

Unit-IV Web Applications and Security

CHAPTER 23: Importance of Workplace Safety

A. Select the correct option.

1. b. Heat, oxygen and fuel
2. c. Both of these
3. c. Both of these
4. b. Arc fault
5. c. Both of these

B. Write T for True and F for False.

1. False
2. True
3. True
4. False
5. True

C. Answer the following questions.

1.

FIRE SAFETY RULES

The following fire safety rules, if implemented correctly, can prevent and reduce fire hazards:

- **Carry Out a Fire Safety Risk Assessment:** Employers should carry out a risk assessment at the workplace, which can include fire prevention, fire detection and warning, and emergency escape, and firefighting. Fire needs three elements—heat, oxygen, and fuel. Without these elements, a fire will not start or spread. Hence, a key strategy to prevent fire is to remove one or more of these elements. The risk assessment should include detail on all the three elements to minimise the risk of a fire starting and/or spreading. A fire prevention strategy should be built based on this assessment.
- **Keep the Workplace Clean:** A clean and tidy workplace helps prevent fire threats, especially, if it handles a lot of flammable material. Such material should be stored in a safe environment; away from flames. An untidy workplace results in clutter, which acts like fuel for the fire to spread and also prevents access to exits and emergency equipment like fire extinguishers and sprinkler systems. Also, smoking should not be allowed at the workplace.
- **Maintain Electrical Safety:** A faulty wiring and malfunctioning of electrical equipment can lead to voltage fluctuations or short circuit that can further be a reason or cause of fire at workplace. Even defective wiring, overloaded sockets or plugs, and equipment that are old and faulty may lead to heating of cables and equipment, which in turn can lead to fire. Regular inspection and maintenance of electrical equipment should become a compulsory and regular practice to prevent overheating or sparking of cables or equipment.

2. Common causes of slips or trips are:

- Poor lighting
- Trailing cables
- Unsuitable floor coverings
- Uneven or damaged floor surfaces
- Contaminated floor surfaces due to liquid or grease
- Poor housekeeping
- Occasional spills

3. Following are some of the ways by which one can prevent slips, trips, and falls around the workplace:

- **Keep Walking Surfaces Clean and Free of Clutter:** Keeping walking surfaces clear, can help reduce the potential for injury. An unobstructed path minimises the risk for an employee to trip over an object and it also reduces the chances of a spill that could lead to a slip.

- **Lighting:** Proper lighting inside and outside of the workplace can help illuminate areas, like steps or other hazards that can cause trips if they are hidden by darkness or shadows. By installing proper lighting, one can reduce the chances of people slipping or falling.
 - **Signage:** Using clear and well-placed signage can help call attention to potential problem areas. A sign indicating a step, gap, uneven ground, or loose rocks will bring the employees' attention to the hazard and increase awareness and attentiveness. Reflective tape can also be used to highlight such problem areas.
 - **Stairways/Handrails:** Stairs are most popular place for falls at the workplace. To reduce the risk of such injuries, stairwells should have handrails, be kept clear of clutter, well lit, and free from any unsecured objects, like rugs and carpets. The first and last stair should always be well marked.
4. Following measures should be included in the electric safety programs of organisations:
- Electrical installations should be done and maintained by a competent person and checked regularly.
 - Extension cables, plugs, sockets, and other flexible leads and their connections that are particularly prone to damage should be visually checked, maintained, and where necessary, replaced before using any equipment.
 - Correct cable connectors or couplers should be used to join cables together; taped joints should not be allowed.
 - Socket outlets should not be overloaded by the use of adaptors.
 - Electrically powered equipment should be used.
5. First aid is the emergency care given immediately to an injured person. It is given to minimise injury and future disability. In serious cases, first aid may be necessary to keep the affected person alive.

The overall goals of first aid are to:

- keep the victim alive.
- prevent the victim's condition from worsening.
- keep the victim awake until help arrives.

The training of a first-aid program includes:

- The first few minutes after an accident or emergency are extremely important. In a lot of cases, the recovery of the victims and their lives depend on the first-aid provided at the scene of the accident. In such a situation, a person who is trained in first-aid can stop the condition of the affected person from becoming worse and even save lives.
- Prompt, properly administered first aid care can mean the difference between life and death, rapid versus prolonged recovery, and temporary versus permanent disability.
- We have seen that it is important to have qualified first-aiders at the workplace. There are nationally accredited training courses as well as certain other equivalent courses available to empower people to become qualified first-aiders. Only employees trained in first aid should assist a victim. As part of their emergency training, employees should know how to respond during an injury or illness situation, while not causing any further damage.

CHAPTER 24: Preventing Accidents and Emergencies

A. Select the correct option.

1. c. Both a and b
2. b. Manmade hazard
3. b. Meteorological, geological, and biological
4. c. Both a and b

5. a. Civil disturbances

B. Fill in the blanks.

1. Asphyxiation
2. Accidental release
3. Protective equipment
4. Blocked
5. An accident

C. Answer the following questions.

1. An accident at a workplace is an event that is an unplanned, unintended, and unexpected. It can happen due to various factors that a person faces at the workplace. Such accidents can cause minor to severe physical injury or even result in death. This may either be due to a risk that has not been identified or identified but not properly controlled.

A workplace emergency is an unforeseen situation that threatens the employees, customers, or public. It disrupts the company's operations and even sometimes causes physical or environmental damage. The hazards leading to accidents and emergencies may be natural or manmade.

2. **Slips, Trips, and Falls:** Slips and trips can result in falls. Slips can occur due to slippery floor, leaks from materials or debris left in walkways, uneven floor or working surfaces, protruding nails and boards, bunched up floor mats or uneven carpeting, holes or depressions in working surfaces, or uneven stairs.

Getting Caught in or Between Hazards: Sometimes minor cave-ins, such as being pulled into or caught in machinery and equipment or being compressed or crushed between rolling, sliding, or shifting objects also happen at the workplace.

Struck by Moving Equipment or Objects or Walking into Objects: Collisions could occur with heavy equipment or any moving object kept either at the same level or from an object falling from the above. A working person can also accidentally walk into an object and get injured.

Vehicle-Related Accidents: Accidents due to a crash or impact injuries are also quite frequent in workplaces. These often involve cars, lorries, or even small vehicles, such as forklift trucks, and at times result in serious injuries.

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Vehicle-Related Accidents: Accidents due to a crash or impact injuries are also quite frequent in workplaces. These often involve cars, lorries, or even small vehicles, such as forklift trucks, and at times result in serious injuries.

Fire and Explosions: Accidents also happen because of fire or other explosive substances. In such cases, problems may not only occur from direct contact with fires, but also because of asphyxiation, which is caused due to the smoke generated from the fires.

4. Mention some preventive measures that can be taken to prevent accidents at the workplace.

Some of the preventive measures, to prevent accidents, are:

- Employers must provide workers with protective equipment, such as safety goggles and other gear they need, to avoid dangerous exposure.
- Reminding employees to be vigilant.
- Removing clutter and putting it out of the way so that people would not step on it and fall accidentally.
- Effective procedures for dealing with employee grievances can help reduce the risk of fights in the workplace; which could otherwise, result in nasty injuries.
- Good training, clear signage, and access to the necessary safety equipment can all be a big help.
- Regular risk assessments are also important.

5. Even when organisations take appropriate workplace safety precautions and measures to avoid injuries, accidents can happen. In such cases, how employers respond to these accidents can make all the difference. When an injury occurs, the person in charge should follow proper protocols to handle a work-related injury or illness. Some such protocols are as follows:

Care for the Affected Employee: The employees' safety comes first and getting an injured employee preliminary treatment quickly is crucial.

- A proper evaluation of the situation should be done.
- An employee, who is trained in first-aid, should attend to the injured person right away.
- In an emergency situation, an ambulance should be called. In non-emergency situations, the injured employee should be taken to a medical care facility at the earliest.
- The family of the employee should be notified immediately about the situation.

Secure the Scene and Evacuation: In case of a serious accident, access to the accident site should be blocked to avoid any further damage. The site of a serious accident needs to be secured as quickly as possible to preserve the physical evidence for investigative purposes.

If there is a potential of the other employees being affected, an evacuation of the premises should be carried out to prevent further injuries or fatalities. The operations of the workplace need to be shut down in such emergencies.

Proper Reporting of the Accident: After ensuring the employees' safety, proper paperwork and documentation must be completed. The accident's report should be completed to help investigate the accident and the required documents for processing the claim from the insurance company should be filled in.

CHAPTER 25: Protecting Health and Safety

A. Select the correct option.

1. c. Both a and b
2. a. Radiation
3. b. Identifying possible hazards before accidents occur
4. c. Both a and b
5. b. Fruits and nuts

B. Fill in the blanks.

1. Hazard
2. Unhealthy
3. Health program
4. Long-term
5. Mental.

C. Answer the following questions.

1. Every workplace has its own unique environment and equipment. It is important that all potential emergency situations, like accidents, injuries, and health issues should be anticipated and identified so as to be prepared with a proper response plan, when and if such incidences occur. This will result in controlling the threats to human life and damage to property. It should not be just a one-time activity but an ongoing process. Proper planning will result in an effective safety and health program at the workplace.
1. Three examples of workplace hazards are:
 - Improperly fitted or guarded moving parts that can hit a person
 - Getting hit by sharp edges, corners, or parts that are protruding out from the equipment
 - Working at potentially hazardous places, like heights where there is possibility of a fall, or narrow places where one could get trapped
2. At the workplace, emergencies may arise due to several hazards. Often, the best protection in an emergency is to move out from where one is and shift to a safer place. When there are emergencies, like fires, hazardous chemical spills, radiation leakages, terrorism threats, or some health crisis, the workplace may need to be evacuated. For example, when a building catches fire, everyone in it must leave it and move out to a pre-decided safe area.
4. Three tips for healthy living of working people are:
 - **Eating Healthy:** It is said, 'You are what you eat'. Having a healthy breakfast in the morning, lunch that is nutritious and avoiding junk and fried food are some of the key factors in maintaining one's health.
 - **Having Adequate Amount of Water:** While working, one tends to lose track of the amount of water consumed. Drinking adequate amount of water is extremely essential to maintain the body temperature and other important functions of the body.
 - **Limit Drinks with Caffeine:** Office goers often get into the habit of having tea, coffee, or other caffeinated beverages frequently and in large amounts.
5. The availability of healthy food at the workplace, like fresh fruits and dry fruits, healthy snacks, juices, and healthy food in the canteen as well as during official programs and meetings can establish a culture of eating healthy at the workplace. This would, in turn, result in employees making healthy food choices in their personal life too.

SECTION 4: APPLICATION BASED QUESTIONS (UNSOLVED)

1. An electric safety program should be established by all organisations and followed properly.
 - Electrical installations should be done and maintained by a competent person and checked regularly.
 - Extension cables, plugs, sockets, and other flexible leads and their connections that are particularly prone to damage should be visually checked, maintained, and where necessary, replaced before using any equipment.
 - Correct cable connectors or couplers should be used to join cables together; taped joints should not be allowed.
 - Electrically powered equipment should be used.
 - A fuse protects the device from over current. It is designed to 'blow' and cut off the electricity when the current exceeds its rated capacity.
 - It is important to ensure that the correct fuse is used for all appliances.

- Employees working in areas where there are potential electrical hazards must be provided with appropriate, safe, and tested protective equipment.
2. Rahul should ask the mall manager to have stairways/Handrails in order to reduce the risk of such injuries, stairwells should have handrails, be kept clear of clutter, well lit, and free from any unsecured objects, like rugs and carpets. The first and last stair should always be well marked. They should also provide ladders and accessible step stools can help reduce the chances of a fall by helping employees reach heights safely. Availability of these, reduces the chances of employees using unstable objects or other furniture to climb.
 3. Most office systems are computerised now and staring at computer screens for hours while working causes eyestrain and damage to them in the long run. Rohit can suggest the following points:
 - Atleast an arms-length distance should be maintained from the screen. One must also look away from the screen at regular intervals to reduce eyestrain and long-term damage to the eyes.
 - One should take short breaks every half an hour, performing desk exercises or even having standing desks at the workplace.
 4. Office desks, copy machines, computer screens, and keyboards as well as mobile screens are some of the places that have a lot of microbes, which may cause infections. Vandana can ask the employees to clean all the objects used at the workplace regularly, using surface disinfectants and sanitising wipes. One must wash one's hands regularly with soap to stay healthy and germ-free.
 5. Kalpana can educate employees with work-life balance and can also encourage physical fitness to refresh themselves by working out and staying energised for the entire day. She can inform employees that drinking adequate amount of water is extremely essential to maintain the body temperature and other important functions of the body.

SECTION 5: SHORT ANSWER TYPE QUESTIONS (UNSOLVED)

1. An electric shock is a shock that occurs when a person comes in contact with a source of electrical energy. A person experiences a shock when this electrical energy flows through the body. An arc fault is initiated by the passing of the current between the two conducting metals through ionised gas or vapour, which is caused by a flashover or other conductive material. An arc fault results in a massive electrical explosion. This results in an arc flash, which is the light and heat from the explosion and an arc blast, which is a pressure wave that follows.
2. The first aid kit should include basic equipment for administering first aid for injuries. In order to know what contents are actually needed inside a first aid kit, a risk assessment of the workplace is required. The kits must be identifiable with a white cross on a green background and made of a material that will protect its contents from dust, moisture, and contamination.
3. The preferable scenario is, of course, to prevent accidents by providing adequate safety equipment and putting the right procedures, including training, in place.
Some of the preventive measures, to prevent accidents, are:
 - Employers must provide workers with protective equipment, such as safety goggles and other gear they need, to avoid dangerous exposure.
 - Reminding employees to be vigilant.
 - Removing clutter and putting it out of the way so that people would not step on it and fall accidentally.

4. Preparing a proper emergency action plan, which should include the following:
 - There should be an emergency evacuation plan ready for emergencies.
 - There should be clearly marked and well lit, unobstructed evacuation routes and emergency exits.
 - Employees should be able to have an access to lists with names and telephone numbers of emergency contacts.
 - Procedures for employees to shut down critical plant operations, operate fire extinguishers, or perform other essential services before evacuating should be clearly communicated as a part of the emergency plan.
 - Employees should be trained in first-aid procedures.
 - Practice drills for emergency action plans should be regularly conducted.
 - Make sure emergency/ fire alarms are recognised by all the employees.
 - Employers should have a reporting system in place for all accidents and dangerous incidents.
5. Try to juggle the roles and responsibilities at work and home can lead to exhaustion and mental stress. This may impact the quality of life and also have an adverse effect on the physical health. One great way to beat stress is to do things one enjoys. These may include spending time with family or friends, watching movies, listening to music, reading books, and exercising. A healthy work-life balance can help to avoid future mental and physical health issues.

SECTION 6: LONG ANSWER TYPE QUESTIONS (UNSOLVED)

1. The first few minutes after an accident or emergency are extremely important. In a lot of cases, the recovery of the victims and their lives depend on the first-aid provided at the scene of the accident. In such a situation, a person who is trained in first-aid can stop the condition of the affected person from becoming worse and even save lives. Prompt, properly administered first aid care can mean the difference between life and death, rapid versus prolonged recovery, and temporary versus permanent disability. It is important to have qualified first-aiders at the workplace. There are nationally accredited training courses as well as certain other equivalent courses available to empower people to become qualified first-aiders. Only employees trained in first aid should assist a victim. As part of their emergency training, employees should know how to respond during an injury or illness situation, while not causing any further damage.
2. An electric safety program should be established by all organisations and followed properly.
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 - Extension cables, plugs, sockets, and other flexible leads and their connections that are particularly prone to damage should be visually checked, maintained, and where necessary, replaced before using any equipment.
 - Correct cable connectors or couplers should be used to join cables together; taped joints should not be allowed.
 - Socket outlets should not be overloaded by the use of adaptors.
 - Electrically powered equipment should be used.
 - Fixed electrical equipment should have a clearly identified switch to cut off power in an emergency.
 - A fuse protects the device from over current. It is designed to 'blow' and cut off the electricity when the current exceeds its rated capacity.
3. The different types of accidents that can occur at a workplace includes:
 - **Slips, Trips, and Falls:** Slips and trips can result in falls. Slips can occur due to slippery floor, leaks from materials or debris left in walkways, uneven floor or working surfaces, protruding nails and boards, bunched up floor mats or uneven carpeting, holes or depressions in working surfaces, or uneven stairs.

- **Getting Caught in or Between Hazards:** Sometimes minor cave-ins, such as being pulled into or caught in machinery and equipment or being compressed or crushed between rolling, sliding, or shifting objects also happen at the workplace.
- **Struck by Moving Equipment or Objects or Walking into Objects:** Collisions could occur with heavy equipment or any moving object kept either at the same level or from an object falling from the above. A working person can also accidentally walk into an object and get injured.
- **Vehicle-Related Accidents:** Accidents due to a crash or impact injuries are also quite frequent in workplaces. These often involve cars, lorries, or even small vehicles, such as forklift trucks, and at times result in serious injuries.
- **Fire and Explosions:** Accidents also happen because of fire or other explosive substances. In such cases, problems may not only occur from direct contact with fires, but also because of asphyxiation, which is caused due to the smoke generated from the fires.

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- Employees should be able to have an access to lists with names and telephone numbers of emergency contacts.
- Procedures for employees to shut down critical plant operations, operate fire extinguishers, or perform other essential services before evacuating should be clearly communicated as a part of the emergency plan.
- Employees should be trained in first-aid procedures.
- Practice drills for emergency action plans should be regularly conducted.

5. In the event of an emergency, such as a fire or chemical spill, which requires evacuation, always consider the following points:

- The first person to notice the emergency should activate the emergency alarm or inform a senior officer and proceed to leave the building immediately.
- On noticing a hazard, be safe and then alert the emergency control personnel of your organisation as soon as possible. If unsafe, then, on reaching a safe location and distance, alert the personnel and call the relevant emergency services, like the fire department with the information about the emergency and its location. Medical services, like hospitals and ambulance can also be called if there are any injured people that require medical attention.
- On hearing an evacuation alarm, or on instruction of emergency control personnel, all personnel should immediately stop all the activities and follow the evacuation procedure. Do not attempt to collect personal items except for your wallet or purse. If there is an emergency kit nearby, take it with you.
- Shut down any hazardous equipment or processes, if practical, without endangering yourself or others.
- In the case of a fire, before opening a door, feel it for heat. If it is hot, do not touch or open it. Stay low if there is smoke in the room or passageway. Do not break windows unless absolutely necessary for ventilation and escape.
- If it is safe to leave, close doors, but do not lock them.
- Use a fire extinguisher only if it is safe to do so and you know how to use it.
- In case of a fire, do not use a lift to evacuate a building.

- Follow the directions given by the emergency control personnel and assist with the general evacuation, if directed to do so by them.
- Help with the evacuation of the disabled personnel.
- All the people in the building should walk quickly to the nearest exit and ask the others to do the same.
- In case there is a designated evacuation area, move calmly towards it and do not leave the evacuation assembly area until the 'All Clear' has been given.
- Do not return to the building until it has been declared safe.
- Remain calm, do not panic, and proceed calmly and without pushing others towards the exit. If the exit is blocked or crowded, use a secondary exit.
- Alert others to the nature and location of emergency on your way out. Assist any person in immediate da

