

**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, October 26, 2005 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).

CPB

This paper consists of 3 printed pages.

SECTION A (10 marks)

Answer **all** questions in this section.

1. (i) The part of the vehicle that holds the passengers and the cargo to be transported is known as
- A chassis B hull C aft D sedan
E cabin.
- (ii) An opposed-cylinder engine has
- A one crankshaft and one camshaft B one crankshaft and two camshafts
C two crankshafts and two camshafts D two crankshafts and four camshafts
E two crankshafts and one camshaft.
- (iii) The device for smoothing out the power impulse from the engine is called
- A clutch B differential C fly wheel D torque converter
E gear box.
- (iv) In S.I. engine if the spark plug deposit indicates black coating of soot, it indicates that the engine has been generally operating on
- A too lean mixture B stoichiometric mixture
C most economical mixture D slightly rich mixture E too rich mixture.
- (v) At the first sight a petrol engine is identified by
- A cylinder size B power output C operating speed
D spark plug E size of air cleaner.
- (vi) The function of diesel feed pump (whenever provided) is to
- A pump the fuel from the injector pump to the injector
B pump the fuel from the tank into the injector pump
C pump the oil into the main gallery
D send back the fuel to the injector into the tank
E pump the fuel to the injector.
- (vii) The device in the cooling system that increases the boiling point of the water in the system is called
- A radiator B drain plug C water jacket
D pressure cap E vacuum valve.
- (viii) In an engine the probable cause for low oil pressure **cannot** be
- A use of heavy engine oil B use of diluted engine oil
C air leaks in oil pump suction line D excessive clearances at valve pushers
E water, sludge, dirt etc restricting oil pump intake screen.
- (ix) In an automobile the probable cause for ineffective brakes could be
- A grease on lining B excessive lining wear
C drums scored D grease and excessive lining wear
E none of the above.

$\rho = 1.28$

(x) When fully charged, the specific gravity of acid in a battery is usually

- | | | | | | | | |
|---|------|---|------|---|------|---|------|
| A | 0.74 | B | 0.84 | C | 1.00 | D | 1.12 |
| E | 1.28 | | | | | | |

SECTION B (30 marks)

$\mu = \frac{f}{H}$

Answer all questions in this section.

2. State **two (2)** types of antifriction bearings used in automobile driving wheel.
3. List down **four (4)** causes of dragging brakes.
4. For a spark plug M14 x 1.25; what does the figure 1.25 stand for?
5. What is the purpose of a suspension damper?
6. Why is a compensation system incorporated in a modern fixed-choke carburettor?
7. State the purpose of double declutching when changing down a gear.
8. State the name given to crown wheel and pinion.
9. Give a reason why a laminated spring is made up a series of leaves.
10. What is the function of a "well" in a wheel rim?
11. How is the front wheel alignment adjusted?

$T = 80 \text{ Nm}$

$r = 0.2 \text{ m}$

$\mu = 0.4$

SECTION C (60 marks)

Answer **three (3)** questions in this section.

12. (a) A simple plate clutch transmits a torque of 80 Nm. Six springs supply the clamping force. What force must each spring exert if the mean radius of the friction plate is 200 mm? Take the coefficient of friction to be 0.4.
(b) Explain why brake efficiency tends to fall after a prolonged steep inclined descent.
13. Explain briefly each of the following terms in connection with batteries:
(a) Sulphation (b) Battery capacity (c) Gassing in a battery.
14. (a) State **three (3)** steering faults that may be due to a faulty suspension system.
(b) Laminated leaf springs are said to be "self damping". Justify this statement.
15. With the help of a simple sketch, explain the following:
(a) Camber angle (b) Caster angle (c) King pin inclination (k.p.i.)
16. List down the causes of large quantities of blue smoke emitted from the exhaust.

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