higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

MOTOR TRADE THEORY N2

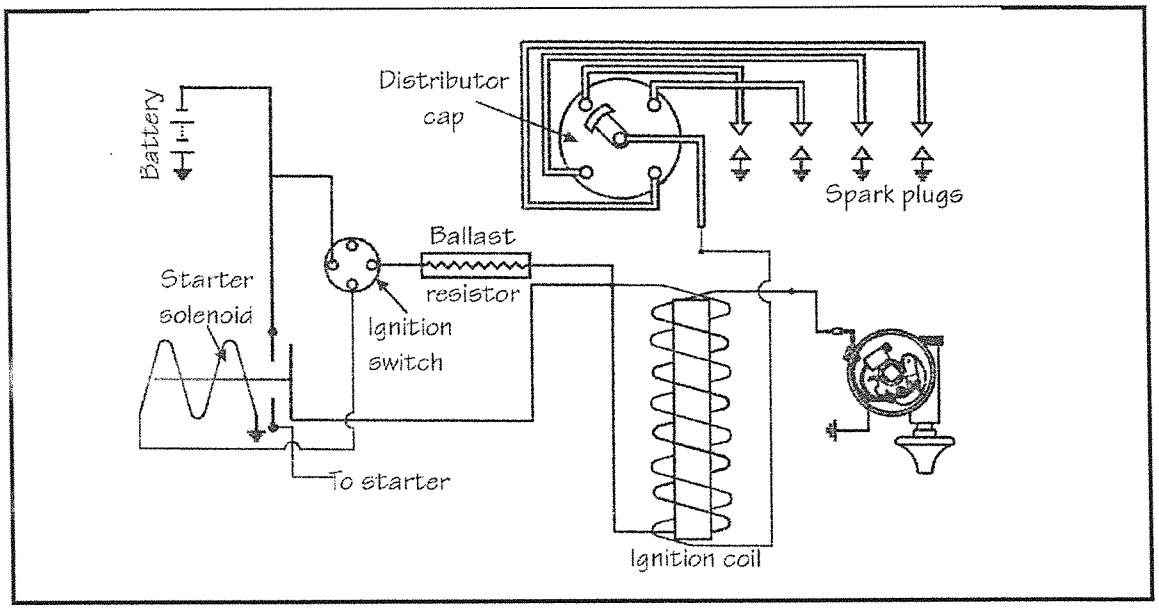
10 APRIL 2013

This marking guideline consists of 6 pages.

QUESTION 1

1.1 The engine will continue to run on for a short period of time after you have switched the ignition switch off or cut the power to the ignition system. (2)

1.2



CONVENTIONAL IGNITION SYSTEM (8)

1.3 The ignition coil transforms a low battery voltage of 12 volts to a high/secondary voltage of 16 000 to 24 000 volts

When the circuit is suddenly broken by the points, the magnetic field of the primary coil collapses rapidly. The secondary coil is engulfed by a powerful and changing magnetic field. This field induces a current in the coils – a very high-voltage current (up to 24 000 volts) because of the number of coils in the secondary winding. The secondary coil feeds this voltage to the distributor via a very well-insulated, high-voltage wire. (4)

1.4 It is the stumble or hesitation when the accelerator is pressed to the floor. The air moves faster and in larger volume and the fuel lags behind or is too little. (2)

1.5

Choke circuit:	Supplies an extremely rich mixture for cold engine starting
Float bowl:	Storage area for fuel before being drawn into air horn
Venturi:	Narrowed portion of air horn that creates vacuum
Accelerator circuit:	Provides extra fuel above idle speeds (Any 3 × 2) (6)

[22]

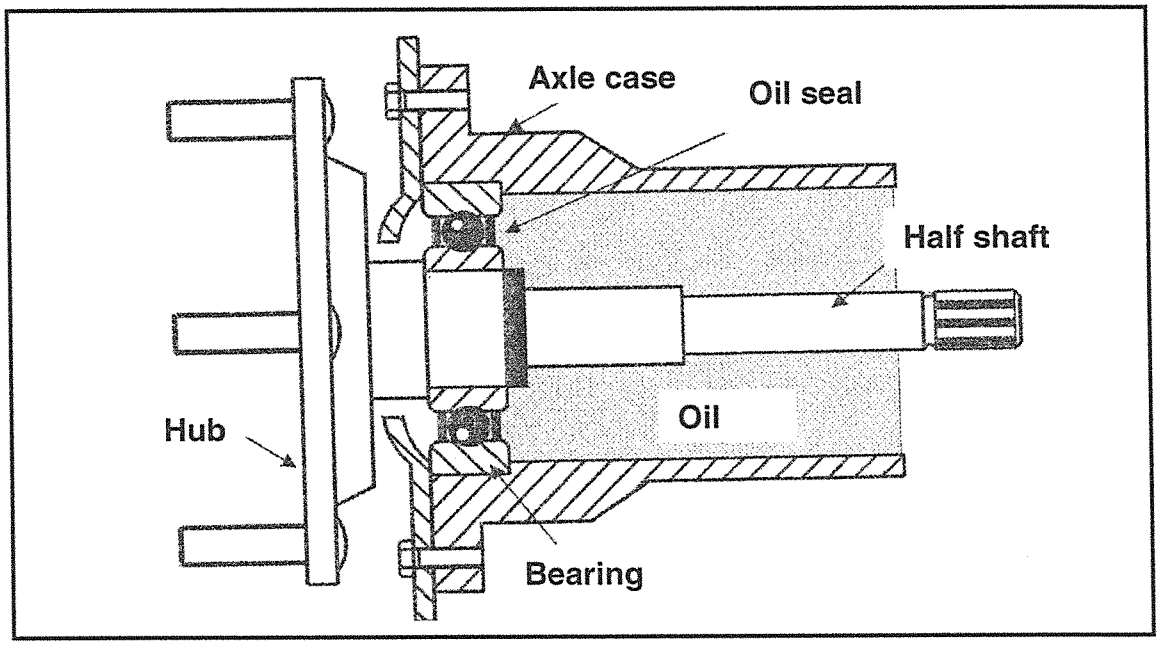
QUESTION 2

2.1
- Control arm – Movable lever that connects steering knuckle to frame/body
- Ball joint – Swivel joint that allows control arm and steering knuckle to move
- Spring – Supports weight of the vehicle and allows control arm and wheel to move up or down (6)

2.2 The shock absorber controls the spring oscillations, the up and down movements of the spring as the vehicle moves over different surfaces (bumps). (2)

2.3 Nitrogen (1)

2.4



SEMIFLOATING REAR AXLE UNIT (6)

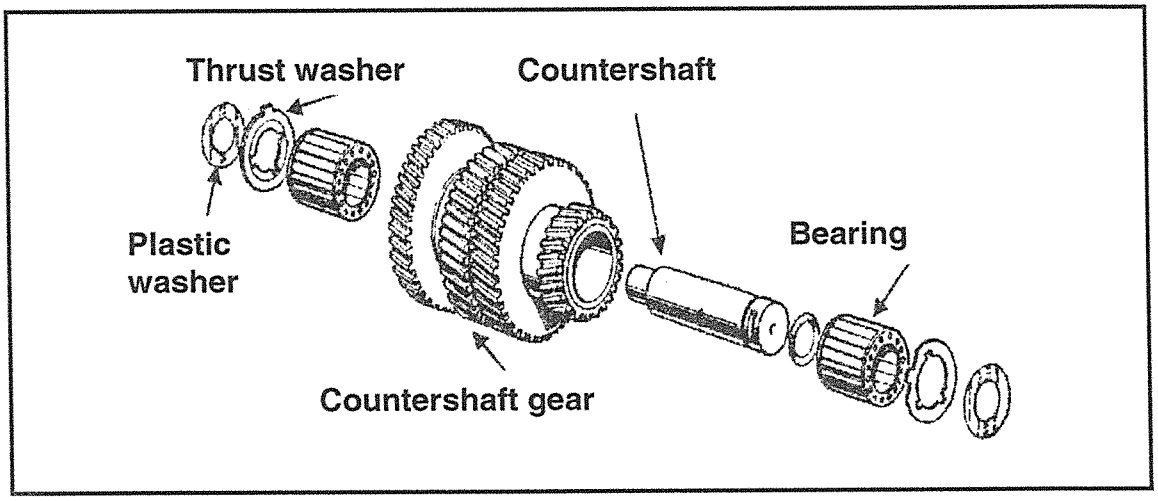
2.5
- Semi-floating drive axle
- Three-quarter floating axle
- Full-floating axle (Any 2 × 1) (3)

[18]

QUESTION 3

3.1 Input shaft – cluster shaft – no. 3 main gear – synchroniser cone – synchroniser hub – output shaft (6)

3.2



CLUSTER GEAR (6)

3.3 This is termed as an overdrive ratio and happens when the input shaft turns 0,8 times and the output shaft turns 1 revolution. A bigger gear is driving a smaller gear. This is normally the fifth speed in a five-speed gearbox (3)

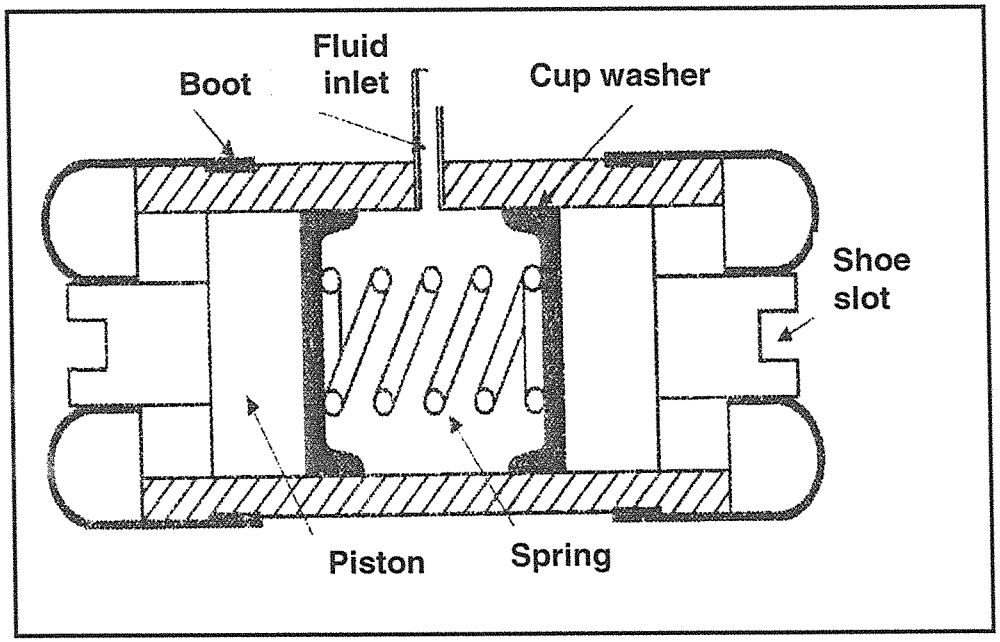
3.4 The interlocking device prevents the simultaneous engagement of two gears and thereby prevents gears from clashing or breaking. (3)

3.5
- Spur gear
- Helical gear
- Double-helical gear

(Any 2 × 1) (2)
[20]

QUESTION 4

4.1



DOUBLE-ACTING WHEEL CYLINDER (8)

4.2
- Corrosion of disc due to water
- No self-energising action
- Difficult to arrange effective handbrake mechanism (Any 2 × 1) (2)

4.3
- Air in system
- Shoes not centred on drum
- Soft brake hoses swell under pressure (3)

4.4
- Floating disc brake callipers
- Fixed callipers (2)

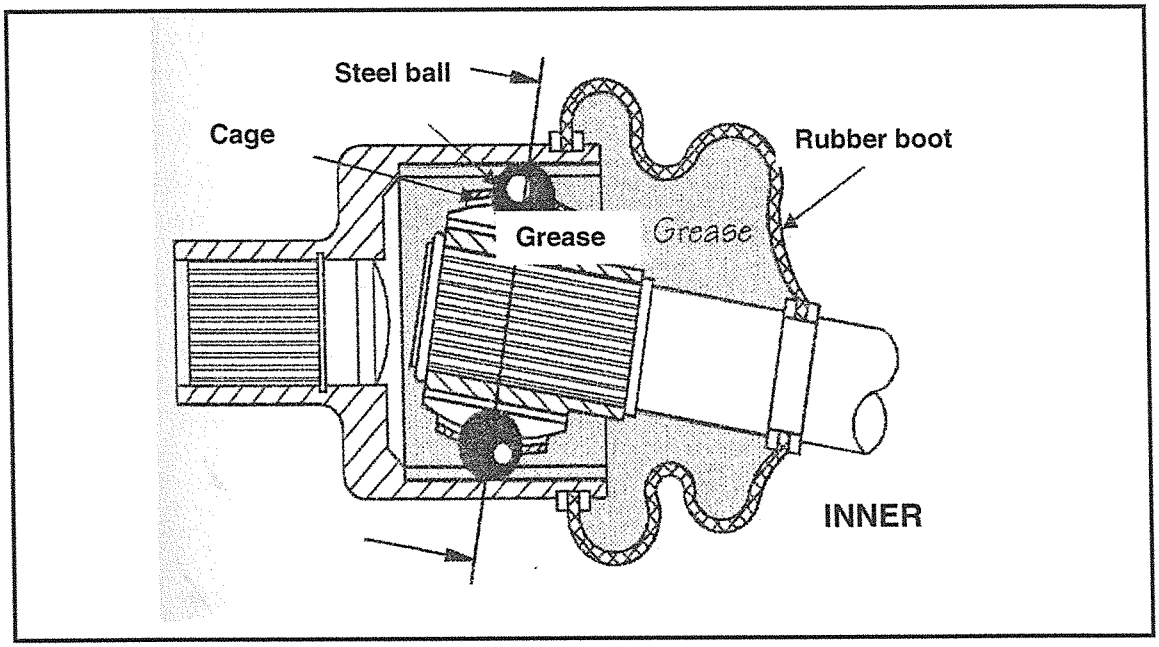
4.5
- In the event of one cylinder failing, the other can still operate and brake the vehicle.
- The rear and front brakes can be split between the two cylinders to operate rear and front separately. (2)

4.6
- Maintains even viscosity over wide temperature range
- Lubricates internal parts of brake systems
- Must not corrode metal parts or damage rubber seals
- Be hydroscopic (Any 3 × 1) (3)

[20]

QUESTION 5

5.1



CONSTANT VELOCITY JOINT

Labelling = 3 marks; Sketch and accuracy = 3 marks (6)

5.2
- Straight-tooth bevel gear (spur gear)
- Spiral bevel gear
- Hypoid gear

(3)

5.3
- Very noisy operation
- Weak and wears faster

(2)

5.4
- Prevents pinion from moving in and/or out under load
- Ensures that the taper bearings are not too tight or too loose

(3)

5.5 Advantages
- Adjustable
- Possesses minimal friction and takes less space

Disadvantages
- More expensive to manufacture and build into a car
- Space must be found under a car to accommodate its length

(4)

5.6 It provides drive from the propeller shaft at a right angle at reduced speed. (2)

[20]

TOTAL: 100