Total No. of Questions : 8]

SEAT No. : ____

PF-12560

[Total No. of Pages : 2

[6625]-173
S.E. (Electronics and Communication-Advanced Communication Technology)
DIGITAL COMMUNICATION
(2019 Pattern) (Semester - IV) (204204)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, and Q7 or Q8.***
2) ***Neat diagrams must be draw whenever necessary.***
3) ***Figures to the right side indicat full marks.***
4) ***Use of Calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Explain frequency spectrum and signal space diagram for M-ary FSK. **[6]**

b) Explain OFDM with its benefits. **[6]**

c) Compare M-ary PSK and M-ary QAM. **[6]**

OR

Q2) a) Compare BPSK, FSK, M-ary PSK, M-ary FSK w.r.t Bandwidth, Euclidian distance and probability of error. **[6]**

b) What is inter symbol interference and explain its effects. **[6]**

c) Explain M-ary QAM transmitter with suitable block diagram. **[6]**

Q3) a) Describe the significance of PN sequence and state its properties. **[6]**

b) Compare DSSS and FHSS w.r.t Definition, chip rate, Modulation technique, processing gain and error probability. **[6]**

c) With neat block schematic and waveforms explain DSSS generation and detection. **[6]**

OR

Q4) a) Represent variation of the frequency of a fast hop spread spectrum system with binary FSK, having following parameters. Number of bits per MFSK symbol K = 2, Number of MFSK tones $M = 2^K = 4$, length of PN segment per hop K = 3, total number of frequency hops $2^K = 8$ for the binary message of 01111110001001111010. **[6]**

b) Explain in brief with mathematical expressions Processing gain and Jamming margin. **[6]**

c) Compare Fast Hopping and Slow Hopping. **[6]**

P.T.O.

Q5) a) Derive the expression of probability error (P_e) for matched filter. **[9]**

b) State and Explain the three different types of decision rules. **[9]**

OR

Q6) a) Derive the expression of SNR for integrator and dump filter and explain is working**.** **[9]**

b) Explain Coherent detection of binary signal in presence of noise. **[9]**

Q7) a) With the help of neat schematic explain non coherent detection of BFSK **[8]**

b) Draw and explain power spectra of BPSK, BFSK and QPSK. Comment on Bandwidth requirement of each. **[8]**

OR

Q8) a) Draw and explain passband transmission model. **[8]**

b) Draw signal constellation diagram explain the generation and regeneration of M-ary QAM. **[8]**

◆ ◆ ◆

103.157.122.163 06/06/2026 09:46:17 in-pnq-static-163-122-157-103 CEGP019671