higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

AUTOMOTIVE REPAIR AND MAINTENANCE
NQF LEVEL 3

16 November 2022

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
1.1.1 D
1.1.2 B
1.1.3 D
1.1.4 D
1.1.5 B
1.1.6 C
1.1.7 A
1.1.8 A
1.1.9 C

(9 × 1) (9)

1.2
1.2.1 True
1.2.2 False
1.2.3 True
1.2.4 True
1.2.5 False
1.2.6 True
1.2.7 False

(7 × 1) (7)

[16]

QUESTION 2

2.1
- Coil spring
- Leaf spring
- Rubber spring
- Torsion bar

(Any 2 × 1) (2)

2.2
- Smoothens vehicle ride
- Provides a comfortable drive for the passengers
- Prevents excessive wear of suspension parts
- Prevents tyre wear
- Keeps the vehicle stable on the road
- Prevents suspension from continuous bouncing after spring compression and extension

(Any 2 × 1) (2)

2.3
2.3.1 Stiffness or tension of a spring, determined by the weight needed to bend it

2.3.2 The weight of all parts supported by the spring or weight of all the components above the spring

(2 × 2) (4)

2.4
- Camber
- Caster
- Toe in or toe out
- Toe out on turns
- SAI/KPI
- Included angle
- Ackerman's angle (Any 3 × 1) (3)

2.5
- Rack and pinion
- Recirculating ball and nut type
- Worm and nut
- Worm and peg
- Worm and sector (Any 2 × 1) (2)

2.6
- Check the tyre pressure
- Check tyre threads and side walls for damage
- Check rim for any damages
- Check old balancing weights and remove them (4)

2.7 2.7.1 Rim width calliper:✓ to measure the rim width.✓

2.7.2 Wheel weight remover/combination hammer:✓ to remove and replace wheel weights✓

(2 × 2) (4)

2.8 Stick on✓ and clip/knock on balancing weight✓ (2)
[23]

QUESTION 3

3.1 3.1.1 A rectifier is used to convert alternating current (AC)✓ to direct current (DC),✓ during the charging process.

3.1.2 The voltage regulator regulates power output from the alternator✓ to the battery ✓

(2 × 2) (4)

3.2 A – Ignition switch
B – Resistor
C – Battery
D – Alternator (4)

3.3
- Remove distributor primary wire.
- Disconnect distributor vacuum pipe.
- Remove distributor cap and high tension leads – note their position.
- Turn engine for no. 1 cylinder to be firing.
- Scribe a mark noting the position of the rotor.
- Scribe a mark on the block indicating the position of the distributor.
- Remove the distributor lock bolt; remove the distributor; note the rotor for any slight movement (7)

3.4
- Pull-in test
- Hold-in test
- Pinion-return test
- No-load test (4)

3.5
- Wear appropriate PPE
- Always use a test light or multi meter to test components
- Never test the current by shorting the positive wire to earth
- Remove the battery earth terminal before removing the starter
- Keep electrolyte away from the eyes, skin or motor vehicle body paintwork
- When removing connectors, ensure sure to pull the connector and not the wire

(Any 5 × 1) (5)
[24]

QUESTION 4

4.1 4.1.1 Allow each wheel actuator to receive an equal pull force,✓ irrespective of the lining, joint or cable wear.✓

4.1.2 Improves the efficiency of the braking system by increasing the braking force at the drum or disc✓ with relatively less force applied on the brake pedal.✓

(2 × 2) (4)

4.2 To purge or remove air from the brake system pipes,✓ which causes a spongy brake pedal.✓ (2)

4.3 A – Brake calliper
B – Master cylinder
C – Brake pedal
D – Brake drum (4)
[10]

QUESTION 5

5.1 5.1.1 A point when paraffin wax separates from diesel fuel; when this happens, the fuel turns cloudy or milky

5.1.2 A rapid and quick spreading of flames at extremely high pressure in a combustion chamber; burns almost explosively

(2 × 2) (4)

5.2
- Oxidation inhibitors: prevent gum formation during storage of petrol.
- Metal deactivators: to protect fuel from harmful effects or metal pickups.
- Anti-rusting agent: to protect fuel system against corrosion/rust.
- Phosphorus compound: to combat surface ignition and spark-plug fouling.
- Detergents: to keep the components clean from carbon deposits

(Any 3 × 2) (6)

5.3
- Ensure that the battery is fully charged before doing the test.
- Start the engine and let it warm up to operating temperature. Turn the engine off.
- Clean any dirt around the spark plug; remove the spark plug.
- Fit the compression tester in the spark plug hole.
- Crank the engine at least four compression strokes to obtain highest possible reading; record reading. (5)

5.4
- Burnt valves
- Piston damaged
- Piston ring damaged
- Blown cylinder head gasket
- Incorrect valve adjustment (Any 3 × 1) (3)

5.5
- Telescopic gauges
- Bore gauge
- Micro-meter
- Vernier calliper
- Dial gauge
- Feeler gauge (Any 4 × 1) (4)

5.6
- Was the machining work done according to the request and specifications?
- Are the parts supplied with the reworked components according to manufacturer specifications?
- Is the component clean and free from machine filings or shavings?
- Did the engineering company supply the new sizes and additional parts?
- Did the engineering company coat the components with a rust- preventative substance? (5)

[27]

TOTAL: 100

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