NATIONAL BUSINESS AND TECHNICAL EXAMINATIONS BOARD (GENERAL EDUCATION EXAMINATION)

MOTOR VEHICLE MECHANICS

QUESTIONS: 1

(a) Briefly explain the recommended procedure of oil change in motor vehicle.
(b) List any THREE methods of maintaining a motor vehicle battery.
(c) In vehicle maintenance, name any FOUR specific parts to be checked.

ANSWERS:

1(a) RECOMMENDED PROCEDURE OF OIL CHANGE IN MOTOR VEHICLE.

(i) Park the motor vehicle on a flat surface.
(ii) Allow the engine to cool down.
(iii) Place a big bowl under the engine sump.
(iv) Unscrew the nut on the sump.
(v) Allow the oil to drain unto the big bowl.
(vi) Tighten the nut properly on the sump after the oil has completely drained.
(vii) Clean the floor after draining.
(viii) Pour the recommended new oil into the engine.

(b) METHODS OF MAINTAINING A MOTOR VEHICLE BATTERY

(i) Checking of the electrolyte condition using hydrometer.
(ii) Check regularly the specific gravity of each cell.
(iii) Check that the battery is firmly fixed in the location.
(iv) Check the vent plugs for tightness.
(v) Check the earth connection for rust and corrosion.

(c) SPECIFIC PARTS TO BE CHECKED.

(i) Ignition system.
(ii) Cooling system.
(iii) Braking system.
(iv) Lubrication system.
(i) Road wheels.

QUESTIONS: 2

(a) State FOUR reasons for the use of gearbox
(b) Write short notes on :

(i) Universal joints
(ii) Constant velocity joint
(iii) Over drive.

ANSWERS:

2(a) USES OF GEAR BOX

(i) It enables the vehicle to overcome its inertial.
(ii) It allows permanent neutral position of the vehicle.
(iii) It varies the speed of the vehicle.
(iv) It enables the vehicle to climb hills.

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(v) It allows the vehicle to be driven in opposite direction.

(b) UNIVERSAL JOINTS:- (i) This is the joints on the propeller shaft that allow for the flexibility of the propeller shaft. It allows for the rear axle assembly to twist due to the drive and brake forque reaction.

(ii) CONSTANT VELOCITY JOINTS:-These are special couplings that transmit constant speeds of the sharpest angles. They are often used when the engine is located close to the driving wheels, and a sloot shaft connecting the drive is inclined at a steep angle.

(iv) OVER DRIVE:- This is used so that the proper ilea shaft can rotate faster than the engine. It is usually used when conising. It permits the propeller shaft to rotate faster in top gear than the primary shaft.

QUESTIONS: 3

(a) State : (i) The differences between a disc brake and drum brake

(ii) Two advantages of the disc brake over the drum brake.

3(a) A disc brake is a type of brake that use brake pad for it's operation while a druw braKe uses brake shoe for it's operation.

(II) ADVANTAGES OF DISC BRAKE

(i) The disc brake has no risk of brake fade.

(ii) The disc brake is more effective than the down brake.

(iii) There is good heat dissipation in disc brake than in down brake.

(iv)The pad of the disc brake can be easily changed than the shoe of the down brake.

(I) LEADING SHOE

(II) TRAILING SHOE

(III) ADJUSTER

(IV) WHEEL CYLINDER

QUESTIONS: 4

(a) State the materials from which the following vehicle parts are manufactured

(i) Clutch lining.

(ii) Hoses for petrol

(iii) Brake pad

(iv) Distributor housing

(b) State ONE reason for each of the materials chosen

ANSWERS:

(a)	COMPONENTS		MATERIALS
(i)	Clutch lining	-	Asbestos, synthetic rubber
(ii)	Hoses for petrol	-	Flexible rubber
(iii)	Brake pad	-	Asbestos, synthetic resin
(iv)	Distributor housing	-	Plastics

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(b)(i) Asbestos is used for frictional efficiency.

(ii) Flexible rubber is used for easy flow for flexibility.

(iii) Asbestos is used for frictional effectiveness.

(iv)Asbestos is used to prevent shock and loss of current.

QUESTIONS: 5

(a) List FOUR different types of steering gearboxes

(b) State the type of adjustment on each.

ANSWERS:

5(a) TYPES OF STEERING GEAR BOXES

(i) Cam and peg.

(ii) Cam and roller

(iii) Recirculating ball

(iv) Rack and pinion

(b) Adjustments on steering gear boxes.

(i) Cam and peg – Backlash

(ii) Recirculation ball – Adjusting screw.

(III) Rack and pinion – spring loaded.

(iv)Cam and roller – Backlash

QUESTION: 6

State FOUR operational differences between the compression ignition and spark ignition.

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ANSWER:

6. OPERATIONAL DIFFERENCES BETWEEN COMPRESSION IGNITION AND SPARK IGNITION ENGINE.

S/NO	COMPRESSION IGNITION	SPARK IGNITION
i	Air only is drawn in during induction stroke.	Air and fuel are drawn in during induction stroke.
ii	Uses injection nozzles to spray atomized fuel for combustion	Uses spark plug to ignite fire for combustion.
iii	Fuel used is diesel	Fuel used is petrol.
Iv	Bigger and hollowed crown piston.	Smaller and flat crown piston.
V	Additional compression rings	No additional rings.

QUESTION: 7

Define the following terms:

(i) Decarbonization
(ii) Overhauling
(iii) Dilution
(iv) Thermo siphon cooling system

ANSWER:

7(I) DECARBONIZATION:- This is the process of removing the accumulated carbon deposit on the valves on the engine cylinder head. It entails removal and grinding of the valve stem. It is carried out to improve the efficiency of the engine and reduce high fuel consumption.

(ii) OVERHAULING:- This is the total dismantling of engine componenent parts to put the engine back to proper working condition.

(iii) THERMO SYPHON COOLING SYSTEM:- This is the type of water cooling system that relies on the force of gravity for cooling of engine.

(IV)DILUTION:-This is the process of mixing together of fuel for proper cetonization before delivering into the engine combustion chamber.

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