

UNIT 2: Principles and Applications of Science and Technology in Safety

Total Time: 5:00 hours
Total Questions: 15

Total Marks: 150
Passing Marks: 75

- The maximum marks for each question are 10.
- Answers may be illustrated by sketches or process flow diagrams where appropriate.
- This question paper & answer sheets must be returned to the invigilator after the examination.
- Support your answers with **logical arguments** and **examples**. Generic and Bookish answers will not be accepted by the examiners.
- All Questions are compulsory and must be answered to gain maximum marks
- Use bullet points for questions asking to **Outline** and make sure each bullet point has unique and valuable content.

Part A

(Each Question carries 10 Marks)

- 1- You have been tasked by the Managing Director to identify the requirements of suitable PPEs for the whole organizational need. **Outline** the criteria you will establish to ensure you identify suitable PPEs for all employees?
- 2- A courier company delivery staff has complained about the ill-health issues due to manual handling. They often have to deliver heavy parcels (upto 15 Kg Each) to 3rd and 4th Floors where lifts are not installed. **Outline** the control measures to eliminate the risk of ill health due to manual handling in the specific context mentioned above?
- 3- You have been tasked as investigating officer subsequent to a sudden collapse of scaffold which resulted into fatal injuries at the workplace. The scope of investigation is "To find out the root cause of the collapse of scaffold". **Outline** your action plan?
- 4- You are working as a safety officer in a 30 storey hotel building with more than 500 rooms. you have been tasked to get fire emergency escape system designed from a reputable engineering firm. **Outline** the features you wish to be included in the design keeping in view the prevailing technological advancements available?
- 5- You are working as safety officer in a company offering 3rd party inspection services. One of your clients in Government sector has requested you to carry out the inspection using X-Ray method of the metallic bridge. **Outline** the control measures you will take to reduce the risk of exposure to the workers and member of public at this site?

Part B
(Each Question carries 10 Marks)

- 6- **Outline** the control measures to reduce the risk of accidents to member of public from inter-city transportation of flammable materials?
- 7- **Explain** toxicology and outline the limitations of prevailing methods of measuring toxicology of chemicals?
- 8- **Outline** various workplace examples where Potential Energy can be a hazard from Occupational Health and safety perspective?
- 9- **Outline** the instances where destructive testing methods can be effectively used?
- 10- A suitably designed product failed at worksite. **Outline** the factors which may have influenced the performance of the equipment?
- 11- **Outline** the control measures to eliminate the risk of contact with overhead power lines?
- 12- **Outline** the characteristics of effective escape routes within an organization?
- 13- **Explain** in detail the Stochastic Health Effects and Non- stochastic Health Effects?
- 14- **Outline** the control measures which should be put in place if it is not technically possible to prevent exposure to biological agents?
- 15- **Outline** the factors which may influence the effectiveness of engineering controls?

(End of Question Paper)