

1	Name of Syllabus	<b>C.C. In Repairing and Servicing of Radio &amp; LCD/LED TV (301105)</b>																																																
2	Max. Nos of Student	25 Students																																																
3	Duration	6 Months																																																
4	Type	Part Time																																																
5	Nos Of Days / Week	6 Days																																																
6	Nos Of Hours /Days	4 Hrs																																																
7	Space Required	Laboratory = 200 Sq feet Class Room = 200 Sq feet TOTAL = 400 Sq feet																																																
8	Entry Qualification	S.S.C. Appeared																																																
9	Objective Of Syllabus/ introduction	Knowledge of soldering techniques, use of tools in assembly. Knowledge of electronic competent used in Radio, LCD/LED TV field Ability to read schematic layouts wrings diagrams. Awareness of Safety precautions. Maintenance of Radio, LCD/LED TV																																																
10	Employment Opportunity	The trainee will either to be able to take up jobs with agencies which maintain and repair such equipments or with working experience will be in a position to start his own independent Business.																																																
11	Teacher’s Qualification	Diploma in Electronics & Telecommunication Engineering. With 3 year experience in Electronic Field Teaching. Diploma or Degree in Electronic& Telecommunication Engineering or equivalent profession Qualification. With 1 year experience in Electroni Field Teaching.																																																
12	Training System	<table><tr><th colspan="7">Training System Per Week</th></tr><tr><th>Theory</th><th>Practical</th><th colspan="5">Total</th></tr><tr><td>6 Hours</td><td>18 Hours</td><td colspan="5">24 Hours</td></tr></table>							Training System Per Week							Theory	Practical	Total					6 Hours	18 Hours	24 Hours																									
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## **Theory I :- Basic Electronics & Assembly Technique**

1. Introduction of training & institute, Familiarization with the institute, type of work & responsibility of trainees, syllabus, safety precautions, elementary first aid, and symbols related to the theory Han- Tools & equipments identification, Introduction to Tools & Soldering Techniques uses and maintenance
2. Introduction to electricity, batteries, voltage, current, resistance & power ohm's law. Alternating current A. C. induced voltage, current. Direct current simple lead cell, lead acid accumulator, battery charger, Battery is an electric.
3. RESISTORS: - Construction of carbon resistor wire wound resistors, wire wound resistors potentiometer, thermostat, series & parallel connection of resistors colour code of resistors, unit for resistance.
4. Capacitors :- what is capacity & capacitance parallel & series connection of capacitor in electric circuit unit of capacitor different, types of capacitor variable & fixed value trimmers, mica ceramic, paper polyester electrolytic etc value of capacitor.
5. Inductor & transformer-coil concept, mutual induction series & parallel connection of inductors Types of coils air core, Iron core, Powdered iron core etc. unit for inductance Transformers, turns ratio types of transformer, step-up & step down transformer, power transformer etc.
6. Simple Meters: - Moving coil meter voltmeter, ammeter, ohm meter, multimeter (Moving coil and digital).
7. Semiconductor: - difference between semiconductor & conductor, Germanium & Silicon. Type semiconductor 'P' type & 'N' type semiconductor, P.N. junction diode, junction diode types of diodes, Zener diode, LED etc.
8. Transistor: - PNP and NPN transistor pin configuration, CB, CE, CC connection function of transistor Heat sink, use of heat sink. P C B (printed circuit Board).
9. Rectifiers, filters, Regulated power supply with Zener diode, transistors and regulator IC's 741, 7806, 7906, 7812, 7912, etc.
10. ACOUSTICS :- Wave, sound wave conversion of sound wave & electric wave by use of speaker & microphone, principal, construction & working of speaker & microphone, Types of speaker, head phones types of mic stereo sound Echo sound, Reverse sound P-A system , equalizer system.
11. Amplifier: - Range of audio amplifier frequency use of amplifier, types of amplifier transistor as an amplifier, coupling of amplifier pre-amplifier.
12. AF power amplifier: - Use of transformer matching, push-pull amp. Transformer less amplifier, differential amplifier, feedback circuit.
13. What is IC? Use of IC's in Home Theater, IC based AF power amplifiers with different no's IC's.
14. Working principle of CD/VCD/DVD/ Blue ray Player, CD/DVD/Blue Ray mechanism & power supply. Types of ACD/VCD/DVD/Blue ray & their writing procedure on ACD/VCD/DVD/ Blue ray. Five in one system, MP3 formats/ Flash memory recording
15. Transducer  
Microphones, Loudspeakers, Photocell, Laser diodes, Telephone.

## **Theory II :- Repairing & Maintenance of Radio & TV**

1. Modulation, Demodulation, Amplitude Modulation, Frequency Modulation and Phase Modulation, Modulation Index, Noise, Bandwidth & Power considerations. Demodulation Techniques-Detectors SSB, DSB-SC. Radio Wave Propagation Ground wave, Sky wave and Space wave propagations. Overview of various types of Antenna. fault finding procedure
2. Working of Audio System / PA System Microphone types / loudspeakers-Types (Woofer, Midrange & Tweeters). Stereo System and Stereo Amplifiers. Crossover networks. Surround Sound systems & Sound processors. fault finding procedure
3. Superhetrodyne Receiver-Block Diagram-stage wise explanation, Radio transmitter- Block diagram FM radio and circuits AM/FM transmitters, Antennas, types of antennas, transmission lines, feeders Cables ,types, specifications, Fiber optics-advantages. fault finding procedure
4. Introduction to Television. Broadcasting TV frequency range, elements of color, composite color signal, color TV systems-TSC/SECAM/PAL Color picture tube, TV receiver Antenna RF tuner, AFT, video IF amplifier ,Video Detector,, Y amplifier, Chroma band pass amplifier U and V signals, color burst circuits ,deflection systems and power supply. fault finding procedure
5. Fundamentals of LCD/LED/Plasma television Hi definition television Display type-LCD/LED /Plasma, screen size Viewing angle, picture contrast, Multi layer structure of LCD panel Differences between LCD/LED and Plasma Standards-specifications of different manufacturers. fault finding procedure
6. Digital communication/satellite TV/Cable TV and DTH systems Fundamentals of Digital communications Quantization and sampling PCM and Delta modulation Advantages of Digital modulation Cable TV and concepts, DTH systems Signal unlinking and down linking Block diagram of Earth station ,frequency Range, Dish Antennas , LNB and Amplifiers TVRO set up CCTV concepts. fault finding procedure

## **Practical –I - (Basic Electronics & Assembly Technique)**

1. Introduction to work- shop & equipments care. Introduction to electricity supply system. Uses of Tools, measuring instruments soldering & disordering.
2. Identification of conductors, insulator voltage, current power. Test measure of A. C. Voltage current. Test of measure of D. C. Voltage and current.
3. To study differ. Types of resistors. Colour code reading value of resistors calculation of series & parallel resistance testing of resistance by multimeter.
4. Checking of capacitor, testing by multimeter. Function and uses of capacitor.
5. Checking of coil by multimeter. Checking of differ. Type of transformer hot checking & cold checking To sturdy their uses.
6. Operation, Rules and use of multimeter, voltmeter, ammeter.
7. Testing of P N junction diode by multimeter Identify their poles (A & K.)
8. Transistor testing by multimeter Identification of lead, Build a CB, CC & CE circuits. Design the PCB.
9. Assembled various rectifier circuits with R.C. & L. C. filter CKT. Voltage doublers circuit.
10. Build Zener diode regulator circuit, Build transistor regulator circuits, Build a regulator circuit, and Build a regulator IC power supply
11. Study of special components in Colour TV (LCD/LED) Plasma TV, Radio, DVD/Home Theater and Telephone,.

## **Practical –II - (Repairing & Maintenance of Radio & LCD/LED TV)**

1. TV Power supplies, SMPS, Testing and repairing, Familiarize with various SMPS circuits
2. Identify and test the Chroma section - Measure the voltage and observe the wave form on chroma input and output sections. Fault finding in chroma section, AGC sync and horizontal sections.

3. Trace and rectify the faults of a various remote controls, Identify the various controls and sections of Plasma , projection TV, Digital TV.
4. Dismantle and identification of various parts, wiring, tracing of various controls, fault finding in Various types of TV
5. Study the layout of (DVD, LCD Monitor)
6. Study the Telephone Systems
7. Tracing & Fault finding in Radio (Minium 15 faults)
8. Tracing & Fault Finding in DVD player/ Home theater (Minium 15 faults)
9. Tracing & Fault finding in LCD/LED/Plasma TV (Minium 15 faults)
10. Tracing & Fault finding in LCD monitor (Minium 2 faults)
11. Tracing & Fault finding in Colour TV in Croma & Video section only (Minium 8 faults)
12. Tracing & Fault finding in colour monitor (Minium 2 faults)
13. Tracing & Fault finding in VCD/DVD (Minium 5 faults)

### **List of Tools Equipment:**

Sr No	Description of Tools/ Equipments	No/ Required
1	Transistor Radio	10
2	Low Power Audio Amp.	2
3	LCD/LED TV, Plasma TV	1
4	Low Voltage Power Supply	2
5	Multimeter (low sensitivity)	28
6	Multimeter (High sensitivity 20 KZ/V)	1
7	Record player	1
8	R.F. Signal Gen	1
9	Two in one (Radio + Tape)	1
10	Oscilloscope	1
11	Stereo Amp	1
12	Other Components. Accessories material as per laboratory equipment	-
	Furniture	
13	1 1/2 X 4 Table	
14	Small Cupboard	
15	Stool	
16	White Board	
	Desirable – for video cassette demonstration	
	i) DVD Player	
	ii) Colour T.V.	

## Reference Book

### A)

i)	Practical Transistor Radio Servicing – by R.C Vijay
ii)	DVD Servicing – by R.C. Vijay
iii)	Basic Radio and Television – by S.R. Sharma
iv)	Electronic Technical Handbook – by Cafule A Grads Russi Terpoori
v)	Stereo Amplifiere – by Nishinak Tata Mc
vi)	Principal Of Electronics -- By V. K. Mahata

### B) Video CD/DVD

- 1) Fundamental of Electricity I and II
- 2) Safety in Electrical
- 3) Multimeter
- 4) Know your oscilloscope
- 5) Waves
- 6) Transformer
- 7) Junction Diode
- 8) Semi Conductor I, II, III.

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