Seat No. : _____

AD-103

April-2016

B.Sc., Sem.-VI

CC-309 : Electronics

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.

(2) Symbols carry usual meanings.

1. (a) Explain the basic operation of the fibre as a communications link. Give a brief of the history of fiber optics. **7**

OR

Explain the advantages of optical fiber compared to copper wire. Also explain what is dispersion, diffraction and absorption of light.

(b) Explain how communication takes place in a optical fiber. Calculate the critical angle of incidence between two substances with different refractive indices where $n_1 = 1.5$ and $n_2 = 1.46$. **7**

OR

Explain total internal reflection and Fresnel reflection. How can we calculate fiber losses ?

2. (a) Draw the block diagram of a tuned radio frequency receiver and explain its disadvantages. **7**

OR

Explain negative peak clipping in diode detectors.

(b) Draw and explain the block diagram of a superheterodyne receiver. **7**

OR

What are frequency tracking errors and how can they be kept minimum ?

3. (a) Draw the block diagram of the transmitter of a basic monochrome television system. **7**

OR

Explain how beam scanning is achieved in a television system.

(b) Draw and explain the block diagram of a typical monochrome television receiver. **7**

OR

Explain what is meant by the Y, I and Q signals in colour TV. Also with the help of the circuit diagram of a simple matrix show how these signals are generated in a colour TV transmitter.

4. (a) What is digital technology ? Draw a comparison between analog and digital signals. **7**

OR

Discuss the hamming code as an error-detecting code.

(b) Write a note on constant ratio codes. **7**

OR

What is cross talk and how can it be controlled ?

5. Answer the following in short : **14**

(1) Give the relation between the energy in a photon and the frequency of light.

(2) What is the range of light spectrum used for fiber optics ?

(3) Who demonstrated guided light systems to the royal society ?

(4) What is the refractive index of water ?

(5) What is negative video modulation polarity ?

(6) What is aspect ratio ?

(7) What is the type of modulation used for the sound system of a TV ?

(8) What is the number of lines per frame in the American television system ?

(9) Define conversion transconductance.

(10) Define image frequency.

(11) Define sensitivity of a receiver.

(12) How is the S/N ratio of a data channel calculated ?

(13) What is transmission efficiency ?

(14) What is the binary coded decimal of the decimal number 25 ?

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