

**National Exams December 2013**  
**11-CS-2-Engineering in Society – Health and Safety**  
**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. Candidates may use one of two calculators, the 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) 6, (ii) 7, (iii) 7
6. (i) 7, (ii) 7, (iii) 6
7. (i) 6, (ii) 8, (iii) 6

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1. (i) What are the typical environmental hazards? Explain your understanding of environmental hazards.  
(ii) What are the effects of environmental hazards?  
(iii) Explain the sources of environmental standards?
2. (i) What is your understanding of cumulative trauma or repeated motion injuries resulting from repeated motion or use of tools and equipment.  
(ii) Explain the typical cumulative trauma injuries or disorders, such as (a) trigger finger, (b) carpal tunnel syndrome and (c) tenosynovitis.  
(iii) State the basic principles of machine guarding.
3. (i) State the types of airborne contaminants.  
(ii) What are the health effects of chemicals?  
(iii) What are the main routes of entry for hazardous substances into the body? Explain.
4. (i) What are the agents and sources of biological hazards?  
(ii) Give some broad examples of biohazards.  
(iii) State the classification of biohazards.
5. (i) Explain the general principles that should be followed in selecting personal protective equipment.  
(ii) State the various devices used for eye and face protection.  
(iii) State the typical respiratory protections used in industry.
6. (i) What is your understanding of contingency training in safety?  
(ii) What are the training techniques generally used in a company?  
(iii) State the methods used in promoting safety in industry.
7. An employee in a foundry was using an over-head wall-mounted electrically controlled crane to move a heavy casting from one position to another at his workstation. The casting weighted 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.