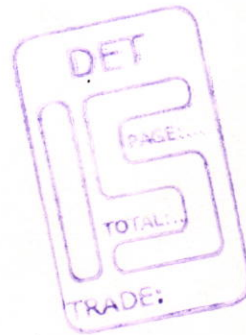


SYLLABUS FOR ( TRADE NAME ) : MECHANIC ( AUDIO )

UNDER CODE OF REGULATIONS  
FOR INDUSTRIAL SCHOOLS : SCVT



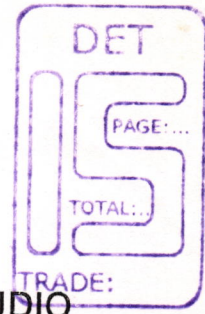
AS APPROVED BY

DEPARTMENT OF EMPLOYMENT  
& TRAINING, CHEPAUK  
CHENNAI - 600 005.

..... 2004

\* \* \* \* \*

**LIST OF COMMITTEE MEMBERS**



**FOR THE TRADE - MECHANIC AUDIO**

1. Members and Experts : 1. T. Sundar Raj  
Regional Joint Director, Guindy  
Department of the Employment & Training,  
Chennai.
2. P. Dwaraka  
Assistant Director, Guindy  
Department of the Employment & Training  
Chennai.
3. R. ULAGA NAMBI M.A.,D.T.T., D.E.E.E  
Principal  
Agasthya Samee Industrial Training School  
Maduranthagam.
4. A. Selvaraj D.E.E.E  
Instructor  
Agasthya Samee Industrial Training School  
Maduranthagam.



### COURSE DETAILS

**Name of Trade** : **MECHANIC AUDIO**

**Qualification** : **10<sup>TH</sup> PASS / FAIL**

**Age** : **14-40 Years**

**Duration** : **1 Year**

**Number of Trainees** : **20**

**Number of Practical hours** : **32 hrs. per week**

**Number of Theory Hours** : **8 hrs. per week**

**Number of Workshop Calculation hours** : **2 hrs. per week.**

**Number of Engineering Drawing hours** : **2 hrs. per week**

**Space Required**

**Workshop** : **400sq. feet**

**ClassRoom** : **200 sq. feet**

**Power Required in KW** : **3 k.w.**



**MECHANIC AUDIO TRADE TIME TABLE**

**ENGINEERING DRAWING**

FRIDAY → Morning 9.30 - 11.30 A.M → E. D → 2 Hrs / Week

**WORKSHOP CALCULATION & SCIENCE**

Monday & Tuesday → Morning 11.00 - 12.00 P.M → W / Cal & Science → 2 Hrs / Week  
 Wednesday & Thursday

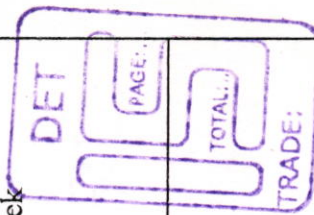
**TRADE THEORY**

Monday & Tuesday → Morning 11.00 - 12.00 P.M → Theory ( 1 1/2 Hrs . Day )  
 Wednesday & Thursday }  
 Saturday → Morning 9.30 - 11.30 P.M → Theory ( 2 Hrs . Day )  
 8 Hrs / Week

**TRADE PRACTICALS**

Monday & Wednesday → Noon 12.00 - 5.30 P.M → Practicals (5 Hrs . Day)  
 Friday → Noon 11.30 - 5.30 P.M → Practicals (5 1/2 Hrs . Day)  
 Saturday → Noon 11.30 - 4.30 P.M → Practicals (4 1/2 Hrs . Day)  
 Tuesday & Thursday → Noon 11.30 - 5.30 P.M → Practicals (6 Hrs . Day)  
 32 Hrs / Week

Note : Daily Afternoon 1.00 - 1.30 P.M Lunch

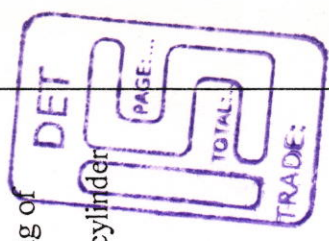




# SYLLABUS FOR THE TRADE OF MECHANIC AUDIO

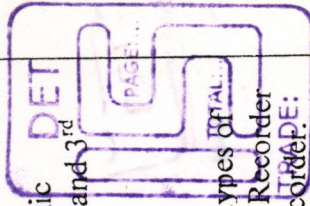
Period of Training : 1 Year

WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
1.	<p>Familiarisation with Trade Instructor, Supervisor, Foreman, Principal. Activities, of the Trade, Future Prospect etc. Duties and Responsibilities of Trainees, Safety measures to be observed. Elementary First Aid. Concept of Standard &amp; Standardisation</p>	<p>Visit to the different sections of the Institute.                      Demonstration on elementary first aid.                      Artificial Respiration.                      Handling of emergencies like Electric Shock, Fracture                      Demonstration &amp; Practice.</p>	<p>Fraction – addition, subtraction, multiplication &amp; division.                      Unit &amp; measurement, fundamental &amp; derived unit</p>	<p>Free hand sketching                      Projection of Solid &amp; hollow object.</p>
2.	<p>Matter, Atoms-Structure, Importance of Physics-Basic Principles – Work, Power, Energy.</p>	<p>Demonstration Trade hand tools.                      Identification of simple types – screws, nuts &amp; bolts, chasis, rivets etc.,</p>	<p>Matter, mass, volume, density &amp; specific gravity.</p>	<p>Free hand sketching of simple solid cube, rectangular block cylinder etc.,</p>
3 & 4.	<p>Identification of Trade, Hand tools – Specification and uses, Cares and maintenance of Hand Tools.                      Fundamentals of Electricity &amp; Electron Theory – Solar System – Elements, Free Electrons Fundamental Terms, Definitions, Units &amp; Effects of Electric Current.</p>	<p>Practice in using steel rules, cutting plier, screw drivers etc., Skinning the cables, and joint practice on single strand.</p>	<p>Decimal addition, subtraction, multiplication &amp; division.                      Conversion of decimals to common fraction.                      Motion displacement speed, velocity acceleration.</p>	<p>Use of different types of line &amp; symbol for drawing.</p>





WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
5&6.	<p>Radio Receiver &amp; tape Recorder  Basics of Electricals &amp; Electronics  Atomic structure  Source of Electricity – Cells  Current &amp; Voltage  ( Direct &amp; Alternating )  Magnet &amp; Electromagnets</p>	<p>Drawing of electrical, electronic symbols  Use of different tools &amp; equipments.  Soldering &amp; de soldering  Practice on old PCB's  Practice of drawing simple locks, including diagrams of electronic circuits (Radio/TV) Layout  Schematic &amp; wiring  To make electromagnet</p> <p>Connections of Ammeter &amp; Voltmeter in a circuit  Practice in using Multimeter &amp; R.F. Signal Generator.</p>	<p>Reduction of common fraction to decimal.  Motion displacement speed, velocity, acceleration.  Percentage and its application.</p> <p>Weight , gravitation and centre of gravity.</p>	<p>Free hand sketching nut bolt rivet and washers etc.,</p> <p>Free hand sketching of screw and screw threads.</p>
7.	<p>Measuring Instruments  Functions and uses of :  Ammeter, Voltmeter &amp; Multimeter.  R.F. Signal generator.</p>	<p>To Measure the value of resistance using multimeter  To measure current flowing in a circuit  Verification of Ohms law  Finding the value of current &amp; total resistance for parallel &amp; series connections of resistances.  &amp; Kirchoff's Laws</p>	<p>Mensuration area of square, triangle, circle and ellipse.  Evaporation, boiling, condensation freezing.  Effect of pressure on boiling and freezing point.  Work, power, energy, source of energy,  Kinetic energy &amp; potential energy.  Ratio, proportion &amp; its application</p>	<p>Simple ortho graphic projection 1<sup>st</sup> angle and 3<sup>rd</sup> angle.</p> <p>Drawing different types of diagram of Tape Recorder</p> <p>Sketching of different views of simple solid ; hollow bodies.</p>
8 & 9.	<p>Resistance  Concept &amp; Types  Resistance in series  Resistance in parallel  Resistance in network etc.,  Ohm's Law &amp; Kirchoff's Law</p>			





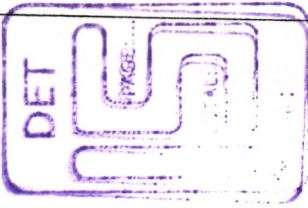
WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
10.	Inductance Definitions and meaning of self and mutual inductance, choke, IFT.	Testing of different types of coil. Behaviour of L in AC & DC circuit.	Square root of perfect square. Square root of whole number & decimal.	Isometric views of simple object such as cubes, rectangular block, prism etc.
11.	Capacitance Capacity – Types of Capacitors (Fixed & Variable).	Testing of capacitor with the help of multi meter / circuits.	Horse power indicated horse power, brake horse power.	Ckt Diagrams of CB, CC & CE Connections.
12.	Transformer Types of Transformers (Step up, Step down, auto IFT'S etc.)	Testing of transformers with the help of multi meter.	Metric system weight and measurement unit and conversion factors problems. Transformer's Problems	drawing of simple figure and solid with dimensions & titles.
13&14.	Resonance & Oscillators Importance of resonance Tuned circuits Advantages and disadvantages of Transformers L.C. circuits (Series and parallel) Oscillator : Types & uses	To construct a resonance circuit Preparation of (Pie) failters for Battery eliminators Construction & testing of an oscillator	Simple machine & mechanical advantage. Simple equations & transposition problems. Stress & strain . Modules of elasticity ultimates strength. Factor of safety.	Use of drawing instruments, T-square, Drawing boards. Use of different types of scales, inch and mm lettering, number and alphabets.



WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
15.	Microphones & Speakers Principles & Construction of : Microphone, Earphone, Loudspeaker	Testing of Microphone, Earphone and Loud speaker with the help of multimeter	Electric Power Energy Calculation	Drawing of simple figure & solid with dimensions & titles.
16.	Vacuum Tubes Circuits and uses of : Diode, Triode, Tetrode, Pentode, Valves.	- do -	Construction of Micro Phone & Loudspeaker	
17&18.	Semi Conductors Elementary knowledge of : Semi conductors (P.Type and N Type) P.N., junction, Diode and Zenor diode. NPN and PNP Transistors Common emitter, common Collector, common base.	Semi Conductors Elementary knowledge of : Semi conductors (P. Type and N Type) P.N., junction, Diode and Zenor diode. NPN and PNP Transistors Common emitter, common Collector, common base	Standard formulas. Simple simultaneous equations with two unknown quantities. Pressure, atmospheric pressure, absolute pressure, gauge pressure and vacuum.	Symbols of all Electronic Components. Projection of Square, Circle, Polygon etc.,
19.	Radio Receiver Transmission of Radio signal Brief description of wave propagation Need for modulation: Amplitude modulation Frequency modulation Diode detection FM detector Antenna.	Recognition, Installation & testing of different types of Antenna. Testing of balun transformer.  Assembling & Testing of Detector Circuit.	Series R,L,C Circuit	Projection of solid and hollow object.  Symbol of all electronic components.





WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
20.	<p>Power Supply Director (D) Alternate (A) Regulated and stabilized power supply.</p>	<p>Circuit Tracing Assembling of AC power supply. Fault finding with voltage check</p>	<p>Chemistry Of Common Elements Such As Carbon, Oxygen, Hydrogen &amp; Halogen.</p>	<p>Circuit diagram of different types of Amplifiers.</p>
21&22.	<p>Super – Hetrodyne Receiver (Transistorize) Principles of hetrodyne &amp; superhydrodyne Block of diagram of super hetrodyne receiver &amp; function Circuits &amp; function of : RF Amplifier Mixer &amp; converter stage with local oscillator</p>	<p>Assembling Voltage checking Tracing &amp; fault finding of RF Section IF Section Detector Mixer Local oscillators Band change wiring (Three Banding )</p>	<p>Simple algebraic problem  Algebraic equation with Single &amp; Two unknown quantities.  Radio Receiver <math>\lambda = C / F</math> Image Frequency, Local Oscillator Frequency Problems</p>	<p>Circuit diagram of Oscillators &amp; Regulated power supplies.</p> 
23.	<p>Tape recorder &amp; Compact Disc Magnetic Recording Principles of magnetic recording, various processes of sound recording</p>	<p>To study the function of Tape recorder's, and jacks.</p>	<p>Logarithm Reading from table determination of characteristic &amp; anti logarithm.</p>	<p>Block diagram of Super heterodyne receiver.</p>
24.	<p>Biasing D.C Bias - A.C Bias Optimum Bias level Bias Frequency</p>	<p>Tracing of biasing circuits Testing of various types of biasing circuits.</p>	<p>Application of logarithm, Geometry – prline, angle, triangle and circle.</p>	<p>Complete circuit diagram of Radio receiver.</p>

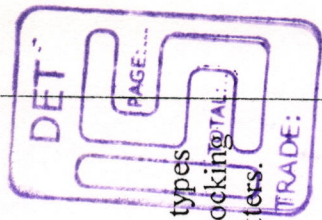


WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
25 & 26.	<p>Electronic Circuit Microphone Recording &amp; play back head Erase head, Pre- Amplifier Driver stage Automatic level control Bias oscillator Power supplies Motor circuit.</p>	<p>Tracing / Wiring of Electronic circuits.</p>	<p>The chemistry compound like carbon di oxide, ammonia, freon Graph object &amp; use of plotting graph. Interpolation. Properties and use cast-iron, wrought iron, plain carbon steel &amp; alloy steel.</p>	<p>Isometric view to orthographic views. Orthographic views to isometric views.</p>
27.	<p>Driving Mechanism Tape driving mechanism Capstan Rewinding, Fast forward winding Speed control, Breaks etc., Complete circuit diagram of a Tape Recorder</p>	<p>Assembling of a mechanical deck of a tape recorder Checking mechanical coupling system Adjustment of heads &amp; HF Biasing Cleaning &amp; oiling</p>	<p>Effect of alloying elements on properties of metals. Properties of copper, zinc, lead, tin, aluminium etc.,</p>	<p>Ckt Diagram of regulated Power Supply.</p>
28 & 29	<p>Two-in-One Various connection with circuitry Complete circuit diagram Comparison of different types of tape recorder / two in one</p>	<p>Wiring of a two-in-one Comparing a two-in-one with a standard recorder Assembling of various additional switches required for two-in-one.</p>	<p>Trigonometry Formulae &amp; Functions &amp; Problems</p>	<p>Circuit diagram of Tape-recorder.</p>



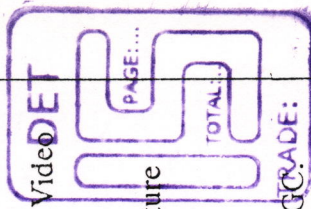


WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
30 & 31.	<p>Compact Disc Explanation of Drive mechanism Explanation of circuit involved.</p>	<p>Checking of mechanical coupling system Tracing &amp; Testing electronic circuitry.</p>	<p>Unit Conversion Current - A, mA, <math>\mu</math>A Voltage - mv, v, kv Resistance - <math>\Omega</math>, k<math>\Omega</math>, M<math>\Omega</math></p>	<p>Driving mechanism of CD &amp; Block diagram of CD Player.</p>
32.	<p>Fault Finding Procedure of fault finding Different types of faults &amp; their remedies in Tape Recorder, Two-in-one Compact disc</p>	<p>Fault finding &amp; rectification in electrical &amp; electronic circuits of Tape Recorder Two-in-one Compact Disc Fault finding &amp; servicing of mechanical parts of Desks.</p>	<p>Ohms law problems V.I.R Power</p>	<p>Block diagram of CD Player</p>
33.	<p>Tuner Section, RF Amplifier Mixer Explanation of SCR supply Fine tuning control Trap circuit</p>	<p>Recording of voltage at various test points in turner Detection of fault and their rectification</p>	<p>Kirchoff's law problems</p>	<p>Drawing of different types threads, nuts, bolts, locking devices, keys and cutters.  Circuit diagram of Electronic Tuner.</p>



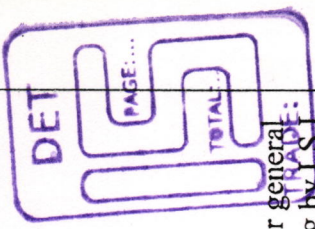


WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
34&35.	<p>IF &amp; Video Detector Stage Cascade amplifier: its utility Staggered tuning Picture &amp; Sound IF Signals Function of video detector.</p>	<p>Tracing of IF &amp; Video Detector stage Recording of voltage check at various test points Fault finding.</p>	<p>Series, Parallel Combination connection of resistors</p>	<p>Drawing of different types threads, nuts, bolts, locking devices, keys and cutters, riveted joints.</p>
36.	<p>Audio System Limiter Discriminator Sound IF detector Audio Amplifier Volume &amp; Tone controls</p>	<p>Tracing of Audio section Recording of voltage at various test points. Detection &amp; rectification of faults.</p>	<p>Inductor's Problems  Capacitor's Problems</p>	<p>Block diagram of TV Receiver.  Circuit diagram of Video Section.</p>
37.	<p>Video amplifier Amplification of video signal Contrast control Brightness control.</p>	<p>Tracing of video amplifier Studying effects of contrast &amp; Brightness control on voltages of CRT. Detection &amp; rectification of faults.</p>	<p>Transistor's Biasing</p>	<p>Construction of Picture Tube.  Circuit diagram of different types of AGC. GRADE:</p>
38.	<p>A.G.C. System</p>	<p>Delayed A.G.C circuit Keyed A.G.C. circuit</p>	<p>- do -</p>	<p>Circuit diagram of Sync separator.</p>
39.	<p>Sync Separation Section Separation of sync pulses from composite video signal Separation of vertical &amp; horizontal synchronous pulses from each other</p>	<p>Tracing of sync circuit Recording of voltage check at various test points Detection &amp; rectification of faults.</p>	<p>Unit of Real, Specific heat of solids, liquids &amp; gases Heat gained &amp; loss</p>	<p>Circuit diagram of Horizontal Section &amp; EHT Section.</p>
40.	<p>Horizontal Oscillator Horizontal O / P Section EHT Section.</p>	<p>Tracing &amp; Testing of Horizontal Oscillator. Tracing &amp; Testing of EHT Section.</p>	<p>- do -</p>	<p>Circuit diagram of Horizontal Section &amp; EHT Section.</p>



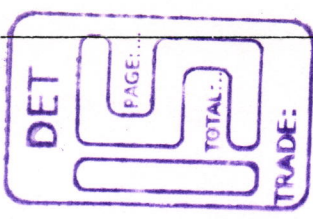


WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
41.	Vertical section Vertical oscillator Height & vertical hold control Vertical linearity control.	Tracing of vertical section Studying the effect of linearity Height control on picture & circuit voltage Detection & rectification of faults.	Frequency Calculation in all types of Oscillators	Drawing of details components from assemblies.
42 & 43.	Sound Section Sound I.F amplification Audio Output.	Tracing of circuit Voltage measurement at various test points Common faults finding & repairing	- do -	Circuit diagram of Vertical section.
44 & 45.	Video Amplification section Buffer Amplification Video amplification	Tracing of circuit Study the effects of contrast & brightness control Measuring voltage at various test points Common faults finding & repairing	Simple algebraic formulas problems.	Code of practice for general engineering drawing by I.S.I
46 & 47.	Study of complete circuit Study of various circuits	Tracing of complete circuit Fault finding & repairing	- do -	Sound IF Amplifier & Output Section.





WEEK NO.	TRADE THEORY	TRADE PRACTICAL	W.S	ENGG.DRG
48 & 49.	Entrepreneurship Project formulation Budgeting Finances ( including loans ) Marketing Store Keeping.	Preparation of sample project Budget preparation Account Keeping Practice in Market survey Stock taking & Verification	$\alpha, \beta, \gamma$	Reading & Plotting of Graphs
50.	Revision Test - 1	Revision Test	Revision Test	Revision Test
51.	Revision Test - 2	Revision Test	Revision Test	Revision Test
52.	Model Trade Test			





**INDUSTRIAL SCHOOLS****TRADE SYLLABUS – REVISED**

**Name of the Trade** : **MECHANIC (AUDIO)**

**SPACE REQUIRED :**

**(1) Workshop/Lab** : 400 sq. ft.

**(2) Class Room** : 200 sq. ft.

**Trade Theory** : No change

**Trade Practical** : No change

**Engineering Drawing** : No change

**Workshop Calculations** : No change

**List of Tools & Equipments**  
**For The Trade of MACHANIC (AUDIO)**

**FOR A BATCH OF 20 TRAINEES****HAND TOOL**

<b><u>SLNO</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>QUANTITY</u></b>
1	Combination plier 15 cm insulated	10
2	Long nose plier 15 cm insulated	10
3	Diagonal plier 15cm insulated	10
4	End cutting nipper 15cm insulated	10
5	Tweezers 10cm insulated	10
6	Hear sink plier insulated	10
7	Neon tester	10
8	Knob screw driver	10
9	Screw driver set of 6	10
10	Alignment kit	10
11	Wire stripper	10
12	Soldering iron 25 w soldron	10
13	Portable Multimeter	10



**WORKSHOP TOOLS & EQUIPMENTS**

<b><u>SL.NO</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>QUANTITY REVISED</u></b>
1	Fire Extinguisher	1
2	First Aid Kit	1
3	Work Bench with all Electrical Fittings	4
4	Steel Rule	4
5	Scriber	4
6	Center Punch	4
7	Hammer Cross pein	4
8	Hammer Ball Pein	4
9	Spanner set Double ended set	4
10	Tenon Saw 25 cm	4
11	Hacksaw 20-25 cm adjustable with blades	2
12	File flat second cut 20 cm	2
13	File half round 10 cm bar	2
14	File found 20 cm	2
15	Instrument files set of 12	2
16	Vice bench 10cm jaw	2

**EQUIPMENTS**

<b><u>SL.NO</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>QUANTITY REVISED</u></b>
1	Wire Gauge Set 20cm	1
2	Feeler Gauge Set	1
3	Permanent Magnet Bar 15cm	2
4	Rheostat Various Values & Ratings.	5
5	Digital Multimeter	2
6	Moving Coil meter different ranges	1
7	Public address amplifier -40 W	1
8	Microphone	2
9	Loudspeaker	2
10	Service Oscillator	2
11	CRO-50MHZ	1
12	Regulated Power Supply (0-30) V	2
13	AM/FM Generator	1
14	Steel Cabinet	2
15	Commercial Radio Receiver AM/FM	4
16	Tape Recorder / Two-in-One	4
17	TV Receiver Colour / B & W	2 each
18	DVD Player	1