

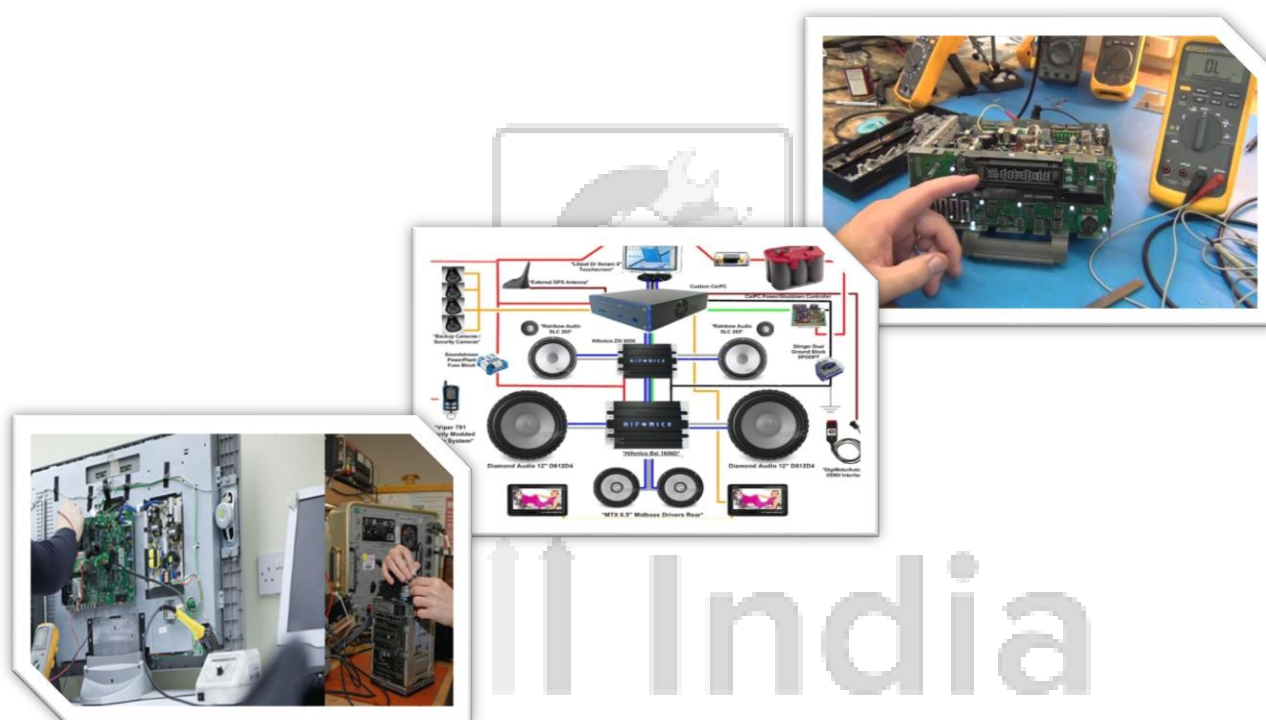
MECHANIC RADIO, AUDIO, VIDEO SYSTEM AND APPLIANCES

COMPETENCY BASED CURRICULUM

(Duration: 2 Yrs.)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 5



India
कौशल भारत - कुशल भारत
SECTOR – ELECTRONICS



सत्यमेव जयते

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



MECHANIC RADIO, AUDIO, VIDEO SYSTEM AND APPLIANCES

(Revised in 2018)

APPRENTICESHIP TRAINING SCHEME (ATS)



NSQF LEVEL - 5

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कौशल भारत - कुशल भारत

Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

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ACKNOWLEDGEMENT

The DGT sincerely expresses appreciation for the contribution of the Industry, State Directorate, Trade Experts and all others who contributed in revising the curriculum.

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

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1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate (ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry. There are four categories of apprentices namely; **trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.



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2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

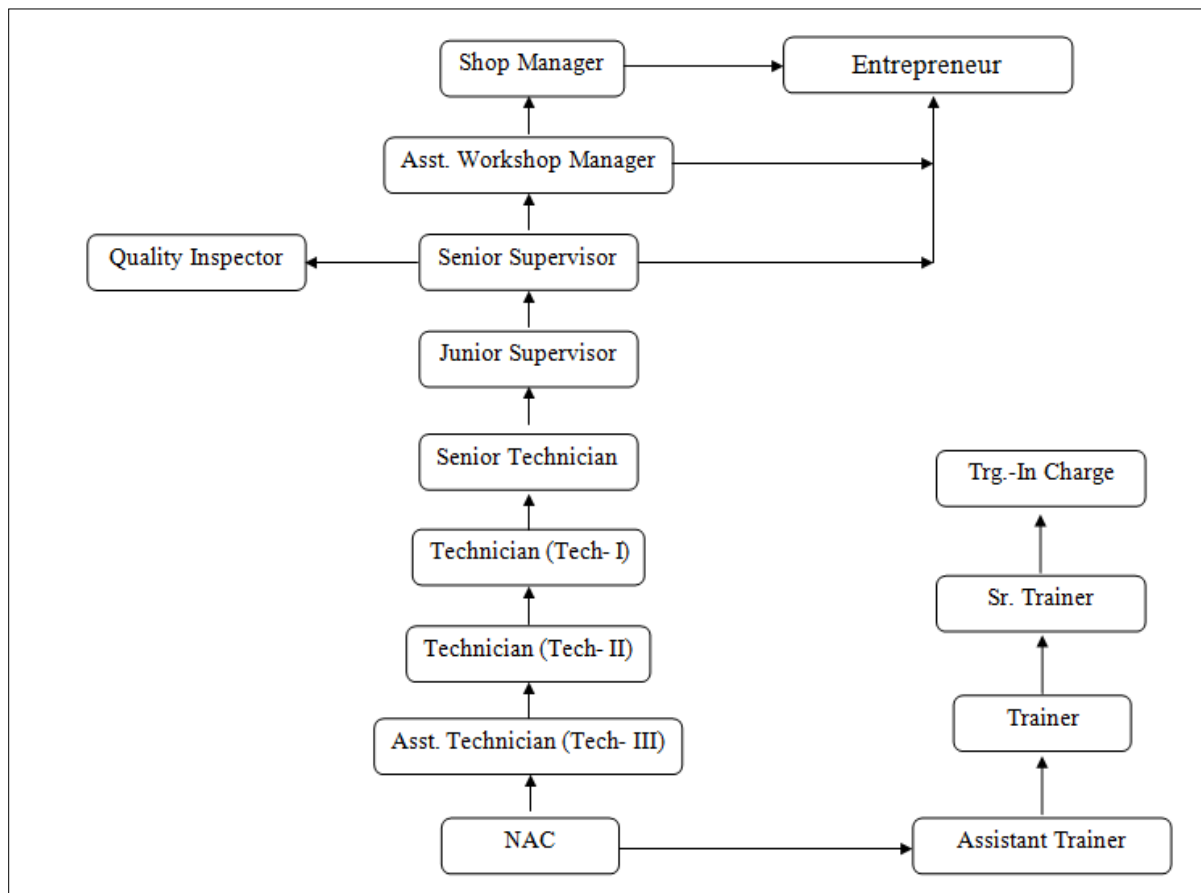
Mechanic Radio, Audio, Video System and Appliances trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of two years (02 Blocks) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS:

- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of two years (*Basic Training and On-Job Training*): -

Total training duration details: -

Time (in months)	1-3	4-12	13-15	16-24
Basic Training	Block– I	-----	Block – II	-----
Practical Training (On - job training)	----	Block – I	-----	Block – II

A. Basic Training

For 02 yrs. Engg. Course:-**Total 06 months:** 03 months in 1styr. + 03 months in 2nd yr.

For 01 yr. Engg. course:- **Total 03 months:** 03 months in 1st yr.

Sl. No.	Course Element	Total Notional Training Hours	
		For 02 yrs. course	For 01 yr. course
1	Professional Skill (Trade Practical)	550	275
2	Professional Knowledge (Trade Theory)	240	120
3	Workshop Calculation & Science	40	20
4	Engineering Drawing	60	30
5	Employability Skills	110	55
	Total (including Internal Assessment)	1000	500

A. On-Job Training:-

For 02 yrs. Engg. Course :- (**Total 18 months:** 09 months in 1st yr. + 09 months in 2nd yr.)
Notional Training Hours for On-Job Training: 3120 Hrs.

For 01 yr. Engg. course :-(**Total 12 months**) Notional Training Hours for On-Job Training: 2080 Hrs.

B. Total training hours:-

Duration	Basic Training	On-Job Training	Total
For 02 Engg. yrs. course	1000 hrs.	3120 hrs.	4120 hrs.
For 01 yr. Engg. course	500 hrs.	2080 hrs.	2580 hrs.

2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.**

2.4.1 PASS REGULATION

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment • Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the

	component/job/set standards. • A fairly good level of neatness and consistency in the finish • Occasional support in completing the project/job.
(b) Weightage in the range of above 75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.	• Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

Brief description of Job roles:

Radio Mechanic; Radio Repairer tests, repairs, services and maintains radio receiving sets in accordance with diagrams and manufacturers specifications, using hand tools and electrical measuring instrument. Removes radio cabinet from chassis and examines equipment for damaged components and loose or broken connections and wires either by connecting set with current supply or otherwise. Replaces defective components and parts according to specifications such as tubes (valve), condensers, transformer resistors etc. using hand tools. Makes necessary electrical connections according to diagrams and solders or tightens loose ones. Tests equipment for output frequency, noise level, audio quality, dial calibration and other factors using oscilloscopes radio frequency and watt meters, ammeters, volt-meters, valve testers etc. Tunes and aligns radio frequency and watt meters, ammeters, in battery sets and gets them charged or replaces them if necessary. May repair transistors and television sets. May repair and service electronic equipment such as microphones, record player, tape recorders, etc.

Radio Technician (Radio Manufacturing) tests assembled radio sets with testing equipment to ensure that assembly soldering, frequency, performance, etc. are in accordance with prescribed standards. Places assembled radio set in position and visually examines it to ensure that position of components, connections, soldering, wiring, etc. are in order. Switches on and operates different knobs to check calibration, audibility and general performance of set by varying its tone and listening to various stations and frequencies. Tightens loose nuts and screws, locates faults, replaces defective components and conducts necessary changes. Approves correctly assembled sets for further processing and rejects defective ones for rectification. May tests sets at different stages of assembly. May service, repair and overhaul radio sets.

Television Repair Technician job role is applicable to both Television manufacturing facilities as well as electronics service centres. This role pertains to rectify faults identified during testing of TV on in manufacturing process and providing after sales assistance and ensuring appropriate functioning of television sets. A TV repair technician identifies the section in the TV that is not functioning. If the problem identified is in the Printed Circuit Board (PCB), the technician identifies the specific fault in the PCB and corrects it. Replaces the dysfunctional PCB with a new one, if the damage identified requires fixing at the service centre.

Television Service and Repairman repairs and adjusts radios and television receivers, using hand tools and electronic testing instruments. Tunes receiver on all channels and observes audio and video characteristics to locate source of trouble. Adjusts controls to obtain desired density, linearity, focus and size of picture. Examines chassis for defects. Tests voltages and resistance of circuits to isolate defect following schematic diagram and using voltmeter, oscilloscope, signal generator and other electronic testing instruments. Tests and changes tubes, solders loose connections and repairs or replaces defective parts, using hand tools and soldering iron. Repair radios and other audio equipment. May install television sets.

TV Repair Technician is also, called 'Field Technician-TV', the TV Repair Technician provides after sales service to customers. The individual at work interacts with customers to install the TV as well as diagnose the problem and assess possible causes of fault reported. Once the

problem and causes have been identified, the individual rectifies minor problems or replaces faulty modules for failed parts or recommends factory repairs for bigger faults.

Electronic Mechanics and Servicers, other include all other workers engaged in installing, servicing and repairing radios and television sets and other audio equipment, not elsewhere classified.

Reference NCO:

- i) 7422.1500-Radio Mechanic
- ii) 7422.1400-Radio Technician (Radio Manufacturing)
- iii) 7422.1302-Television Repair Technician
- iv) 7422.1300-Television Service and Repairman
- v) 7421.1301-TV Repair Technician
- vi) 7421.9900-Electronic Fitters, Mechanics and Servicers, Other



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4. NSQF LEVEL COMPLIANCE

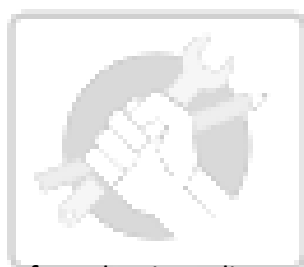
NSQF level for Mechanic Radio, Audio, Video System and Appliances trade under ATS:
Level 5

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

- a. Process
- b. Professional knowledge,
- c. Professional skill,
- d. Core skill and
- e. Responsibility.



The Broad Learning outcome of Mechanic Radio, Audio, Video System and Appliances trade under ATS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context.	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problem by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and Learning and some responsibility for other's works and learning.

5. GENERAL INFORMATION

Name of the Trade	MECHANIC RADIO, AUDIO, VIDEO SYSTEM AND APPLIANCES
NCO - 2015	7422.1500, 7422.1400, 7422.1302, 7422.1300, 7421.1301, 7421.9900
NSQF Level	Level – 5
Duration of Apprenticeship Training (Basic Training + On-Job Training)	Two years (02 Blocks each of one year duration).
Duration of Basic Training	a) Block – I : 3 months b) Block – II : 3 months Total duration of Basic Training: 6 months
Duration of On-Job Training	a) Block–I: 9 months b) Block–II : 9 months Total duration of Practical Training: 18 months
Entry Qualification	Passed 10th class examination under 10+2 system of education or its equivalent.
Selection of Apprenticeship	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	As per ITI instructors qualifications as amended time to time for the specific trade.
Infrastructure for basic training	As per related trade of ITI.
Examination	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
Rebate to Ex-ITI Trainees	01 year
CTS trades eligible for Mechanic Radio, Audio, Video System And Appliances Apprenticeship	1. Electronics Mechanic 2. Mechanic Consumer Electronic Appliances

Note:

- Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.
- For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.

6. LEARNING OUTCOME

6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the MECHANIC RADIO, AUDIO, VIDEO SYSTEM AND APPLIANCES course of 02 years duration under ATS.

Block I & II

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]*
4. Select and ascertain measuring instrument and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Block – I

1. Install, operate, maintain and troubleshoot Computer Based DVD Drives, Blue Ray Player, Portable DVD Player, CD Playbacks etc.
2. Construct, install, operate and verify characteristics of Microphone & Loudspeakers, Home Theatre Systems.
3. Test, troubleshoot and maintain DJ Equipment, Mixer, Amplifier, DJ Headphones etc.
4. Install, Operate, maintain and troubleshoot Satellite Radio System & DTH System.

Block – II

5. Install, operate, maintain and troubleshoot Different types of Camera.
6. Test & troubleshoot various Domestic Appliances.

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7. Install, operate & maintain different types of Security Systems.
8. Install, operate, maintain and troubleshoot various Computer Peripherals.
9. Test & Check different Portable Gadgets.

Note: Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.



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7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1.4 Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures in regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement.
	1.12 Identify environmental pollution & contribute to avoidance of same.
	1.13 Take opportunities to use energy and materials in an environmentally friendly manner
	1.14 Avoid waste and dispose waste as per procedure
	1.15 Recognize different components of 5S and apply the same in the working environment.
2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and apply in day to day work. <i>[Different mathematical calculation]</i>	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.
	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply given tolerance.
	2.5 Prepare list of appropriate materials by interpreting

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<i>& science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]</i>		detail drawings and determine quantities of such materials.
	2.6	Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7	Explain basic electricity, insulation & earthing.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing- Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]</i>	3.1	Read & interpret the information on drawings and apply in executing practical work.
	3.2	Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.
	3.3	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1	Select appropriate measuring instruments such as micrometers, vernier callipers, dial gauge, bevel protector and height gauge (as per tool list).
	4.2	Ascertain the functionality & correctness of the instrument.
	4.3	Measure dimension of the components & record data to analyse with the given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1	Explain the concept of productivity and quality tools and apply during execution of job.
	5.2	Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3	Knows benefits guaranteed under various acts
6. Explain energy conservation, global warming and pollution and	6.1	Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment

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contribute in day to day work by optimally using available resources.	pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7.1 Explain personnel finance and entrepreneurship.
	7.2 Explain 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.
	7.3 Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8.1 Use documents, drawings and recognize hazards in the work site.
	8.2 Plan workplace/ assembly location with due consideration to operational stipulation
	8.3 Communicate effectively with others and plan project tasks
	8.4 Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
SPECIFIC OUTCOME	
Block-I & II (Section:10)	
<i>Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under block – I & block – II (section: 10) must ensure that the trainee achieves well developed skill with clear choice of procedure in familiar context. Assessment criteria should broadly cover the aspect of Planning (Identify, ascertain, estimate etc.); Execution (perform, illustration, demonstration etc. by applying 1) a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information 2) Knowledge of facts, principles, processes, and general concepts, in a field of work or study 3) Desired Mathematical Skills and some skill of collecting and organizing information, communication) and Checking/ Testing to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for own work and learning and some responsibility for other's work and learning.</i>	

BASIC TRAINING (Block – I)**Duration: (03) Three Months**

Week No.	Professional Skills	Professional Knowledge
1	Occupational Hazards and safety measures related to the trade. Introduction about environment and environment management system. Environment pollution and mechanics role in minimizing the same. Installation, Operation, Maintenance and Troubleshooting	Occupational Hazards and safety measures related to the trade. Introduction about environment and environment management system. Environment pollution and mechanics role in minimizing the same. TV fundamentals: visual perception and measurements, the scanning process, the analog TV waveform, elements of picture quality Essentials of B & W and color T.V., LCD, Plasma Panel, HDTV Analog Color Video Signals and Delivery Systems: NTSC, PAL, SECAMs, Television Transmitting Systems-Broadcast TV, CATV/Cable TV Overview, Introduction to Satellite Systems, Fiber Optics in Television Television Cameras and Color TV Receivers, Computer Monitors and Standards
2-3	Installation, Operation, Maintenance and Troubleshooting	DVD Player Recorder Technical Details, CD Playbacks, Output, Software, Portable DVD Player. Computer Based DVD Drives Blue Ray Player Technical Details, Disc Formats, Blue Ray Vs HD DVD
4-5	Installation, Operation, Maintenance and Troubleshooting	Microphone & Loudspeakers: Construction, working principle, characteristics, and application of different types of microphones, & Loudspeakers. Home Theatre Systems, Home Theatre Flow Diagram, THX 7.1 Speaker AV Receiver System: Block Diagram, Usage, Features, Decoders, Radio Reception, Amplification, AV Inputs/Outputs
6-7	Installation, Operation, Maintenance and Troubleshooting	DJ Equipment, Mixer, Amplifier, DJ Headphones, Motorised Lighting, Laser Pattern Lighting

8-9	Installation, Operation, Maintenance and Troubleshooting	Satellite Radio System: System Design, Satellite Radio Vs. Other Radio Formats
10-11	Installation, Operation, Maintenance and Troubleshooting	DTH System Terminology, Technology, Installations, Free & Commercial DBS Services, DTH Service Providers. Satellite Dish principle of operation, size, Systems design & types
12	Revision	
13	Assessment/Examination 03days	



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BASIC TRAINING (Block – II)**Duration: (03) Three Months**

Week No.	Professional Skills	Professional Knowledge
1-2	Installation, Operation, Maintenance and Troubleshooting.	Video Camera Introduction to twin lens reflex Camera, single lens reflex camera & Digital Camera. Analog Vs Digital Video Cameras, Major Components, Modern Recording media, Other devices with video capturing ability. Digital Camcorders.
3-4	Installation, Operation, Maintenance and Troubleshooting.	Domestic Appliances Microwave Oven, Washing Machines (Fuzzy Logic), Water Purifiers. Functions & their usage. Block Diagram. Testing & troubleshooting.
5-6	Installation, Operation, Maintenance and Troubleshooting.	Security Systems: Various Types of Security Systems like Electronic Lock, Burglar Alarm, Biometrics, Closed Circuit Television, and Smart Cards etc. Features & Operation of Closed Circuit Television, Electronic Lock, Electronic Safe
7-9	Installation, Operation, Maintenance and Troubleshooting.	Computer Peripherals: Monitors, Colour Laser Printers, Modem, Hard Disc, RAM, SMPS, Routers, Ethernet, Graphic Cards, Speakers, Wireless Keyboard and Mouse,
10-11	Installation, Operation, Maintenance and Troubleshooting.	Portable Gadgets: iPod, MP3 Players, Palmtops, LAPTOP
12	Revision	
13	Assessment/Examination 03days	

Note: - More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.

9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

Block – I		
Sl. No.	Workshop Calculation and Science (Duration: - 20 hrs.)	Engineering Drawing (Duration: - 30 hrs.)
1	Unit: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units.	Engineering Drawing: Introduction and its importance - Viewing of engineering drawing sheets. Method of Folding of printed Drawing Sheet as per BIS SP:46-2003 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.
2	Fractions & Simplification: Fractions, Decimal fraction, Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems Simplification using BODMAS.	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
3	Square Root : Square and Square Root, method of finding out square roots, Simple problem using calculator	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.
4	Ratio &Proportion: Simple calculation on related problems.	Lettering and Numbering as per BIS SP46-2003: - Single Stroke, Double Stroke, inclined, Upper case and Lower case.

5	Percentage: Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.	Free Hand sketch: Hand tools and measuring instruments used in electronics mechanics trades
6	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.	Free hand drawing : - Lines, polygons, ellipse, etc. - Geometrical figures and blocks with dimension. - Transferring measurement from the given object to the free hand sketches.



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Block – II		
Sl. No.	Workshop Calculation and Science (Duration: - 20 hrs.)	Engineering Drawing (Duration: - 30 hrs.)
1	Mass ,Weight and Density : Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals	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.
2	Work, Power and Energy: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.	Construction of Scales and diagonal scale
3	Three phase Induction motor Free hand sketching of Slip-ring and Squirrel cage Induction motor. Typical wiring diagram for drum controller operation of A.C. wound rotor motor.	Drawing the schematic diagram of Autotransformer starter, DOL starter and Star Delta Starter. Drawing circuit diagram of A.C. motor speed control by TRIAC.
4	Algebra: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	Drawing block diagram of AC Drive showing variable voltage and variable frequency control (VVVF).
5	Mensuration: Area and perimeter of square, rectangle, parallelogram, triangle, circle and semi circle. Volume of solids – cube, cuboids, cylinder, cone and sphere	Drawing Relay logic circuits. Construction of control circuits using normally open, normally closed contacts; Time delay relays (TDRs) of on delay and off delay.

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9.2 EMPLOYABILITY SKILLS**(DURATION: - 110 HRS.)**

Block – I (Duration – 55 hrs.)		
1. English Literacy		Duration: 20 Hrs. Marks : 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		Duration: 20 Hrs. Marks : 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	
Duration: 15 Hrs. Marks : 07	
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
Block – II (Duration – 55 hrs.)	
4. Entrepreneurship Skills	
Duration: 15 Hrs. Marks : 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.

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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	
Duration: 10 Hrs. Marks : 05	
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.
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.
6. Occupational Safety, Health and Environment Education	
Duration: 15 Hrs. Marks : 06	
Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibro acoustic 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 legislation of India. 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	
Duration: 05 Hrs. Marks : 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	
Duration: 10 Hrs. Marks : 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.

10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)

The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

Block – I

1. Install, operate, maintain and troubleshoot Computer Based DVD Drives, Blue Ray Player, Portable DVD Player, CD Playbacks etc.
2. Construct, install, operate and verify characteristics of Microphone & Loudspeakers, Home Theatre Systems.
3. Test, troubleshoot and maintain DJ Equipment, Mixer, Amplifier, DJ Headphones etc.
4. Install, operate, maintain and troubleshoot Satellite Radio System & DTH System.

Block – II

5. Install, operate, maintain and troubleshoot Different types of Camera.
6. Test & troubleshoot various Domestic Appliances.
7. Install, operate & maintain different types of Security Systems.
8. Install, operate, maintain and troubleshoot various Computer Peripherals.
9. Test & Check different Portable Gadgets.

Note:

1. Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.
2. In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

MECHANIC RADIO, AUDIO, VIDEO SYSTEM AND APPLIANCES			
LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)			
Sl. No.	Name of the Tools and Equipments	Specification	Quantity
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit sl. 1-12 is required additionally)			
1.	Connecting screwdriver	100 mm	10 Nos.
2.	Neon tester 500 V.	500 V	6 Nos.
3.	Screw driver set	Set of 7	10 Nos.
4.	Insulated combination pliers	150 mm	6 Nos.
5.	Insulated side cutting pliers	150mm	8 Nos.
6.	Long nose pliers	150mm	6 Nos.
7.	Soldering iron	25 Watt, 240 Volt	10 Nos.
8.	Electrician knife	100 mm	6 Nos.
9.	Tweezers	150 mm	10 Nos.
10.	Digital Multimeter	(3 3/4 digit) ,4000 Counts	10 Nos.
11.	Soldering Iron Changeable bits	15 Watt, 240 Volt	6 Nos.
12.	De- soldering pump electrical heated, manual operators	230 V, 40 W	10 Nos.
B. SHOP TOOLS, INSTRUMENTS – For 2 (1+1) units no additional items are required			
Lists of Tools:			
13.	Steel rule graduated both in Metric and English Unit	300 mm,	4 Nos.
14.	Precision set of screw drivers	T5, T6, T7	2 Nos.
15.	Tweezers – Bend tip		2 Nos.
16.	Steel measuring tape	3 meter	4 Nos.
17.	Tools makers vice	100mm (clamp)	1 Nos.
18.	Tools maker vice	50mm (clamp)	1 Nos.
19.	Crimping tool (pliers)	7 in 1	2 Nos.
20.	Magneto spanner set	8 Spanners	2 Nos.
21.	File flat bastard	200 mm	2 Nos.
22.	File flat second cut	200 mm	2 Nos.
23.	File flat smooth	200 mm	2Nos.
24.	Pliers - Flat Nose	150 mm	4 Nos.
25.	Round Nose pliers	100 mm	4 Nos.
26.	Scriber straight	150 mm	2 Nos.
27.	Hammer ball pen	500 grams	1 No.
28.	Allen key set (Hexagonal -set of 9)	1 - 12 mm, set of 24 Keys	1 No.
29.	Tubular box spanner	Set - 6 - 32 mm	1 set.
30.	Magnifying lenses	75 mm	2 Nos.
31.	Continuity tester		6 Nos.
32.	Hacksaw frame adjustable	300 mm	2 Nos.

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33.	Chisel - Cold - Flat	10 mm X 150 mm	1 No.
34.	Scissors	200mm	1 No.
35.	Handsaw 450mm	Hand Saw - 450 mm	1 No.
36.	Hand Drill Machine Electric with Hammer Action	13 mm	2 Nos.
37.	First aid kit		1 No.
38.	Bench Vice	Bench Vice - 125 mm	1 No. each
		Bench Vice - 100 mm	
		Bench Vice - 50 mm	
List of Equipments			
39.	Dual DC regulated power supply	30-0-30 V, 2 Amps	4 Nos.
40.	DC Regulated Variable Programmable DC Power Supply	0-30V/3A	2 Nos.
41.	LCR meter (Digital) Handheld		1 No.
42.	CRO Dual Trace	20 MHz (component testing facilities)	2 Nos.
43.	Signal Generator with Digital Display for Frequency Amplitude	10 Hz to 100 KHz, 50/600 Ohms (output impedance)	2 Nos.
44.	Battery Charger	0 - 6 - 9 - 12 - 24 , 15 Amps	1 No.
45.	Analog multimeter		4 Nos.
46.	Clamp meter	0 - 10 A	2 Nos.
47.	Function generator (DDS Technology (Sine, Square, Triangle, Ramp, Pulse, Serial Data, TTL and Modulation.)	1 MHz -10 MHz Function-Pulse – Modulation Generator with Built in 40MHz Frequency Counter	2 Nos.
48.	Dimmer starter	3 Amps	2 Nos.
49.	Autotransformer	15 Amps	2 Nos.
50.	Analog Component Trainer	Breadboard for Circuit design with necessary DC /AC power supply: • 8 pin ZIF socket • 16 pin ZIF socket • Resistor bank • Capacitor bank • Potentiometers • Diodes • Zener diodes • NPN Transistor • N-channel MOSFET • LED • Bread board • Ready to use Experimental Boards Lab Manual with list of experiments to perform various experiments	4 Nos.

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51.	Milli Ammeter (AC)	0 – 200 mA	2 Nos.
52.	Milli Ammeter (DC)	0 – 500 mA	2 Nos.
53.	Op Amp trainer	• $\pm 15V$, ± 12 and $+5V$ fixed DC power supply • 8pin ZIF socket • 16 pin ZIF socket • Resistor bank • Capacitor bank • Potentiometers • Bread board • Built in oscillator : sine, square and tri-angular waveform	2 Nos.
54.	Digital IC Trainer	Breadboard for Circuit design with necessary DC Power Supply, Graphical LCD, Clock Frequency 4 different steps, Data Switches: 8 Nos, LED Display: 8 Nos. (TTL), Seven Segment Display, Teaching Simulation Software	4 Nos.
55.	Digital and Analog IC Tester		1 No.
56.	Rheostats various values and ratings		2 Nos. each
57.	POWER ELECTRONICS TRAINER with at least 6 no's of application board MOSFET Characteristics SCR Characteristics SCR Lamp Flasher SCR Alarm Circuit Series Inverter Single Phase PWM Inverter		4 No.
58.	Computers in the assembled form (including cabinet, motherboards, HDD, DVD, SMPS, Monitor, KB, Mouse, LAN card, Blu-ray drive and player), MS Office education version.		4 Nos.
59.	Laptops latest configuration		1 No.
60.	Laser jet Printer		1 No.
61.	INTERNET BROADBAND CONNECTION		1 No.
62.	Electronic circuit simulation software with 6 user licenses	Circuit Design and Simulation Software with PCB Design with Gerber and	1 No.

		G Code Generation, 3D View of PCB, Breadboard View, Fault Creation and Simulation.	
63.	Different types of electronic and electrical cables, connectors, sockets, terminations.		As required
64.	Different types of Analog electronic components, digital ICs, power electronic components, general purpose PCBs, bread board, MCB, ELCB		As required
65.	DSO (colour)	4 Channel , 50MHz Real Time Sampling 1G Samples/Sec, 12 MPTS Memory with PC Interface USB, LAN and math function includes +, -, FFT, differential, integral, abs, log etc.	1 No.
66.	Soldering & De soldering Station		1 No.
67.	SMD Soldering & De soldering Station with necessary accessories	SMD Rework Station : Soldering station : Output Voltage : 26V – 40V AC Temp Range : 50 to 4800 C Desoldering Station : Output Voltage : 24V – 40V AC Vacuum Generator : Vacuum pump: double cylinder type Vacuum Pressure : 80 k Pa Suction flow: 15 L/min. Hot air station: Air flow: 1-9 L/min Temp: 50 to 500 °C Hand piece of Hot air accessories	2 Nos.
68.	DOL starter	½ hp	1 No.
69.	AC Motor Trainer Kit ¼ HP motor Single Phase Contactors Relays MCB DOL Starter		1 No.
70.	Frequency modulator and Demodulator trainer kit	FM Modulator Type : Reactance Modulator, Varactor Modulator, VCO Based Modulator FM Demodulator type All 5	2 Nos.

Mechanic Radio, Audio, Video System and Appliances

		demodulation techniques Detailed teaching and learning contents through software.	
71.	PAM, PPM, PWM trainer kit	With on board function Generator Analog inputs in 4 steps 1-10 Hz, 10-100, 100-1KHz, -10kHz Analog input voltage variable from 0 12 V Built in Square wave pulse	2 Nos.
72.	AM/FM Commercial radio receivers		2 Nos.
73.	Microcontroller kits (8051) along with programming software (Assembly level Programming)	Core 8051, ready to run programmer for AT89C51/52 & 55, programming modes Key Pad and PC circuits. Detailed learning content through simulation Software.	4 Nos.
74.	Application kits for Microcontrollers 6 different applications	1. Input Interface : 4x4 Matrix Keypad, ASCII Key PAD, Four Input Switch 2. Display Module 16X2 LCD, Seven Segment, LED Bar Graph 3. ADC/DAC Module with most popular DC/DAC0808 4. PC Interface: RS232 & USB 5. Motor Drive: DC, Servo, Stepper 6. DAQ: Data Acquisition to sense different sensors signals	1 set
75.	Sensor Trainer Kit Containing following Sensors 1. Thermocouple 2. RTD 3. Load Cell/ Strain Gauge 4. LVDT 5. Smoke Detector Sensors 6. Speed Sensor 7. Limit Switch 8. Photo sensors 9. Optocoupler 10. Proximity Sensor	Graphical touch LCD with inbuilt processor for viewing the output waveforms, In built DAQ, and standard processing circuits like Inverting , Non – Inverting , Power, Current , Instrumentation Differential Amplifier, F/V, V/F, V/I, I/V Converter, Sensors :RTD, NTC Thermistor, LM35 Thermocouple, Gas(Smoke) Sensor, Load cell, LVDT Sensor, Speed Sensor	2 Nos.
76.	Various analog and digital ICs useful for doing project works mentioned in the digital and analog IC		As required

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	applications modules		
77.	Different types of electronic and electrical cables, connectors, sockets, terminations.		As required
78.	Fiber optic communication trainer	Full Duplex Analog & Digital Trans-receiver with 660nm & 950nm, Noise Generator with variable gain, Four Seven Segment Display BER Counter, Eye Pattern.	2 Nos.
79.	Seven segment DPM trainer		6 Nos.
80.	Precision set of screw drivers-	T5, T6, T7	2 Nos
81.	SMPS of different make		4 Nos.
82.	UPS trainer	PWM switching technology, Test points to measures the voltages of different sections Overall functioning of UPS Trainer, AVR transformer, UPS with load condition	1No.
83.	UPS 3 KVA with backup time minimum 30 minutes		1 No.
84.	Allen key screw driver	5 No. of set	1 Set
85.	CCTV set up		2 system
86.	Washing machine	Auto and semi automatic	1 each
87.	Vacuum cleaner	Portable and industry model	2 Nos (1 each)
88.	Microwave oven	20 liters (two technologies)	1 No each
89.	Mixer cum grinder		2 Nos
90.	Steam iron automatic		4 Nos
91.	Electric rice cooker		3 Nos
92.	Water purifier	(RO and UV technologies)	1 No
93.	LCD TV (Trainer kit)	21-inch full HD LCD Color Television should support PAL/ NTSC video formats Complete block diagram of a LCD TV system, Study board indicating various sections of LCD TV along with the test points and switch faults	1 No.
94.	Immersion Heater	2 KVA	4 Nos
95.	Induction cook top	Induction cook top with following feature: Safety sensor Auto switch-off Auto heat-up Booster	2 Nos

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		Protection against overflows	
96.	Printers	DMP, laser, DeskJet	1 each
97.	L ED /LCD Projector		1 No
98.	DTH with accessories		1 set
99.	SAT meter		1 No
100.	Co- Axial cable cutter		1 No
101.	LCD TV	21" screen smart TV, with different inputs (HDMI, VGA, component video etc)	2 Nos.
102.	Jacket stripper/ Coring tool for 500 series cable		1 No.
103.	Centre conductor cleaner		1 No
104.	Universal drop trimmer for RG 6/11 cables		1 No
105.	F - connector tool for RG 6/11 cables		1 No
106.	F – connector compression tool for RG 6/11 cables		1 No
107.	LED TV (Trainer kit)	20-inch full HD LED Color Television, PAL/ NTSC video formats, complete block diagram of a LED TV system , Study board indicating various sections of LED TV along with the test points and switch faults Trouble shooting in different sections.	1 No.
108.	LED TV	21" screen smart TV, with different inputs (HDMI, VGA, component video)	2 Nos.
109.	Home theatre system		1No.
110.	Solar Training Kit/ Simulator	With built in meters for DCV, DCA, AC multifunction Meter (for ACI, ACV, Power, Frequency), Protection Circuits, BS-10 terminals for making the connection, Single/ Dual axis tracking system Charge Controller : PWM based MPPT, Charging Stage : Bulk, Absorptions and Float	1 No.

111.	LED lighting system	Measurement of Power, Voltage, Current, Power Factor and Light output performance of different lighting products like LED, CFL at variable input voltages 0 to 245V variable AC.	2 sets
C. Shop Floor Furniture and Materials - For 2 (1+1) units no additional items are required.			
112.	Instructor's table		1 No.
113.	Instructor's chair		2 Nos.
114.	Metal Rack	100cm x 150cm x 45cm	4 Nos.
115.	Lockers with 16 drawers standard size		2 Nos.
116.	Steel Almirah	2.5 m x 1.20 m x 0.5 m	2 Nos.
117.	Black board/white board	12' x 4'	2 No.(one for lab and one class room)
118.	Fire Extinguisher		2 Nos.
119.	Fire Buckets		2 Nos.
120.	Class room furniture (dual desk)		10 Nos.
121.	Lab tables (work bench)		6 Nos.
122.	Stools for lab		20 Nos.

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**INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND
ENGINEERING DRAWING**

TRADE: MECHANIC RADIO, AUDIO, VIDEO SYSTEM AND APPLIANCES

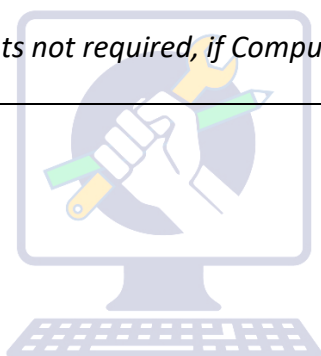
LIST OF TOOLS& EQUIPMENTS FOR -20APPRENTICES

1) Space Norms : 45 Sq. m.(For Engineering Drawing)

2) Infrastructure:

A : TRAINEES TOOL KIT:-			
Sl. No.	Name of the items	Specification	Quantity
1.	Draughtsman drawing instrument box		20+1 set
2.	Set square celluloid	45° (250 X 1.5 mm)	20+1 set
3.	Set square celluloid	30°-60° (250 X 1.5 mm)	20+1 set
4.	Mini drafter		20+1 set
5.	Drawing board	(700mm x500 mm) IS: 1444	20+1 set
B : Furniture Required			
Sl. No.	Name of the items	Specification	Quantity
1	Drawing Board		20
2	Models : Solid & cut section		as required
3	Drawing Table for trainees		as required
4	Stool for trainees		as required
5	Cupboard (big)		01
6	White Board	(size: 8ft. x 4ft.)	01
7	Trainer's Table		01
8	Trainer's Chair		01

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.
<i>Note: - Above Tools & Equipments not required, if Computer LAB is available in the institute.</i>		



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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 :			Semester:			Duration of the Trade/course:							
Learning Outcome:													
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													