**STEP WISE MARKING SCHEME**

**CLASS 10TH**

**AUTOMOTIVE**

| Q.NO | ANSWERS | MARKS |
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| 1 | Measuring Tools Measuring tools are important tools in automobile workshop. It helps mechanic to measure the sizes and dimensions of various components of automobile. Measuring tools are commonly used. Auto mechanic should know the use and handling of these tools. Important measuring tools are steel rule, caliper, multi meter, screw gauge, multi meter, hydrometer etc.<br>**Steel ruler** A steel ruler is an instrument used in geometry, technical drawing, printing and engineering/building to measure distances and/or to rule straight lines. Metal is used for more durable rulers for use in the workshop.<br>**Caliper** A caliper is a device used to measure the distance between two opposing sides of an object. The tips of the caliper are adjusted to fit across the points to be measured, the caliper is then removed and the distance read by measuring between the tips with a measuring tool, such as a ruler. It is used in many fields such as mechanical engineering, metalworking, woodworking, science and medicine.<br>OR<br>**Multi meter**- A multi meter or a multi tester, also known as a VOM (Volt-Ohm meter), is an electronic measuring instrument that combines several measurement functions in one unit. A typical multi meter may include features such as the ability to measure voltage, current and resistance. A multi meter can be a hand-held device useful for basic fault finding and field service work or a bench instrument which can measure to a very high degree of accuracy. They can be used to troubleshoot electrical problems in a wide array of industrial and household devices such as electronic equipment, motor controls, domestic appliances, power supplies, and wiring systems.<br>**Tachometer**- A tachometer is an instrument that measures the working speed of an engine. It is mostly used to measure engine speeds of road vehicles in revolutions per minute. The word comes from two Greek words; tachos, "speed" and metron, "to measure". The engine speed is displayed on the tachometer on a calibrated analogue dial.<br>**Hydrometer**- A hydrometer is an instrument used to measure the specific gravity (or relative density) of liquids; that is, the ratio of the density of the liquid to the density of water. A hydrometer is usually made of glass and consists of a cylindrical stem and a bulb weighted with mercury or lead shot to make it float upright. The liquid to be tested is poured into a tall container, often a graduated cylinder | 5 |
| 2 | 1. Cycle of Operation | 5 |

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| | • Otto Cycle Engine • Diesel Cycle Engine<br>2. No. of Strokes Per Cycle • Two Stroke Engine • Four Stroke Engine<br>3. Fuel Used • Petrol Engine (or Gasoline Engine) • Diesel Engine • Gas Engine<br>4. Types of Ignition • Spark Ignition (SI) Engine • Compression Ignition (CI) Engine<br>5. No. of Cylinders • Single-cylinder Engine • Two-cylinder Engine • Three-cylinder Engine • Four-cylinder Engine • Six-cylinder Engine • Eight-cylinder Engine • Twelve-cylinder Engine • Sixteen-cylinder Engine<br>6. Arrangement of Cylinders • Inline Vertical Engine • Horizontal Engine • V-type Engine • Opposed cylinder Engine • Radial Engine<br>7. Valve Arrangement Engine • L-head Engine • I-head Engine • F-head Engine • T-head Engine<br>OR<br>• Top Dead Centre (T.D.C): This refers to the position of the crankshaft when the piston is in its topmost position i.e. the position closest to the cylinder head.<br>• Bottom Dead Centre (B.D.C): This refers to the position of the crankshaft when the piston is in its lowest position i.e. the position farthest from the cylinder head.<br>• Bore: Diameter of the engine cylinder is referred to as the bore.<br>• Stroke: Distance travelled by the piston in moving from T.D.C. to the B.D.C is called 'stroke'.<br>• Horse Power (H.P.): This is the amount of energy required to do 4500kgm. of work in one minute. | |
| **3** | 1. Body shell – The body structural assemblies are joined into an integral shell by electric spot welding.<br>2. Floor Assemble – Generally, the floor of the body is assembled first and after that the pillars, rails and panels are welded in order to form the complete body.<br>3. Doors – Each door is provided with a check arm consisting of an articulated plate secured on a pillar and sliding into a slot in door. A rubber pad on check arm tip prevents the arm from sliding out of its slot, thus checking opening of the door. Door windows are held by fasteners.<br>4. Windshield and Back window – To improve visibility the windshield and back window are curved. They are also provided with weather strips and bright metal reveals.<br>5. Body inner trimming – The car body is lined with special paints, sound reducing and water proofing compounds as well as stuffing and covering materials. It is done for following two main purposes. • To reduce mechanical components vibrations • To improve car appearance and comfort.<br>6. Seats – The bench type front seat consists of a metal framing on which the stuffed, cloth and imitation leather upholstered seat back is fixed. A lever projecting laterally to the cushion disengages the slide catch for seat position adjustment. The cushion is just press fitted in the | **5** |

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| | framing. The rear seat is in two separate parts. • The back, fitted between the rear wheel boxes and resting against the luggage compartment partition. • The cushion, resting directly on floor and positioned by two rubber studs.<br>7. Hood – The hood is made in a single piece, hinged at the rear to cover the engine compartment. Around the edges of the engine compartment on which the hood rests<br>OR<br>Classification of Chassis According to the fitting of engine the classification of Chassis is as follows:<br>1. Full forward<br>2. Semi-forward.<br>3. Bus chassis.<br>4. Engine in front.<br>5. Engine at centre.<br>**Full forward**- chassis is one in which the engine is fitted outside the driver cabin or seat like in cars and old Tata-trucks. In this type of arrangement, the driver seat is far from the front wheels and he is not able to see just in front of the vehicle.<br>**Semi-forward chassis**- half portion of the engine is in the driver's cabin and the remaining half is outside the cabin like in standard, Bedford pick. It provides better visibility of road to the driver.<br>**bus chassis-**the whole engine is fitted in the driver cabin. It provides an increased floor space in the vehicle. The driver seat is just above the front wheel and he can see the full front road right from the front wheels. In most of the vehicles, the<br>**ENGINE IN FRONT**- engine is fitted in front portion of the chassis. The drive is given to the front wheels only in matador vehicles. The engine may also be fitted at the back portion of the chassis, like in Tata and Ashok Leyland buses. This arrangement does not require long propeller shaft. Gearbox and differential are combined in one unit.<br>**ENGINE IN CENTER**-The engine may also be fitted at the centre of the chassis. This arrangement provides full space of chassis floor for use.<br>According to the number of wheels fitted in the vehicles and the number of driving wheels, the vehicle chassis's are of the following types: | |
| **4** | Self-employed people are those who start businesses to satisfy the needs of people. A selfemployed person who is always trying to make his/her business better by taking risks and trying new ideas is an entrepreneur. Example: Ramya and Ramu both own plant shops. Ramu sits at his shop every day. | 3 |
| **5** | 1. On the basis of their state<br>2. On the basis of their origin<br>3. On the Basis of Variation in Viscosity<br>4. On the basis of special preparation<br>OR<br>• Sells/leases and delivers a minimum number of vehicle per month (target given by shop owner). | 3 |

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| | • Approaches, greets and offers assistance or direction to any customer who enters the dealership.<br>• Assists customers in selecting a vehicle by asking questions and listening carefully to their responses. | |
| **6** | 1. Purchase the coolant as per manufactures specifications<br>2. Prepare the vehicle: Keep your car in plain space and keep engine off for few hour so that engine is cool.<br>3. Keep a pan below radiator<br>4. Open the radiator cap and see level of coolant<br>5. Open the drain plug nut below radiator chamber by using wrench or by hand if possible | 3 |
| **7** | Unscrew the oil cap<br>Locate the oil drain plug<br>Place the container<br>Drain out the old oil<br>Locate the oil filter | **3** |
| **8** | Axle is a central shaft for a rotating wheel or gear. Axles are an integral component of a wheeled vehicle. | 3 |
| **9** | • The brakes should stop the vehicle in shortest possible distance and time.<br>• The brakes should work equally well on fair or bad roads.<br>• Pedal effort applied by the driver should not be more so as not to strain the driver.<br>• Brakes should work equally well in all weathers.<br>• It should have very few wearing parts.<br>OR<br>Pressure System: In the pressure system, a hermitically sealed fuel tank is used. Pressure is created in the tank by means of engine exhaust or a separate air pump. For starting, the pump is primed by hand. It is under the pressure thus produced, that, the fuel flows to the float chamber of the carburetor. There are chances of pressure leak, but, the advantage lies in the fact the fuel tank can be placed at any suitable location. | 3 |
| **10** | **Raditor**<br>**Hose Pipe**<br>**Fan**<br>**Water pump** | 2 |
| **11** | ICT stands for Information and Communication Technology. ICT refers to all the methods, tools, concepts related to storing, recording and sending digital information. | 2 |
| **12** | Non-verbal communication is the expression or exchange of information or messages without using any spoken or written word.<br>OR<br>The innovation: They help maintain control while stopping, as well as throw the door open to stability control and roll mitigation technologies | **2** |
| **13** | Anticipate Guest Needs – Nothing surprises your customer more than an employee going the extra mile to help them. Always look for ways to | 2 |

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| | serve your customer in more ways than they expect. | |
| **14** | The hammers are general purpose workshop hand tools used for straightening of sections, riveting, striking of nails, inserting the components by striking, inserting keyways and fitting by striking. | 2 |
| **15** | A mallet is a kind of hammer, usually of rubber or wood smaller. Mallets are used when a softer blow is called for than that delivered by a metal hammer<br>OR<br>• It should multiply the turning effort applied on the steering wheel by the driver.<br>• It should be to a certain degree irreversible so that the shocks of the road surface encountered by the wheels are not transmitted to the driver's hands | 2 |
| **16** | **B- Pour point** | **1** |
| **17** | **C – Dipsticks** | **1** |
| **18** | **A - Radiator** | **1** |
| **19** | **A – tappet Wrench** | **1** |
| **20** | **C – 22000** | **1** |
| **21** | **A- Highest Position** | **1** |
| **22** | **2** | **1** |
| **23** | **2** | **1** |
| **24** | **Function** | **1** |
| **25** | **Cntr+S** | **1** |
| **26** | **Visual Communication** | **1** |
| **27** | **Visual Communication** | **1** |
| **28** | **True** | **1** |
| **29** | **False** | **1** |
| **30** | **True** | **1** |