



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

NOVEMBER 2011

**PLANT AND EQUIPMENT
NQF LEVEL 3**

2 NOVEMBER 2011

This marking guideline consists of 7 pages.

QUESTION 1: BASIC FIRE AWARENESS

- 1.1
- Oxygen ✓ (1)
 - Heat ✓ (1)
 - Fuel ✓ (1 x 3) (1)
- 1.2 1.2.1 Identify which fire extinguisher you would use for the following fires:
Class C fire – Powder fire extinguisher. ✓ (1)
- 1.2.2 Class D fire – Carbon dioxide fire extinguisher. ✓ (1)
The book only speaks about THREE CLASSES of fire [5]

QUESTION 2: LIFTING HEAVY OBJECTS

- 2.1 It means the maximum load that the device is designed to lift the load safely. ✓✓ (2)
- 2.2 2.2.1 Chains = 5 ✓ (1)
- 2.2.2 Wire ropes = 6 ✓ (1)
- 2.2.3 Natural fibre ropes = 10 ✓ (1)
Any suitable answer accepted
- 2.3
- Lift with your back held straight and keep your elbows in. ✓ (1)
 - Bend your knees and keep your feet slightly apart. ✓ (1)
- Use your knees and legs to do the lift. ✓ (1 x 3) (1)
- 2.4
- Check that the chain is in good condition. ✓ (1)
 - Attach upper hook to a suspension point that can handle the weight of load to be moved. ✓ (1)
 - Make sure the load is properly fixed to the bottom hook. ✓ (1)
 - Check that the safety clips on both hooks are closed correctly and balance the load before moving it. ✓ (1 x 4) or (any relevant answer) (1)

- | | | | |
|-----|-------|--|-------------|
| 3.2 | 3.2.1 | Armature or converter. ✓ | (1) |
| | 3.2.2 | Crankshaft, piston and connecting rods. ✓ | (1) |
| | 3.2.3 | Electronic device. ✓ | (1) |
| | 3.2.4 | Ignition system. ✓ | (1) |
| | 3.2.5 | Creates mechanical energy interaction of magnetic fields and current carrying conductors. ✓ | (1) |
| | 3.2.6 | Creates mechanical energy by the pressure generated through combustion fuel. ✓ | (1) |
| | 3.2.7 | Cleaning of motor, replacing brushes and commutators if they wear out. ✓ | (1) |
| | 3.2.8 | Checking of oil level and water, periodical change of oil when dirty, air filter and spark plugs when worn out. ✓
(1 x 8) or (any relevant answer)
Learners should be given the benefit of the doubt because the question is very ambiguous | (1) |
| 3.3 | • | Petrol engines use an electric spark to ignite the fuel in a cylinder. ✓ | (2) |
| | • | Diesel engines the fuel ignites spontaneously due to the heat generated by the compression of air in the cylinder ✓
(1 x 2) or any relevant answer | (2) |
| 3.4 | • | The fuel is not reaching the engine. ✓ | (1) |
| | • | Fuel is not reaching the engine at the right time. ✓ | (1) |
| | • | Air is not reaching the engine. ✓ | (1) |
| | • | Compression stroke does not compress enough air. ✓ | (1) |
| | • | Cold start systems (if fitted) does not work. ✓ | |
| | • | Battery problem | |
| | • | Lack of fuel | |
| | | (1 x 5) or (any relevant answer) | [20] |

QUESTION 4: TRANSMISSIONS

- | | | | |
|-----|-------|---|----------------------------------|
| 4.1 | 4.1.1 | True ✓ | (1) |
| | 4.1.2 | False ✓ | (1) |
| | 4.1.3 | False ✓ | (1) |
| | | | (1 x 3) |
| 4.2 | 4.2.1 | Synchromesh – is the arranging for gears to turn at the same speed. ✓✓ | (2) |
| | 4.2.2 | Mechanical sympathy – the process of treating machines and vehicle carefully so that they perform well and do not get damaged. ✓✓ | (2) |
| | | | (2 x 2) or (any relevant answer) |
| 4.3 | • | Sun gear. ✓ | (1) |
| | • | Planet gear. ✓ | (1) |
| | • | Ring gear ✓ | (1) |
| | | | [10] |

QUESTION 5: MAINTANANCE OF VEHICLES

- | | | | |
|-----|-------|---|----------------------------------|
| 5.1 | • | It is the regular servicing of a vehicle, changing oil and doing things to keep the vehicle working properly. ✓✓ | (3) |
| 5.2 | 5.2.1 | Hand brake – it is used to keep the vehicle stationary, preventing it from rolling away when the engine is off. ✓ | (1) |
| | 5.2.2 | A.B.S. Systems – it helps to prevent the vehicles from skidding out of control when brakes are applied. ✓ | (1) |
| | 5.2.3 | Fuel filter – to prevent dirt in the fuel from going into the engine. ✓ | (1) |
| | | | (1 x 3) or (any relevant answer) |
| 5.3 | | What is the metric unit of measurement of a tyre pressure?
Kilopascal. – Kpa ✓ | (1) |

- 5.4
- The tyre may be damaged or even burst. ✓ (1)
 - The driver may lose control of the vehicle. ✓ (1)
 - Pressure on the road may cause the road itself to be damaged. ✓ (1)
 - Can create more expenses, because of wear and tear on tyres, brakes, shock absorbers and use more fuel. ✓ (1)
- (1 x 4) or (any relevant answer.)
- 5.5
- Prevent corrosion on battery`s terminals by cleaning at regular intervals. ✓ (1)
 - Top up the fluid in a battery. ✓ (1)
 - Making sure that the battery is always fully charged. ✓ (1)
- (1 x 3) or (any relevant answer)
- 5.6
- Allowing gases to leak out the inside of the battery through small holes in battery caps on top of the cells. ✓✓ (2)
- 5.7
- heats up a battery less because it supplies a small steady current. ✓✓ (2)
 - Trickle charger and battery require little attention, just be left to do their own work. ✓✓ (2)
- (2 x 2) or (any relevant answer.)

[20]**QUESTION 6: SMALL PLANT AND POWER TOOL OPERATION**

- 6.1
- 6.1.1 Impeller – is the flat blade in the pump that pushes the air or water through the system. ✓✓ (2)
- 6.1.2 Self priming pump – it is a water pump that automatically prepares itself for use when you switch it on ✓✓ (2)
- (2 x 2) or (any relevant answer)
- 6.2
- Peak rating is the additional power a generator can supply when an electric motor starts up. ✓✓ (2)
 - Normal running is the power that the machine can produce to run appliances and tools. ✓✓ (2)
- (2 x 2) or (any relevant answer)

- 6.3
- Check the shell for corrosion or damage. ✓ (1)
 - Check all the emergency devices that could stop them from operating normally ✓ (1)
 - All labels, markings on the tank should be clearly visible and easy to read. ✓ (1)
 - Check the piping, gasket, valves and attachments for damage. ✓ (1)

(1 x 4) or (any relevant answer)

- 6.4 To disconnect electricity immediately if there is **a short in the circuit** (1)
- 6.5
- They break easily when subjected to pressure. (1)
 - Flying drill bit pieces and grit cause injury to your eyes. (1)

(1 x 2) or (any relevant answer)

[15]**QUESTION 7: OXYACETELYNE**

- 7.1
- 7.1.1 Oxygen hose and bottle – Black. ✓ (1)
- 7.1.2 Acetylene hose and bottle – **Maroon / red.** ✓ (1)
- 7.2
- Cylinders can hurt you by falling if you bump into them. ✓ (1)
 - Explosion of fire can injure or kill you. ✓ (1)
 - Without enough fresh air, gas fumes and welding dust can poison or suffocate you. ✓ (1)
 - Noise can damage your ears. ✓ (1)

(1 x 4) or (any relevant answer)

- 7.3
- Natural flame. ✓ (1)
 - Oxidizing flame. ✓ (1)
 - Carburizing flame ✓ (1)

(1 x 3)

- 7.4
- Using a safe gas to blow out all dangerous gases out of the pipes. ✓ (1)

[10]**TOTAL: 100**