

National Exams December 2012
98-Ind-B10 - Industrial Safety and Health
3 hours duration

Notes:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.
2. This is a Closed Book exam. One of two calculators is permitted any Casio or Sharp approved models.
3. Any five questions constitute a complete paper. Only the first five questions as they appear in your answer book will be marked.
4. All questions are of equal value.
5. Write your answers in point-form whenever possible, but fully.

Marking Scheme (marks)

1. (i) 7, (ii) 7, (iii) 6
2. (i) 6, (ii) 7, (iii) 7
3. (i) 7, (ii) 7, (iii) 6
4. (i) 7, (ii) 7, (iii) 6
5. (i) 8, (ii) 6, (iii) 6
6. (i) 7, (ii) 7, (iii) 6
7. (i) 6, (ii) 8, (iii) 6

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1. (i) Explain the emphasis placed by Occupational Health and Safety Act (OHSA) to deal with the new hazards in non-traditional sectors of industry that include service industries.
(ii) State the means by which workplace safety and health can be improved through information technology or electronic access to regulatory information and services.
(iii) What are the cooperative agreements the companies may establish with OHSA for maintaining safe and healthful employment to obtain exemption from certain formal inspections?
2. (i) State the objectives of fault-free analysis (FTA).
(ii) State the elements of a Process Safety Management Program.
(iii) What are the applications of FTA (fault-free analysis) methodology
3. (i) Explain the manner by which engineering deficiencies can cause or contribute to accidents.
(ii) State the means by which accidents can be prevented in industry.
(iii) Describe the various safety features that can be installed in hand drills to prevent accidents.
4. (i) What are the responsibilities of facilities and equipment designers in providing safety measures for toxic materials?
(ii) How are the toxic agents detected? What are the typical industrial operations that require the use of respiratory protective equipment and protective clothing?
(iii) State the major types of respiratory protection equipment including their characteristics.
5. (i) What is your understanding of the following in the context of skin absorption:
(a) corrosives, (b) dermatitis, (c) eye damage and (d) gastrointestinal absorption.
(ii) What are the chemicals used as air purifiers in canisters?
(iii) Explain briefly the following equipment or apparatus: (a) self-contained air or oxygen-breathing apparatus, and (b) air-line breathing equipment.
6. (i) Define physical hazards and name some of the physical hazards.
(ii) What is a confined space? Give some examples of confined spaces.
(iii) What is your understanding of the criterion for permit-required confined space?
7. An employee in a foundry was using an overhead wall-mounted electrically controlled crane to move a heavy casting from one position to another at his workstation. The casting weighed approximately 3,000 pounds. While he was moving the casting, it fell, causing the hoist cables to snap and strike the employee a glancing blow to his head. Fortunately, he was wearing protective head gear, or the blow could have been fatal when the hoist eyebolt assembly failed.
(i) Determine the causes of the accident.
(ii) State the corrective actions required.
(iii) Suggest the follow-up action required.

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Synopsis of Examination Paper

1. The question deals with OSHA's recognition of non-traditional sectors of industry, improvement of workplace safety and health through information technology and cooperative agreements between OSHA and companies in maintaining safe and healthful employment.
2. The question is concerned with the objectives of fault tree analysis (FTA), elements of Process Safety Management Program and applications of FTA methodology.
3. The question deals with the engineering deficiencies causing or contributing accidents, means of preventing accidents and the safety features that can be installed in hand drills to prevent accidents.
4. The question is concerned with the responsibilities in providing safety measures for toxic materials, detection of toxic agents and the typical industrial operations requiring respiratory protective equipment and protective clothing and the major types of respiratory protective equipment and their characteristics.
5. The question deals with the understanding of corrosives, dermatitis, eye damage and gastrointestinal absorption, the chemicals used as air purifiers in canisters and oxygen-breathing apparatus and air-line breathing equipment.
6. The question is concerned with the physical hazards, confined spaces and the criterion for permit-required confined spaces and the criterion for permit-required confined space.
7. The case problem deals with an accident and subsequent injury. The candidate is asked to determine the causes of the accident, corrective actions and follow-up actions required.