

# 17316

**21314**

**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.
- (5) Assume suitable data, if necessary.
- (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
- (8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

**Marks**

1. a) Answer any **SIX** of the following: **12**
- i) Define Pitch and Timbre.
- ii) List any four controls of Audio Amplifier.
- iii) Define frequency modulation and draw FM wave.
- iv) State the principle of magnetic recording.
- v) Draw and label the structure of CD.
- vi) Give atleast one application of Tie clip microphone and shotguns type microphone.

P.T.O.

- vii) Define bass and Treble.
- viii) Give the application of Hi fi Amplifier.

b) Answer any **TWO** of the following: 08

- i) Derive the mathematical expression for Amplitude Modulated Wave.
- ii) Differentiate AM and FM on the bases of sideband, modulation Index, Noise and Transmitted power.
- iii) Give reasons why optical recording is better than magnetic recording system.

2. Answer any **FOUR** of the following: 16

- a) Explain the working principle of Electrodynamic loudspeaker with its schematic diagram.
- b) Explain variable density method of optical recording of sound.
- c) Draw block diagram of PA system and give its functioning.
- d) Explain how optical recording has done on compact disc.
- e) Draw block diagram of AM transmitter and state function of each block.
- f) Explain generation of FM using varactor diode modulator.

3. Answer any **FOUR** of the following: 16

- a) Derive the mathematical expression for power in AM.
- b) Draw time domain and frequency domain spectrum of FM.
- c) Draw block diagram of FM trans-mitter and give its operation of working.
- d) A 800 watt carrier is amplitude modulated to the depth of 70%. Calculate the total power in the modulated wave and power in side bands.
- e) Explain the use of preemphasis and de-emphasis technique as noise reduction technique.
- f) Draw and explain block diagram of communication system.

**4. Answer any FOUR of the following:****16**

- a) Give working principle of reactance modulator with the help of circuit diagram.
- b) List different types of analog modulation technique and specify why modulation is needed.
- c) Define any four specifications of PA system.
- d) Draw 3-way cross over network and give its working.
- e) Draw the block diagram of Hi Fi amplifier and give function of each block.
- f) Explain how compact disk is prepared with relevant schematic diagrams.

**5. Answer any FOUR of the following:****16**

- a) Differentiate between direct and indirect methods of FM generation.
- b) What is VSB ? Give its application. Draw the VSB in spectrum AM.
- c) Explain construction and working principle of ribbon microphone.
- d) Compare complementary symmetry push-pull amplifier with symmetry push-pull amplifier.
- e) What is reverberation ? Explain the necessity of reverberation.
- f) Explain the generation of DSBSC AM signal using balanced modulator with circuit diagram.

**6. Answer any FOUR of the following:****16**

- a) Give reason why multiway speaker system is needed for good sound quality.
  - b) Draw circuit diagram of tone control and explain how bass and Treble controlled in sound system.
  - c) Give the PA system layout and planning for an auditorium.
  - d) What is stereophony ? Give the difference between monophony and stereophony system with the help of block diagram.
  - e) Compare power amplifier and voltage amplifier.
  - f) What is the bandwidth required for FM signal in which modulating frequency is 3KHz and the maximum deviation is 15KHz ?  
(no. of sidebands 8)
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