higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

AUTOMOTIVE REPAIR AND MAINTENANCE
NQF LEVEL 3

XX February 2020

This marking guideline consists of 6 pages.

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QUESTION 1

1.1
1.1.1 E
1.1.2 A
1.1.3 G
1.1.4 I
1.1.5 D
1.1.6 C
1.1.7 K
1.1.8 F
1.1.9 B
1.1.10 H

(10 × 1) (10)

1.2
- Off-idle circuit
- Acceleration circuit
- High-speed circuit
- Full-power circuit (Any 2 × 1) (2)

1.3
1.3.1 Detergent
1.3.2 Anti-icing agent
1.3.3 Oxidation inhibitor

(3 × 1) (3)

1.4
- Do not keep large amounts of flammable liquids in a working area.
- Spills must be cleaned up immediately.
- Rags that are soaked with flammable liquids must be disposed of in the correct containers.
- Do not store them in open containers as evaporation of these fluids can easily ignite and cause huge fires.
- Do not weld or grind near flammable liquids. (Any 2 × 1) (2)

1.5
- When the engine is cold, a glow plug is used to heat up the combustion chamber for the quick start
- and proper combustion of the mixture until the engine is warm. (2)

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QUESTION 2

2.1 2.1.1 The regulator keeps the voltage at a required level (14 V) at all speeds and under all loads.

2.1.2 The rectifier changes the alternating voltage as it is unsuitable for charging the battery and the motor vehicle's electrical system also requires direct voltage.

(2 × 1) (2)

2.2
- The alternator is driven by the engine rotation by means of a fan belt and if the belt is slack it will cause slippage.
- This means there could be rotation loss at the alternator.
- This could cause a drop in the charge rate. (3)

2.3 A – Rotor
B – Stator (2)

2.4
2.4.1 False
2.4.2 False
2.4.3 True
2.4.4 True
2.4.5 False
2.4.6 True
2.4.7 False

(7 × 1) (7)

2.5
- Battery
- Low-tension wire
- Ignition switch
- Points
- Condenser
- Ignition coil (Any 4 × 1) (4)

2.6
- During light-load acceleration the vacuum in the inlet is high
- causing suction in the vacuum unit on the distributor.
- The lever from the vacuum pot will pull the base plate which will cause the points to open earlier (advanced). (3)

[21]

QUESTION 3

3.1
- Tyre wear on the outside
- Tyre wear on the inside
- Flat spots on the tread
- Feathering of the tread (Any 3 × 1) (3)

3.2 3.2.1
- The control arms accommodate the mounting of the wheel hub.
- The control arms allow the up-and-down movement of the wheel.

3.2.1
- The leaf springs support the weight of the vehicle and load.
- The leaf spring allow for the mounting of the differential to the body.

(2 × 2) (4)

3.3
- Understeering would cause the vehicle to take the turn wider than what was intended.
- The driver then has to turn the steering wheel sharper to correct. (2)

3.4 Negative camber (1)

3.5 Caster (1)

3.6
- If the tread is not below the limit
- Uneven tread wear
- Damage on the tyre
- Foreign objects in the tread
- If tyre is out of round
- Tyre pressure (Any appropriate 3 × 1) (3)

3.7
- It would cause a vibration through the vehicle body at a certain speed.
- It could cause shaking on the steering wheel.
- It could cause up-and-down bounce of the tyre.
- It can cause premature wear on suspension parts.
- It can cause abnormal tyre wear.
- It will cause a very uncomfortable ride. (Any 3 × 1) (3)

3.8
- Wheel-width calliper
- Wheel-weight hammer (2)

3.9 Mag rims: Stick-on weights, clip-on weights
Steel rims: Knock-on weights (2)

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QUESTION 4

4.1 A – Wheel cylinder
B – Brake adjuster/spring
C – Handbrake lever
D – Backing plate
E – Brake shoe (5)

4.2 4.2.1
- Overheated brakes or brake fluid
- A slow brake fluid leak
- Thin brake drums or discs
- Internal master cylinder leaks (Any 2 × 1)

4.2.2
- Soft flexible hoses
- Air in the brake system
- Brake drums worn or too thin
- Brake shoes not centred in drum (Any 2 × 1)

(2 × 2) (4)

4.3
- Input shaft
- Cluster gear
- Third gear
- Synchro sleeve
- Synchro hub
- Main shaft (Any 5 × 1) (5)

4.4 The contact between the crown-wheel and pinion is too much to the heel (rear end) of the crown-wheel teeth. (1)

[15]

QUESTION 5

5.1
- Compression rings worn
- Cylinder wall worn or damaged
- Cylinder head gasket leaking
- Valves leaking or burnt
- Loose valve seats (Any 3 × 1) (3)

5.2
- Worn or broken rings
- Worn or damaged cylinders
- Damaged pistons (Any 2 × 1) (2)

5.3
- The cylinders
- Valve guides
- Camshaft bearings in cylinder head
- Main bearings on engine block
- Connecting rod bearings
- Gudgeon pin bore (Any 3 × 1) (3)

5.4
- Trolley jack and safety stands
- Engine crane
- Hoist (Any 2 × 1) (2)

5.5
- Machine the main bearing journals.
- Machine the big-end journals.
- Machine front and rear seal surfaces.
- Balance the crankshaft. (Any 2 × 1) (2)

5.6
- Telescopic gauges
- Bore gauge
- Outside micrometer
- Vernier callipers
- Dial gauge
- Feeler gauge
- Straight edge (Any 4 × 1) (4)

5.7
- Remove the engine from the stand.
- Clean lubricated parts from the rust prevention lubrication.
- Unwrap loose components in protective material and inspect for damage.
- Unclog all the closed holes to prevent blockages. (Any 3 × 1) (3)

5.8
- Check for abnormal noise.
- Check for vibrations.
- Check the performance of the vehicle.
- Check for smooth running of the engine. (Any 3 × 1) (3)

5.9
- High-pressure cleaner
- A solvent gun
- A firm paint brush
- A compressor with air line
- An air gun
- A scraper
- A container with cleaning solvent (Any 2 × 1) (2)

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TOTAL: 100

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