higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N1

2 August 2021

This marking guideline consists of 5 pages.

QUESTION 1

1.1	1.1.1	B		
	1.1.2	A		
	1.1.3	A		
	1.1.4	D		
	1.1.5	A		
	1.1.6	C		
	1.1.7	D		
	1.1.8	B		
	1.1.9	A		
	1.1.10	C		
			(10 × 1)	(10)
1.2	1.2.1	False		
	1.2.2	True		
	1.2.3	True		
	1.2.4	True		
	1.2.5	False		
	1.2.6	False		
	1.2.7	False		
	1.2.8	False		
	1.2.9	False		
	1.2.10	True		
			(10 × 1)	(10)
				[20]

QUESTION 2

2.1	2.1.1	Grinding goggles		
	2.1.2	Welding goggles/welding helmet		
			(2 × 1)	(2)
2.2	• Ensure the work surface is firm. • Support the car with axle stands. • Ensure the work surface is level. • Vehicle engine must be off and wheels chocked.		(Any 3 × 1)	(3)
2.3	2.3.1	Escape route		
	2.3.2	Fire extinguisher position		
	2.3.3	High voltage sign		
	2.3.4	First-aid position sign		
			(4 × 1)	(4)

2.4 2.4.1 To measure float/run-out
2.4.2 To measure cylinder pressure
2.4.3 To measure small clearances
2.4.4 To measure outside/inside diameters
(4 × 1) (4)

2.5 11.✓ 70 mm✓ (2)
[15]

QUESTION 3

3.1
- Timing belt
- Timing gears
- Timing chain (3)

3.2
- Cast iron
- Aluminium (2)

3.3
- Double overhead cam
- Overhead valve (2)

3.4 3.4.1 Injector
3.4.2 Exhaust port
3.4.3 Exhaust valve
3.4.4 Inlet port
3.4.5 Crankshaft
3.4.6 Conrod
3.4.7 Piston
3.4.8 Blower/supercharger
(8 × 1) (8)

3.5 The valve spring (1)
[16]

QUESTION 4

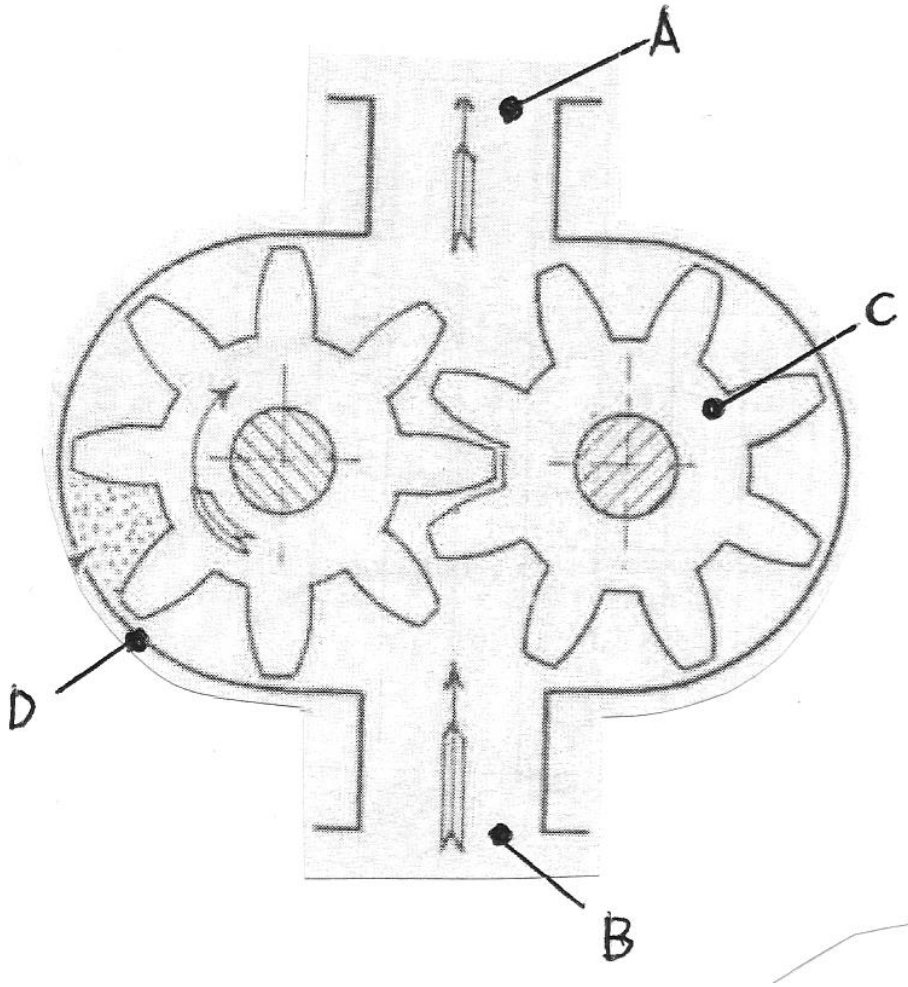
4.1 Viscosity is described as the resistance to flow by a liquid. (1)

4.2 Positive crankcase ventilation (1)

4.3
- Pulsation
- Noisy operation (2)

4.4
- Seals piston, rings and cylinder
- Absorbs shock between moving parts
- Removes dirt and grit from engine's internal parts
- Reduces rust and corrosion
- Cools parts from heat generated by friction
- Reduces friction (Any 4 × 1) (4)

4.5



A – Outlet
B – Inlet
C – Gear
D – Housing

(Correct drawing 3 × 1)
(Labelling 4 × 1) (7)
[15]

QUESTION 5

5.1 The thermo-syphon cooling system operates on the principle of convection currents.✓ As the water heats up, it rises✓ and circulates to the top of the radiator✓ and is replaced by cooler water from the bottom radiator tank.✓
(Any 3 × 1) (3)

5.2 Thermostat (1)

5.3 To prevent freezing,✓ especially in sub-zero temperatures, the shutter will close, restricting air flow through the radiator.✓ (2)

5.4 In cross flow, the radiator tubes run horizontally,✓ while in down flow the tubes run vertically.✓ (2)

5.5
- Radiator
- Expansion bottle
- Thermostat
- Radiator cap
- Water pipes
- Cooling fan
- Water pump
- Water jackets
- Coolant
- Any other components (Any 6 × 1) (6)

5.6 To transfer heat from the cylinder to the atmosphere (1)
[15]

QUESTION 6

6.1 A – exhaust manifold
B – tailpiece
C – silencer
D – exhaust pipe
E – catalytic converter (5)

6.2 The exhaust gases drive the turbine.✓ The common shaft transfers the rotation to the compressor.✓ The compressor drives clean air into the cylinder.✓ (3)

6.3 Sulphation is the formation of a non-conducting✓ substance on the positive and negative plates of the battery. This increases the resistance✓ of the cell and reduces the capacity✓ of the battery to take electrical charge. (3)

6.4
- Visual check
- Specific gravity check
- Electrolyte level check
- Open voltage check
- Load test (Any 4 × 1) (4)

6.5 When the driver brakes or releases the accelerator,✓ energy is captured of the rotating wheels✓ to power the generator.✓ This energy in the form of electricity is stored in the battery✓ for later use.✓ (5)
[20]

TOTAL: 100

