higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PLANT AND EQUIPMENT
NQF LEVEL 3

14 November 2022

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 Ignites
1.2 Ignition temperature
1.3 Ignition temperature
1.4 Fuel
1.5 Oxygen

(5 × 1) **[5]**

QUESTION 2

2.1 The amount of work you need to apply in order✓ to lift an object is equal to the force times distance.✓ (2)

2.2 2.2.1 It is where the force is applied✓ and is measured from the fulcrum to the point at which the efforts are applied.✓

2.2.2 It is where the load is placed and is measured from the fulcrum to the load.

(2 × 2) (4)

2.3 First you always lift with your back held straight ✓and keeping your elbows in✓, bend your knees✓, keep your feet slightly apart✓ and use the knees ✓and legs to do the lifting✓. Always keep the object that is being lifted closer to your body✓. (6)

2.4

CONVEYOR BELT	BUILDER'S HOIST
• It is a type of belt and pulley system. • It is used to convey or move materials from one place to another. • The belt rotates around two or more pulleys, one of which is powered by a motor to drive the conveyor belt along. • It is used in airports to move luggage around a collection point.	• It is a platform used to lift a small load of up to 200 kg. • The hoist can move up a maximum of 10 metres and is ideal for lifting builders and construction tools on site. • A builder's hoist should be positioned next to the building where the builders are working to allow it to carry them from one level to another. • The platforms move up and down by means of a cable system that is run by a motor.

(2 × 4) (8)
[20]

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QUESTION 3

3.1
- Internal fan
- Ball bearing
- Shaft
- Keyway
- Windings
- Starting capacitor
- Centrifugal switch
- Sealed inner housing
- External fan
- Ventilation slots
- Wiring junction box
- Mounting feet (Any 6 × 1) (6)

3.2 Because an induction motor always runs at a speed lower than synchronous speed. (2)

3.3
- Single-phase induction motor
- Three-phase induction motor (2)

3.4

ELECTRIC MOTOR	INTERNAL COMBUSTION ENGINE
• Uses a simple electronic device to start the motor • Maintenance involves: - cleaning the motor - dust that builds up - replacing brushes - replacing bearings - replacing commutators if they wear out. • Usually fitted with maintenance-free bearings that need no lubrication	• Uses an ignition system to start the engine • Maintenance involves: - regularly checking water, coolant level and oil - periodically changing the oil and filters when they get dirty - periodically changing the air filter - checking the ignition wires and valves - setting timing • Replacing timing belts

(6 × 1) (6)

3.5 $fuel\ efficiency = amount\ of\ fuel \div total\ kilometers \times 100$ (3)

3.6 A (1)
[20]

QUESTION 4

4.1 V belt (1)

4.2
- Irregular and violent movement of air or water
- State of confusion without any order (2)

4.3 There are two types of transmission, namely manual and automatic. A manual transmission is connected to a clutch, which makes a mechanical connection to the engine.
An automatic transmission has no clutch. Instead it has a fluid coupling or torque converter. This converter transfers torque from the engine to the transmission indirectly through a fluid. (7)

[10]

QUESTION 5

5.1 Engine oil light (1)

5.2 A – Transmission temperature gauge
B – Tachometer
C – Speedometer/odometer
D – Oil pressure gauge
E – Fuel gauge
F – Voltmeter
G – Engine coolant temperature gauge
H – Driver information centre (8)

5.3 Ampere hour (1)

5.4
- Short journeys
- A loose fan belt
- Loose or dirty battery terminals
- Corroded battery terminals
- A faulty earth connection
- A short circuit
- A faulty alternator/generator (Any 5 × 1) (5)

5.5 Regulation 234 states that no one may operate a vehicle if the gross axle mass load (GA) is exceeded. It also states that the GA must be smaller than the sum of the load index for the tyres, as specified in Regulation 238. (5)

[20]

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QUESTION 6

6.1 Because it has very low resistance, the electricity will safely discharge to the earth instead of a person. (2)

6.2 Air pressure (1)

6.3
- Manufacturer's name
- Its country of origin
- Its operating temperature
- Its year of manufacture
- Its manufacturer's serial number
- The name, number and date of the standard of design
- Its design gauge pressure (in pascals)
- Its maximum permissible operating pressure (in pascals)
- Its capacity in cubic metres
- The mark of an approved inspection authority (12)

[15]

QUESTION 7

7.1
- Single-stage regulator
- Multi-stage regulator (2)

7.2 A single-stage regulator reduces the pressure in one stage and a multi-stage regulator reduces the pressure in two stages. (2 × 2) (4)

7.3
- Mask/respirator
- Ear plugs
- Fireproof overalls
- Boots
- Apron
- Welder's gloves
- Goggles
- Skull cap (4)

[10]

TOTAL: 100

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