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PGIIIS-803 B-19

M.Sc. III Semester (CBCS) Degree Examination

APPLIED ELECTRONICS

Modern Digital Communication

Paper : SCT 3.1

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

1. Answer the questions as per instructions
2. Write the question numbers clearly.
3. Draw figures wherever necessary.

PART - A

1. Answer any **eight** of the following : **(8×2=16)**
   a. Define the terms binit, bit and baud. Which of these are symbols?
   b. Give pictorial format for RZ and NRZ pulse.
   c. Represent uni - polar and polar line code for a binary stream 1001110101.
   d. Define DC Wander.
   e. Sketch a basic digital communication system.
   f. What is meant by probability of bit error in broadband transmission?
   g. Show a scheme for bit timing recovery.
   h. What is the purpose of carrier recovery circuit?
   i. Draw a binary modulated carrier for BASK, PRK and BFSK.
   j. What is orthogonal modulation?

PART - B

Answer any **four** of the following : **(4×7=28)**

2. Explain the differential encoding of a binary message 110101.
3. Discuss M-ary encoding with M = 8 levels.
4. Define aliasing effect. Discuss the importance of sampling frequency on natural PAM.

5. Draw and Explain the eye diagram for examining a digital signal.

6. With a neat diagram, explain delta modulation.

7. Describe the coherent binary PSK.

Part - C

Answer any **three** of the following : **(3×12=36)**

8. With a neat diagram, explain the pulse shaping to avoid ISI.

9. State the salient features of synchronization.

10. Describe the special cases of binary modulation in digital carrier systems.

11. Discuss the non - coherent binary modulation techniques.

12. Write short notes on any **two** of the following : **(2×6=12)**

    a. AMI line code

    b. Basic TDM/PCM system.

    c. The matched filter.

    d. Coherent quadrature modulation techniques.

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PGIIIS-801 B-19

M.Sc. III Semester (CBCS) Degree Examination

APPLIED ELECTRONICS

Networks and Systems

Paper : HCT 3.1

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

1. Answer the questions as per the instructions
2. Write the question number clearly.

PART - A

1. Answer any **Eight** of the following: **(8×2=16)**

a. Define network function for a passive network.

b. Define poles and zeros and show the location of simple and complex conjugate poles and zeros in the s - plane.

c. Draw the pole zero diagram of a network function $F(s) = 3S/[(S+2)(S^2+2S+2)]$.

d. What do you understand by state space and state vector?

e. Why $S^5+4S^4+3S^3+2S^2+S$ is not a positive real function?

f. Define transfer function of a system.

g. Write the Laplace inverse transform of a unit step function.

h. List the advantage of second order over first order system.

i. Define steady state error of a system.

j. Define signal flow graph.

PART - B

Answer any **Four** of the following: **(4×7=28)**

2. Explain the importance of location of poles and zeros in S plane.

3. List the properties of positive real of a network function.

4. A two terminal network consists of a coil having an inductance L and resistance R shunted by a capacitor C. The poles and zeros of the driving point function Z(s) of this network are: poles at $-[(1/2)+j(sqr3)/2], -[(1/2)-j(sqr3)/2]$ and zeros at -(1+j0). If Z(j0) =1 determine the values of R, L and C.

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5. Derive the equation of time domain response of a first order system subjected to unit impulse.

6. Explain in detail, the importance of Mason's gain formula.

7. Derive the root locus plot of a system G(s) = K/(Ts+1) when H(s) =1.

PART - C

Answer any **Three** of the following: **(3×12=36)**

8. Draw the Foster I and II form of the networks from the transfer function :

   F(S)=[(S+1)(S+2)(S+5)]/[S(S+2)(S+4)(S+6)].

9. A system represented by $Y^3 + 6Y^2 + 11Y + 6 = 6U$, where Y is the output and U is the input. Obtain the state space representation.

10. Obtain the root locus plot for the system represented by :

    G(s) = K/[S(S+1)(S+2)] when H(s) =1.

11. With an example, explain the use of Nyquist stability criterion as applied to any control system.

12. Write short notes on any **Two** of the following : **(2×6=12)**

    a. Significance of state variable approach.

    b. Properties of RC functions.

    c. Comparison of open and closed loop control systems.

    d. Control system applications.