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11819

3 Hours / 100 Marks

Seat No.

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- 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.*

Marks

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

12

- a) Define amplitude and wavelength with respect to sound signal.
- b) Draw neat labelled circuit diagram of gain control in audio amplifier.
- c) Define frequency modulation and draw neat waveform of FM signal.
- d) List the different optical recording methods for sound recording.
- e) Define pre-emphasis and de-emphasis techniques.
- f) List application of tie clip microphone.
- g) State function of tone control circuit in audio amplifier.
- h) List any four characteristics of a Hi-Fi amplifier.

B) Attempt **any two** :

8

- a) Define modulation. Explain need for modulation.
- b) Calculate the bandwidth requirement for an Fm signal having a modulating freq. of 3.1 kHz and maximum deviation of 21.7 kHz.
- c) Explain variable area sound recording method with diagram.

2. Attempt **any four** :

16

- a) Explain working principle of moving coil type loudspeaker.
- b) Give any 4 advantages and 4 disadvantages of compact disc.
- c) Explain working of a P.A. system with neat block diagram.
- d) Explain Dolby-A noise reduction technique with neat diagrams.
- e) Explain generation of DSBSC AM signal using diode balanced modulator.
- f) Define phase modulation and modulation index in phase modulation.

P.T.O.



3. Attempt **any four** : 16
- Define modulation index of an AM wave and derive equation of modulation index for AM wave.
 - Draw the time domain and frequency domain spectrum of AM signal.
 - Draw block diagram of FM transmitter and explain its operation.
 - A 10 kW carrier wave is amplitude modulated at 60% depth of modulation by sinusoidal modulating signal. Calculate total power in the modulated wave.
 - Explain preparation technique (sequence) of compact disc with diagram (waveforms).
 - Give advantages of FM over AM.
4. Attempt **any four** : 16
- Explain generation of FM using Armstrong method.
 - List different modulation techniques (methods).
 - State need and application of PA system.
 - Explain construction and working principle of moving coil microphone.
 - Explain working of complimentary symmetry push pull amplifier with neat circuit diagram.
 - Explain optical pickup process of sound signal with block diagram.
5. Attempt **any four** : 16
- Explain FM generation using varactor diode modulator.
 - Define V.S.B. and draw V.S.B. spectrum.
 - Give construction and working of horn type loudspeaker.
 - Compare monophony and stereophony systems.
 - Explain selection criterion of a good microphone as per application.
 - Explain third method of generation of SSBAM with diagrams.
6. Attempt **any four** : 16
- Explain working of 3-way cross over network with ckt diagram.
 - Draw the circuit of tone control and volume control for an audio amplifier.
 - Explain the planning and installation steps of a typical public address system for an auditorium.
 - Draw and explain the block diagram of Hi-Fi system.
 - State characteristics of a good audio amplifier.
 - Give mathematical equation of FM wave, FM modulation index and draw frequency spectrum of Fm.
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