

Total No. of Questions : 8]

SEAT No. :

P2856

[4958]-1042

[Total No. of Pages : 3

T.E.(E&Tc)

DIGITAL COMMUNICATION

(2012Pattern) (End Semester)(Semester-I)

Time : 2 ½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) What are the limitations of Delta modulation? How are they overcome in Delta sigma modulation and Adaptive Delta modulation? Explain with necessary diagrams. [7]

b) What is Equalizer? Explain Adaptive equalizers. [7]

c) Write short note on

i) Thermal Noise or Johnson Noise

ii) White Gaussian Noise [6]

OR

Q2) a) Consider a sinusoidal signal $X(t) = A \cos(\omega_m t)$ applied to a delta modulator with a step size δ . Show that the slope overload distortion

will occur if $A > \frac{\delta}{\omega_m T_s}$ where T_s is the sampling period. [7]

b) Draw and explain CCIT hierarchy of multiplexing. [7]

c) Explain in detail about stationary, wide sense stationary and ergodic process with suitable mathematical expressions. [6]

Q3) a) Derive the expression for signal to noise ratio of integrates and dump receives [8]

P.T.O.

b) Write short note on.

i) Wireless standards

ii) Personal communication system. [9]

OR

Q8) a) Generate the PN sequence for transmitting message through FHSS system. The period of PN sequence is $2^4-1=15$. The initial content of shift register are assumed to be 1 1 0 0

Draw PN sequence generator with waveform. [9]

b) i) Compare DSSS with FHSS

ii) What is need of spread spectrum modulation technique. [9]

