

Seat No. : \_\_\_\_\_

**LF-105**

**April-2014**

**B.Sc. (Sem.-VI)**

**CC-309 : Electronics**

**Time : 3 Hours]**

**[Max. Marks : 70**

- Instructions :** (1) All questions carry equal marks.  
(2) Symbols used have their usual meaning.  
(3) Figures to the right indicate marks.

1. (a) Write the advantages of using optical fibres in comparison to using optical fibres. 7  
(b) Explain dispersion and diffraction of light. 7

**OR**

- (a) Explain total internal reflection with proper diagrams. What is Fresnel reflection and how can it be calculated? 7  
(b) What is Snell's law? How can the critical angle of incidence be found? 4  
(c) Calculate the critical angle of incidence between two substances with different refractive indices, where  $n_1 = 1.5$  and  $n_2 = 1.46$ . 3

2. Explain in detail the super-heterodyne receiver. 14

**OR**

How is the intermediate frequency selected? Draw the circuit of a two-stage IF amplifier and explain it.

3. Draw the block diagram of a basic monochrome TV system and explain how the different elements of the basic TV system can be reproduced faithfully. 14

**OR**

With the help of the circuit diagram of a simple matrix, show how the I, Q and Y signals are generated in a color TV transmitter. Also explain color phase relationships and chroma vectors.

4. (a) Explain the difference between analog and digital signals. 7  
(b) Write a note on the bandwidth requirements of a data transmission circuit. 7

**OR**

What are forward error-correcting codes? Explain in detail the matrix code and hamming code. 14

5. Answer in brief :

14

- (a) Define luminescence.
  - (b) What is scattering of light ?
  - (c) What is the relation between the amount of energy contained in light and its frequency ?
  - (d) Define refractive index.
  - (e) Define conversion transconductance.
  - (f) What is AGC ?
  - (g) What is sensitivity of a radio receiver ?
  - (h) What is aspect ratio and what is this value for a TV system ?
  - (i) What do you mean by negative video modulation polarity ?
  - (j) What is standard field frequency used in the European TV system ?
  - (k) What is the function of the shadow mask ?
  - (l) What is the relation between the maximum signalling speed in bauds and the bandwidth of the channel ?
  - (m) Where is the Baudot code usually used ?
  - (n) Which is the code usually used in punched cards ?
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