

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI - 51

1	Name of Course	CC in Radio, Audio, Video System and Appliances (301121)																																									
2	Max.Nos. of Student	25 Students																																									
3	Duration	6 Months																																									
4	Type	Full Time																																									
5	Nos Of Days / Week	6 Days																																									
6	Nos Of Hours /Days	7 Hrs																																									
7	Space Required	Laboratory = 1000 Sq feet Class Room = 200 Sq feet TOTAL = 1200 Sq feet																																									
8	Entry Qualification	S.S.C.																																									
9	Objective Of Syllabus/ introduction	Awareness of Safety precautions. Knowledge of soldering techniques, Testing, use of tools in assembly. Application of Electronic / Electrical competent used in Radio, Audio, Video System and Appliances. Ability to read schematic layouts wrings diagrams. Repair & Maintenance of Radio, Audio, Video System and Appliances.																																									
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 Engineering.																																									
12	Training System	Training System Per Week <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>12 Hours</td><td>30 Hours</td><td>42 Hours</td></tr></table>							Theory	Practical	Total	12 Hours	30 Hours	42 Hours																													
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13	Exam. System	<table><tr><td>Sr. No.</td><td>Paper Code</td><td>Name of Subject</td><td>TH/PR</td><td>Hours</td><td>Max. Marks</td><td>Min. Marks</td></tr><tr><td>1</td><td>30112111</td><td>Radio, Audio, Video System and Appliances</td><td>TH-I</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30112121</td><td>Basic Electronics & Assembly Technique</td><td>PR-I</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>3</td><td>30112122</td><td>Radio, Audio, Video System and Appliances</td><td>PR-II</td><td>6 hrs</td><td>200</td><td>100</td></tr><tr><td></td><td></td><td>TOTAL</td><td></td><td></td><td>400</td><td>185</td></tr></table>							Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	30112111	Radio, Audio, Video System and Appliances	TH-I	3 hrs	100	35	2	30112121	Basic Electronics & Assembly Technique	PR-I	3 hrs	100	50	3	30112122	Radio, Audio, Video System and Appliances	PR-II	6 hrs	200	100			TOTAL			400	185
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SYLLABUS

Radio , Audio , Video System and Appliances

Practical -II	Theory-I
Plot the Frequency Vs Output characteristics of various types of Microphones and Speakers, Woofer/Tweeter, Baffles, Audio Recording, Find the modulation, Modulation Increase in various Modulation techniques.	RADIO BASICS AUDIO FUNDAMENTALS: Sound wave characteristics, Room, Acoustics, Decibel, B.H. Curve, A.C./D.C. Bias, P.A. System , Amplifiers , Various microphones, speakers and their selection RADIO FUNDAMENTALS: Modulation , Demodulation techniques, Introduction to AM, FM & PM SSBSC & DSBSC FM Generation & Detection : different method FM
Identify and test the various parts & control of Superhetrodyne receiver	Radio Receivers: Types, Super heterodyne receiver Blocks, Principle, characteristics, advantages and disadvantages, FM Receives, Pre-emphasis and De-emphasis, AFC in FM Receivers
Fault findings of RF, IF and AF Amplifier Sections, AGC, AVC Circuits squelch circuit AM/FM RX Alignment	RF, IF & AF Amplifier Sections: Gain, Frequency, Voltage , Power, AGC, AVC Circuits squelch circuit in receives, AM/FM RX Alignment, Radio Wave Propagation - Principle, Fading, Antenna and Testing,
Identify the functions of different parts of different deck mechanism Testing & fault finding in audio cassette recorder	Audio Cassette recorder: Audio recording & playback principle , Audio Deck mechanism- layout & identification , Electronic circuits- block diagram & description of each block, Dolby sound, Surround sound system, Home theatre ,Impedance matching , speakers, graphic equalizer, microphones.
Identify and study the various parts and control of ACD/VCD players	ACD / VCD PLAYER Working principle of ACD/VCD/DVD players, CD mechanism & power supply , types of CD's and writing procedure on CDs , five in one system, MP3 formats / flash memory recording
Circuit study of Audio, RF, Encoder etc. Rectify the fault in the given circuit	Functional detail of circuits - Audio, RF, Encoder etc. , Digital recording techniques , Digital audio receivers Circuit , functional details and fault finding procedure of all circuits

<p>Fault findings of given VCD player</p> <p>Fault finding on given ACD / VCD drive mechanism</p> <p>Study and fault findings of optical pickup units, and drive mechanism ,to wire up ACD to VCD conversion card</p>	<p>Laser fundamentals, optical pickup units, laser beam , CD recording standards</p> <p>Difference between ACD and VCD players, & DVD , ,MP easy card, Single CD and 3 CD changer.</p> <p>Fault finding procedure in different stages including CD drive mechanism.</p>
<p>Identify, operate and adjust front panel controls of CTV Dismantle TV and Identify the internal sections/ICs and Test points. Review on power supplies.</p>	<p>TELEVISION</p> <p>Working principle, Basic Blocks - BW TV & CTV, Difference between Black and White TV & Color TV Receivers, TV Systems and Standards, Color TV Transmitter, Color fundamentals, Television Transmission, VSB , Low Power Transmitters and High Power Transmitters functions,</p>
<p>TV Power supplies, SMPS, Testing and repairing, Familiarize with various SMPS circuits.</p>	<p>Camera Tubes: Light characteristics</p> <p>Types of Tubes: Vidicon, Plumbicon , CCD and their working, Camera circuit functioning, Electronic TV Tuner - Types & Features, TV Antenna, TV Power Supply, Regulated Power Supplies, PS Circuits using Integrated circuits, Switched mode power supply, CTV Blocks, Video camera:Specifications and working</p>
<p>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.</p>	<p>Colour signal: Generation and Encoding</p> <p>Development of Sub-carrier, modulation of Sub-carrier, Composite Video Signal, UV Signals separation, UV Signals demodulation, Chroma Section and Delay line, PAL-D colour receiver, colour signal decoding and matrixing, Video IF and detector section. AGC and Sync Separator: AGC types, AGC circuits and their adjustments, Horizontal oscillator, Horizontal and vertical synchronization.</p>
<p>Identify and test the Horizontal , vertical sections</p> <p>Trace the Sync separator, AFC and Horizontal oscillator circuits /</p> <p>ICs and locate test points for measurement of voltages/wave forms</p> <p>Trace and rectify the faults in a Horz. And Vert. Driver and out put section</p>	<p>Sync Separator: Principle and circuits, Effect of noise in synchronization, IC based circuits, faults in AGC and Sync Separator stages.Horizontal and Vertical Sections: HOT Section, Switching transistor functions, inputs in HOT, Outputs from EHT, Signal Flow through different stages in the block. Vertical Sweep section, Vertical section - blocks scanning, functions of related ICs, Input signals to this stage, outputs from this stage,processing of Video signal -Functions of related IC Video Amplifier ICs - Configuration and functions.</p>

Trace and rectify the faults of a various remote controls Identify the various controls and sections of Plasma , projection TV,Digital TV	Colour Picture tube - Parts and functions,Construction, function of degaussing coil, functions of pure and convergent magnets, difference between monochrome and colour picture tubes. TV Remote Control -Types, parts and functions,IR Code transmitter and IR Code Receiver,Working principle, operation of remote control. Different adjustments,general faults in Remote Control. LCD & Plazma TV,Digital & Projection TV
Dismantle and identification of various parts, wiring, tracing of various controls, fault finding in Microwave oven. Dismantle and identification of various parts, wiring, tracing of various controls,Electronic circuits, fault finding in various types of washing M/C. Dismantle and identification of various parts, wiring, tracing of various controls, Electronic circuits, fault finding in various types of Vacuume cleaners. Dismantle and identification of various parts, wiring, tracing of various controls,Electronic circuits, fault finding in various types of Mixers/grinders.	Domestic Appliances : Microwave oven: Different types of oven,study the various functions of Oven, Microwave generation system-circuit , description & working ,study ,working of Power supply,various precautions to be observed, Different aspects of servicing of Microwave Oven. Washing M/c: different types of machines,Block diagram & basic working principle of manual, semi automatic and fully automatic machines,study the working of motors, different types of timers, power supply circuits, Different aspects of servicing of Washing M/C Vacuume cleaner-Block diagram,working principle, study of different features of the machine,study & working of motor used , Electronic circuit, power supply, Different aspects of servicing of Vacuume cleaner. Mixer/Grinder: Block diagram,working principle , study of different features of machine , Study & working of motor used ,different aspects of servicing of Vacuume cleaner. Fax M/C: Block diagram, working principle, study of different features of the machine, Various precautions to be observed, Different aspects of servicing.
Identification of different blocks on assembled PCB, tracing of different Monitor circuits. Dismantle and identification of various parts, wiring, tracing of various controls , Electronic circuits,mechanical system and its assembly,fault finding in various types of machines. Dismantle and identification of various parts,wiring , tracing of various controls,Electronic circuits, fault finding in various types	Computer Monitors :Block diagram ,working and study of their different circuits,Different aspects of servicing of Monitors. Photocopier & Photocopier cum Duplicator M/C: Block diagram and working principle of Photo copier, study of front panel and its features, mechanical system and electronic circuits of photocopier and duplicatotr, servicing aspects of m/c Scanners: Block diagram, working principle, study of different

Basic Electronics & Assembly Technique

Practical - I
Tool Identification, safety precautions, Familiarization with Electronic Components. Different Type of Soldering Iron. Use of Soldering Iron. Color Code of Fixed Resistors.
Use of various Meters for Measuring Voltage, Current , Resistance etc. Safe Handling of Instruments . Use of Digital & Analog Multimeter. Familiarization with CRO. Measurement of L, C and R using LCR bridge.
Identification & Testing of various types of Diodes. Familiarization with CRO, Operating knobs. Construction of Half Wave & Full Wave Rectifiers. Calculation of Ripple using Filters to improve DC Output
Transistor Testing, study the transistor characteristics. Construction of single stage amplifier. Construction of a transistor- switch and to drive a relay.
Construction of RC Phase Shift Oscillator. Construction of Astable and Bistable multivibrator.
Plotting of V-I Characteristics of SCR/Triac, study of light Dimmer.
Lab Demonstration of all types of Digital Logic Gates. Verification of all truth table. Familiarization with various IC and their Packages.

Equipment List : Radio , Audio , Video system and Appliances

Sr.No.	Description of Items	Qty.
1.	Trainee Tool Kit	10
2.	Trimming kit	04
3.	AM/FM Radio Receivers	04
4.	MW/SW/FM Radio Receiver Trainer	04
5.	Oscilloscope dual trace storage	04
6.	AM/FM Signal Generator	02
7.	Digital Multimeters	04
8.	AF Power Meter	02
9.	RF Power Meter	02
10.	Temperature Controlled Soldering Station	06
11.	Frequency Counters	02
12.	DC Power Supply 0-30V, 1A	04
13.	Washing Machine	02
14.	Microwave Oven	02
15.	Mixer / Grinder	02
16.	Fax Machine	02
17.	Colour T.V.	02
18.	VCD Players	02
19.	DVD Players	02
20.	Computers	02
21.	Scanners	02
22.	Printers	02
23.	Photo Copier	01
