R18 Regulation *Subject code:2P4DC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech IV Semester Regular/Supplementary Examinations, July 2021

ANALOG COMMUNICATIONS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Maximum Marks: 70 Date:31.07.2021 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Illustrate the need for modulation?

2 Distinguish between Time division multiplexing and Frequency division multiplexing?

3 List the applications of different AM systems?

4 Write the expression for SSB wave and draw its spectrum?

5 Explain Zero crossing detector?

6 Explain the need of Phase Locked Loop?

7 Explain the importance of Pre-emphasis and De-emphasis?

8 Explain White noise with neat sketches?

9 Differentiate between PWM and PPM signals?

10 Explain the choice of Intermediate frequency in Super heterodyne receiver?

Part-B

Answer All the following questions. (10MX 5=50Marks)

11 A. Explain the Communication system block diagram and its features? (4M)

B. An audio frequency signal 10 sin $2\pi x500t$ is used to amplitude modulate a carrier of 50 sin $2\pi x10^5 t$. Calculate: (6M)

i. Modulation Index
ii. Side band frequencies
iii. Amplitude of each sideband frequency
iv. Bandwidth required.
v. Total power delivered to the load of 400Ω.

OR

12 Explain the concept of Single tone Amplitude Modulation and identify Power, Bandwidth and Spectrum with neat sketches? (10M)

13 A. Derive the expression for SSBSC modulated wave with upper sideband transmitted with neat sketches? (6M)

B. Explain the detection of VSB using Envelop detection? (4M)

OR

14 A. Explain the generation of AM VSB signal. (4M)

B. A 600W carrier is Amplitude modulated to a depth of 100% (6M)

i. Calculate the total power for SSB.

ii. If 30% of one sideband along with other sideband is transmitted, then calculate the power saving achieved by SSB compared to AM and DSBSC.

iii. If depth of modulation is changed to 60%, then calculate the power required to transmit SSB signal.

15 A. Illustrate the spectrum analysis of Frequency Modulated with neat sketches and prove that the bandwidth of FM signal depends on message signal frequency and frequency deviation? (6M)

B. Explain the method to generate FM signal with the help of neat block diagram? (4M)

OR

16 Explain the operation of Balanced Frequency discriminator with phasor diagrams to demodulate FM signal? (10M)

17 Derive the expression to find signal to noise ratio for coherent detection of SSB-SC? (10M)

OR

18 Explain the noise performance of amplitude modulated receiver with envelope detector and prove its figure of merit? (10M)

19 A. Explain in detail the operation of Super heterodyne receiver with neat sketches? (5M)

B. Classify different types of Transmitters and explain in detail about the AM transmitter? (5M)

OR

20 Explain the generation and detection of Pulse width Modulator with the help of diagrams? (10M)