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18EI61

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Define amplitude modulation with necessary equations. Explain generation and detection of AM waves. **(10 Marks)**
   b. With a neat diagram, explain balanced modulation used for generation of Double Side Band Suppressed Carrier (DSBSC) wave. **(05 Marks)**
   c. With a neat diagram, explain working of Costas receiver used for DSBASC. **(05 Marks)**

OR

2 a. Write a note on VSB modulation. **(10 Marks)**
   b. With a neat diagram explain phase discrimination method for generation of SSB modulated waves. **(07 Marks)**
   c. Compare analog modulation systems with digital systems. **(03 Marks)**

Module-2

3 a. Derive an expression for Wide Band FM and its Fourier spectrum. **(10 Marks)**
   b. Starting from single tone FM obtain an expression for narrow band FM. **(10 Marks)**

OR

4 a. Specify the relationship between phase modulation and frequency modulation with neat diagram and equations. **(10 Marks)**
   b. With a block diagram and necessary equations explain how PLL can be used for FM detection. **(10 Marks)**

Module-3

5 a. With a neat diagram, explain the transmitter and Receiver of Pulse Code Modulation (PCM) scheme. **(10 Marks)**
   b. With neat diagram, explain quantization and its types. **(10 Marks)**

OR

6 a. Define Pulse Amplitude Modulation on (PAM) with necessary equations. Explain sample and hold filter analysis as applied to PAM. **(06 Marks)**
   b. With a neat diagram, explain Delta Modulation (DM). **(07 Marks)**
   c. State and prove sampling theorem. Draw the diagram G(f) and sampling signal. Derive the interpolation formula for the contraction of the original signal. **(07 Marks)**

Module-4

7 a. With neat diagram explain Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK) and Phase Shift Keying (PSK) generation and detection. **(10 Marks)**
   b. Explain generation and detection of Quadrature phase shift keying with the help of neat diagrams and waveforms. **(10 Marks)**

OR

8 a. With a neat diagram, explain Differential Phase Shift Keying (DPSK) transmitter and receiver. **(10 Marks)**

b. Write a note on Minimum Shift Keying. **(10 Marks)**

Module-5

9 a. Draw the diagram of Bluetooth IEEE 802.15.1 protocol stack and brief out the function of each layer and its elements. **(10 Marks)**

b. With a neat diagram, explain WPAN network architecture. **(07 Marks)**

c. Write a note on WPAN components. **(03 Marks)**

OR

10 a. Explain the various applications of WPAN in detail. **(04 Marks)**

b. A Bluetooth Pi conet master has three slaves S_1, S_2 and S_3 having the packet types DM_1, DM_3 and DM_5 respectively. All the slaves want to send the data to the master at different intervals of time. Draw the timing diagram for M-S communication. **(06 Marks)**

c. Explain the Zigbee stack with neat diagram. **(10 Marks)**

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