

2503/105
VEHICLE TECHNOLOGY AND
PRACTICE
June/July 2018
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN AUTOMOTIVE ENGINEERING
MODULE I

VEHICLE TECHNOLOGY AND PRACTICE

3 hours

INSTRUCTIONS TO THE CANDIDATE

You should have the following for this examination:

drawing instruments;

answer booklet.

This paper consists of EIGHT questions in TWO sections; A and B.

Answer FIVE questions taking at least TWO questions from each section.

All questions carry equal marks.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A

Answer at least **TWO** questions from this section.

1. (a) State **four** categories of fires and in each case, state a possible material involved and an appropriate type of fire extinguisher. *class c - bicarb powder fire extinguisher or liquid fire extinguisher* (6 marks)
- (b) (i) Explain the procedure to follow in administering emergency aid to a colleague who has suffered a deep cut on the palm while working in the workshop. *Use a damp cloth to clean the palm*
- (ii) Explain the procedure for resuscitating a colleague who has fainted upon receiving an electric shock. *Make the person lie on the ground so that nothing is touching them* (14 marks)
2. (a) (i) Differentiate between a live and dead axle.
- (ii) Illustrate with labelled diagrams the three types of live axles suited to vehicles. (9 marks)
- (b) With the aid of a diagram, explain the operation of a transfer gearbox. (11 marks)
3. (a) State:
 - (i) **two** functions of a suspension system;
 - (ii) **two** advantages of air suspension. *eliminates driver fatigue*(4 marks)
- (b) With the aid of a labelled diagram, explain the operation of an air suspension system. (16 marks)
4. (a) State **four** advantages of an antilock braking system. *does not require much effort from the driver, it does not require full use of the brakes, it prevents wheel lock-up, it allows the driver to apply the brakes on a steep gradient* (4 marks)
- (b) Using a labelled diagram, explain the operation of an anti-lock braking system. (16 marks)

SECTION B

Answer at least **TWO** questions from this section.

5. (a) State **two** causes for each of the following brake faults:
- (i) dragging brakes;
 - (ii) vehicle pulling to one side upon brake application. *No lubricating oil in the system. Presence of air in the system. Bring the vehicle to a stand. Remove the brake and inspect it. Clean the parts of the drum.* (4 marks)
- (b) A vehicle has been brought into the workshop with worn out disc brake seals. Describe the procedure to follow in replacing the seals and preparing the vehicle for use. (16 marks)
6. (a) State **two** suspension causes that would lead to:
- (i) vehicle leaning to one side;
 - (ii) frequent leaf spring breakage. (4 marks)
- (b) A heavy commercial truck has been brought into the workshop with a damaged equalizer beam. Describe the procedure to follow in replacing the beam. (16 marks)
7. (a) State **two** causes for each of the following clutch faults:
- (i) clutch spin;
 - (ii) clutch slip. *worn out clutch plates* (4 marks)
- (b) (i) Describe the procedure to follow in carrying out the clutch stall test.
- (ii) A van has been brought into the workshop with a faulty diaphragm spring clutch. Describe the procedure in replacing the faulty components. (16 marks)
8. (a) State **two** causes for each of the following faults:
- (i) hard steering; *worn out bearings*
 - (ii) front end noise. *worn out bearing. No lubricating oil* (4 marks)
- (b) A truck fitted with a front beam axle has its kingpin bushes worn. Describe the procedure to follow in replacing them. (16 marks)

disassembly
disassembly

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