17316

15162

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : *(1)* ***All*** *questions are* ***compulsory****.*
(2) Illustrate your answers with neat sketches ***wherever*** *necessary.*
(3) Figures to the ***right*** *indicate* ***full*** *marks.*
(4) Assume suitable data, if ***necessary****.*
(5) Use of Non-programmable Electronic Pocket Calculator is ***permissible****.*

Marks

1. A) Attempt **any six**. **12**

i) Define frequency and wavelength of a sound wave.
ii) State the need for graphic equalyzer in an audio amplifier.
iii) Define frequency in modulation.
iv) State the types of sound audio recording mechanisms.
v) State the principle of Audio optical recording.
vi) State the application of Tie-Chip microphone (any two).
vii) What is the difference between parametric and graphic equalizer (any two) ?
viii) State applications of Hi-Fi Audio amplifiers (any two).

B) Attempt **any two**. **8**

i) Draw a neat labeled time domain and frequency domain representation of AM wave.
ii) Compare FM and AM (Four points).
iii) Describe the variable density optical recording of sound with diagram.

2. Attempt **any four.** **16**

i) Explain the working principle and construction of horn type Loudspeaker.
ii) Explain Dolby – A system for noise reduction with suitable diagram.
iii) Draw block diagram and explain the working of public address system.
iv) Explain the principle of reproduction of sound from a recorded film.
v) Draw the block diagram of a low level AM transmitter and explain its operation.
vi) Draw the block diagram of Armstrong frequency modulator and explain its operation.

3. Attempt **any four**. **16**

i) Define modulation index of an AM wave and give the mathematical representation of AM wave.

ii) A modulating signal $10 \sin \left(2\pi \times 10^3 t\right)$ is used to modulate a carrier signal $20 \sin \left(2\pi \times 10^4 t\right)$. Find the modulation index, frequency of the sideband components and their amplitudes. What is the bandwidth of the modulated signal ?

P.T.O.

Marks

iii) Explain the generation of FM wave using varactor diode.

iv) A 10 kW carrier wave is amplitude modulated at 80% dept of modulation by a sinusoidal modulating signal. Calculate sideband power, total power and transmission efficiency of the AM wave.

v) Draw the block diagram of detection circuit in a compact desk player and explain its operation.

vi) Define phase modulation. Write the expression of modulation index of a PM wave.

4. Attempt **any four**. **16**

i) State the mathematical representation of a FM wave. Define modulation index and frequency deviation in FM wave.

ii) What is DSBSC ? Draw its time domain and frequency domain representation.

iii) State the need and application of Public Address system.

iv) Explain the construction and working principle of ribbon type microphone.

v) Draw circuit diagram and explain the working principle of complementry symmetry push-pull amplifier.

vi) Explain the concept of optical recording on compact disc with block diagram.

5. Attempt **any four**. **16**

i) Describe the generation of FM using reactance modulator.

ii) Explain the method for generation of DSBSC AM signal using diode balanced modulator.

iii) Explain the construction and working principle of moving coil microphone.

iv) State the causes affecting fidelity and give the remedies for them.

v) State and explain the selection criterion of microphones.

vi) Explain third method for generation of 8SBAM with suitable diagram.

6. Attempt **any four**. **16**

i) Explain the concept of multiway speaker with suitable diagram.

ii) Draw the circuit of microphone gain control, volume control and tone control (Bass and Treble) in a typical audio amplifier.

iii) Explain the planning and installation steps of a typical public address system.

iv) Draw and explain the block diagram of a Hi Fi system.

v) Explain classification of Audio amplifier on the basis of their efficiency and output waveforms.

vi) Draw the block diagram of FM transmitter and explain its operation.