

## Section 6- Schedule of supply

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## 1. List of Goods and Related Services

**Package Name: Supply of Automobile and related equipment's for Industrial Training Institutes to enhance technical and vocational skills among the youth of Himachal Pradesh (Package -01)**

The Goods and Related Services are grouped in Lots. Bidders shall have the option of submitting Bids for one, any combination, or all of the lots. Lots shall not be further subdivided for the purpose of bidding. The bidder is required to supply the items as mentioned below for the respective Package and Lot(s) for which bidding.

Besides the supply of equipment, the bidder shall also carry-out required related services including unloading, installation & commissioning, after sales warranty & maintenance as well as the relevant handholding to the trainers of the ITI for proper usage and operations. The bidder shall do the necessary site preparation including electrical work, earthing, minor civil work, etc. as required for installation & commissioning of the equipment's/goods. While doing the site preparation the bidder shall ensure that aesthetics of the labs/workshops, IT Lab and the Library shall maintain /restored.

Lot No : 1							
Lot Name: Simulators, Working Models & Cut Section Models							
Item No	Name of Goods or Related Services	Description	Unit of Measure -ment	Quantity	Specification by the supplier(To be filled by the supplier)	Detailed information brochure attached at Page No.	Pass/Fail (By Purchaser)
1.	Driving Simulator	<b>- Driving cabin :</b> Driver's cabin with single seating arrangement should be equipped with actual car's equipments / controls as under: Adjustable seat, Seat belts, Steering wheel , Gear shifting lever, Accelerator / Brake & Clutch pedals, Hand brake. Simulator should be housed in a close room type enclosure with projection system and an instructor station. <b>- Instructor Station</b>	No.	1			

		<p>This station should provide the facility to Register the Trainee and set the test. Reports should be printed through this station. Server should be networked with the Simulator Station.</p> <p>- <b>Visual projection</b> Seamless Curved Screen Projection System of 180 Deg using short throw projector giving a realistic panoramic view to the trainee.</p> <p>- <b>Compatibility with VR</b> The simulator should be compatible with Virtual reality kit for future upgrades.</p> <p>- <b>Processing type</b> Computer based processing. Computers for the Simulator should be of branded make.</p> <p>- <b>Rear &amp; side view</b> The system should have provision for rear &amp; side view mirror displayed into the Simulation display.</p> <p>Languages English , Hindi Electric Supply 220 – 240 volts</p> <p><b>SIMULATED FEATURES</b></p> <p>Activated controls Simulator should have all following controls fully activated &amp; simulated</p> <ul style="list-style-type: none"> <li>• Steering wheel,</li> <li>• Gears,</li> <li>• Clutch,</li> <li>• Accelerator,</li> <li>• Brake ,</li> <li>• Handbrake</li> <li>• Windshield wiper,</li> </ul>					
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		<ul style="list-style-type: none"> <li>• Lighting combination switch,</li> <li>Complete instrument cluster</li> <li>Following elements of instrument cluster of actual vehicle should activated on the live instrument cluster:</li> <li>• Speedometer,</li> <li>• L / R turn indicator,</li> <li>• Hand brake indicator,</li> <li>• Head light indicator ,</li> <li>• High beam indicator ,</li> <li>• Hazard switch,</li> <li>• Temperature indicator,</li> <li>• Odometer.</li> </ul> <p>Force feedback steering Simulator should have steering to give same feeling on turning as observed in actual vehicle.</p> <p><b>TRAINING SOFTWARE – FEATURES</b> <b>VISUAL ENVIRONMENT</b> <b>TERRAINS</b> Simulator should have 3D visual environment covering following elements. 1. CITY TERRAIN: Including commercial area , residential area 2. HIGHWAY TERRAIN: Including tunnels, railway crossings 3. HILL TERRAIN: Including gradients, hilly driving environment. Looks &amp; type of surrounding vehicles, buildings &amp; other objects as per Indian driving conditions. Please note: THE TERRAIN SHOULD BE DEPICTING INDIAN ROADS AND ROAD MARKINGS , TRAFFIC SIGNALS &amp; ROAD SIGNS SHOULD AS PER INDIAN ROAD CONGRESS (IRC)</p>					
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		<p><b>REALISTIC SOUND ENVIRONMENT</b>  Simulator should have high quality stereophonic sound &amp; should capture following elements:</p> <ul style="list-style-type: none"> <li>• Starting ignition sound,</li> <li>• Vehicle engine sound,</li> <li>• Surrounding traffic noise ,</li> <li>• Horn,</li> <li>• Rain drops</li> <li>• Screeching brake sound ,</li> <li>• Indicator's ticking sound.</li> </ul> <p><b>INSTRUCTOR CONTROLS</b>  Customized Scenario settings  The simulator should enable the instructor to customize the following in various combinations:</p> <ul style="list-style-type: none"> <li>• Selection of terrain</li> <li>• Daylight conditions</li> <li>• Weather conditions</li> <li>• Traffic density</li> </ul> <p>- <b>Calibration of the vehicle</b>  The Simulator should be capable of self-maintenance including calibration and diagnostics. The systems should have calibration of the following controls for easy self-maintenance:</p> <ul style="list-style-type: none"> <li>• Steering</li> <li>• Brake,</li> <li>• Accelerator</li> <li>• Clutch.</li> </ul> <p>Record and Replay  All the Driving Sessions of the User should have the option of recorded and can be replayed.</p> <p><b>TRAINING CURRICULUM</b></p>					
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		<p><b>- Features</b>  Progressive training modules as follows to cover comprehensive training curriculum starting from acquiring basics to advanced driving skills developed on an actual city terrain and not test tracks.  Training cues in Hindi, English as Guiding aid to learners in clear practice areas &amp; written audio messages.  Record and replay option for easy and self evaluation.</p> <p><b>Training Chapters / Lessons</b>  I. Cockpit Drill (Video Demonstration)  (a) Pre Checks  (b) Foot controls  (c) Hand Controls  (d) Light Switches  (e) Instrument Cluster  II. Basic Training  (a) Driving off  (b) Stopping Safely  (c) Changing Gears  (d) Mastering Steering  (e) Emergency stopping  III. Advanced Training  (a) Emerging left and right  (b) Uphill  (c) Downhill  (d) Gears  (e) Manuvering around parked cars</p> <p><b>DANGEROUS SCENARIOS</b>  Simulator should have multiple driving scenarios giving learner an opportunity to drive in different risky situations.</p> <p><b>PERFORMANCE EVALUATION</b>  Simulator to have provision for evaluating</p>					
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		<p>driver throughout the training process .The Evaluation criteria should be as per Rules of Road Regulations (RRR) and Indian Motor vehicle Act.</p> <p><b>- Report Generation:</b> A printed report should be generated at the end of each session. The system should also produce and print a consolidated report of the drivers' entire training period.</p> <p><b>SIMULATED INDIAN ENVIRONMENT</b> Free driving in fully immersive environment Simulator should provide complete freedom to drive in simulated Indian environment in different driving situations.</p> <p>i) Normal driving situations. ii) Hazard Perceptions (Risky situations) Different simulated modes / time of day. Simulator should have provision to drive in different simulated modes of day ranging from 0 to 24 hours including Dawn, Day, Dusk and Night</p> <p>Varying traffic density Simulator should have provision to drive / practice in three varying traffic density.</p> <ul style="list-style-type: none"> <li>• Slow traffic</li> <li>• Medium traffic</li> <li>• High traffic</li> </ul> <p>Adverse weather conditions Simulator should have provision to drive / practice in adverse weather conditions and experience.</p> <ul style="list-style-type: none"> <li>• Fog drive with three different varying visibility options i.e. Low / Medium &amp; Full visibility.</li> <li>• Rain drive with three different intensity of rainfall i.e. Low / Medium &amp; High</li> </ul>					
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		<p>Traffic density Simulated vehicle density of 150 vehicles including vehicles like cars, trucks, bus, taxi, motorcyclists, auto rickshaws.</p> <p><b>DRIVER TESTING SOFTWARE CONFIGURATION</b></p> <p><b>- Theory Test Module</b> This Module should offer an Online theory test Module with min 100 Questions to test the driver on his the practical knowledge of Driving. The test should include questions on Road rules, behaviour, driving operations. Randomly selected questions should be auto generated by the Computer for each trainee. There should be a fixed time to appear for each test. Multi Choice question bank should be designed in English Language. Driver Database should be stored and the report after each session should be printable.</p> <p><b>- Driving Ability and Clinical Test</b> Driving Ability and Clinical Test module to test the driver. Module should include 5 Different Test as follows; a. Judgment Test b. Reaction Test c. Anticipation Test d. Aptitude Test e. Colour Vision Deficiency Test Driving Skill Testing in Controlled Terrain This Module should have tests in driving on a virtual test track with minimum of 10 test variables like : • Parking exercise, • Reverse exercise,</p>					
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		<ul style="list-style-type: none"> <li>• S bend,</li> <li>• 90 Deg Turns,</li> <li>• 3 point turns,</li> <li>• Slopes – uphill &amp; downhill</li> <li>• Perpendicular Parking</li> </ul> <p>The Trainee should be tested under a single test on all the variables.</p> <p>- <b>Walk Around Inspection</b></p> <p>Vehicle Walk around module should be made available for control familiarization and pre start inspection.</p> <p>- <b>Fuel Efficiency</b></p> <p>This module should be designed to train drivers on eco driving skills. The module should be designed such that captures the various parameters leading to change in fuel consumption. This module should help to improve fuel efficiency.</p>					
2.	Air bag simulator	<p><b>Air bag simulator:</b></p> <ul style="list-style-type: none"> <li>- The simulator adopts the real components of Air bag system to illustrate Air bag safety system structure and working principle.</li> <li>- The simulator should have Driver &amp; Co Driver Air Bags, Seat belts with front seats, crash sensors, air bag ECU, Wiring Harness</li> <li>- Airbag Control ECU Monitors no of Related Sensors within the Vehicle including accelerometers, Wheel Speed Sensors, Seat Occupancy Sensors and Brake Pressure Sensors etc.</li> <li>-When requisite threshold has been reached or exceeded, the air bag control unit will trigger the ignition of a gas generator propellant to rapidly inflate air bag.</li> <li>- As the vehicle occupant collides with and</li> </ul>		15			

		squeezes the bag, the gas escapes in a controlled manner through small Vent Hole.					
3.	Air conditioning service Unit (Car)	<ul style="list-style-type: none"> <li>- Functions: Recovery, Oil discharge, Vacuum, Oil re-integration, Gas Charging</li> <li>- Refrigerant Type: R134a or Equivalent</li> <li>- Operation: Automatic</li> <li>- Refrigerant filling accuracy: <math>\pm 10</math> gram</li> <li>- Vacuum Pump Capacity: 84 l/min(Minimum)</li> <li>- Gas reservoir capacity: 12 litres (Refillable)</li> <li>- Display: LCD Graphic</li> <li>- Power supply :220 V 50 Hz</li> </ul>		13			
4.	Car Air conditioning trainer kit	<ul style="list-style-type: none"> <li>- <b>Made out of Original Parts :</b></li> <li>- AC compressor</li> <li>- Condenser</li> <li>- Evaporator with thermostatic expansion valve</li> <li>- Receiver with sight glass</li> <li>- All ideal controls and safety controls for car AC</li> <li>- Radiator, its Pipe Lining</li> <li>- Blower / Fan Assembly etc.</li> <li>- Single phase electric motor to run the compressor</li> <li>- Suitable battery to run condenser fan, evaporator fan and to operate magnetic clutch of compressor</li> <li>- Alternator facility to recharge Battery</li> <li>- Other accessories like on/off switch, fan speed selector switch and complete wiring jack and clips</li> </ul>		3			
5.	Cut section Model of Mock layout of a motor car –electrical system working model	<b>The mock layout consisting of minimum :</b> <ul style="list-style-type: none"> <li>- Head Light Circuit</li> <li>- Horn Circuit</li> <li>- Tail Light Circuit</li> <li>- Side Indicators</li> </ul>		15			

		<ul style="list-style-type: none"> <li>- Brake light Circuit</li> <li>- Ignition Circuit</li> <li>- Working of Self-starter</li> <li>- Charging Circuit (Motor Driven Alternator)</li> <li>- Front Lighting Panel</li> <li>- Dash Board Panel</li> <li>- Ignition System ( sparks from plug to be shown with Distributor &amp; battery)</li> <li>- Car Audio system</li> <li>- Power Window mechanism</li> <li>- Wiper Motor</li> <li>- Anti Theft Device Wiring Circuit</li> <li>- Electric Power Steering Circuit</li> <li>- Immobilizer Circuit</li> <li>- Reverse Parking Assist</li> </ul>					
6.	Demonstration board Ignition system, ignition coil	<p>The demonstration- working unit consisting of minimum :</p> <ul style="list-style-type: none"> <li>- Ignition switch</li> <li>- Ignition coil</li> <li>- Distributor driven by DC Motor</li> <li>- Spark plugs</li> </ul> <p>- By switching on the switch and by giving rotation to the distributor by DC Motor, Sequential Sparks in the spark plug can be demonstrated</p> <p>-AC to DC convertor shall be provided as an alternative to battery for power input</p>		1			
7.	Demonstration board of CRDI system working model	<p><b>The Demonstration Board for Four Cylinder CRDI Engine consisting of minimum :</b></p> <ul style="list-style-type: none"> <li>- Diesel Injector</li> <li>- Inlet Manifolds</li> </ul>		1			

		<ul style="list-style-type: none"> <li>- ECU</li> <li>- CRDI Pump</li> <li>- EGR Valve</li> <li>- Fuel Tank Module</li> <li>- Supporting Sensors such as Lambda Sensor, Engine Speed sensor, Cam Position sensor, Oxygen sensor, Airflow sensor, MAP sensor etc.</li> <li>- Suitable Motor to drive the fuel pump</li> <li>- Necessary wiring connections to show the circuit connections</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> </ul>					
8.	Demonstration board of MPFI system working model	<p>The Demonstration Board for Three Cylinder MPFI Engine consisting of minimum :</p> <ul style="list-style-type: none"> <li>- Injectors</li> <li>- Rail</li> <li>- Inlet manifolds</li> <li>- Throttle body</li> <li>- Distributor</li> <li>- ECU</li> <li>- Canister Purge Valve</li> <li>- Carbon Canister</li> <li>- Fuel Tank Module</li> <li>- Supporting Sensors such as Lambda Sensor, Engine Speed sensor, Cam Position sensor, Oxygen sensor, Airflow sensor, MAP sensor etc.</li> <li>- Crank Pulley</li> <li>- Fuel Tank Module</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> </ul>		12			

9.	Working Model of power windows	<ul style="list-style-type: none"> <li>- Actual working model of power window of Car/SUV Showing parts like door, glass with motor and its gear arrangement and operating switch.</li> <li>- Single Door should be provided</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> <li>- Door should be suitable sectioned and arranged to demonstrate the internal construction details showing the minute information's such as motor and its gear arrangement etc.</li> </ul>		12			
10	Working model of Air Brake Assembly	<p>The working Model of Air brake assembly consisting of minimum :</p> <ul style="list-style-type: none"> <li>- One front drum should be cut out show the working internally of drum and whole parts assembly fitted on the frame.</li> <li>- The front drum should run hand operated,</li> <li>- One rear drum assembly (without drum ) brake shoe with liner show working of the brake.</li> <li>- Air compressor</li> <li>- Air Dryer</li> <li>- Unloader valve</li> <li>- Foot valve</li> <li>- Booster</li> <li>- Air tank with safety valve</li> <li>- Control valve</li> <li>- Brake chamber</li> <li>- Foot brake</li> <li>- Hand brake</li> <li>- Brake Light/Stop Light should be functional</li> <li>- Air Pressure gauges should be provided for checking air tank air pressure.</li> <li>- Single phase 220V AC motor should be coupled to the compressor for generation of</li> </ul>		11			

		the air, which is used for the operation of the air brake assembly					
<b>11</b>	Cut section models of shock absorbers	<b>Cut section Model of Shock Absorber For Two Wheeler :</b> - Telescopic Type - The Model should be suitably sectioned to demonstrate the internal construction details showing the minute information  <b>Cut section Model of Shock Absorber For Four Wheeler :</b> - Telescopic Type - The Model should be suitably sectioned to demonstrate the internal construction details showing the minute information		13			
<b>12</b>	Cut section of cross ply tyres	<b>Cut Section Model of Cross Ply Tyre :</b> - Size : 155/65 R13 - Model should be suitably sectioned to demonstrate the internal construction details		14			
<b>13</b>	Cut section of radial tyres	<b>Cut Section Model of Radial Ply Tyre:</b> - Size : 155/65 R13 - Model should be suitably sectioned to demonstrate the internal construction details		13			
<b>14</b>	Cut section working model of automatic transmission Gear box	<b>Cut Section Working Model of Automatic Transmission :</b> - Model made out of original full size gearbox - Model suitably sectioned to show the internal mechanism of forward and reverse speeds.		11			

<b>15</b>	Cut section working model of centrifugal clutch assembly.	<b>Cut Section Working Model of Four Wheeler Centrifugal Clutch Assembly:</b> <ul style="list-style-type: none"> <li>- The model should be made out of original parts such as clutch pulley, clutch liner, clutch plate, clutch spring, and Input shaft. to demonstrate the working of clutch assembly.</li> <li>- Model should be operated by suitable electric motor (220V/50 Hz AC ) with manually speed control for demonstration</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>		15			
<b>16</b>	Cut section working model of Diaphragm clutch assembly.	<b>Cut Section Working Model of Diaphragm Clutch Assembly:</b> <ul style="list-style-type: none"> <li>- The model should be made out of original parts such as Flywheel, Pressure Plate Diaphragm type ,Clutch plate, fork clutch release bearing, input shaft etc. to demonstrate the working of clutch assembly.</li> <li>- By operating The pedal provided The operation can be demonstrated.</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>		11			
<b>17</b>	Cut section working model of Single plate clutch assembly.	<b>Cut Section Working Model of Single Plate Clutch Assembly:</b> <ul style="list-style-type: none"> <li>- The model should be made out of original parts such as Flywheel, Pressure Plate Finger type ,Clutch plate, fork clutch release bearing, input shaft etc. to demonstrate the working of clutch assembly.</li> <li>- By operating The pedal provided The operation can be demonstrated.</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>		13			
<b>18</b>	Demonstration board of electronic	Demonstration Board of Electronic Ignition System		9			

	Ignition system, ignition coil	<ul style="list-style-type: none"> <li>- The open demonstration- working unit consisting of minimum:</li> <li>- Ignition Switch</li> <li>- Electronic Ignition Coil</li> <li>- HT Wires</li> <li>- Distributor</li> <li>- Four Spark Plugs</li> <li>- Battery</li> </ul>					
19	Different type of Engine Bearing model	<b>Different type of Engine Bearing(Generic Size for Demonstration) Model of(One Each) suitable for Engine:</b> <ul style="list-style-type: none"> <li>- Shell bearing for crankshaft(Main Journal &amp; Big End Journal)</li> <li>- Thrust bearing for Crankshaft</li> <li>- Ball Bearing for Crank Shaft</li> <li>- Bush Bearing for Connecting Rod</li> <li>- Needle bearing for Connecting Rod</li> <li>- Bush bearing for Camshaft &amp; Rocker Arm</li> <li>- Shell bearing for Overhead Cam Shaft</li> <li>- Needle Bearing for Rocker Arm</li> </ul>		18			
20	Different type of piston model	<b>Different Type of Piston Model(Generic Size for Demonstration(One Each) :</b> <ul style="list-style-type: none"> <li>- As Per Piston Head Design :Dome head, Flat Head, Concave Head, Irregular Head.</li> <li>- As Per Skirt : Solid Skirt &amp; Split Skirt</li> <li>- As Per Ring Groove :Rectangular Groove, Taper Faced Ring Groove, Barrel Faced Ring Groove, Inside Bevel Ring Groove, Key Stone Ring Groove.</li> <li>- As per gudgeon pin : Fixed Gudgeon Pin, Semi Fixed Gudgeon Pin, Full Floating Gudgeon Pin. All to be provided with Lock.</li> </ul>		16			
21	Functional/experiment model of different type of sensors.	Functional/experiment model of different type of sensors consisting of minimum: <ul style="list-style-type: none"> <li>- Petrol injector</li> </ul>		13			

		<ul style="list-style-type: none"> <li>- Inlet manifolds</li> <li>- Throttle body</li> <li>- Distributor</li> <li>- ECU</li> <li>- Canister Purge Valve</li> <li>- Carbon Canister</li> <li>- Fuel Tank Module</li> <li>- Supporting Sensors such as Throttle Position Sensor, Manifold Absolute Pressure Sensor, Engine Coolant Temperature Sensor, Vehicle Speed Sensor, Oxygen Sensor, Crankshaft Position Sensor, Camshaft Position Sensor, Intake Air Temperature Sensor, Mass Air Flow Sensor, Knock Sensor etc.</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> </ul>					
22	Radiator cut section-cross flow	<b>Cut Section Model of Radiator :</b> <ul style="list-style-type: none"> <li>- Cross Flow Type</li> <li>- Radiator with sectioned side tanks, radiator core to demonstrate the internal construction details.</li> </ul>		16			
23	Radiator cut section-down flow	<b>Cut Section Model of Radiator :</b> <ul style="list-style-type: none"> <li>- Down Flow Type</li> <li>- Radiator with sectioned upper &amp; lower tanks, radiator core and cap to demonstrate the internal construction details.</li> </ul>		16			
24	Steering assembly - Rack & pinion	<b>Rack &amp; Pinion Steering Assembly Comprising of :</b> <ul style="list-style-type: none"> <li>- Steering wheel,</li> <li>- Steering Column &amp; Steering Shaft</li> <li>- Rack &amp; Pinion Assembly</li> <li>- Tie Rod, Tie Rod Ends &amp; all other steering linkages</li> </ul>		12			

		<ul style="list-style-type: none"> <li>- Boot</li> <li>- Brake Assembly with Wheels</li> </ul>					
25	Steering assembly - Worm & roller	<b>Worm &amp; Roller Steering Assembly</b> <b>Comprising of minimum :</b> <ul style="list-style-type: none"> <li>- Steering wheel,</li> <li>- Steering Column &amp; Steering Shaft</li> <li>- Worm &amp; Roller Steering Gear Box</li> <li>- Drop Arm</li> <li>- Idler Arm</li> <li>- Tie Rod Ends</li> <li>- Centre Link</li> <li>- Brake Assembly with Wheels</li> </ul>		14			
26	Steering assembly - Recirculating ball	<b>Recirculating Ball Steering Assembly</b> <b>Comprising of minimum :</b> <ul style="list-style-type: none"> <li>- Steering wheel</li> <li>- Steering Column &amp; Steering Shaft</li> <li>- Recirculating ball Steering Gear Box</li> <li>- Drop Arm</li> <li>- Pitman Shaft</li> <li>- Track Rod</li> <li>- Tie Rod</li> <li>- Steering Arms</li> <li>- Brake Assembly with Wheels</li> </ul>		16			
27	Steering assembly - Power steering	<b>Power steering(Hydraulic) Assembly</b> <b>Comprising of minimum :</b> <ul style="list-style-type: none"> <li>- Steering Wheel</li> <li>- Steering Column</li> <li>- Power Steering Unit ( Rack &amp; Pinion Type)</li> <li>- Power Steering Pump with Oil Reservoir</li> <li>- Hydraulic Hoses</li> <li>- Tie Rod, Tie Rod Ends &amp; all other steering linkages</li> <li>- Brake Assembly with Wheels</li> <li>- Suitable Single Phase Motor to run the power</li> </ul>		12			

		steering pump					
<b>28</b>	Steering assembly - Electric Assisted Power Steering	<b>Electric Assisted Power Steering</b> <b>Comprising of minimum :</b> <ul style="list-style-type: none"> <li>- Steering Wheel</li> <li>- Steering Column</li> <li>- Rack &amp; Pinion Assembly</li> <li>- Signal Sensors</li> <li>- Electric Motor and Motor Control Module with compatible battery supply</li> <li>- Tie Rod, Tie Rod Ends &amp; all other steering linkages</li> <li>- Brake Assembly with Wheels</li> </ul>		14			
<b>29</b>	Turbocharger cut sectional view Latest WGT type	<b>Actual Cut Section of a Latest WGT type Turbocharger:</b> <ul style="list-style-type: none"> <li>- Turbocharger should be suitably sectioned to show following components:</li> <li>- turbine</li> <li>- impeller</li> <li>- compressor wheels</li> <li>- Waste Gate Valve</li> <li>- Inlet Manifold</li> </ul>		14			
<b>30</b>	Working model of torque converter of LMV	<b>Working model of torque converter of LMV:</b> <ul style="list-style-type: none"> <li>- Driven by compatible Variable Speed Single Phase Motor to demonstrate the working of Torque Converter.</li> </ul>		13			
<b>31</b>	Bus AC tutorial model	<b>Bus AC tutorial model consisting of minimum:</b> <ul style="list-style-type: none"> <li>- AC compressor</li> <li>- Condenser</li> <li>- Evaporator with thermostatic expansion valve</li> <li>- Receiver with sight glass</li> <li>- All ideal controls and safety controls for Bus</li> </ul>		2			

		AC - Radiator, its Pipe Lining - Blower / Fan Assembly etc. and air-conditioning distribution/ducts of Bus with grill - Single phase electric motor to run the compressor - Suitable battery to run condenser fan, evaporator fan and to operate magnetic clutch of compressor - Alternator facility to recharge Battery - Other accessories like on/off switch, fan speed selector switch and complete wiring jack and clips					
32	Cut section of 6 cylinder diesel engine with moving condition to show momentum of internal parts	The model should be made out of full size original six cylinder, four stroke Diesel engine comprising of parts and accessories like Six cylinders, cylinder head, inlet and Exhaust manifolds, Fuel pump, oil pump, Water pump, Fuel Filter, Fuel Injection pump, injectors, self-starter, alternator. - Suitable single phase AC Motor should be coupled through a Reduction drive unit to the engine by which the model can be demonstrated at very low speed of about 15 to 20 rpm. - By running the engine, the working of individual parts and accessories like Crankshaft, Camshaft, Connecting rod, Pistons, Valves, different pumps, can be demonstrated. -The Injector should spray as per firing order with LED light Simultaneously.		17			

**Note: For detailed specifications please refer table 3: Technical Specifications**

Lot No : 2							
Lot Name: Engine, Chassis & engine parts (please see Annexure-A wherever MMV & Mechanic Diesel syllabus Sr. No. reference is given)							
Item No	Name of Goods or Related Services	Description	Unit of Measure -ment	Quantity	Specification by the supplier(To be filled by the supplier)	Detailed information brochure attached at Page No.	Pass/Fail (By Purchaser)
1.	Distributor –Duel advance type	<b>Distributor :</b> - Duel advance type	No.	1			
2.	Distributor-Reluctance type	<b>Distributor :</b> - Reluctance type	No.	1			
3.	Electrical horn ( different types )	<b>Electrical Horn(One Each) :</b> - Windtone Type & Diaphragm Type - Volts : 12 V DC - Current :2.5 Amp. Max	No.	1			
4.	Multi-point fuel injection pump	<b>Multi-point fuel injection pump :</b> This Fuel Injection Pump should be compatible with MPFI Engine being procured at Sr No. 177 of MMV Trade Syllabus.	No.	1			
5.	Thermostat for Use with Petrol MPFI Engine	-This Thermostat is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	No.	32			
6.	Thermostat for Use with Diesel Engine – CRDI - 4 stroke	-This Thermostat is to be used with CRDI Engine being procured at SR. NO 184 of Mechanic diesel Trade Syllabus.	No.	2			
7.	Alternator assembly used for LMV	-This Alternator assembly is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	No.	12			

<b>8.</b>	Electronic engine control module for LMV MPFI	-This Electronic engine control module is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	<b>No.</b>	1			
<b>9.</b>	Petrol Engine(4-stroke) Motor Cycle/Scooter along with special tools	<b>Single cylinder Motorcycle/Scooter Engine :</b> - Engine Displacement Range : 90-180 cc. - Engine Cycle : Four Stroke - Fuel : Petrol - Engine should have all the fittings such that the working of the engine can be checked. Should also have its integral parts such as Fuel Tank, Ignition switch, silencer, Wheels such that working of the engine can be checked on road and fault finding can be done.	<b>No.</b>	1			
<b>10</b>	Starter motor axial type	<b>Starter Motor :</b> - Starter motor axial type - Compatible with Petrol/Diesel Engine	<b>No.</b>	15			
<b>11</b>	Starter motor pre-engagement type	<b>Starter Motor :</b> - Starter motor Pre-engagement type - Compatible with Petrol/Diesel Engine	<b>No.</b>	16			
<b>12</b>	Starter motor Co-axial type	<b>Starter Motor :</b> - Starter motor Co-axial type - Compatible with Petrol/Diesel Engine	<b>No.</b>	18			
<b>13</b>	Wiper motor assembly	<b>Wiper motor Complete assembly:</b> - Compatible with LMV- Petrol/Diesel - The assembly should be supplied along with wiper blade.	<b>No.</b>	2			
<b>14</b>	Cylinder liner- Dry & press fit liner	<b>Cylinder liner :</b> - Dry liner for engine cylinder(Press Fit)	<b>No.</b>	16			
<b>15</b>	Cylinder liner- wet liner & slide fit liner	<b>Cylinder liner :</b> - Wet liner for engine cylinder with Rubber 'O' Ring( Sidefit liner)	<b>No.</b>	16			
<b>16</b>	Disk brake in working condition with caliper assembly with all	The Working Model of LMV disk brake assembly consisting of following minimum parts & practically demonstrable: - Brake disc Assembly	<b>No.</b>	10			

	parts	<ul style="list-style-type: none"> <li>- Caliper assembly</li> <li>- Tandem Master Cylinder &amp; Operating Mechanism</li> <li>- Brake Hoses, Oil Reservoir with Oil</li> <li>- Pedal</li> </ul>					
<b>17</b>	Drum brake assembly in Working Condition	<p>The Working Model of drum brake assembly should have minimum:</p> <ul style="list-style-type: none"> <li>- Brake drum Assembly</li> <li>- Drum with liner plate, wheel cylinder and operating mechanism</li> <li>- Wheel Cylinder</li> <li>- Tandem Master Cylinder &amp; Operating Mechanism</li> <li>- Brake Hoses, Oil Reservoir with Oil</li> <li>- Brake Pedal</li> </ul>	<b>No.</b>	11			
<b>18</b>	Front axle ( Rzeppa Joint) with stand for Dismantling and assembly	Front axle (Rzeppa Joint) of a Generic LMV of Engine Minimum 1000cc Capacity(petrol/Diesel)	<b>No.</b>	10			
<b>19</b>	Fuel feed pump for diesel	-This Fuel feed pump for diesel is to be used with Fuel injection pump (Diesel) inline being procured at SR. NO 61 of MMV Trade Syllabus.	<b>No.</b>	12			
<b>20</b>	Fuel injection pump (Diesel) inline	<p><b>Fuel injection pump (Diesel) Inline :</b></p> <ul style="list-style-type: none"> <li>- Complete Pump assembly suitable for 4/6 cylinders Diesel engine</li> <li>- RSV Mechanical Pneumatic Governor Type</li> </ul>	<b>No.</b>	12			
<b>21</b>	Fuel injection pump dismantling tool kit /Universal Vice	-This dismantling tool kit /Universal Vice is to be used for dismantling & assembling Fuel injection pump (Diesel) inline being procured at SR. NO 72 of Mechanic diesel Trade Syllabus.	<b>No.</b>	1			

<b>22</b>	Distributor Type fuel rotary pump (DPC) pump along with special tools and accessories.	<b>Fuel injection pump (Diesel) :</b> - Type :Distributor fuel rotary pump (DPC) - Complete Pump assembly compatible for 4 cylinders Diesel engine	<b>No.</b>	15			
<b>23</b>	Full floating axle Assembly	<b>Full floating axle Assembly :</b> The Assembly should be consist of minimum : - Full floating axle - Differential assembly - Brake assembly	<b>No.</b>	10			
<b>24</b>	Semi-floating axle assembly	<b>Semi floating axle Assembly :</b> The Assembly should be consist of minimum : - Semi floating axle - Differential assembly - Brake assembly	<b>No.</b>	7			
<b>25</b>	Injector – Multi hole type	Complete Multi hole type Injector Assembly	<b>No.</b>	59			
<b>26</b>	Injector – Pintle type	Complete Pintle type Injector Assembly	<b>No.</b>	60			
<b>27</b>	Radiator pressure cap(LMV)	- This Radiator pressure cap for LMV is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	<b>No.</b>	23			
<b>28</b>	Radiator pressure cap	- This Radiator pressure cap is to be used with CRDI Engine being procured at Sr No. 184 of Mechanic Diesel Trade Syllabus.	<b>No.</b>	2			
<b>29</b>	Synchronous Gear box with 5 Forward & 1 Reverse Gear for Use with CRDI Diesel Engine	<b>Purpose :</b> '-This Synchronous Gear box with 5 Forward & 1 Reverse Gear is to be integrated with CRDI Engine being procured at SR. NO 164 of MMV Trade Syllabus.	<b>No.</b>	12			

<b>30</b>	Working model of Tandem master cylinder with booster	The working Model should be made of following minimum parts : - Tandem Master Cylinder - Complete Vacuum Booster System consisting of suitable vacuum pump and other necessary parts.	<b>No.</b>	15			
<b>31</b>	Tandem master cylinder with booster	-This Tandem master cylinder with booster is to be used with Working model of Tandem master cylinder with booster being procured at SR. NO 155 of MMV Trade Syllabus.	<b>No.</b>	46			
<b>32</b>	Tubed tyre of car, trucks & motorcycle	<b>Tyre(One Each) :</b> Tyre with Tube for Motorcycle: - Size : 100/90-17 - Fitted on a suitable alloy wheel Tyre with Tube for Car: - Size : 155/65 R13 - Fitted on a suitable alloy wheel Tyre with tube for Truck: -Size :10" X 20" 16 PR - Fitted on a suitable wheel	<b>No.</b>	15			
<b>33</b>	Tubeless tyre of cars & trucks	<b>Tubeless Tyre(One Each)</b> Tubeless Tyre with Tube for Car: - Size : 155/65 R13 - Fitted on a suitable alloy wheel Tubeless Tyre with tube for Truck: - Size :10" X 20" 16 PR - Fitted on a suitable wheel	<b>No.</b>	15			
<b>34</b>	Tyre & split rim wheel assembly	Tyre & Split Rim Wheel Assembly for Two Wheeler	<b>No.</b>	14			
<b>35</b>	Automotive Water pump for dismantling and assembling	- This Automotive Water pump for dismantling and assembling is to be used with CRDI Engine being procured at Sr No. 164 of MMV Trade Syllabus..	<b>No.</b>	53			

<b>36</b>	Water pump for dismantling and assembling	- This Water pump for dismantling and assembling is to be used with CRDI Engine being procured at Sr No. 184 of Mechanic Diesel Trade Syllabus..	<b>No.</b>	4			
<b>37</b>	Diesel Engine – CRDI - 4 stroke for Dismantling and assembling with swivelling stand	<p>Engine Specifications:</p> <ul style="list-style-type: none"> <li>- Latest 4 Stroke 4 Cylinder</li> <li>- Fuel Type : Diesel</li> <li>- Engine Displacement :800-1600cc</li> <li>- Fuel Injection Sysyem : CRDI, Turbocharged</li> <li>- The Diesel Engine should be in running condition, with ECM, BCM, a Ignition Switch with Keys, all sensors(Air Mass Flow, EGR, Lambda/Oxygen Sensor, Fuel Pressure Regulator, Rail Pressure Sensor, Crank Angle/RPM/TDC Sensor, Coolant Temperature Sensor, Cam Angle Sensor, Boost Pressure Sensor, Fuel Temperature &amp; Water in Fuel Filter Sensor), wiring, fuel feed &amp; cooling system &amp; instrument cluster, Radiator with Intercooler and Cooling Fan, Air Filter Assy, A Mounting, Fuse Box, Glow Plug Timer, Fuel Filter, Engine Oil Pressure Switch, Alternator, Starter Motor</li> <li>- Instrument Cluster should display Fuel level, Battery Charging Light, Oil Pressure Light, Engine RPM.</li> <li>- Fuel Tank of Minimum Capacity 10 Litre, Engine Accessories- Silencer, and compatible Battery with clamp, Safety Guard for Silencer &amp; Radiator.</li> </ul>	<b>No.</b>	14			
<b>38</b>	Diesel engine ( Running condition ) Stationary type	<p>Diesel engine ( Running condition ) Stationary type:</p> <ul style="list-style-type: none"> <li>- Type : Vertical, Single Cylinder, Water-Cooled,</li> </ul>	<b>No.</b>	11			

		Four Stroke Cycle, OH valves, Compression Ignition Diesel Engine - Minimum Rated Power : 5 HP					
39	Four stroke petrol engine with CNG setup-working condition	<p>Engine Specifications: :</p> <ul style="list-style-type: none"> <li>- Fuel Type : Petrol &amp; CNG</li> <li>- Fuel Injection System : MPFI</li> <li>- Engine Displacement :800-1600 cc</li> <li>- Cycle : Four Stroke</li> <li>- No of Cylinders : 3/4</li> <li>- Engine should be supplied with ECM, BCM Ignition Switch with Keys, all sensors( Crank Angle/RPM/TDC Sensor, Oxygen/Lambda Sensor, Coolant Temperature Sensor, Engine Oil Pressure Switch, Absolute Pressure Sensor, Throttle Position Sensor), wiring, fuel feed system, Air Intake &amp; Exhaust System, cooling system, Engine Starting System and Charging System, Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter, Lubrication System with compatible battery &amp; instrument cluster with CNG/ Petrol selection switch on Panel</li> <li>- Instrument Cluster should display Fuel level, Battery Charging Light, Engine Oil Pressure Light, and Coolant High Temperature Warning Light.</li> </ul> <p>Fuel Tank of Capacity Minimum 10 Litre, CNG Tank/ Cylinder of Capacity Minimum 7 Kgs.</p> <p>Engine Accessories- Silencer, New Battery with clamp, and Wire Mesh/Perforated Sheet - Safety Guards for Radiator and Silencer.</p>	No.	13			

<b>40</b>	Heavy Commercial vehicle type Fitted with Latest 06 cylinder CRDI diesel engine with all parts and accessories.(witho ut body on frame), Non-Air Conditioned	<ul style="list-style-type: none"> <li>- Transmission Type : Manual</li> <li>- No of Gears(Minimum) : 5 Forward+1 Reverse</li> <li>- Engine Displacement(Minimum) : 5500 cc</li> <li>- Drive : Rear Wheel drive</li> <li>- Clutch Type: Single Clutch Plate Hydraulic Assisted</li> <li>- Comfort Features: <ul style="list-style-type: none"> <li>- Air Brake</li> <li>- Push Back Front Seats</li> <li>- Seat Belts &amp; Warning</li> <li>- Power Steering</li> <li>- Anti Glare Rear View Mirror</li> <li>- Engine Immobilizer</li> <li>- Seat Belt Warning</li> </ul> </li> <li>- Fitted with Latest 06 cylinder CRDI diesel engine with all parts and accessories</li> <li>All other standard Specifications of any standard HCV</li> </ul>	<b>No.</b>	19			
<b>41</b>	MPFI petrol engine with swivelling stand along with special tools for dismantling and assembling	<p>Engine Specifications: :</p> <ul style="list-style-type: none"> <li>- Fuel Type : Petrol</li> <li>- Fuel Injection System : MPFI</li> <li>- Engine Displacement :800-1600 cc</li> <li>- Cycle : Four Stroke</li> <li>- No of Cylinders : 3/4</li> <li>- Engine should be supplied with ECM, BCM Ignition Switch with Keys, all sensors( Crank Angle/RPM/TDC Sensor, Oxygen/Lambda Sensor, Coolant Temperature Sensor, Engine Oil Pressure Switch, Absolute Pressure Sensor, Throttle Position Sensor), wiring, fuel feed system, Air Intake &amp; Exhaust System, cooling system, Engine Starting System and Charging System, Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter, Lubrication System with</li> </ul>	<b>No.</b>	14			

		compatible battery & instrument cluster - Instrument Cluster should display Fuel level, Battery Charging Light, Engine Oil Pressure Light, and Coolant High Temperature Warning Light. Fuel Tank of Capacity Minimum 10 Litre, - Engine Accessories- Silencer, Compatible Battery with clamp, and Wire Mesh/Perforated Sheet - Safety Guards for Radiator and Silencer.					
42	Transfer case with stand for Dismantling and assembly.	-This Transfer case is to be integrated with Synchronous Gear box being procured at SR. NO 154 of MMV Trade Syllabus.	No.	12			
43	Diesel Engine – CRDI - 4 stroke Engine assembly with fault simulation board in working condition	<b>Complete Engine assembly with Fault simulation Board with following minimum :</b> - Engine Fuel Type : Diesel - Fuel Injection System : CRDI, Turbocharged - Cycle : Four Stroke - No of Cylinders : 4 - Engine Displacement(Minimum) : 1200-2200 cc - The Diesel Engine should be in running condition, with ECM, BCM, Ignition Switch with Keys, all sensors(Air Mass Flow, EGR, Lambda/Oxygen Sensor, Fuel Pressure Regulator, Rail Pressure Sensor, Crank Angle/RPM/TDC Sensor, Coolant Temperature Sensor, Cam Angle Sensor, Boost Pressure Sensor, Fuel Temperature & Water in Fuel Filter Sensor), wiring, fuel feed & cooling system & instrument cluster, Radiator with Intercooler and Cooling Fan, Air Filter Assy, A Mounting, Fuse Box, Glow Plug Timer, Fuel Filter, Engine Oil Pressure Switch, Alternator, Starter Motor - Instrument Cluster should display Fuel level,	No.	16			

		Battery Charging Light, Oil Pressure Light, Engine RPM. - Fuel Tank of Minimum Capacity 20 Litre, Engine Accessories- Silencer, and compatible Battery with clamp, Safety Guard for Silencer & Radiator.					
44	Working Condition of Petrol MPFI Engine Assembly with fault simulation board	<b>Complete Engine assembly with Fault simulation Board with following minimum :</b> - Fuel Type : Petrol - Fuel Injection System : MPFI - Engine Displacement : 800-1600 cc - Cycle : Four Stroke - No of Cylinders : 3/4 - Engine should be supplied with ECM, BCM Ignition Switch with Keys, all sensors( Crank Angle/RPM/TDC Sensor, Oxygen/Lambda Sensor, Coolant Temperature Sensor, Engine Oil Pressure Switch, Absolute Pressure Sensor, Throttle Position Sensor), wiring, fuel feed system, Air Intake & Exhaust System, cooling system, Engine Starting System and Charging System, Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump & Filter Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump & Filter, Lubrication System with compatible battery & instrument cluster - Instrument Cluster should display Fuel level, Battery Charging Light, Engine Oil Pressure Light, and Coolant High Temperature Warning Light. Fuel Tank of Capacity Minimum 10 Litre, Engine Accessories- Silencer, Compatible Battery with clamp, and Wire Mesh/Perforated	No.	13			

		Sheet - Safety Guards for Radiator and Silencer.					
<b>45</b>	Diesel Engine 4 stroke vertical (up to about 10 KW/15HP)	<b>Diesel engine 4 stroke :</b> - Type : Vertical self-start with battery - Power Rating : Up to 10 Kw/15HP, - No of Cylinder : Minimum 2 - Cooling :Water Cooled - Fuel tank Capacity: 10 to 20 litres.	<b>No.</b>	1			
<b>46</b>	Diesel Engine upto 3.5 KW /4.5 HP fitted with pump	<b>Diesel Engine Fitted with Pump:</b> -Self start with battery - Engine Type :Single Cylinder, Four Stroke Cycle, Compression Ignition Diesel Engine - Engine Power Rating : Up to 3.5 KW/4.5 HP - Pump Type : Centrifugal - Pump Head Range: 7- 18 metres	<b>No.</b>	1			
<b>47</b>	Diesel Engine six Cylinder in running condition	<b>Latest Diesel Engine six Cylinder in running condition with minimum :</b> - Fuel Type : Diesel - Fuel Injection System : CRDI, Turbocharged - Cycle : Four Stroke - No of Cylinders : 6 - Engine Displacement(Minimum) : 5500 cc - The Diesel Engine should be in running condition, with ECM, BCM, a Ignition Switch with Keys, all sensors(Air Mass Flow, EGR, Lambda/Oxygen Sensor, Fuel Pressure Regulator, Rail Pressure Sensor, Crank Angle/RPM/TDC Sensor, Coolant Temperature Sensor, Cam Angle Sensor, Boost Pressure Sensor, Fuel Temperature & Water in Fuel Filter Sensor), wiring, fuel feed & cooling system & instrument cluster, Radiator with Intercooler and Cooling Fan, Air Filter Assy, A Mounting, Fuse Box, Glow Plug Timer, Fuel Filter, Engine Oil	<b>No.</b>	17			

		Pressure Switch, Alternator, Starter Motor, - Instrument Cluster should display Fuel level, Battery Charging Light, Oil Pressure Light, Engine RPM. - Fuel Tank of Minimum Capacity 20 Litre, Engine Accessories- Silencer, and compatible Battery with clamp, Safety Guard for Silencer & Radiator.					
<b>48</b>	Automotive oil pump for dismantling and assembling.	- This Automotive oil pump for dismantling and assembling. for dismantling and assembling is to be used with CRDI Engine being procured at Sr No. 164 of MMV Trade Syllabus..	<b>No.</b>	24			

**Note: For detailed specifications please refer table 3: Technical Specifications**

Lot No : 3							
Lot Name: Machines/ General Installation of Automobile Workshop & tools							
Item No	Name of Goods or Related Services	Description	Unit of Measure -ment	Quantity	Specification by the supplier(To be filled by the supplier)	Detailed information brochure attached at Page No.	Pass/Fail (By Purchaser)
1.	Car Jet washer with standard accessories	- Power Supply : 3 Phase - Minimum Motor Power : 1 HP - Minimum RPM : 1400 - Discharge Pressure: 10.0-20MPa (1MPa: 10.2 kgf/cm <sup>2</sup> ) - No of Reciprocating Plungers : 3 - Max Water Discharge: 10-20 lpm	No.	13			
2.	Lifting jack screw type 3 ton	<b>Lifting Jack Screw Type:</b> -Capacity: 3 Ton	No.	13			
3.	Lifting jack screw type 5 Ton capacity	<b>Lifting Jack Screw Type:</b> -Capacity: 5 Ton	No.	12			
4.	Lifting jack screw type 20 Ton capacity	<b>Lifting Jack Screw Type:</b> -Capacity: 20 Ton	No.	11			
5.	Portable Head Light Beam Aligner	- Lux value indication in 1 meter scale & 25 meter scale - Lux meter : Digital - Measuring range Min : 240 mm , Max : 1280 mm - Accuracy : +/- 15% (15-32 Lux) , +/- 10% (32-64 Lux), +/- 5%(64-240 Lux)	No.	1			
6.	Liquid penetrant Inspection kit	Liquid penetrant Inspection kit Consisting of : - Cleaner	No.	1			

		<ul style="list-style-type: none"> <li>- Penetrant</li> <li>- Developer</li> </ul>					
<b>7.</b>	Memory keeper / Battery backups	<ul style="list-style-type: none"> <li>- Should maintain voltage continuity to engine computer, clock and radio memory when vehicle battery is disconnected.</li> <li>- Should Retain radio presets, ECM codes.</li> </ul>	<b>No.</b>	1			
<b>8.</b>	Multi Scan Tool To scan Engine, ABS & EBD, AT, SRS, Body Control and immobilizer	<ul style="list-style-type: none"> <li>- Should be connected to all current laptops/ computers via the USB interface.</li> <li>- Connectivity : Bluetooth, Wireless, USB cable</li> <li>- Should be easily connected to a vehicle of different models of all manufactures using an OBD connector</li> <li>- LED display</li> <li>- Should Measure all actuators and sensors in the vehicle</li> <li>- Multimeter measurements during guided trouble-shooting with automatic transfer of measured values</li> <li>- Automatic control unit search function</li> <li>- Resistance measurement with extended measuring ranges</li> <li>- Continuity tester for fault localisation</li> <li>- Voltage measurement with enhanced measurement functions</li> </ul>	<b>No.</b>	16			
<b>9.</b>	Ultrasonic injection cleaning equipment	<b>Ultrasonic injection cleaning equipment :</b> <ul style="list-style-type: none"> <li>- Main Supply : 220 V AC, Single Phase, 50HZ</li> <li>- Also operatable on 12 V DC</li> <li>- Ultrasonic Cleaning Power : Minimum 80 W</li> <li>- Stimulated RPM Range 10~9900 rpm; step :10 rpm</li> <li>- Time range:1~9999 sec</li> <li>- Fuel tank capacity: Minimum 500 ML</li> </ul>	<b>No.</b>	17			

<b>10.</b>	AC alternator slip ring puller	- AC alternator slip ring puller of Variable Size - Puller Material : Steel	<b>No.</b>	13			
<b>11.</b>	Compression testing gauge suitable for diesel Engine with standard accessories	<b>Compression testing gauge:</b> - Analog Type - 2-1/2 inch gauge - Dual scale gauge reads 0-300 psi (0-2100 kPa)	<b>No.</b>	20			
<b>12.</b>	Connecting rod alignment fixture	<b>Connecting rod alignment fixture :</b> - Capable of checking Straightness and Parallelism with Dial gauge with horizontal Telescopic shaft for mounting collets.	<b>No.</b>	1			
<b>13.</b>	Cylinder bore gauge capacity 20 to 160 mm	<b>Cylinder Bore Gauge :</b> - Display Type: Analog - Accuracy: 0.01mm - Measuring Range:20 to 160 mm	<b>No.</b>	12			
<b>14.</b>	Injector cleaning unit	<b>Injector Cleaning Unit :</b> - For Injector Cleaning of Diesel Engine - Main Supply : 220 V AC, Single Phase,50HZ - Also operatable on 12 V DC	<b>No.</b>	2			
<b>15.</b>	Injector testing set (Hand tester)	<b>Injector testing set (Hand tester):</b> -Comprising of Injection pump with hand lever transparent fuel container with filter, Three way shut off valve with valve spindle to isolate the pressure gauge while operating hand lever at high speed. - High quality Pressure gauge Range: 0 - 400 BAR (0 - 40 MPa).	<b>No.</b>	20			
<b>16.</b>	Piston ring compressor	<b>Piston Ring Compressor :</b> - Maximum size : 5 inches - Minimum size : 2 inches	<b>No.</b>	17			
<b>17.</b>	Piston Ring expander and remover.	<b>Piston Ring Expander and Remover :</b> - Maximum size : 4 inches - Minimum size : 2 inches	<b>No.</b>	17			

<b>18.</b>	Piston Ring groove cleaner	<b>Piston Ring Groove Cleaner :</b> - Multi sizes groove cleaners for cleaning groove of Piston	<b>No.</b>	15			
<b>19.</b>	Spark plug spanner Size: 14mm & 18 mm Long bit	<b>Heavy Duty Spark Plug Spanner Long bit :</b> - Long neck Socket type with T Handle, - Set of Sizes- 14mm,16mm & 18mm(One Each)	<b>No.</b>	23			
<b>20.</b>	Tachometer (Counting type)	<b>Tachometer (Counting type):</b> - Type: Digital - Display: 5-digit Backlight LCD Display - Accuracy: 0.02% +/- 2 digits - Contact Measuring Range: 2-20000 RPM - Non-contact Measuring Range: 2-99999 RPM - Measuring Distance: 50mm-600 mm -To be supplied with suitable power supply	<b>No.</b>	7			
<b>21.</b>	Tyre pressure gauge with holding nipple	<b>Tyre Pressure Gauge With Holding Nipple:</b> - Type : Analog - Pressure Range : 0-170 PSI - Accuracy: $\pm 1$ PSI - Unit: PSI, BAR	<b>No.</b>	20			
<b>22.</b>	Universal puller for removing pulleys, bearings	- Universal puller Capable for Removing Pulleys and Bearings of Size Range : 1" to 8 " -Universal Puller Material : Steel	<b>No.</b>	11			
<b>23.</b>	Vacuum gauge to read 0 to 760 mm of Hg.	<b>- Vacuum Gauge :</b> - Type : Analog - Range :0 to 760 mm of Hg	<b>No.</b>	20			
<b>24.</b>	Valve Lifter	Valve Lifter	<b>No.</b>	12			
<b>25.</b>	Valve spring compressor universal.	Valve Spring Compressor Universal	<b>No.</b>	12			
<b>26.</b>	Automotive exhaust 5 gas analyser (petrol	<b>Automotive exhaust 5 gas analyser (petrol &amp; Diesel):</b> - Exhaust 5 Gas Analyser Petrol ARAI approved	<b>No.</b>	16			

	& Diesel)	to check CO, CO <sub>2</sub> , O <sub>2</sub> and HC & NO. - CO Range : 0- 15 %,Resolution : 0.001% - HC Range :0-20000 ppm, Resolution : 1 ppm - CO <sub>2</sub> Range : 0- 20 %,Resolution : 0.01% - O <sub>2</sub> Range : 0- 25 %,Resolution : 0.01% - NO Range : 0-5000 ppm, Resolution : 1 ppm - Accuracy : ±2 % to ±3 % - Measuring Gas Intake : Minimum 1 ltr/min - Display : LED display - Response time   < 5 Seconds - Warm-up time @25°C & above < 3 Minutes - Operating temperature : 0°C to +50°C, - Power Supply : 230 V/50 Hz AC Mains					
<b>27.</b>	Hydraulic jack HI-LIFT type -3 ton capacity	<b>Hydraulic Jack :</b> - Hydraulic Jack HI-LIFT type: -Capacity : 3 Ton	<b>No.</b>	9			
<b>28.</b>	Hydraulic jack HI-LIFT type - 5 Ton capacity	<b>Hydraulic Jack :</b> - Hydraulic Jack HI-LIFT type: -Capacity : 5 Ton	<b>No.</b>	14			
<b>29.</b>	Spring tension tester	<b>Spring tension tester:</b> - Capable to test the spring up to upto 5" free length - Manually operated - Display : analog. - Capacity to test springs :100 Kg/CM <sup>2</sup>	<b>No.</b>	12			
<b>30.</b>	Tube/ tyre vulcanizing machine	<b>Tube/ Tyre Vulcanizing Machine :</b> - Voltage : 220 V/50Hz Mains - Minimum Heater Capacity :400W x 2 - The electric heating plate with Thermostat to control Heat.	<b>No.</b>	13			
<b>31.</b>	Two post car lift – capacity 4000	<b>Two Post Car Lift :</b> - Capacity : 4000 Kg	<b>No.</b>	14			

	kg Hydraulic Type with Mechanical Arms Locking	<ul style="list-style-type: none"> <li>- Hydraulic Type with Mechanical Arms Locking</li> <li>- Minimum Overall Width:3400 mm</li> <li>- Minimum Width Between Columns:2750 mm</li> <li>- Minimum Drive-Thru:2400 mm</li> <li>- Minimum Over all Height : 3700 mm</li> </ul>					
32.	Tyre Changer Machine	<b>Tyre Changer Automatic Passenger Carrying Vehicle(PCV) &amp; Light commercial vehicle(LCV):</b> <ul style="list-style-type: none"> <li>- Can Work with Tyres upto 23" rim diameter</li> <li>- Motorcycle tyres with optional adaptor</li> <li>- Minimum Motor Power: 1.1 kW</li> <li>- Air Requirement: 8 – 10 bar</li> <li>- Internal Rim Clamping :12" – 23"</li> <li>- External Rim Clamping: 10" – 20"</li> <li>- Bead breaker tire width :3" – 15"</li> <li>- Maximum Tire Diameter: 41"</li> <li>- Power supply Single phase</li> <li>- Complete with all accessories and components</li> </ul>	No.	9			
33.	Wheel alignment Machine – computerised 3D	<b>Latest Wheel alignment Machine for four wheel alignment–Computerised 3D:</b> <ul style="list-style-type: none"> <li>- Rim Size:10" - 22"</li> <li>- Tyre Width:48" - 96"</li> <li>- Wheel Base:79" - 180"</li> <li>- Individual Toe:+/- 35 degrees</li> <li>- Caster:+/- 30 degrees,</li> <li>- Camber:+/- 55 degrees</li> </ul>	No.	16			
34.	Wheel balancing machine For wheel balancing of LMV	<b>Wheel Balancing Machine For wheel balancing of LMV:</b> <ul style="list-style-type: none"> <li>- Motor : Minimum 0.5 HP</li> <li>- Shaft Diameter : Min 38mm</li> <li>- Rim Diameter : 8" - 32"</li> <li>- Rim Width :1" - 20"</li> <li>- Offset :1" - 20</li> <li>- Power Supply :220 - 240 V, 50 - 60 Hz</li> </ul>	No.	11			

		<ul style="list-style-type: none"> <li>- Max. wheel diameter :1050 mm</li> <li>- Wheel width:76-508 mm</li> <li>- Max. wheel weight : 70 Kg</li> </ul>					
<b>35.</b>	Carge winches 3 tonnes	<b>Carge Winches</b> <ul style="list-style-type: none"> <li>- Loading capacity: 3 Ton</li> <li>- Wire rope capacity: 20-150 m</li> </ul>	<b>No.</b>	2			
<b>36.</b>	Carge winches 5 tonnes	<b>Carge Winches</b> <ul style="list-style-type: none"> <li>- Loading capacity: 5 Ton</li> <li>- Wire rope capacity: 20-150 m</li> </ul>	<b>No.</b>	2			
<b>37.</b>	Chain Pulley Block-3 ton capacity with tripod stand	<b>Chain Pulley Block with compatible tripod stand:</b> <ul style="list-style-type: none"> <li>- Capacity :3 Ton</li> </ul> <b>Tripod Stand Specifications :</b> <ul style="list-style-type: none"> <li>- Capacity to lift minimum 3 Ton of load</li> <li>- Minimum Height to Eye : 3000 mm</li> <li>- Minimum Leg Length : 3400 mm</li> <li>- Minimum Weight : 85 Kg</li> <li>- Legs should be Adjustable for un-level ground, shallow slopes and slight inclines</li> <li>- Feet Should be suitable for hard and soft ground.</li> </ul>	<b>No.</b>	13			
<b>38.</b>	Crab	<b>Crab Tool :</b> <ul style="list-style-type: none"> <li>- Size : 6"</li> </ul>	<b>No.</b>	2			
<b>39.</b>	Timing lighter	<ul style="list-style-type: none"> <li>- LED tachometer display reads 0-9999 RPM</li> <li>- Unique flashlight feature</li> <li>- 2/4 cycle and RPM/advance lights</li> </ul>	<b>No.</b>	2			
<b>40.</b>	Fuel injection test bench for calibration of	<ul style="list-style-type: none"> <li>- Speed Range : 0-4,000 RPM in both directions C.W. &amp; A.C.W</li> <li>- Temperature Control Range : 30-50, +/- 0.5</li> </ul>	<b>No.</b>	1			

	fuel pump	deg C - Test Pressure : 18-220 MPa - Testing Injectors : 06 Nos Fitted with Calibrating Nozzle set at standard pressure					
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**Note: For detailed specifications please refer table 3: Technical Specifications**

## 2. Delivery and Completion Schedule

The delivery period shall start as of *date of Signing the Contract*

Lot No.	Description of Goods or Related Services	Delivery Schedule (Duration)	Location	Required Arrival Date of Goods or Completion Date for Related Services
Lot-1	Lot 1: Simulators, Working Models & Cut Section Models	Within 365 Days from the Signing of the contract.	<b>The location of Delivery of various items of Lot-1 attached separately</b>	Within 365 Days from the Signing of the contract.
Lot-2	Lot 2: Engine, Chassis & engine parts	Within 365 Days from the Signing of the contract.	<b>The location of Delivery of various items of Lot-2 attached separately</b>	Within 365 Days from the Signing of the contract.
Lot-3	Lot 3: Machines/ General Installation of Automobile Workshop & tools	Within 365 Days from the Signing of the contract.	<b>The location of Delivery of various items of Lot-3 attached separately</b>	Within 365 Days from the Signing of the contract.

### 3. Technical Specifications

<b>Special Note: 1</b>	As a part of Documentation even if not mentioned all items supplied shall have minimum of 1. User/Operation Manual and 2. Warranty Certificate. Additional requirements for specific items will be explicitly mentioned.
<b>Special Note: 2</b>	The installation has to be carried out as per the guidelines given by the OEM with necessary ground work and fixtures wherever necessary.
<b>Special Note: 3</b>	All Light, Medium and Heavy machineries and item needing installation either on Ground or on Wall is the sole responsibility of the supplier.
<b>Special Note: 4</b>	All costs involved in installation such as materials and Labour is to be borne by the Supplier.
<b>Special Note: 5</b>	Machines and items shall be installed at the identified position in the designated ITI workshop /Laboratory.
<b>Special Note: 6</b>	Warranty of One/Two/.. / means that the Supplier of the item takes full responsibility in ensuring the best working condition of the item during the warranty period.
<b>Special Note: 7</b>	In the event the item is not working the OEM ensure that the item is brought back to best working condition with-in a reasonable period of time not more than 5 days in the worst case.
<b>Special Note: 8</b>	All parts of the machine not intentionally damaged by the user should be replaced free of cost by the supplier.
<b>Special Note: 9</b>	All consumable items if any needing replacement will be supplied by the ITI.
<b>Special Note: 10</b>	All Items of delicate nature shall be supplied in a suitable Cloth/Wooden/ Other suitable storage case/cover for protection of the item from dust and moisture.
<b>Special Note: 11</b>	Detailed information brochures having specifications, make and model number of individual item to be attached.

#### Lot 1: Simulators, Working Models & Cut Section Models

Item No.	Name of Goods or Related Services	Technical Specifications of Item and/or Bureau of Indian Standards (BIS) (if applicable) reference	Features	Accessories	Spare parts	Documents	Installation & Training	Warranty of Equipment/parts
1.	Driving Simulator	<b>- Driving cabin :</b> Driver's cabin with single seating arrangement should be equipped with actual car's equipments / controls as under: Adjustable seat, Seat belts, Steering wheel , Gear shifting lever, Accelerator / Brake & Clutch pedals, Hand brake. Simulator should be housed in a close room type enclosure with projection system and an instructor station. <b>- Instructor Station</b>	-Driving module should be specially designed with focus on car basics, traffic rules and road signs, should also include practice exercises for learning moving	- Software and other Programmes related to Simulator in DVD	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificates	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and	Three Years

		<p>This station should provide the facility to Register the Trainee and set the test. Reports should be printed through this station. Server should be networked with the Simulator Station.</p> <p>- <b>Visual projection</b> Seamless Curved Screen Projection System of 180 Deg using short throw projector giving a realistic panoramic view to the trainee.</p> <p>- <b>Compatibility with VR</b> The simulator should be compatible with Virtual reality kit for future upgrades.</p> <p>- <b>Processing type</b> Computer based processing. Computers for the Simulator should be of branded make.</p> <p>- <b>Rear &amp; side view</b> The system should have provision for rear &amp; side view mirror displayed into the Simulation display.</p> <p>Languages English , Hindi Electric Supply 220 – 240 volts</p> <p><b>SIMULATED FEATURES</b></p> <p>Activated controls Simulator should have all following controls fully activated &amp; simulated</p> <ul style="list-style-type: none"> <li>• Steering wheel,</li> <li>• Gears,</li> <li>• Clutch,</li> <li>• Accelerator,</li> <li>• Brake ,</li> <li>• Handbrake</li> <li>• Windshield wiper,</li> <li>• Lighting combination switch,</li> </ul> <p>Complete instrument cluster Following elements of instrument cluster of actual vehicle should activated on the live instrument cluster:</p> <ul style="list-style-type: none"> <li>• Speedometer,</li> <li>• L / R turn indicator,</li> </ul>	<p>off and stopping, gears shifting, steering control, driving onhills and manoeuvring in city traffic, Handling emergency situations like obstacles avoidances, Reaction time measurement which provide drivers actual response time and other Programmes related to Simulator in DVD</p>				<p>maintenance staff of the Industrial Training Institute</p>	
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		<ul style="list-style-type: none"> <li>• Hand brake indicator,</li> <li>• Head light indicator ,</li> <li>• High beam indicator ,</li> <li>• Hazard switch,</li> <li>• Temperature indicator,</li> <li>• Odometer.</li> </ul> <p>Force feedback steering          Simulator should have steering to give same feeling on turning as observed in actual vehicle.</p> <p><b>TRAINING SOFTWARE – FEATURES VISUAL ENVIRONMENT</b></p> <p><b>TERRAINS</b>          Simulator should have 3D visual environment covering following elements.          1. CITY TERRAIN: Including commercial area , residential area          2. HIGHWAY TERRAIN: Including tunnels, railway crossings          3. HILL TERRAIN: Including gradients, hilly driving environment.          Looks &amp; type of surrounding vehicles, buildings &amp; other objects as per Indian driving conditions.          Please note: THE TERRAIN SHOULD BE DEPICTING INDIAN ROADS AND ROAD MARKINGS , TRAFFIC SIGNALS &amp; ROAD SIGNS SHOULD AS PER INDIAN ROAD CONGRESS (IRC)</p> <p><b>REALISTIC SOUND ENVIRONMENT</b>          Simulator should have high quality stereophonic sound &amp; should capture following elements:</p> <ul style="list-style-type: none"> <li>• Starting ignition sound,</li> <li>• Vehicle engine sound,</li> <li>• Surrounding traffic noise ,</li> <li>• Horn,</li> <li>• Rain drops</li> <li>• Screeching brake sound ,</li> <li>• Indicator's ticking sound.</li> </ul> <p><b>INSTRUCTOR CONTROLS</b>          Customized Scenario settings</p>						
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		<p>The simulator should enable the instructor to customize the following in various combinations:</p> <ul style="list-style-type: none"> <li>• Selection of terrain</li> <li>• Daylight conditions</li> <li>• Weather conditions</li> <li>• Traffic density</li> </ul> <p>- <b>Calibration of the vehicle</b> The Simulator should be capable of self-maintenance including calibration and diagnostics. The systems should have calibration of the following controls for easy self-maintenance:</p> <ul style="list-style-type: none"> <li>• Steering</li> <li>• Brake,</li> <li>• Accelerator</li> <li>• Clutch.</li> </ul> <p>Record and Replay All the Driving Sessions of the User should have the option of recorded and can be replayed.</p> <p><b>TRAINING CURRICULUM</b></p> <p>- <b>Features</b> Progressive training modules as follows to cover comprehensive training curriculum starting from acquiring basics to advanced driving skills developed on an actual city terrain and not test tracks. Training cues in Hindi, English as Guiding aid to learners in clear practice areas &amp; written audio messages. Record and replay option for easy and self-evaluation.</p> <p><b>Training Chapters / Lessons</b> I. Cockpit Drill (Video Demonstration)</p> <ol style="list-style-type: none"> <li>(a) Pre Checks</li> <li>(b) Foot controls</li> <li>(c) Hand Controls</li> <li>(d) Light Switches</li> <li>(e) Instrument Cluster</li> </ol>						
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		<p>II. Basic Training</p> <p>(a) Driving off</p> <p>(b) Stopping Safely</p> <p>(c) Changing Gears</p> <p>(d) Mastering Steering</p> <p>(e) Emergency stopping</p> <p>III. Advanced Training</p> <p>(a) Emerging left and right</p> <p>(b) Uphill</p> <p>(c) Downhill</p> <p>(d) Gears</p> <p>(e) Manuvering around parked cars</p> <p><b>DANGEROUS SCENARIOS</b></p> <p>Simulator should have multiple driving scenarios giving learner an opportunity to drive in different risky situations.</p> <p><b>PERFORMANCE EVALUATION</b></p> <p>Simulator to have provision for evaluating driver throughout the training process .The Evaluation criteria should be as per Rules of Road Regulations (RRR) and Indian Motor vehicle Act.</p> <p>- <b>Report Generation:</b></p> <p>A printed report should be generated at the end of each session. The system should also produce and print a consolidated report of the drivers' entire training period.</p> <p><b>SIMULATED INDIAN ENVIRONMENT</b></p> <p>Free driving in fully immersive environment Simulator should provide complete freedom to drive in simulated Indian environment in different driving situations.</p> <p>i) Normal driving situations.</p> <p>ii) Hazard Perceptions (Risky situations)</p> <p>Different simulated modes / time of day.</p> <p>Simulator should have provision to drive in different simulated modes of day ranging from 0 to 24 hours including Dawn, Day, Dusk and Night</p> <p>Varying traffic density</p> <p>Simulator should have provision to drive / practice in three varying traffic density.</p> <ul style="list-style-type: none"> <li>• Slow traffic</li> <li>• Medium traffic</li> </ul>						
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		<ul style="list-style-type: none"> <li>• High traffic Adverse weather conditions Simulator should have provision to drive / practice in adverse weather conditions and experience.</li> <li>• Fog drive with three different varying visibility options i.e. Low / Medium &amp; Full visibility.</li> <li>• Rain drive with three different intensity of rainfall i.e. Low / Medium &amp; High</li> </ul> <p>Traffic density Simulated vehicle density of 150 vehicles including vehicles like cars, trucks, bus, taxi, motorcyclists, auto rickshaws.</p> <p><b>DRIVER TESTING SOFTWARE CONFIGURATION</b></p> <p><b>- Theory Test Module</b> This Module should offer an Online theory test Module with min 100 Questions to test the driver on his the practical knowledge of Driving. The test should include questions on Road rules, behaviour, driving operations. Randomly selected questions should be auto generated by the Computer for each trainee. There should be a fixed time to appear for each test. Multi Choice question bank should be designed in English Language. Driver Database should be stored and the report after each session should be printable.</p> <p><b>- Driving Ability and Clinical Test</b> Driving Ability and Clinical Test module to test the driver. Module should include 5 Different Test as follows; a. Judgment Test b. Reaction Test c. Anticipation Test d. Aptitude Test e. Colour Vision Deficiency Test</p>						
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		<p>Driving Skill Testing in Controlled Terrain This Module should have tests in driving on a virtual test track with minimum of 10 test variables like :</p> <ul style="list-style-type: none"> <li>• Parking exercise,</li> <li>• Reverse exercise,</li> <li>• S bend,</li> <li>• 90 Deg Turns,</li> <li>• 3 point turns,</li> <li>• Slopes – uphill &amp; downhill</li> <li>• Perpendicular Parking</li> </ul> <p>The Trainee should be tested under a single test on all the variables.</p> <p>- <b>Walk Around Inspection</b> Vehicle Walk around module should be made available for control familiarization and pre start inspection.</p> <p>- <b>Fuel Efficiency</b> This module should be designed to train drivers on eco driving skills. The module should be designed such that captures the various parameters leading to change in fuel consumption. This module should help to improve fuel efficiency.</p>						
2.	Air bag simulator	<p><b>Air bag simulator:</b></p> <ul style="list-style-type: none"> <li>- The simulator adopts the real components of Air bag system to illustrate Air bag safety system structure and working principle.</li> <li>- The simulator should have Driver &amp; Co Driver Air Bags, Seat belts with front seats, crash sensors, air bag ECU, Wiring Harness</li> <li>- Airbag Control ECU Monitors no of Related Sensors within the Vehicle including accelerometers, Wheel Speed Sensors, Seat Occupancy Sensors and Brake Pressure Sensors etc.</li> <li>-When requisite threshold has been reached or exceeded, the air bag control unit will trigger the ignition of a gas generator propellant to rapidly inflate air bag.</li> </ul>	<ul style="list-style-type: none"> <li>- Real and operatable Air bag system</li> <li>- The simulator is fabricated using steel pipe frame with spray painted for good looks and the entire setup is provided with caster wheels with brakes for easy movement of the same</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificates</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

		- As the vehicle occupant collides with and squeezes the bag, the gas escapes in a controlled manner through small Vent Hole.						
3.	Air conditioning service Unit (Car)	<ul style="list-style-type: none"> <li>- Functions: Recovery, Oil discharge, Vacuum, Oil re-integration, Gas Charging</li> <li>- Refrigerant Type: R134a or Equivalent</li> <li>- Operation: Automatic</li> <li>- Refrigerant filling accuracy: <math>\pm 10</math> gram</li> <li>- Vacuum Pump Capacity: 84 l/min(Minimum)</li> <li>- Gas reservoir capacity: 12 litres (Refillable)</li> <li>- Display: LCD Graphic</li> <li>- Power supply :220 V 50 Hz</li> </ul>	<ul style="list-style-type: none"> <li>- Automatic operation</li> <li>- Suitable for All Types of Cars</li> <li>- Fully automatic single gas station for recovering, recycling and recharging R134 refrigerant or Equivalent</li> <li>- Recovery with vacuum pump</li> <li>- Alarm for High pressure, Full bottle &amp; Empty bottle</li> <li>- Service Alarm for maintenance and filter replacement, replacement request</li> <li>- Automatic leak check during vacuum phase</li> <li>- Automatic drain</li> </ul>	- Suitable Capacity voltage Stabilizer for safer operation of AC unit	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

			& stop after recovery - Automatic discharge of non-condensable gases from the bottle					
4.	Car Air conditioning trainer kit	<b>- Made out of Original Parts :</b> - AC compressor - Condenser - Evaporator with thermostatic expansion valve - Receiver with sight glass - All ideal controls and safety controls for car AC - Radiator, its Pipe Lining - Blower / Fan Assembly etc. - Single phase electric motor to run the compressor - Suitable battery to run condenser fan, evaporator fan and to operate magnetic clutch of compressor - Alternator facility to recharge Battery - Other accessories like on/off switch, fan speed selector switch and complete wiring jack and clips	- The Complete System should be mounted on painted iron frame - System in running condition with refrigerant charged. - All the items used Should be new	-The unit to be supplied with test chamber of suitable size with door facility, Inspection glass window and digital temperature indicator to demonstrate the working.	- Standard	- Block Diagram - Wiring Diagram - User/Operating Manual - Warranty Certificates	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
5.	Cut section Model of Mock layout of a motor car – electrical system working model	<b>The mock layout consisting of minimum :</b> - Head Light Circuit - Horn Circuit - Tail Light Circuit - Side Indicators - Brake light Circuit - Ignition Circuit - Working of Self-starter - Charging Circuit (Motor Driven Alternator) - Front Lighting Panel - Dash Board Panel - Ignition System ( sparks from plug to be shown with Distributor & battery) - Car Audio system - Power Window mechanism	- Wiring with parts and accessories of a car to be arranged according to the electrical circuit of a car - Should be mounted on suitable table of suitable dimension.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training	One Year

		<ul style="list-style-type: none"> <li>- Wiper Motor</li> <li>- Anti Theft Device Wiring Circuit</li> <li>- Electric Power Steering Circuit</li> <li>- Immobilizer Circuit</li> <li>- Reverse Parking Assist</li> </ul>					Institute	
6.	Demonstration board Ignition system, ignition coil	<p>The demonstration- working unit consisting of minimum :</p> <ul style="list-style-type: none"> <li>- Ignition switch</li> <li>- Ignition coil</li> <li>- Distributor driven by DC Motor</li> <li>- Spark plugs</li> </ul> <p>- By switching on the switch and by giving rotation to the distributor by DC Motor, Sequential Sparks in the spark plug can be demonstrated</p> <p>-AC to DC convertor shall be provided as an alternative to battery for power input</p>	<ul style="list-style-type: none"> <li>- The Demonstration board should be mounted on painted iron frame.</li> <li>- All the items used should be New</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- Wiring Diagram</li> <li>- Warranty Certificate</li> </ul>	<p>To be delivered at the designated Industrial Training Institute in Himachal Pradesh</p> <p>- As required by the training and maintenance staff of the Industrial Training Institute</p>	One Year

7.	Demonstration board of CRDI system working model	<b>The Demonstration Board for Four Cylinder CRDI Engine consisting of minimum :</b> <ul style="list-style-type: none"> <li>- Diesel Injector</li> <li>- Inlet Manifolds</li> <li>- ECU</li> <li>- CRDI Pump</li> <li>- EGR Valve</li> <li>- Fuel Tank Module</li> <li>- Supporting Sensors such as Lambda Sensor, Engine Speed sensor, Cam Position sensor, Oxygen sensor, Airflow sensor, MAP sensor etc.</li> <li>- Suitable Motor to drive the fuel pump</li> <li>- Necessary wiring connections to show the circuit connections</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> </ul>	<ul style="list-style-type: none"> <li>- The Demonstration board should be mounted on painted iron frame.</li> <li>- All the items used should be New</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- Warranty Certificate</li> <li>- Wiring Diagram</li> </ul>	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
8.	Demonstration board of MPFI system working model	<b>The Demonstration Board for Three Cylinder MPFI Engine consisting of minimum :</b> <ul style="list-style-type: none"> <li>- Injectors</li> <li>- Rail</li> <li>- Inlet manifolds</li> <li>- Throttle body</li> <li>- Distributor</li> <li>- ECU</li> <li>- Canister Purge Valve</li> <li>- Carbon Canister</li> <li>- Fuel Tank Module</li> <li>- Supporting Sensors such as Lambda Sensor, Engine Speed sensor, Cam Position sensor, Oxygen sensor, Airflow sensor, MAP sensor etc.</li> <li>- Crank Pulley</li> <li>- Fuel Tank Module</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> </ul>	<ul style="list-style-type: none"> <li>- The Demonstration board should be mounted on painted iron frame.</li> <li>- All the items used should be New</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- Warranty Certificate</li> <li>- Wiring Diagram</li> </ul>	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

9.	Working Model of power windows	<ul style="list-style-type: none"> <li>- Actual working model of power window of Car/SUV Showing parts like door, glass with motor and its gear arrangement and operating switch.</li> <li>- Single Door should be provided</li> <li>-AC to DC convertor shall be provided as an alternative to battery for power input</li> <li>- Door should be suitable sectioned and arranged to demonstrate the internal construction details showing the minute information's such as motor and its gear arrangement etc.</li> </ul>	- The model should be suitably painted and The entire model shall be mounted on a sturdy iron frame	-Standard	- Standard	- Warranty Certificate	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
10.	Working model of Air Brake Assembly	<p>The working Model of Aiir brake assembly consisting of minimum :</p> <ul style="list-style-type: none"> <li>- One front drum should be cut out show the working internally of drum and whole parts assembly fitted on the frame.</li> <li>- The front drum should run hand operated,</li> <li>- One rear drum assembly (without drum ) brake shoe with liner show working of the brake.</li> <li>- Air compressor</li> <li>- Air Dryer</li> <li>- Unloader valve</li> <li>- Foot valve</li> <li>- Booster</li> <li>- Air tank with safety valve</li> <li>- Control valve</li> <li>- Brake chamber</li> <li>- Foot brake</li> <li>- Hand brake</li> <li>- Brake Light/Stop Light should be functional</li> <li>- Air Pressure gauges should be provided for checking air tank air pressure.</li> <li>- Single phase 220V AC motor should be coupled to the compressor for generation of the air, which is used for the operation of the air brake assembly</li> </ul>	- Complete unit is mounted on a painted sturdy iron frame with caster wheel.	-Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

11.	Cut section models of shock absorbers	<b>Cut section Model of Shock Absorber For Two Wheeler :</b> <ul style="list-style-type: none"> <li>- Telescopic Type</li> <li>- The Model should be suitably sectioned to demonstrate the internal construction details showing the minute information</li> </ul> <b>Cut section Model of Shock Absorber For Four Wheeler :</b> <ul style="list-style-type: none"> <li>- Telescopic Type</li> <li>- The Model should be suitably sectioned to demonstrate the internal construction details showing the minute information</li> </ul>	-The Model should be mounted on iron frame painted. - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
12.	Cut section of cross ply tyres	<b>Cut Section Model of Cross Ply Tyre :</b> <ul style="list-style-type: none"> <li>- Size : 155/65 R13</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>	-The Model should be mounted on iron frame painted - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	

13.	Cut section of radial tyres	<b>Cut Section Model of Radial Ply Tyre:</b> <ul style="list-style-type: none"> <li>- Size : 155/65 R13</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>	<ul style="list-style-type: none"> <li>-The Model should be mounted on iron frame painted.</li> <li>- The item should be supplied in a dust proof wooden box &amp; covered by the acrylic sheet</li> </ul>	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
14.	Cut section working model of automatic transmission Gear box	<b>Cut Section Working Model of Automatic Transmission :</b> <ul style="list-style-type: none"> <li>- Model made out of original full size gearbox</li> <li>- Model suitably sectioned to show the internal mechanism of forward and reverse speeds.</li> </ul>	<ul style="list-style-type: none"> <li>- Complete unit is mounted on a sturdy iron frame</li> </ul>	- Standard	- Standard	- User/Operating Manual	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	

15.	Cut section working model of centrifugal clutch assembly.	<b>Cut Section Working Model of Four Wheeler Centrifugal Clutch Assembly:</b> <ul style="list-style-type: none"> <li>- The model should be made out of original parts such as clutch pulley, clutch liner, clutch plate, clutch spring, and Input shaft. to demonstrate the working of clutch assembly.</li> <li>- Model should be operated by suitable electric motor (220V/50 Hz AC ) with manually speed control for demonstration</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>	- Complete unit is mounted on a painted sturdy iron frame	- Standard	- Standard	- User/Operating Manual	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
16.	Cut section working model of Diaphragm clutch assembly.	<b>Cut Section Working Model of Diaphragm Clutch Assembly:</b> <ul style="list-style-type: none"> <li>- The model should be made out of original parts such as Flywheel, Pressure Plate Diaphragm type ,Clutch plate, fork clutch release bearing, input shaft etc. to demonstrate the working of clutch assembly.</li> <li>- By operating The pedal provided The operation can be demonstrated.</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>	- Complete unit is mounted on a painted sturdy iron frame	- Standard	- Standard	- User/Operating Manual	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	

17.	Cut section working model of Single plate clutch assembly.	<b>Cut Section Working Model of Single Plate Clutch Assembly:</b> <ul style="list-style-type: none"> <li>- The model should be made out of original parts such as Flywheel, Pressure Plate Finger type, Clutch plate, fork clutch release bearing, input shaft etc. to demonstrate the working of clutch assembly.</li> <li>- By operating The pedal provided The operation can be demonstrated.</li> <li>- Model should be suitably sectioned to demonstrate the internal construction details</li> </ul>	- Complete unit is mounted on a painted sturdy iron frame	- Standard	- Standard	- User/Operating Manual	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
18.	Demonstration board of electronic Ignition system, ignition coil	Demonstration Board of Electronic Ignition System <ul style="list-style-type: none"> <li>- The open demonstration- working unit consisting of minimum:</li> <li>- Ignition Switch</li> <li>- Electronic Ignition Coil</li> <li>- HT Wires</li> <li>- Distributor</li> <li>- Four Spark Plugs</li> <li>- Battery</li> </ul>	<ul style="list-style-type: none"> <li>- The model should be supplied with necessary wiring connections.</li> <li>- By switching on the switch and by giving rotation to the Distributor, Sequential Sparks in the spark plugs</li> <li>- Complete unit is mounted on a painted sturdy iron frame</li> </ul>	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year

19.	Different type of Engine Bearing model	<b>Different type of Engine Bearing(Generic Size for Demonstration) Model of(One Each) suitable for Engine:</b> <ul style="list-style-type: none"> <li>- Shell bearing for crankshaft(Main Journal &amp; Big End Journal)</li> <li>- Thrust bearing for Crankshaft</li> <li>- Ball Bearing for Crank Shaft</li> <li>- Bush Bearing for Connecting Rod</li> <li>- Needle bearing for Connecting Rod</li> <li>- Bush bearing for Camshaft &amp; Rocker Arm</li> <li>- Shell bearing for Overhead Cam Shaft</li> <li>- Needle Bearing for Rocker Arm</li> </ul>	<ul style="list-style-type: none"> <li>- Model should be mounted on a wooden board name mentioned of each bearing</li> <li>- The item should be supplied in a dust proof wooden box &amp; covered by the acrylic sheet</li> </ul>	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
20.	Different type of piston model	<b>Different Type of Piston Model(Generic Size for Demonstration(One Each) :</b> <ul style="list-style-type: none"> <li>- As Per Piston Head Design :Dome head, Flat Head, Concave Head, Irregular Head.</li> <li>- As Per Skirt : Solid Skirt &amp; Split Skirt</li> <li>- As Per Ring Groove :Rectangular Groove, Taper Faced Ring Groove, Barrel Faced Ring Groove, Inside Bevel Ring Groove, Key Stone Ring Groove.</li> <li>- As per gudgeon pin : Fixed Gudgeon Pin, Semi Fixed Gudgeon Pin, Full Floating Gudgeon Pin. All to be provided with Lock.</li> </ul>	<ul style="list-style-type: none"> <li>- All the Piston Models should be mounted on a wooden board name mentioned of each type of Piston.</li> <li>- The item should be supplied in a dust proof wooden box &amp; covered by the acrylic sheet</li> </ul>	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	

21.	Functional/experiment model of different type of sensors.	Functional/experiment model of different type of sensors consisting of minimum: - Petrol injector - Inlet manifolds - Throttle body - Distributor - ECU - Canister Purge Valve - Carbon Canister - Fuel Tank Module - Supporting Sensors such as Throttle Position Sensor, Manifold Absolute Pressure Sensor, Engine Coolant Temperature Sensor, Vehicle Speed Sensor, Oxygen Sensor, Crankshaft Position Sensor, Camshaft Position Sensor, Intake Air Temperature Sensor, Mass Air Flow Sensor, Knock Sensor etc. -AC to DC convertor shall be provided as an alternative to battery for power input	- The Demonstration board should be mounted on painted iron frame. - All the items used should be New.	- Standard	- Standard	- Warranty Certificate - Wiring Diagram	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
22.	Radiator cut section-cross flow	<b>Cut Section Model of Radiator :</b> - Cross Flow Type - Radiator with sectioned side tanks, radiator core to demonstrate the internal construction details.	- The Model should be mounted on painted iron frame - Radiator should be corrosion free and dent free.	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	

23.	Radiator cut section-down flow	<b>Cut Section Model of Radiator :</b> <ul style="list-style-type: none"> <li>- Down Flow Type</li> <li>- Radiator with sectioned upper &amp; lower tanks, radiator core and cap to demonstrate the internal construction details.</li> </ul>	<ul style="list-style-type: none"> <li>- The Model should be mounted on painted iron frame</li> <li>- Radiator should be corrosion free and dent free.</li> </ul>	- Standard	- Standard		<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	
24.	Steering assembly - Rack & pinion	<b>Rack &amp; Pinion Steering Assembly</b> <b>Comprising of :</b> <ul style="list-style-type: none"> <li>- Steering wheel,</li> <li>- Steering Column &amp; Steering Shaft</li> <li>- Rack &amp; Pinion Assembly</li> <li>- Tie Rod, Tie Rod Ends &amp; all other steering linkages</li> <li>- Boot</li> <li>- Brake Assembly with Wheels</li> </ul>	<ul style="list-style-type: none"> <li>- The assembly should be operational</li> <li>- All items should be mounted on suitable iron frame and easily operatable.</li> </ul>	- Standard	- Standard	- Warranty Certificate	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

25.	Steering assembly - Worm & roller	<b>Worm &amp; Roller Steering Assembly Comprising of minimum :</b> - Steering wheel, - Steering Column & Steering Shaft - Worm & Roller Steering Gear Box - Drop Arm - Idler Arm - Tie Rod Ends - Centre Link - Brake Assembly with Wheels	- The assembly should be operational - All items should be mounted on suitable iron frame and easily operatable.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
26.	Steering assembly - Recirculating ball	<b>Recirculating Ball Steering Assembly Comprising of minimum :</b> - Steering wheel - Steering Column & Steering Shaft - Recirculating ball Steering Gear Box - Drop Arm - Pitman Shaft - Track Rod - Tie Rod - Steering Arms - Brake Assembly with Wheels	- The assembly should be operational - All items should be mounted on suitable iron frame and easily operatable.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

27.	Steering assembly - Power steering	<b>Power steering(Hydraulic) Assembly Comprising of minimum :</b> <ul style="list-style-type: none"> <li>- Steering Wheel</li> <li>- Steering Column</li> <li>- Power Steering Unit ( Rack &amp; Pinion Type)</li> <li>- Power Steering Pump with Oil Reservoir</li> <li>- Hydraulic Hoses</li> <li>- Tie Rod, Tie Rod Ends &amp; all other steering linkages</li> <li>- Brake Assembly with Wheels</li> <li>- Suitable Single Phase Motor to run the power steering pump</li> </ul>	<ul style="list-style-type: none"> <li>- The assembly should be operational</li> <li>- All items should be mounted on suitable iron frame and easily operatable.</li> </ul>	- Standard	- Standard	- Warranty Certificate	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year
28.	Steering assembly - Electric Assisted Power Steering	<b>Electric Assisted Power Steering Comprising of minimum :</b> <ul style="list-style-type: none"> <li>- Steering Wheel</li> <li>- Steering Column</li> <li>- Rack &amp; Pinion Assembly</li> <li>- Signal Sensors</li> <li>- Electric Motor and Motor Control Module with compatible battery supply</li> <li>- Tie Rod, Tie Rod Ends &amp; all other steering linkages</li> <li>- Brake Assembly with Wheels</li> </ul>	<ul style="list-style-type: none"> <li>- The assembly should be operational</li> <li>- All items should be mounted on suitable iron frame and easily operatable.</li> </ul>	- Standard	- Standard	- Warranty Certificate	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

29.	Turbocharger cut sectional view Latest WGT type	<b>Actual Cut Section of a Latest WGT type Turbocharger:</b> <ul style="list-style-type: none"> <li>- Turbocharger should be suitably sectioned to show following components:</li> <li>- turbine</li> <li>- impeller</li> <li>- compressor wheels</li> <li>- Waste Gate Valve</li> <li>- Inlet Manifold</li> </ul>	<ul style="list-style-type: none"> <li>- The sectioned parts to be suitably painted to demonstrate The internal construction details</li> <li>- The item should be supplied in a dust proof wooden box &amp; covered by the acrylic sheet</li> </ul>	- Standard	- Standard		<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	
30.	Working model of torque converter of LMV	<b>Working model of torque converter of LMV:</b> <ul style="list-style-type: none"> <li>- Driven by compatible Variable Speed Single Phase Motor to demonstrate the working of Torque Converter.</li> </ul>	<ul style="list-style-type: none"> <li>-The Model should be mounted on suitable stand for safety and working purpose.</li> </ul>	- Standard	- Standard	- Warranty Certificate	<ul style="list-style-type: none"> <li>To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

31.	Bus AC tutorial model	<b>Bus AC tutorial model consisting of minimum:</b> <ul style="list-style-type: none"> <li>- AC compressor</li> <li>- Condenser</li> <li>- Evaporator with thermostatic expansion valve</li> <li>- Receiver with sight glass</li> <li>- All ideal controls and safety controls for Bus AC</li> <li>- Radiator, its Pipe Lining</li> <li>- Blower / Fan Assembly etc. and air-conditioning distribution/ducts of Bus with grill</li> <li>- Single phase electric motor to run the compressor</li> <li>- Suitable battery to run condenser fan, evaporator fan and to operate magnetic clutch of compressor</li> <li>- Alternator facility to recharge Battery</li> <li>- Other accessories like on/off switch, fan speed selector switch and complete wiring jack and clips</li> </ul>	<ul style="list-style-type: none"> <li>- The Tutorial Model should be mounted on painted iron frame</li> <li>- System in running condition with refrigerant charged.</li> <li>- Suitable size of insulated wooden cabinet with door and inspection window</li> </ul>	-The tutorial model should be provided with test chamber of suitable size made up of transparent fabric sheet leak proof with inspection window, door and digital temperature indicator to demonstrate the working.	- Standard	<ul style="list-style-type: none"> <li>- Block Diagram</li> <li>- Wiring Diagram</li> <li>- User/Operating Manual</li> <li>- Warranty Certificates</li> </ul>	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
32.	Cut section of 6 cylinder diesel engine with moving condition to show momentum of internal parts	The model should be made out of full size original six cylinder, four stroke Diesel engine comprising of parts and accessories like Six cylinders, cylinder head, inlet and Exhaust manifolds, Fuel pump, oil pump, Water pump, Fuel Filter, Fuel Injection pump, injectors, self-starter, alternator. <ul style="list-style-type: none"> <li>- Suitable single phase AC Motor should be coupled through a Reduction drive unit to the engine by which the model can be demonstrated at very low speed of about 15 to 20 rpm.</li> <li>- By running the engine, the working of individual parts and accessories like Crankshaft, Camshaft, Connecting rod, Pistons, Valves, different pumps, can be demonstrated.</li> <li>-The Injector should spray as per firing order with LED light Simultaneously.</li> </ul>	<ul style="list-style-type: none"> <li>- The sectioned parts to be suitably painted to demonstrate the internal construction details showing the minute information and momentum of internal parts</li> <li>- The Engine should be mounted on painted iron frame.</li> </ul>	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	

**Lot 2: Engine, Chassis & engine parts**

Item No.	Name of Goods or Related Services	Technical Specifications of Item and/or Bureau of Indian Standards (BIS) (if applicable) reference	Features	Accessories	Spare parts	Documents	Installation & Training	Warranty of Equipment/parts
1.	Distributor –Duel advance type	<b>Distributor :</b> - Duel advance type	- Standard	- High Tension Chords	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
2.	Distributor-Reluctance type	<b>Distributor :</b> - Reluctance type	- Standard	- High Tension Chords	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
3.	Electrical horn ( different types )	<b>Electrical Horn(One Each) :</b> - Windtone Type & Diaphragm Type - Volts : 12 V DC - Current :2.5 Amp. Max	- Suitable for All Types of Vehicle - The part should be brand new	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
4.	Multi-point fuel injection pump	<b>Multi-point fuel injection pump :</b> This Fuel Injection Pump should be compatible with MPFI Engine being procured at at Sr No. 177 of MMV Trade Syllabus.	- This item will be used by trainees for practical integration with the MPFI Engine.	- Standard	- Standard	- User/Operating Manual - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year

5.	Thermostat for Use with Petrol MPFI Engine	-This Thermostat is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	- The item Should be New - This item will be used by trainees for practical integration with the MPFI Engine.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
6.	Thermostat for Use with Diesel Engine – CRDI - 4 stroke	-This Thermostat is to be used with CRDI Engine being procured at SR. NO 184 of Mechanic diesel Trade Syllabus.	- The item Should be New - This item will be used by trainees for practical integration with the CRDI Engine.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
7.	Alternator assembly used for LMV	-This Alternator assembly is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	- This item will be used by trainees for practical integration with the MPFI Engine. - Nominal output >50 Amp - The item should be New	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
8.	Electronic engine control module for LMV MPFI	-This Electronic engine control module is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	- This item will be used by trainees for practical integration with the MPFI Engine. - The item should be New	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
9.	Petrol Engine(4-stroke) Motor Cycle/Scooter along with special tools	<b>Single cylinder Motorcycle/Scooter Engine :</b> - Engine Displacement Range : 90-180 cc. - Engine Cycle : Four Stroke - Fuel : Petrol - Engine should have all the fittings such that the working of the engine can be	- Engine and all its associated items should be on a genuine chassis as in an actual Two-wheeler.	- To be supplied with all tools for servicing including engine special tools (Manual Clutch Puller, Magneto	- Standard	- User/Operating Manual - Warranty Certificate - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in	One Year

		checked. Should also have its integral parts such as Fuel Tank, Ignition switch, silencer, Wheels such that working of the engine can be checked on road and fault finding can be done.	- Should be able to test the running on road with all controls such as Clutch, Throttle, Brake etc., - Engine and All items supplied should be new.	Spanner/Puller, T Socket of different sizes for assembly/disassembly of engine)		from the Engine OEM.	Himachal Pradesh	
10.	Starter motor axial type	<b>Starter Motor :</b> - Starter motor axial type - Compatible with Petrol/Diesel Engine	- The item should be New	-Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
11.	Starter motor pre-engagement type	<b>Starter Motor :</b> - Starter motor Pre-engagement type - Compatible with Petrol/Diesel Engine	- The item should be New	-Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
12.	Starter motor Co-axial type	<b>Starter Motor :</b> - Starter motor Co-axial type - Compatible with Petrol/Diesel Engine	- The item should be New	-Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
13.	Wiper motor assembly	<b>Wiper motor Complete assembly:</b> - Compatible with LMV- Petrol/Diesel - The assembly should be supplied along with wiper blade.	- The item should be New	-Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in	One Year

							Himachal Pradesh	
14.	Cylinder liner- Dry & press fit liner	<b>Cylinder liner :</b> - Dry liner for engine cylinder(Press Fit)	- The item used should be New	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
15.	Cylinder liner- wet liner & slide fit liner	<b>Cylinder liner :</b> - Wet liner for engine cylinder with Rubber 'O' Ring( Side fit liner)	- The item used should be New	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
16.	Disk brake in working condition with caliper assembly with all parts	The Working Model of LMV disk brake assembly consisting of following minimum parts & practically demonstrable: - Brake disc Assembly - Caliper assembly - Tandem Master Cylinder & Operating Mechanism - Brake Hoses, Oil Reservoir with Oil - Pedal	- Complete unit is mounted on a painted sturdy iron frame - Disc should be run by suitable electrical motor with facility for changing the speed along with necessary safety circuit for motor to show working of brake system. - Should be able to rotate the disc manually as and when desired.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
17.	Drum brake assembly in Working Condition	The Working Model of drum brake assembly should have minimum: - Brake drum Assembly - Drum with liner plate, wheel cylinder and	- Complete unit is mounted on a painted sturdy iron frame	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated	One Year

		operating mechanism - Wheel Cylinder - Tandem Master Cylinder & Operating Mechanism - Brake Hoses, Oil Reservoir with Oil - Brake Pedal	- Drum should be run by suitable electrical motor with facility for changing the speed along with necessary safety circuit for motor to show working of brake system. - Should be able to rotate the drum manually as and when desired.				Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	
18.	Front axle ( Rzeppa Joint) with stand for Dismantling and assembly	Front axle (Rzeppa Joint) of a Generic LMV of Engine Minimum 1000cc Capacity(petrol/Diesel)	- The axle should be mounted on stand	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
19.	Fuel feed pump for diesel	-This Fuel feed pump for diesel is to be used with Fuel injection pump (Diesel) inline being procured at SR. NO 61 of MMV Trade Syllabus.	- Hand operated Plunger Type - The item should be New - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
20.	Fuel injection pump (Diesel) inline	<b>Fuel injection pump (Diesel) Inline :</b> - Complete Pump assembly suitable for 4/6 cylinders Diesel engine - RSV Mechanical Pneumatic Governor Type	- The part should be New - The item should be supplied in a dust proof wooden box & covered by the	- Standard	- Standard	- Complete Basic setting Chart - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal	One Year

			acrylic sheet.				Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	
21.	Fuel injection pump dismantling tool kit /Universal Vice	-This dismantling tool kit /Universal Vice is to be used for dismantling & assembling Fuel injection pump (Diesel) inline being procured at SR. NO 72 of Mechanic diesel Trade Syllabus.	- Should be provided in Rugged hard case.	- Standard	- Standard	"- Complete Basic setting Chart - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
22.	Distributor Type fuel rotary pump (DPC) pump along with special tools and accessories.	<b>Fuel injection pump (Diesel) :</b> - Type :Distributor fuel rotary pump (DPC) - Complete Pump assembly compatible for 4 cylinders Diesel engine	- To be supplied with along with all tools & special tools and accessories for dismantling & assembling Fuel injection pump	- Standard	- Standard	- Complete Basic setting Chart - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

23.	Full floating axle Assembly	<b>Full floating axle Assembly :</b> The Assembly should be consist of minimum : - Full floating axle - Differential assembly - Brake assembly	- Complete unit is mounted on a sturdy frame - Drum & axle casing should be with all components in working condition - Working can be demonstrated by operating the crank handle fitted on the differential pinion.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
24.	Semi-floating axle assembly	<b>Semi floating axle Assembly :</b> The Assembly should be consist of minimum : - Semi floating axle - Differential assembly - Brake assembly	- Complete unit is mounted on a sturdy frame - Drum & axle casing should be with all components in working condition - Working can be demonstrated by operating the crank handle fitted on the differential pinion.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
25.	Injector – Multi hole type	Complete Multi hole type Injector Assembly	- The item should be New - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year

26.	Injector – Pintle type	Complete Pintle type Injector Assembly	<ul style="list-style-type: none"> <li>- The item should be New</li> <li>- The item should be supplied in a dust proof wooden box &amp; covered by the acrylic sheet</li> </ul>	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year
27.	Radiator pressure cap(LMV)	- This Radiator pressure cap for LMV is to be used with MPFI Engine being procured at SR. NO 177 of MMV Trade Syllabus.	<ul style="list-style-type: none"> <li>- The item Should be New</li> <li>- This item will be used by trainees for practical integration with the MPFI Engine.</li> </ul>	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
28.	Radiator pressure cap	- This Radiator pressure cap is to be used with CRDI Engine being procured at Sr No. 184 of Mechanic Diesel Trade Syllabus.	<ul style="list-style-type: none"> <li>- The item Should be New</li> <li>- This item will be used by trainees for practical integration with the CRDI Engine.</li> </ul>	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year
29.	Synchronous Gear box with 5 Forward & 1 Reverse Gear for Use with CRDI Diesel Engine	<b>Purpose :</b> '-This Synchronous Gear box with 5 Forward & 1 Reverse Gear is to be integrated with CRDI Engine being procured at SR. NO 164 of MMV Trade Syllabus.	<ul style="list-style-type: none"> <li>- Complete unit is mounted on a painted sturdy frame suitable for Dismantling and assembly practice.</li> <li>- This item will be used by trainees for practical integration with the CRDI Engine.</li> </ul>	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

30.	Working model of Tandem master cylinder with booster	The working Model should be made of following minimum parts : - Tandem Master Cylinder - Complete Vacuum Booster System consisting of suitable vacuum pump and other necessary parts.	- Standard - This item should be independently operatable - All the items should be new	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
31.	Tandem master cylinder with booster	-This Tandem master cylinder with booster is to be used with Working model of Tandem master cylinder with booster being procured at SR. NO 155 of MMV Trade Syllabus.	- The item Should be New - This item will be used by trainees for practical integration with the Working model of Tandem master cylinder with booster.	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
32.	Tubed tyre of car, trucks & motorcycle	<b>Tyre(One Each) :</b> Tyre with Tube for Motorcycle: - Size : 100/90-17 - Fitted on a suitable alloy wheel Tyre with Tube for Car: - Size : 155/65 R13 - Fitted on a suitable alloy wheel Tyre with tube for Truck: -Size :10" X 20" 16 PR - Fitted on a suitable wheel	- All items Should be New	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
33.	Tubeless tyre of cars & trucks	<b>Tubeless Tyre(One Each)</b> Tubeless Tyre with Tube for Car: - Size : 155/65 R13 - Fitted on a suitable alloy wheel Tubeless Tyre with tube for Truck: - Size :10" X 20" 16 PR - Fitted on a suitable wheel	- All items Should be New	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
34.	Tyre & split rim wheel assembly	Tyre & Split Rim Wheel Assembly for Two Wheeler	- All items Should be New	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial	One Year

							Training Institute in Himachal Pradesh	
35.	Automotive Water pump for dismantling and assembling	- This Automotive Water pump for dismantling and assembling is to be used with CRDI Engine being procured at Sr No. 164 of MMV Trade Syllabus..	- The item Should be New - This item will be used by trainees for practical integration with the CRDI Engine. - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
36.	Water pump for dismantling and assembling	- This Water pump for dismantling and assembling is to be used with CRDI Engine being procured at Sr No. 184 of Mechanic Diesel Trade Syllabus..	- The item Should be New - This item will be used by trainees for practical integration with the CRDI Engine. - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year
37.	Diesel Engine – CRDI - 4 stroke for Dismantling and assembling with swivelling stand	Engine Specifications: - Latest 4 Stroke 4 Cylinder - Fuel Type : Diesel - Engine Displacement :800-1600cc - Fuel Injection System : CRDI, Turbocharged - The Diesel Engine should be in running condition, with ECM, BCM, a Ignition Switch with Keys, all sensors(Air Mass Flow, EGR, Lambda/Oxygen Sensor, Fuel Pressure	- The Engine Assembly Should be New - The Engine should be possible to mount on a swivelling stand with 360 degree rotation and	- Standard	- Standard	- User/Operating Manual - Warranty Certificate from OEM or Proof of New Engine to be provided - List of Local	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required	One Year

		<p>Regulator, Rail Pressure Sensor, Crank Angle/RPM/TDC Sensor, Coolant Temperature Sensor, Cam Angle Sensor, Boost Pressure Sensor, Fuel Temperature &amp; Water in Fuel Filter Sensor), wiring, fuel feed &amp; cooling system &amp; instrument cluster, Radiator with Intercooler and Cooling Fan, Air Filter Assy, A Mounting, Fuse Box, Glow Plug Timer, Fuel Filter, Engine Oil Pressure Switch, Alternator, Starter Motor</p> <ul style="list-style-type: none"> <li>- Instrument Cluster should display Fuel level, Battery Charging Light, Oil Pressure Light, Engine RPM.</li> <li>- Fuel Tank of Minimum Capacity 10 Litre, Engine Accessories- Silencer, and compatible Battery with clamp, Safety Guard for Silencer &amp; Radiator.</li> </ul>	<p>interlock-able at different positions.</p> <ul style="list-style-type: none"> <li>- A large oil drip pan should be provided at the bottom to collect the small screws, parts and oil dripping.</li> <li>- Separate Trolley with castor wheels on which radiator assembly with perforated safety guard is fixed.</li> <li>- Separate Trolley with castor wheels on which Battery, panel Board, fuel tank, with wiring harness is fixed.</li> <li>- Any other accessories required to run the engine and test its performance.</li> <li>- Complete tool kit required for Dismantling and assembling the Engine.</li> </ul>			Service Providers	by the training and maintenance staff of the Industrial Training Institute	
38.	Diesel engine ( Running condition ) Stationary type	<p>Diesel engine ( Running condition ) Stationary type:</p> <ul style="list-style-type: none"> <li>- Type : Vertical, Single Cylinder, Water-Cooled, Four Stroke Cycle, OH valves, Compression Ignition Diesel Engine</li> <li>- Minimum Rated Power : 5 HP</li> </ul>	<ul style="list-style-type: none"> <li>- The assembly should be mounted on iron frame and painted.</li> <li>- All items should be New</li> <li>- Should be provided with Air</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate from OEM or Proof of New Engine to be provided</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	One Year

			Intake System, Exhaust System, Fuel Supply System, Oil Lubrication System and other standard accessories etc.			- List of Local Service Providers	- As required by the training and maintenance staff of the Industrial Training Institute	
39.	Four stroke petrol engine with CNG setup-working condition	<p>Engine Specifications: :</p> <ul style="list-style-type: none"> <li>- Fuel Type : Petrol &amp; CNG</li> <li>- Fuel Injection System : MPFI</li> <li>- Engine Displacement :800-1600 cc</li> <li>- Cycle : Four Stroke</li> <li>- No of Cylinders : 3/4</li> <li>- Engine should be supplied with ECM, BCM Ignition Switch with Keys, all sensors( Crank Angle/RPM/TDC Sensor, Oxygen/Lambda Sensor, Coolant Temperature Sensor, Engine Oil Pressure Switch, Absolute Pressure Sensor, Throttle Position Sensor), wiring, fuel feed system, Air Intake &amp; Exhaust System, cooling system, Engine Starting System and Charging System, Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter, Lubrication System with compatible battery &amp; instrument cluster with CNG/ Petrol selection switch on Panel</li> <li>- Instrument Cluster should display Fuel level, Battery Charging Light, Engine Oil Pressure Light, and Coolant High Temperature Warning Light.</li> </ul> <p>Fuel Tank of Capacity Minimum 10 Litre, CNG Tank/ Cylinder of Capacity Minimum 7 Kgs.</p> <p>Engine Accessories- Silencer, New Battery with clamp, and Wire Mesh/Perforated Sheet - Safety Guards for Radiator and Silencer.</p>	<ul style="list-style-type: none"> <li>-All the items should be new</li> <li>- The assembly should be mounted on iron frame and painted.</li> <li>- Any other accessories required to run the engine and test its performance.</li> <li>- This assembly should be independently operatable</li> </ul>	- Filled CNG Gas Cylinder(Re-fillable) mounted on trolley for running the Engine	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate from OEM or Proof of New Engine to be provided</li> <li>- List of Local Service Providers</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

40.	Heavy Commercial vehicle type Fitted with Latest 06 cylinder CRDI diesel engine with all parts and accessories.(without body on frame), Non-Air Conditioned	<ul style="list-style-type: none"> <li>- Transmission Type : Manual</li> <li>- No of Gears(Minimum) : 5 Forward+1 Reverse</li> <li>- Engine Displacement(Minimum) : 5500 cc</li> <li>- Drive : Rear Wheel drive</li> <li>- Clutch Type: Single Clutch Plate Hydraulic Assisted</li> <li>- Comfort Features: <ul style="list-style-type: none"> <li>- Air Brake</li> <li>- Push Back Front Seats</li> <li>- Seat Belts &amp; Warning</li> <li>- Power Steering</li> <li>- Anti Glare Rear View Mirror</li> <li>- Engine Immobilizer</li> <li>- Seat Belt Warning</li> </ul> </li> <li>- Fitted with Latest 06 cylinder CRDI diesel engine with all parts and accessories</li> <li>All other standard Specifications of any standard HCV</li> </ul>	<ul style="list-style-type: none"> <li>- Seat Upholstery : Fabric</li> <li>- Mud Guard Flaps</li> </ul>	<ul style="list-style-type: none"> <li>- One Spare Wheel</li> <li>- Tool Kit With Jack</li> <li>- First Aid Kit</li> <li>- Warning Reflector with Stand</li> </ul>	<ul style="list-style-type: none"> <li>- Spare Head Light Bulbs</li> <li>- Spare Ignition Key</li> </ul>	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Service Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificates</li> <li>- Insurance Certificates</li> <li>- Registration Certificate in the name of Industrial Training Institute of Delivery Location</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	3yrs comprehensive
41.	MPFI petrol engine with swivelling stand along with special tools for dismantling and assembling	<p>Engine Specifications: :</p> <ul style="list-style-type: none"> <li>- Fuel Type : Petrol</li> <li>- Fuel Injection System : MPFI</li> <li>- Engine Displacement :800-1600 cc</li> <li>- Cycle : Four Stroke</li> <li>- No of Cylinders : 3/4</li> <li>- Engine should be supplied with ECM, BCM</li> </ul> <p>Ignition Switch with Keys, all sensors( Crank Angle/RPM/TDC Sensor, Oxygen/Lambda Sensor, Coolant Temperature Sensor, Engine Oil Pressure Switch, Absolute Pressure Sensor, Throttle Position Sensor), wiring, fuel feed system, Air Intake &amp; Exhaust System, cooling system, Engine Starting System and Charging System, Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump &amp; Filter, Lubrication System with compatible battery &amp; instrument cluster</p> <ul style="list-style-type: none"> <li>- Instrument Cluster should display Fuel level, Battery Charging Light, Engine Oil</li> </ul>	<ul style="list-style-type: none"> <li>-All the items should be new</li> <li>- The assembly should be mounted on iron frame and painted.</li> <li>- Any other accessories required to run the engine and test its performance.</li> <li>- This assembly should be independently operatable</li> </ul>	<ul style="list-style-type: none"> <li>- All tools and special tools for dismantling and assembling Engine and standard accessories</li> </ul>	<ul style="list-style-type: none"> <li>- Standard</li> </ul>	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate from OEM or Proof of New Engine to be provided</li> <li>- List of Local Service Providers</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year

		Pressure Light, and Coolant High Temperature Warning Light. Fuel Tank of Capacity Minimum 10 Litre, - Engine Accessories- Silencer, Compatible Battery with clamp, and Wire Mesh/Perforated Sheet - Safety Guards for Radiator and Silencer.						
42.	Transfer case with stand for Dismantling and assembly.	-This Transfer case is to be integrated with Synchronous Gear box being procured at SR. NO 154 of MMV Trade Syllabus.	- Complete unit is mounted on a painted sturdy frame suitable for Dismantling and assembly practice. - This item will be used by trainees for practical integration with Synchronous Gear box.	- Standard	- Standard		- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	
43.	Diesel Engine – CRDI - 4 stroke Engine assembly with fault simulation board in working condition	<b>Complete Engine assembly with Fault simulation Board with following minimum :</b> - Engine Fuel Type : Diesel - Fuel Injection System : CRDI, Turbocharged - Cycle : Four Stroke - No of Cylinders : 4 - Engine Displacement(Minimum) : 1200-2200 cc - The Diesel Engine should be in running condition, with ECM, BCM, Ignition Switch with Keys, all sensors(Air Mass Flow, EGR, Lambda/Oxygen Sensor, Fuel Pressure Regulator, Rail Pressure Sensor, Crank Angle/RPM/TDC Sensor, Coolant Temperature Sensor, Cam Angle Sensor, Boost Pressure Sensor, Fuel Temperature & Water in Fuel Filter Sensor), wiring, fuel feed & cooling system & instrument cluster, Radiator with Intercooler and Cooling Fan, Air Filter Assy, A Mounting, Fuse Box, Glow Plug Timer, Fuel Filter, Engine Oil Pressure	-All the items should be new - The assembly should be mounted on iron frame and painted. - Any other accessories required to run the engine and test its performance. - This assembly should be independently operatable - Fault setting bank for minimum 8 sensors and with diagnostic socket & Scanner to	- Standard	- Standard	- User/Operating Manual - Warranty Certificate from OEM or Proof of New Engine to be provided - List of Local Service Providers	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One year

		Switch, Alternator, Starter Motor - Instrument Cluster should display Fuel level, Battery Charging Light, Oil Pressure Light, Engine RPM. - Fuel Tank of Minimum Capacity 20 Litre, Engine Accessories- Silencer, and compatible Battery with clamp, Safety Guard for Silencer & Radiator.	read the faults. - Engine management circuit diagram to be printed on the panel board					
44.	Working Condition of Petrol MPFI Engine Assembly with fault simulation board	<b>Complete Engine assembly with Fault simulation Board with following minimum :</b> - Fuel Type : Petrol - Fuel Injection System : MPFI - Engine Displacement :800-1600 cc - Cycle : Four Stroke - No of Cylinders : 3/4 -Engine should be supplied with ECM, BCM Ignition Switch with Keys, all sensors( Crank Angle/RPM/TDC Sensor, Oxygen/Lambda Sensor, Coolant Temperature Sensor, Engine Oil Pressure Switch, Absolute Pressure Sensor, Throttle Position Sensor), wiring, fuel feed system, Air Intake & Exhaust System, cooling system, Engine Starting System and Charging System, Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump & Filter Radiator with Cooling Fan, Air Filter Assy., Fuse Box, Fuel Pump & Filter, Lubrication System with compatible battery & instrument cluster - Instrument Cluster should display Fuel level, Battery Charging Light, Engine Oil Pressure Light, and Coolant High Temperature Warning Light. Fuel Tank of Capacity Minimum 10 Litre, Engine Accessories- Silencer, Compatible Battery with clamp, and Wire Mesh/Perforated Sheet - Safety Guards for Radiator and Silencer.	-All the items should be new - The assembly should be mounted on iron frame and painted. - Any other accessories required to run the engine and test its performance. - This assembly should be independently operatable - Fault setting bank for minimum 6 sensors and with diagnostic socket & Scanner to read the faults. - Engine management circuit diagram to be printed on the panel board	- Standard	- Standard	- User/Operating Manual - Warranty Certificate from OEM or Proof of New Engine to be provided - List of Local Service Providers	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One year

45.	Diesel Engine 4 stroke vertical (up to about 10 KW/15HP)	<b>Diesel engine 4 stroke :</b> <ul style="list-style-type: none"> <li>- Type : Vertical self-start with battery</li> <li>- Power Rating : Up to 10 Kw/15HP,</li> <li>- No of Cylinder : Minimum 2</li> <li>- Cooling : Water Cooled</li> <li>- Fuel tank Capacity: 10 to 20 litres.</li> </ul>	<ul style="list-style-type: none"> <li>-The assembly should be provided with all standard accessories and mounted on painted iron frame.</li> <li>- The Engine Should be New.</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One year
46.	Diesel Engine upto 3.5 KW /4.5 HP fitted with pump	<b>Diesel Engine Fitted with Pump:</b> <ul style="list-style-type: none"> <li>-Self start with battery</li> <li>- Engine Type :Single Cylinder, Four Stroke Cycle, Compression Ignition Diesel Engine</li> <li>- Engine Power Rating : Up to 3.5 KW/4.5 HP</li> <li>- Pump Type : Centrifugal</li> <li>- Pump Head Range: 7- 18 metres</li> </ul>	<ul style="list-style-type: none"> <li>-The assembly should be provided with all standard accessories and mounted on painted iron frame.</li> <li>- The Engine and Pump should be New.</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One year
47.	Diesel Engine six Cylinder in running condition	<b>Latest Diesel Engine six Cylinder in running condition with minimum :</b> <ul style="list-style-type: none"> <li>- Fuel Type : Diesel</li> <li>- Fuel Injection System : CRDI, Turbocharged</li> <li>- Cycle : Four Stroke</li> <li>- No of Cylinders : 6</li> <li>- Engine Displacement(Minimum) : 5500 cc</li> <li>- The Diesel Engine should be in running condition, with ECM, BCM, a Ignition Switch</li> </ul>	<ul style="list-style-type: none"> <li>-All the items should be new</li> <li>- The assembly should be mounted on iron frame and painted.</li> <li>- Any other accessories required to run</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate from OEM or Proof of New Engine to be provided</li> <li>- List of Local</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required</li> </ul>	One year

		with Keys, all sensors(Air Mass Flow, EGR, Lambda/Oxygen Sensor, Fuel Pressure Regulator, Rail Pressure Sensor, Crank Angle/RPM/TDC Sensor, Coolant Temperature Sensor, Cam Angle Sensor, Boost Pressure Sensor, Fuel Temperature & Water in Fuel Filter Sensor), wiring, fuel feed & cooling system & instrument cluster, Radiator with Intercooler and Cooling Fan, Air Filter Assy, A Mounting, Fuse Box, Glow Plug Timer, Fuel Filter, Engine Oil Pressure Switch, Alternator, Starter Motor, - Instrument Cluster should display Fuel level, Battery Charging Light, Oil Pressure Light, Engine RPM. - Fuel Tank of Minimum Capacity 20 Litre, Engine Accessories- Silencer, and compatible Battery with clamp, Safety Guard for Silencer & Radiator.	the engine and test its performance. - This assembly should be independently operatable			Service Providers	by the training and maintenance staff of the Industrial Training Institute	
48.	Automotive oil pump for dismantling and assembling.	- This Automotive oil pump for dismantling and assembling is to be used with CRDI Engine being procured at Sr No. 164 of MMV Trade Syllabus..	- The item Should be New - This item will be used by trainees for practical integration with the CRDI Engine. - The item should be supplied in a dust proof wooden box & covered by the acrylic sheet	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year

**Lot 3: Machines/ General Installation of Automobile Workshop & tools**

Item No.	Name of Goods or Related Services	Technical Specifications of Item and/or Bureau of Indian Standards (BIS) (if applicable) reference	Features	Accessories	Spare parts	Documents	Installation & Training	Warranty of Equipment/parts
1.	Car Jet washer with standard accessories	<ul style="list-style-type: none"> <li>- Power Supply : 3 Phase</li> <li>- Minimum Motor Power : 1 HP</li> <li>- Minimum RPM : 1400</li> <li>- Discharge Pressure: 10.0-20MPa (1MPa: 10.2 kgf/cm<sup>2</sup>)</li> <li>- No of Reciprocating Plungers : 3</li> <li>- Max Water Discharge: 10-20 lpm</li> </ul>	<ul style="list-style-type: none"> <li>- Compact design for easy use</li> <li>- Reliable operations</li> <li>- Long functional life</li> <li>- To be provided with all safety guards</li> </ul>	<ul style="list-style-type: none"> <li>- Pressure regulator &amp; gauge</li> <li>- High-pressure water hose minimum 8m with pressure adjustable brass nozzle</li> <li>- Inlet Hose: 10 mtrs</li> <li>- Starter</li> <li>- SS Gun</li> <li>- Water Filter</li> <li>- Trolley</li> <li>- Attachment for foam wash</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year
2.	Lifting jack screw type 3 ton	<b>Lifting Jack Screw Type:</b> -Capacity: 3 Ton	-The jack need to be operational by inserting the bar in the hole at the top of turning	- Bar for operating the Jack	- Standard	<ul style="list-style-type: none"> <li>- Test Certificate from Competent Authority for Rated Load Capacity for Jack should be Provided</li> <li>- Warranty Certificate</li> </ul>	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year
3.	Lifting jack screw type 5 Ton capacity	<b>Lifting Jack Screw Type:</b> -Capacity: 5 Ton	-The jack need to be operational by inserting the bar in the hole at the top of	- Bar for operating the Jack	- Standard	<ul style="list-style-type: none"> <li>- Test Certificate from Competent Authority for</li> </ul>	- To be delivered at the designated Industrial Training	One year

			turning			Rated Load Capacity for Jack should be Provided - Warranty Certificate	Institute in Himachal Pradesh	
4.	Lifting jack screw type 20 Ton capacity	<b>Lifting Jack Screw Type:</b> -Capacity: 20 Ton	-The jack need to be operational by inserting the bar in the hole at the top of turning	- Bar for operating the Jack	- Standard	- Test Certificate from Competent Authority for Rated Load Capacity for Jack should be Provided - Warranty Certificates	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year
5.	Portable Head Light Beam Aligner	- Lux value indication in 1 meter scale & 25 meter scale - Lux meter : Digital - Measuring range Min : 240 mm , Max : 1280 mm - Accuracy : +/- 15% (15-32 Lux) , +/- 10% (32-64 Lux), +/- 5%(64-240 Lux)	- Accurate headlight alignment - Facility to check alignment of high and low beam. - Wheel mounted base for horizontal movement. - Checks and aligns head lamp beams of all type of Two Wheelers, Light Motor Vehicles, Light Commercial Vehicles and Heavy Vehicles.	- Standard	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificates	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
6.	Liquid penetrant Inspection kit	Liquid penetrant Inspection kit Consisting of : - Cleaner - Penetrant - Developer	- Standard	- Standard	- Standard	- Material Safety Data Sheet (MSDS).	- To be delivered at the designated Industrial Training Institute in Himachal	

							Pradesh	
7.	Memory keeper / Battery backups	<ul style="list-style-type: none"> <li>- Should maintain voltage continuity to engine computer, clock and radio memory when vehicle battery is disconnected.</li> <li>- Should Retain radio presets, ECM codes.</li> </ul>	<ul style="list-style-type: none"> <li>- Compatible with all type of Vehicle Manufactures &amp; Models when changing or interrupting the power source prevents loss of certain driveability codes, keyless entry codes, digital radio setting, cellular phone settings and other memory related functions.</li> <li>- Prevents loss of radio function on anti-theft radio systems.</li> <li>- Plugs into vehicle's cigarette lighter outlet</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	One Year
8.	Multi Scan Tool To scan Engine, ABS & EBD, AT, SRS, Body Control and immobilizer	<ul style="list-style-type: none"> <li>- Should be connected to all current laptops/ computers via the USB interface.</li> <li>- Connectivity : Bluetooth, Wireless, USB cable</li> <li>- Should be easily connected to a vehicle of different models of all manufactures using an OBD connector</li> <li>- LED display</li> <li>- Should Measure all actuators and sensors in the vehicle</li> <li>- Multimeter measurements during guided trouble-shooting with automatic transfer of measured values</li> <li>- Automatic control unit search function</li> <li>- Resistance measurement with extended</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for most Indian vehicles of different models and manufactures</li> <li>- Should perform automotive sensor simulation test specially designed to diagnose and simulate vehicle sensor faults for sensors like MAP</li> </ul>	<ul style="list-style-type: none"> <li>- OBD connection cable (1.5m)</li> <li>- Power supply Unit</li> <li>- Measuring accessories</li> <li>- USB connecting cable (3m)</li> <li>- Bluetooth USB adaptor</li> <li>- Trolley mounting parts set</li> <li>- Case</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificates</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	3 Years

		measuring ranges - Continuity tester for fault localisation - Voltage measurement with enhanced measurement functions	sensor, Intake air temperature sensor, TP sensor etc -Support for all relevant and future diagnostic protocols based on Ethernet. - Enhanced measurement technique included to Support diagnosis and vehicle repair - Parallel operation of diagnostic protocols ensuring optimal use of vehicle manufacturer protocols - Sturdy design, optimised for rough workshop environments - Powerful Bluetooth hardware for mobile use and reliability - Built-in technology to measure voltage, resistance and current - Built-in LEDs indicate the current communication status between the vehicle and	- Operating Software compatible with Windows 7, Windows 8 and Windows 10				
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			PC					
9.	Ultrasonic injection cleaning equipment	<b>Ultrasonic injection cleaning equipment :</b> - Main Supply : 220 V AC, Single Phase, 50HZ - Also operatable on 12 V DC - Ultrasonic Cleaning Power : Minimum 80 W - Stimulated RPM Range 10~9900 rpm; step : 10 rpm - Time range: 1~9999 sec - Fuel tank capacity: Minimum 500 ML	- Ultra Sonic Cleaning - Ultrasonic test with timer - Flow analysis & spray pattern test - Leakage test - Injecting Flow test - Auto programming mode - On-Vehicle Cleaning - Ultrasonic test with timer - SS Tank with Lid - SS Stand	- 10 Ltr Cleaning Chemical for Injector - Adaptors and couplers to facilitate cleaning on injectors on vehicle	- Standard	- User/Operating Manual - Warranty Certificate	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
10.	AC alternator slip ring puller	- AC alternator slip ring puller of Variable Size - Puller Material : Steel	- Standard	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
11.	Compression testing gauge suitable for diesel Engine with standard accessories	<b>Compression testing gauge:</b> - Analog Type - 2-1/2 inch gauge - Dual scale gauge reads 0-300 psi (0-2100 kPa)	- Suitable for diesel Engine - Corrosion resistant nickel plated finish - Adapters work on both flat and tapered seat plugs - Extra-long 25 inch flex hose gauge assembly with quick coupler	- 12 inch flex-14 millimetre standard reach - 12 inch flex-14 millimetre long reach - 10, 12, and 18 millimetre thread adapters	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year

			- Should be provided in Rugged blow moulded hard case					
12.	Connecting rod alignment fixture	<b>Connecting rod alignment fixture :</b> - Capable of checking Straightness and Parallelism with Dial gauge with horizontal Telescopic shaft for mounting collets.	- Standard	- Standard	- Standard	- Warranty Certificate	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
13.	Cylinder bore gauge capacity 20 to 160 mm	<b>Cylinder Bore Gauge :</b> - Display Type: Analog - Accuracy: 0.01mm - Measuring Range:20 to 160 mm	- Should be provided in Rugged blow moulded hard case	- Measuring head - Extension rods	- Standard	- User/Operating Manual - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
14.	Injector cleaning unit	<b>Injector Cleaning Unit :</b> - For Injector Cleaning of Diesel Engine - Main Supply : 220 V AC, Single Phase,50HZ - Also operatable on 12 V DC	-Facility to clean on different RPM - Protection for short circuit injectors by means of electronics circuit -Capable of Injector Cleaning, Pressure Test, Leak off test, Spray Pattern Test and others	- 10 Ltr Cleaning Chemical for Injector - Adaptors and couplers to facilitate cleaning on injectors on vehicle	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

15.	Injector testing set (Hand tester)	<b>Injector testing set (Hand tester):</b> -Comprising of Injection pump with hand lever transparent fuel container with filter, Three way shut off valve with valve spindle to isolate the pressure gauge while operating hand lever at high speed. - High quality Pressure gauge Range: 0 - 400 BAR (0 - 40 MPa).	- Hand Operated Injector Testing set capable to adjust nozzle seat tightness, carrying out leakage tests, for Injector nozzle opening pressure, chatter characteristic tests and spray pattern atomization repetition tests	- Standard	- Standard	- User/Operating Manual - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
16.	Piston ring compressor	<b>Piston Ring Compressor :</b> - Maximum size : 5 inches - Minimum size : 2 inches	- Standard	- Allen Key for Operation	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
17.	Piston Ring expander and remover.	<b>Piston Ring Expander and Remover :</b> - Maximum size : 4 inches - Minimum size : 2 inches	- Standard	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
18.	Piston Ring groove cleaner	<b>Piston Ring Groove Cleaner :</b> - Multi sizes groove cleaners for cleaning groove of Piston	- Suitable to clean the all types of piston ring groove of Car, Buses, Trucks, Motorcycles	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
19.	Spark plug spanner Size: 14mm & 18 mm Long bit	<b>Heavy Duty Spark Plug Spanner Long bit :</b> - Long neck Socket type with T Handle, - Set of Sizes- 14mm,16mm & 18mm(One Each)	- Chrome Plated	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training	One Year

							Institute in Himachal Pradesh	
20.	Tachometer (Counting type)	<b>Tachometer (Counting type):</b> <ul style="list-style-type: none"> <li>- Type: Digital</li> <li>- Display: 5-digit Backlight LCD Display</li> <li>- Accuracy: 0.02% +/- 2 digits</li> <li>- Contact Measuring Range: 2-20000 RPM</li> <li>- Non-contact Measuring Range: 2-99999 RPM</li> <li>- Measuring Distance: 50mm-600 mm</li> <li>-To be supplied with suitable power supply</li> </ul>	<ul style="list-style-type: none"> <li>- Can Measure RPM in Non-contact &amp; Contact</li> <li>- Should be provided in Rugged blow hard case</li> </ul>	- Reflecting Tape	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year
21.	Tyre pressure gauge with holding nipple	<b>Tyre Pressure Gauge With Holding Nipple:</b> <ul style="list-style-type: none"> <li>- Type : Analog</li> <li>- Pressure Range : 0-170 PSI</li> <li>- Accuracy: ±1 PSI</li> <li>- Unit: PSI, BAR</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for testing Pressure in Car, Motorcycle and Truck</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	One Year
22.	Universal puller for removing pulleys, bearings	<ul style="list-style-type: none"> <li>- Universal puller Capable for Removing Pulleys and Bearings of Size Range : 1" to 8 "</li> <li>-Universal Puller Material : Steel</li> </ul>	- Standard	- Standard	- Standard	- Warranty Certificate	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	One Year
23.	Vacuum gauge to read 0 to 760 mm of Hg.	<b>- Vacuum Gauge :</b> <ul style="list-style-type: none"> <li>- Type : Analog</li> <li>- Range :0 to 760 mm of Hg</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for checking the engine vacuum of Two Wheeler/Four Wheeler Vehicles of different Models &amp; Manufacturers</li> <li>- Should be</li> </ul>	- Adaptors and standard accessories	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> </ul>	One Year

			provided in Rugged blow moulded hard case with removable lid					
24.	Valve Lifter	Valve Lifter	- Compatible with Engines of Two Wheeler/Four Wheeler Vehicles of different Models & Manufacturers	- Standard	- Standard	- Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One Year
25.	Valve spring compressor universal.	Valve Spring Compressor Universal	- Compatible with Engines of Two Wheeler/Four Wheeler Vehicles of different Models & Manufacturers	- Standard	- Standard	- Warranty Certificate		One Year
26.	Automotive exhaust 5 gas analyser (petrol & Diesel)	<b>Automotive exhaust 5 gas analyser (petrol &amp; Diesel):</b> <ul style="list-style-type: none"> <li>- Exhaust 5 Gas Analyser Petrol ARAI approved to check CO, CO<sub>2</sub>, O<sub>2</sub> and HC &amp; NO.</li> <li>- CO Range : 0- 15 %,Resolution : 0.001%</li> <li>- HC Range :0-20000 ppm, Resolution : 1 ppm</li> <li>- CO<sub>2</sub> Range : 0- 20 %,Resolution : 0.01%</li> <li>- O<sub>2</sub> Range : 0- 25 %,Resolution : 0.01%</li> <li>- NO Range : 0-5000 ppm, Resolution : 1 ppm</li> <li>- Accuracy : ±2 % to ±3 %</li> <li>- Measuring Gas Intake : Minimum 1 ltr/min</li> <li>- Display : LED display</li> <li>- Response time   &lt; 5 Seconds</li> <li>- Warm-up time @25°C &amp; above &lt; 3 Minutes</li> <li>- Operating temperature : 0°C to +50°C,</li> <li>- Power Supply : 230 V/50 Hz AC Mains</li> </ul>	<ul style="list-style-type: none"> <li>- Should Measure emission in petrol and diesel engines</li> <li>- Self diagnostic facility</li> <li>- Integrated self-check facility</li> <li>- Electronic leak check facility</li> <li>- Automatic pump control facility</li> <li>- Automatic zero calibration</li> <li>- Digital span calibration</li> <li>- USB and RS 232C parts for PC interface</li> <li>- Operable on both AC and DC</li> <li>- Fuel selection</li> </ul>	<ul style="list-style-type: none"> <li>- Sampling Tube</li> <li>- Sampling Probe</li> <li>- Battery cable (for DC operation &amp; Engine RPM measurement)</li> <li>- RPM adaptor</li> <li>- Vertical exhaust extension pipe</li> <li>- Camera</li> <li>- Latest software &amp; RS232 Interface cable</li> <li>- Printer and all other standard accessories.</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> <li>- List of Service Centres in India</li> </ul>	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

			facility petrol/Diesel - Low battery voltage cut-off - Pass / Fail indication and emission limit in printout - Vehicle no., vehicle specification, operator name and test data in printout - RS232C serial port for PC interface - RPM and oil temperature of the engine					
27.	Hydraulic jack HI-LIFT type -3 ton capacity	<b>Hydraulic Jack :</b> - Hydraulic Jack HI-LIFT type: -Capacity : 3 Ton	- Standard	- Standard	- Standard	- Test Certificate from Competent Authority for Rated Load Capacity for Hydraulic Jack should be Provided - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year
28.	Hydraulic jack HI-LIFT type - 5 Ton capacity	<b>Hydraulic Jack :</b> - Hydraulic Jack HI-LIFT type: -Capacity : 5 Ton	- Standard	- Standard	- Standard	- Test Certificate from Competent Authority for Rated Load Capacity for Hydraulic Jack should be Provided - Warranty Certificate	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh	One year

29.	Spring tension tester	<b>Spring tension tester:</b> <ul style="list-style-type: none"> <li>- Capable to test the spring up to upto 5" free length</li> <li>- Manually operated</li> <li>- Display : analog.</li> <li>- Capacity to test springs :100 Kg/CM2</li> </ul>	- Standard	- Standard	- Standard	- Standard	-To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One year
30.	Tube/ tyre vulcanizing machine	<b>Tube/ Tyre Vulcanizing Machine :</b> <ul style="list-style-type: none"> <li>- Voltage : 220 V/50Hz Mains</li> <li>- Minimum Heater Capacity :400W x 2</li> <li>- The electric heating plate with Thermostat to control Heat.</li> </ul>	<ul style="list-style-type: none"> <li>- The main frame should be tough, strong and durable</li> <li>- Auto Controlled can maintain constant temperature automatically to ensure the temperature required during tire vulcanization.</li> <li>- Auto control temperature indicator light for safety</li> </ul>	- Different types of Die & Mould	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> <li>- List of Service Centres in India</li> </ul>	- To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One year
31.	Two post car lift – capacity 4000 kg Hydraulic Type with Mechanical Arms Locking	<b>Two Post Car Lift :</b> <ul style="list-style-type: none"> <li>- Capacity : 4000 Kg</li> <li>- Hydraulic Type with Mechanical Arms Locking</li> <li>- Minimum Overall Width:3400 mm</li> <li>- Minimum Width Between Columns:2750 mm</li> <li>- Minimum Drive-Thru:2400 mm</li> <li>- Minimum Over all Height : 3700 mm</li> </ul>	<b>Key Features:</b> <ul style="list-style-type: none"> <li>- Two separate lifting piston synchronized by steel cable</li> <li>- Twin stage adjustable lifting pad suitable for low pick up points</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> <li>- List of Service Centres in India</li> </ul>	- Installation and Commissioning of Lift in Supplier's Scope -Test Certificate to be provided after installation - To be	Two years

			<ul style="list-style-type: none"> <li>- Two stage telescopic arms suitable to reach lifting points.</li> <li>safety mechanisms -</li> <li>Mechanical lock with the slotted bar at a various height</li> <li>- Dual function auto shut off overhead limit switch</li> <li>- Arm lock with gear teeth design</li> </ul> <p><b>Safety features:</b></p> <ul style="list-style-type: none"> <li>- Mechanical lock at both column</li> <li>- Dual function overhead shut off switch</li> <li>- Arm lock 25mm teeth design</li> </ul>				<p>delivered at the designated Industrial Training Institute in Himachal Pradesh</p> <ul style="list-style-type: none"> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	
32.	Tyre Changer Machine	<p><b>Tyre Changer Automatic Passenger Carrying Vehicle(PCV) &amp; Light commercial vehicle(LCV):</b></p> <ul style="list-style-type: none"> <li>- Can Work with Tyres upto 23" rim diameter</li> <li>- Motorcycle tyres with optional adaptor</li> <li>- Minimum Motor Power: 1.1 kW</li> <li>- Air Requirement: 8 – 10 bar</li> <li>- Internal Rim Clamping :12" – 23"</li> <li>- External Rim Clamping: 10" – 20"</li> <li>- Bead breaker tire width :3" – 15"</li> <li>- Maximum Tire Diameter: 41"</li> <li>- Power supply Single phase</li> <li>- Complete with all accessories and components</li> </ul>	<ul style="list-style-type: none"> <li>-Motorized Pneumatic Type, Rim clamping facility, and bead breaking facility with air inflating device</li> <li>- Handles both standard steel wheels and delicate alloy wheels</li> <li>- High torque turntable with reversible direction Tilt – back arm design</li> <li>- Pneumatic lock</li> </ul>	-The Machine to be provided with suitable voltage stabilizer	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> <li>- List of Service Centres in India</li> </ul>	<ul style="list-style-type: none"> <li>- Installation and Commissioning of Tyre Changer Machine in Supplier's Scope</li> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance</li> </ul>	Two years

			for tower				staff of the Industrial Training Institute	
33.	Wheel alignment Machine – computerised 3D	<b>Latest Wheel alignment Machine for four wheel alignment–Computerised 3D:</b> <ul style="list-style-type: none"> <li>- Rim Size:10" - 22"</li> <li>- Tyre Width:48" - 96"</li> <li>- Wheel Base:79" - 180"</li> <li>- Individual Toe:+/- 35 degrees</li> <li>- Caster:+/- 30 degrees,</li> <li>- Camber:+/- 55 degrees</li> </ul>	<ul style="list-style-type: none"> <li>- Fixed Vertical Support</li> <li>- Camera Boom LH and RH with Ultra High Resolution Camera System</li> <li>- IR Lighting Source min. 8mm</li> <li>- Reflector metal based</li> <li>-Should work in sunlight</li> <li>- New light wheel clamps 12"-22" with targets,front,1ea ch for RH and LH side</li> <li>- Closed Mobile Cabinet with printer drawer</li> <li>-PC with software and Power Backup(UPS)of Minimum 30 min</li> <li>- 19" color monitor</li> </ul>	<ul style="list-style-type: none"> <li>- 1 set (2 nos) Turn Plates</li> <li>- Mechanical wheel chock unit</li> <li>- Steering wheel holder</li> <li>- Brake pedal depressor</li> <li>- Connecting lead cabinet with PC</li> <li>- Power cord</li> <li>- Color Printer</li> <li>- Vehicle specs, hard disc &amp; DVD &amp; Floppy drive</li> <li>- Suitable UPS</li> <li>- All other Standard Accessories</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> <li>- List of Service Centres in India</li> </ul>	<ul style="list-style-type: none"> <li>- Installation and Commissioning of Wheel alignment Machine – computerised 3D in Supplier's Scope</li> <li>-Test Certificate to be provided after installation</li> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	Two years
34.	Wheel balancing machine For wheel balancing of LMV	<b>Wheel Balancing Machine For wheel balancing of LMV:</b> <ul style="list-style-type: none"> <li>- Motor : Minimum 0.5 HP</li> <li>- Shaft Diameter : Min 38mm</li> <li>- Rim Diameter : 8" - 32"</li> <li>- Rim Width :1" - 20"</li> <li>- Offset :1" - 20"</li> <li>- Power Supply :220 - 240 V, 50 - 60 Hz</li> <li>- Max. wheel diameter :1050 mm</li> <li>- Wheel width:76-508 mm</li> </ul>	<ul style="list-style-type: none"> <li>- Semi-automatic input of rim diameter and offset with gauge arm</li> <li>- Hardened flange assy. Balancing catch nut of metal</li> <li>- 19" TFT</li> </ul>	-The Machine to be provided with suitable voltage stabilizer	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Warranty Certificate</li> <li>- List of Service Centres in India</li> </ul>	<ul style="list-style-type: none"> <li>- Installation and Commissioning of Tyre Changer Machine in Supplier's Scope</li> <li>- To be delivered at the designated</li> </ul>	Two years

		- Max. wheel weight : 70 Kg	<ul style="list-style-type: none"> <li>monitor</li> <li>- Manual input of rim width</li> <li>- Imbalance optimisation program</li> <li>- Imbalance minimisation program</li> <li>- Constant rotational speed</li> <li>- Semi-automatic selection of balancing modes</li> <li>- Reduced cycle time</li> <li>- Split weight mode</li> <li>- The pedal-operated mechanical lock should firmly hold the wheel in every position</li> </ul>				Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	
35.	Carge winches 3 tonnes	<b>Carge Winches</b> <ul style="list-style-type: none"> <li>- Loading capacity: 3 Ton</li> <li>- Wire rope capacity: 20-150 m</li> </ul>	<ul style="list-style-type: none"> <li>- The Winch should be mounted on a painted sturdy iron frame</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- Test Certificate from Competent Authority for Rated Load Capacity for Each Carge Winch should be Provided</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificates</li> </ul>	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year

36.	Carge winches 5 tonnes	<b>Carge Winches</b> - Loading capacity: 5 Ton - Wire rope capacity: 20-150 m	- The Winch should be mounted on a painted sturdy iron frame	- Standard	- Standard	- User/Operating Manual Test Certificate from Competent Authority for Rated Load Capacity for Each Carge Winch should be Provided - List of Service Centres in India - Warranty Certificates	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
37.	Chain Pulley Block- 3 ton capacity with tripod stand	<b>Chain Pulley Block with compatible tripod stand:</b> - Capacity :3 Ton  <b>Tripod Stand Specifications :</b> - Capacity to lift minimum 3 Ton of load - Minimum Height to Eye : 3000 mm - Minimum Leg Length : 3400 mm - Minimum Weight : 85 Kg - Legs should be Adjustable for un-level ground, shallow slopes and slight inclines - Feet Should be suitable for hard and soft ground.	- Standard	- Standard	- Standard	- User/Operating Manual Test Certificate from Competent Authority for Rated Load Capacity for Chain Pulley Block & tripod Stand should be Provided - List of Service Centres in India - Warranty Certificates	To be delivered at the designated Industrial Training Institute in Himachal Pradesh - As required by the training and maintenance staff of the Industrial Training Institute	One Year
38.	Crab	<b>Crab Tool :</b> - Size : 6"	- Heavy Duty	- Standard	- Standard	- Warranty Certificate	-To be delivered at the designated	One Year

							Industrial Training Institute in Himachal Pradesh	
39.	Timing lighter	<ul style="list-style-type: none"> <li>- LED tachometer display reads 0-9999 RPM</li> <li>- Unique flashlight feature</li> <li>- 2/4 cycle and RPM/advance lights</li> </ul>	<ul style="list-style-type: none"> <li>- For use with Conventional, electronic, computer controlled ignition systems</li> <li>- On/off touch control</li> <li>- 2 /4 cycle and RPM/advance mode lights</li> <li>- 2 to 4 cycle selector button</li> <li>- Flashlight feature button</li> <li>- RPM advance selector button</li> <li>- Up or down scroll buttons</li> <li>- All metal inductive pickup</li> <li>- Super bright Xenon flash</li> <li>- One-touch control</li> <li>- Should be provided in Rugged hard case</li> </ul>	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificates</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and maintenance staff of the Industrial Training Institute</li> </ul>	One Year
40.	Fuel injection test bench for calibration of fuel pump	<ul style="list-style-type: none"> <li>- Speed Range : 0-4,000 RPM in both directions C.W. &amp; A.C.W</li> <li>- Temperature Control Range : 30-50, +/- 0.5 deg C</li> <li>- Test Pressure : 18-220 MPa</li> <li>- Testing Injectors : 06 Nos Fitted with Calibrating Nozzle set at standard pressure</li> </ul>	<ul style="list-style-type: none"> <li>- Closed loop precise temperature control</li> <li>- Integrated cooling system</li> <li>- Electronic monitoring and display</li> <li>- Self-diagnosis</li> </ul>	<ul style="list-style-type: none"> <li>- Mains connection lead</li> <li>- Hydraulic hoses</li> <li>- software</li> <li>- protective cover</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificates</li> <li>- Complete</li> </ul>	<ul style="list-style-type: none"> <li>- To be delivered at the designated Industrial Training Institute in Himachal Pradesh</li> <li>- As required by the training and</li> </ul>	One Year

			system -Electronic Quantity Measurement - Electronic supply pressure control			Basic setting Chart for Pumps of Different Models and Manufacture r	maintenance staff of the Industrial Training Institute	
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**Annexure A****Mechanic Motor vehicle**

<b>Syllabus S.No.</b>	<b>Name of item</b>
21	AC alternator slip ring puller
32	Car Jet washer with standard accessories
37	Compression testing gauge
39	Cylinder bore gauge capacity
40a	Cylinder liner- Dry & wet liner
40b	Cylinder liner- press fit & slide fit liner
43	Different type of Engine Bearing model
44	Different type of piston model
60	Fuel feed pump for Diesel
61	Fuel injection pump (Diesel) inline
62	Fuel injection pump VE pump / Distributor fuel rotary pump (DPC) pumps / along with special tools and accessories
75a	Injector – Multi hole type
75b	Injector – Pintle type
76	Injector testing set
79a	Lifting jack screw
79b	Lifting jack screw
79c	Lifting jack screw
84	Automotive oil pump for dismantling and assembling.
90	Piston ring compressor
91	Piston Ring expander and remover
92	Piston Ring groove cleaner
99	Radiator cut section-cross flow
100	Radiator cut section-down flow
101	Radiator pressure cap
109	Spark plug spanner 14mm x 18mm x Size
110a	Starter motor axial type
110b	Starter motor pre-engagement type
110c	Starter motor Co-axial type
117	Tachometer (Counting type)
118	Tandem master cylinder with booster
119	Thermostat
123	Turbocharger cut sectional view
124	Tyre pressure gauge with holding nipple

125	Universal puller for removing pulleys, bearings
127	Vacuum gauge
128	Valve Lifter
129	Valve spring compressor universal
132	Automotive Water pump for dismantling and assembling
135	Working model of Air Brake Assembly
136	Alternator assembly used for LMV
137a	Carburetor – Solex for dismantling and assembling
137b	Carburetor – Mikun for dismantling and assembling
138	Chain Pulley Block-3 ton capacity with tripod stand
139	Cut section Model of Mock layout of a motor car –electrical system working model
140	Cut section models of shock absorbers
141a	Cut section of cross ply tyres
141b	Cut section of radial tyres
142	Cut section working model of automatic transmission Gear box
143	Cut section working model of centrifugal clutch assembly
144	Cut section working model of Diaphragm clutch assembly
145	Cut section working model of Single plate clutch assembly
146	Demonstration board of electronic Ignition system, ignition coil
147	Demonstration board of MPFI system
148	Disk brake in working condition with caliper assembly with all parts
149	Drum brake assembly in Working Condition
150	Front axle ( Rzeppa Joint) with stand for Dismantling and assembly
151a	Full floating axle assembly
151b	Semi-floating axle assembly
152	Functional/experiment model of different type of sensors.
153a	Steering assembly –Rack & pinion
153b	Steering assembly – Worm & roller
153c	Steering assembly – Recirculating ball
153d	Steering assembly – Power steering
153e	Steering assembly – Electric Assisted Power Steering
154	Synchronous Gear box with stand for Dismantling and assembly
155	Tandem master cylinder with booster
156	Tubed tyre of car, trucks & motorcycle
157	Tubeless tyre of cars & trucks

158	Tyre & split rim wheel assembly
159	Working Model of power windows
160	Working model of torque converter
161	Air conditioned CRDI Vehicle in running condition -LMV
163	Automotive exhaust 5 gas analyser (petrol & Diesel) and Diesel Smoke meter (Optional)
164	Diesel Engine – CRDI - 4 stroke for Dismantling and Assembling with Swivelling Stand.
165	Diesel engine ( Running condition ) Stationary type single cylinder
166a	Hydraulic jack HI-LIFT type 3 ton capacity
166b	Hydraulic jack HI-LIFT type 5 Ton capacity
167	Multi Scan Tool To scan Engine, ABS & EBD, AT, SRS, Body Control and immobilizer
168	Spring tension tester
170	Working Condition of Diesel Engine – CRDI - 4 stroke Engine, Assembly with fault simulation board
171	Cut section of 4/6 cylinder diesel engine in moving condition to show movement of internal parts
172	Diesel Engine six Cylinder in running condition
173	Air bag simulator
174	Air conditioning service Unit (Car)
175	Four stroke petrol engine with CNG setup- working condition
176	Heavy Commercial vehicle
177	MPFI petrol engine with swivelling stand along with special tools for dismantling and assembling
178	Petrol Engine(2-stroke) Motor Cycle/Scooter along with special tools and accessories (Optional) * If not available in market video demonstration may be used to explain working.
179	Transfer case with stand for Dismantling and assembly.
180	Tube/ tyre vulcanizing machine
181	Two post car lift – capacity 4000 kg
182	Tyre Changer Machine
183	Ultrasonic Injection cleaning equipment
184	Wheel alignment Machine –computerized 3D (Optional)
185	Wheel balancing machine
186	Working Condition of Petrol MPFI Engine Assembly with fault simulation board

**Mechanic Diesel**

<b>Syllabus S.NO.</b>	<b>Name of item</b>
35	Car Jet washer with standard accessories
45	Connecting rod alignment fixture
48a	Cylinder liner- Dry & wet liner
48b	Cylinder liner- press fit & slidefit liner
52	Different type of Engine Bearing model
53	Different type of piston model
71	Fuel feed pump for Diesel
72	Fuel injection pump (Diesel) inline
73	Fuel injection pump dismantling tool kit /Universal Vice
74	Fuel injection pump VE pump / Distributor fuel rotary pump (DPC) pumps / along with special tools and accessories
92 (a)	Injector – Multi hole type
92 (b)	Injector – Pintle type
93	Injector cleaning unit
94	Injector testing set (Hand tester)
114	Piston ring compressor
115	Piston Ring expander and remover.
116	Piston Ring groove cleaner.
124	Radiator cut section-cross flow
125	Radiator cut section-down flow
126	Radiator pressure cap
147	Spark plug spanner 14mm x 18mm x Size
158	Tandem master cylinder with booster
163	Thermostat
165	Timing lighter
168	Turbocharger cut sectional view
169	Tyre pressure gauge with holding nipple
172	Vacuum gauge
173	Valve Lifter
174	Valve spring compressor universal
177	Water pump for dismantling and assembling
180	Air conditioned CRDI Vehicle in running condition -LMV
182	Automotive exhaust 5 gas analyser (petrol & Diesel) or Diesel Smoke meter
184	Diesel Engine – CRDI - 4 stroke
185	Diesel engine ( Running condition ) Stationary type
191	Heavy Commercial vehicle type (without body on frame)
202	Working Condition of Diesel Engine –CRDI - 4 stroke Engine, Assembly with fault simulation board
203	Cut section of 4/6 cylinder diesel engine with moving condition to show

	momentum of internal parts
204	Fuel injection test bench for calibration of fuel pump
206	Diesel Engine six Cylinder in running condition

## 4. Drawings

*Not Applicable*