1804E092

Candidate's Seat No :_____

B.Sc. Sem.-6 Examination
309 - Electronics
Electronics Communication
April 2022

Time : 2-00 Hours] **[Max. Marks : 50**

Instructions : (1) Attempt any three questions in section-I Carry equal marks..
(2) Symbols carry their usual meaning.

SECTION-I

Answer any three questions :

1 (a) Give a brief history of fiber optics. 07

(b) Discuss, giving reasons, why optical fibers are preferred over copper wires for communication. 07

2 (a) State and explain the Snell's law. Derive the critical angle of incidence using Snell's law. Calculate the critical angle of incidence between two substances with different refractive indices where n_1=1.5 and n_2=1.46. Also draw appropriate diagram showing total internal reflection in a fiber. 07

(b) Discuss the light wave spectrum with proper diagrams. 07

3 (a) Explain the basic principles of radio communication. 07

(b) Draw and explain the block diagram of a TRF receiver. What are the disadvantages of a TRF receiver? 07

4 (a) Draw the block diagram of a superheterodyne receiver and explain it in detail. 07

(b) Write a note on adjacent channel selectivity. 07

5 (a) Draw the basic monochrome television system and explain it. 07

(b) Explain beam scanning. 07

6 (a) Draw the block diagram of a monochrome television receiver and explain the function and operation of all the block in brief. 07

(b) With the aid of the circuit diagram of a simple matrix, show how the I, Q and Y signals are generated in a colour TV transmitter. 07

7 (a) Write a note on the history of computer systems. 07

(b) Describe any two characteristics of data transmission circuits. 07

8 (a) Write a note on parity check codes. 07

(b) Explain the three-level matrix sum forward error-correcting code. 07

SECTION II (Compulsory)

9 Answer any eight questions : 08

(a) What is dispersion?

(b) What is energy of a photon?

(c) What is luminescence?

(d) R.I. of a material depends on the velocity of light in the specific medium. Is this statement true or false?

(e) What is a the band of frequencies amplified by the IF amplifier in a AM receiver?

(f) Define transconductance g_c.

(g) What is AGC?

(h) Which is the most common device used for AM demodulation?

(i) Which signal is sent by the TV transmitter to ensure correct scanning in the receiver?

(j) What is the number of frames per second in the United States TV system?

(k) What is the aspect ratio in television?

(l) What is the full form of ASCII?

(m) What is the BCD form of "89"?

(n) How many different code combinations are possible in the Badout code?

(o) What is the formula for the capacity of a channel as given by the Shannon-Hartley theorem?

(p) What is shadow mask?