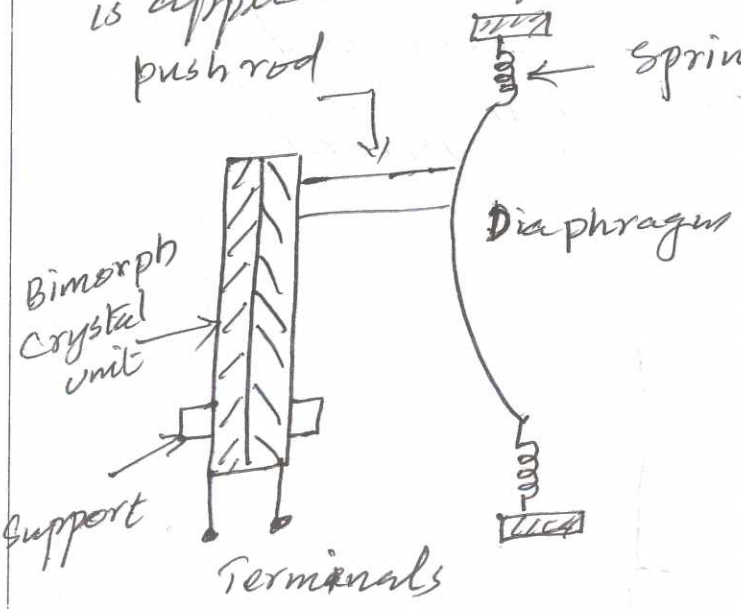
Scoring Indicators

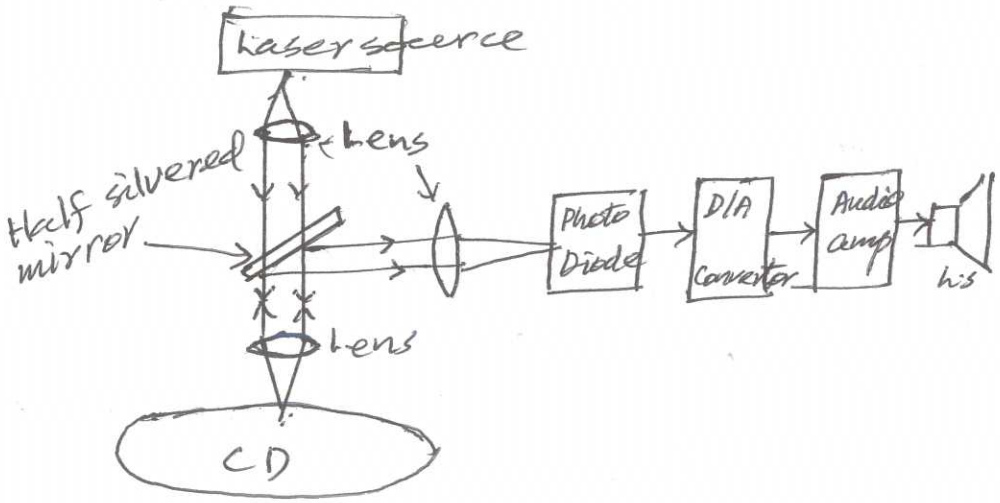
Code : TED(15) 6046. Version: SETA.

Qn. No.	Scoring Indicators	Split score	Total score
I	PART A		
	1. It is the ratio of sound intensity in the maximum response direction to the sound intensity which would exist if the speaker is omnidirectional	2	
	2. 7MHz	2	
	3. The distance between d.c. level of video signal and pedestal is the pedestal height.	2	
	4. It eliminates the cross modulation between luminance and chrominance signals in digital TV.	2	
	5. OLED display panels are made from organic materials that emit light when an electricity is applied through them	2	10
II		3	

It works under piezo electric effect when a sound wave impingie on the diaphragm, it vibrates. This vibration picked by bimorph element and a voltage is developed across its faces

3 + 6 -

(2)

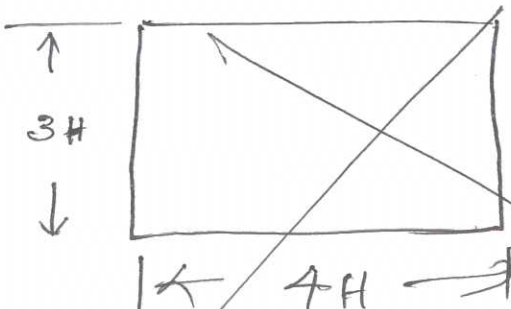


3

A low power laser beam of 780 Nm is fall on the surface of the disc through half silvered mirror. It allow the laser through it but does not allow returning beam through it. The reflected beam fall on photo diode which convert the beam as electrical signals.

3 + 6 -

(3)



It is width to height ratio

Scoring Indicators

Code : (3) Version: SETA

Qn. No.	Scoring Indicators	Split score	Total score
(3)	Blanking pulses are Horz: blanking pulses and Vertical blanking pulses. The blanking pulse duration is 12μs in Horz blanking But is 1280μs in vertical blanking. The frequency of Horz blanking 15625Hz Vertical blanking freq = 50Hz. Blanking periods are used to make retrace lines invisible.		- 6 -
(4)	ITU has been a major leader in the digital video coding area with codecs defined in the H.120 and H.26x series of recommendations. 3 ITU video coding standards are ITU-TH.120, ITU-TH.261, ITU-TH.263 ITU TH 262, ITU TH 264, ITU TH.265 etc. Explain shortly ITU TH.120 - codecs for video conferencing. ITU TH.261 - Video codec for audiovisual service. ITU TH.263 - video coding for low bit rate ITU TH.262 - Generic coding of moving pictures ITU TH.264 - { Advance video coding for generic audio visual services ITU TH.265 - High efficiency video coding standard		6 -

(5) * Improvement in both vertical and horizontal resolution
* Increase the size of screen with aspect ratio 16:9.
* Stereophonic digital audio
* Solid state display and pick up devices
* Greatly improved colour rendition due to component of signals -6-

-6- colour television system the colour signals R, G, B from the output of camera are transmitted as (R-Y) (B-Y) signals. Here it requires only two colour signals are transmitted, which are modulated at the transmitter by two carriers. At the receiver very easily colour signals are obtained by adding "Y" signal to the colour difference signals. $(G-Y)+Y=G$;

$B = (B-Y) + Y = B$;

$R = (R-Y) + Y = R$

(G-Y) also obtained at the receiver by (B-Y) and (R-Y) signals. Thus the system become simple. -6-

$$(G-Y) = \frac{-0.3}{0.59}(R-Y) - \frac{0.11}{0.59}(B-Y)$$

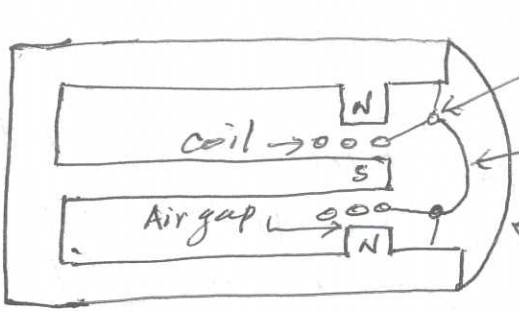
7. Video on Demand allows users to select video or audio contents together with broadcast time. Applications are
* Providing video films on Demand
* Local news and weather forecasting
* Games, music, Education and remote learning, Banking, Home shopping -6-

Scoring Indicators

(5)

Code :

Version:

Qn. No.	Scoring Indicators	Split score	Total score
	PART C		
III	(1). 	-3-	
	when sound waves strikes, the diaphragm vibrates, coil moves in the magnetic field of a P.M. field, producing output in the microphone	3	
	Adv: Inexpensive, Robust, Good response, low distortion	2	-8-
	Disadv: More weight, Keep 25 cm away from sound source		
	(2) It is a noise reduction system used in audio video systems. Dolby A — Used for professional recording (explain) Dolby B — Used for Domestic recording (explain) Dolby C — Recent and very effective.		-7-

IV (1)

* **Sensitivity**
  Input signal requires to give sound pressure level of 0.1 Pa.

* **Frequency response**
  Range of frequencies having an amplitude ± 1dB.
  ~~±1dB~~ ± 1dB (16Hz – 20KHz)

* **Distortion** change in frequency phase or amplitude of the output

* **S/N ratio** – ratio of output with signal to without signal. It is made as high as possible.

* **Directivity**

* **Input Impedance** – Expressed in ohms

* **power** – Maximum audio power in watts

– 8 –

(2)

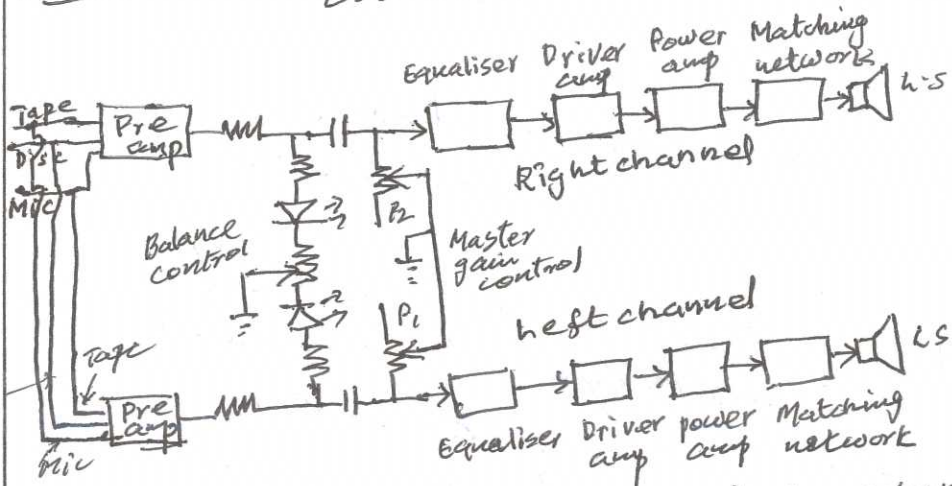
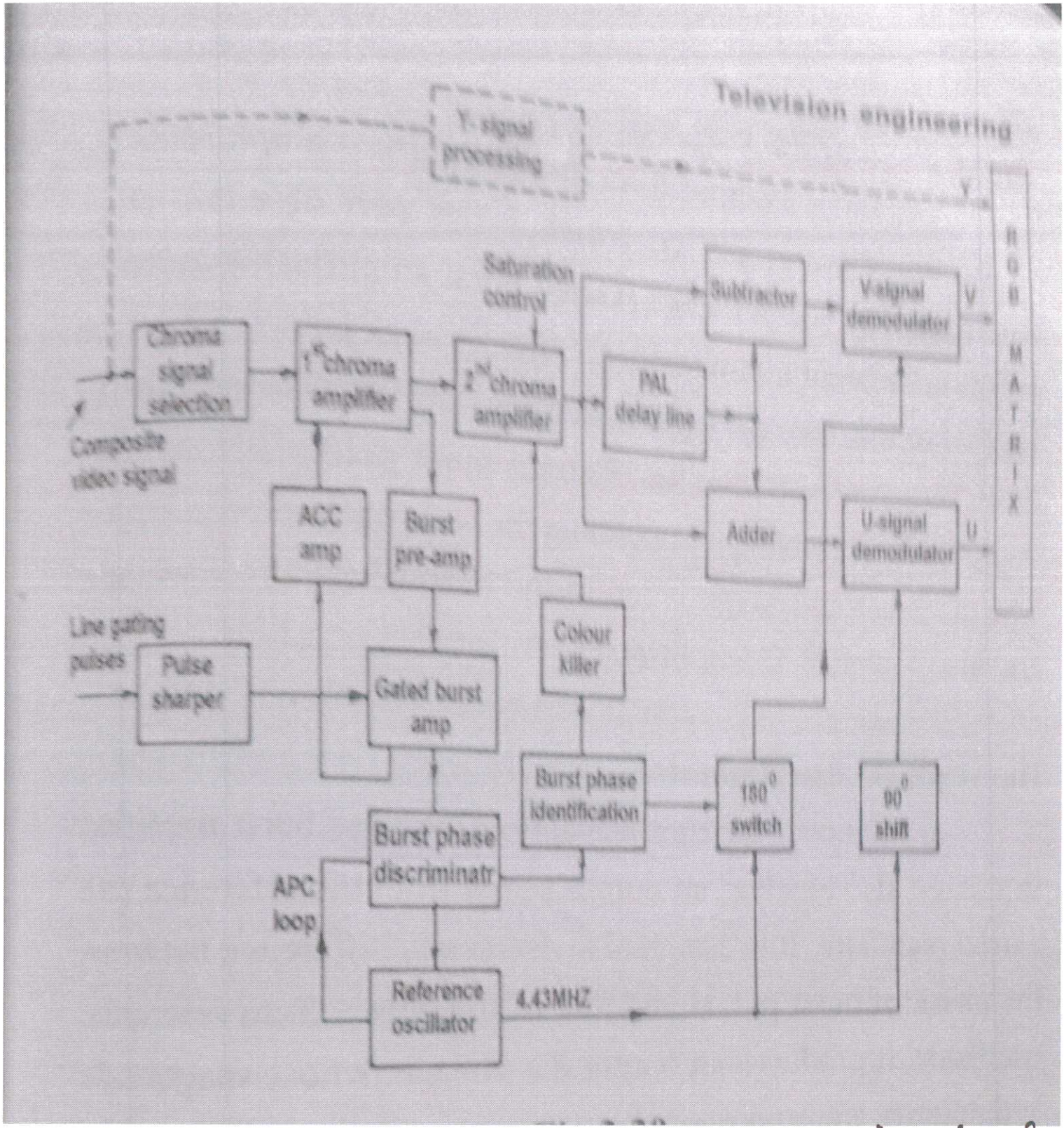


fig – 3

Blend control – Dilute stereo effect of any channel
Balance control – Used for adjusting mismatching of the signal in two channels.
Master gain control – Adjusting overall volume of sound without disturbing balance.
Equaliser – Used to improve S/N ratio
Signal then Amplified by driver, Power amp and then through matching network to speaker

(4) 7

V (12)



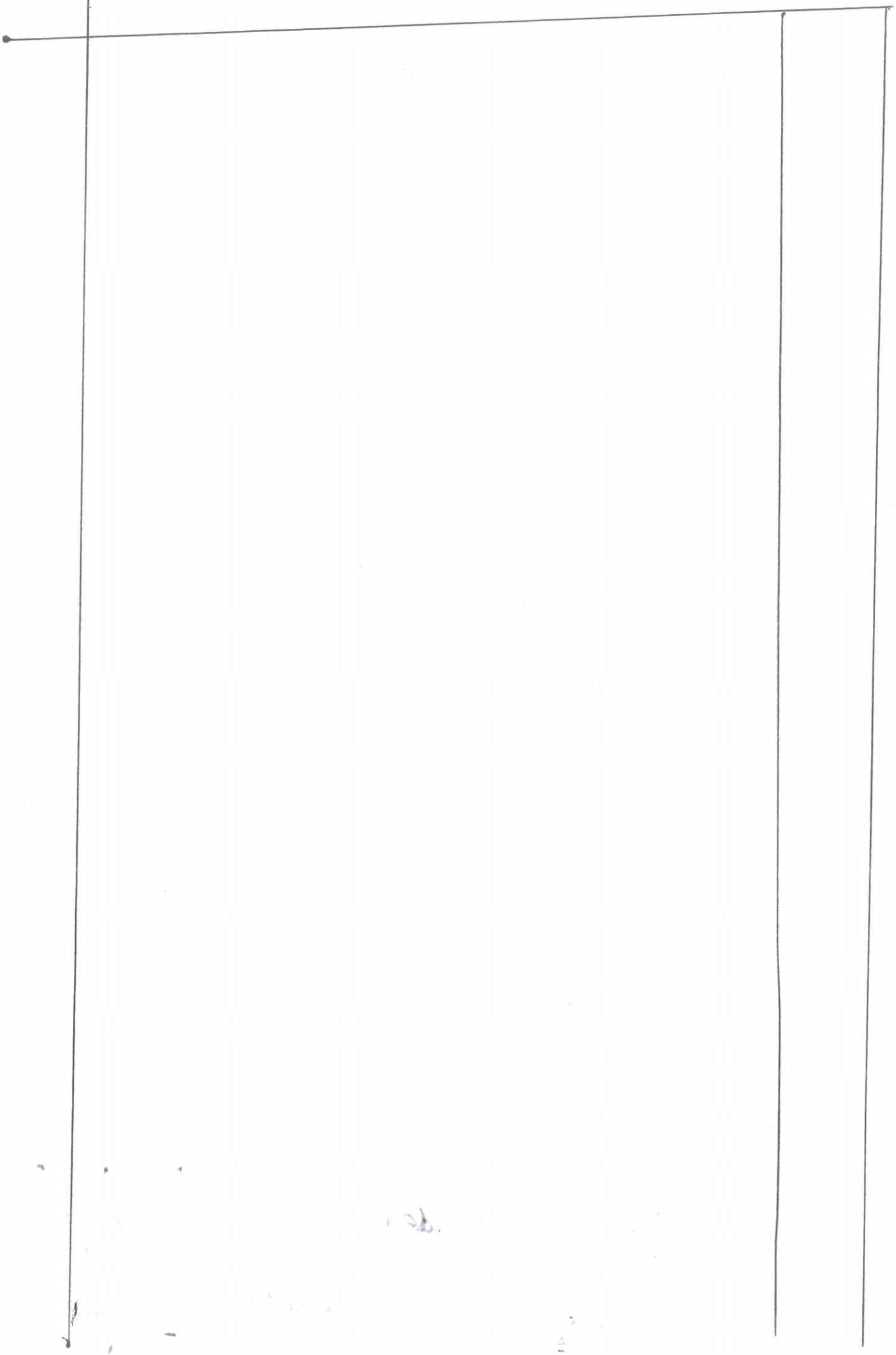
PAL D decoder

Explanation

(4)

4

8 11

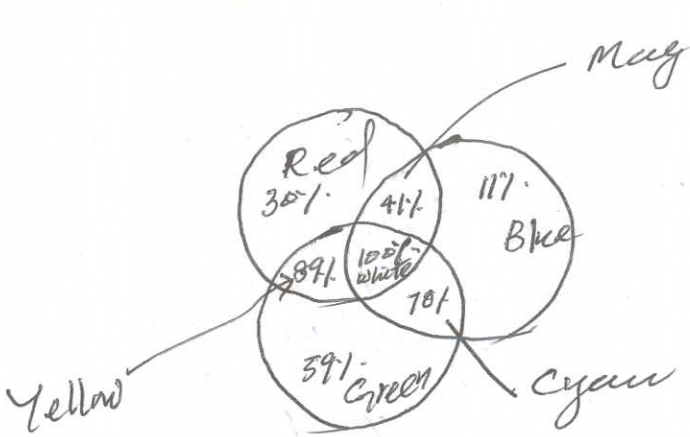


Scoring Indicators

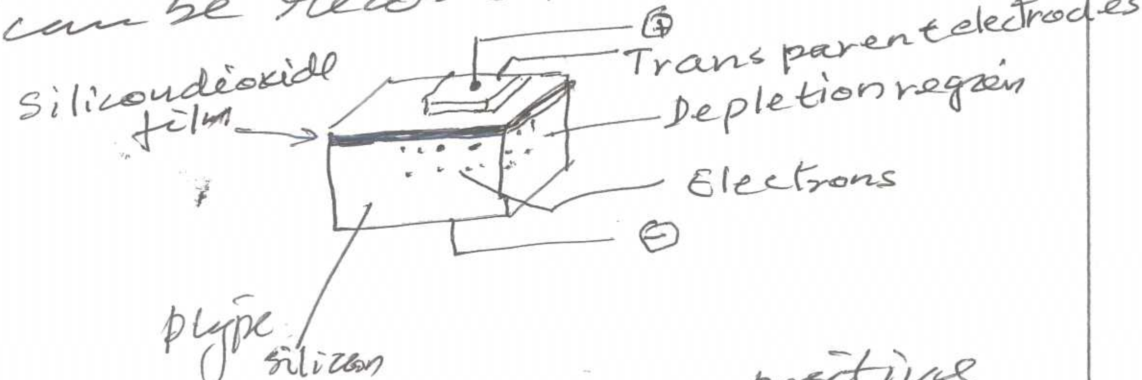
(8)

Code :

Version:

Qn. No.	Scoring Indicators	Split score	Total score
V (2)	 Red + Green = Yellow. Red + Blue = Magenta. Blue + Green = Cyan. Red + Green + Blue = white. In additive colour mixing two or more colours are combined to get different colours. Additive mixing used in TV.	3	7
VI (b)	NTSC: Horz freq 15.734 kHz; Lines/field 525/60; Vert freq – 60 Hz; colour sub carrier 3.579 MHz; Video bandwidth 4.2 MHz; Sound carriers 4.5 MHz; colour information I & Q; Channel Bandwidth 6 MHz. PAL: 15625 Hz; 625/50; 50 Hz; 4.43 MHz; 5.0 MHz; 5.5 MHz; U & V; 7 MHz. SECAM: 15625 Hz; 625/50; 50 Hz; 4.43 MHz; 5.0 MHz; 5.5 MHz; Db & Dr; 8 MHz. (Any eight)	8	

(2) CCD camera consist of an array of Metal oxide semiconductor capacitors represent a pixel A photon of light falls on each pixel will be converted into one or more electrons. When the CCD is clocked out the number of electrons in each pixel is measured and the scene can be reconstructed



The CCD shown above, a positive voltage applied to transparent electrode a depletion layer forms inside the substrate. When light falls free electrons are generated which fill the depletion layer, due to its positive voltage at the metal plate. A potential well creates

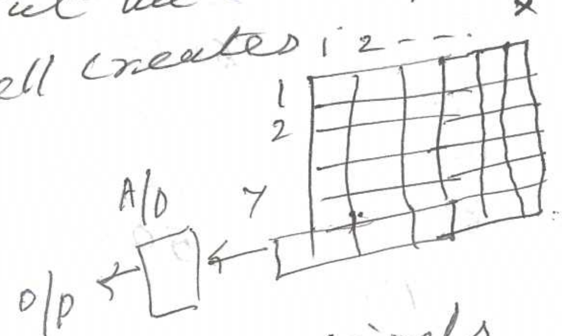
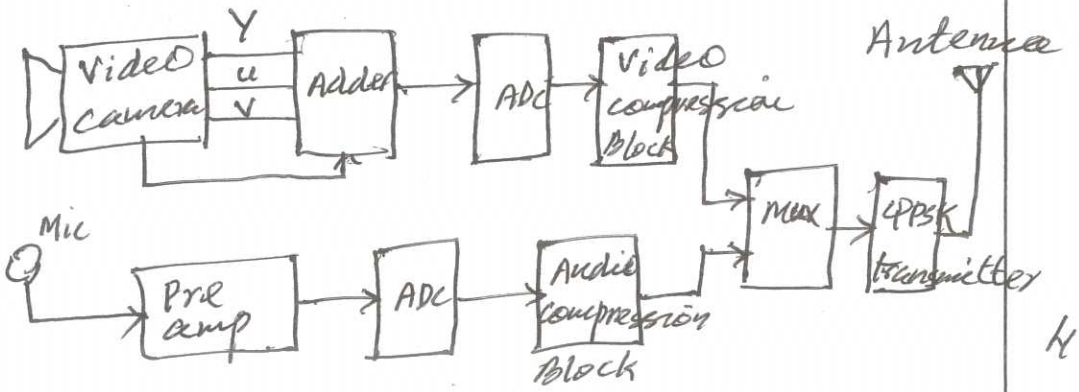


fig - 2
Exp 4
Total. 6

In camera a large no of pixels (potential wells) arranged as shown above. Each potential consist of charge proportional to light intensity falling on it. By the principle of shift register each charge is transfered and converted as electrical signal.

VII (1)



4

Analog video from camera and converted as Y, U, V signals.

Analog camera signals are digitalised by ADC using sampling, quantization process. The bits produced by ADC output is very high

To reduce Bandwidth digital compression technique like MPEG 2 is applied

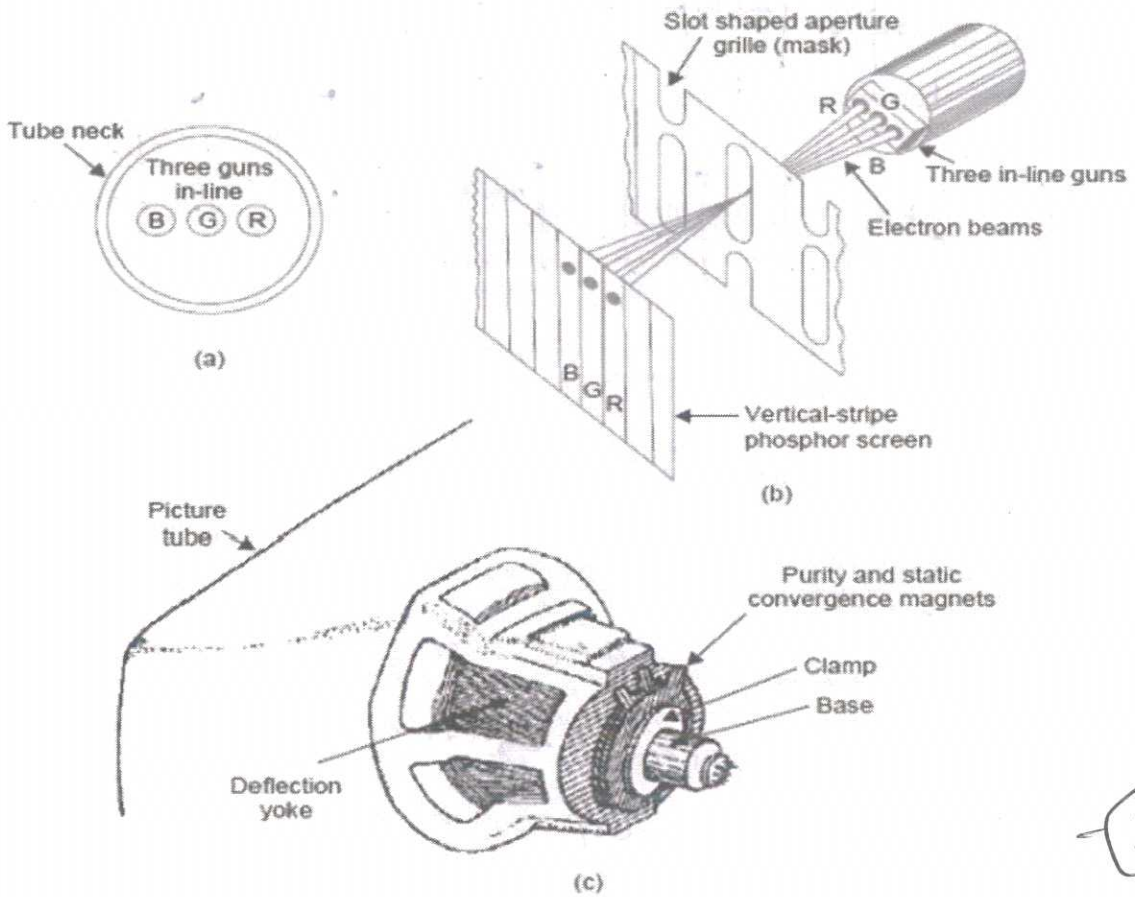
Sound signals also similarly digitalized, audio compressed and then applied to mux

It is modulated by QPSK and is transmitted

4

VII (2)

(11)



(3)

Figure. Precision in-line (P-I-L) or cathodes-in-line color picture tube

· (a)in-line guns (b) electron beams, aperture grille and striped three color phosphor screen (c) mountings on neck and bowl of the tube

Here three guns are placed precisely in a horizontal line. Colour phosphors are also deposited in line, in the form of vertical strips in triads (RGB). These are repeated along the breadth of the tube. One vertical ~~group~~ slot for one group of fine strip of Red, green and blue phosphors. The slots in mask are designed that each beam strike its own phosphor and prevent to reach other phosphors. More efficient, requires less convergent adjustments.

(4)

7

VIII (1) Digital TV provides a new way of broadcasting. Audio and video images are digitally processed and multiplexed.
Digital TV provides cinema style wide screen and stereo sound

Merits

less bandwidth, Multitasking, Editing, Picture in Picture, zooming, wide Dimension, Blasting Reduced ghost and noise, Reduced flicker, High resolution, High reliability. 8 8

(2) MPEG-I

First compression procedure designed by motion picture expert Group for video signals.
It is applicable for progressive scanning.
It uses six layers for effectively compressing video signals.

1. sequence layer
   using random access content
2. Group of picture layer (GOP)
   Using random access video content

3. Picture layer
   Using primary coding unit

4. Slice layer
   Using resynchronization unit within picture

5. Macro block layer (MB)
   Using motion compression unit with slice

6. Block layer
   Using matrix of 8x8 pixels within macro block. Here each layer has a header for synchronization

-5-

Demerit

* audio compression limited to 2 channel stereo
* not support sorround sound
* not support Interlaced scanning
* not suitable for high resolution

-7-

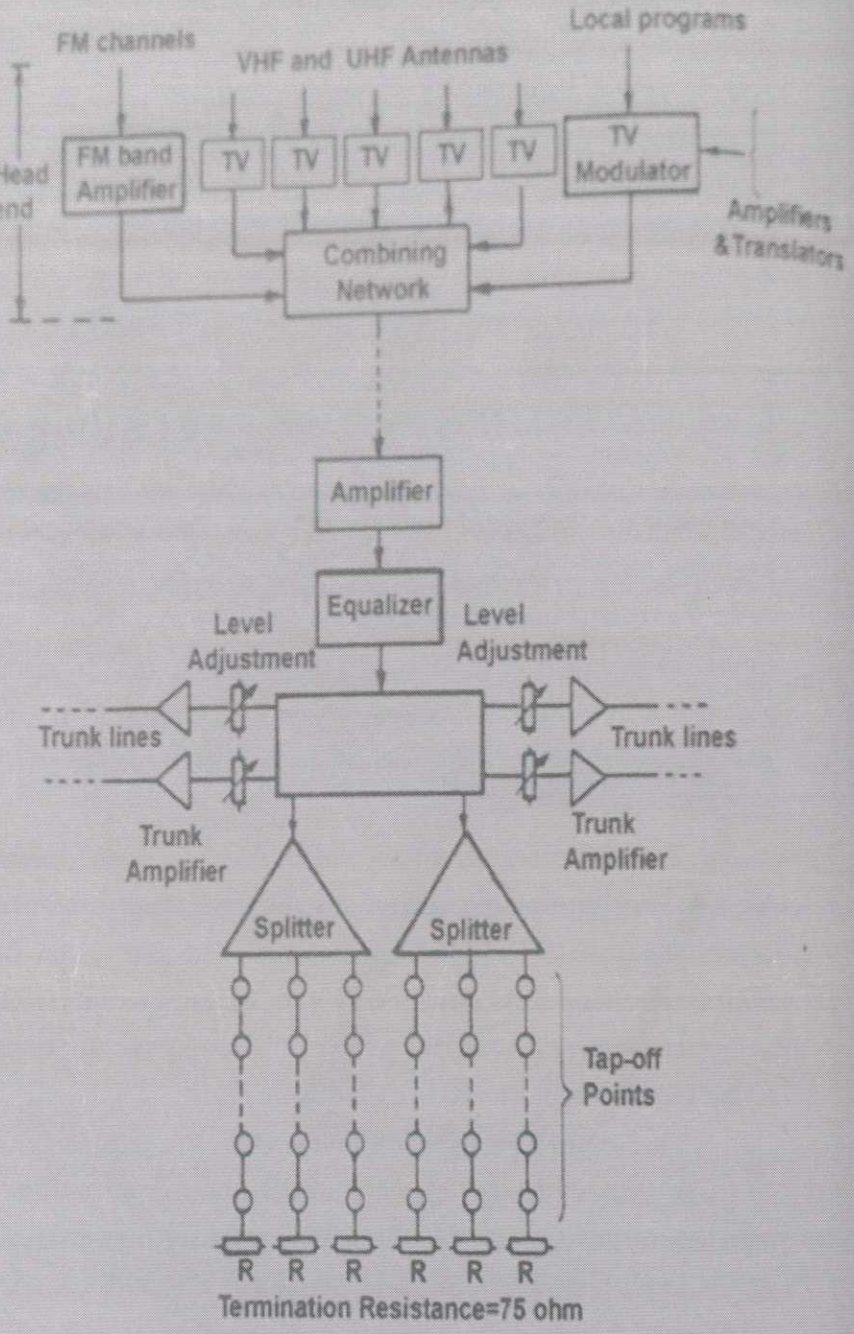
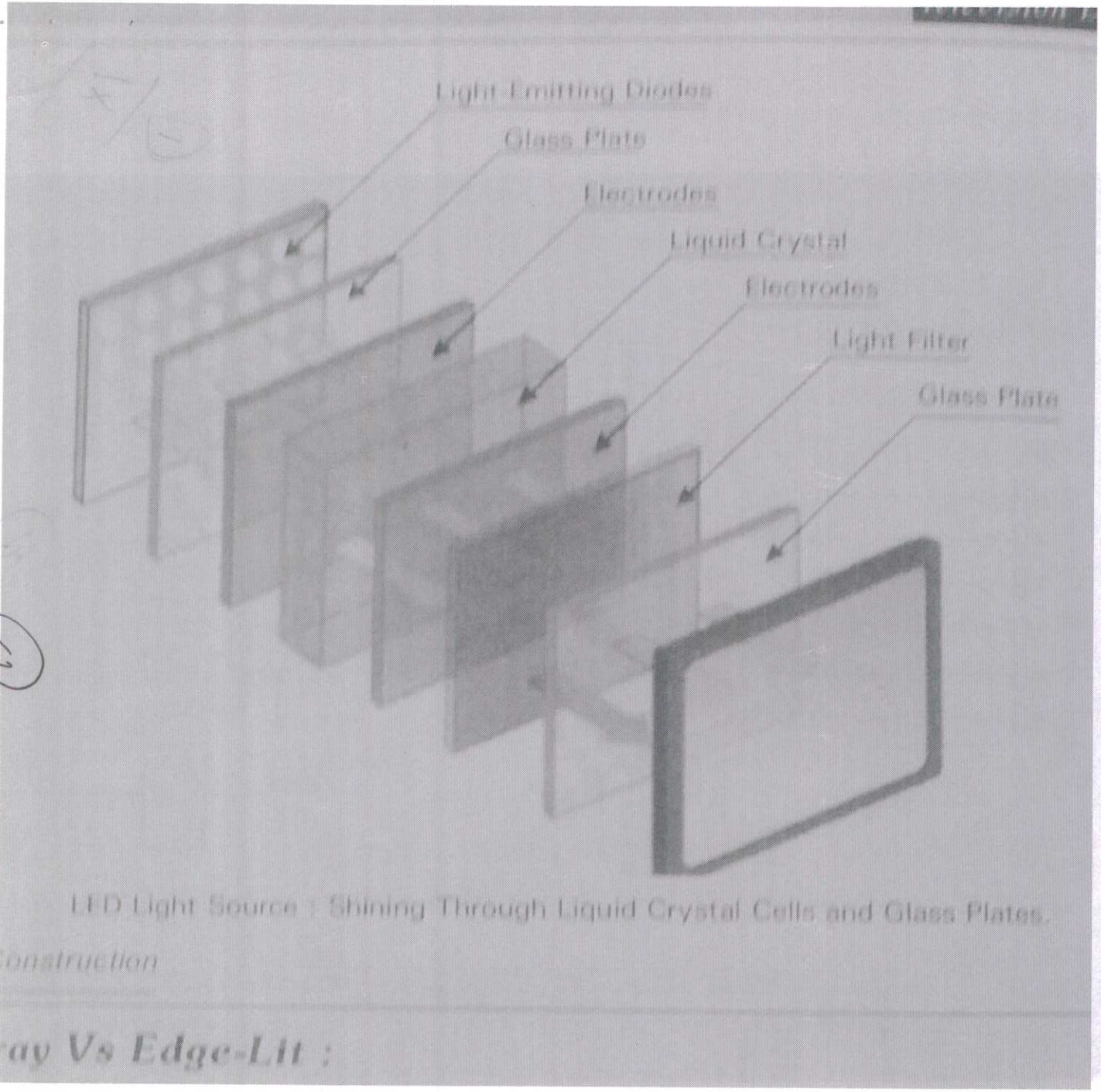


Fig.4.6

CATV

Figure (4)



LED Light Source : Shining Through Liquid Crystal Cells and Glass Plates.

Construction

ray Vs Edge-Lit :

IX

(i)

* Cable television system by a group of community uses cable TV by specially designed antenna.

* In addition UHF and VHF channels, in commercial TV and FM broadcast, local sports etc.

combining network

All signals from various TV channels are processed and combined.

* It is fed the distribution amplifier and their trunk cables.

* Equaliser used to improve high frequency response

* It provide 1.5 mv pp to the input of TV receiver.

Applications

Hospital, Hotels, Schools etc

fig — 4 -8-

IX) LED TV uses LCD ~~screen~~ Display and backlight is LED,
LCD is used as transducer and
LED provide back light only.

2 types

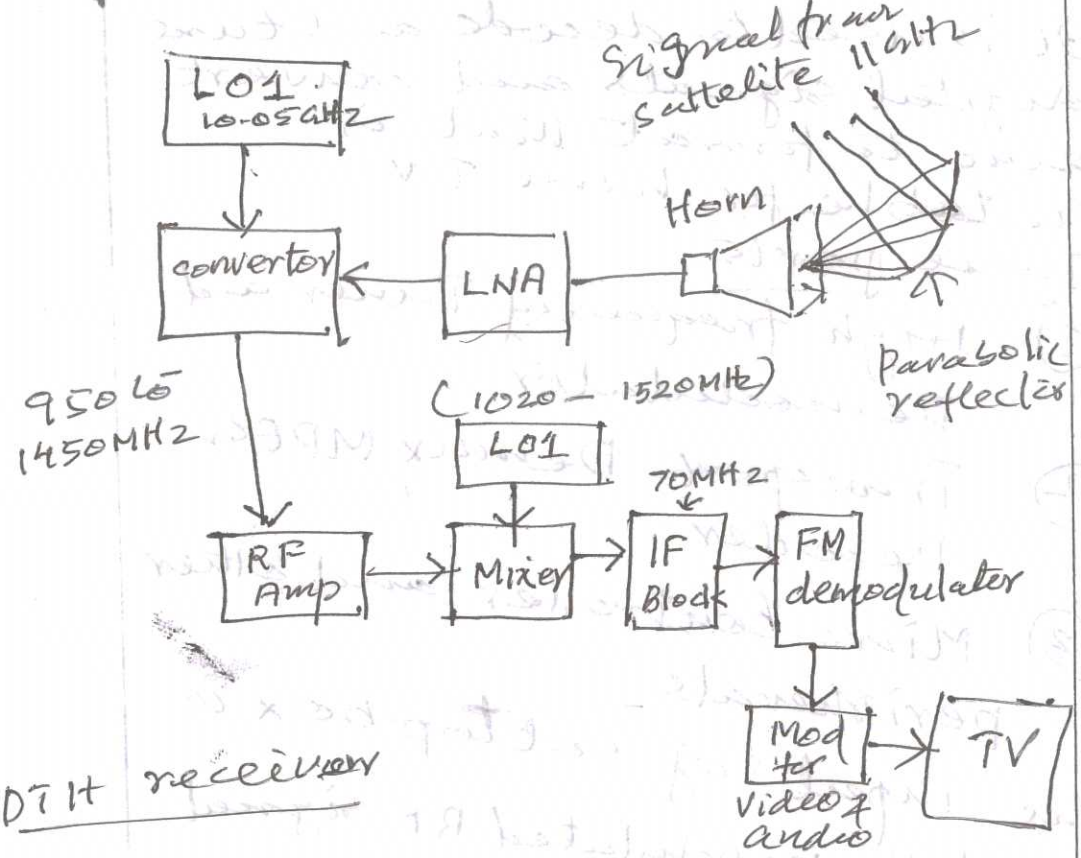
* Full array LED backlighting
* lit LED backlighting.

LED consume less energy

fig - 2

Exp 4

X (b)



DTH receiver 5

DTH is reception of satellite signals on a TV with a personal dish in an individual home.

Outdoor unit (LNB)

Receiving antenna, low noise amplifier and converter.

Indoor unit

RF amp - Amplifies signal

* Selected channel down converted to IF of 70MHz by local osc and mixer.
* IF block amplifies IF signal.
* FM detector. Then
* Modulator modulates audio and video signals required for TV 5

10

(2) It is used to decode and tune digital signals and convert them to format that is suitable for home T.V.

Three parts

1. High frequency Tuner and Demodulator
2. Transport Demux, MPEG Decoder
3. Micro controller and other peripherals

* The input of settop box is digitally modulated RF signal from channel.
* Box process this signal and gives base band analog audio and video signal. as well as PAL, NTSC encoded and modulated UHF/VHF standard analog TV signal

-5- -5-