Registration No : | | | | | | | | | | |

Total Number of Pages : 02

Course: B.Tech
Sub_Code: REC5C002

6th Semester Regular/Back Examination: 2023
SUBJECT: ANALOG & DIGITAL COMMUNICATION
BRANCH(S): CST, CSE, CSIT, IT
Time : 3 Hour
Max Marks : 100
Q.Code : M127

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions :** **(2 x 10)**

a) Why high frequency carrier signal is required in analog modulation?
b) What are the advantages in digital communication?
c) Derive the efficiency for FM.
d) What is digital modulation trade-off concept?
e) Find out the Nyquist rate of $x(t) = 10\cos(120\pi t) + 8\sin(100\pi t)$.
f) Write the importance of Delta modulation.
g) What is the basic difference between PAM & PWM?
h) Draw the constellation diagram of BPSK.
i) What is the specialty of QAM technique?
j) Why equalization technique is required in digital communication?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 × 8)**

a) How VSB modulation is useful in analog communication systems? Also, write down its merits and demerits.
b) Explain Armstrong method for FM generation.
c) Draw pre-emphasis & de-emphasis filter circuit diagram & justify its application for FM.
d) Discuss the generation methods for SSB-SC & write the merits of SSB-SC.

e) What is ISI? What is the cause of its occurrence?

f) Discuss the basic concept of pass band digital transmission systems.

g) Explain QAM technique with its constellation diagram.

h) Define mean & variance and establish a relation between them.

i) Define SNR? Derive the SNR for Delta modulation with suitable assumptions.

j) What are noise sources in analog communication system, explain briefly. Define white noise and draw its power spectrum.

k) Explain the generation & demodulation process for PAM. Write its advantages & disadvantages.

l) Discuss equalization principle & its application.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 a) Discuss various modulation schemes in analog communication systems. **(6)**

b) Derive SNR in FM & discuss the threshold effects in it. **(10)**

Q4 Discuss the coherent FSK system with the necessary transmitter and receiver blocks. Derive the probability error for the proposed system with suitable assumptions. **(16)**

Q5 a) A PCM system uses uniform quantizer with 8 bit encoder. The bit rate of the system is 40 Mbps. Determine **(6)**

i) Message bandwidth

ii) Output SNR (where the modulating signal frequency is 1.4 MHz)

b) Explain TDM concept with required time wave analysis. **(10)**

Q6 a) Explain the transmitter & receiver section for QPSK technique. **(8)**

b) Explain Maximum likelihood sequence detection principle. **(8)**