

**MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION,  
MUMBAI -51**

1	Name of Syllabus	<b>C.C. In Telecom Equipment Maintenance (301102)</b>																																															
2	Max.Nos of Student	25 Students																																															
3	Duration	6 Month																																															
4	Type	Part Time																																															
5	Nos Of Days / Week	6 Days																																															
6	Nos Of Hours /Days	4 Hrs																																															
7	Space Required	Workshop = 200 Sq feet Class Room = 200 Sq feet TOTAL = 400 Sq feet																																															
8	Entry Qualification	S.S.C. Appeared																																															
9	Objective Of Syllabus/ introduction	Considering the rate at which Telecom Field is expanding, it is observed that there is shortage of man power required to repair and maintain telecom equipments. More over MTNL no longer takes responsibility of repairing or maintaining Telecom Equipments. The course is designed by considering today’s technique of modular assembly and as such a block diagram approach with signal flow is proposed to be adopted.																																															
10	Employment Opportunity	The candidate 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 with communication with 1 year experience. B.E. (Electronics) with 1 year experience. Certificate course in Licentiate in computer hardware maintenance of Maharashtra state board of vocational examination with 2 year’s experience.																																															
12	Training System	<table><tr><th colspan="3">Training System Per Week</th></tr><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>6 Hours</td><td>18 Hours</td><td>24 Hours</td></tr></table>						Training System Per Week			Theory	Practical	Total	6 Hours	18 Hours	24 Hours																																	
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13	Exam. System	<table><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks</th><th>Min. Marks</th></tr><tr><td>1</td><td>30110211</td><td>Introduction to Telecommunication System</td><td>TH-1</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30110212</td><td>Telecom Equipment Maintenance</td><td>TH-2</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>3</td><td>30110221</td><td>Introduction to Telecommunication System</td><td>PR-1</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>4</td><td>30110222</td><td>Telecom Equipment Maintenance</td><td>PR-2</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td></td><td></td><td>Total</td><td></td><td></td><td>400</td><td>170</td></tr></table>						Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	30110211	Introduction to Telecommunication System	TH-1	3 hrs	100	35	2	30110212	Telecom Equipment Maintenance	TH-2	3 hrs	100	35	3	30110221	Introduction to Telecommunication System	PR-1	3 hrs	100	50	4	30110222	Telecom Equipment Maintenance	PR-2	3 hrs	100	50			Total			400	170
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## **Theory I - Introduction to Telecommunication System**

**a) Electricity :**

Basics of AC and DC, units for voltage, current and power, simple calculations using Ohms's law.

**b) Passive and Active components :**

Types of resistors, capacitors, their colour coding and testing, chokes and transformers, types and testing of loudspeaker, semiconductor devices, Type of diodes and transistors, photo diodes, photo transistor, opto coupler & Electromagnetic devices, their testing.

**c) Power Supplies :**

Studying and testing of half wave, full wave rectifier circuits, one transistor series and shunt regulator, introduction of SMPS simple faults in power supply.

**d) Analog and Digital signals :**

Frequency, amplitude, wave length, difference between analog and digital, advantages and disadvantages, their every day life examples, introduction to types of modulations – AM, FM, FSK, PSK

**e) Transistor Circuits :**

Transistor as a switch, Amplifier and oscillator (concepts using simple circuit block module)

**f) Digital Electronics :**

Introduction symbols and truth table of Gates, Flip Flop, Registers, Counter, Encoder, Decoder, multiplexer, Demultiplexer, and memory. Introduction to Microprocessor.

## **Theory II - Telecom Equipment Maintenance**

**g) Tools and Instruments :**

Use of common tools, soldering Iron, use of multimeters, DMM, logic pulser, logic probe, oscilloscope.

**h) Telephone :**

Introduction to telephone system, Mechanical dial type telephone, Electronic push button telephone, block diagram simple faults, introduction to DTMF Telephone, mobile telephone, introduction to EPBAX System.

**i) Computer System :**

Introduction to computer system, block diagram, introduction to various parts of computer system, adapter cards, input and output devices, operating system, introduction to DOS, software maintenance, card level hardware maintenance.

**j) Fax :** Facsimile exchange, type of information sent, ITU-T recommendations for facsimile machines, scanning of documents, introduction to functional blocks. Read operation, CCD image sensor, optical system (conversion into electrical signal), grey scale mode, data compression, modulation, demodulation, line interface unit, receiving of documents, printing. Fax control units, ITU – t protocols. Times sequence, G3 protocol, transmission of binary signal, protocol signals. Simple faults introduction to E.MAIL.

k) **Pager :**

Paging, How a sender sends a message to a person on the move range of pager, kind of message sent on a pager, standard features like display, alerting memory, message length, call log facility, real time clock, alarm, low battery, error in message, simple block diagram, basic customer facing test.

### **Practical I - Introduction to Telecommunication System**

No.	Name of the Experiment	No. of Experiments
I.	Study of components + Testing of components Resistors, Capacitors, inductors/coils transformers, diodes, transistors, optical and electromechanical devices.	08
II.	Study of Instruments Multimeter, DMM, Oscilloscope, Logic probe	04
III.	Verification of Ohm's Law by using a voltmeter and an ammeter.	01
IV.	Verification of law of resistances/capacitors connected in series/parallel / series parallel.	03
V.	Study of various types of IC packages	01
VI.	Study of Resistance, Voltage analysis and faults A) Half wave rectifier B) Full wave (2 diode type) rectifier C) Full wave bridge (4 diode type ) rectifier D) Shunt voltage regulator E) Series voltage regulator	10
VII.	Study of various types of sine-wave oscillators	01
VII	Study of various AF/RF. Amplifiers discrete and IC type.	04
IX.	DIGITAL	
	A) Study of gates using discrete components B) Study of gates using IC's. C) Study of monostable multivibrator D) Study of Bitable multivibrator/Flip Flops E) Study of Astable multivibrator F) Study of Registers G) Study of counters H) Study of Encoder/Decoder I) Study of Multiplexer/Demultiplexer J) Fault in digital circuits/Applications	

## **Practical II - Telecom Equipment Maintenance**

No.	Name of the experiment	No. of Experiments
X.	Tracing and testing of push button Telephone and simple faults (MTNL)	10
XI.	Study of Fax machine & Faults	10
XII.	Study of Computer & Faults	10

### **List of Equipments & Material**

Multimeters -----	06 Nos.
DMM -----	02 Nos.
Logic probe -----	02 Nos.
Oscilloscope -----	01 Nos.
PC-XT/AT -----	02 Nos.
FAX Machine -----	01 Nos.
Pager -----	02 Nos.
Soldering Iron -----	02 Nos.
Tool kit -----	01 Set.
Telephone (MTNL)	03 Nos.
Other material as per list of experiments.	

### **TELECOM EQUIPMENT MAINTENANCE COURSE**

1. Basic Radio and television	S.P. Sharma
2. Radio made easy	D.C. Shahani
3. Servicing Transistor Radio	R.C. Vijay
4. Digital Electronics practice	Jain and Ananda
5. Digital Electronics	Malvino
6. Digital Electronics	D.C. Shahani
7. Easy PC Maintenance and Repair	Philip Laplante
8. PC Companion	S. Mehta
9. Modern all about Monitors	Manahar Lotia/Nair
10. Modern all about floppy disks & Drives.	Manahar Lotia/Nair
11. Modern all about Mother board.	Manahar Lotia/Nair
12. Understanding FAX and Electronic Mail,	Michael Banks
13. Electronic Telephone project	Anthony J. Caristi
14. Casio	
15. Motorola pager	Manuals/Product information
16. Philips pager	
17. Journals	

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