higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FUNDAMENTALS
NQF LEVEL 2

(6021002)

19 November 2018 (X-Paper)
09:00–12:00

This question paper consists of 7 pages.

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TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Write neatly and legibly.

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QUESTION 1

1.1 Name and briefly explain the THREE sectors in which the occupational areas in the manufacturing, engineering and technology fields can be divided. (6)

1.2 Noise in a working environment can lead to hearing loss if not properly controlled.

What are the duties of employees with regard to noise? (4)

1.3 Choose a description from COLUMN B that matches a/an item/word in COLUMN A. Write only the letter (A–L) next to the question number (1.3.1–1.3.10) in the ANSWER BOOK.

	COLUMN A		COLUMN B
1.3.1	Labour Relations Act	A	the steel is slowly heated to a certain temperature and then allowed to cool down slowly
1.3.2	Work environment	B	can be caught on a machine
1.3.3	Employment equity	C	cornerstone of democracy in South Africa
1.3.4	Annealing	D	to promote employee participation in decision making by establishing a workplace forum
1.3.5	Storage of metal	E	poor planning without any order
1.3.6	Loose clothing	F	to achieve equity in the workplace
1.3.7	Prohibitory signs	G	stacking must be done only on solid flooring
1.3.8	Bill of Rights	H	includes all areas of the factory
1.3.9	Haphazard planning	I	tells the employees how to keep the workplace clean
1.3.10	Safety procedure	J	tells you what you must not do
		K	things that make machines safe
		L	the ability of a metal to be shaped easily without heat

(10 × 1) (10)

1.4 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.4.1–1.4.5) in the ANSWER BOOK.

1.4.1 Continuous noise is produced by machinery that operates without interruption in the same mode, for example, pumps and processing equipment.

1.4.2 The Constitution is the most important legislation and applies to all South Africans.

1.4.3 Hand forging was probably the first method used by man to shape metal.

1.4.4 The background colour of a warning sign is yellow and red.

1.4.5 Every company has safety procedures that must be adhered to, but they are available to supervisors and managers only.

(5 × 1) (5)

1.5 Briefly explain FOUR examples of maintenance-based careers. (4)

1.6 Tin is classified as a non-ferrous metal and has a good resistance to acid.

Give FIVE properties of tin. (5)

1.7 A mould is the second step in the process of manufacturing castings.

What is a mould? (2)

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QUESTION 2

2.1 First-aid stations need to be easily accessible. The OHSA provides that all workers must have access to first-aid stations.

List the general guidelines that assist in determining locations for first-aid stations. (5)

2.2 Name the THREE important categories in which safeguarding are divided. (3)

2.3 Housekeeping means that there is a proper and safe place for every tool.

List THREE benefits of good housekeeping. (3)

2.4 Poor housekeeping creates conditions in which accidents can occur.

List THREE accidents that can be caused by poor housekeeping. (3)

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2.5 Write the following abbreviations in full.

2.5.1 OHSA

2.5.2 PPE

2.5.3 UIF

(3 × 2) (6)

2.6 In engineering workplaces there are numerous potential hazards around machinery and equipment.

2.6.1 State THREE safety hazards that can occur in the work environment. (3)

2.6.2 State TWO health hazards that can occur in the work environment. (2)

2.7 Machine guards protect workers against injuries caused by moving or dangerous machine parts. Each statement below defines a different type of machine guard.

Read each statement and name the machine guard it applies to.

2.7.1 They prevent access to dangerous areas by means of barrier fences

2.7.2 This guard automatically moves into position if the machine or cycle is started

2.7.3 This guard stops the machine as soon as a worker moves into a position where he can be injured

2.7.4 They have no moving parts and prevent contact between moving machinery parts and body parts

2.7.5 These are moveable and the moving parts are connected to the control system

(5 × 1) (5)

[30]

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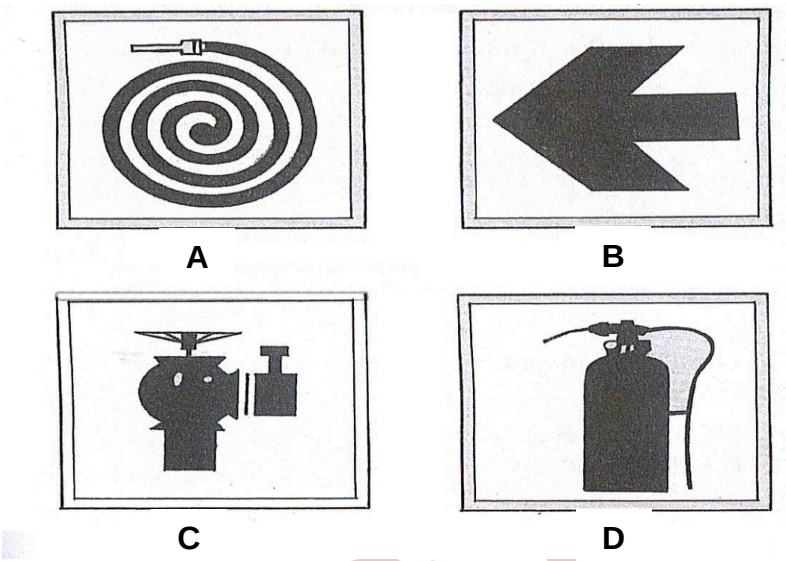
QUESTION 3

3.1 State TWO common causes of fire in industrial premises. (2)

3.2 Identify the symbolic safety signs (A–D) below that are recommended for all fire fighting equipment.



(4)

3.3 Protective clothing and equipment are very important in fire fighting.

Read the statements below and name the type of protective clothing:

3.3.1 These are worn as hand protection in fighting chemical fires

3.3.2 This should be used when working in a dusty environment

3.3.3 They are worn if the air in a work area cannot be extracted safely

3.3.4 These are used for handling sharp objects during fire fighting

3.3.5 They are made of leather, lined with thermal installation material and used during fire fighting

(5 × 1) (5)

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QUESTION 4

4.1 Complete the following sentences by filling in the missing word or words. Write down only the word or words next to the question number (4.1.1–4.1.5) in the ANSWER BOOK.

casualty; radiation; resuscitation; unconsciousness; not insulated; fracture; injured.

4.1.1 … assist someone that struggles to breath.

4.1.2 A … is a cracked or broken bone.

4.1.3 A … is a person who has been injured.

4.1.4 When an electric current is not protected it is …

4.1.5 … can be caused by an X-ray overdose.

(5 × 1) (5)

4.2 Burns can be classified into groups of severity.

List the THREE types of burns. (3)

[8]

QUESTION 5

5.1 Every workplace, company or organisation should have a safety procedure manual or a safety, health and environment manual.

5.1.1 What is a safety procedure manual? (2)

5.1.2 List THREE examples of information included in a safety procedure manual. (3)

5.2 State FIVE responsibilities of health, safety and environmental representatives. (5)

5.3 Health and safety representatives often need to communicate with workers about safety issues.

State FIVE methods of communication they can use. (5)

[15]

TOTAL: 100

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