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18EC53

Fifth Semester B.E. Degree Examination, July/August 2022
Principles of Communication Systems

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Illustrate the item domain and frequency domain characteristics of standard amplitude modulation produced by a single tone. **(10 Marks)**
   b. Explain switching modulator with circuit diagram and characteristic curve. **(10 Marks)**

OR

2 a. Explain the generation of DSBSC wave using a Ring modulator. **(07 Marks)**
   b. Explain the scheme of generation and demodulation of VSB modulated wave with relevant spectrum of signals and mathematical expressions. **(07 Marks)**
   c. Explain with block diagram of FDM system. **(06 Marks)**

Module-2

3 a. Explain with block diagram generation of FM wave using PM and PM wave using FM. **(07 Marks)**
   b. Explain the indirect method of generation FM wave with relevant equation and diagram. **(07 Marks)**
   c. Explain FM stereo multiplexing. **(06 Marks)**

OR

4 a. Derive the expression for Linear model of PLL. **(08 Marks)**
   b. Explain with diagram for superheterodyne receiver. **(08 Marks)**
   c. Determine the bandwidth of an FM signal. If the maximum value of the frequency deviation Δf is fixed at 75KHz for commercial FM broadcasting by radio and modulation frequency is W = 15KHz. Bycarson's rule. **(04 Marks)**

Module-3

5 a. Derive the expression for figure of merit for DSB-SC receiver. **(07 Marks)**
   b. Write short notes on :
      i) Shot noise
      ii) Thermal noise
      iii) Whit noise. **(06 Marks)**
   c. Find figure of merit for single tone AM. **(07 Marks)**

OR

6 a. With FM receiver model, derive the expression for figure of merit. **(07 Marks)**
   b. Briefly explain the following as applicable to FM
      i) Pre–emphasis
      ii) De-emphasis. **(06 Marks)**
   c. Explain about FM threshold effect and its reduction method. **(07 Marks)**

Module-4

7 a. What are the advantages of digital signal over analog signal? (06 Marks)
 b. State sampling theorem and explain same with neat sketches and equation. (07 Marks)
 c. Explain with block diagram for TDM. (07 Marks)

OR

8 a. Explain with diagram the generation of PPM waves. (07 Marks)
 b. Explain the detection of PPM waves. (07 Marks)
 c. Explain the following terms :
   i) Under sampling
   ii) Over sampling
   iii) Nyquist rate. (06 Marks)

Module-5

9 a. Explain the midtread and midrise related to quantization noise. (06 Marks)
 b. Explain with diagram for pulse-code modulation. (07 Marks)
 c. Explain Delta modulation with transmitter and receiver systems. (07 Marks)

OR

10 a. Explain the unipolar NRZ, polar NRZ and Bipolar RZ with an example. (06 Marks)
 b. Write a note on MPEG + Video. (07 Marks)
 c. Explain Linear prediction coding VOCODER. (07 Marks)

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