

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech Summer 2022 - 23 Examination

Semester: 4th
Subject Code: 203107251
Subject Name: Analog Communication

Date: 20/03/2023
Time: 2:00 pm to 4:30 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions**(15)**

1. What is balance modulator?
2. What is multiplexing?
3. Define modulation index
4. What is difference between SSB and DSB Wave
5. What is carson's rule?
6. Write the expression for thermal noise generated in resistor
7. Four channels, each with a 150-kHz bandwidth are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10 kHz between the channels to prevent interference?
 (a)600 khz (b)640 khz (c)630 khz (d)500 khz
8. Which of the following is not included in the process of reception?
 (a) Encoding (b)storage (c) decoding (d) channel
9. Select types AM modulation based on power requirement (lower to higher).
 (a) DSBSC-SSB-VSB (b) SSB-DSBSC-VSB
 (c) VSB-DSBSC-SSB (d) SSB-VSB-DSBSC
10. Convert Physical quantity to electrical signal is _____
11. The bandwidth of SSB is _____
12. For wideband FM, modulation index value is _____
 (a) Exceed to unity (b)unity (c) less than unity (d) infinite
13. What is image frequency?
14. Define signal to noise ratio?
15. Pre-emphasis and de-emphasis networks are essential in _____ modulation system.

Q.2 Answer the following questions. (Attempt any three)**(15)**

- A) Give the classification of Noise
- B) Give the comparison of Amplitude and frequency modulation
- C) Draw and explain Phase shift method for SSB generation
- D) Explain the concept of phase locked loop with block diagram

Q.3 A) Explain the importance of modulation in communication with suitable example**(07)**

- B) Draw block diagram of super heterodyne receiver and explain function of each block

(08)**OR**

- B) Define noise factor. Derive the friss formula for noise factor when amplifiers are in cascaded connection

(08)**Q.4 A) Discuss the basic principal of FM detection and explain the frequency discriminator****(07)****OR**

- A) Find the carrier and modulating frequencies, the modulation index and the maximum deviation of FM wave represent by the voltage equation $V = 12 \sin(6 \times 10^8 t + 5 \sin 1250 t)$

(07)

- B) Define Multiplexing. List types of multiplexing. Explain FDM with necessary diagram

(08)