CURRICULUM

FOR THE TRADE OF

MECHANIC DIESEL (Dual Mode)

UNDER

DUAL TRAINING SYSTEM

BY

सत्यमेव जयते
Government of India

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

PROPOSED TIME DISTRIBUTION FOR MECHANIC DIESEL TRADE
UNDER INDUSTRY INSTITUTE - TRAINING SCHEME

BLOCK WITH DURATION	**THEORY**	**PRAC.**	**WSC/ CAL**	**ENGG. DRG.**	**EMP. SKILL**	**ECA, LIB. & OTHERS**	**REM.**
BLOCK – I (05 months/22 Weeks duration) Institute level trg.	230hrs.	300 hrs.	80 hrs.	120 hrs.	100hrs.	10 hrs.	40 hrs. Revision & Test
BLOCK – II (05 months / 22 weeks duration) Industry level trg.	---	880 hrs.	---	---	---	---	---
BLOCK – III (2 months/ 8 Weeks duration) Institute level trg.	90 hrs.	114 hrs. (Practical practice and submission of report related to industry training)	30 hrs.	30 hrs.	10 hrs.	06 hrs.	Last 1 week revision & exam. (40 hrs.)
GRAND TOTAL	**320hrs.**	**1294hrs.**	**110 hrs.**	**150 hrs.**	**110 hrs.**	**16hrs.**	**80 hrs.**
Total duration of training inclusive of Industry & Institute is 1 years (2080 hrs.)							

GENERAL INFORMATION FOR INSTITUTE (ITI)

1. **Name of the Trade** **: Mechanic Diesel (Dual mode)**

2. **N.C.O. Code No.** : **7233.24**

3. **Duration of Craftsmen Training:** One year (Three Blocks).

4. **Power norms** : 4.8KW

5. **Space norms** : 190 Sq.m and Parking Area-20 Sqm

6. **Entry Qualification** : Passed 10th class examination with Maths and Science

7. **Trainees per unit** :16 (Max. supernumeraries seats: 5)

8a. **Qualification for Instructors**:

a) Degree in Automobile/ Mechanical Engg. (with specialization in Automobile) from recognised college/University with one year experience in the automobile industry and should possess valid LMV driving license.

OR

Diploma in Automobile/Mechanical (specialization in automobile) from recognized board of technical education with two years experience in the automobile industry and should posses valid LMV driving license.

OR

10th Passed + NTC/NAC in the Trade of "**Mechanic Diesel)**" with 3 years post qualification experience in the relevant field and should possess valid LMV driving license.

and

b) With "**National Crafts Instructor Certificate".**

8b. **Desirable qualification**: Preference will be given to a candidate with Craft Instructor Certificate (CIC) in relavant **Trade**.

Note:

(i) Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.

(ii) Instructor qualification for WCS and E.D, as per the training manual.

Distribution of training on Hourly basis:

Total hours /week	Trade practical	Trade theory	Work shop Cal. &Sc.	Engg. Drawing	Employability skills	Extra curricular activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

SYLLABUS CONTENT WITH TIME STRUCTURE FOR MECHANIC DIESEL TRADE

Block – I

Duration- 05 Months (22 weeks)

Institute Level Training: -

Sl. No.	Practical Duration:- 300 hrs.	Theory Duration:- 230 hrs.
1.	Visit to various section of ITI and Draw a layout of workshop, Equipment and Machinery installed in your workshop. Types of work done by the students in the shop floor. Practice on maintenanceandcleanliness ofWorkshop	**Admission & introduction to the trade:** Introduction to the Courseduration, coursecontent, studyofthe syllabus. General rule pertainingto theInstitute, facilitiesavailable–Hostel, Recreation, Medicaland Libraryworking hours andtime table **AutoIndustry**- History, leading manufacturers, developmentin automobileindustry, trends,newproduct. Brief about Ministry of Road transport & Highways, The Automotive Research Association of India (ARAI), National Automotive Testing and R&D Infrastructure Project (NATRIP), & Automobile Association.
2.	Demonstration on use of Personal protective equipment (PPE) Demonstration on First aid and Fire safety, Use of fire extinguishers. Demonstration on safe handling and Periodic testing of lifting equipment, and Safety disposal of used engine oil. Determine the energy consumption of your ITI	**Occupational Safety & Health** ImportanceofSafetyandgeneral Precautionstobeobservedintheshop. Basic first aid, safety signs - for Danger, Warning, caution & personal safety message. Safe handling of Fuel Spillage, Fire extinguishers used for different types of fire. Safe disposal of toxic dust, safe handling and Periodic testing of lifting equipment, Authorization of Moving & road testing vehicles. **Energy conservation**-Definition, Energy Conservation Opportunities (ECOs)-Minor ECos and Medium ECOs, Major ECOs), Safety disposal of Used engine oil, Electrical safety tips**.**
3.		**Systems of measurement:-** Description, care & use of - Micrometers- Outside and depth micrometer, Micrometer adjustments, Vernier calipers, Telescope gauges, Dial bore gauges, Dial indicators, straightedge, feeler gauge, thread pitch gauge, vacuum gauge, tire pressure gauge.
4.	Practice using all marking aids, like steel rule with spring calipers, dividers,	**Hand & Power Tools:-** Marking scheme, **Marking material**-chalk, Prussian

	scriber, punches, Chisel etc., Layout a work piece- for line, circle, arcs and circles. Practice on General workshop tools & power tools.	blue. Cleaning tools- Scraper, wire brush, Emery paper, Description, care and use of Surface plates, steel rule, measuring tape, try square. Calipers- inside and outside. Dividers, surface gauges, scriber, punches-prick punch**,** center punch, pin punch, hollow punch, number and letter punch. Chisel-flat, cross-cut. Hammer- ball pein, lump, mallet. Screw drivers-blade screwdriver, Phillipsscrew driver, Ratchet screwdriver. Allenkey,bench vice & C-clamps, Spanners- ring spanner, open end spanner & the combination spanner, universal adjustable open end spanner, Sockets &accessories, Pliers - Combination pliers, multi grip, long nose, flat-nose, Nippersor pincer pliers,Side cutters, Tin snips, Circlip pliers**,** external circlips pliers.Airimpactwrench, airratchet, wrenches- Torque wrenches, pipe wrenches, car jet washersPipeflaring&cutting tool, pullers-Gear and bearing.
5.	Practice on General cleaning, checking and use of nut, bolts, & studs etc., Removal of stud/bolt from blind hole. Practice on cutting tools like Hacksaw, file, chisel, Sharpening of Chisels, center punch, safety precautions while grinding	**Fasteners:**- Study of different types of screws, nuts, studs & bolts, locking devices, Such as lock nuts, cotter, split pins, keys, circlips, lock rings, lock washers and locating where they are used. Washers & chemical compounds can be used to help secure these fasteners. Function of Gaskets,Selection of materials for gaskets and packing, oil seals**.** **Cutting tools** :- Study of different type of cutting tools like Hacksaw, File-Definition, parts of a file, specification, Grade, shape, different type of cut and uses., OFF-hand grinding with sander, bench and pedestal grinders, safety precautions while grinding. **Limits, Fits & Tolerances**:-Definition of limits, fits & tolerances with examples used in auto components
6.		**Drilling machine:**- Description and study of Bench type Drilling machine, Portable electrical Drilling machine, drill holding devices, Work Holding devices, Drill bits. Taps and Dies: Hand Taps and wrenches, Calculation of Tap drill sizes for metric and inch taps. Different type of Die and Die stock. **Screw extractors.** Hand Reamers – Different Type of hand reamers, Drill size for reaming, Lapping, Lapping abrasives, type of Laps.
7.	Practice on making Rectangular Tray.	**Sheet metal** :- State the various common metal

	Pipe bending, fitting nipples unions in pipes. Soldering and Brazing of Pipes	Sheets used in Sheet Metal shop Sheet metal operations - Shearing, bending, Drawing, Squeezing Sheet metal joints - Hem & Seam Joints Fastening Methods - Riveting, soldering, Brazing. fluxes used on common joints. Sheet and wire-gauges. The blow lamp- its uses and pipe fittings.
8.	Practice in joining wires using soldering Iron, Construction of simple electrical circuits, Measuring of current, voltage and resistance using digital multimeter, Practice continuity test for fuses, jumper wires, fusible links, circuit breakers.	**Basic electricity:-** Electricityprinciples**,** Ground connections**,** Ohm's law, Voltage, Current, Resistance,Power, Energy. Voltmeter, ammeter, Ohmmeter Mulitmeter,Conductors & insulators**,** Wires**,** Shielding**,** Length vs. resistance**,** Resistor ratings
9.	Diagnose series, parallel, series-parallel circuits using Ohm's law, Check electrical circuit with a test lamp, perform voltage drop test in circuits using multimeter, measure current flow using multimeter /ammeter, use of service manual wiring diagram for troubleshooting.	**Fuses & circuit breakers**:-Ballast resistor**,** **Stripping wire insulation**, cable colour codes and sizes, Resistors inSeries circuits **,** Parallel circuitsandSeries-parallel circuits**,** Electrostatic effects**,** Capacitors and its applications, Capacitors in series and parallel.
10.	Cleaning and topping up of a lead acid battery, Testing battery with hydrometer, Connecting battery to a chargerfor battery charging, Inspecting & testing a battery after charging, Measure and Diagnose the cause(s) of excessive Key-off battery drain (parasitic draw) and do corrective action. Testing of relay and solenoids and its circuit.	**Batteries & cells**, Description of Chemical effects**, ,** Lead acid batteries& Stay Maintenance Free (SMF) batteries, Magnetic effects**,** Heating effects**,** Thermo-electric energy**,** Thermisters, Thermo couples, Electrochemical energy**,** Photo-voltaic energy**,** Piezo-electric energy**,** Electromagnetic induction**,** Relays**,** Solenoids, Primary & Secondary windings, Transformers, stator and rotor coils.
11.	identify and test power and signal connectors for continuity, Identify and test different type of Diodes, NPN & PNP Transistors for its functionality**,** Construct and test simple logic circuits OR, AND & NOT and Logic gates using switches.	**Basic electronics**: Description of Semi conductors, Solid state devices- Diodes**,** Transistors**,** Thyristors, Uni Junction Transistors (**UJT)**, Metal Oxide Field Effect Transistors (MOSFETs), Logic gates-OR, AND & NOT and Logic gates using switches.
12.		**Introduction to welding and Heat Treatment** **Welding processes** – Principles of Arc welding,

		brief description, classification and applications. Manual Metal Arc welding -principles, power sources, electrodes, welding parameters, edge preparation & fit up and welding techniques; Oxy – Acetylene welding - principles, equipment, welding parameters, edge preparation & fit up and welding techniques;. Heat Treatment Process– Introduction, Definition of heat treatment, Definition of Annealing, Normalizing, Hardening and tempering. Case hardening, Nitriding, Induction hardening and Flame Hardening process used in auto components with examples.
13.		**Non-destructive Testing Methods-** Importance of Non-Destructive Testing In Automotive Industry, Definition of NDT**,** Liquid penetrant and Magnetic particle testing method – Portable Yoke method **Introduction to Hydraulics & Pneumatics: -** Definition ofPascal law, pressure, Force, viscosity. Description, symbols and application in automobile of Gear pump-Internal & External, single acting, double acting & Double ended cylinder; Directional control valves-2/2, 3/2, 4/2, 4/3 way valve, Pressure relief valve, Non return valve, Flow control valve used in automobile. Pneumatic Symbols, Description and function of air Reciprocating Compressor. Function of Air service unit (FRL-Filter, Regulator & Lubricator).
14.		Definition: - Classification of vehicles on the basis of load as per central motor vehicle rule, wheels, final drive, and fuel used, axles, position of engine and steering transmission, body and load. Brief description and uses of Vehicle hoists – Two post and four post hoist, Engine hoists, Jacks**,**Stands.
15.		**Introduction to Engine:** Description of internal & external combustion engines, Classification of IC engines, Principle & working of 2&4-stroke diesel engine (Compression ignition Engine (C.I)),Principle of Spark Ignition Engine(SI), differentiate between 2-stroke and 4 stroke, C.I engine and S.I Engine, Direct injection and Indirect injection, Technical terms used in engine, Engine specification. Study of various gauges/instrument on a dash board of a vehicle-

		Speedometer, Tachometer, Odometer and Fuel gauge, and Indicators such as gearshift position, Seat belt warning light, Parking-brake-engagement warning light and an Engine-malfunction light. Different typeof startingandstopping methodofDiesel Engine Procedure for dismantling of diesel engine from a vehicle..
16.		**Diesel EngineComponents:** Descriptionand Constructional featureofCylinder head,Importanceof Cylinderhead design, Typeof Dieselcombustion chambers,Effecton sizeofIntake&exhaust passages, Headgaskets. Importanceof Turbulence **Valves &Valve Trains**- Descriptionand FunctionofEngine Valves,different types,materials, Typeofvalve operating mechanism, ImportanceofValve seats**,**Valveseats insertsincylinder heads**,** importance ofValverotation**,** Valve stemoilseals**,** sizeofIntakevalves**,** Valvetrains**,**Valve-timingdiagram**,** conceptofVariable valvetiming**.** Descriptionof Camshafts&drives**,** Descriptionof Overhead camshaft**,** importanceofCam lobes**,**Timing belts &chains**,** Timing belts&tensioners.
17.		Description&functionsof different typesof **pistons**,piston rings and pistonpins and materials.Used recommended clearancesforthe ringsand its necessity precautionswhile fittingrings, commontroubles and remedy. Compressionratio. Description&functionof **connecting rod,** importanceofbig- end splitobliquely, Materialsusedfor connectingrodsbig end&main bearings. Shells pistonpinsand lockingmethodsof pistonpins.
18.		Descriptionand functionof**Crank shaft**, camshaft, Enginebearings- classificationand location– materials used&composition ofbearing materials- Shellbearingand their advantages- specialbearings material fordiesel engineapplication bearingfailure&its causes-care&maintenance. Crank-shaft balancing,Firing orderofthe engine.
19.		Descriptionand functionofthe**fly wheel**andvibration damper.Crankcase &oilpump,gears

		timingmark,Chain sprockets,chain tensioneretc. Functionofclutch& couplingunits attachedtoflywheel.
20.		Descriptionof **Cylinderblock,** Cylinderblock construction, and Different typeof Cylinder sleeves (liner).
21.		**Engineassembly** procedurewithaid ofspecialtoolsand gaugesusedfor engineassembling..
22.		**NeedforCooling systems,** Heat transfer method, Boilingpoint& pressure,Centrifugal force,Vehicle coolantproperties andrecommended changeofinterval, Different typeof coolingsystems, **Basiccooling systemcomponents-** Radiator,Coolant hoses,Waterpump, Coolingsystem thermostat,Cooling fans,Temperature indicators,Radiator pressurecap, Recoverysystem, Thermo-switch. **Needforlubrication system**,Functionsof oil,Viscosityand its gradeasperSAE **,** Oiladditives**,** Syntheticoils, The lubricationsystem**,** Splashsystem**,** Pressuresystem**,** Corrosion/noise reductioninthe lubricationsystem. Lubricationsystem components- Descriptionand functionofSump**,** Oilcollectionpan**,** Oiltank**,**Pickuptube**,**differenttype ofOilpump&Oil filtersOilpressure relief valve**,**Spurt holes&galleries**,** Oilindicators**,** Oil cooler.
23.		**Intake&exhaust systems**– Descriptionof Diesel induction&Exhaust systems. Description&functionofair compressor, exhauster,Super charger, Intercoolers,turbo charger,variable turbo charger mechanism. **Intakesystem components-** Descriptionand functionofAir cleaners,Different typeair cleaner, Descriptionof Intakemanifoldsand material**,** **Exhaustsystemcomponents-** Descriptionand functionofExhaust manifold**,** Exhaust pipe**,**Extractors**,** Mufflers- Reactive, absorptive, Combination.**,**Catalytic converters**,** Flexible connections**,** Ceramiccoatings**,** Back-pressure, Electronic mufflers**.**
24.		**Diesel Fuel Systems-** Descriptionand functionofDiesel fuelinjection,fuel characteristics**,** conceptofQuiet dieseltechnology**&**Cleandiesel technology.

		Dieselfuelsystem components– Descriptionand functionofDiesel tanks&lines**,**Diesel fuelfilters**,**water separator,Liftpump**,** Plungerpump**,** Primingpump**,** Inlineinjection pump**,**Distributor-type injectionpump**,** Dieselinjectors**,** Glowplugs**,** Cummins&Detroit Diesel injection. **ElectronicDiesel control-**Electronic Dieselcontrol systems**,** Common RailDieselInjection (CRDI) system**,** Hydraulically actuated electronically controlledunit injector(HEUI) dieselinjection system. Sensors, actuatorsandECU (ElectronicControl Unit)usedinDiesel Engines.
25.		**Marine&Stationary Engine**:-Types, Doubleacting engines,opposed pistonengines, starting systems, coolingsystems, lubricatingsystems, supplying fueloil, hydrauliccoupling, reductiongeardrive, electromagnetic coupling,electrical drive,generatorsand motors, supercharging.
26.	Monitoring emissionsprocedures by use of Engine gas analyser or Diesel smoke meter. Checking& cleaninga Positivecrankcase ventilation(PCV) valve**.**Obtaining &interpretingscantool data. Inspection of EVAP canister purge system by use of scan Tool. EGR /SCR Valve Remove and installation for inspection.	**EmissionControl:-** Vehicleemissions Standards-Euro and Bhart II, III, IV, V Sourcesofemission, Combustion**,** Combustion chamberdesign. **Typesofemissions**: Characteristicsand Effectof Hydrocarbons**,** Hydrocarbonsin exhaust gases**,** Oxides ofnitrogen**,** Particulates**,**Carbon monoxide**,**Carbon dioxide**,** Sulphurcontentinfuels Descriptionof Evaporation emissioncontrol**,** Catalytic conversion**,**Closed loop**,**Crankcase emissioncontrol**,** Exhaustgas recirculation**(**EGR) valve**,** Controlling air-fuelratios**,** Charcoalstorage devices,Diesel particulatefilter (DPF). Selective Catalytic Reduction (SCR), EGR VS SCR
27.	Practiceonremoving alternatorfromvehicle dismantling,cleaning checking fordefects, assemblingandtesting formotoringactionof alternator&fittingto vehicles. Practiceonremoving startermotor Vehicle andoverhauling the startermotor,testing ofstartermotor	Description .of **charging circuit**operation of alternators, regulator unit, ignition warning lamp-troubles andremedy inchargingsystem. Description of **startermotorcircuit,** Constructional detailsof starter motor solenoid switches, common troubles andremedy in startercircuit.
28.	Practiceon troubleshooting in LMV/HMV for EngineNotstarting–Mechanical&Electricalcauses, Highfuel consumption, Engine overheating,	**Troubleshooting:** Causesandremedy for EngineNotstarting –Mechanical&Electricalcauses, Highfuel consumption, Engineoverheating, LowPower Generation, Excessiveoil consumption, Low/HighEngine OilPressure, EngineNoise.

	LowPower Generation, Excessiveoil consumption, Low/HighEngineOil Pressure, EngineNoise.	
29.	**Revision & Examination**	

NOTE: - Maximum uses of video demonstration and other IT based teaching aids may be adopted to deliver the theoretical knowledge.

Syllabus for

EMPLOYABILITY SKILLS

GENERAL INFORMATION
(Employability Skill)

1. **Name of the subject: EMPLOYABILITY SKILLS**

2. **Hours of Instruction:** 110 Hrs.

3. **Examination:** The examination will be held at the end of the training.

4. **Instructor Qualification:**

   MBA OR BBA with two years experience OR Graduate in Sociology/ Social Welfare/ Economics with Two years experience OR Graduate/ Diploma with Two years experience and trained in Employability Skills from DGET institutes

   AND

   Must have studied English/ Communication Skills and Basic Computer at 12^{th} / Diploma level and above

   OR

   Existing Social Studies Instructors duly trained in Employability Skills from DGET institutes

5. **Instructor:**

   One full time regular instructor shall be engaged on every 240 numbers of trainees for teaching the subject "Employability Skills". One additional full time regular instructor would be required on increase in every 240 trainees. Wherever the trainees are less than 240 or part thereof, a part-time instructor may be engaged to teach the subject.

ALLOTMENT OF TIME AND MARKS AMONG THE TOPICS

Sl. No.	Topics	Allotted Hours	Marks Allotted	To be covered in
1.	English Literacy	20 hrs.	9	Block – I
2.	I.T. Literacy	20 hrs.	9	
3.	Communication Skills	15 hrs.	7	
4.	SUB TOTAL:	55	25	
5.	Entrepreneurship Skills	15 hrs.	6	
6.	Productivity	10 hrs.	5	
7.	Occupational safety , health and Environment Education	15 hrs.	6	
8.	Labour Welfare Legislation	05 hrs.	3	
9.	Quality Tools	10 hrs.	5	
	Sub Total:	55	25	
TOTAL		**110** hrs.	50	

Detail of Syllabus

1. English Literacy **Hours of Instruction: 20 Hrs.**	**Marks Allotted: 09**
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking / Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.
2. I.T. Literacy **Hours of Instruction: 20 Hrs.**	**Marks Allotted: 09**
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.
Word processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets
Computer Networking and INTERNET	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.

3. Communication Skills Hour of Instruction: 15 Hrs. Marks Allotted: 07	
Topic	Contents
Introduction to Communication Skills	Communication and its importance
	Principles of Effective communication
	Types of communication - verbal, non verbal, written, email, talking on phone.
	Non verbal communication -characteristics, components- Para-language
	Body - language
	Barriers to communication and dealing with barriers.
	Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.
	Triple- A Listening - Attitude, Attention & Adjustment.
	Active Listening Skills.
Motivational Training	Characteristics Essential to Achieving Success
	The Power of Positive Attitude
	Self awareness
	Importance of Commitment
	Ethics and Values
	Ways to Motivate Oneself
	Personal Goal setting and Employability Planning.
Facing Interviews	Manners, Etiquettes, Dress code for an interview
	Do's & Don'ts for an interview
Behavioral Skills	Problem Solving
	Confidence Building
	Attitude
4. Entrepreneurship Skills Hour of Instruction: 15 Hrs. Marks Allotted: 06	
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of
	entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.
Project Preparation & Marketing analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.
Institutions Support	Preparation of Project. Role of Various Schemes and Institutes

	for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.

5. Productivity

Hour of Instruction: 10 Hrs. Marks Allotted: 05

Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard. Industry Nation.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.

7. Occupational Safety, Health and Environment Education Hour of

Instruction: 15 Hrs. Marks Allotted: 06

Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident & safety	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.
First Aid	Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person
Basic Provisions	Idea of basic provision of safety, health, welfare under legislative of India.

Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water
Environment	Right attitude towards environment, Maintenance of in -house environment
7. Labour Welfare Legislation Hour of Instruction: 05 Hrs. **Marks Allotted: 03**	
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.
8. Quality Tools **Hour of Instruction: 10 Hrs.** **Marks Allotted: 05**	
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of House keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples

Tools & Equipments for Employability Skills:

Sl. No.	Name of the Equipment	Quantity
1	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 nos.
2	UPS - 500Va	10 nos.
3	Scanner cum Printer	1 no.
4	Computer Tables	10 nos.
5	Computer Chairs	20 nos.
6	LCD Projector	1 no.
7	White Board 1200mm x 900mm	1 no.

* Note: Above Tools & Equipments not required, if Computer LAB is available in the institute.

Syllabus for

ENGINEERING DRAWING

GENERAL INFORMATION
(Engineering Drawing)

1. **Name of the Subject :** ENGINEERING DRAWING

2. **Hours of Instruction:** 150 hrs.

3. **Instructor Qualification:** Degree in Engineering with one year experience
   OR
   Diploma in Engineering with two years experience
   OR
   NCVT / NAC in the Draughtsman (Mechanical / Civil) with three years experience.

4. **Desirable:** Craft Instructor Certificate in RoD & A course under NCVT.

5. **Instructor:**
   - One full time instructor is required for 144Engineering seats sanctioned in the institute. Additional instructor will be required on increase in every 144 students.
   - For seats less than 144, the instructor may be out sourced/ hired on contract basis.

Details of syllabus

Sl. No.	Topics (Total duration – 150 hrs.)
1.	Engineering Drawing: Introduction and its importance - Relationship to other technical drawing types - Conventions - Viewing of engineering drawing sheets. - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003
2.	Drawing Instruments : their Standard and uses - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips.
3.	Lines : - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment
4.	Drawing of Geometrical Figures: Definition, nomenclature and practice of - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements.
5.	Lettering and Numbering as per BIS SP46-2003: - Single Stroke, Double Stroke, inclined, Upper case and Lower case.
6.	Dimensioning: - Definition, types and methods of dimensioning (functional, nonfunctional and auxiliary) - Types of arrowhead - Leader Line with text
7.	Free hand drawing of - Lines, polygons, ellipse, etc. - geometrical figures and blocks with dimension - Transferring measurement from the given object to the free hand sketches.
8.	Sizes and Layout of Drawing Sheets - Basic principle of Sheet Size - Designation of sizes - Selection of sizes - Title Block, its position and content - Borders and Frames (Orientation marks and graduations) - Grid Reference - Item Reference on Drawing Sheet (Item List)
9.	Method of presentation of Engineering Drawing - Pictorial View - Orthogonal View - Isometric view
10.	Symbolic Representation (as per BIS SP:46-2003) of : Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints.

	- Electrical and electronics element - Piping joints and fittings
11.	Construction of Scales and diagonal scale
12.	Practice of Lettering and Title Block
13.	Dimensioning practice: - Position of dimensioning (unidirectional, aligned, oblique as per BIS SP:46-2003) - Symbols preceding the value of dimension and dimensional tolerance. - Text of dimension of repeated features, equidistance elements, circumferential objects.
14.	Construction of Geometrical Drawing Figures: - Different Polygons and their values of included angles. Inscribed and Circumscribed polygons. - Conic Sections (Ellipse & Parabola)
15.	Drawing of Solid figures (Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions.
16.	Free Hand sketch of hand tools and measuring tools used in respective trades.
17.	Projections: - Concept of axes plane and quadrant. - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1^{st} angle and 3^{rd} angle projection as per IS specification.
18.	Drawing of Orthographic projection from isometric/3D view of blocks
19.	Orthographic Drawing of simple fastener (Rivet, Bolts, Nuts & Screw)
20.	Drawing details of two simple mating blocks and assembled view.
21.	Revision
22.	Examination

LIST OF TOOLS & EQUIPMENTS

Sl. No.	NAME OF TOOLS / EQUIPMENTS	QUANTITY
1.	Drawing Board	20
2.	Models : Solid & cut section	as required
3.	Table for trainees	20
4.	Stool for trainees	20
5.	Cupboard (big)	01
6.	White Board (size: 8ft. x 4ft.)	01
7.	Trainer's Table	01
8.	Trainer's Chair	01

Syllabus for

Workshop Calculation &Science

GENERAL INFORMATION
(Workshop Calculation & Science)

1. **Name of the subject :** WORKSHOP CALCULATION & SCIENCE

2. **Hours of Instruction:** 110 hrs.

3. **Examination:** The examination for the subject will be held at the end of training.

4. **Instructor Qualification:** Degree in Engineering with two years experience OR
   Diploma in Engineering with one year experience

5. **Desirable:** Craft Instructor Certificate in RoD & A course under NCVT.

6. **Instructor:**

One full time instructor is required for 144Engineering seats sanctioned in the institute. Additional instructor will be required on increase in every 144 students.
For seats less than 144, the instructor may be out sourced/ hired on contract basis.

SYLLABUS FOR WORKSHOP CALCULATION AND SCIENCE

(Total duration – 110 hrs.)

Topic No	Workshop Calculation	Workshop Science
1.	**Unit:** Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	**Material Science** : properties -Physical & Mechanical, Types -Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous metals, Non-Ferrous Alloys.
2.	**Fractions** : Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator.	**Mass .Weight and Density** : Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals.
3.	**Square Root**:Square and Square Root, method of finding out square roots, Simple problem using calculator.	**Speed and Velocity:** Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.
4.	**Ratio & Proportion** : Simple calculation on related problems.	**Work, Power and Energy:** work, unit of work, power, unit of power, Horse power of engines,
5.	**Percentage** : Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.	mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.
6.	**Algebra** : Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	**Heat & Temparature:** Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relation between different scale of temperature, Thermometer, pyrometer, transmission of heat, conduction, convection, radiation.
7.	**Mensuration :** Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle, Volume of solids - cube, cuboid, cylinder and Sphere. Surface area of solids -cube, cuboid, cylinder and Sphere.	**Basic Electricity:** Introduction, use of electricity, how electricity is produced, Types of current_ AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of connections - series, parallel, electric power, Horse power, energy, unit of electrical energy.
8.	**Trigonometry:** Trigonometrical ratios, measurement of angles. Trigonometric tables	**Levers and Simple Machines:** levers and its types. Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.

BLOCK – II

DURATION: 05MONTHS (22 weeks)

Industry level training

BROAD LEARNING TO BE COVERED IN INDUSTRY FOR MECHANIC DIESELTRADE:

1. **Safety and best practices /Basic Industrial Culture (5S, KAIZEN, etc.)**
2. **Record keeping and documentation**
3. **Measure/check different parameters of vehicle components**
4. **Repair & maintenance of Diesel engine**
5. **Overhauling of Diesel engine**
6. **Inspection & testing**

DETAILS OF PRACTICAL SKILLS TO BE COVERED DURING INDUSTRY TRAINING FOR MECHANIC DIESELTRADE

Duration of training: - 05 Months

The candidate should be competent to execute following operation/ skills after completion of the industrial training: -

1. Apply safe working practices in an automotive work shop
2. Comply environment regulations and housekeeping in the work shop.
3. Perform precision measurements on the components and compare parameters with specifications used in automotive work shop practices
4. Use of different type of fastening and locking devices in a vehicle
5. Perform basic fitting operations used in the work shop practices and inspection of dimensions.
6. Inspect the auto component using Non-destructive testing methods (LPI, MPI)
7. Manufacture components with different types of welding processes in the given job.
8. Identify the hydraulic and pneumatic components in a vehicle.
9. Identification of vehicle information Number (VIN) &Demonstration of vehicle specification data
10. Identify and check functionality of Dashboard Gauges & engine performance.
11. Overhauling of Diesel Engine.
12. Servicing of Cooling and Lubrication system
13. Service Intake and Exhaust System
14. Service Diesel Fuel System
15. Check and adjust Engine Emissions
16. Overhauling Charging and Starting System
17. Diagnose and Troubleshoot Diesel Engines

Note:

1. In addition to the above mentioned skills/ operations industry may impart training on any other skills/ operations related to the trade.
2. Assignment should be planned so that the trainees may spend 20% of the total time of production/service type of work (using gauges, instruments etc.) for developing their skill and confidence about manufacturing/servicing which will help ever in self-employment, if found necessary in the future.

BLOCK – III

DURATION: 2month (08 weeks)

Institute level training

For last two months candidates will be engaged in following works: -

1. Revision of theoretical components covered during Block – I.
2. Practical practice and report submission
3. Preparing candidate to face interview, preparation of bio-data, and awareness about different jobs in the related field and grooming to be an entrepreneur.
4. Self study and final AITT examination

Note:-

1. The training may be conducted in Block mode i.e. few months in ITI & few in Industry.
2. The training may be conducted in flexible mode i.e. few days of a week in ITI& few days in Industry.
3. Five months industrial training is mandatory.
4. Last two months of training in ITI is mandatory.
5. No admission of trainees without signing MOU with industry by the Institute (ITI).
6. To sign MOU with ITI, industry must ensure that, training facility is available to impart all skill sets as indicated in Block-II. Industry should make arrangements to provide all the Skill set as in Block-II for Mechanic Diesel in the Industry either by itself or through its ancillary units or in association with some other Industries.
7. If the industry ensures delivery of skill training as per Sl. 6 then 2nd MOU is not necessary.
8. However, Industry should ensure 100% skill training indicated in Block-II & necessary arrangement to be made to cover training on rest skill set (beyond the % indicated in sl.6) in collaboration with any other related industries. Extensive use of E-learning process may also be adopted.

TRADE: Mechanic Diesel (Dual Mode)

LIST OF TOOLS & EQUIPMENTS FOR 16 TRAINEES

A. TRAINEESTOOLKIT per 4 Trainees

Sl. No.	Item with specification	Qty (Nos.)
1.	Allen Key set of 12 pieces (2mm to 14mm)	5
2.	Caliper inside 15 cm Spring	6
3.	Calipers outside 15 cm spring	6
4.	Center Punch 10 mm. Dia. x 100 mm.	6
5.	Dividers 15 cm Spring	6
6.	Electrician Screw Driver 250mm	6
7.	Hammer ball peen 0.5 kg with handle	6
8.	Hands file 20 cm. Second cut flat	6
9.	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)	6
10.	Pliers combination 20 cm.	6
11.	Screw driver 20cm.X 9mm. Blade	6
12.	Screw driver 30 cm. X 9 mm. Blade	6
13.	Scriber 15 cm	6
14.	Spanner D.E. set of 12 pieces (6mm to 32mm)	6
15.	Spanner, ring set of 12 metric sizes 6 to 32 mm.	6
16.	Spanners socket with speed handle, T-bar, ratchet and universal upto 32 mm set of 28 pieces with box	6
17.	Steel rule 30 cm inch and metric	6
18.	Steel tool box with lock and key(folding type) 400x200x150mm	6
19.	Wire cutter and stripper	6

B. Tools Instruments and General Shop outfits AT ITI

Sl.No.	Item with specification	Qty. (Nos)
1.	Adjustable spanner (pipe wrench 350 mm)	2
2.	Air blow gun with standard accessories	1
3.	Allen Key set of 12 pieces (2mm to 14mm)	4
4.	Ammeter 300A/ 60A DC with external shunt	4
5.	Angle plate adjustable 250x150x175	1
6.	Angle plate size 200x100x200mm	2
7.	Anvil 50 Kgs with Stand	1
8.	Battery –charger	2
9.	Belt Tensioner gauge	1
10.	Blow Lamp 1 litre	2
11.	Caliper inside 15 cm Spring	4
12.	Calipers outside 15 cm spring	4
13.	Chisel 10 cm flat	4
14.	Chisels cross cut 200 mm X 6mm	4
15.	Circlip pliers Expanding and contracting type 15cm and 20cm each	4
16.	Clamps C 100mm	2
17.	Clamps C 150mm	2
18.	Clamps C 200mm	2

19.	Cleaning tray 45x30 cm.	4
20.	Copper bit soldering iron 0.25 Kg	4
21.	Cylinder bore gauge capacity 20 to 160 mm	4
22.	DC Ohmmeter 0 to 300 Ohms, mid scales at 20 Ohms	2
23.	Depth micrometer 0-25mm	4
24.	Dial gauge type 1 Gr. A (complete with clamping devices and with magnetic stand)	4
25.	Different type of Engine Bearing model	1 set
26.	Different type of piston model	1each
27.	Dividers 15 cm Spring	4
28.	Drift Punch Copper 15 Cm	4
29.	Drill point angle gauge	1
30.	Drill twist 1.5 mm to 15 mm (various sizes) by 0.5 mm	4
31.	Electric Soldering Iron 230 V 60 watts 230 V 25 watts	2 each
32.	Electric testing screw driver	4
33.	Engineer's square 15 cm. Blade	4
34.	Engineers stethoscope	1
35.	Feeler gauge 20 blades (metric)	4
36.	File flat 20 cm bastard	4
37.	File, half round 20 cm second cut	4
38.	File, Square 20 cm second cut	4
39.	File, Square 30 cm round	4
40.	File, triangular 15 cm second cut	4
41.	Files assorted sizes and types including safe edge file (20 Nos)	2 set
42.	Flat File 25 cm second cut	4
43.	Flat File 35 cm bastard	4
44.	Fuel feed pump for Diesel	1
45.	Glow plug tester	2
46.	Granite surface plate 1600 x 1000 with stand and cover	1
47.	Grease Gun	2
48.	Grease Gun heavy duty trolley type 10 kg capciaty	1
49.	Growler	2
50.	Hacksaw frame adjustable 20-30 cm	10
51.	Hammer Ball Peen 0.75 Kg	4
52.	Hammer Chipping 0.25 Kg	5
53.	Hammer copper 1 Kg with handle	4
54.	Hammer Mallet	4
55.	Hammer Plastic	4
56.	Hand Shear Universal 250mm	2
57.	Hand vice – 37 mm	2
58.	Hollow Punch set of seven pieces 6mm to 15mm	2 sets each
59.	Injector – Multi hole type, Pintle type	4 each
60.	Insulated Screw driver 20 cm x 9mm blade	4
61.	Insulated Screw driver 30 cm x 9mm blade	4
62.	Left cut snips 250mm	4
63.	Lifting jack screw type 3 ton, 5ton & 20 Ton capacity	1 each
64.	Magneto spanner set with 8 spanners	1 set
65.	Magnifying glass 75mm	2
66.	Marking out table 90X60X90 cm.	1
67.	Multimeter digital	5

68.	Oil can 0.5/0.25 liter capacity	4
69.	Oil Stone 15 cm x 5 cm x 2.5 cm	1
70.	Outside micrometer 0 to 25 mm	4
71.	Outside micrometer 25 to 50 mm	4
72.	Outside micrometer 50 to 75 mm	1
73.	Outside micrometer 75 to 100 mm	1
74.	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)	2
75.	Pipe cutting tool	2
76.	Pipe flaring tool	2
77.	Piston ring compressor	2
78.	Piston Ring expander and remover.	2
79.	Piston Ring groove cleaner.	1
80.	Pliers combination 20 cm.	2
81.	Pliers flat nose 15 cm	2
82.	Pliers round nose 15 cm	2
83.	Pliers side cutting 15 cm	2
84.	Portable electric drill Machine	1
85.	Prick Punch 15 cm	4
86.	Punch Letter 4mm (Number)	2 set
87.	Radiator cut section-cross flow	1
88.	Radiator cut section-down flow	1
89.	Radiator pressure cap	2
90.	Right cut snips 250mm	2
91.	Rivet sets snap and Dolly combined 3mm, 4mm, 6mm	2
92.	Scraper flat 25 cm	2
93.	Scraper half round 25 cm	2
94.	Scraper Triangular 25 cm	2
95.	Scriber 15 cm	2
96.	Scriber with scribing black universal	2
97.	Set of stock and dies -Metric	2 sets
98.	Shear Tin Man’s 450 mm x 600mm	2
99.	Sheet Metal Gauge	2
100.	Sher Tinmans 300mm	4
101.	Soldering Copper Hatchet type 500gms	2
102.	Solid Parallels in pairs (Different size) in Metric	2
103.	Spanner Clyburn 15 cm	1
104.	Spanner D.E. set of 12 pieces (6mm to 32mm)	4
105.	Spanner T. flocks for screwing up and up-screwing inaccessible	2
106.	Spanner, adjustable 15cm.	2
107.	Spanner, ring set of 12 metric sizes 6 to 32 mm.	4
108.	Spanners socket with speed handle, T-bar, ratchet and universal upto	2
109.	Spark lighter	2
110.	Spark plug spanner 14mm x 18mm x Size	2
111.	Steel measuring tape 10 meter in a case	4
112.	Steel rule 15 cm inch and metric	4
113.	Steel rule 30 cm inch and metric	4
114.	Straight edge gauge 2 ft.	2
115.	Straight edge gauge 4 ft.	2
116.	Stud extractor set of 3	2 sets
117.	Stud remover with socket handle	1
118.	Surface gauge with dial test indicator plunger type i.e. 0.01 mm	4

119.	Tachometer (Counting type)	1
120.	Taps and Dies complete sets (5 types)	1 set
121.	Taps and wrenches - Metric	2 sets
122.	Telescope gauge	4
123.	Temperature gauge with sensor 0-100 deg c	2
124.	Thermostat	2
125.	Thread pitch gauge Metric,	2
126.	Timing lighter	2
127.	Torque wrenches 5-35 Nm, 12-68 Nm & 50-225 Nm	1 each
128.	Trammel 30 cm	2
129.	Turbocharger cut sectional view	1
130.	Tyre pressure gauge with holding nipple	2
131.	V' Block 75 x 38 mm pair with Clamps	2
132.	vernier caliper 0-300 mm with least count 0.02mm	4
133.	Vice grip pliers	2
134.	Wire Gauge (metric)	2
135.	Work bench 250 x 120 x 60 cm with 4 vices 12cm Jaw	4

C. General Installation/Machineries AT ITI

Sl. No.	Item with specification	Qty (Nos.)
1.	Bench lever shears 250mm Blade x 3mm Capacity	1
2.	Discrete Component Trainer / Basic Electronics Trainer	1
3.	Grinding machine (general purpose) D.E. pedestal with 300 mm dia wheels rough and smooth	1
4.	Hydraulic jack HI-LIFT type -3 ton capacity, and 5 Ton capacity	1 each
5.	Pipe Bending Machine (Hydraulic type) 12mm to 30mm	1
6.	Tin smiths bench folder 600 x 1.6mm	1
7.	Trolley type portable air compressor single cylinder with 45 liters capacity Air tank, along with accessories & with working pressure 6.5 kg/sq cm	1
8.	Working condition of diesel engine – crdi 4 stroke, 6 cylinder engine assembly with fault simulation board.	1
9	Automotive exhaust 5 gas analyzer (petrol & Diesel) or Diesel Smoke	1

ALLOTMENT OF TIME &MARKS AMONG

THE SUBJECTS FOR EXAMINATION

Sl. No.	SUBJECTS	Duration of exam (in Hrs.)	Full Marks	Pass Marks
1.	Trade Theory + E/S (150+50)	3	200	80
2.	Workshop Cal. & Sc.	3	50	20
3.	Engineering Drawing	4	50	20
4.	Internal Marks (ITI)	--	50	30
5.	Trade Practical –I*	4	50	30
6.	Internal Marks (Industry)	--	50	30
7.	Trade Practical-II** + Project work (200+50)	8	250	150
GRAND TOTAL			**700**	**360**

Note:-

1. "*" represents practical conducted at ITI
2. "**" represents practical conducted at Industry at the end of training
3. 40% pass marks for theory subjects and 60% pass marks for practical
4. The project work will be conducted at industry and industry will allot marks for the same.

Format for Internal Assessment

Name & Address of the Assessor :													**Year of Enrollment :**		
Name & Address of ITI (Govt./Pvt.) :													**Date of Assessment :**		
Name & Address of the Industry :													**Assessment location: Industry / ITI**		
Trade Name :		**Block:**											**Duration of the Trade/course:**		
Operation/Skill:															
Sl. No	**Maximum Marks (Total 100 Marks)**		**15**	**5**	**10**	**5**	**10**	**10**	**5**	**10**	**15**	**15**	**Total internal assessment Marks**	**Result (Y/N)**
	Candidate Name	**Father's/Mother's Name**	Safety consciousness	Workplace hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA		
1														
2														

LIST OF TRADE COMMITTEE MEMBERS

Sl. No.	Name & Designation	Organization
1.	Shri.R.Senthil Kumar, Director	ATI, Chennai
2.	Shri S.Mathivanan, Joint Director of Training	ATI, Chennai
3.	Shri.M.Thamizharasan, Joint Director of Training	CSTARI, Kolkata
4.	Shri.K.Srinivasa Rao, Joint Director of Training	NIMI Chennai
5.	Shri.Amrit Pal Singh, Dy. Director of Trg.	DGT, New Delhi
6.	Shri.C.Yuvaraj, Deputy Director of Training	ATI, Chennai
7.	Shri.R.Rajesh Kanna, Training Officer	ATI, Chennai
8.	Shri D. Sankar, V.I.	CTI, Chennai
9.	Shri.K.K.Bhuvaneswaran, Manager	G.D.Naidu Technical Trg. Institute, Coimbatore
10.	Shri.S.Manohar, Training Officer	SRMU I.T.I., Coimbatore
11.	Shri.P.Thangapazham, AGM/HR/Trg	Daimler India Comm. Vehicle (P) Ltd., Chennai
12.	Shri.V.Krishnashankar, DGM	Ashok Leyland Chennai
13.	Shri.K.Aravind, Regional Manager	Bosch Ltd., Chennai
14.	Dr.K.Annamalai, Associate Professor	M.I.T., Anna University Chennai
15.	Shri.R.Durairaj, Associate Manager	Lanson Toyota, Chennai
16.	Shri.S.M.Abdul Gani, Instructor	Lanson Toyota, Chennai
17.	Shri.S.Muthuraman, Dealer Training Manager	Cars India, Ambattur, Chennai
18.	Shri.J.F.Vasanth Kumar, Head- Service	VSTGrandeur, Chennai