



# UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, NOV/DEC 2018

COURSE NO: ES 271  
COURSE NAME: INTRODUCTION TO SAFETY MANAGEMENT  
CLASS: ES II TIME: 3 HOURS

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## ANSWER ALL QUESTIONS

### SECTION A

ANSWER *TRUE OR FALSE* from 1 to 30 in SECTION A and A, B, C or D from 31 to 60 in SECTION B in your answer booklet. You will be instructed as to how to arrange the numbering of your answers in your answer booklets. The question paper in Section A and B must be tied loosely *into* the answer booklet and therefore not leaving the Exams Room. (60 marks)

1. Risk may be defined as the probability that an unsafe act or condition will result in a loss
2. Risk combines both probability and severity of occurrence.
3. The iceberg illustration suggests that the indirect cost of accidents are much higher than the direct costs.
4. Indirect cost of an accident does not include medical expenses and legal fees.
5. Generally, indirect costs of accidents are always higher than the direct costs.
6. Acts of parliaments are primary legislation and must be signed by the President.
7. Regulations have to be laid before parliament but most of them do not need a vote to become law.
8. Guidance notes have no legal force but may be persuasive in lower courts.
9. 'Reasonably practicable' duty is imposed when the risk of injury is low.
10. 'Practicable' duty allows the employer to take into consideration the availability of suitable technology against the risk being considered.
11. The words 'shall', 'must' and 'may' are used in the act to indicate 'Absolute' duty.
12. Ensuring compliance with regulations and standards is a major objective of safety management.
13. Health and safety policies must be communicated to all employees and reviewed every five years or more.
14. Two people can ride on a forklift provided they wear seatbelts.
15. Risk may be defined as an evaluation of potential failure or the chance of loss occurring.
16. Reactive monitoring of health and safety performance involves learning from system failures.
17. Deductive reasoning in hazard identification is based on a list of undesired events, then working backwards to identify causes of that event.
18. Fault tree analysis technique for hazard analysis employs an inductive reasoning method.
19. Hazard and operability studies (HAZOPS) is used when all information about the system is not available.

20. ACT 328 provides that “Adequate and suitable washing facilities be provided so far as practicable and kept clean for the use of all employees”.
21. Safety is the state of being safe and can also be defined as the control of accidental losses.
22. Poor housekeeping is a typical substandard act which refers to a disorderly workplace.
23. Safety can be defined as the condition of being protected against any event which can be considered undesirable.
24. Both accidents and near misses are events but near misses are desired events.
25. An accident can result in harm to people, damage to property, loss to process or environment.
26. A fatal accident is an undesired exchange of energy by contact that results in harm to people, damage to property, loss to process or environment.
27. Frank Bird’s triangle has to do with both accidents and near misses.
28. Injury may be defined as the consequence of an accident.
29. An accident may result in injury but near misses do not.
30. Heinrich’s ratio deals with near miss accidents but Frank Bird’s ratio deals with incidents.

## **SECTION B**

1. Active monitoring of health and safety performance involves amongst others
  - A. Collecting and analyzing information about system failure
  - B. Learning from mistakes
  - C. Ensuring that standards are kept and management controls are working properly
  - D. Ensuring that documentation of all performance standards are kept
  
2. Policies on health and safety must
  - A. Be displayed at key location on the work site
  - B. Identify objectives of the company and targets which are attainable and relevant
  - C. Ensure standards achieved conform to company objectives
  - D. Consider, control and eliminate all risks
  
3. FMEA represents a hazard analysis technique known as
 

A. Fault mode and effects analysis	C. Fault mode and events analysis
B. Failure mode and events analysis	D. Failure mode and effects analysis
  
4. Preliminary hazard analysis requires
 

A. A critical review of a system	C. A systematic rigorous examination of a process
B. Asking the questions such as “what if”	D. None of the above

5. The hazard analysis technique which breaks down the system into all its components and systematically evaluates how components might fail, and what the effects of these failures might be is called
- |                                |                                     |
|--------------------------------|-------------------------------------|
| A. Preliminary hazard analysis | C. Failure mode and events analysis |
| B. Fault tree analysis         | D. None of the above                |
6. Risk analysis is done to
- |  |                                      |
|--|--------------------------------------|
| A. Enable control measures to be devised             | C. Enhance effective decision making |
| B. Improve ideas on the relative importance of risks | D. All of the above                  |
7. Economic objectives of accident prevention seek to avoid
- |  |                     |
|--|---------------------|
| A. Costs associated with compensation payments | C. Property damage  |
| B. Medical costs                               | D. All of the above |
8. Which of the following is true of the iceberg illustration of financial impacts of accidents?
- Accidents have both direct and indirect costs
  - For every unit direct cost there are 6 to 53 times the amount in indirect cost
  - Property, process, material and miscellaneous costs are indirect costs
  - All of the above
9. Which of the following are provisions in the Factories Offices and Shops Act (1970), Act 328?
- Every factory must be kept clean so far as practicable
  - Adequate and suitable washing facilities must be provided and kept clean for the use of all employees
  - There must be sufficient and suitable natural lighting in every part of the factory where people are working.
  - All of the above
10. Which of the following is not true of common law?
- It has evolved over hundreds of years
  - It is a system of precedents or decisions in previous cases
  - It fills the gap where statute law has not covered
  - It is the written law of the land
11. The OHSAS 18001 standard is based on the PDCA methodology. What is PDCA?
- |                         |                                  |
|-------------------------|----------------------------------|
| A. Plan-Do-Check-Act    | C. Policy-Design-Check-Action    |
| B. Prepare-Do-Check-Act | D. Prepare-Design-Correct-Action |
12. Which of the following is a typical unsafe condition?
- |                      |                              |
|----------------------|------------------------------|
| A. Failure to warn   | C. Horseplay                 |
| B. Failure to secure | D. Inadequate warning system |

- 13.** Which of the following is a typical unsafe act?
- A. Inadequate ventilation  
B. Poor housekeeping  
C. Inadequate guards or barriers  
D. None of the above
- 14.** Which of the following is not an unsafe act?
- A. Descending stairs while reading  
B. Lifting a load with back straight and knee bent  
C. Carrying wood with one hand and a bucket with the other while looking straight on  
D. All of the above
- 15.** Defenses against common law claims include
- A. There was no negligence  
B. There was no duty owed  
C. Volenti non fit injuria  
D. All of the above
- 16.** Effective hazard control methods include
- A. Use of hazard classification techniques  
B. Use of personal experience  
C. Use of alternate improved designs  
D. None of the above
- 17.** Which of the following methods should be adopted for the communication of health and safety policies?
- A. Including it in safety manuals  
B. Posting on notice boards  
C. Making reference to it at induction safety training programmes  
D. All of the above
- 18.** Which of these statements is true of an accident?
- A. All accidents do not result in injury  
B. Accidents are caused and until steps are taken to prevent them accidents will continue to happen  
C. An accident is an unforeseen and unplanned event, often with lack of intent  
D. All of the above
- 19.** Which of the following is not a safe system of work?
- A. Task procedure  
B. Permit to work  
C. Safe operating procedure  
D. Locked and tagged

- 20.** Which of the following jobs requires a safe system of work?
- A. Cleaning and maintenance operations
  - B. Changes to normal procedure
  - C. Working alone or away from the workplace
  - D. All of the above
- 21.** Frank Bird's ratio may be expressed as:
- A. 630-10-1
  - B. 640-1
  - C. 600-30-10-1
  - D. All of the above
- 22.** A moral objective for preventing accidents is
- A. To prevent adverse publicity
  - B. To avoid prosecution
  - C. To avoid injury and the associated expenses
  - D. To comply with regulations
- 23.** Which of the following is a common law duty?
- A. Breach of Statutory Duty
  - B. Absolute Duty
  - C. Duty to do what is practicable
  - D. None of the above
- 24.** One of the major objectives of safety management is to:
- A. Provide effective personal protective equipment
  - B. Prevent near miss accidents
  - C. To ensure compliance with regulations and standards
  - D. None of the above
- 25.** OHSAS 18001:2007 defines hazard as:
- A. An unsafe act or condition which can result in an accident
  - B. An unsafe act or condition which can result in human injury or ill health, or a combination of these
  - C. A source, situation or act with a potential for harm in terms of human injury or ill health, or a combination of these.
  - D. A workplace condition which exists, or can be caused in combination with other variables, and has the potential for accidents.
- 26.** Which of the following will be considered as a primary legislation?
- A. Standard Operating Procedures
  - B. Orders and Rules
  - C. Guidance Notes
  - D. None of the above

- 27.** When an employer can be held liable for the actions of his employees causing injury to others provided the actions were committed in the course of employment, this is referred to as:
- A. Duty of care
  - B. Vicarious liability
  - C. Res Ipsa Loquitur
  - D. Reasonably practicable obligation
- 28.** When an employee knowingly willingly accepts the risk in performing a task, resulting in an accident, this is referred to as
- A. Res Ipsa Loquitur
  - B. Volenti non fit injuria
  - C. Contributory negligence
  - D. Breach of statutory duty
- 29.** The best way to carry out the analysis of accidents is to use
- A. Frank Bird's Triangle
  - B. Pareto'
  - C. Iceberg Illustration
  - D. Heinrich's Ratio
- 30.** Act 328 states that:
- A. So far as is reasonably practicable there must be provided safe means of access to every place at which any person has at any time to work
  - B. There must be provided safe means of access to every place at which any person has at any time to work
  - C. So far as is practicable there must be provided safe means of access to every place at which any person has at any time to work
  - D. None of the above

**SECTION C (40 marks)**

**Answer any eight (8) Questions in this section**

- Qu. 1)** Define Safety Management and give two (2) objectives of safety management. (5 marks)
- Qu. 2)** Differentiate between Common law and Statute law. (5 marks)
- Qu. 3)** Give any three (3) common law duties and explain any one of them. (5 marks)
- Qu. 4)** Differentiate between Safety and Security. (5 marks)
- Qu. 5)** a) What is Pareto's principle? (2 marks)  
b) Mention any three hazard analysis techniques. (3 marks)
- Qu. 6)** a) Why is risk ranking important? (2 marks)  
b) Give three (3) ways of hazard identification through experience. (3 marks)
- Qu. 7)** Differentiate between an accident and a near miss. (5 marks)
- Qu. 8)** Give any five (5) defenses against common law. (5marks)
- Qu. 9)** a) What is an injury? (2 marks)  
b) Mention three general reasons why accident prevention is necessary. (3 marks)
- Qu. 10)** Mention the three (3) types of duties are imposed by statute law and explain any one of them. (5 Marks)

**Prof N. A. Amegbey**