



Unit C: Workplace and work equipment

THURSDAY 7 JULY 2011
3 hours, 0930 to 1230

10 minutes reading time is allowed before the start of this examination. You may not write anything during this period.

Answer both Section A and Section B

SECTION A

This section contains six questions. Answer **ALL SIX** questions.

All questions carry equal marks.

The maximum marks for each question, or part of a question, are shown in brackets.

You are advised to spend about **15 minutes** on each question.

Start each answer on a new page.

- 1 **Outline** the issues that need to be addressed when planning a fire evacuation procedure for a multi-storey office building. (10)
- 2 In order to install a large item of machinery such as a turbine rotor, it is sometimes necessary to perform adjustments while the rotor is in motion. These adjustments are necessarily undertaken with the rotor in an unguarded condition.
- Outline** the elements of a safe system of work for this activity. (10)
- 3 Maintenance work on electrical distribution panels and control circuitry commonly involves diagnostic testing and fault finding on live systems.
- Outline** the requirements of the Electricity at Work Regulations 1989 that apply to this situation **AND** the practical precautions that should be in place before the work is undertaken. (10)

- 4 X-ray radiography is a non-destructive testing (NDT) technique that is sometimes used to examine the internal structure of fuel tanks in the wings of large passenger aircraft.
- (a) **Outline** the principles of operation when using X-ray radiography for this application. (4)
- (b) Other than visual inspection, **explain** why different forms of NDT might not be appropriate for this application. (4)
- (c) **Identify TWO** disadvantages in the application of X-ray radiography. (2)
- 5 **Outline** the key safety features of a facility that is to be used for the storage of highly flammable solvents in 200 litre drums. (10)
- 6 The use of a tower crane on a construction site must be notified to the Health and Safety Executive before it is brought into first use.
- Outline** the safety concerns in relation to the use of tower cranes on construction sites that have influenced the introduction of this legal requirement. (10)

SECTION B

This section contains five questions. Answer **THREE** questions only.

All questions carry equal marks.

The maximum marks for each question, or part of a question, are shown in brackets.

You are advised to spend about **30 minutes** on each question.

Start each answer on a new page.

- 7 A storage tank requires inspection, cleaning and repair. It is 6 metres in diameter and 10 metres high and was previously used for storing leaded petrol.
- Outline** the arrangements that should be considered in order to comply with the Confined Spaces Regulations 1997. (20)
- 8 (a) With reference to the Pressure Systems Safety Regulations 2000, **explain** what is meant by a '*pressure system*'. (4)
- (b) **Outline FOUR** examples of the mechanisms of mechanical failure in pressure systems. (8)
- (c) **Outline** the technical **AND** procedural measures to minimise the likelihood of failures in pressure systems. (8)

- 9 (a) **Describe** the effects of a fire in a workplace on the following structural materials:
- (i) steel; (4)
 - (ii) concrete; (4)
 - (iii) wood. (4)
- (b) **Outline** the precautions that could be taken to prevent failure of these materials in the event of fire. (8)
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- 10 Part 4 of the Construction (Design and Management) Regulations 2007 require that certain places of construction work are to be inspected by a competent person.
- (a) **Identify:**
- (i) when statutory inspections of supported excavations must be carried out; (3)
 - (ii) the information that should be recorded in a statutory excavation inspection report. (5)
- (b) **Outline** the particular features of an excavation that could result in it being considered unsafe. (12)
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- 11 (a) With respect to UK mains voltage electricity, **outline** the factors that determine the severity of the effects of an electric shock. (6)
- (b) For **EACH** of the following protective devices, **describe** their principles of operation:
- (i) residual current devices; (3)
 - (ii) fuses; (3)
 - (iii) 110v centre tapped to earth reduced voltage systems. (3)
- (c) **Outline** other design features of electrical systems intended to improve safety. (5)