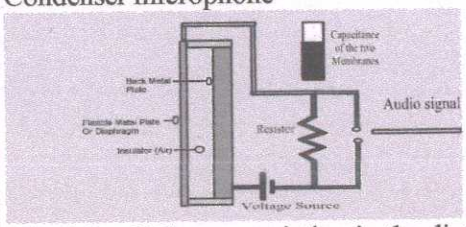
SCHEME OF EVALUATION
(SCORING INDICATORS)

Revision : 2015 **Course code : (TED(15) - 6046**

Course Title : TELEVISION ENGINEERING

Qst.No	Scoring indicators	Split up score	Sub total	Total
I	PART-A			
I	It is the measure of how much electrical output is produced by a microphone Or the output in millivolts for the sound pressure of 1 pascal at 1000 Hz.	2	2	10
2	Sensitivity frequency response Signal to Noise ratio Distortion Directivity Power Input impedance	2	2	
3	Ratio of width to height of a picture frame used in T V ie Aspect ratio = 4 : 3	2	2	
4	C-MAC /packet D-MAC / packet D2 – MAC / packet B-MAC Hue or Tint is the predominant spectrual colour of the received light ie actual colour of the object.	2	2	
5	SMPTE 296 M SMPTE 274 M	2	2	
II	PART – B			
1	Condenser microphone  Principle– If there a variation in the distance between the plates of a capacitor, there is a variation in the capacitance. Capacitance of the plate is inversely proportional to the distance b/w them. Diaphragm act as one plate & back plate as the other plate. The vibration s on the diaphragm produces changes in the distance	6		

b/w the plates. Since the plates are biased with afixed charge , the voltage maintained across the capacitor plates changes with the vibrations in the air.

2

1) Signal to noise ratio - better than 50 dB
2) Freq. Response - flat within +/- 1dB over the freq. Range of 40 Hz to 15 KHz
3) Nonlinear distortion - less than 1 %
4) Dynamic range - at least 80 dB
5) Stereo phonic effect __provided
6) Environmental conditions - to eliminate the external noise in the listening room, and to give the desired reverberation time

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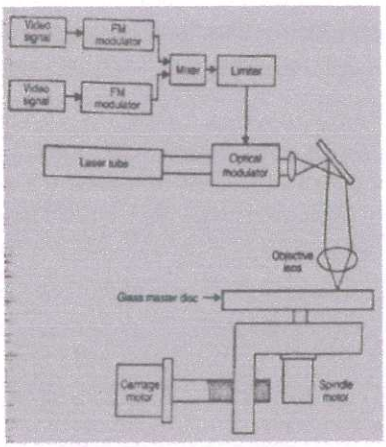
3



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Microphone converts sound energy into electrical signals.After amplifieing it is sampled at a rate of 44.1 Khz . 16 bits for each sample.For error correction & controlling additional bits are added to this signal.This corrected bits are made to modulate the laser beam and it is focused on the surface of RMD, which is fixed on to a turn table which is rotated by constant speed motor . It produces the record in the form of pits on RMD.

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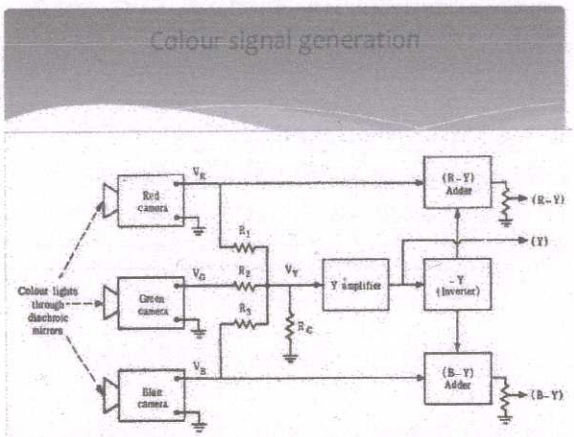

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Each camera tube converts the received light into voltages. i.e. The output of the camera tubes are Red, Green, & Blue voltages. To produce Luminance signal 30% red, 59% green & 11% blue voltages are added together with the help of a resistance matrix. The ratio is selected on the basis of three relative brightness signal.

Y signal = 0.3R + 0.59 G + 0.11B

Colour difference signal voltages are obtained by adding the inverted Y signal voltages with the three colour voltages.

ie (R-Y) , (G-Y) , & (B-Y) . out of these three colour difference signals

(R-Y) & (B-Y) signals are transmitted along with the luminance signal'

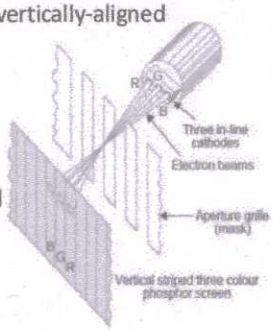
5 Three electron gun – one for each primery colours . Three guns are arranged in horizontal line. The inline configuration helps to simplify the convergence adjustments.

Three primary colour phosphour dots are deposited on the screen in the form of vertical strip triads. Which are repeating along the breadth of the screen. The shadow mask has vertical slots instead of holes .one slot for one triad.

5 PIL PICTURE TUBE

Working

- The single gun consists of a long-necked tube with a single electrode at its base, flaring out into a horizontally-aligned rectangular shape with three vertically-aligned rectangular cathodes inside
- Each cathode is fed the amplified signal from one of the decoded RGB signals.
- The electrons from the cathodes are all aimed toward a single point at the back of the screen where they hit the aperture grille, a steel sheet with vertical slots cut in it.



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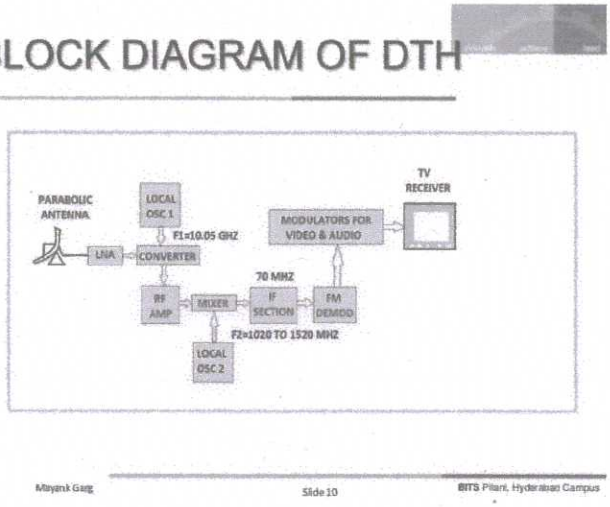
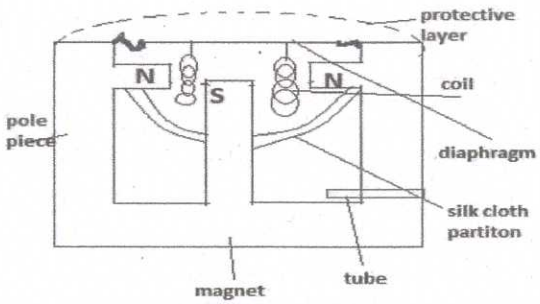
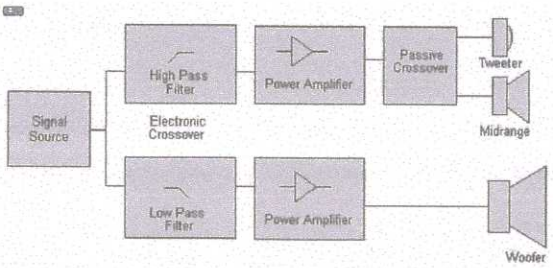
1) Bandwidth 7 Mhz
2) Location of PC & SC should not change
3)Colour signal should not affect in monochrome TV
4) Colour signal should carry both colour signal & B &W signals for decoding them
5)Deflection freq ,sync.freq are same as monochrome TV
6)Colour signal should have the same luminance information as would a monochrome signal transmitting the same scene

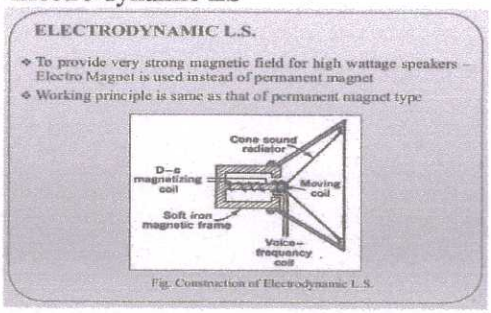
7) colour information should not produce any interference on the B&W picture reproduced on a B&W TV receiver.

7	DTH Rx  Two units -outdoor unit & indoor unit Outdoor unit -receiving antenna, LNA, & converter. Rx antenna -parabolic reflector with horn as the active element. Received signal 11Ghz fed to LNA for amplification. Converter converts this signal to 950Mhz UHF range. Indoor unit- RF amp -amplify the signal 950Mhz.It is down converted to a fixed IF (70Mhz) by using LO & mixer.FM demodulator recovers the original base band signal consisting of CVS & audio signals - this modulated signals are fed to normal domestic TV receivers.	6		
III	PART - C			
A	Moving coil microphone  Fig. a Moving coil microphone Sound waves strike the diaphragm, it moves & hence coil moves in & out in the magnetic field – flux changes through the coil which results an emf induced in the coil due to the Electromagnetic induction. Value of emf depends on the rate of change of flux & hence the motion of the coil. The displacement of the coil depends on the pressure of the sound waves strike on the diaphragm.	8		
b	Stereo system	7	15	



In stereo phonic system – at least two channels -left & right -each with independent microphone, amp & loudspeaker. Signals of these two channels are recorded & playback separately & independently.

IV a Electro dynamic LS



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Current at audio frequency passes through the voice coil, varying magnetic field is produced. This field interacts with the magnetic field of electromagnet and creates a force. This force causes a to & fro motion of voice coil & the diaphragm vibrates & produces sound signal.

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b PA system

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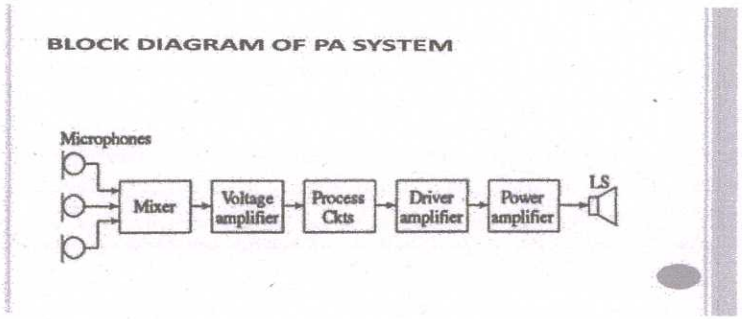
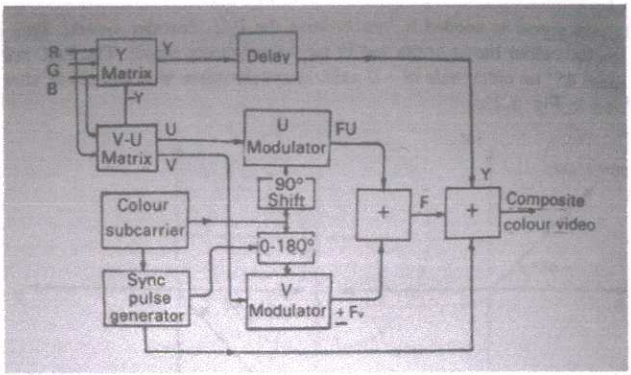
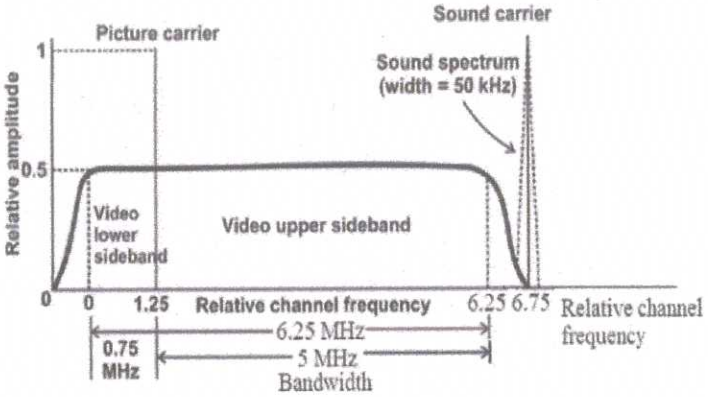
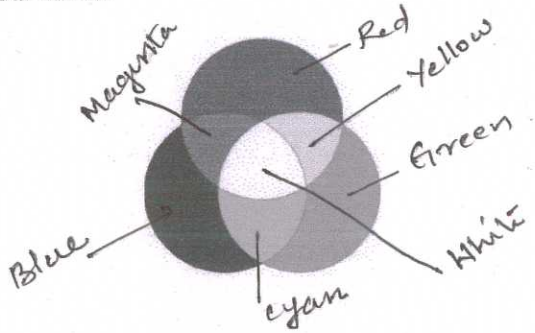


Consists of microphones, mixer, voltage amp, processing ckts, driver amp, power amp & loud speaker.
Mic -converts sound waves to electrical vibrations-called audio signals.
Mixer – isolate different channels from each other before feeding in to the main amp.
Voltage amp - amplify the o/p of mixer.

	Processing ckt – it consists of main controls -master gain, tone etc. Driver amp – gives sufficient voltage for power amplification. Power amp – for power amplification. LS –Converts audio signal to sound signal.			
V a	PAL encoder  brief explanation	10 4		
b	VSB  	5	15	
VI a	Additive colour mixin  White (100%) = 30% Red + 59% Green + 11% Blue primary colours – Red , Green & Blue Red + Green =Yellow Red + Blue = Magenta Blue + green = Cyan	6		

b

NTSC – National Television System Committee.
PAL – Phase Alternation by Line
SECAM – Sequential Colour with A Memory.

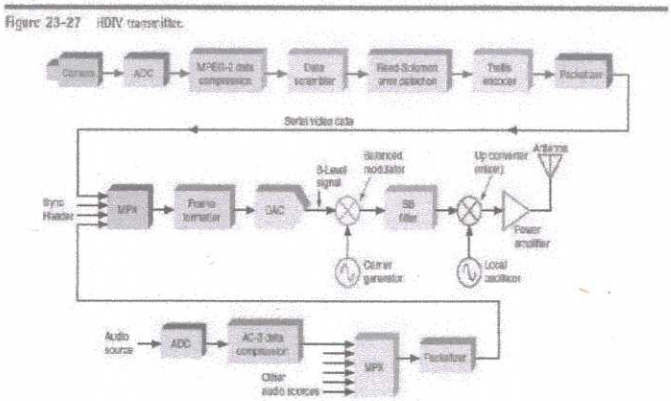
comparision

Si no		NTSC	PAL	SECAM
1	Line/field	525/60	625/50	625/50
2	Hori.freq	15734Hz	15625Hz	15625Hz
3	Vert freq	60Hz	50Hz	50Hz
4	Colour sub carrier	3.579Mhz	4.43Mhz	4.43Mhz
5	freq	4.2Mhz	5Mhz	5Mhz
6	Video bandwidth Sound carrier	4.5Mhz	5.5Mhz	5.5Mhz

9 15

VII a

Digital TV transmitter



brief expn

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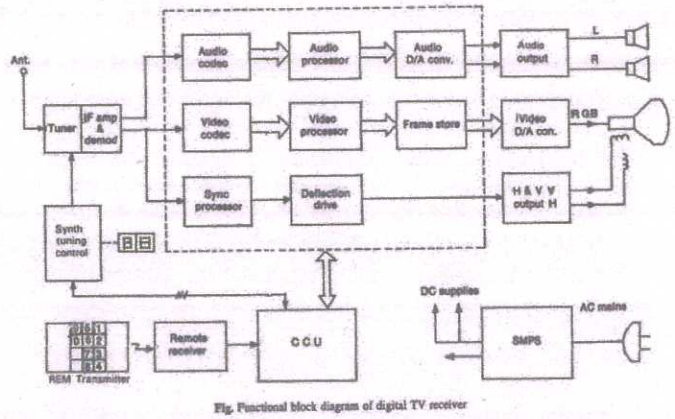
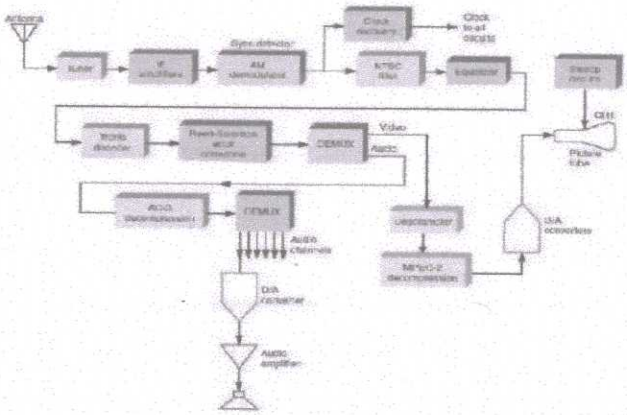
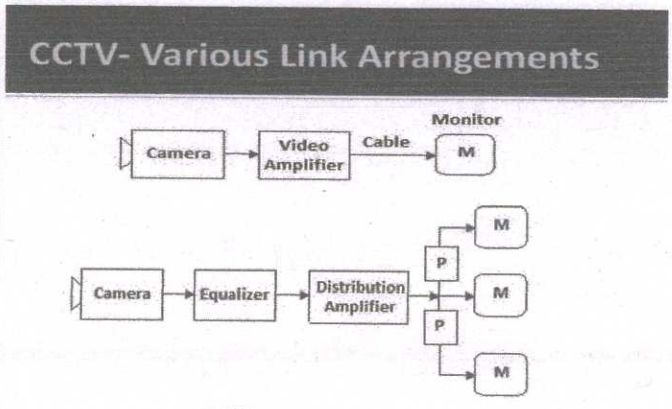
b

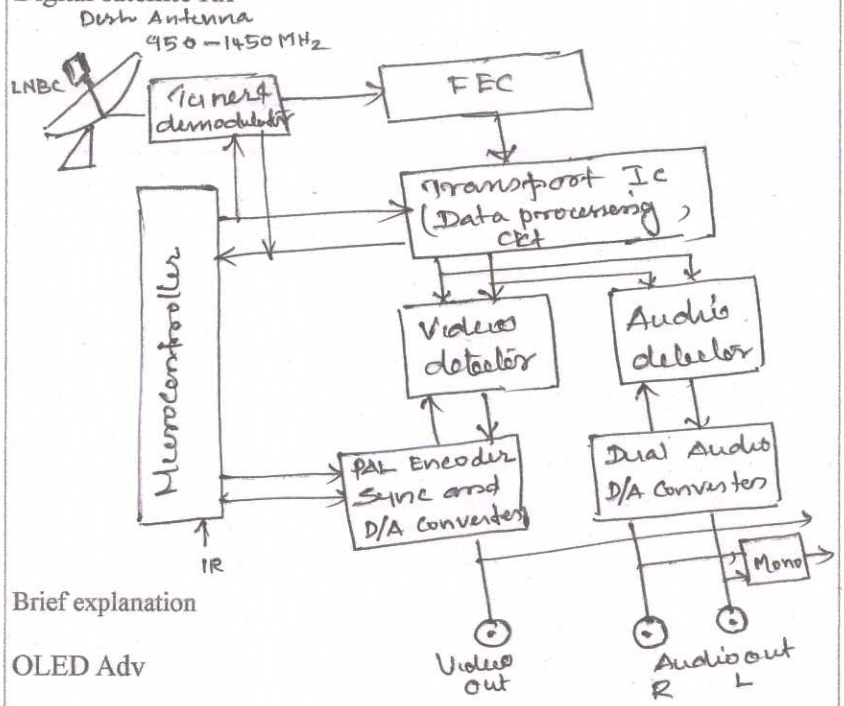
MAC signal advantages

1) Higher performance than composite system
2) Because of compression the baseband band width is increased by 50%
3) Best suited for direct reception of satellite programs by individual & community antenna installations to maintain high quality of picture
4) MAC processing produces all 625 lines on each scan instead of the interlaced scan. So high definition picture can be displayed
5) MAC system is adaptable into various formats having different specifications for different purposes
6) Data structure of MAC signals can be altered at well, by transmitting the structure map for the receiver to identify the type of service mix offered

6 15

	7) The component coding in which each color signal has separate identity in the transmission chain gives it flexibility in transcoding into any other format , any future change & improvements in the TV technology 8) Signal power of MAC is greater than PAL			
VIII a	Digital TV Rx BD  Fig. Functional block diagram of digital TV receiver Tuner & demodulator – tuner selects the desired channel freq from the antenna. Demodulator demodulate the video & audio IF signals. IF amp & filter – separate the video & audio IF signals and amplify them. Video codec – Convert analog IF signals into **8** bit digital signal by using a high speed flash A/D converter. Video processor – separate digital VIF signal into two channels as luminance & chrominance. RGB matrix – Converts colour difference signal into colour signal. ie (R ,G & B signal). Sync processor – separate Hori . & vert. Sync pulses & then fed to defletion processing unit. Deflection processing – generates & synchronizes the Hori & vert sweep signals by counting the color sub carriers & locking to it. Hori & vert sweep outputs are fed to Hori & vert output amps. After amplifiying these signals are used to drive Hori & vert defletion yokes. Audio codec - A/D converter – Analog IF signal sampled & converted in to **16** bit digital stream Audio processor – split in to two channels. Audio D/A converter – Audio signals of each channel in the digital stream is converted in to analog form & fed to audio o/p amp. After amplification ,fed to LS CCU -a microcomputer based device which controls & co-ordinates all the ckts & signal processing functions	12 8		
b	1) ATSC Advanced Television Systems Committee. 2) ISDB-T Integrated Services Digital Broadcasting Terrestrial. 3) DVB-T Digital Video Broadcast Terrestrial. 4) DTMB Digital Terrestrial multimedia Broadcast	3	15	

IX a	HD TV RX  Pick up composite signals & then demodulates & decodes the signal in to the original video & audio signals. Tuner – Used to select channel & also converts the incoming signal in to IF signal. IF amp amplifies this signal. Demodulator detects the video & audio signals.NTSC filter is used to avoid adjacent channel interference. Trellis decoder & RS decoder – used for error correction.Error corrected signals are demultipluxed into video & audio bits stream.this signal is again decompressed by using MPEG-2 decompressor stage. then converted into analog signals by D/A converter & then fed to R , G & B electron guns of the PT Audio signals from Demux is decompressed from AC-3 decoders & demultiplexed to different channels .Again this signal is converted into analog signals by D/A converter, given to audio channels.it is amplified & fed to LS.	10 9 10		
b	CCTV sys  Signals from the camera directly transmitted through a cable to the	5	15	

		another. 1) Direct link from camera to only one monitor. 2) direct link from camera to several receivers. Camera o/p will be given to a distributers amplifier.The signals will be supplied through a pads to the different monitors connected.this links deponds up on the application s & the distance b/w camera & location.			
X	a	Digital satellite Rx  Brief explanation	10		
	b	OLED Adv 1) Improved imade quality. 2) Better contrast. 3) Heigher brightness. 4) Fuller viewing angle. 5) Wider color range. 6) Faster refresh rates. 7) Low power consumption. 8) Simpler design. 9) Better durability.	5	15	60

QUESTION WISE ANALYSIS

COURSE : TELEVISION ENGINEERING

VERSION : 2015