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 **Tuesday, 08th November 2016 p.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. Calculators and Cellular phones are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (10 Marks)

Answer **all** questions in this section.

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

(i) Which of the following are types of fire-extinguisher?
A Water, hydrogen, oxygen and nitrogen.
B Foam, nitrogen, oxygen and air.
C Dry-powder, air, hydrogen and nitrogen.
D Water, foam, dry-powder and CO_2.
E Carbon dioxide, air, water and hydrogen.

(ii) Which of the following are the main types of tool/equipment used in repair shops?
A Hand tools, working tools, heavy tools and machine tools.
B Special hand tools, light-duty tools, heavy-duty tools and electric tools.
C Hand tools, measuring tools, special hand tools and equipment or machines.
D Measuring tools, machines or equipment, light tools and heavy tools.
E Equipment or machines, air or electric tools, power tools and measuring tools.

(iii) The float of the carburetor is usually made of
A aluminium B copper sheet C cast iron D brass sheet E bronze.

(iv) The motion of cam is transferred to the valves through
A pistons B camshaft pulley C valve stem
D rocker arms E tappet.

(v) One difference between S.I and C.I engine is
A type of fuel used B number of cylinders C weight of engine
D speed of engine E type of valves used.

(vi) Leads from the distributor cap are much thicker than the other cables in the system because
A they carry high current
B they have high resistance
C they carry high voltage
D they need protection
E they carry low voltage

(vii) The purpose of the oil pressure relief valve is
A to permit oil to pass through the filter
B to limit oil to pass through the filter
C to reduce oil pressure
D to maintain oil within pre-determined limits
E to limit low pressure of the oil.

(viii) The device in the cooling system that increases the boiling point of the water in the system is called
A radiator B pressure cap C water jacket
D drain plug E vacuum valve.

(ix) When the engine coolant leaks into the engine oil, the engine oil
A becomes foamy B turns black C becomes greenish
D turns red E appears milky.

(x) Which of the following may be used as locking devices?
A Cotter pin, flat washer and bolt. B Lock washer, flat plate and nut.
C Lock nuts, cotter pin and lock washer. D Tongue washer, lock nuts and washers.
E Circlip, snap ring and palnuts.

SECTION B (30 Marks)

Answer **all** questions in this section.

2. (a) Give the names of the tools in Figure 1.
(b) Briefly explain the uses of the tools in Figure 1.

(i) (ii)

Figure 1

3. State the major operating difference between two stroke and four stroke engines.

4. Briefly explain the following engine components.
(a) Cylinder head gasket.
(b) Cylinder head bolt washer.

5. Briefly explain the following with regard to internal combustion engine.
(a) Valve timing.
(b) Valve overlap.

6. What are the three phases of combustion in the C.I. engine?

7. Mention three common methods of holding work during drilling operations.

8. (a) Give the names of the engine parts indicated in Figure 2.
   (b) Differentiate the engine parts indicated in Figure 2 (i) and (ii)

(i) (ii)

Figure 2

9. Name three type of engine oil pump.

10. What is the advantage of a cross-flow radiator which is using a separate header tank?

11. Enumerate six lathe accessories.

SECTION C (60 Marks)

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

12. Describe the five lubricating system service jobs. **(20 marks)**

13. (a) (i) Differentiate between puller and pulley according to their use in motor vehicles. **(08 marks)**

    (ii) Differentiate between chassis frame and integral body constructions of motor vehicles.

    (b) Give six advantages of rear engine rear wheel drive arrangement in vehicles. **(12 marks)**

14. (a) Describe the following components of the motor vehicle engine:
    (i) Cylinder block in light engines. (ii) Cylinder head. **(10 marks)**
    (b) (i) What is the purpose of engine piston?
    (ii) Enumerate four properties that manages engine piston to carry out its duty. **(10 marks)**

15. (a) Differentiate between Internal combustion engine and External combustion engine. **(04 marks)**

    (b) A 4 cylinder engine has a stroke length of 70 mm and bore diameter of 80 mm. Calculate its,
    (i) Capacity in litres. (ii) Swept volume in cc. **(11 marks)**

(c) If the compression ratio is 10:1, what will be its clearance volume in cc? Give your answer in 2 decimal places. **(05 marks)**

16. Figure 1 shows some components found in transmission system of a motor car. Study them and answer the questions that follows:

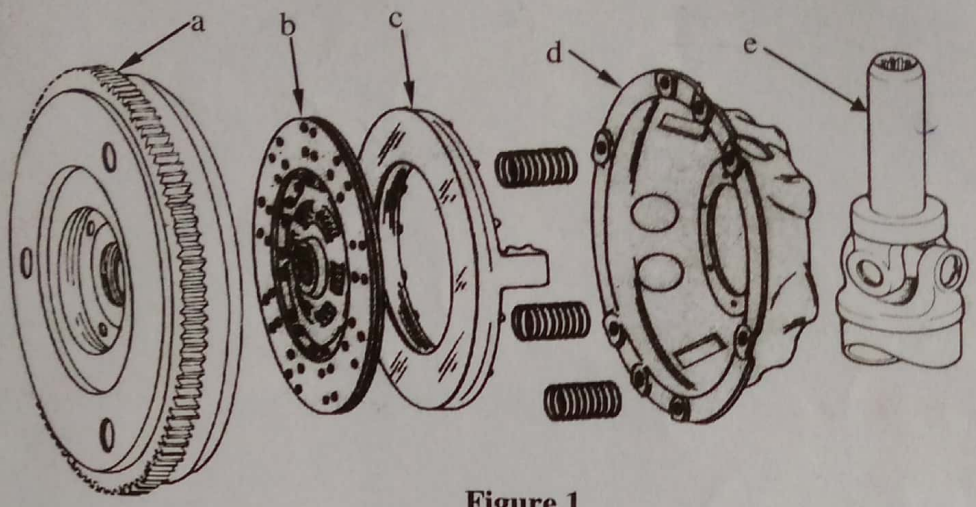

Figure 1

(a) Give the names of the engine components indicated by letters a, b, c, d and e. **(05 marks)**

(b) (i) Explain four functions which can be performed by the component 'a' in the engine.
(ii) Why are universal joints needed in automotive vehicle? Briefly explain. **(10 marks)**

(c) Differentiate between the engine components indicated by letters 'b' and 'c'. **(05 marks)**