



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**ENGINEERING FUNDAMENTALS
NQF LEVEL 2**

(6021002)

**23 November 2023 (Y-paper)
13:00–16:00**

This question paper consists of 9 pages.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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ENGINEERING FUNDAMENTALS
NQF LEVEL 2
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. Use only a black or blue pen.
 5. Write neatly and legibly.
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QUESTION 1

- 1.1 Give the full meaning of the following acronyms.
- 1.1.1 ERD
- 1.1.2 EEA
- 1.1.3 BCEA
- (3 × 2) (6)
- 1.2 In terms of Section 193 of the Labour Relations Act 66 of 1995, there are THREE remedies for unfair dismissal and labour practices. List these remedies.
- 1.3 State THREE examples of unfair labour practices.
- 1.4 Complete the following sentences by filling in the missing word or words. Write only the word or words next to the question number (1.4.1–1.4.5) in the ANSWER BOOK.
- 1.4.1 Because you have chosen to study Engineering, it is your ...
- 1.4.2 Installation careers are linked to ... careers.
- 1.4.3 A code of conduct is a written set of rules explaining how workers must ... in the workplace.
- 1.4.4 In the world of work, many ... protect workers in all fields.
- 1.4.5 It is important to give workers the opportunity to gain work experience while they ... skills that are useful in the workplace.
- (5 × 1) (5)

- 1.5 Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (1.5.1–1.5.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.5.1	Poor work ethics	A	they have been passed and are also called acts
1.5.2	Safety regulations	B	not enough fresh air in a room where people are at work
1.5.3	Department of Labour	C	require workers to wear protective clothing and use equipment safely
1.5.4	Laws	D	someone who does as little work as possible has it
1.5.5	Labour organisation	E	because of it, workers find it difficult to see what they are doing
1.5.6	Occupational areas	F	personal safety equipment and facility requirements
1.5.7	Warning signs	G	to discipline an employee who has done something wrong
1.5.8	Poor lighting	H	consists of manufacturing, engineering and technology
1.5.9	Poor ventilation	I	not to divulge confidential information
1.5.10	Train workers	J	workers join it to protect or improve the conditions of their work lives
		K	protection of human rights
		L	shows that dangerous chemicals are stored in a certain place

(10 × 1)

(10)

- 1.6 Briefly discuss the following terms:

1.6.1 Safeguard

1.6.2 Induction

1.6.3 Unfair labour practice

1.6.4 Stress

(4 × 2)

(8)

1.7 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.7.1–1.7.5) in the ANSWER BOOK.

- 1.7.1 Good work ethics means doing the job you are given and asking for help when you do not know.
- 1.7.2 Reasonable working hours and a job that does not entail too much stress are examples of quality of work life.
- 1.7.3 Not paying attention to safety rules is an example of unsafe conditions.
- 1.7.4 To improve safety in a workplace, workers must be qualified and do not need training.
- 1.7.5 By agreement, an employee's ordinary hours of work may be extended by up to 15 minutes a day, but not more than by 60 minutes a week.

(5 × 1)

(5)
[40]

QUESTION 2

2.1 Below are a list of unsafe conditions. Copy the table in your ANSWER BOOK and briefly explain what could go wrong if the unsafe conditions are not attended to.

Unsafe Conditions		What could go wrong.	
1.	Slippery floors	A	
2.	No demarcation signs	B	
3.	Cables or wires lying on the floor	C	
4.	Blocked or cluttered exits	D	
5.	Overcrowding in a workshop	E	
6.	Items are not packed or stacked safely	F	

(6 × 2) (12)

- 2.2 Workers must report unsafe conditions to their supervisors to avoid accidents. Read the scenario below and compile a report by answering the questions below.

Federal Mogul Car Valve Manufacturing is a company based in Westmead. On 2 June 2022, one of their press operators in the forging department was reported to have cut his finger while cutting rods with a guillotine used to make valves. The accident was reportedly caused by bad housekeeping and the guillotine was used without a machine guard.

Mr W. Dlalisa, the supervisor, was notified of the accident. He instructed the first-aider to assist the injured press operator and called an ambulance. The following day, the supervisor called a safety meeting. It was recommended that maintenance be done on all machines and that workers be prohibited from using machines without guards.

- 2.2.1 When and in which department did the accident occur? (2)
- 2.2.2 What type of injury did the guillotine operator sustain? (1)
- 2.2.3 What task did the operator perform? (1)
- 2.2.4 What type of machine did he operate? (1)
- 2.2.5 Name the company and state where it is based. (1)
- 2.2.6 What type of product does the company manufacture? (1)
- 2.2.7 Who was the supervisor? (1)
- 2.2.8 Recommend TWO safety measures to prevent the accident from happening again. (2)
- 2.3 List THREE things to be found in a manufacturer's instruction manual for a machine. (3)
- 2.4 Chemicals and gases can be extremely dangerous.
List THREE acts that can harm your health when you work with chemicals. (3)
- 2.5 State TWO high-risk occupations. In other words, occupations with the most injuries. (2)

[30]

QUESTION 3

3.1 Briefly discuss FOUR ways to prevent and control fires in the workplace. (4)

3.2 Study the diagrams below and identify each by writing only their names next to the numbers (3.2.1–3.2.3) in the ANSWER BOOK.

3.2.1



3.2.2



3.2.3



(3 × 2)

(6)
[10]

QUESTION 4

- 4.1 First-aid training is of great value in an emergency situation. It may save someone a great deal of agony or even someone's life.

List the THREE Cs that you need to remember when you have to give first aid.

(3)

- 4.2 Choose a term from COLUMN A that matches a description in COLUMN B. Write only the letter (A–E) next to the question number (4.2.1–4.2.4) in the ANSWER BOOK.

COLUMN A		COLUMN B	
4.2.1	Concussion	A	a wound caused by torn soft body tissue
4.2.2	Laceration	B	used to retain a dressing on a finger or toe
4.2.3	Epilepsy	C	a traumatic brain injury that affects the functioning of the brain
4.2.4	Gauze bandage	D	an injury to tissue caused by a cut, a blow or any other impact
		E	common condition that affects the brain and causes frequent seizures

(4 × 1)

(4)
[7]**QUESTION 5**

- 5.1 Briefly discuss THREE benefits of a healthy workplace for employers.

(3)

- 5.2 Complete the following sentences by filling in the terms provided below. Write only the term next to the question number (5.2.1–5.2.5) in the ANSWER BOOK.

engineering controls; protect workers; elimination; substitution; lockout; administrative control and supervision

5.2.1 The physical removal of hazards is called ...

5.2.2 Replacing hazards is referred to as ...

5.2.3 The purpose of ... is to protect workers against hazards.

5.2.4 Changing the way that people work is termed ...

5.2.5 The purpose of personal protective equipment is to ...

(5 × 1)

(5)

- 5.3 Briefly discuss THREE of the most common hazards associated with overhead cranes. (3)
- 5.4 All crane operators, riggers and employees working in an area where overhead cranes are used must wear the appropriate PPE. (2)
- State TWO types of PPE that must be worn. [13]
- TOTAL: 100**