National Exams December 2008
98-CS-2-Engineering in Society - Health, Safety and the Environment
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. No calculators are allowed for this exam.

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.

Front Page

Marking Scheme (marks)

1. (i) 7, (ii) 7, (iii) 6
2. (i) 7, (ii) 6, (iii) 7
3. (i) 7, (ii) 7, (iii) 6
4. (i) 6, (ii) 7, (iii) 7
5. (i) 7, (ii) 7, (iii) 6
6. (i) 7, (ii) 7, (iii) 6
7. (i) 7, (ii) 7, (iii) 6
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1. (i) State the costs associated with OHSA Act and OHSA Standards that companies, especially the smaller ones, generally object to because they feel that such costs are not economically justifiable.
   (ii) Explain the manner by which workplace health and safety can be improved for all workers through information technology or electronic access to regulatory information and services.
   (iii) State the new hazards in non-traditional sectors in industry that are emphasized by Occupational Health and Safety Act (OHSA).

2. (i) Give some examples of hazard elimination and accident avoidance.
   (ii) Explain the means by which hazard levels may be limited.
   (iii) Explain your understanding of initiating and contributing hazards resulting in injury and damage of a pressurized steel tank.

3. (i) Give some common examples of isolation to prevent injury or damage.
   (ii) What is the difference between lockouts and lockins? Give some examples of lockout and lockin devices.
   (iii) State the steps followed in the investigation of an accident. What are the basic or typical equipment used for accident investigation?

4. (i) What are the basic objectives of fire protection, prevention and control?
   (ii) Explain the means by which the spread of fire can be prevented once fire is discovered.
   (iii) What are the possible effects of fire hazards?

5. (i) Name some toxic substances and their effects on the human body.
   (ii) What are the various types of air contaminants? What are the basic approaches to measuring air contaminant exposures?
   (iii) What are the major types of respiratory protective equipment?

6. (i) What are the sources of vibrations and noise by equipment?
   (ii) State the characteristics and purpose of (a) an audiometric test program, (b) a sound-level meter, and (c) an octave-band analyzer.
   (iii) What are the various types of hearing protection devices?

7. A millwright was reaching out to make an adjustment on a flywheel chain on a press while standing on a 20-foot ladder. In doing so, he lost his balance and fell onto the shaft and then struck a conveyor and fell to the floor, approximately 15 feet below. This caused a compound fracture of his right leg and property damage of $5,000 for a broken shaft and belts on a large press and broken guard on the conveyor belt.
   (i) Determine the cause of the accident.
   (ii) State the corrective actions required.
   (iii) Suggest the follow-up actions required