

**INDIRA TECHNICAL INSTITUTE EDUCATION SOCIETY
NASHIK**

**CERTIFICATE COURSE
COLOUR TELEVISION SERVICING [CTVS]**

**EXAM SCHEME: THEORY PAPER 100 MARKS – 3 HRS.
PRACTICAL 100 MARKS – 2 HRS.**

[CTVS / DVTES – II / DETES – IV]

THEORY SYLLABUS

1) COLOUR PHYSICS: -

- a) Colour fundamentals, Visible spectrum of electromagnetic waves.
- b) Colour Mixing: - 1) Subtractive mixing. 2) Additive mixing.
- c) Chrominance signal response of Human eye.
- d) Concepts of Luminance, Hue and Saturation.
- e) Luminance signal/Chrominance signal.
- f) Different Transmitting colour TV signal
1) PAL 2) NTSC 3) SECAM
- g) PAL coder block diagram.
- h) Frequency interleaving, choice of colour sub carrier.
- i) Composite colour video signal (CCVS) / Sub carrier suppress.
- j) PAL Decoder block diagram.

2) COLOUR DEMODULATION CIRCUIT: -

- a) Chroma band pass amplifier.
- b) Burst gate amplifier, Sand castle pulses.
- c) Automatic colour control circuit (AGC).
- d) Colour killer circuit.
- e) Colour sub carrier generator / Automatic frequency & Phase control circuit (AFPC).
- f) Ident pulse generator.
- g) PAL line driver / PAL delay line, PAL switch.
- h) Colour demodulator.
- i) RGB matrix.
- j) RGB video amplifier.
- k) Colour PAL decoder IC circuit.

3) COLOUR PICTURE TUBE: -

- a) Colour picture tube: - Shadow mask tube, Trinitron tube, Inline Picture tube. Automatic degaussing circuit, Gray scale, Purity convergence & Pincushion adjustment.
- b) Picture tube electronic circuit.
- c) Precautionary methods at the time of replacement & Installation of picture tube

4) VISION I.F. AMPLIFIER (V.I.F.) / VIDEO DETECTOR: -

Study of IF band pass frequency, staggered tuning. SAW filter, Coupling circuit's, IF response, Gain control circuit. Noise canceling circuit, AFT circuit. IC CA 3068, TA 7680, TDA 3540/3541, μ PC 1366 circuits.

5) VIDEO AMPLIFIER: - (Revision)

- a) Video frequency response / Frequency compensation methods.
- b) D.C. restoration circuit.
- c) Video amplifier gain control (contrast) circuits.
- d) Retrace blanking circuits.
- e) 'Y' Delay Line, Luminance Amplifier, Beam current limiting.

6) SOUND: - (Revision)

- a) Study of sound IF, Introduction of sound detector circuit.
- b) IC's used for sound IF and audio amplifier TDA 1190, μ PC 1353.
- c) Sound mute circuit.

7) REMOTE CONTROL: -

- a) Types of Remotes.
- b) Pulse modulation (P.P.M encoding).
- c) Infra Red transmitter & Receiver.
- d) Block diagram of remote control. (Transmitter and Receiver).
- e) Testing of remote control.

8) POWER SUPPLY: -

- a) Regulated power supply.
- b) Switch Mode Power Supply SMPS.
- c) STR power supply.
- d) Advantages & disadvantages of SMPS & STR power supply.

9) SCANNING CIRCUITS: - (Revision)

A) SYNCHRONISATION: -

- a) Need of synchronization.
- b) Synchronization (Sync) separator circuit: - Basic circuit, Integrator & Differentiator circuit, Transistorized sync separator circuit.
- c) Need of Requirement of automatic frequency correction (AFC) circuit, Anti Hunt network in a TV receiver.

B) HORIZONTAL & VERTICAL CIRCUIT: -

Horizontal scanning circuit: - Different horizontal oscillator & automatic frequency correction (A.F.C.). horizontal driver and output circuit used in monochrome television circuit. EHT voltage stability & effect on picture. Auxiliary low voltage power supply.

Vertical scanning circuit: - Different vertical oscillator, driver & output circuits. Function and working of a Height control, Vertical Hold & Vertical linearity control.

10) TROUBLE SHOOTING TECHNIQUE: -

- a) Preliminary test for colour television servicing.
- b) Precaution taken at the time of colour TV servicing.
- c) Systematic fault finding procedure for the following symptoms:
 - 1) No colour B/W picture OK.
 - 2) Weak colours.
 - 2) Intermittent colours.
 - 4) No picture, raster with retrace lines.
 - 5) Colour snow.
 - 6) Wrong colour
 - 7) Negative colour picture.
- d) Colour TV
 - 1) Fonda Kit (Toshiba TV circuit): - IC CD 7680, CD 7698, M220D0105F (System control IC) & STR 5314
 - 2) Fonda Kit (Sanyo TV circuit): -IC 51R4-3800 (System control IC), 24C16 (Memory IC), LA7681, LC75342, LA4277, LA7840 & 7805.

11) SERVICING TOOLS & EQUIPMENTS: -

The Equipments that is required for Trouble shooting and Alignment in a B/W and colour Television are listed below. Give the brief description and working of the front control panel and application of these test instruments in Servicing.

- 1) D.M.M.
- 2) Marker Generator
- 3) Wobbullo Scope.

GUIDELINES FOR QUESTION PAPER SETTERS - CTVS / DVTES - II / DETES – IV

There will be total 6 Compulsory questions. Q 1 is objective question and asks on full syllabus. Question paper set on Fonda Kit 1 & 2 circuit.

	Marks
Q No.1 A) Fill in the blanks.	(05)
B) Match the following.	(05)
C) Write short answer.(answers should not be more than 2 lines)	(10)
Q No.2A) Topic 1.	(08)
B) Topic 3.	(08)
Q No.3A) Topic 4.	(04)
B) Topic 5.	(08)
C) Topic 6.	(04)
Q No.4A) Topic 8.	(08)
B) Topic 7.	(04)
C) Topic 11.	(04)
Q No.5A) Topic 9.	(04)
B) Topic 2.	(12)
Q No.6 From the given diagram & related to Topic No. 10	
A) Topic No. 10.	(08)
B) Topic No. 10.	(08)

PRACTICAL EXAMINATION FOR: - CTVS / DVTES - II / DETES – IV

Each candidate will have to locate three faults. Each fault will give 8 marks to locate fault and 12 marks for write up. One fault in Power supply or CRT circuit, One fault in Video Tuner, VIF, Sound circuit and One fault in Scanning circuits. The write up indicate the logical method of located faults.

Journal / Term work	20 Marks.
(Journal should contain minimum 50 recommended experiments)	
Oral examination	20 Marks.

RECOMMENDED BOOKS FOR REFERENCE

Monochrome and colour Television	R.R.Gulati
Television and video engineering	A.M.Dhake
T.V. Servicing made easy	R.C.Vijay
Colour Television Theory and Practice	S.P.Bali
Colour Television Theory and Principles	R.R.Gulati.

