

C-2788

Sub. Code

50311

DIPLOMA EXAMINATION, APRIL 2024

First Semester

Fire and Industrial Safety

BASICS OF FIRE SAFETY

(2023 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the questions.

1. What is the primary cause of a BLEVE?
 - (a) Overpressure in a closed container
 - (b) Rapid cooling of a liquid
 - (c) A chemical reaction with water
 - (d) Radiation exposure

2. Which stage of a fire is characterized by the peak heat release, a well-established flame, and maximum growth of the fire?
 - (a) Incipient stage
 - (b) Smoldering stage
 - (c) Growth stage
 - (d) Fully developed stage

3. What material is commonly used to manufacture the shell of a safety helmet, providing impact resistance and protection from falling objects?
 - (a) Steel
 - (b) Aluminum
 - (c) Plastic
 - (d) Wood

4. Which type of fire extinguisher is appropriate for electrical fires including those involving live electrical equipment?
 - (a) Class A tire extinguisher
 - (b) Class B fire extinguisher
 - (c) Class C fire extinguisher
 - (d) Class D fire extinguisher

5. When conducting a visual inspection of a sprinkler system, what should be examined for signs of potential issues?
 - (a) Water pressure in the system
 - (b) Type of sprinkler heads installed
 - (c) Corrosion or physical damage to the sprinkler components
 - (d) Water temperature in the system

6. What type of leg protection is specifically designed to protect against cuts, abrasions, and punctures in hazardous work environments?
 - (a) Kneepads
 - (b) Steel-toed boots
 - (c) Leggings
 - (d) Cut-resistant pants

7. According to NFPA 72, which class of fire alarm system is necessary for properties where the total evacuation time may be longer, such as high-rise buildings and large assembly spaces?
- (a) Class A
 - (b) Class B
 - (c) Class C
 - (d) Class D
8. Protective crampons are primarily used for:
- (a) Providing additional ankle support
 - (b) Enhancing the aesthetic appeal of footwear
 - (c) Improving traction on icy and snowy surfaces
 - (d) Increasing the comfort level of footwear
9. Oxygen deficiency is typically defined as an atmosphere containing less than what percentage of oxygen?
- (a) 21%
 - (b) 15%
 - (c) 10%
 - (d) 5%
10. What is the main distinction between flammable and combustible liquids?
- (a) Their color and odor
 - (b) Their density and viscosity
 - (c) Their flashpoints
 - (d) Their chemical reactivity

Part B

(5 × 5 = 25)

Answer **all** the questions.

11. (a) How do heat transfer methods affect fire control and prevention?

Or

- (b) Differentiate between an accident, an incident, and a near miss in terms of workplace safety.

12. (a) Describe the types and construction of safety helmets, along with their care and maintenance.

Or

- (b) Identify and discuss the various types of goggles used for eye protection.

13. (a) Discuss the emergency measures for hand injuries and the key strategies for their prevention.

Or

- (b) Describe the components of a water-based sprinkler system.

14. (a) Discuss the different types of detectors used in fire alarm systems.

Or

- (b) Discuss the physical hazards and chemical substances that can affect the skin.

15. (a) Discuss the safety considerations for storing and transporting flammable liquids.

Or

- (b) Discuss the key components of respirators in detail.

Part C (5 × 8 = 40)

Answer **all** the questions.

16. (a) How do flash point, auto-ignition temperature, and fire point influence fire behaviour and safety measures?

Or

- (b) What are the basic types of Personal Protective Equipment (PPE), and how should they be selected for different work environments?.

17. (a) Detail the operating methods and precautionary steps for using fire extinguishers effectively

Or

- (b) Describe the types and construction of safety helmets, along with their care and maintenance.

18. (a) Elaborate on the introduction of hand protection, emphasizing its significance in preventing injuries and hazards in the workplace.

Or

- (b) Outline the inspection procedures for a dry pipe sprinkler system, emphasizing the key points to consider for ensuring its optimal performance.

19. (a) Explain the NFPA 72 classification of fire alarm systems, emphasizing its relevance in ensuring safety standards.

Or

- (b) Explain the importance of promptly removing skin irritants and the use of protective creams in preserving skin integrity in hazardous environments.
20. (a) Elaborate on the differences between air-purifying respirators and self-contained breathing apparatus, and when to select each type.

Or

- (b) Explain the precautions and procedures for loading and unloading combustible liquids.
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C-2789

Sub. Code

50312

DIPLOMA EXAMINATION, APRIL 2024.

First Semester

Fire and Industrial Safety

**OCCUPATIONAL HEALTH AND SAFETY
MANAGEMENT**

(2023 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the questions.

1. What is the primary purpose of conducting a risk assessment in a workplace setting?
 - (a) To increase employee workload
 - (b) To eliminate all workplace hazards
 - (c) To identify and mitigate potential risks and hazards
 - (d) To discourage workers from reporting incidents

2. What is the unit used to measure the absorbed dose of radiation in human tissue?
 - (a) Roentgen (R)
 - (b) Curie (Ci)
 - (c) Rad (radiation absorbed dose)
 - (d) Rem (roentgen equivalent man)

3. Prolonged exposure to which of the following types of vibration can lead to hand- arm vibration syndrome (HAVS) in workers?
 - (a) Low-frequency vibration
 - (b) Whole-body vibration
 - (c) High-frequency vibration
 - (d) Vibration with irregular frequency patter

4. Which of the following lighting standards specifies guidelines for workplace lighting conditions to ensure visual comfort and adequate illuminance for tasks?
 - (a) ISO 9001 (b) ANSI/IES RP-7
 - (c) ASTM A53 (d) IEEE 802.11

5. What is the first step you should take when encountering an unconscious person?
 - (a) Check for breathing and pulse
 - (b) Perform CPR immediately
 - (c) Offer water or food
 - (d) Check for external bleeding

6. What is the term used to describe a position closer to the midline of the body or a structure?
 - (a) Lateral (b) Medial
 - (c) Distal (d) Superficial

7. What is the recommended practice for maintaining first-aid skills in an industrial setting?
 - (a) Conducting regular fire drills
 - (b) Attending monthly safety meetings
 - (c) Participating in first-aid training and refresher courses
 - (d) Increasing the number of safety inspections

8. What is the first step in assessing a casualty?
 - (a) Administering first aid
 - (b) Checking for responsiveness
 - (c) Calling emergency services
 - (d) Evaluating the severity of the injury

9. What is the primary goal of implementing psychological hazard assessments in the workplace?
 - (a) To increase employee workload
 - (b) To foster a competitive work environment
 - (c) To identify and mitigate factors that may cause stress and mental health issues
 - (d) To discourage employees from seeking mental health support

10. What is the goal of integrating Behavior-Based Safety into an organization's safety culture?
 - (a) Assigning blame for accidents and incidents
 - (b) Increasing production targets at all costs
 - (c) Creating a safer work environment by addressing unsafe behaviors and actions
 - (d) Ignoring safety concerns raised by employees

Part B

(5 × 5 = 25)

Answer **all** the questions.

11. (a) What are the functional units and activities of occupational health services and how do they contribute to maintaining a healthy work environment?

Or

- (b) Explain the characteristics of notifiable occupational diseases and how they can be prevented.

12. (a) Discuss vibration control methods and the effects of whole-body vibration, along with available mitigation strategies.

Or

- (b) Discuss the types of ventilation systems and the instruments used for measuring their effectiveness.
13. (a) What are the key principles of First Aid and what is the role of the first aider, including the necessary sequence of actions on arrival at the scene?

Or

- (b) Discuss the characteristics and management of head injuries, including fractures of the base vault and sides of the skull.
14. (a) How does the circulatory system work and what are the necessary steps for handling a heart attack, including chest compression and CPR?

Or

- (b) Discuss the management of poisoning cases, including common symptoms and first aid interventions.
15. (a) Discuss Motivational Theory, Job Satisfaction and the Value System's impact in industrial settings.

Or

- (b) How can Behavior-Based Safety measures contribute to a secure work environment and enhance overall safety culture within the organization?

Part C

(5 × 8 = 40)

Answer **all** the questions.

16. (a) Explain the key principles of industrial toxicology, including local and systemic effects, chronic and temporary effects and the significance of threshold limit values (TLVs) in managing occupational health risks.

Or

- (b) What are the essential instruments for the detection and measurement of radiation and how do they contribute to the early recognition of radiation hazards in occupational settings?

17. (a) Explain noise measurement, evaluation and control methods, highlighting the biological effects leading to hearing loss.

Or

- (b) Highlight the purpose and advantages of good workplace illumination, including principles, design and maintenance considerations.

18. (a) Discuss the vital signs, including breathing and pulse and their importance in the assessment of a patient's condition during First Aid.

Or

- (b) Discuss the recognition and management of fainting, including the necessary aftercare procedures.

19. (a) Discuss the causes signs, symptoms and management of shock, emphasizing the crucial steps to be taken during first aid.

Or

- (b) Explain the classification of fractures and the principles of immobilization, focusing on the proper first aid measures for sprains and dislocations.
20. (a) Discuss workplace Stress, the General Adaptation Syndrome and strategies for managing it, including the role of Eustress and Distress.

Or

- (b) Highlight the importance of Psychological Counseling and Employee Assistance Programs in promoting employee well-being.
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C-2790

Sub. Code

50321

DIPLOMA EXAMINATION, APRIL 2024.

Second Semester

Fire and Industrial Safety

SAFETY ON ELECTRICAL AND CHEMICAL HAZARDS

(2023 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** questions.

1. What is the SI unit of electric current?
(a) Joule (b) Volt
(c) Ampere (d) Ohm
2. What is the main hazard associated with short circuits?
(a) Electrical Fires (b) Electric shock
(c) Overvoltages (d) Power Outages
3. Which of the following is considered a secondary hazard in electrical hazard analysis?
(a) Shocks (b) Burns
(c) Falls (d) Excess Energy
4. The corona effect is primarily associated with:
(a) Static electricity (b) Voltage fluctuation
(c) Energy leakage (d) Electromagnetic forces

5. Which of the following devices is used to protect electrical circuits from overload?
- (a) Fuses (b) Circuit breakers
(c) Overload relays (d) All of the above
6. What is the purpose of insulation in electrical systems?
- (a) To increase conductivity
(b) To decrease resistance
(c) To prevent electric shocks
(d) To reduce voltage fluctuations
7. Which system is used for the labeling of chemicals globally?
- (a) WHMIS (b) GHS
(c) OSHA (d) EPA
8. What does CLP stand for in hazard communication?
- (a) Chemical Labeling Protocol
(b) Chemical Labelling and Packaging
(c) Classification, Labelling and Packaging
(d) Chemical Leveling Protocol
9. Which of the following is NOT a physical hazard associated with chemicals?
- (a) Flammability (b) Radioactivity
(c) Reactivity (d) Explosiveness
10. What does LD50 represent in toxicology?
- (a) Lethal Dose for 50%
(b) Lethal Dilution for 50%
(c) Lethal Dosage for 50%
(d) Lethal Distribution for 50%

Part B

(5 × 5 = 25)

Answer **all** the questions.

11. (a) Explain Ohm's Law and its significance in electrical circuits.

Or

- (b) Explain the concept of hazard analysis in electrical safety and its importance.

12. (a) Describe the importance of safety measures in preventing falls related to electrical hazards.

Or

- (b) Discuss the significance of energy leakage age in electrical systems.

13. (a) Explain the concept of overload relays and their significance in preventing electrical hazards.

Or

- (b) What are the safe limits of amperage in electrical circuits, and why are they important to maintain?

14. (a) Explain the significance of Safety Data Sheets (SDS) in chemical hazard evaluation and risk assessment.

Or

- (b) Describe the purpose and significance WHMIS symbols in identifying chemical hazards in the workplace.

15. (a) Compare and contrast the different methods of chemical classification and their implications for chemical management practices.

Or

- (b) Explain the concept of Green Chemistry and its significance.

Part C

(5 × 8 = 40)

Answer **all** the questions.

16. (a) Compare the Indian Electricity Rules with international standards on electrical safety. Highlight any significant differences and their implications.

Or

- (b) Discuss the importance of CPR in electrical safety protocols. Explain its relevance and significance in emergency response to electrical accidents.

17. (a) Analyse the importance of grounding and lightning arrestors in mitigating the risks associated with lightning hazards.

Or

- (b) Discuss the role of the National electrical Safety Code in promoting electrical safety standards and practices.

18. (a) Analyse the differences between miniature circuit breakers (MCBs) and earth leakage circuit breakers (ELCBs) in terms of their applications and functionalities.

Or

- (b) List different types of PPE recommend for electrical workers and their specific functionalities.

19. (a) Evaluate the importance of physical hazard assessment in chemical safety management.

Or

- (b) Compare and contrast the various routes of entry for chemical exposure and discuss their implications in risk assessment and hazard evaluation.

20. (a) Analyse the challenges associated with the acquisition and inventory tracking of hazardous chemicals in industrial settings.

Or

- (b) Evaluate the effectiveness of various risk control measures in mitigating chemical exposure hazards.

C-2791

Sub. Code

50322

DIPLOMA EXAMINATION, APRIL 2024

Second Semester

Fire and Industrial Safety

FOOD SAFETY

(2023 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the questions.

1. Which of the following is NOT a classification of quality attributes in food?
 - (a) Intrinsic quality attributes
 - (b) Extrinsic quality attributes
 - (c) Sensory quality attributes
 - (d) Monetary quality attributes

2. How are quality attributes classified in the context of food quality?
 - (a) Intrinsic and extrinsic quality attributes
 - (b) Nutritional and sensory quality attributes
 - (c) Visual and olfactory quality attributes
 - (d) All of the above

3. What are the primary factors contributing to physical contamination in the food chain?
 - (a) Microorganisms
 - (b) Pesticides
 - (c) Allergens
 - (d) Foreign objects like glass or metal fragments
4. What is a crucial aspect of personal hygiene for food handlers?
 - (a) Wearing stylish attire
 - (b) Frequent handwashing with soap and water
 - (c) Using strong perfumes
 - (d) Keeping long nails
5. Which practice involves establishing guidelines and procedures to ensure that food products are safe for consumption?
 - (a) Good Agricultural Practices (GAP)
 - (b) Good Manufacturing Practices (GMP)
 - (c) Good Hygienic Practices (GHP)
 - (d) Good Veterinary Practice (GVP)
6. What are some of the current challenges to food safety?
 - (a) Climate change impacts on food production
 - (b) Food fraud and adulteration
 - (c) Allergen labeling discrepancies
 - (d) All of the above

7. What certification is associated with the quality of agricultural products in India?
- (a) AGMARK (b) ISI
- (c) BIS (d) FDA
8. Which ISO standard focuses on quality management systems applicable to all types of organizations?
- (a) ISO 9000 (b) ISO 17025
- (c) ISO 22000 (d) ISO 14000
9. What is the main objective of import intelligence and alert systems in food safety?
- (a) Facilitating faster customs clearance for imported food products
- (b) Identifying potential risks associated with imported food products
- (c) Providing discounts on imported food items
- (d) Promoting international trade agreements
10. Traceability in food safety refers to
- (a) Tracing the history, application, or location of food products through the entire supply chain
- (b) Identifying different food safety regulations across countries
- (c) Recalling contaminated food products from the market
- (d) Monitoring food consumption patterns of consumers

Part B

(5 × 5 = 25)

Answer **all** the questions.

11. (a) Explain the objective and importance of quality control in the food industry.

Or

- (b) Discuss the quality assessment methods for fruits, milk, and meat.

12. (a) List and briefly explain the three main factors contributing to contamination in the food chain.

Or

- (b) Explain the importance of personal hygiene for food handlers and mention one hygiene practice they should follow.

13. (a) Describe the principles of Total Quality Management (TQM) and its relevance to the food industry.

Or

- (b) Explain the concepts of risk assessment, and risk management in the context of food safety.

14. (a) Explain the importance of AGMARK and ISI (BIS) certification in maintaining food quality standards.

Or

- (b) Explain the role of FSSAI and PFA in maintaining food safety standards in India.

15. (a) Explain the concept of food alerts and their significance in ensuring food safety.

Or

- (b) Discuss the role of packaging and labeling specifications and certifications in ensuring food safety during export and import.

Part C

(5 × 8 = 40)

Answer **all** questions.

16. (a) Describe the importance of proper sampling methods in quality evaluation of food products.

Or

- (b) Evaluate the significance of quality control measures in addressing food adulteration and contamination issues.

17. (a) Discuss the role of sanitation methods and pest control in ensuring food safety, providing examples of each method.

Or

- (b) Compare the methods for preventing physical, chemical, and biological contamination in the food chain, highlighting their differences and similarities.

18. (a) Discuss the role of Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP) in ensuring food safety.

Or

- (b) Discuss the challenges associated with implementing and maintaining food safety standards in global food supply chains.

19. (a) Discuss the significance of ISO standards in ensuring food safety, and its impact on international trade.

Or

- (b) Describe the significance of WTO agreements in regulating international trade of food products.

20. (a) Discuss the significance of traceability systems in ensuring food safety and facilitating food product recall procedures.

Or

- (b) Explore the role of import intelligence and alert systems in preventing the entry of unsafe food products into the market.
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