GUJARAT TECHNOLOGICAL UNIVERSITY B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012

Subject code: 161002 Subject Name: Audio-Video Systems Time: 02.30 pm - 05.00 pm Instructions:

Date: 03/01/2013

Total Marks: 70

- 1. Attempt any five questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) (I) Explain following terms with reference to sound: 07 (1) Timbre (2) Pitch (3) Threshold of hearing (4) Overtones (5) Inverse square law.
 - (II) If the velocity of sound at 0^{0} C is 332 m/s, calculate Velocity and wavelength of sound of 400 Hz at 20^{0} C.
 - (b) (I) Explain various classes of amplifier based on location 07 of operating point.
 - (II) Distinguish between single ended power amplifier and push pull amplifier.
- Q.2 (a) With the help of a neat sketch explain principle, 07 construction and working of a Permanent Magnet Moving Coil loud speaker.
 - (b) Explain directivity of a microphone. Draw 07 Omnidirectional, Bidirectional, Cardioid, Supercardiod and Hypercardiod pattern specify their applications.

OR

- (b) Explain principle of working of a Ribbion microphone. 07With the help of a neat sketch explain its construction and functioning. Mention its applications.
- Q.3 (a) Why a single loudspeaker cannot have a flat response for 07 the whole audio frequency range? How the problem is solved? Design two way crossover network to give 12 dB per octave woofer for a critical (cut-off) frequency of 500 Hz. Loudspeaker resistance is 8 Ohm.
 - (b) Draw block diagram of basic monochrome television and 07 explain how it works.

OR

- Q.3 (a) State advantages and disadvantages of CDs 07
 - (b) What do you understand by scanning? Why is it needed? 07 Explain interlaced scanning and state its advantage. Also discuss factors which determine number of scanning lines in a TV system.
- Q.4 (a) Sketch the details of horizontal blanking and sync pulses. 07 Label on it (i) front porch, (ii) horizontal sync pulse

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(iii) back porch and (iv) visible line (picture information) periods. Why is the front porch and back porch intervals provided before and after the horizontal sync pulse?

(b) Why AMVSB for video signal, AMSC for colour signal 07 and FM for audio signal is chosen in TV system?

OR

- Q.4 (a) Explain how the horizontal and vertical sync pulses are 07 separated and shaped at the receiver.
- Q.4 (b) Describe briefly co-channel interference adjacent channel 07 interference and Ghost interference effects.
- Q.5 (a) Show that a total channel bandwidth of 7 MHz is necessary 07 for successful transmission of both picture and sound signals in the 625 line TV system. Sketch frequency distribution of the channel and mark the location of picture and sound signal carrier frequencies. Why is the sound carrier located 5.5 MHz away from the picture carrier?
 - (b) Draw simplified block diagram of PAL colour encoder and 07 explain in detail pal swinging burst.

OR

Q.5 (a) Explain the terms:

07

- (1) Primary colours
- (2) Complementary colours
- (3) Additive colour mixing
- (4) Hue
- (5) Saturation
- (6) Luminance
- (7) Chrominance.
- (b) What is Plasma TV? State advantages and disadvantages of **07** Plasma TV.
