

17316

21819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.

Marks

1. (A) Attempt any SIX :

12

- (a) Define pitch & overtone.
- (b) State function of balance control and loudness control in Hi-Fi audio system.
- (c) Define Modulation index in FM.
- (d) State the principle of optical recording.
- (e) State the principle of magnetic recording.
- (f) List any four characteristics of ribbon microphone.
- (g) List the different controls of Audio ampr.
- (h) Draw the circuit diagram of single stage transistor power amplifier.

(B) Attempt any TWO :

8

- (a) Prove that
- (i) $P_t = 1.5 P_c$ in AM for 100% of modulation.
- (ii) For DSBFC, prove that $P_t = \frac{P_c M_a^2}{2}$.
- (b) Compare AM & FM (four points).
- (c) State the reasons due to which noise is reduced in Dolby system as compared to other audio system.

2. Attempt any FOUR :

16

- (a) Draw and explain the construction of Horn type loudspeaker.
- (b) Draw & describe optical recording of sound on film is done by variable density method.
- (c) State the need of line transformer in PA system.
- (d) List the advantages and disadvantages of compact disc.
- (e) Explain AM generation using collector modulator with neat diagram.
- (f) Draw only the block diagram of indirect method of generation of frequency modulation.

3. Attempt any FOUR :

16

- (a) A modulating signal $20 \sin (2\pi \times 10^3 t)$ is used to modulate a carrier signal $50 \sin (2\pi \times 10^4 t)$ find modulation index, % of modulation side band frequency and its amplitude, Bandwidth of AM wave & draw the frequency spectrum.
- (b) Draw the block diagram of communication system & explain its working.

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- (c) With neat circuit diagram, explain generation of FM signal by reactance modulator.
- (d) Describe frequency spectrum of AM with a neat sketch.
- (e) Draw the structure of CD & explain the principle of recording.
- (f) Derive expression of modulation index in FM.

4. Attempt any FOUR :

16

- (a) Draw FM wave in time domain and write output equation of FM wave.
- (b) Represent the AM wave in frequency & time domain.
- (c) Draw neat labelled block diagram of PA system. Mention which type of output stage is used.
- (d) Draw a neat sketch showing constructional details of condenser microphone & give its working principle.
- (e) Draw a neat block diagram of Hi-Fi stereo system and label its blocks.
- (f) Draw and explain stepwise, procedure for preparation of compact disc.

5. Attempt any FOUR :

16

- (a) (i) List four advantages of FM over AM.
(ii) Define phase modulation & modulation index.
- (b) Explain concept of Vestigial Side Band (VSB) in T.V..

P.T.O.

- (c) Draw and explain construction & working of moving coil μ phone (microphone).
- (d) State the factor which affect the fidelity of Hi-Fi system and list their remedies.
- (e) Explain the operation of cone type loudspeaker. How does it help to increase the efficiency ?
- (f) Draw block diagram of high level & low level AM transmitter.

6. Attempt any FOUR :

16

- (a) Draw and explain 3-way crossover network with its response.
 - (b) Explain the operation of graphic equalizer with neat labelled diagram.
 - (c) Explain how will you install PA system for Auditorium with neat sketch.
 - (d) Explain the concept of stereophony. Give the difference between monophony and stereophony.
 - (e) Draw and explain complementary symmetry push-pull amplifier.
 - (f) Draw and explain the generation of FM wave using varactor diode modulator.
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