

C-7346

Sub. Code

90332

DIPLOMA EXAMINATION, NOVEMBER 2025

Third Semester

Fire and Industrial Safety

SAFETY IN CONSTRUCTION SECTOR

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Define Noise and Vibration.
2. Define accident.
3. What is meant by PTW?
4. Define excavations?
5. Write about the causes of accident.
6. Define confined spaces.
7. What is meant by safe access?
8. Write about the types of crane.
9. What is meant by demolition?
10. Define First aid.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What are all the problems impeding safety in construction?

Or

- (b) Explain in detail about the PTW systems.

12. (a) Explain about scaffolding systems and mention the parts.

Or

- (b) Explain the safety measures to be followed during construction of high rise buildings.

13. (a) Write about the OSHA requirements for work at height.

Or

- (b) Explain anyone accident case studies in construction sector.

14. (a) Frame inspection checklist for hoist cranes.

Or

- (b) Explain about the manual material handling procedures.

15. (a) Write about the soil types and soil test.

Or

- (b) Mention some health hazards in demolition activity.

Part C

(3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain in detail about the types of accidents and its cause.

Or

- (b) Explain in detail about the PTW systems.

17. (a) Define excavations and what are the hazards involved in excavation.

Or

- (b) Explain in detail about the type of conveyor and safe use of it.

18. (a) Describe about the safety in earth moving equipments.

Or

- (b) Explain in detail about the safety in demolition work.
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C-7347

Sub. Code

90344

DIPLOMA EXAMINATION, NOVEMBER 2025

Fourth Semester

Fire and Industrial Safety

SAFETY INSPECTION AND AUDIT

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is the primary purpose of a workplace inspection?
2. What is the role of the inspection team in a workplace inspection?
3. Explain the concept of “audit findings” in the context of a safety audit.
4. What are the main objectives of conducting a safety audit?
5. What is an Environmental Management System (EMS)?
6. Briefly explain the concept of “continual improvement” in the context of ISO 14001.
7. Define High-Level Structure (HLS).
8. Explain the concept of “compliance” in the context of OHSAS 18001.

9. What is the purpose of the “closing meeting” in an OS&H audit?
10. List two types of records that should be examined during a safety audit according to Annex B of IS 14489:1998.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss common workplace hazards and how inspections help identify and mitigate them.
- Or
- (b) Discuss the factors influencing the frequency of workplace inspections.
12. (a) How do management systems contribute to safety, and how can audits assess them?
- Or
- (b) Describe the different types of safety audits and their specific purposes.
13. (a) Discuss the significance of ISO 14000 for management and the benefits of ISO14001 implementation.
- Or
- (b) What is the role of Environmental Impact Assessment (EIA) in an EMS?
14. (a) Discuss eco-labeling (ISO 14020), types of eco-labels, and their role in promoting eco-friendly products.
- Or
- (b) Outline the certification procedure for OHSAS 18001.

15. (a) Discuss the importance of implementing the audit report recommendations and the follow-up process.

Or

- (b) Explain key elements of an OH&S management system (OHSAS 18001) and the importance of an OH&S policy.

Part C

(3 × 10 = 30)

Answer **all** the questions, choosing either (a) or (b).

16. (a) Analyse the role of safety committees in conducting and following up on workplace inspections.

Or

- (b) Discuss the role of audit evidence in supporting audit findings. Explain methods for collecting and evaluating evidence to assess safety management systems.

17. (a) Analyse the potential impact of a poorly conducted safety audit on an organization.

Or

- (b) Critically assess the importance of top management commitment in the successful implementation of an ISO 14001-based EMS.

18. (a) Evaluate the importance of employee participation and consultation in the effective implementation of ISO 45001.

Or

- (b) Discuss the qualifications and competencies required for an effective OS & H auditor.

C-7348

Sub. Code

90351

DIPLOMA EXAMINATION, NOVEMBER 2025

Fifth Semester

Fire and Industrial Safety

SAFETY IN HIGH HAZARDOUS AREAS

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Explain short about Explosion Proof Equipment.
2. What is NEC & CENELEC?
3. Define about Auto Ignition Temperature.
4. What is Corona Discharge?
5. What is SF6 and its uses.
6. What are all the consequences of Fault on Power System?
7. Mention any two ways to reduce electricity in home.
8. What is explosion proof enclosure?
9. What is Fiber Optics?
10. Define Electrical Arcing.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe about expert systems for maintenance and trouble shooting.

Or

- (b) What are the guideline to reduce the risk of explosion and fire.

12. (a) Explain about the structural emission due to failure.

Or

- (b) What are all the causes and failure for the high emission of Hydro Carbon and CO.

13. (a) Explain about the Intrinsically Safe Equipment.

Or

- (b) Explain about Corona Discharge and the harmful effects of faults on power system.

14. (a) Explain detail about Explosion Proof Enclosure.

Or

- (b) Explain briefly about Limiting the energy.

15. (a) Explain about Electrical Sparks and Flame.

Or

- (b) What are all the advantages in Intrinsic Safety Devices and Equipments.

Part C

(3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) Describe a detailed information about Non Sparking Enclosures.

Or

- (b) Explain about the emissions due to failure of Gas, Dust, Fibers and Flying.

17. (a) Explain about Nitrogen Filled Equipment.

Or

- (b) Explain about
(i) SF₆ Insulation
(ii) Oil immersed equipment

18. (a) Explain about
(i) Pressurization
(ii) Purging
(iii) Hermetic Sealing
(iv) Encapsulation

Or

- (b) Explain about the Ionization Radiation and Static Electricity.
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C-7349

Sub. Code

90352

DIPLOMA EXAMINATION, NOVEMBER 2025

Fifth Semester

Fire and Industrial Safety

SAFETY IN OIL AND GAS INDUSTRIES

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is the primary need for safety in the oil and gas industry?
2. Define 'product hazard classification' in the context of oil and gas safety.
3. What is the purpose of Root Cause Analysis in safety and reliability analysis?
4. Define Job Safety Analysis (JSA) in the context of the oil and gas industry.
5. What is the primary risk picture associated with the offshore oil and gas industry?
6. Define 'situation awareness' in the context of offshore workers.
7. What are human factors that commonly affect safety in the oil and gas industry?

8. Define organizational factors in the context of accident causation.
9. What is the purpose of accident databases in the offshore oil and gas industry?
10. Name one source of accident data collection for the offshore oil and gas industry.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the key principles of safety management in the oil and gas industry.

Or

- (b) How does occupational stress contribute to human error in the workplace?

12. (a) Explain the Technique of Operations Review (TOR) and its importance in safety analysis.

Or

- (b) Outline the steps involved in performing an Interface Safety Analysis.

13. (a) Explain the concept of offshore worker situation awareness and discuss its importance.

Or

- (b) Analyze the key factors leading to the Bohai 2 oil accident.

14. (a) Discuss how organizational factors contribute to accidents in the oil and gas industry.

Or

- (b) Analyze the findings from oil field fatality analysis and their implications for safety.

15. (a) Explain the importance of the Worldwide Offshore Accident Databank in analyzing offshore oil and gas accidents.

Or

- (b) Outline the key lessons learned from landmark offshore oil and gas accidents and their impact on safety practices.

Part C

(3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss the common causes of work injuries in the oil and gas industry and analyze the impact of mechanical injuries on overall safety performance.

Or

- (b) Provide a comprehensive analysis of how human, organizational, and group factors contribute to accidents in the oil and gas industry.

17. (a) Compare and contrast Root Cause Analysis (RCA) and Failure Mode and Effect Analysis (FMEA).

Or

- (b) What are the main accident data sources for the offshore oil and gas industry, and how do they compare in their contributions to accident analysis?

18. (a) Provide a detailed analysis of the Piper Alpha accident, including its causes, impact, and subsequent safety improvements in.

Or

- (b) Explain the consequences of human error in the oil and gas sector and discuss various reasons for its occurrence.

C-7354

Sub. Code

90361

DIPLOMA EXAMINATION, NOVEMBER 2025

Sixth Semester

Fire and Industrial Safety

SAFETY MANAGEMENT SYSTEM

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is meant by 'social costs' of accidents?
2. Define 'Management Information System (MIS)' in the context of safety management.
3. Define 'Management by Objectives' (MBO) and its role in safety management.
4. What are some common barriers to effective communication in Safety, Health, and Environment (SHE) management?
5. What is the difference between job instructions and safety instructions?
6. What is e-learning in the context of safety training?
7. What is meant by integrating SHE in collective bargaining?

8. Briefly describe the concept of safety competitions.
9. How do individual differences impact safety behavior?
10. What is the role of perception in the acceptance of risks?

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the role of budgeting in safety management.

Or

- (b) Outline the procedure for collecting and compiling SHE information.

12. (a) Discuss the effective system of communication for Safety, Health, and Environment (SHE) within an organization.

Or

- (b) Outline the qualifications and attributes required for a safety officer in a safety department.

13. (a) Explain the key components of an in-plant training program.

Or

- (b) Outline the modern methods of safety training and their benefits.

14. (a) What is a safety suggestion scheme?

Or

- (b) Briefly describe the concept of safety competitions.

15. (a) Discuss how theories of motivation can be applied to improve safety performance.

Or

- (b) Outline the ethical issues related to behavioural safety in the workplace.

Part C

(3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) How are modern IT tools used in storing and retrieving MIS for SHE systems, with examples?

Or

- (b) What are the various training methods for SHE education, and what are the advantages of out-of-plant training programs and seminars?

17. (a) What is 'Management by Objectives' (MBO) and how can it be effectively implemented to improve safety planning and performance in an organization?

Or

- (b) How can motivation theories be applied to enhance safety behavior, considering individual differences and perceptions of danger and risk acceptance?

18. (a) How important is integrating safety into operating procedures, and how do job instructions compare to safety instructions in ensuring workplace safety?

Or

- (b) Explain the various performance appraisal techniques used in safety promotion and how they contribute to improving safety standards in an organization.

C-7355

Sub. Code

90362

DIPLOMA EXAMINATION, NOVEMBER 2025

Sixth Semester

Fire and Industrial Safety

COMPUTER AIDED HAZARD ANALYSIS

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Briefly describe 'What-If Analysis'.
2. What is Preliminary Hazard Analysis (PHA)?
3. Briefly explain the function of the Reaction System Screening Tool (RSST).
4. What is the Minimum Ignition Energy Test designed to measure?
5. Briefly describe the concept of Minimal Cut Set Ranking in Fault Tree Analysis.
6. Name one software used for risk analysis of heat radiation and pool fire.
7. Briefly describe the concept of a flash fire.
8. What is meant by 'plotting the damage distances on plant/layout'?

9. Briefly describe the significance of the Feyzin Disaster (1966) in risk assessment.
10. What type of installations does the Convey Report specifically assess?

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the procedure and methodology involved in hazard assessment.

Or

- (b) Outline the process and benefits of Hazard Operability Studies (HAZOP).

12. (a) Discuss the significance and application of explosive testing in safety assessments.

Or

- (b) How does the Shock Sensitiveness Test contribute to the safety evaluation of materials?

13. (a) Describe the basic concepts of reliability in the context of risk analysis.

Or

- (b) Compare Fault Tree Analysis (FTA) and Failure Mode and Effect Analysis (FMEA) in terms of their methodologies and applications.

14. (a) Outline the steps involved in conducting a chemical inventory analysis.

Or

- (b) Compare the effects of pool fires and jet fires in a chemical plant.

15. (a) Explain the key findings of the Rasmussen Report regarding reactor safety in nuclear power plants.

Or

- (b) Analyze how the Mexico disaster has informed hazard analysis and consequence analysis of chemical accidents.

Part C

(3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) Evaluate the importance of safety warning systems in hazard monitoring and risk management.

Or

- (b) Discuss the development and application of Fire Explosion and Toxicity Index (FETI).

17. (a) Evaluate the role and effectiveness of advanced instruments like the Reactive Calorimeter (RC) and Reaction System Screening Tool (RSST).

Or

- (b) Analyze the risk analysis methodologies and findings from the Rasmussen Report and the Reactor Safety Study, including current risk assessment practices.

18. (a) Evaluate the role and effectiveness FMEA in mechanical and electrical systems.

Or

- (b) Evaluate the methods used to estimate and analyze gas/vapor dispersion explosions, UVCE, flash fires, and confined explosions, including their toxic effects.
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C-7356

Sub. Code

90363

DIPLOMA EXAMINATION, NOVEMBER 2025

Sixth Semester

Fire and Industrial Safety

**BEHAVIOUR BASED SAFETY AND
INDUSTRIAL ERGONOMICS**

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Define personality.
2. What is motivation?
3. Define team building.
4. What is group dynamics?
5. What is safety culture?
6. Define BBS.
7. What is ergonomics?
8. Define switch gears.
9. Define personal risk factors.
10. Give a short notes of fatigue.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain in detail about Learning and Types of Learners.

Or

- (b) Write about motivation and its types.

12. (a) Explain in detail about group decision making techniques.

Or

- (b) Discuss in detail about organization structure.

13. (a) Explain in detail about Behaviour based safety.

Or

- (b) Explain about critical impact of social comparison feedback.

14. (a) Explain about applications of ergonomic principles in the shop floor.

Or

- (b) Explain about principles of motion Economy.

15. (a) Give some guide lines for safe design and safe postures.

Or

- (b) Explain in detail about man-machine interface control.

Part C

(3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain in details about learning, types of learners, learning process and learning theories.

Or

- (b) Explain about
(i) Group dynamic.
(ii) Team Building.

17. (a) Explain in detail about ABC behaviour modification.

Or

- (b) Write about physiology of workers.

18. (a) Explain in detail about body sizes and postures.

Or

- (b) Discuss in details about interpersonal perception impression management.
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