higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FUNDAMENTALS
NQF LEVEL 2

(6021002)

9 March 2020 (Y-paper)
13:00–16:00

This question paper consists of 7 pages.

315Q1S2009

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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. Start each question on a new page.
5. Use only a blue or black pen.
6. Write neatly and legibly.

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QUESTION 1: SOUTH AFRICAN MANUFACTURING, ENGINEERING AND TECHNOLOGY

1.1 There are different job opportunities within the secondary sector.

Briefly discuss THREE types of engineering sectors and name ONE leading firm for each sector. (12)

1.2 The manufacturing and engineering field covers a wide spectrum of different industries. An employee who starts out in the manufacturing and engineering field may be placed in different work environments.

State FIVE work environments in which a new employee in the manufacturing and engineering field may be placed. (5)

1.3 Legislation covers all areas of the relationship between employers and employees in South Africa.

1.3.1 Name the most important legislation which applies to all South Africans. (1)

1.3.2 State FIVE values that are promoted by this legislation. (5)

1.4 State THREE methods that can be used when bending metal. (3)

1.5 State FOUR basic hand forging equipment. (4)

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1.6 Choose a description from COLUMN B that matches an item in COLUMN A. Write only the letter (A–J) next to the question number (1.6.1–1.6.10) in the ANSWER BOOK.

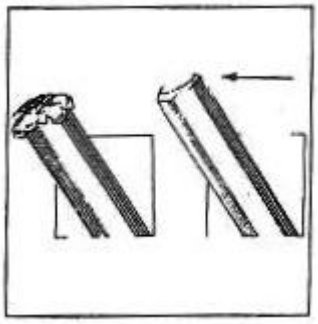
COLUMN A		COLUMN B	
1.6.1	Bar folder	A	the ability of a metal to be worked with easily without heat
1.6.2	Boring	B	the ability of a metal to return to its original shape
1.6.3	Parting	C	process of drilling a specific size hole
1.6.4	Elasticity	D	used to bend sheet metal to form edges
1.6.5	Malleability	E	process of cutting off material after machining
1.6.6	Public servants	F	broken tools
1.6.7	A movement	G	wanting to be better than other workers
1.6.8	Unsafe condition	H	time during which an employer can see if an employee is suitable for a job
1.6.9	Competitive	I	do not benefit from UIF
1.6.10	Probation	J	body of persons with a common objective

(10 × 1) (10)
[40]

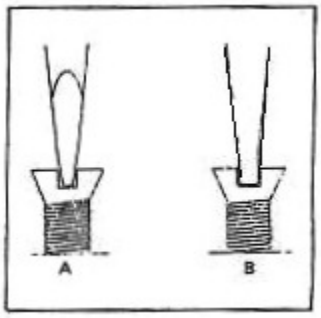
QUESTION 2: SAFETY PRACTICES IN THE ENGINEERING WORKSHOP

2.1 Briefly explain how you would eliminate the unsafe act in each of the following diagrams:

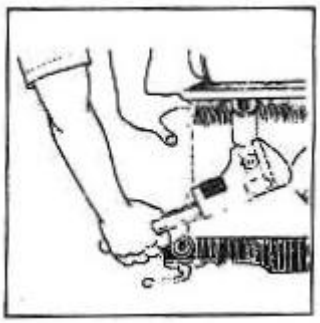
2.1.1



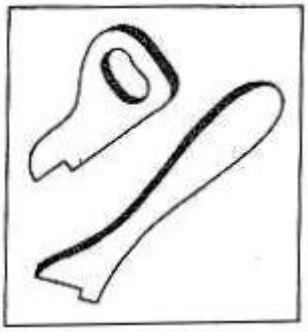
2.1.2



2.1.3



2.1.4



(4 × 2) (8)

2.2 State THREE advantages of colour identification in a factory. (3)

2.3 State FIVE characteristics that a machine guard should have. (5)

2.4 State FIVE precautionary measures that you would take to protect workers especially maintenance crew when working on electrical equipment. (5)

2.5 Choose a word or term from the list below for the following descriptions. Write only the answer next to the question number (2.5.1–2.5.5) in the ANSWER BOOK.

emergency button; safety programme; accident report; decibel; loose clothing

2.5.1 It is a unit measurement of the degree of loudness.

2.5.2 It should not be worn when working with machinery in which it can get caught.

2.5.3 It is a useful means of obtaining publicity for each individual, letting the workers know how they are improving compared to their previous records.

2.5.4 It is a switch or button on a machine that switches off immediately when something goes wrong.

2.5.5 It must be in writing and must include all necessary facts, such as the date, time, when the unsafe situation was noticed.

(5 × 1) (5)

2.6 State FOUR types of hazards that are associated with the workplace. (4)

[30]

QUESTION 3: BASIC FIREFIGHTING

3.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (3.1.1–3.1.3) in the ANSWER BOOK.

3.1.1 Fuel, heat, carbon dioxide and some sort of ignition will cause a fire to burn.

3.1.2 A chemical fire can be extinguished by using water.

3.1.3 Removing one of the following elements, oxygen, fuel or heat, will extinguish the fire.

(3 × 1) (3)

3.2 Name the type of fire that can be extinguished by each of the following and give a reason for each one:

3.2.1 Water

3.2.2 Dry chemical

3.2.3 Foam

(3 × 2) (6)

3.3 What is the function of the safety pin in a fire extinguisher? (1)

[10]

QUESTION 4: BASIC FIRST AID

4.1 State TWO first-aid benefits to employers in a workplace. (2)

4.2 State TWO first-aid benefits to workers in a workplace. (2)

4.3 What is the normal body temperature of a person? (1)

4.4 What is *electric shock*? (2)

[7]

QUESTION 5: HEALTH AND THE ENVIRONMENT

5.1 State when and where safety committees are required to be established. (2)

5.2 State FIVE major aims and requirements of a safety training programme. (5)

5.3 Briefly explain TWO requirements that are needed when you are appointed as a SHE representative in a workplace. (2)

5.4 A SHE representative should have formal training on carrying out inspections.

State FOUR general guidelines that the SHE representative should adhere to when doing inspections. (4)

[13]

TOTAL: 100

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