

2
THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

093

MOTOR VEHICLE MECHANICS
(For Both School and Private Candidates)

Time : 3 Hours

Wednesday November 19, 2003 a.m.

Instructions

1. This paper consists of sections A, B and C.
2. Answer **ALL** questions in sections A and B, and **THREE (3)** questions from section C.
3. Electronic calculators are **not** allowed in the examination room.
4. Cellular phones are **not** allowed in the examination room.
5. Write your Examination Number on every page of your answer booklet(s).

This paper consists of 4 printed pages.

SECTION A (10 Marks)

Answer ALL questions in this section.

1. For each of the items (i) – (x) choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) As a number of cylinders on multicylinder engines increases, the power to weight ratio

- A remains the same
- B decreases
- C increases
- D becomes zero
- E has nothing to do with number of cylinders.

(ii) In a four wheel drive, the number of gear boxes is

- A 1
- B 2
- C 4
- D one gearbox with more gears
- E dependent on the design of vehicle.

(iii) For faultless operation of hydraulic braking system

- A brake fluid should be pure
- B boiling point of brake fluid should be high
- C viscosity of brake fluid should be high
- D there should be minimum amount of trapped air
- E viscosity of brake fluid should be low.

(iv) The breaking up of a liquid into fine droplets by spraying is a process known as

- A vaporization
- B carburation
- C atomisation
- D ionisation
- E injection.

(v) The speedometer is driven from the gearbox by a shaft called

- A primary
- B lay
- C counter
- D main
- E propeller.

(vi) Which of the following suspension springs also acts as a means for locating the axle?

- A Laminated
- B Helical
- C Torsion bar
- D Rubber
- E Chassis.

(vii) A collapsible steering column is one which collapses to

- A damp out road vibration
- B improve safety for the driver
- C simplify its removal for repair
- D provide adjustment for the steering wheel
- E reduce friction.

(viii) Front wheel alignment is adjusted by altering the

- A angle of the track arm
- B length of the track arm
- C distance between the king pins
- D position of the drag link
- E angle of the drag link.

(ix) The direction of flow of water through the radiator of a thermo-syphon cooling system is from the

- A top to the bottom
- B bottom to the top
- C front to the back
- D back to the front
- E left to the right.

(x) In an engine the probable cause of low oil pressure **cannot** be the

- A use of heavy engine oil
- B use of diluted engine oil
- C air leakage in oil pump suction line
- D excessive clearance at valve pushers
- E water, sludge, dirt etc, restricting oil pump intake screen.

SECTION B (30 Marks)

Answer **ALL** questions in this section.

2. What is compression ratio?
3. Explain three factors which control the engine temperature in thermo-syphon cooling system.
4. Why do air cooled engines have fins?
5. Give three causes of warning lights to remain on when the engine is running in a lubrication system.
6. What is the purpose of universal joint in transmission system?
7. With the help of a simple sketch, explain SLIP ANGLE in steering system.
8. (a) What is a mixture strength in a petrol fuel system?
(b) What does 15:1 mixture strength mean?
9. (a) How are tyre sizes designated?
(b) What does 165 R 14 radial ply tyres mean?

10. Between what members is the coil spring fixed for coil spring rear suspensions?
11. What is the aim of steering system linkages?

SECTION C (60 Marks)

Answer **THREE (3)** questions from this section.

- ✓ 12. (a) What is a backfire?
(b) Explain the three-purposes of air cleaners?
- ✓ 13. An engine cylinder has a bore of 70 mm, a swept volume of 300 cm^3 and a clearance volume of 37.5 cm^3 .
(a) What is the compression ratio?
(b) If the compression height (distance between gudgeon pin centre and crown) is increased by 1 mm, what is the new compression ratio?
- ✓ 14. Explain the chief difference in the purpose for which the foot brake and hand brake are used.
15. Explain FIVE causes of a car pulling to one side.
16. State four probable causes of the "gear jump out of mesh".