



11819

17439

**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) Mobile Phone, Pager and any other Electronic Communication devices are **not permissible** in Examination Hall.

**Marks**

1. A) Attempt **any six** of the following :

**(6×2=12)**

- a) Define :
  - a) Base band signal
  - b) Digital signal.
- b) Explain need of modulation.
- c) Draw radiation pattern for the following resonant dipole of following length :
  - 1)  $l = \lambda/2$
  - 2)  $l = 3\lambda/2$ .
- d) Compare resonant and nonresonant antenna (any two points).
- e) State the principle of superheterodyne Radio receiver.
- f) State Grassman's law.
- g) Draw neat sketch of PIL TV camera tube.
- h) List any two application of MATV.

B) Attempt **any two** of the following :

**(4×2=8)**

- a) Draw the block diagram of electronic communication system. Explain each block in detail.
- b) Explain the concept of vestigial side band techniques with waveforms.
- c) Define following characteristics of AM radio receiver :
  - 1) Sensitivity
  - 2) Selectivity
  - 3) Fidelity
  - 4) Noise figure.

**P.T.O.**



**Marks**  
**(4×4=16)**

2. Attempt **any four** of the following :

- a) Explain the concept of pre-emphasis and de-emphasis with typical circuit diagram.
- b) i) Calculate modulation index in FM if modulating frequency is 1 kHz and a frequency deviation is 2.25 kHz.  
ii) Draw circuit diagram of PAM using transistor.
- c) Draw the circuit diagram of FM reactance modulator. Explain it in detail.
- d) Compare PAM, PWM, PPM on the basis of following points.
  - i) Definition
  - ii) Waveforms
  - iii) Advantages
  - iv) Disadvantages.
- e) Explain the various types of wave propagation.
- f) Define :
  - a) Skip distance
  - b) Critical frequency
  - c) Fading
  - d) MUF.

3. Attempt **any four** of the following :

**(4×4=16)**

- a) Compare amplitude modulation and frequency modulation (any four points).
- b) Describe the sky wave propagation with diagram.
- c) Define :
  - a) Bandwidth
  - b) Beamwidth
  - c) Directivity
  - d) Power gain.
- d) Write one application of following antenna.
  - a) Yagi-uda antenna.
  - b) Microwave-dish antenna.
  - c) Horn antenna.
  - d) Loop antenna.
- e) Compare half wave dipole and folded dipole antenna with respect to construction, input impedance, radiation pattern and application.
- f) Sketch yagi-uda antenna. Describe the function of each component.



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**Marks**  
**(4×4=16)**

4. Attempt **any four** of the following :

- a) Draw the waveform for modulating signal, carrier and corresponding AM signal.
- b) Draw and explain circuit diagram of PLL FM demodulation.
- c) Explain need of AGC. Draw the circuit diagram for delayed AGC.
- d) Draw and explain block diagram of Tuned Radio RX.
- e) Draw block diagram of FM superheterodyne receiver and state IF for FM.
- f) Define :
  - a) Aspect ratio
  - b) Horizontal and vertical resolution.

5. Attempt **any four** of the following :

**(4×4=16)**

- a) Draw and explain circuit diagram of practical diode detector.
- b) Derive power relation in AM wave.
- c) Explain :
  - a) Additive colour mixing
  - b) Subtractive colour mixing.
- d) List CCIRB Standards for colour signal transmission (any eight).
- e) Draw, label and explain various levels in composite video signal.

6. Attempt **any four** of the following :

**(4×4=16)**

- a) Describe equalizing pulses and post equalising pulses.
  - b) Explain with sketch photo emission techniques to generate video signal.
  - c) Draw block diagram of PAL -D decoder. State function of H and V demodulator.
  - d) Draw block diagram of MATV system and explain its operation in detail.
  - e) Draw constructional details and explain working principle of plumbicon camera tube.
  - f) Define-Hue, saturation, luminance, compatibility.
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