C–7587	Sub. Code
	30611

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

First Semester

Industrial Safety and Hygiene

SAFETY IN FACILITY DESIGN

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A ($10 \times 2 = 20$)

Answer **all** questions.

1. List any four factors required to be considered while selecting a location for a plant.

2. Write the two importance of safe between LPG storage vessel and pump house.

3. How the location of fire extinguisher can be identified?

4. Give any two rules related to fire safety layout as per Tamilnadu factories rules.

5. What are the lighting requirements in a factory according to factories act 1948?

6. Give two objectives of good ventilation.

7. What are all the safety measures you will take care for team lifting and carrying?

8. List out the different types of slings.

9. What is meant by Gantry crane?

10. What is meant by pull cord system in a conveyor?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) How to prevent common injuries caused by manual lifting?

Or

(b) Write short notes on hood and duct design.

12. (a) Explain the safety aspects to be considered to design layout a site for safe effluent disposal and treatment tanks.

Or

(b) Explain the safety aspects to be considered to design layout site for nuclear power stations.

13. (a) Write short notes on different factors that affect lighting and Requirements of good lighting.

Or

(b) Write short notes on Glare and its effect and Selection of lamps.

14. (a) What are all the different types of wire rope? How do you inspect and test the wire rope?

Or

(b) Write short notes forklift & its safety measures.

15. (a) Write short notes on Escalator safety and elevator safety.

Or

(b) Explain about how the crane accidents can be prevented.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) What are all the different factors to be considered for the safe plant layout of any process industry? Explain considering any one process industry as an example.

Or

(b) With the neat diagram and explain the design consideration to be made for locating Ammonia storage vessel.

17. (a) Explain about how plant layout will be helpful to safeguard the industry during the emergency period.

Or

(b) Discuss ergonomic consideration to be taken care for manual material handling.

18. (a) What is local exhaust ventilation? Explain the procedure for the design of exhaust hood system.

Or

(b) With the neat sketch and explain the design consideration to be made for locating LPG storage vessel.

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C–7588	Sub. Code
	30612

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

First Year

Industrial Safety and Hygiene

WORK STUDY AND ERGONOMICS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Anatomy?

2. What is Ergonomics?

3. What is meant by Motivation?

4. Define Conflicts.

5. What is Anthropometry?

6. Mention the hazard associated with standing job.

7. What is meant by human factors engineering?

8. What is Wmsds? Give some examples for Wmsds.

9. Define Injury.

10. What is Manual Handling task? Give examples for manual handling tasks.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain briefly on behavior aspects of posture.

Or

(b) What are the attempts to humanize work.

12. (a) What are the factors contributing to personality?

Or

(b) Write a brief note on Accident proneness.

13. (a) Explain briefly on sources of human variability.

Or

(b) Explain on ergonomics approach to work station design.

14. (a) Explain on human factors engineering.

Or

(b) Explain Briefly on Wmsds.

15. (a) What are the principles to be considered for design of visual display?

Or

(b) Write a short note on Cognitive system.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain briefly on ergonomics and its area of application in work place.

Or

(b) Explain in brief on Modern Ergonomics.

17. (a) Write shortly on Job satisfaction and job enrichment theory.

Or

(b) Define Motivation, Frustration, Conflicts, Emotion and Attitude with example.

18. (a) Give detailed guidelines on design of static work.

Or

(b) What is cognitive problem solving theory? Explain in brief with its stages.

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C–7589	Sub. Code
	30613

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

First Semester

Industrial Safety and Hygiene

SAFETY CONCEPTS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define safety.

2. What is meant by safety sampling?

3. Define safety audit.

4. What is NCR?

5. Define reportable accidents.

6. What is accident and its types?

7. What is meant by frequency rate?

8. What is meant by safety "T" score?

9. What is the objective of safety training?

10. Define – motivation in safety.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Briefly explain about incident recall technique.

Or

(b) Explain the term "SAFETY POLICY".

12. (a) Briefly explain about safety audit and its types.

Or

(b) Explain about unsafe act and unsafe condition at workplace and mention three examples in each case.

13. (a) Explain about domino's sequence.

Or

(b) Discuss in detail about principles of accident prevention.

14. (a) Explain about the types of disabilities.

Or

(b) Write short notes on calculation of Accident indices.

15. (a) Explain about safety posters.

Or

(b) Explain about identification of safety training needs.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain about JSA.

Or

(b) Discuss in detail about safety-budgeting. What points are to be considered while preparing safety budget?

17. (a) Explain in detail about accident investigation and reporting.

Or

(b) Explain in detail about Cost of Accident.

18. (a) Explain the following terms:

(i) Severity Rate

(ii) Incident Rate

(iii) Accident rate

(iv) Safety Activity rate

Or

(b) How to create safety awareness among workers and managers?

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C–7590	Sub. Code
	30614

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

First Semester

Industrial Safety and Hygine

FIRE SAFETY – DESIGN, INSTALLATION AND MAINTENANCE

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. When does the fire spread horizontally in a room?

2. Name the three areas included in Fire protection procedure.

3. Which is on-site 24-hour-a-day fire protection system?

4. Write the classes of fire and the types of fire extinguishers.

5. What is the function of Post fire guards in each area in the fire drill?

6. Define Fire load.

7. Where shall a multi risk fire extinguisher of 134 rating be installed?

8. Why are Fire drills to be conducted at frequent intervals?

9. Give few examples of fire resistant materials used in buildings.

10. What is the first step of all companies in the fire prevention activities?

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Explain in detail about the science of combustion.

Or

(b) Write about shock waves and auto ignition.

12. (a) Explain Isolation.

Or

(b) Explain in detail about foam generators.

13. (a) Explain with example the active Fire protection Systems.

Or

(b) Explain with example the passive Fire protection Systems.

14. (a) Discuss in detail about the vapour clouds explosions.

Or

(b) Discuss in detail about the unconfined vapour cloud explosions.

15. (a) Write short notes on Venting and rupture disc in process vessels.

Or

(b) Write short notes on Flame arrestor.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain in detail about the fire hydrant and sprinkler system for float roof oil storage tanks.

Or

(b) Explain in detail about the fire protection selection criteria for the Tank farms.

17. (a) Calculate the fire load for the 2 numbers of 40 T LPG storage bullets. Explain the Procedure in detail.

Or

(b) Explain in detail about the fire safety requirements for High rise buildings.

18. (a) Explain in detail the principle of explosion, detonation and blast wave explosion.

Or

(b) Discuss about 2004 Kumbakonam School Fire accident and also bring out the lessons learnt from this.

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C–7579	Sub. Code
	30715A/ 30615A

M.B.A./M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

First Semester

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT

(Common for M.B.A (E&IS)/M.Sc.(ISH))

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List the properties of sound.
2. What is meant by industrial audiometry?
3. Define Chemical hazards.
4. How to control chemical hazards in the industry?
5. Write the classification of bio-hazardous agents.
6. List the Advantage of Conducting an employee health program.
7. What are all the activities of occupational health services?
8. Define Industrial toxicology.
9. What is meant by occupational work capacity?
10. Define Stress.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write short notes on (i) Noise (ii) Properties of sound.

Or

(b) Write short notes on (i) Noise networks (ii) Noise surveys.

12. (a) Explain about Industrial hygiene calculations.

Or

(b) Explain about recognition of chemical hazards.

13. (a) Discuss about the classification of bio-hazardous agents.

Or

(b) Write short notes on the Bio-hazard control program.

14. (a) Write short notes on the concept and spectrum of health.

Or

(b) Explain about pre-employment and post-employment medical examinations.

15. (a) Write short notes on Man as a system component.

Or

(b) Difference between aerobic and anaerobic work.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain in detail about OSHA standards.

Or

(b) Briefly discuss about physical hazards in the industry.

17. (a) Discuss in detail about Ergonomical hazards in the industry.

Or

(b) Briefly discuss about (i) Carpal Tunnel Syndrome (CTS) (ii) Tendon pain disorders of the neck.

18. (a) Explain about (i) Personal hygiene (ii) Categorization of job heaviness.

Or

(b) Discuss about occupational physiology in detail.

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C–7580	Sub. Code
	30615B/ 30715B

M.B.A./M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

First Semester

SAFETY IN MINING INDUSTRY

(Common for M.B.A (E&IS)/M.Sc.(I.S.H))

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Write some accident sources in mines.

2. What is garage safety?

3. Define occupational hazards.

4. List out some effects of fire explosion in the underground mine.

5. Why is lighting important in tunnelling?

6. What is trapping?

7. List out elements in risk assessment.

8. What are control charts?

9. What is a safety audit?

10. Define safety engineering.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Illustrate in detail about fire prevention, garage safety, and accidental reporting system in mines.

Or

(b) Discuss in detail about safe transportation in open cast mines.

12. (a) Explain in detail about occupation hazards in underground mining.

Or

(b) Discuss Winding and transportation in underground mining.

13. (a) Illustrate falls from platforms, danger from falling bodies in tunnelling.

Or

(b) Explain in detail about atmospheric pollution and electrical hazards while tunnelling.

14. (a) Describe fault tree analysis mode and failure mode analysis.

Or

(b) Discuss activity relationship analysis and fuzzy model for risk assessment.

15. (a) Explain in detail about accident frequency rates and investigation measures in mines.

Or

(b) Discuss on improving safety in mines and the cost of an accident along with emergency preparedness.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain in detail about causes and prevention of accidents from heavy machinery. belt and bucket conveyors, pneumatic tools, and electrical systems.

Or

(b) Illustrate in detail about gas detectors and warning sensors in underground mines.

17. (a) Explain in detail about ventilation, lighting, and PPE requirement in tunnelling?

Or

(b) Discuss in detail about elements in risk assessment.

18. (a) Classify the accident and explain each in detail.

Or

(b) Explain in detail about safety audit and recent development of safety engineering along with disaster management.

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C–7581	Sub. Code
	30615C/ 30715C

M.B.A./M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

First Semester

SAFETY IN FIRE WORKS INDUSTRY

(Common for M.B.A., (E&IS)/M.Sc.(I.S.H))

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. List out the properties of Potassium Nitrate.

2. Write down the impact of fireworks.

3. What is the minor prevention done in the firework industry?

4. List out some hazards in firework industries.

5. What is fuse cutting?

6. List out some hand tools in process safety.

7. What is intermediate parking in material handling?

8. List out some handling methods for paper caps.

9. What are wastes associated with fireworks?

10. What are the restrictions associated with waste control?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write short notes on barium nitrate. and sulphur.

Or

(b) Explain in detail about borax and ammonia.

12. (a) Describe static charge meter and its process.

Or

(b) Illustrate in detail about earth pit maintenance.

13. (a) Illustrate the layout of the firework industry with a neat sketch.

Or

(b) Describe various stages of drying and packing of fireworks.

14. (a) Explain in detail about the design of vehicles for explosive transposition.

Or

(b) Illustrate in detail about material movement and storage facilities for firework products.

15. (a) Explain in detail about spillage and storage of residual in firework industries.

Or

(b) Illustrate waste handling methods in other countries.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Describe properties of fire and describe in detail about its explosion, impact, and sensitivity of friction.

Or

(b) Describe cause and effects in firework industries.

17. (a) Illustrate in detail about pollution prevention techniques and personal protective equipment used in firework industries.

Or

(b) Explain fire prevention and control along with risks related to the firework industry.

18. (a) Write down any case study associated with material handling in the firework industry.

Or

(b) Explain in detail about the concept of wastes in fireworks and their disposal with the necessary flow chart.

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C–7591	Sub. Code
	30616

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

First Semester

Industrial Safety & Hygiene

INDUSTRIAL HYGIENE I : RECOGNITION OF HAZARDS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Industrial hygiene

2. What is meant by a confined space?

3. Define auditing.

4. Mention some work – related diseases.

5. What is electrical hazard?

6. Explain fall from height.

7. Define Risk Assessment.

8. Mention some hazards due to moving vehicles.

9. Define Mechanical hazard.

10. What is meant by asphyxiation?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain Fatigue. How to eliminate unnecessary fatigue?

Or

(b) Explain in detail following

(i) Noise.

(ii) Vibration.

(iii) Illumination.

(iv) Radiation.

12. (a) Explain the pulmonary function test.

Or

(b) Explain auditing and its types in detail.

13. (a) State the precautionary measures to be taken while working in live surfaces.

Or

(b) Explain in short about work equipment hazards.

14. (a) What are the key management activities in manual handling?

Or

(b) Explain in short about vehicle hazards.

15. (a) Explain the following terms.

(i) Tripping.

(ii) Slipping.

(iii) Being struck by a falling object.

Or

(b) Write in short about biological hazards.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Write about waste disposal methods in detail.

Or

(b) Explain in detail about hearing conservation programme.

17. (a) Elaborate about any two Occupational diseases and its causes.

Or

(b) Write about General Safety Requirements as per Indian Electricity Rules 1956.

18. (a) Explain in detail about mechanical hazards.

Or

(b) Explain in detail about chemical hazards.

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C–7592	Sub. Code
	30621

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Second Semester

Industrial Safety and Hygiene

BEHAVIOUR BASED SAFETY

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define attitude.

2. Define perception.

3. List the types of leadership.

4. Short note on group dynamics.

5. What is feedback and it's types?

6. What is the purpose of ABC model?

7. What is INSITU safety training?

8. Explain health promotion.

9. How to define performance?

10. Define safety leadership.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the factors influencing perception?

Or

(b) Explain emotional intelligence?

12. (a) Explain team building and it's benefits?

Or

(b) Explain how communication can benefit organization?

13. (a) Explain impact of social comparison?

Or

(b) Describe importance integration of behaviour safety principles in an organization?

14. (a) Write the guidelines of brain storming?

Or

(b) Explain the don'ts at a brain storming?

15. (a) List the ten leadership qualities for total safety culture?

Or

(b) Explain employees involvement in occupational safety?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain management intervention, types and how it can be improved?

Or

(b) What is organization structure and formation and list advantages?

17. (a) How to improve the behaviour of employee to use PPE and enhance the safety culture?

Or

(b) Explain interpersonal and intrapersonal conversation advantages and disadvantages?

18. (a) Explain ten myths of behaviour based safety?

Or

(b) Explain the barriers affecting performance and how to break-through the barrier?

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C–6348	Sub. Code
	30622

M.Sc. DEGREE EXAMINATION, APRIL 2022.

Second Semester

Industrial Safety and Hygiene

LEGISLATIONS – ENVIRONMENT, HEALTH AND SAFETY

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define hazardous process.

2. What is the employment age for young person?

3. What do you understand by PCB?

4. What is air pollution?

5. Which year hazardous chemical rule published?

6. Write full form of SDS?

7. Write full form of SMPV?

8. How compressed cylinders shall be stored?

9. OSHAS 18000 deals with...?

10. Write full form of ANSI.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Define young person and guidelines on employing them.

Or

(b) What is hazardous process and give examples of hazardous activity as per TN factories act.

12. (a) Explain role of TN pollution control board.

Or

(b) Short notes on Noise and environment pollution.

13. (a) Who all shall be notified in the event major accident and mention the time frame also?

Or

(b) List at least five chemicals which are declared as Hazardous and toxic as per TN factories act.

14. (a) Briefly explain the key points of TN Gas cylinders rules.

Or

(b) Briefly explain the key points of TN petroleum rules.

15. (a) List key points of occupational safety and health act of USA.

Or

(b) Briefly explain the difference between OSHAS 18000 and ISO 14001

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Write briefly on special provisions for penalties and procedures in TN factories act 1950.

Or

(b) Explain prevention, control and abatement on environmental pollution.

17. (a) What is the duties of authorities and occupier in the event of major accident?

Or

(b) Explain building and other construction workers act 1996.

18. (a) Explain any four ANSI standards and the relevant industry.

Or

(b) What is noise pollution, applicability of exposure limits and relevant standard in force.

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C–6349	Sub. Code 30623

M.Sc. DEGREE EXAMINATION, APRIL 2022.

Second Semester

Industrial Safety and Hygiene

ELECTRICAL SAFETY

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define OHM's law.

2. What is electric shock?

3. What is voltage classification?

4. Purpose of lightning arrester.

5. What is FRLS insulation?

6. Write full form of GFCI?

7. What is LOTO?

8. Explain portable tools.

9. Explain of grouping of gases.

10. What is temperature classification?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the types of electrical fault.

Or

(b) Explain the effect of shock on Nervous system.

12. (a) Explain primary and secondary hazards.

Or

(b) What are the electrical causes of fire and explosion?

13. (a) Explain the protection against over voltage and under voltage.

Or

(b) Explain the purpose of GFCI.

14. (a) Explain earthing and requirements of earth pit.

Or

(b) Define cabling and methods of cable joints.

15. (a) Explain explosion proof electrical apparatus.

Or

(b) Briefly explain the barriers and isolators.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) What are the statutory requirements from electrical inspectorate to be complied by an organization?

Or

(b) Explain Excess energy, current surge, over current and short circuit current.

17. (a) Explain overload seven short circuit protection.

Or

(b) Explain permit to work system.

18. (a) Explain intrinsically safe devices and which zone they are used with examples.

Or

(b) Explain how electrical hazard can be a cause for fire and explosion.

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C–6350	Sub. Code 30624

M.Sc. DEGREE EXAMINATION, APRIL 2022.

Second Semester

Industrial Safety and Hygiene

INDUSTRIAL HYGIENE II : EVALUATION AND CONTROL OF HAZARDS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define safety audit.

2. Define safety sampling.

3. Write down hazards posed by pedestrian.

4. What should be worn by road side workers in addition basic PPE?

5. Which body parts are affected by manual handling?

6. List few lifting equipment used in civil construction site.

7. What are the forms of chemical agent?

8. What are the forms of a biological agent?

9. Write the full form of HAZAN?

10. Define the term occupational safety.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the preliminary hazard analysis.

Or

(b) What do you understand by what if analysis?

12. (a) What is heat and radiation hazards in a work place?

Or

(b) How you can control the causes and violence in a workplace?

13. (a) How you will ensure safety in the use of lifting and moving equipment?

Or

(b) Explain the statutory requirement of examination of lifting equipment.

14. (a) Explain the term health surveillance and personal hygiene.

Or

(b) Explain the requirements of transporting hazardous substances by road.

15. (a) Explain the steps involved in HAZOP.

Or

(b) Briefly explain the term fault tree analysis (FTA).

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain hierarchy of control in detail and why use of PPE is last option in control measure of a hazard.

Or

(b) What are the strategies to be followed to improve pedestrian safety and how you can control mobile equipment in work place?

17. (a) Explain the hazards in workplace equipment and the related control measures to minimize incident/accident?

Or

(b) Explain the routes of entry for a biological agent to enter human body and list the control measures to be implemented?

18. (a) Explain the five steps involved in HIRA (Hazard identification and risk assessment).

Or

(b) List the requirements of COSHH in handling toxic and hazardous chemicals.

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C–6326

Sub. Code
30725 a/ 30625 a

M.B.A./M.Sc. DEGREE EXAMINATION, APRIL 2022

Second Semester

Environment and Industrial Safety

SAFETY IN OIL AND GAS INDUSTRY

(Common for M.B.A. (E & IS)/M.Sc. (ISH)

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Explain Occupational Stressor.

2. How are human errors classified?

3. Define HAZOP.

4. Define Job Safety Analysis.

5. What is Markov method?

6. Explain bathtub hazard curve.

7. Define Preliminary Hazard Analysis.

8. Write the organizational factors affecting safety.

9. Name any four accident causation theories.

10. How offshore oil and gas industry are different from onshore installations?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write brief note on safety management principles.

Or

(b) Explain FMEA with an example.

12. (a) Explain steps involved in Oil Field Fatality Analysis.

Or

(b) Explain Fault Tree Analysis with an example.

13. (a) Write the common causes of accidents in offshore industry?

Or

(b) List oil and gas industry accident databases and accident data collection sources.

14. (a) Write a note on lessons learnt in recent offshore oil and gas accidents.

Or

(b) Discuss Mumbai High North Platform accident and its causes.

15. (a) Discuss Bohai 2 oil accident and its causes.

Or

(b) Discuss Seacrest Drill Ship accident and how it could have been prevented.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Write an essay on Prevention of accidents in Oil and Gas industry.

Or

(b) Compare safety challenges in Onshore and Offshore Oil and Gas installations.

17. (a) Write in detail about any two offshore oil and gas industry accident databases.

Or

(b) Write note on Emergency Planning and Preparedness for offshore platforms.

18. (a) Discuss any two accident causation theories.

Or

(b) Write an essay on Safety Awareness Training for Offshore O and G Industry employees.

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C–6351	Sub. Code
	30625B

M.Sc. DEGREE EXAMINATION, APRIL 2022.

Second Semester

Industrial Safety and Hygiene

HAZARD AND RISK ANALYSIS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the term, Risk matrix?

2. Explain the term Hazard and Risk?

3. What is JSA?

4. Who is responsible for preparation of JSA?

5. What is SOP?

6. Write the full form of HAZOP and HAZAN.

7. List the types of accidents?

8. Where Dominos theory is used?

9. What is accident rate?

10. Define incident rate?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain Severity rate and Frequency rate.

Or

(b) Explain ALARP and why it has been used.

12. (a) What are the steps involved in preparation of JSA?

Or

(b) Why JSA is prepared and list the benefits of JSA?

13. (a) How SOP is different from risk assessment, explain your view?

Or

(b) Explain fault tree analysis with a diagram.

14. (a) Explain the Heinrich triangle with a line diagram.

Or

(b) Explain reportable and non-reportable accidents.

15. (a) Explain the term partial and total disability.

Or

(b) Briefly explain safety activity rate and its problems.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the five steps of HIRA (Hazard Identification and Risk Assessment)?

Or

(b) Explain the procedures involved in preparation of SOP and how it is approved?

17. (a) What is HAZOP, why and when it is performed?

Or

(b) What is the difference between preventive action and corrective action, list the advantages over each other?

18. (a) Explain the calculations of accident indices and it's advantages and dis-advantages?

Or

(b) What is PPE and explain why PPE's cant rule out accidents/incidents in any manufacturing industry?

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C–6352	Sub. Code 30625C

M.Sc. DEGREE EXAMINATION, APRIL 2022.

Second Semester

Industrial Safety and Hygiene

HAZARD ANALYSIS AND CRITICAL CONTROL POINT

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the term Bacteria.

2. Explain the term Fungi.

3. What do you understand by food borne Hazard?

4. Explain the term Food poisoning.

5. How do you identify spoiled eggs?

6. What are all the preservatives added in canned foods?

7. Define the term Noise in manufacturing industry?

8. Explain the term vibration in manufacturing industry.

9. Write the full form of HACCP and country of origin?

10. Define hazard analysis.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the principles of microbiology.

Or

(b) Explain the factors influencing the growth of bacteria.

12. (a) What do you understand by Poisonous plants and give example?

Or

(b) Explain Salmonellas, campylobacter, and Aures.

13. (a) Explain the spoilage of fish and Shellfish.

Or

(b) Explain spoilage of cereal based foods with examples.

14. (a) Explain the importance of ventilation and air-conditioning in handling food materials.

Or

(b) Explain general principles and structural techniques in construction and lay out.

15. (a) Explain the raw material control and process control.

Or

(b) Explain critical control point and critical control limit.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the characteristics of Bacteria and Fungi.

Or

(b) Explain the bacterial food poisoning and incidences of food poisoning.

17. (a) What is food spoilage and how it can be prevented different categories of foods?

Or

(b) Explain the importance of employee service and welfare areas in promoting employee participation.

18. (a) Explain HACCP, quality schemes, objectives and origin of HACCP.

Or

(b) Explain the spoilage of frozen foods, spoilage of dehydrated foods, spoilage of irradiated foods and spoilage of canned foods?

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C–7598	Sub. Code 30626

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Second Semester

Industrial Safety and Hygiene

INTERNATIONAL HEALTH AND SAFETY STANDARDS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. List out the levels of documentation for ISO 14000.

2. What is environmental aspect as per ISO 14000?

3. What are the general principles of ISO 45001?

4. What are the objectives of ISO 45001?

5. What do you mean by imminent danger?

6. Define Audit.

7. What are main functions of ILO?

8. What is AIHA?

9. Define the general principles of LCA.

10. List out the features of OSHAS 18001.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write down the short notes on AUDITING ISO 14000.

Or

(b) Discuss the importance of ISO 14000.

12. (a) Explain the process and procedures in implementation of ISO 45001.

Or

(b) Discuss about the salient features of ISO 45001.

13. (a) Write short notes on "General duties of Employer" as per Health and safety at work act 1974.

Or

(b) What are the main objectives of the Health and Safety at Work Act 1974?

14. (a) Write short notes on functions of ILO.

Or

(b) What is the labour inspection?

15. (a) Explain the objective and targets of OHSAS 18001.

Or

(b) What are the stages involved in ISO 14040?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss the general principle of ISO 14001 and stages of ISO 14001.

Or

(b) Explain the accident reports, Performances measurement and monitoring in ISO 45001.

17. (a) Explain about Health and Safety Work Act 1974.

Or

(b) Discuss the role ILO in promoting the Occupational safety and health standards.

18. (a) Explain in detail about the ISO 14040.

Or

(b) Write in detail about the difference between OHSAS 18001 and ISO 45001.

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C–7599	Sub. Code
	30631

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Third Semester

Industrial Safety and Hygiene

CONSTRUCTION SAFETY ANALYSIS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What is impregnation of timber?

2. What is the IS standard for safety gloves (hand protection)?

3. Define accident.

4. What is safety fuse in explosion operations?

5. Checklist before starting the forklift operation.

6. What is the use of safe load indicator?

7. What is guard rails and toe board? Write the standard size of toe board as per BOCW Act?

8. Define height work.

9. What is hot work?

10. List out the safety precautions while performing electrical works.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Why noise and vibrations are hazardous? Mention the occupational diseases caused due to it and control measures.

Or

(b) Write short notes on the welfare facilities to be provided in the construction sites.

12. (a) Safety precautions to be followed to prevent collapse of soil.

Or

(b) Give short notes on various soil test and soil types.

13. (a) Write short notes on general safety precaution to be followed while operating the excavators.

Or

(b) Give short notes on erection, inspection, maintenance of mobile crane.

14. (a) List the types of scaffolding and with neat sketch explain any one of the type.

Or

(b) General precautions to be involved in concreting works.

15. (a) Give short notes on ergonomic hazards related issue with an example.

Or

(b) What is height work and list the precautions for it.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) List and explain the common hazards present in a construction site and methods to control it.

Or

(b) Write short notes on the BOCW Act,1996.

17. (a) A step by step activities involved in explosion operation and safety precaution to be followed while performing it.

Or

(b) Explain in detail about application of hoist and general safety measures followed during hoist handling.

18. (a) Write a case study on any one of the construction site accident along with its root cause.

Or

(b) What are the hazards and control measures for welding, grinding and gas cutting?

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C–7600	Sub. Code
	30632

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Industrial Safety and Hygiene

INDUSTRIAL SAFETY ENGINEERING

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. List any two criteria in selection of a plant location?

2. What are the types of plant layouts?

3. Write the expansion of ZMS?

4. List the benefits of good guarding systems?

5. Name any two personal protective equipment for welding?

6. Give colour codes for industrial gas supply?

7. What do you mean by electroplating?

8. Name any two personal monitoring devices?

9. What do you mean by OSHA standards?

10. List the advantages of OSHA certification?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the term land productivity.

Or

(b) Write short notes on disposal of waste and treatment.

12. (a) Write notes on machine guarding.

Or

(b) Discuss the necessity of good guarding systems.

13. (a) List the safety precautions for welding.

Or

(b) Explain the safety measures for explosive welding.

14. (a) Discuss the steps in safety check for a boiler.

Or

(b) Write notes on hydro-testing.

15. (a) What are the highlights of OH&S policy?

Or

(b) Write notes on OSHA certification

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) With a line sketch explain the layout for fireworks and match industry.

Or

(b) Discuss in detail about good guarding systems for mechanical equipment.

17. (a) Discuss in detail about gas cylinder-storage, leak detection and handling.

Or

(b) Discuss about radiation hazards- its harmful effects and preventive measures.

18. (a) With a block diagram explain OSHA 1800 certification process.

Or

(b) Write notes on safety checks for suitability [A] pulleys [b] belts.

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C–7601	Sub. Code
	30633

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Industrial Safety and Hygiene

EVOLUTION OF MODERN SAFETY CONCEPTS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define safety Policy.

2. What is meant by Incident Recall Technique?

3. What does Maslow's hierarchy of needs say?

4. What is the Theory X approach?

5. Define the term "HAZARD".

6. What are the steps involved in HIRA?

7. What is accident causation theory?

8. Define JSA.

9. What is product analysis?

10. What is Hazard Rate?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain in detail about general concepts of management.

Or

(b) Explain in detail about Safety budgeting.

12. (a) Write short notes on Herzberg motivational theory.

Or

(b) Explain in detail about Directive democrat and Directive Autocrat.

13. (a) Explain about ETA concepts.

Or

(b) Explain in detail about Hazard assessment.

14. (a) Explain in detail about Domino Theory.

Or

(b) What is the purpose of accident investigation?

15. (a) Explain in detail about Pareto analysis uses.

Or

(b) Explain in detail about Weibull model.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain the following terms

(i) Safety sampling

(ii) Safety Inspection

Or

(b) Explain in detail about Maslow's Hierarchy theory.

17. (a) Explain in detail about Human Factor theory.

Or

(b) Explain in detail about Risk assessment concepts.

18. (a) Explain in detail about accident investigation procedures.

Or

(b) What are the stages involved in product life cycle?

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C–7602	Sub. Code 30634

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Industrial Safety and Hygiene

COMPUTER AIDED HAZARD ANALYSIS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Mention the procedure for risk estimation.

2. Differentiate voluntary and involuntary risk.

3. State the application of thermo calorimetry.

4. Define card gap test.

5. Define Risk Priority Number.

6. What is meant by 'pool fire'?

7. Give few examples for Chemical toxicants.

8. State the significance of plant layout.

9. List the merits of past accident analysis.

10. Mention the need for good plant layout.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Discuss about HAZOP in detail.

Or

(b) Summarize the main ways to control a hazard.

12. (a) Describe the safety audit procedure in detail.

Or

(b) Distinguish impact and friction testing methods.

13. (a) Explain the working of thermo gravimetric analyser.

Or

(b) Write short notes on Safety Testing of explosives.

14. (a) Differentiate fault tree and event tree analysis.

Or

(b) Write short notes on HAZAN.

15. (a) Describe "FMEA" in detail.

Or

(b) Mention few merits of reliability software on "FMEA".

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the hazard assessment technique with example.

Or

(b) Elaborate the construction of differential scanning calorimeter.

17. (a) Explain UVCE and flash fire with example.

Or

(b) Write short notes on Rijnmond report.

18. (a) Recall Bhopal disaster and its effects. Describe Port Hudson disaster in detail.

Or

(b) Discuss in detail reactor safety study on nuclear power plant.

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C–7603	Sub. Code
	30635A

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Industrial Safety and Hygiene

SAFETY IN POWDER HANDLING

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. How do you handle aluminium?

2. Name some metal and non-metal powders.

3. What is the disadvantage of powder coating?

4. Define atomization.

5. What are the types of dust separators and filter?

6. Explain venting of ducts.

7. What is deflagration?

8. What is dust fire?

9. Characteristic determining the processing behaviour of metal powder?

10. What are the Hazards of exposure to silica in coal mine?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain in detail following metal properties

    (i) Flow rate

    (ii) Particle size

    (iii) Porosity

Or

(b) Explain in detail about properties of metal powder.

12. (a) Explain in detail about types of atomization.

Or

(b) Explain in detail about powder treatment and handling.

13. (a) Write about technical safety parameters of dust.

Or

(b) Explain detailed process about hartmann vertical tube apparatus.

14. (a) Explain in detail about types of dust collectors.

Or

(b) Explain in detail about types of bucket elevator.

15. (a) Write about minimum required respirator, cartridges and filter for any ten hazard based on NIOSH.

Or

(b) Explain the following terms.

    (i) Sources of dust

    (ii) Methods to break down dust

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain in detail about internal and external use of bulk powder.

Or

(b) Write advantage and disadvantage of types of powder.

17. (a) Write any case study on dust explosion.

Or

(b) Explain in detail about active Vs passive explosion valve.

18. (a) Explain in detail about any five baghouse filter.

Or

(b) Explain detailed process about godbert – greenwald furnace with diagram.

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C–7604	Sub. Code
	30635B

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Industrial Safety and Hygiene

SAFETY IN AIRPORT AND SHIPYARD

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the common hazards in loading deck?

2. What is the objective of environmental protection act?

3. Define working principle of hatch cover.

4. How to minimize the risk of electrical hazards in shipyard?

5. How often lifting appliance should be tested?

6. Define transtainer.

7. What is the use of side loader forklift?

8. Define stack load or stack weight.

9. What is the function of hatch beams?

10. Define conveyor and its types.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Give short notes on main function of advisory committee in the dock works.

Or

(b) Give short notes on off-site emergency plan.

12. (a) Give short notes on design and types of ship hatch cover.

Or

(b) What are the condition and limitation in handling of hatch cover and beam under dock works?

13. (a) Define natural synthetic fibre rope. Give short notes on handling, care and maintenance of natural synthetic rope.

Or

(b) What is a sling? Explain in detail about different types of slings.

14. (a) Give short notes on restriction of loading and unloading operation in shipyard.

Or

(b) What are the conditions followed by stacking and un-stacking under the dock works regulation.

15. (a) Explain in detail about emergency action plan during gas leakage and spillage of dangerous goods.

Or

(b) Give short notes on on-site emergency plan and safety report in shipyard.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain in detail about marking of heavy packages act 1951.

Or

(b) Explain in detail about stacking construction and maintenance under dock works regulation.

17. (a) Give short notes on different types of training followed of dock workers.

Or

(b) Explain in detail about safety in handling of hatch beams.

18. (a) Explain in detail about different types of slings and loose gears.

Or

(b) Give short notes on dock worker rules and regulation 1990.

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C–7605	Sub. Code
	30635C

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Industrial Safety Hygiene

HAZARDOUS WASTE MANAGEMENT

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Hazardous waste.

2. What is Minifest?

3. What is Sorption?

4. What is Volatization?

5. Mention types of transport of contaminants in groundwater.

6. Define solid waste.

7. What are the steps involved in management of solid waste?

8. Define environment risk.

9. Define disinfection.

10. Define solidification.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the types and sources of hazardous waste.

Or

(b) Discuss the importance of public involvement and participation in SWM.

12. (a) Explain the following points in context of hospital solid wastes.

(i) Categories of wastes

(ii) Treatment and disposal

Or

(b) Explain in detail the fate and transport of contaminants through air.

13. (a) Explain the types and sources of solid waste.

Or

(b) Write a short note on waste generation from nuclear power plants.

14. (a) Write a short notes on environment risk assessment.

Or

(b) Write a short notes on Leachate collection and removal.

15. (a) State and explain the factors affecting composting.

Or

(b) What are different methods of composting? Explain any one.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Describe the current status of' recycling of SWM in India.

Or

(b) Explain in detail about hazardous waste transport vehicle and manifest system.

17. (a) Classify the biomedical waste treatment, with respect to option, category, treatment and disposal.

Or

(b) Explain the steps involved in storage, handling and management of batteries in an organization.

18. (a) With a help of neat sketch compare single composite and double composite liner for hazardous waste landfills.

Or

(b) List the different operation issues at a land fill and explain the control measures.

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C–7606	Sub. Code
	30641

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Fourth Semester

Industrial Safety and Hygiene

ENVIRONMENTAL SAFETY MANAGEMENT

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define air pollution. Point out the pollutants from automobile exhaust.
2. Explain Deforestation with and example.
3. Define water pollution. What are the parameters to be considered for water pollution?
4. Elaborate ETP, BOD, COD, STP.
5. Mention the steps involved in Hazardous waste Management.
6. Define Incineration.
7. Mention the difference between sampling and Analysis.
8. Explain the function of Bag Filter.
9. Mention all the pollutants generated from textile industries.
10. Mention the control methods for the air pollutants from cement industry.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain briefly on air pollution sources and its effects on Human beings.

Or

(b) Write a brief note on Ozone depletion.

12. (a) Write a brief note on sampling and analysis of wastewater.

Or

(b) Write a brief note on permissible limit of effluent water quality by PCB for tannery industry.

13. (a) Explain briefly on Hazardous Waste Management in India.

Or

(b) Explain on treatment process of different hazardous waste.

14. (a) What is AAS? Explain the function of AAS.

Or

(b) Explain briefly on Gravitation Settling Chambers.

15. (a) Define Eco friendly energy with examples.

Or

(b) What are the pollution control methods in Thermal Power Plants.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain effluent quality standards and laws for chemical industry.

Or

(b) With neat diagram explain wastewater treatment process for textile industry. Also mention the effluent quality standard for textile industry.

17. (a) Explain in brief on methods of collection and disposal of Solid waste.

Or

(b) What are the hazardous associated with toxic and radioactive waste. Explain.

18. (a) Explain in brief about pollution control in petroleum industry.

Or

(b) Explain in brief about pollution control in thermal power plants.

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C–7607	Sub. Code
	30642

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Fourth Semester

Industrial Safety and Hygiene

EHS MANAGEMENT STANDARDS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define ISO 9001:1994.

2. Write about the element of OH and S management system.

3. What are the General Objective and Targets for a management?

4. Write about Reviewing the Safety Policy for an organization.

5. What are the actions will be done by Inspector while performing Inspection?

6. Why it is important to secure the scene of an accident?

7. Explain the Implementation Plan of ISO 14001.

8. What are the steps involved in Audit?

9. Write the Stages of LCA.

10. What are the benefits of EIA?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the benefits and requirements of ISO 14001:1996?

Or

(b) Write short on the Development of OSHAS Standard.

12. (a) Describe the methodology steps for development action plan.

Or

(b) Write the moral, legal and financial reasons while developing safety policy.

13. (a) If an organization is good in communication with its employees, then the management will be in profit. Justify this statement by considering Safety.

Or

(b) You are the safety representative of an organization. You are asked to monitor the performance of the organization. On what basis you will perform the monitoring with example.

14. (a) What are the General principles of Environmental audit?

Or

(b) Briefly explain the Environmental Management system.

15. (a) Write short note eco labelling and its history.

Or

(b) How Audit will influence the growth of an organization? Give your explanation in the view of an auditor.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) (i) Write the general aspect of Labour Inspection and the Role of a Labour Inspector.

(ii) Write the Functions of Inspection System.

Or

(b) How Proactive and Reactive monitoring will make the organization performance better? Detail your explanation.

17. (a) If you are in the top-level management of an organization and you are given the role of obtaining the certification procedure for ISO14001. Briefly explain your role.

Or

(b) The appointed safety officer is advised to do an Accident Investigation. The Accident happens before two months. What are the activities to be done by the appointed safety officer? How will he save the accident details?

18. (a) Briefly explain the auditing methodology for an organization.

Or

(b) Give a detail account on Emergency action plan.

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