

National Exams Dec 2018
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.
Show all calculations.

Marking Scheme (marks)

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

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1.
 - (i) State the elements of Domino Theory.
 - (ii) Explain by means of a diagram, the four system safety factors: the four Ms
 - (iii) What is single factor theory? Explain its limitation.

2.
 - (i) What are the engineering activities that result in hazards in industry?
 - (ii) State the other (than engineering) factors causing hazards.
 - (iii) What are the components of communication essential in safety engineering? Show by means of a diagram.

3.
 - (i) Briefly explain the types of safeguards used in machines.
 - (ii) State the purpose of point-of-operation devices used in a machine. Give examples.
 - (iii) Explain the importance of handle design of hand tools from an ergonomics viewpoint.

4.
 - (i) Explain the controls used for protecting people from exposure to hazardous materials in the workspace.
 - (ii) State the characteristics of confined spaces. Name the confined spaces in industry.
 - (iii) What are the main hazards of confined spaces? Explain.

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. 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.