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

Marks

1. a) Attempt any SIX of the following:

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- (i) Write down different frequencies for following (frequency ranges)
- (1) Voice frequency
- (2) High frequency
- (3) IR frequency
- (4) Visible frequency (light)
- (ii) Define modulation index in FM. What is maximum value of deviation ratio.
- (iii) Define pulse modulation. State its types.
- (iv) What are the different types of FM detector?
- (v) Write any two drawbacks of TRF radio receiver.
- (vi) Draw general equivalent circuit of transmission line.
- (vii) Write two reasons of fading.
- (viii) What is electro magnetic polarization?

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b) **Attempt any TWO of the following:****8**

- (i) Draw block diagram of basic electronic communication system and state the function of each block.
- (ii) Draw Yagi uda antenna with its radiation pattern.
- (iii) For a transmission line, the incident voltage $E_i = 6V$, and $E_r = 3V$. Calculate:
 - (1) Reflection coefficient
 - (2) Standing wave ratio

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

- a) Draw the block diagram of AM superhetrodyene radio receiver and state the function of each block.
- b) Draw the circuit diagram of PWM using IC555. State its operation.
- c) Draw the AM signal representation in:
 - (i) Time Domain
 - (ii) Frequency Domain
- d) Explain standing waves with load terminal open circuited and short circuited.
- e) Compare ground wave and space wave propagation on the basis of:
 - (i) Frequency range
 - (ii) Method of wave propagation.
- f) Explain half dipole antenna (Resonant antenna) with its radiation pattern.

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

- a) State and explain the types of noise in communication system.
- b) Differentiate between AM and FM on the basis of :
 - (i) Definition
 - (ii) Bandwidth
 - (iii) Modulation Index
 - (iv) Application
- c) Describe the term virtual height with the help of diagram showing ionized layer and the path of wave.
- d) Draw the circuit diagram of practical diode detector and explain its working.
- e) In a broad cast superheterodyne receiver having loaded Q of antenna coupling of 100, if intermediate frequency of 455 KHz, calculate image frequency and its rejection ratio at 1000 KHz.
- f) Explain power relations in AM wave.

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

- a) Define pre-emphasis. State its need. Draw the circuit of pre-emphasis.
- b) Compare the bandwidth that would be required to transmit baseband signal with a frequency range from 300 Hz to 3 KHz using.
 - (i) Narrow band FM with maximum deviation of 5 KHz.
 - (ii) Wide band FM with maximum deviation of 75 KHz.
- c) Draw the structure and radiation pattern of parabolic dish antenna.
- d) For a transmission line, if R is the reflection co-efficient what will be its value.
 - (i) If there is no reflected voltage?
 - (ii) If reflected and incident voltages are same?
 - (iii) If reflected voltage = 10V and incident voltage = 20V?
 - (iv) If reflected voltage = 2V and incident voltage = 2V?

- e) Draw block diagram of tuned radio receiver with waveforms.
- f) Explain:
 - (i) Critical frequency
 - (ii) Skip distance

5. Attempt any FOUR of the following: 16

- a) Describe the FM generation using IC 566.
- b) State the need of AGC. Explain its types.
- c) Describe with sketch working principle of dish antenna.
- d) State the different losses in transmission line.
- e) Describe the application of transmission line as stub. Write the situation where single stub or double stub is used.
- f) What is frequency changing and tracking?

6. Attempt any TWO of the following: 16

- a) What are different microwave antenna? Explain horn antenna with neat sketch. Explain loop antenna.
 - b) Derive the equation for characteristic impedance of transmission line at low frequency and high frequency. State four characteristics of transmission line.
 - c) Explain Duct propagation. Explain ionosphere layer and the ionospheric propagation.
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