



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**ENGINEERING FUNDAMENTALS
NQF LEVEL 2**

(6021002)

**19 November 2019 (X-Paper)
09:00–12:00**

This question paper consists of 5 pages.

TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Read ALL the questions carefully.
 2. Answer ALL the questions.
 3. Number the answers according to the numbering system used in this question paper.
 4. Start each question on a NEW page.
 5. Write neatly and legibly.
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QUESTION 1: South African manufacturing, engineering and technology

- 1.1 Briefly explain the effects of an accident in a workplace. (12)
- 1.2 Write down next to the question number (1.2.1–1.2.4) in the ANSWER BOOK the act that deals with each of the following situations:
- 1.2.1 A new employee needs training. 
- 1.2.2 An older woman loses her job and a younger man is employed in her place.
- 1.2.3 An employee must work 45 hours a week.
- 1.2.4 An employee is not given the same benefits (pension, leave) as another employee doing the same work. (4 × 1) (4)
- 1.3 State into which category, *mechanical*, *electrical* or *automotive* industry, the trades below fall into:
- 1.3.1 Boilermaker
- 1.3.2 Armature winder
-  1.3.3 Millwright
- 1.3.4 Panel beater
- 1.3.5 Spray-painter
- 1.3.6 Jig & die maker (6 × 1) (6)
- 1.4 The Labour Relations Act, 66 of 1995, gives the rules for the unfair labour practice between the employer and employee. 
Briefly explain the main purpose of the Act. (8)
- 1.5 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.5.1–1.5.10) in the ANSWER BOOK.
- 1.5.1 The union can represent its members in relation to any problems or complaints about wages and salaries.
- 1.5.2 If a machine does not work properly, it could cause an accident.
- 1.5.3 The background colour of a protection sign is green.
- 1.5.4 Diluting means making a chemical stronger by adding water.
- 1.5.5 The CCMA is the Commission for Conciliation, Mediation and Arbitration. 
- 1.5.6 An employee is entitled to six weeks paid sick leave in a period of 36 months.

- 1.5.7 Cornice brake is used to bend long sections of metal sheets.
 - 1.5.8 A lathe is a machine that can hold a workpiece and rotate it at very high speed. 
 - 1.5.9 A miner extracts coal from above ground level.
 - 1.5.10 Technicians are especially trained for installation work that they do. (10 x 1) (10)
- [40]**

QUESTION 2: Safety practices in the workplace

- 2.1 Briefly explain THREE things that can be done to reduce or remove the danger posed by machines.  (3)
- 2.2 Study the list below and answer the questions.

- Lack of machine guards
- Working at unsafe speed
- Taking chances
- Unsafe construction
- Disorder and haphazard planning
- Fooling, teasing or abusive co-workers
- Overcrowding in a workshop
- Adjusting or working on moving equipment
- Failure to use safety equipment
- Defective working conditions

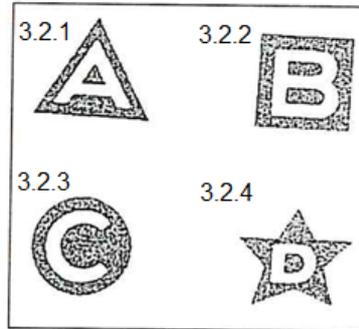


- 2.2.1 Choose the unsafe acts from the list.
 - 2.2.2 Choose the unsafe conditions from the list. (2 x 5) (10)
 - 2.3 State FOUR types of gloves used to protect your hands in work situations. (4)
 - 2.4 State FOUR basic causes of an accident. (4)
 - 2.5 State FIVE safety factors that should be remembered when stacking materials in a workplace.  (5)
 - 2.6 List FOUR colours that are used to indicate safety aspects in a workshop. (4)
- [30]**

QUESTION 3: Basic fire fighting

- 3.1 In case of a fire what will happen to the fire when the following actions are taken:
 - 3.1.1 Water is poured onto a fire 
 - 3.1.2 Blanketing a fire with sand, foam or a chemical
 - 3.1.3 Cutting off the fuel supply
- (3 x 1) (3)

- 3.2 In a diagram below, a symbol is associated with each class of fire. Write down the correct name of the symbols next to the number (3.2.1–3.2.4) in the ANSWER BOOK. (4)



- 3.3 State THREE types of fire extinguishers that should be found in a workplace environment. (3)
[10]

QUESTION 4: Basic first aid

- 4.1 State THREE important things you need to remember when contacting the emergency medical services for help. (3)
- 4.2 Define *fainting*.  (2)
- 4.3 State TWO common causes of fainting. (2)
[7]

QUESTION 5: Health and the environment

- 5.1 List THREE objectives of an industrial health programme. (3)
- 5.2 Briefly discuss what role posters play in the safety programme and also explain how they could be used. (5)
- 5.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (5.3.1–5.3.5) in the ANSWER BOOK.
- 5.3.1 In a workplace, safety posters should be located at the entrance to the factory building or cloakrooms.  (3)
- 5.3.2 One of the duties of the safety committees is to assist management in isolating hazards and unsafe working procedures. (5)
- 5.3.3 Safety training is a detailed extension of safety education to cover specific occupations, process, jobs or activities. (5)
- 5.3.4 The Safety Act requires that all employees keep accident registers for recording. (5)
- 5.3.5  A safety officer should function as management's assistant and adviser on safety, and perform supervisory duties. (5)

(5 × 1) (5)

[13]

TOTAL: 100