the working place in the quickest oe safe process  
7. After mock drill, improvements can be suggested to have effectiveness in tne e .  
Fire Drill Objectives: . .  
1. Giving employees an opportunity to practice emergency procedures in a simulated but safe  
environment. .  
2. Determining if employees understand and can carry out emergency duties.  
3. Evaluating effectiveness of evacuation procedures.  
4. Complying with requirements of the local fire code.  
Fire of Fire Drill:  
1. Fire prone places - Once in 3 months.  
2. Other work places - Once in 6 months.  
oe NEED FOR SAFETY MANAGEMENT  
Safety Management is needed because:  
1. Managing workplace safely is an important goal of an Organization.  
2. It ensures better working environment for employees.  
3. The software system used in safety management always help to record, manage and analyze safety  
related data.  
4. This system can see exactly where accidents and unsafe situations are occurring,  
Safety management also ensures proactive steps to eliminate accidents.  
6. Due to safety management system, day to day activities are observed t  
sheets, software application to record the safety data. Also to investig  
follow-up and feedback mechanism.  
7. Safety management ensures centralized compliances from all locations,  
8. Safety management brings repeatability to safety operatio  
can be methodically improved. x ns when processes are repeatable, they  
9. Safety management make standardization so  
10. It automates the safety investigation process.  
11. Safety management softwares enhance communication : .  
supervisors, managers, safety professionals, medical staff re Sharing of appropriate data among  
12. Due to safety management corrective actions are taken,  
13. It helps to place employees in jobs suitable to their work restrictions  
14. It ensures that when a task is carried out in .  
accidents.  
veness.  
quipment are in working  
   
   
   
ui  
hrough paper forms, excel  
ate accidents. It also take  
that all locations Operate uniformly  
our w  
your workplace, every Precaution has been taken to avoid

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11.  
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extremities, all other body parts.  
Personal Protective Equipment must be available and in good working condition.  
sed to overhead  
Head protection: There should be use of appropriate head protection when expo:  
hazards from electrical shock, burn hazards, impact hazards and penetration hazards. Head  
protection is required when exposed to object falling from above  
Eye and Face protection: Each employee shall u  
face hazards from flying particles, molten metal, liquid chemicals,  
Hearing protection: Each employee exposed to noise levels that excee'  
period must wear approved ear plugs.  
Hand and Foot protection: Each employee should use  
exposed to injury from potential skin absorption hazards,  
se eye or face protection when exposed to eye or  
acids or gas vapours.  
d 85 decibels for an extended  
appropriate hand and foot protection when  
chemical or thermal burns, electrical  
dangers, cuts, fractures etc.  
Protective clothing and personal hygiene: :  
rsons who are exposed to hazards such as solid and  
Protective clothing shall be worn by those pe  
liquid chemicals, high or low temperatures, Op’  
When persons are exposed to moving or rotating equipment, protective c  
en flames and large amount of ultraviolet light.  
lothing must fit tightly.  
Shirts shall be tucked in.  
Long sleeves must be buttoned.  
Jewelery should not be worn when operating industrial equipment.  
Lockout of energy sources:  
All employees should follow the strict procedure for lockout of energy sources.  
All equipments/circuits should be locked out to protect against accidental operation.  
Do not attempt to operate any switch, valve bearing a lock.  
Any employee not following procedures should be subjected to strict disciplinary actions.  
Hand tool and portable power, tool safety:  
Compressed gas cylinders  
All persons should use personal protective equipment while using any tools.  
Check for working safety guards, shields, warning labels etc.  
Always use right tool for the job.  
Dull tools are more dangerous than sharp ones. So use sharp tools.  
While working an electrical equipments, ensure that all metal hand tools are insulated.  
Never use compressed air to remove dust and debris from clothing.  
Use only those cylinders that are approved for interstate transportation.  
Close the cylinder main valve and bleed the lines.  
Remove any regulators.  
Tighten the cylinder valve cap.  
Cylinders may be rolled for moving purposes but not dragged.  
When there is doubt about how to use the cylinder, the user shall contact the supplier of the  
cylinder for consultation.  
Regulators and pressure gauges are  
Cylinders should not be kept near elevators.  
to be used only with gases for which they are designed.

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12. Welding and Cutting tools:  
e Use fire resistant gloves.  
e Use a leather cap to prevent hot sparks.  
e Hard hats shall be used when there is a hazard of falling objects.  
° Goggles, helmets and shields should be used for all types of welding.  
13. Power movers and tractors are designed to seat only the driver.  
14. Avoid lack of oxygen in a space that could cause immediate respiratory failure.  
15. Serious care must be taken where toxic gases or vapours can poison the workers.  
16. Avoid slipping, trapping surfaces.  
   
   
   
   
   
   
   
Es  
be designed considering safety first.  
en for that, while deciding the  
1. Safe Working Methods: Operations in the factory mu  
Possibility of accident should be eliminated. Prior care must be tak  
methods and operations.  
2. Proper Selection of Workers: Disciplined, mentally stable, emotionally balanced and alert people  
always work in safe manner. Workers with above qualities, with good motive of work must be  
selected for the work. The attitude and aptitude of workers must be tested through various  
psychological tests and interviews at the time of selection.  
3. Training for Safe Working: Training gives knowledge of work, which improves person's attitude  
and gives correct direction. Trained employees work safely. Proper workers with proper training is  
the better manpower to be employed. So training of workers is:the assurance of safe working. Hence,  
training is one of the preventive measures to avoid accidents.  
   
   
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4. Accident Prone Areas: Survey of industrial processes, plant layout, material transportation, sensitive  
operations help us to understand where the possibility of accident is More. Corrective actions and  
prevention can be taken at such places. Instructions regarding the same make awareness among the  
concerned authorities or employees and thus accidents can be avoided, j  
   
5. Safety Devices: During the industrial operations prevention can be taken  
Helmets, goggles, breath purifiers, pads, hand gloves, safety shoes, apron  
some of the personal safety devices which can be used. It depends on the  
of body exposure. Unnecessary extra care which creates difficulties in work  
must be trained to use the safety devices effectively.  
by using safety devices.  
S, Protection shields are  
type of process and kind  
Must be avoided. Persons

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6. Safety Programme: A systematic working with safety is possible through establishment of Safety  
Department. This department will be dedicated for safety related work only. A complete schedule for  
safety awareness will be carried out by the same. Workers can be educated by conducting various  
   
safety programmes and imparting trainings to make them conscious for safety.  
7. Safety Provisions:  
e Fencing of rotary and moving parts.  
e Provision of fire extinguishing equipments.  
Employment of adolescents on dangerous machines must be restricted.  
e Availability of first Aid facilities.  
e Instructions for ‘safety and related precautions’, while working must be displayed wherever  
required.  
(8) Promoting Safety Awareness in Employees: -  
Eventhough everybody knows miseries of accident, there are number of accidents everyday. So it is  
also important to create safety consciousness among the employees.  
By the following ways management may promote safety awareness:  
1. Safety training programmes.  
Display of Banners, Posters which underlines importance of safety.  
Organising Seminars, Conferences, Sessions by experts on industrial safety related issues.  
Displaying safety related messages, instructions, guidelines near the work area.  
Competition in industry related to safety and awards to those departments where minimum  
wv swn  
accident instances occur.  
Celebrating safety awareness week for creating safety consciousness among employees.

Safety Managemen,  
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7. Formation of safety committees. ny periodicals / magazines.  
. ' a :  
8. Publication of articles related to industrial safety in the comp strial safety.  
du  
° sa lated to in  
9. Essay competition, picture competion, slogan competition re reness.  
‘ of safety awa  
In these ways or other, management can create environment wareness plans may reduce  
: 4 safety a  
The above mentioned safety procedures, preventive measures and voach i  
accidents considerably. Accidents are undesirable and hence this safety apP  
SAFETY PROCEDURES:  
s the vital one.  
Tee  
   
   
   
Safety procedure includes following:  
1. ' Develop, establish and maintain plans for safety. “1 include safety training, industrial  
2. Define policies for administration of a safety programme which will inclu  
safety, safe working conditions etc.  
3. Providing accident prevention guidance to staff.  
   
4. Developing safety education, award programmes to create safety awareness.  
5. Reviewing documents related to safety, and directions mentioned in handbooks.  
6. Understanding legal systems related to accidents and deciding policies accordingly.  
7. Providing Safety Engineering at workplace,  
8. Short term and long term planning for safety factors related to technical developments and  
associated operational methods.  
9. Formation of Safety Department with dedicated staff for the same function.  
10. Establishing procedures of safe working.  
11. Checking the ground reality and finding out accident Prone areas. Actions must be taken to avoid  
accidents. .  
12. Handling workman's compensation claims and correspondences after unfortunate occassions,  
13. Provision of safety aids, first aid services near the workplace,  
14. Documentation related to accidents should be maintained,  
15. Review of plans related to construction, faciliti  
confirmation with acceptable safety standards.  
16. Evaluating and approving safety practices in potentially hazardous areas /o  
17, Ensure that, the health and safety of all employees are taken Care,  
18. Accident analysis to learn in future for no repetitions of the same  
—  
ies, i  
equipment and Other systems to ensure  
Perations,

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K PERMITS  
   
   
   
   
   
   
   
Work permit is a documented format that authorizes certain people to carry out specific work within a  
specified time frame/area, It sets out the precautions required to complete the work safely, based on a risk  
management.  
   
Features of Permit-to-Work Systems:  
A standard Operating procedure.  
The equipment and tools to be used.  
A hazard and risk assessment.  
Required Precautions, mitigating actions and control measures.  
The permit issue, extension and withdrawal details.  
The names and signatures of those who are responsible for the job.  
A tool box talk signed by all workmen.  
work permit system consists of standard procedure essential:  
Details of the necessary preparatory work method statement.  
Clear definition of responsibilities.  
It is a formal recorded process.  
It monitors and audits to ensure that the system works as intended.  
It is for authorized persons.  
Training of authorized persons.  
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Instructions in the issue, use and closure.  
8. There is provision of safety equipment.  
Where Work Permits Needed: .  
1. Works which may adversely affect the safety of personnel, the environment or the plant.  
2. High risk or non-routine activities which will require some form of prior to work commencing.  
3. Non-production work like maintenance, repair, cleaning, testing etc.  
4. Jobs where two or more individuals or groups need to coordinate activities to complete the job  
safely.  
5. Work on high voltage electrical equipment.  
Work on electrical trouble shooting or repair on live circuits.  
Work involving the use of hazardous or dangerous substances including radioactive materials and  
explosives.  
Complex machinery.  
. Pressure testing.  
10. Escape or rescue systems.  
11. Critical lifting, use of mobile cranes.  
12. Work at height.  
13. Operational pipelines.  
14. Work near energized lines.  
15. Should not be used for all activities, if not necessary.  
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When PTW not required:  
1. Emergency.  
2. Routine activity.  
Definitions in Work Permits: : keeping his area ang  
Responsible person: is a person authorized by manager who will responsible for Kerr  
staff safe. fs nga  
i : er ensuring t  
Issuer: is a person who is trained competent and authorized to issue a permit to work patel  
recaution  
all the hazards, associated with the work being done in that area and all necessary uty = oa  
being implemented to ensure that the work can be completed safely. ‘ble for the work bei  
Executor: is a person who is trained, competent and authorized who is responsible for "3  
completed as described in the Permit to work. i i  
Field Operator: is a competent person and supports the isolator at site, checks the site compliance to  
permit conditions and signs the permit.  
Types of work permits:  
1. Cold work.  
2. Hot work.  
3. Confined space.  
4. Excavation.  
5. Radiography.  
Cold work permit: A cold work permit shall be obtained for all general work that does not involve  
   
activities related to hot work.  
Examples: Routine maintenance, inspection, hand tools.  
Hot work permit: It is any work that could create a source of ignition, that could result in a fire or  
explosion.  
Examples: Spark producing tools, Hammering in high risk gas areas, explosives, welding etc.  
Elements of Work Permits System:  
1. Issue, 2. Receipt, 3. Clearance, 4. Cancellation  
1. Issue:  
¢ It means prejob checks.  
Description of work to be carried out.  
° Description of plant and location.  
e Assessment of hazards.  
¢ Identification of controls.  
2. Receipt:  
It means handover of permit.  
Competent and authorized person issues permit to workers.  
e  
   
e Work can now start.  
Plant is now under the control of the workers.  
Workers sign to say they accept controls.  
   
3. Clearance:  
¢ It means hand back of permit.  
\* Workers sign to say they have left the job site and equipment can restart.  
4. Cancellation:  
¢ Authorised person accept plant back and can remove isolations etc,  
e Plant is now returned to the control of the site. |

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Accident is an unfortunate and sudden mishappening. It damages property, material or human. As per  
various parameters there are many types of accidents like minor, major, industrial, permanent etc. Causes of  
accidents are due to workers, management, unsafe conditions and natural reasons also. Effects of accidents  
are on worker, industry, family and management. Fire is also main reason for industrial accidents. Fire drill is  
a method of emergency evacuation for practice of workers and’ employees. To avoid accidents, safety  
management is essential. Industry should follow safety norms and use preventive measures. Safety  
procedures ensure safe working. Also work permits help to restrict accidents. .  
   
   
   
   
(a) Injury to body (b) Production stoppage  
() Loss of job (d) Financial loss  
2. If affected worker is recovered within 10 hours, then which type of accident is it?  
(a) Minor (b) Reportable  
(c) Major (d) Fatal  
3. What happens in fatal accident?  
(a) Hospitalisation (b) Fractures  
(c) Disablement (d) Death  
4. Who can be responsible for accident?  
(a) Worker (b) Management  
(c) Working conditions (d) All the above  
5. Who is responsible for "unguarded moving parts"?  
(a) Workers (b) Management  
(c) Government : (d) None  
6. Which is not included in the causes of accidents due to 'Unsafe Working Conditions’?  
(a) Chemicalleakages i (b) Suffocation at work  
(c) Irregular floor heights (d) Quarrels of workers  
7. Which is not included in the ‘causes of accidents' due to nature?  
(a) Floods (b) Gas leakage  
(c) Heavy rains (d) Temperature strokes  
8. Who gets affected directly or indirectly due to accidents?  
(a) Worker (b) Industry  
(c) Family of worker (d) All  
9. Accident is  
(a) Unfortunate ' (b) Mishappening  
(). Sudden : (d) All the above  
10. Which is not included in the cause of accident due to worker?  
(a) Lack of concentration : (b) Poor housekeeping  
(c) Mischievous behaviour (d) Overconfidence  
11. Which is not included in the cause of accident due to management?  
(a) Bad habits of worker (b) Untrained workers  
(c) Bad construction of plant (d) Faulty equipments

12. Injury after accident disables the affected worker forever is  
(a) Fatal (b) Major  
(c) Permanent (d) None  
13. Internal accident means \_\_\_  
(a) Accident in the premises of company  
(b) Injury without showing external signs  
(c) Both  
(d) None  
14. Which preventive measure industry should take to avoid accidents? .  
(a) Safety provisions — - (b) Training for safe working  
(c) Safety devices (d) All the above  
15. Examples of fire hazards are .  
(a) Smoking (b) Overloading power sockets  
(c) Faculty electrical equipment (d) All the above  
16. Faulty electrical equipment may cause  
(a) Fire hazards (b) Industrial accidents  
(c) Loss of property (d) all the above  
17. Fire involving solid materials is of type .  
   
   
   
   
   
   
(a) (A) (b) (B)  
() (0 (d) (D)  
18. Fire involving flammable liquids such as petrol, diesel etc. is of type  
(a) (A) (b) (B)  
() (O (d) (D)  
19. Fire involving gases is.of type  
(a) (A) (b) (B)  
( (d) (D)  
20. Fire involving metals is of type  
(a) (B) (b) (Q)  
(c) (D) (d) (E)  
21. E type of fire is by a  
(a) Solid materials (b) Gases  
(c) Electrical apparatus (d) Metals  
22. Don't leave temporary equipment plugging when its use.  
(a) in, notin (b) off, in  
(c) off, not in (d) in, in  
23. Fire drill is  
(a) Drilling in fire (b) Fire near drill  
(c) Demo of fire evacuation training (d) None of the above  
24. Whom to communicate before doing fire drill operation?  
(a) Fire Marshall (b) Fire Commander  
(b) Fire Superintendent (d) Fire Inspector  
25. During fire drill :  
1. Communicate evacuation routes to people  
2. Create an in house safety committee  
(a) only 1 is correct  
(c) both are correct  
   
(b) only 2 is correct  
(d) both are wrong  
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Management 4.17 Safety Management  
26. ensures the safe evacuation of all individuals during fire drill. . :  
(a) Fire Marshall (b) Supervisor |  
(c) Fire Warden (d) Fire Inspector ;  
|  
27. During fire drill :  
1. Fire alarm system is not used  
2. All individuals assembly at the master point  
(a) only 1 is true (b) only 2 is true  
(c) both are true (d) both are false  
28. To give practice of evacuation in emergency \_\_\_\_is done.  
(a) Fire (b) Fire drill  
(c) Fire fight (d) Fire awareness  
29. Frequency of fire drill at fire prone places is . .  
(a) Once in a year (b) Once in 6 months i]  
(c) Once in 3 months (d) Once in 2 months \  
30. Frequency of fire drill at non-fire prone places is .  
(a) Once in a year (b) Once in 6 months  
(c) Once in 3 months (d) Once in 2 months \_  
31. is a documented format that authorizes specified people to work under conditions.  
(a) Work license (b) Work permit  
(c) Work authority (d) Work order  
In work, following facts are important. :  
(a) Specific work (b) Specified time  
(c) Specific area (d) All the above  
33. Work permit sets out the required to do work safely under  
(a) Risk, Permission (b) Function, Labour law  
(c) Process, Higher authority (d) Precautions, Risk management  
34. Work permits is  
1. Formal recorded process  
2. It is for authorized persons  
3. There is no clear definition of responsibilities  
(a) 1, 2 correct; 3 incorrect  
(c) 1lcorrect, 2, 3 incorrect  
35. Work permit is done at\_\_.  
1. High risk areas  
2. Routine activities  
(a) only 1 correct  
(b) both correct  
36. Work permit is done at\_\_.  
(a) High voltage work  
(c) Pressure testing  
37. When work permit is not required?  
(a) Complex machinery (b) Emergency  
(c) Work at height (d) Operational pipelines  
38. is a person authorized by manager who will be responsible for keeping area and staff safe.  
(a) Issuer (b) Field operator  
(c) Responsible person (d) Executor  
   
32.  
nN  
   
   
(b) 1,2 incorrect, 3 correct  
(d) lincorrect; 2, 3 correct  
(b) only 2 correct  
(d) both incorrect  
(b) Electrical trouble shooting  
(d) All

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is a person who is trained, competent and authorized to issue P  
   
   
   
   
39.  
(a) Responsible person (b) Issuer  
(c) Executor (d) Field operator ermit.  
40. is a person who is trained, competent and authorized as per work P  
(a) Field operator (b) Executor  
(c) Issuer (d) Responsible person site and signs the work  
41. is a person who is competent person and support the isolator at  
permit.  
(a) Executor " (b) Field operator  
(c) Issuer (d) Responsible person  
42. Match the pairs:  
1. Cold work (A) Fire  
2. Hot work (B) Hand tools  
3. Confined space (C) Welding  
(D) Pipeline  
4. Excavation  
(a) 1. (B), 2. (©), 3. (D), 4. (A)  
(b) 1. (A), 2. (B), 3. (©, 4. (D)  
43. Match the pairs.  
(A) Hand back of permit  
(b) 1. (D), 2. (©), 3. (8), 4. A)  
(d) 1. (©), 2. (B), 3. A), 4. P)  
1. Issue  
2. Receipt (B) Prejob checks  
3. Clearance (C) Remove isolation  
4. Cancellation (D) Handover of permit  
(a) 1. (D), 2. (C), 3. (B), 4. (A) (b) 1. (D), 2. (B), 3. (C), 4. (A)  
~ (c) 1.(A), 2. (B), 3. (©), 4. (D) (d) 1. (B), 2. (D), 3. (A), 4. (©)  
44. Safety management does not ensure  
(b) Time management  
(a) Safe workplace  
(c) Standardization of operation » (d) Investigation of accident -  
45. Safety management brings to safety operations.  
(a) Repeatability (b) Avoidance  
(c) Control (d) None  
46. Safety management does not apply\_  
(a) Standardization  
(c) Do not use software  
47. Safety management softwares do not share data among  
(a) Medical staff (b) Safety Professionals  
(c) Customers (d) Supervisors  
48. 1.. Safety management is not helpful in corrective actions.  
2. Safety management brings repeatability to safety operation,  
4  
(b) 2 is Correct  
(d) Both Incorrect  
   
(b) Ensures centralized compliances  
(d) Safety investigation process  
(a) 1is Correct  
(c) Both Correct  
49. Head protection does not help to safeguard  
(a) Burn hazards (b) Impact hazards  
(c) Gas fumes (d) Penetration hazards  
50. \_ is required when exposed to object falling from above.  
(a) Head protection (b) Eye protection  
(c) Hearing protection (d) Foot protection

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Management 4.19 Safety Managem  
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51. Face protection is not required in\_\_ :  
(a) Flying particles (b) Gas vapours |  
(c) Noise above 85 decibels (d) Molten metal  
   
52. For extended period we should not be exposed to noise above \_\_ decibles.  
(a) 50 (b) 60  
(c) 75° (d) 85  
53. Protective clothings are not useful for  
(b) Falling object  
(c) Low temperature (d) Liquid chemicals  
54. Protective clothing must be when exposed to rotating equipment. -  
(a) Loose (b) Tight  
() Both (d) None  
55. Safe clothing includes  
1. Shirts tucked in  
2. Long sleeves buttoned  
(a) Only 1 correct  
(c) Both correct  
56. All equipments should be  
(a) Open flames  
   
   
(b) Only 2 correct  
(d) Both incorrect  
to protect against accidental operation.  
   
(a) Locked in (b) Locked out  
(c) Closed in (d) Closed out  
57. Using hand tools one must care  
(a) Work with safety guards (b) Warning labels  
(c) Shields “@) All the above  
58. While working on electrical equipments ensure that all metal hand tools are \_  
(a) Insulated . (b) Folded  
(C) Protected . (d) None of the above  
59. Never use to remove dust and debris from clothing.  
(a) hand tools ; ~ (b) sticks  
() clothes (d) compressed air  
60. While using gas cylinders, use only those cylinders that are approved by  
(a) statement transportation / (b) interstate transportation  
(c) district officials (d) gas agencies .  
61. When there is doubt about how to use the cylinder, the user shall contact  
(a) Police (b) Supplier  
(c) Fire control (d) None of the above  
62. Regarding cylinders  
1. Cylinders should be kept near elevators for easy transportation  
2. Cylinders must be dragged, but not be rolled  
(a) Only 1 correct (b) Only 2 correct  
(c) Both correct (d) Both wrong  
63. Match the pairs:  
1. Gloves (A) Falling objects  
2. Hard hats (B) Hot sparks  
3. Leather cap (CQ) Welding  
4. Face protection (D) Molten metal  
(a) 1. (A), 2. (B), 3. (©), 4. (0) (b) 1.(B), 2. (C), 3. (D), 4. (A)  
(c) 1. (C), 2. (A), 3. (B), 4. (D) (d) 1. (D), 2. (8), 3. (O),, 4. (A)

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