higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

AUTOMOTIVE REPAIR AND MAINTENANCE
NQF LEVEL 2

(6021032)

12 March 2018 (X-Paper)
09:00–12:00

This question paper consists of 7 pages.

Copyright reserved

TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each question on a NEW page.
5. Write neatly and legibly.

Copyright reserved

QUESTION 1

1.1 Choose a/an item/word from COLUMN B that matches a description in COLUMN A. Write only the letter (A–J) next to the question number (1.1.1–1.1.9) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	Do not use without safety goggles	A	two stroke engine
1.1.2	The first step before you remove the tyre from the rim	B	check zero setting
1.1.3	Part of the lifting equipment	C	hydrometer
1.1.4	It causes premature bearing failure	D	unsafe condition
1.1.5	Completes four strokes in one rotation	E	saddles
1.1.6	A factor that can lead to an accident	F	leaking seals
1.1.7	Check the calibration before you use it	G	overloading
1.1.8	Used to test specific gravity of electrolyte	H	angle grinder
1.1.9	A cause for oil consumption	I	deflate the tyre
		J	level

(9 × 1) (9)

1.2 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.2.1–1.2.5) in the ANSWER BOOK.

1.2.1 Only air drawn into the cylinder during intake stroke of a diesel engine.

1.2.2 The shape of an information safety sign is round.

1.2.3 Oil additives improve the performance of the engine oil.

1.2.4 Anti-friction bearings do not require any lubrication.

1.2.5 Magnesium is one of the materials used to manufacture wheel-rims.

(5 × 1) (5)

Copyright reserved

1.3 Complete the following sentences by filling in the missing words from the list below. Write only the word next to the question number (1.3.1–1.3.4) in the ANSWER BOOK.

safety-goggles; turn-table; key; dressing; tool-rest

1.3.1 Remove the … from the chuck before switching the droll on.

1.3.2 Always wear … when working with a drill-press.

1.3.3 The … on a bench-grinder should be adjusted close to the stone.

1.3.4 Keep the grinder's stone neatly trimmed by using a … tool.

(4 × 1) (4)

1.4 There are different classes of fires.

List any THREE types of fires that could occur in a motor workshop. (3)

1.5 The OHS Act has a set of regulations to protect the health and safety of employees.

1.5.1 What do the abbreviation *OHS* mean? (1)

1.5.2 Name TWO responsibilities of the employee concerning the act? (2)

1.5.3 Name TWO responsibilities of the employer concerning the act? (2)

1.6 Briefly explain why components should be measured at the same temperature. (2)

1.7 Name TWO measurements that can be taken with a dial gauge. (2)

[30]

QUESTION 2

2.1 List FOUR safety precautions that need to be followed before lifting a vehicle with a two-post hoist. (2 × 2) (4)

2.2 Explain how the air/fuel mixture of a two-stroke petrol engine is moved from the inlet port to the top of the piston to be compressed. (5)

2.3 Name the parts that are responsible for the following functions.

2.3.1 It heats up the combustion chamber in a diesel engine.

2.3.2 It produces the spark to ignite the air/fuel mixture.

2.3.3 It opens the valves.

(3 × 1) (3)

Copyright reserved

2.4 Describe TWO differences between *hydrostatic* and *hydrodynamic* lubrication. (2 × 2) (4)

2.5 Briefly explain why crankcase ventilation is needed in an engine. (2)

2.6 Why should an oil filter be replaced regularly, according to the service schedules? (2)

2.7 Explain the operation of the viscous type cooling fan. (4)

2.8 Name ONE type of water cooled system. (1)

[25]

QUESTION 3

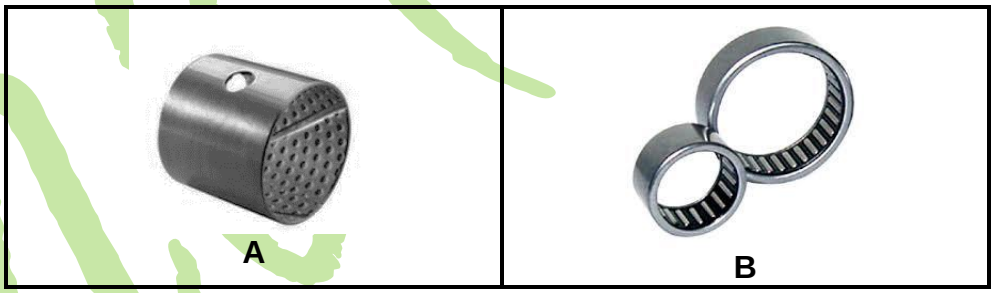
3.1 Use the images of the bearings in the FIGURE 1 below in order to answer the questions:

3.1.1 Identify and name the anti-friction bearing.

3.1.2 Identify and name the friction bearing.

3.1.3 Name the load that can be applied to bearing B.

(3 × 1) (3)



FIGURW 1

3.2 Name THREE advantages of mag wheels over steel rims. (3)

3.3 List THREE ways in which the life of a vehicle tyres will be extended when you take proper care of them. (3)

3.4 Answer the following questions by using the information given in the FIGURE 2 below.

3.4.1 Is this tyre a radial-ply or cross-ply?

3.4.2 What would cause the tyre to wear at A and B at the same time?

(2 × 1) (2)

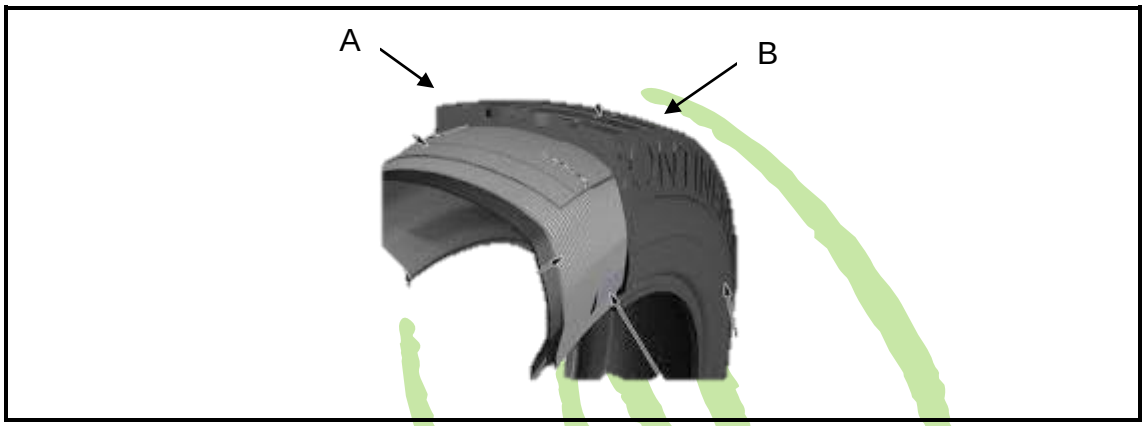


FIGURE 2

3.5 Working with batteries can be hazardous.

Explain any THREE hazards you should be aware of when working with batteries. (3)

3.6 Name TWO parts of a vehicle battery. (2)

3.7 Explain the test steps that should be followed to determine whether the plates of a battery are sulphated. (4)

3.8 Make a simple sketch of the following electrical symbols.

3.8.1 A diode

3.8.2 A fuse

(2 × 1) (2)

3.9 List THREE pre-checks that should be done on a vehicle before doing headlight adjustment. (3)

[25]

QUESTION 4

4.1 Give TWO reasons why the automatic transmission has a filter in the fluid system. (2)

4.2 You are requested to check the oil levels of a rear wheel drive vehicle.

Name TWO oil levels that can be checked under the bonnet. (2)

4.3 Name FOUR tools you would require to perform a service on a vehicle. (4)

4.4 State THREE reasons why it is necessary to do a post-operational check after the service is completed. (3)

4.5 List THREE safety items you should inspect on the exterior of a vehicle during a service. (3)

4.6 What steps should you follow to examine a safety belt before you can say it is in perfect working order? (4)

4.7 Name TWO tasks that is part of your prepare the vehicle for service task. (2)

[20]

TOTAL: 100

Copyright reserved