Sem-VI(R) – ETRX – Comm^{n} Sys & App 9/May 2012

AGJ 1st half (m) 3

Con. 4856-12. **GN–9702**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** questions out of the remaining **six** questions.
(3) Assume any **suitable** data wherever required by justify the **same**.

1. Answer any **four** questions :– **20**
   (a) Define directivity and antenna gain. Why nonresonant antenna are generally unidirectional ?
   (b) What is geostationary orbit ? Prove that as per Kepler's law satellite orbit is an ellips.
   (c) Justify, Interlaced scanning help to reduce flicker and bandwidth of the video signal.
   (d) What are the factors influencing the bandwidth of a radar receiver ? Why radar pulse should have vertical edges and flat tops ?
   (e) What are the major elements of an optical fiber transmission link ? Draw the neat block diagram of an optical link.

2. (a) A half wave dipole in operating at 90 MHz with efficiency of 98% the directivity of antenna in 2·15 dB and its loss resistance is 2Ω find – **10**
      (i) Radiation Resistance
      (ii) Length of antenna
      (iii) Antenna power gain.
   (b) What is the effect of ground on antenna ? Explain in brief the mechanism used to increase the conductivity of the system. **5**
   (c) Explain in brief Antenna Coupling Networks. **5**

3. (a) Justify, the highest modulating frequency used in 625 line TV system is 5 MHz and the channel bandwidth is about 7 MHz. **5**
   (b) Explain the necessity of blanking, synchronizing and colour burnt signal in T.V. Transmission System. **5**
   (c) Define composite video signal sketch the composite video signal waveform for three successive lines and indicate. **10**
      (i) Extreme white level
      (ii) Pedestal height and DC level
      (iii) Blanking level
      (iv) Synchronous pulse level
      (v) Front and Back Porch.

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4. (a) With the help of suitable diagram justify that PAL-D system is capable of cancelling phase error. **5**

   (b) What are the features of HDTV draw the neat block diagram of HDTV encoder ? **5**

   (c) Draw the functional block diagram of PAL-D colour TV receiver. Explain the difference between chrominance and luminance signal. How is colour picture tube able to display white ? **10**

5. (a) Explain in brief MTI radar system. What do you mean by blind speed in MTI radar system ? **5+5**

   Calculate the two lowest blind speeds of a radar system, operating at 3 GHz with a pulse repetation freq. of 600 PPS.

   (b) With the help of neat block diagram explain FM-CW radar. What are its advantages over CW-doppler radar ? **6+4**

6. (a) What are the direct broadcast satellite services ? With the help of neat block diagram explain Digitial Satellite Television System. **10**

   (b) Explain – **5**

   (i) Look Angles

   (ii) Satellite Transponders.

   (c) Write short note on multiple access scheme in satellite communication. **5**

7. (a) Find the core radius necessary for single mode operation at 1320 nm of a step–index fiber with $n_1 = 1{\cdot}480$ and $n_2 = 1{\cdot}478$. **5**

   What are the numerical aperture and maximum acceptance angle of this fiber ?

   (b) Compare the following (any **two**) :– **10**

   (i) LED and LASER

   (ii) P-n photodiode and P-i-n photo diode

   (iii) LCD and PLASMA.

   (c) Write short notes on the following (any **one**) :– **5**

   (i) Cable T.V.

   (ii) Fiber clssification.