Sr. No. of Question Paper : 1816   C   Roll No.............

Unique Paper Code   : 251602

Name of the Course   : B.Sc. (H) Electronics

Name of the Paper   : Digital Communication : ELHT-602

Semester   : VI

Duration   : 3 Hours   Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt five questions in all.
3. Q. No. 1 is compulsory.
4. Non-programmable calculator are allowed.

1. (a) A bandpass signal has a spectral range that extends from 30 to 82 KHz. Find accepted range of sampling frequency f_s.

   (b) Define slope overload and granular noise.

   (c) What are the advantages of PCM over PAM ?

   (d) What is the relationship between information capacity and bandwidth ?

   (e) Compare nonsynchronous and synchronous satellites.   (5×3)

2. (a) What is flat top sampling ? How is it achieved ? What is the advantage of using such sampled signals ?   (6)

   (b) What is TDM ? What are its advantages in pulse communication systems ?   (5)

   (c) What is an aperture effect ? How can it be minimized ?   (4)

3. (a) Explain the generation of PCM using a block diagram.   (6)

(b) What are the two sources of noise in PCM systems ? Can the contribution of these two noises be eliminated completely ? Justify.   (5)

(c) What is delta Modulation ? What are its disadvantages ?   (4)

4. (a) Draw the block diagram of BPSK system and explain its working. What is the significance of QPSK ?   (6)

(b) Draw the block diagram of digital transmission system.   (5)

(c) Determine the (i) peak frequency deviation, (ii) minimum Bandwidth and (iii) Baud for Binary FSK signal with a mark frequency of 51 KHz, space frequency of 49 KHz and input bit rate of 2 kbps.   (4)

5. (a) Derive an expression for signal to quantization noise ratio for a PCM system which employs uniform quantization technique. Given that input to the PCM system is a sinusoidal signal.   (6)

(b) In a binary PCM system. the output signal-to- quantizing noise ratio is to be held to a minimum value of 40 dB. Determine the number of required levels, and find the corresponding output signal to quantizing noise ratio.   (5)

(c) Explain the significance of M-ary coding in digital communication.   (4)

6. (a) Draw the block diagram of an optical communication system. What are its advantages ?   (6)

(b) Explain the coherent detection of binary ASK signals.   (5)

(c) Sketch the waveforms for encoding binary data 11001101 in :

   (i) On-off signalling

   (ii) Return to zero signalling

   (iii) Bipolar signalling or AMI

   (iv) Manchester coding   (4)

7. Write short notes on :

   (i) T1 carrier system

   (ii) Satellite Communication system

   (iii) FDMA   (5×3)