higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ELECTRICAL SYSTEMS AND CONSTRUCTION
NQF LEVEL 2

17 NOVEMBER 2022

This marking guideline consists of 6 pages.

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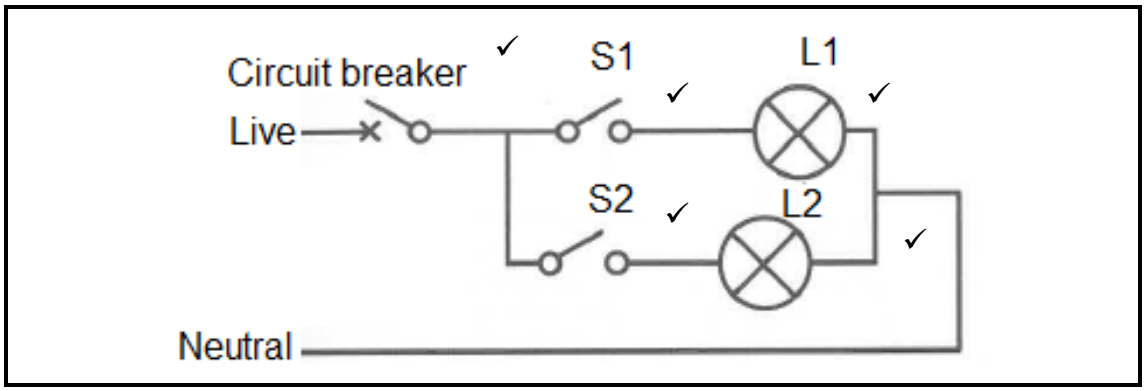
QUESTION 1

1.1

1.1.1	A
1.1.2	D
1.1.3	B
1.1.4	C
1.1.5	D
1.1.6	B
1.1.7	D
1.1.8	B
1.1.9	C
1.1.10	D

(10 × 1) (10)

1.2



(5)

1.3

- By what date must the task be completed?
- Obtain as must information as possible about the task to be done.
- Obtain the necessary plans, documents and diagrams.
- When must the task start?
- How many workers will be available?
- What tools and equipment will be needed?
- What material must be ordered?
- What documentation is needed according to the job instructions?
- Inform all the relevant parties affected.
- Submit appropriate requests to the supply authority.
- What will happen in the case of unforeseen circumstances?

(Any 6 × 1) (6)

1.4 Mandatory rules use the words 'shall' or 'shall not'✓ and they must always be obeyed. If you do not do so, you will be in violation of the code and will therefore be breaking the law.✓ Permissive rules use words such as 'may', 'shall be permitted' or 'shall not be required',✓ and they give you permission to do or not to do something, but you can decide whether to implement the rule or not.✓ (4)

[25]

QUESTION 2

2.1
- Treat all conductors (even de-energised ones) as if they are energised until lockout and tagout devices have been applied.
- Lock out and tag out circuits and machines in accordance with a documented and established policy.
- Prevent exposure to live electrical parts by isolating and insulating them.
- Prevent leakage currents from electrical systems and tools by earthing them.
- Prevent leakage currents by using an earth leakage unit.
- Use overcurrent protection devices.
- Use only approved test instruments that have up-to-date test and calibration status.
- Use appropriate personal protective equipment and use insulated hand tools at all times.
- Do not force and bypass interlocks.
- Have up-to-date equipment drawings on hand to identify isolation points in the event of an emergency.
- A safe observer (electrical) must be present and observing the work for the entire duration of the task.
- Use insulating mats when working on conductive surfaces.
- Use insulating barriers or covers over live parts if there is any chance of accidental contact during the joining process. (Any 5 × 1) (5)

2.2
2.2.1 current
2.2.2 earth continuity
2.2.3 conductor
2.2.4 conduit
2.2.5 spread
2.2.6 cut away
(6 × 1) (6)

2.3
- Place the mould over the outer sheath of the cable.
- Seal the ends of the mould with tape.
- Pour resin through the adaptor into the mould opening.
- Close the mould opening with the attached cap on completion. (4 × 1) (4)

2.4
- Nylon draw tape
- Steel draw tape (2 × 1) (2)

2.5
- Updating records
- Maintaining and filing site drawings, invoices and delivery documents
- Ensuring that all policies and procedures are followed
- Paying suppliers on time
- Paying daily or weekly casual staff on time (Any 3 × 1) (3)

[20]

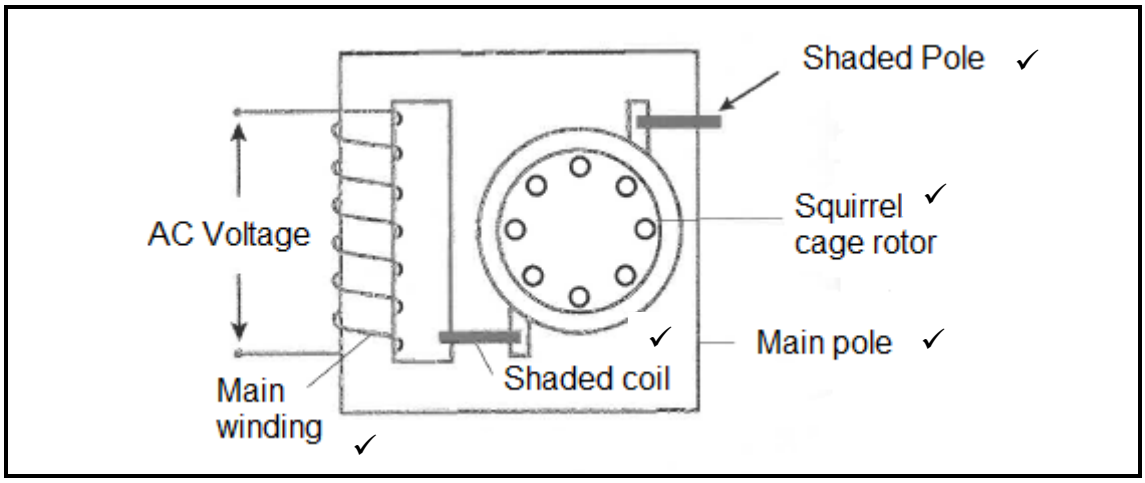
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QUESTION 3

3.1
3.1.1 C
3.1.2 E
3.1.3 F
3.1.4 D
3.1.5 B

(5 × 1) (5)

3.2



(5)

3.3
- Direct coupling
- Gear coupling
- Belt-and-pulley coupling

(3 × 1) (3)

3.4
- Lathes
- Drilling machines
- Milling machines
- Woodworking machines

(Any 2 × 1) (2)
[15]

QUESTION 4

4.1
4.1.1 True
4.1.2 True
4.1.3 False
4.1.4 False
4.1.5 False

(5 × 1) (5)

4.2
- Primary windings and earth
- Secondary windings and earth
- Primary and secondary winding

(3 × 1) (3)

4.3
- Fuses
- Circuit breakers
- Thermostats
- Luminaires
- Transformers
- Cables
- Switches
- Isolators
- Earth leakage relays (Any 4 × 1) (4)

4.4
- Turn the power off and remove the fuse from the circuit.
- Check it with a multimeter set to the lowest ohm range. Connect the probes to both ends of the fuse.
- A good fuse should show continuity or read 0 Ω. A blown fuse is open, which reads infinity on the multimeter. (3 × 1) (3)

[15]

QUESTION 5

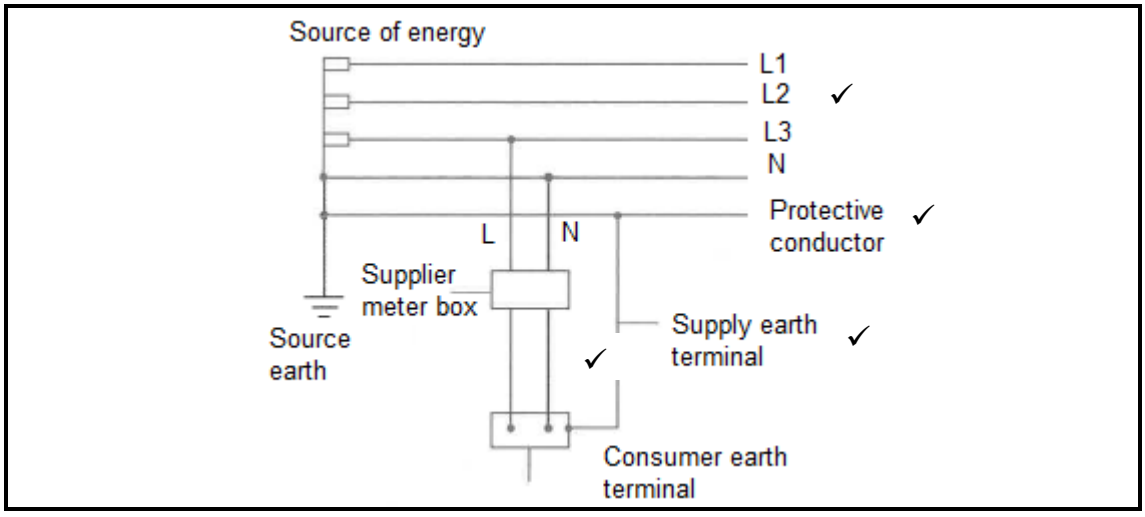
5.1 Job cards are important because they serve written evidence of the job done. (1)

5.2 5.2.1
- Tools can be stored in a toolbox.
- They must be stored in different compartments of suitable sizes.
- The tools used most frequently should be stored on top.

(3 × 1) (3)

5.2.2
- There should be a pegboard on which you can hang larger hand tools.
- Tools must be kept clean and dry because water and dirt cause rust and damage.
- Tools used less frequently can be stored on fixed shelves or in cupboards. (3 × 1) (3)

5.3



(4)

5.4	5.4.1	• Whitewash • Marking blue • Copper sulphate	(Any 2 × 1)	(2)
	5.4.2	• Centre punch • Prick punch	(2 × 1)	(2)
				[15]

QUESTION 6

6.1		• Using electrical power tools • Working with ladder to access equipment and rooftops • Working in hot or cold weather conditions • Working with solar hot-water collector panels • Working with solar PV panels	(Any 4 × 1)	(4)
6.2		• Residential use • Garden lighting • Water pump for agricultural purposes • Telephone call boxes • Telkom transmission link • Medical refrigeration • Solar-powered traffic light	(Any 4 × 1)	(4)
6.3	6.3.1 6.3.2	12 V 9 A		
			(2 × 1)	(2)
				[10]
			TOTAL:	**100**

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