

**DETAILED SYLLABUS FOR THE POST OF DRIVER CUM MECHANIC IN  
TECHNICAL EDUCATION - DIRECT RECRUITMENT**

**(Cat.No: 008/2023)**

**PART - I**

**MODULE-1**

**(8 marks)**

**Safety precautions**, safety rules in automobile workshop, **General tools used in automobile workshop**- Spanners,sockets ,Screw drivers,pliers ,hammers punches files,chisels, **Special Tools** - Piston ring compressor, Piston ring remover Piston ring groove cleaner,Piston ring file Valve spring compressor ,bearing puller,magneto puller .**Measuring tools** various measuring tools used in automobile workshop -Micrometers,vernier caliper,dial gauge,bore gauge,multi meter,pressure gauge, vacuum gauge,compression gauge,tachometer,feeler gauge **equipment s** used in automobile workshop Vehicle hoisting equipment,jacks,safety stands,drilling machine ,air compressor,pneumatic tools,Tyre changer,Car washer,etc,

**MODULE -2**

**( 14 marks)**

Brief description of engines, **classifications of engines, basic engine terminology, detailed classification of IC engines**,construction and working of two stroke and four stroke petrol engine , diesel engine ,comparison between 2stroke and four stroke engines, comparison between diesel engine and petrol engines ,**construction and working of components of IC engines (petrol and diesel engines) in detail**- Cylinder block and crank case,cylinder liners Cylinder head, Sump or oil pan Manifolds-inlet and exhaust ,Gaskets , Cylinder liners, Piston,types of pistons ,piston rings, piston pin, Connecting rod Crankshaft, camshaft, engine bearings , Flywheel, Valves and valve actuating mechanisms, valve timing diagram,**IC engine servicing, causes of various engine troubles and its remedies**

**MODULE -3**

**( 8 marks)**

Purpose of lubrication system, **the properties of lubricants**, **types of lubrication system**, Mist type, Splash type, Dry sump, Pressurized lubrication. **classification of oil pumps, constructional details and working** of Gear pump, rotor pump, vane pump, plunger pump, crescent pump, oil pressure gauges, **trouble shooting of lubrication system** The necessity of cooling system, types of cooling systems Air Cooling, Water cooling, thermo syphon cooling system, Pump circulation system, advantages of pump circulation system, Components of pump circulation system- radiator, water pump, cooling fan, thermostat valve, Pressure cap & Expansion reservoir thermo switch, functions of Anti freeze solution, List various Anti freeze solution Engine temperature warning gauge, **trouble shooting of** cooling system

## **MODULE -4**

**( 10 marks)**

Desirable properties of fuels, classifications of fuels, fuel supply systems- gravity system, pump system components of petrol engine fuel supply system fuel tank, fuel pump- mechanical fuel pump- electrical fuel pump, fuel filter- air cleaner- wet type air cleaner- dry type air cleaner- carburettor- air fuel mixture ratio- simple carburettor- carburettor circuits float chamber- idle and off idle circuits- main circuit- accelerator pump- choke- types of carburettor- SU carburettor- Solex carburettor- trouble shooting of petrol fuel system-.MPFI system- advantage of MPFI.

Diesel engine combustion chambers- method of injection- components of diesel fuel injection system fuel tank- fuel filter - fuel feed pump- plunger type fuel feed pump- fuel injection pump- jerk type fuel injection pump - fuel injector- injector nozzles -governor- common rail direct injection, trouble shooting of diesel fuel

## **MODULE -5**

**( 8marks)**

Battery- role of battery in an automobile, lead acid battery, constructional details of lead acid battery. Chemical action during charging and discharging, Cell voltage, Battery capacity, battery rating, battery testings methods, Specific gravity test Open volt test, care and maintenance of lead acid battery. Lithium ion battery Constructional details of of lithium ion battery

Need of ignition system , Types of ignition system ,Components of Battery coil ignition system in detail - ignition coil,distributor,ballast resistor, condenser spark plug ,Magneto ignition system , Capacitor discharge ignition system ,Electronic ignition system .Ignition timing ,necessity of ignition timing , necessity of ignition advance mechanism system , the classification of ignition advance mechanism-centrifugal advance and vacuum advance mechanism

## **MODULE -6**

**( 6marks)**

The necessity of starting system, components of starting system, starting system circuit , working of starter motor, components of starter motor

Starter motor drive mechanism , various drive mechanism Bendix drive Explain the working of Bendix drive, Solenoid switch , necessity of solenoid switch, Electronic starter control

necessity of charging system, components of charging system,working and Constructional details of Dynamo and alternator, the function of rectifier in alternator ,Regulator , electronic regulator used in alternator

## **MODULE -7**

**( 6marks)**

Classification of Wires based on gauges and its application, various types of wires used for automobile wiring , Common Colour code of Wires, importance of colour coding of wires, List the colour codes of wires used in various circuits

various lighting system, head lamp circuit , Reverse light circuit , Park , tail , Instrument panel lights circuit Stop light circuit.State the function of Electric horn,horn relay Wind shield wiper motor Key less entry system the functions of each components Power lock system, Power window system

Electric vehicle - classification of electric vehicles, advantages of electric vehicles . battery electric vehicle, Plug in hybrid electric vehicle ,Hybrid vehicle

Vehicle Air Conditioning System -functions of various components of Vehicle Air Conditioning System , AC compressor ,Clutch, refrigerant , function of AC pressure Switch

## **MODULE -8**

**(10 marks)**

Function of clutch - types of clutch- principle of friction clutch- single plate clutch- components of clutch- multi plate clutch- clutch release mechanism - clutch adjustments clutch trouble shooting

Function of gear box- classification of gear wheel, gear ratio, types of gear box- construction and working of sliding mesh gear box, constant mesh gear box, and synchromesh gear box. Progressive (2 wheeler) gear box.

advantage of constant mesh gear box , double de clutching merits and demerits of synchromesh gear box- synchromesh device - selector mechanism-working of automatic gear box, Continuously variable transmission(CVT) gear box trouble shooting.

need of propeller shaft and chain drive, Propeller shaft - universal joint- slip joint , classification of joints, Final drive- differential- differential trouble shooting- rear axle- functions of rear axle- type of rear axles - semi floating rear axle- three quarter floating rear axle- fully floating rear axle, wheel hub, components of wheel hub, common troubles of propeller shaft, differential, axles and its remedies

## **MODULE -9**

**(10 marks)**

Functions of a Suspension system. Types of Suspension systems. Conventional suspension system components construction of leaf spring , helper spring , shackle. Details of various types of Independent suspension system , Comparison between Rigid and Independent suspension system , Constructional details of Telescopic shock absorber. Common troubles of suspension system and its remedies

Functions of a Steering system , Components of typical steering system , Types of steering , Rack and Pinion steering system., Worm and wheel type. Recirculating ball nut steering gear box, Worm and sector, Worm and roller

Classifications of Front Axle, Types of Dead Front axles , Live front axle , Explain steering geometry -Camber, King pin inclination, Caster , Toe-in and toe-out . steering linkage for conventional rigid axle suspension Steering linkage for independent front axle common troubles of steering system and

its remedies. **Purpose of a brake system**, Types of a brake system (According to application and operation .Hydraulic brake system.disc and drum brakes Components of Hydraulic brake system. Working of single barrel master cylinder,tandem master cylinder, Working of Wheel cylinder. Construction and working of air brake system ,Requirements of a Tyre. Types of Tyre ( Tubed and Tubeless). Constructional Details of Tyre.tyre wear pattern, Greasing of wheel bearing, Tyre Re threading, Common troubles of brake system and its remedies

## **PART II**

### **Heavy Duty Driving License and Drivers Badge.**

1. Driving License Related Regulations (MV Act 1988 Chapter 1, 2, Central Motor Vehicle Rules 1989 Chapter I, Chapter II(Except Rule 31), Kerala Motor Vehicles Act 1989 )

**(Total 5 marks)**

1. Testing of knowledge on MV Act 1988, CMVR 1989, KMVR 1989 Definitions such as Axle weight, Articulated vehicles, contract Carriage, Driver Refresher Training Course, Gross vehicle weight, Heavy goods and passenger Motor Vehicles.

(1 mark)

2. Testing the knowledge on understanding and Distinguishing of definitions of CMVR 1989 category-M,N&T types of vehicles described in CMVR rule 3 and 2 (c), (i), (w)

(1 mark)

3. Questions from Motor Vehicle Act 1988 to check the knowledge on Sections 3, 4, 5, 6, 10, 14, 15, 18, 20,21 and 23.

(1 mark)

4. Questions from Central Motor Vehicle Rules 1989 to check the knowledge on Rules 3, 4, 5, 9, 15(3), 16, 17A, 18, 21, 22, 26 and 32.

(1 mark)

5. Questions from Kerala Motor Vehicle Rules 1989 to check the knowledge of Rules 4,6,19,20,28,38,40,41,44,45 and 46.

(1 mark)

**2. Drivers Badge Related Questions and Motor Vehicle Driving regulations 2017**

**(5 marks)**

1. Badge Questions (2 marks)

1. Meaning of Public service vehicles,
2. Types of Public service vehicles, types and validity of permit such as motor cab Contract Carriage, goods, hazardous goods, Stage Carriage, Temporary permit, Special Permit etc
3. Validity of fitness certificate of vehicles with respect to age,
4. Colours of Uniform of drivers and conductors in Public service vehicles, KSRTC, Pink Taxi's, Tourist Vehicles.
5. Grace period of Tax payment of Contract carriages, goods Carriages and Stage Carriages.
6. Seating Capacity, Students, Half Ticket, full Tickets Etc.

2. Motor Vehicle Driving regulations 2017 (3Marks)

1. Regulations 3 to 10
2. Regulations 11 to 26
3. Regulations 27 to 40

3. Basic knowledge on Automobile Engineering with respect to Central Motor Vehicle Rules 1989 Rule 31 **(5 marks)**

1. CMV Rule 31A - Driving theory – Foot, Hand and other controls, Pre-driving checks, Beginning to drive, Driving on the road, Driving Inter Sections, Reversing and parking.
2. Drivers responsibility on Roads
3. Priority of Certain Vehicles
4. Introduction to dial gauges and controls, Development of Judgement and anticipation, Cross country and Hill driving.
5. Qualities of a good driver, Holding Steering Wheels, MSM and PSL, types of Stopping Emergency, Normal, Use of Engine brake and Exhaust brake. Etc.

4. Offenses under Motor vehicles Act 1988 **(5 marks)**

1. MV Act 1988 Section 112 Limits of speed in various roads as per latest Government order (S.R.O. No. 707/2023, G.O.(P)No.15/2023/Tran. Dated 23/06/2023.
2. MV Act Section 113, 114 & 115 - Limits of weight and limitation of Use, powers and power to have the vehicle weighed.
3. MV Act Section 130-134 -duty to produce licenses, precautions to be taken, stop, give information, duty while accident.
4. MV Act Section 177 to 201 – General offenses penalty – Penalty for violation of MV regulations 2017, Minimum fine by court, Disobedience, Driving of vehicle by unauthorized person Excessive speed, dangerous driving, Red light Jumping, Drunken driving, Abatement of offenses, Using vehicle in Unsafe, without registration, permit, insurance, carriage of excess load and passengers, Use of seat belts, failure to allow free passage of Emergency vehicles, use of horns and silence zones, offenses by juveniles penalty for causing obstruction to free flow of traffic

5. MV Act 1988 Section 206 & 207 Power of police and other officers to impound documents and vehicles. CMVR 1989, Rule 138, 138A, 138B, 139, 139A & 167- Signals and additional safety measures, FAST TAG, carriage of goods in Motor Vehicles, production of License and Certificate of Registration, production of documents in electronic forms. E-challan, procedure and payment of E-challan.

**NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.**