higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ELECTRICAL WORKMANSHIP
NQF LEVEL 3

(12041013)

6 March 2020 (X-paper)
09:00–12:00

This question paper consists of 6 pages.

275Q1S2006

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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. Write neatly and legibly.

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QUESTION 1

1.1 Choose an item from COLUMN B that matches an item in COLUMN A. Write only the letter (A–F) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	Trade practices forming a very important part of the effective and efficient completion of a task	A	task list
1.1.2	Once you know what is needed for the job	B	measured parts
1.1.3	List of tasks to accomplish a goal	C	personal factor
1.1.4	Materials to be charged per length required	D	lockout and tagout
1.1.5	Lack of knowledge, skill or both causing an incident in the workplace	E	preparing a parts list
		F	planning and scheduling

(5 × 1) (5)

1.2 Give THREE reasons why the lockout procedure is important. (3)

1.3 State TWO questions to consider when prioritising hazards. (2)

1.4 Name FOUR work situations that could cause stress. (4)

1.5 List THREE types of physical evidence that can be included in an accident report. (3)

1.6 State FOUR duties of employers towards their employees. (4)

1.7 Give FOUR reasons for planning and scheduling a task. (4)

[25]

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QUESTION 2

2.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

2.1.1 Testing and measuring equipment give a visual indication of the quantity monitored or measured.

2.1.2 Magnetism will not affect the accuracy of electrical test instruments.

2.1.3 Recording instruments give a continuous record of the condition of an electrical cable or power supply.

2.1.4 The calibration process measures the power in an electrical installation.

2.1.5 A chronometric tachometer measures the amount of cycles per second produced by an AC supply.

(5 × 1) (5)

2.2 What does an energy meter measure? (2)

2.3 Draw a fully labelled circuit diagram showing how to connect an ammeter to an instrument transformer. (4)

2.4 A current transformer has four primary winding turns and 120 secondary winding turns. The full-scale deflection of the ammeter is 5 A.

Calculate the line current. (4)

[15]

QUESTION 3

3.1 List FIVE items on a twin-tub control panel. (5)

3.2 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (3.2.1–3.2.4) in the ANSWER BOOK.

3.2.1 The geyser outlet pipe that supplies water to the taps:

A Overflow pipe
B Main supply pipe
C Hot-water pipe
D Drip-tray drainpipe

3.2.2 The separate part of a stove unit used in modern kitchens:

A Solid stove plate
B Hob
C Eye-level oven
D Spiral stove plate

3.2.3 Which type of stove switch follows the bimetal principle of operation?

A Simmerstat stove switch
B Three-heat stove switch
C Five-heat stove switch
D Six-heat stove switch

3.2.4 Which protective device is used to protect stove circuits from over-current?

A Overload relay
B Circuit breaker
C Earth-leakage relay unit
D Fuse

(4 × 1) (4)

3.3 List THREE main electrical components used in an electric-kettle circuit. (3)

3.4 Name THREE types of stove switches. (3)

[15]

QUESTION 4

4.1 Bearings are used to allow moving parts of machines to rotate easily.

4.1.1 Name the type of bearing that is adjustable. (1)

4.1.2 Name the type of bearing used in power tools. (1)

4.2 Explain TWO checks that can be done on a cordless kettle. (2)

4.3 State FOUR ways of checking the brushes in a drilling machine. (4 × 2) (8)

4.4 4.4.1 Name a portable power tool used to cut and grind metal. (1)

4.4.2 Which power tool is used to smoothen wooden surfaces? (1)

4.4.3 Name the combination of the drive and bevel gears in an angle grinder. (1)

[15]

QUESTION 5

5.1 Name THREE types of mounting methods used to install motors. (3)

5.2 Draw a fully labelled circuit diagram of an AC universal motor-speed control using the tapped-field method. (6)

5.3 Draw the circuit diagram of a capacitor-start-induction-run motor. (4)

5.4 Name TWO types of motor-starter circuits commonly used. (2)

[15]

QUESTION 6

6.1 List THREE factors to consider when buying an electrode holder. (3)

6.2 Name TWO types of welding machines used in SMAW. (2)

6.3 Name TWO potential electrical hazards when doing welding work. (2)

6.4 Name FIVE types of PPE used when doing welding work. (5)

6.5 List THREE major hazards to keep in mind when welding. (3)

[15]

TOTAL: 100

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