

June 12, 2024 02:30 pm - 05:30 pm 1T01233 - S.E.(Information Technology Engineering)(SEM-III)
(Choice Base Credit Grading System) (R- 19) (C Scheme) / 51424 - Principle of Communication
QP CODE: 10056409

Time: 3 Hours

Marks: 80

N.B. (1). Question No.1 is compulsory.

(2). Out of remaining attempt any three.

(3). Assume & mention suitable data wherever required.

(4). Figures to right indicates full marks.

Q.1. Solve any four

[20]

a). The signal power & noise power measured at the input of an amplifier are $150 \mu\text{w}$ & $1.5 \mu\text{w}$ respectively. If the signal power at the o/p is 1.5w and noise power is 40mw , calculate amplifier noise factor & noise figure.

b). Calculate the percentage power saving for DSB-SC signal for percentage modulation

of a) 100 % b) 50 %

c). Compare PAM, PWM & PPM

d). State advantages of digital transmission.

e). Explain in brief different types of communication channels.

f). Explain the principle of reflection and refraction.

Q.2 a) Explain FDM with neat block diagram

[10]

b). State and prove the following properties of Fourier transform with example

i) Convolution in time domain ii) Time scaling

[10]

Q.3. a) In an AM radio receiver, loaded Q of an antenna circuit at the input to the mixer

Is 100. if the intermediate frequency is 455 KHz. calculate the image frequency &

Its rejection at 1 MHz

[10]

b). With the help of neat circuit diagram explain varactor diode method of FM Generation

[10]

Q.4 a). With reference to sky wave propagation explain

- (i) virtual height
- (ii) critical Frequency
- (iii) maximum usable frequency (MUF)
- (iv) skip distance
- (v) Skip Zone

[10]

b). Derive the mathematical expression for FM with neat sketch.

[10]

Q.5 a) define/Explain the following

- (1) Aliasing or fold over error
- (2) Slope overload error
- (3) quantization process
- (4) TDM
- (5) Inter symbol interference (ISI)

[10]

b). Draw the block diagram of BSK generation & detection explain the working giving waveforms

[10]

Q6. a). Consider that bit sequence given below is to be transmitted Bit sequence =10110011.

Draw the resulting waveform if the sequence is transmitted using

- 1. Unipolar RZ
- 2. Polar RZ
- 3. AMI
- 4. Split phase Manchester
- 5. M-ary where M=4 (Polar quaternary)

[10]

b). Write short note on following (any two)

- 1. Need of modulation
- 2. Role of balance modulator
- 3. Delta modulation
- 4. Friss Formula of noise.
