



Tertiary and Vocational Education Commission
Knowledge Assessment – July 2022
Automobile Mechanic
National Vocational Qualification Level 04



Time: 1 1/2 Hours

Instructions for the Candidates

- Answer all Questions
 - In each of the questions from 1 to 50, pick the one of the alternatives (a), (b), (c), (d) which you consider is correct or most appropriate.
 - Mark a cross (x) on the number corresponding to your choice in the answer sheet provided.
 - This question paper consists of 08 pages
-

Part 1

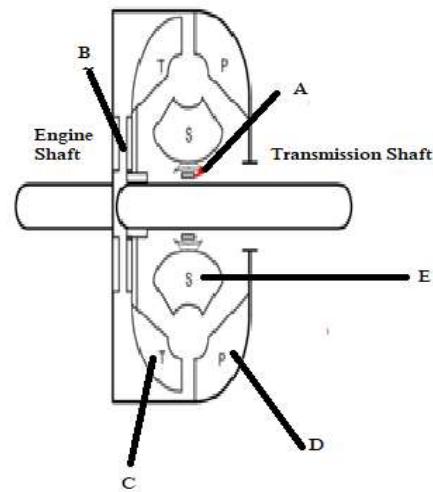
1. Noun “10” is mentioned on one edge of a ring spanner. It means that it can be used to loosen a bolt
 - a) With 10mm diameter of the stem.
 - b) With 10mm length.
 - c) With 10mm distance between two flat surfaces of the head.
 - d) With 10mm diameter of the head.
2. A says that it is needed to use a torque wrench to tight the screw bolts in a multi cylinder engine head. B says that it should tight those bolts in an order from the middle to two edges in number of steps. The correct one is,
 - a) Only A.
 - b) Only B.
 - c) Both A and B are correct.
 - d) Both A and B are wrong.
3. Before removing a radiator pressure cap, it is advisable to,
 - a) Check leaks from its valves.
 - b) Check the engine temperature.
 - c) Cover the cap with a piece of cloth.
 - d) All of the above
4. A bypass valve that is used in a full flow filtering system,
 - a) To control the pressure of the circuit.
 - b) To supply lubricant to the circuit when a filter is blocked.
 - c) To supply lubricant to operating parts and control the line pressure.
 - d) For the safety of the filter

5. The valve overlap in 4 stroke petrol engine is approximately,
- 30°.
 - 60°.
 - 90°.
 - 120°
6. The ignition in a spark ignition engine takes place when it's piston is,
- Exactly at the TDC position on its compression stroke.
 - Approaching to TDC compression.
 - Passing the TDC compression.
 - Reaching to TDC exhaust.
7. A rich mixture is needed to a petrol fuel system,
- When overtaking another vehicle.
 - When braking.
 - When driving on a normal road.
 - When driving down a hill.
8. The engine capacity of a four stroke 4 cylinder engine is 1600cc. The volume of one cylinder is;
- 400 cm³.
 - 600 cm³.
 - 1200 cm³.
 - 2400 cm³.
9. An engine has a clearance volume of 100 cm³ and a swept volume of 800 cm³. The compression ratio is,
- 7: 1
 - 8: 1
 - 9: 1
 - 10: 1
10. The self-ignition temperature of a diesel engine, when comparing with petrol engine is,
- Higher.
 - Lower.
 - Equal.
 - Depended on quantity of fuel.
11. The fuel pump in a programmed fuel injection (EFI) system is located,
- Between the fuel supply line and fuel tank.
 - In the fuel tank.
 - On the distributor mounting in the engine compartment.
 - On the engine compartment bulkhead.

12. A three way catalytic converter,
- Re-circulates exhaust gases.
 - Burns fuel vapor gases.
 - Reduces N_2 , H_2O and NO_2 .
 - Removes CO , HC and NO_2 from the exhaust gases passing through it.
13. The firing order of a six cylinder four stroke engine is,
- 1-5-3-6-2-4
 - 1-4-2-5-6-3
 - 1-3-6-5-2-4
 - 1-6-2-5-4-3
14. The fire timing and advancing of a diesel engine is done by,
- Throttle port.
 - Governor.
 - Feed pump.
 - Injector pump.
15. The importance of the fuel filter with water sediment in a diesel fuel system is,
- To avoid the flow of unclean fuel into high pressure system.
 - To filter the fuel properly.
 - To avoid flow of water that is mixed with fuel.
 - To filter air dust that is mixed with fuel.
16. In a diesel fuel system, after injecting the fuel, there is a leak of fuel drop by drop. It is called as,
- A tip leak.
 - A back leak.
 - A failure of the injector pump.
 - A failure of its delivery valve.
17. The endplay of crank shaft can be adjusted by,
- Fly Wheel.
 - Damper
 - Collar Bearing.
 - Shell Bearing.
18. Clutch is not disengaged, when pressing down the clutch paddle, The reason could be,
- Due to worn out clutch plate
 - Due to increased free play
 - Due to oily clutch plate
 - Due to worn out pressure plate

19. The name of the parts marked in the diagram A – E are,

- a) Turbine / Stator / Impeller /One way Clutch/ Lock up clutch.
- b) Stator / Impeller/Turbine/Lock up clutch/ One way clutch.
- c) One way clutch/ Lock up clutch/ Turbine/ Impeller/ Stator
- d) Lock up clutch/ Stator/Turbine/Impeller/ One way clutch



20. A 1:1 gear ratio is given on a 4 forward gear box by

- a) First Gear.
- b) Second Gear.
- c) Third Gear.
- d) Fourth Gear.

21. In order to implement gear changes in the gear unit of an automatic transmission..... is used.

- a) Synchronizer.
- b) Planetary gear
- c) Magnetic clutch.
- d) Hydraulic multi plate clutch.

22. The sun gear in the planetary gear system meshes with the,

- a) Pinion.
- b) Pinion cage.
- c) Ring gear.
- d) Clutch gear.

23. By the action of the Kick down Switch, an automatic gear box,

- a) Issues data to ECU, which need to speed up the engine.
- b) Changes the present gear ratio into a lower ratio.
- c) Changes the present gear ratio into a higher ratio.
- d) Issues data to ECU, which need to go down the engine speed.

24. In a vehicle with Hotchkiss type propeller shaft, compensate the difference of length between gear box and the final drive,

- a) By suspension Springs
- b) By center Bearing
- c) By universal Joints
- d) By sliding Joints

25. If there is 7 teeth in a pinion of a final drive, the no. of teeth of the crown wheel could be,
- 28
 - 35
 - 38
 - 42
26. Mostly heavy vehicles are with,
- Quarter Floating axles.
 - Semi Floating axles.
 - Three Quarter Floating axles.
 - Full Floating axles.
27. A front stabilizer bar is used,
- To increase vehicle load carrying capacity.
 - To provide soft ride.
 - To minimize uneven tyre wear.
 - To control suspension movement and body roll.
28. Which of the following is the basic characteristics of the brake fluid,
- A high boiling point.
 - Low viscosity.
 - Compatibility with rubber and metal parts.
 - All of those.
29. Duplex shoe brake system is most suitable for,
- Front wheels.
 - Rear wheels.
 - All four wheels.
 - No any specialty.
30. The function of Anti-lock braking system (ABS) is that,
- Reduces the stopping distance.
 - Reduce brake slipping.
 - Maintains directional control during braking by preventing the wheels from locking.
 - Prevents nose dives during braking and thereby postpones locking of the wheels.
31. In a rear wheel drive vehicle with Hotchkiss type propeller, the vehicle is driven forward by,
- Rear axle housing.
 - Rear leave spring set.
 - Shock absorbers.
 - Engine mounts.

32. The unit that is not in a front wheel drive vehicle is
- Propeller Shaft.
 - Differential.
 - Clutch.
 - Fly Wheel.
33. Two types of Independent Suspensions are,
- Coil Spring and Leaf Spring.
 - Leaf Spring and Torsion Bar.
 - Air Spring and Leaf Spring.
 - Coil Spring and Torsion Bar.
34. The strut rod nut of a Macpherson strut suspension system, should be removed,
- After compressing the Coil spring.
 - Before compressing the Coil spring.
 - Before stripping the Macpherson Strut from the vehicle.
 - After stripping the Macpherson Strut from the vehicle.
35. In a weak operation of shock absorber in a suspension system,
- Gives a lean condition between the vehicle body and chassis connection.
 - Gives less spring bumping.
 - Gives more spring bumping.
 - Caused driving failures.
36. The problems that are caused by the wheel imbalance are,
- Hard steering and hard ride.
 - Poor acceleration and hard steering.
 - Steering wheel vibrations and uneven tire wear.
 - Poor acceleration and reduced fuel efficiency.
37. The correct way to rectify an imbalanced wheel is by,
- Adjusting the tire pressure.
 - Rotating tires.
 - Changing the rim.
 - Attaching appropriate weights to the wheel at appropriate positions.
38. The ground clearance of a vehicle can be adjusted by,
- Stabilizer bar.
 - Ball joints.
 - Torsion bars.
 - Shock absorbers.

39. Which of the following steering gear boxes, which is **not** suit for heavy vehicles,
- Worm and Peg.
 - Worm and Nut.
 - Rack and Pinion.
 - Re-circulating Ball type.
40. By increasing the no. of turns of the steering wheel in a steering system it will,
- Easy to drive the vehicle.
 - Easy for the arms of the driver during turning the vehicle.
 - Hard to drive the vehicle.
 - Hard for the arms of the driver during turning the vehicle.
41. When turning a vehicle at a bend according to Ackermann principal, the front wheels,
- Turn with equal angles.
 - Turning of inner wheel is higher than the outer.
 - Turning of outer wheel is higher than the inner.
 - Turning of inner wheel is twice than the outer.
42. The caster is called positive, when the top of the king pin is inclined to the;
- Front of the vehicle.
 - Rear of the vehicle.
 - Left of the vehicle.
 - Right of the vehicle.
43. What is the most important alignment angle signaled by tire wearing?
- Camber angle.
 - Caster angle.
 - Toe angle
 - Included angle.
44. High capacity is needed for a motor vehicle battery for the;
- Starting circuit.
 - Head light circuit.
 - Air conditioning circuit.
 - Wiper circuit.
45. The capacity of a motor vehicle battery is mentioned in,
- Volt.
 - Ampere
 - Weight.
 - Ampere hours.

46. The specific gravity of well charged Lead/Acid battery is approximately,
- 1.15.
 - 1.28.
 - 1.35.
 - 1.50.
47. If the liquid level is low in a battery, it is needed to be added,
- Sulfuric acid.
 - Sulfuric acid diluted with water.
 - Distilled water.
 - Pure water.
48. If the camber angle is out of the required range,
- Wears inner edge of tire.
 - Wears middle of tire.
 - Scattered wearing can be seen on tire.
 - Wears inner or outer edges of tire.
49. A rear-wheel-drive vehicle equipped with front coil springs and rear leaf springs. It is sagging down at the right rear and the left front is higher than the right front. Which is the most immediate reason?
- A broken leaf spring on the right rear
 - A broken left front shock absorber
 - A broken stabilizer bar link in the left front
 - A broken rear track rod
50. . The primary purpose of a Fuse in a electrical circuit of a vehicle is,
- To allow the current to flow into the circuit.
 - To protect the circuit against excessive current flow.
 - To ensure the current is maintained at the correct amperage.
 - To protect the voltage of the circuit.

(01 x 50 = 50 marks)



Tertiary and Vocational Education Commission
Knowledge Assessment – July 2022
Automobile Mechanic
National Vocational Qualification Level 04



Time: 1 1/2 Hours

Instructions for the Candidates

- Answer four (04) questions including question number one (01) (Question number one (01) is compulsory and total number of questions should be answered is four (04)).
- Answer the questions in the spaces provided in the same question paper
- This question paper consists of 07 pages.

Part 2

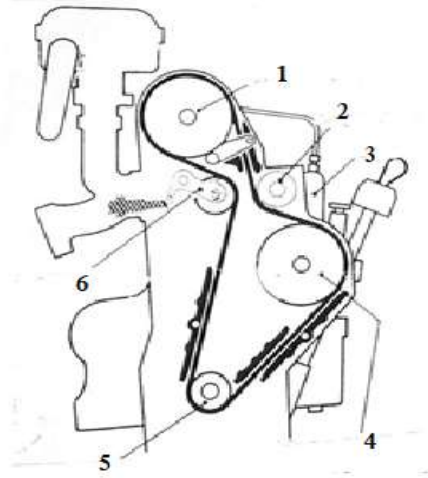
1.
 - i). Name four (04) standard written documents belongs to a vehicle.
 - ii). Write down three (03) types of accidents that could be happened in an automobile repair workshop.
 - iii). Mention four (04) important characteristics of a technician, when he or she is working in a repair workshop.
 - iv). Name two (02) types of lubricant systems available in an engine.

- v). What is the purpose of heater plugs used in diesel engines?
- vi). Name two types of (02) diesel injectors.
- vii). Mention two (02) types of Propeller shafts used in Rear wheel drive vehicles and Write down the methods of drive forward from the above propeller shaft.
- viii). When repairing a final drive, what is the gap considered to be the pinion depth?
- ix). Write down two (02) functions of the inverter that is used in Hybrid and Electrical vehicles.
- x). Write down two (02) functions each for the two (02) cooling systems found in Hybrid vehicles.

(02 x 10 = 20 marks)

2.

- i). Name the parts from 1 – 6 of the given diagram.



1	
2	
3	
4	
5	
6	

- ii). Name two (02) cylinder liners that are used in engines and mention the difference between the above liners.

(02 marks)

- iii). Write down three (03) measurements that are needed to be taken in assembling engine crank shaft.

(03 marks)

- iv). What are the harmful gases that are emitted by a diesel engine during combustion?

(01 marks)

- v). What are the factors required to be considered when changing the cylinder head gasket?

(01 marks)

3.

i). Name three (03) types of main Hybrid systems of vehicles. (03 marks)

ii). Name four (04) parts of Common Rail Injection System used in a modern diesel vehicle. (02 marks)

iii). Name four (04) types of sensors that are used in EFI engine supply systems that provide signals to accurate engine timing of vehicles. (02 marks)

iv). What are the three (03) main components of an ABS system? (03 marks)

4.

- i). A four cylinder four stroke engine rotates with 2800 RPM. What is the total engine capacity in cm^3 . Consider the diameter of one cylinder is 70mm and the stroke is 80mm? (03 marks)

- ii). What is the compression ratio of a four cylinder four stroke engine, if the volume of the combustion chamber is 40cm^3 and engine capacity is 1280cm^3 ? (03 marks)

- iii). Write down four (04) electronic circuit sensors that are used in modern vehicles to provide data for engine timing. (02 marks)

- iv). Identify the functions of the following systems that are used to operate the Constant Venturi Carburetor and match them appropriately using arrows. (02 marks)

Idle Circuit
Choke Circuit
Main Circuit
Acceleration Pump
Floater System

Normal speed
Getting quick speed
Cold start
Idle speed
Fuel delivery

5.

i). What is the angle in degrees between the two strokes of six cylinder four stroke engine? (01 mark)

ii). Write down two (02) firing orders used in inline four stroke six cylinder engine. (02 marks)

iii). Complete below mentioned table using firing order. (05 marks)

Ignition order									
1 st Cylinder									
2 nd Cylinder									
3 rd Cylinder									
4 th Cylinder									
5 th Cylinder									
6 th Cylinder									
Crank Shaft	0°	60°	120°	180°	240°	300°	360°	420°	480°
	540°	600°	660°	720°					

iv). Write down two (02) advantages of an engine with six cylinders? (02 marks)

6.

i). Name two (02) suspension systems that are used in motor cars.

(02 marks)

ii). What is meant by under slung and over slung of a suspension system? What are the types of springs used for it?

(04 marks)

iii). Name two (02) types of bearing used in wheel hubs.

(01 marks)

iv). Briefly describe about the function of the re-generative breaking system.

(03 marks)