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PGIIIS 1562 B - 14

M.Sc. IIIrd Semester (CBCS) Degree Examination

Applied Electronics

(Networks & 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** questions **(8×2=16)**

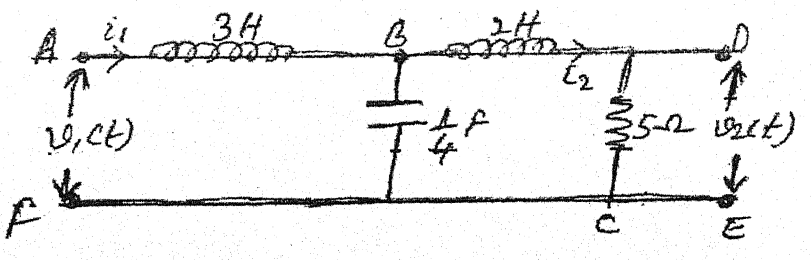
a) Define driving point impedance and admittance of a network function.
b) List the transfer functions of a two port network
c) Draw the pole zero diagram of a network function $F(s)=3s/\{(s+2)(s^2+2s+2)\}$
d) Define state variables
e) Justify the function $s^5+4s^4+3s^3+2s+s$ is not PRF
f) What are the advantages of closed loop control system?
g) Define linear time invariant system
h) Define transient response of a system
i) Define absolute and relative stability of a system
j) Define signal flow graph.

Part - B

Answer any **Four** questions **(7×4=28)**

2. What are the restrictions on the location of poles and zeros in S - Plane?

3. Calculate the voltage transfer function, transfer impedance and driving point impedance of the network.



4. Explain the significance of state space representation
5. What is block diagram representation of a system. Explain the block diagram reduction rules.
6. Draw the signal flow graph of a linear system for the equation $x_1 = a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + b,u$, where '$u$' is input variable and 'x_1' is output.
7. Obtain the root locus plot of a system $G(s) = K/(Ts+1), H(s) = 1$.

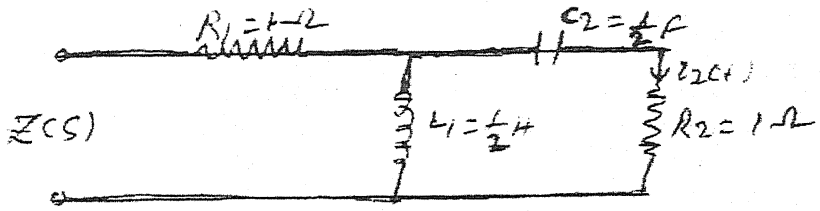
Part - C

Answer any **Three** questions **(12×3=36)**

8. Find the foster I and II form of a network function

$$F(s) = \frac{(s+1)(s+3)(s+5)}{s(s+2)(s+4)(s+6)}$$

9. Calculate the driving point impedance Z (s) of the network function shown below. Locate the poles and zeros of Z (s) on the s - plane. If $e(t) = e^{-5t}$ is applied to the network at t = 0 calculate $i_2(+)\ in - R_2$



10. Explain the Mason's gain formula for signal flow graph. Give an example to illustrate the use of Mason's gain formula for obtaining closed loop transfer function
11. Explain Routh's stability criteria for $s^4 + 2s^3 + 3s^2 + 4s + 5 = 0$
12. Write short notes on any **two** :
    a) Properties of RC functions
    b) State transition matrix (STM)
    c) Open and closed loop control systems
    d) Nyquist stability criterion

Roll No. _____ [Total No. of Pages : 3

PGIIIS 1564 B-14
M.Sc. IIIrd 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

PART-A

I. Answer any Eight Questions **(8x2=16)**

a) What do you mean by RZ and NRZ pulse?

b) Draw AMI code for data '10100 11101 and HDB3 code waveform for PSNXPNYPSSPPN

c) Define DC wander

d) How will you represent data in asynchronous transmission?

e) What do you understand by probability of bit error

f) Write the significance of a key parameter (Eb/No) in digital systems

g) How will you interpret eye pattern

h) Define Nyquist's criterion

i) Show PPM and PWM signal waveforms

j) Mention three basic forms of binary modulation

Part-B

Answer any **four** questions **(4x7=28)**

2. a) Define synchronous and asynchronous transmission. Give its applications **(4)**

   b) Illustrate two forms of carrier recovery circuits **(3)**

3. a) Discuss unipolar and polar NR_z-L code waveforms **(4)**

   b) Explain the meaning of ISI **(3)**

4. a) Define - symbol period and bit rate. Give relation between them **(4)**

   b) Mention $(s/n)_{max}$ voltage ratio and $(P_{be})_{min}$ expression for unipolar and polar signal **(3)**

5. a) Define discrete PAM signal show its power spectra and aliasing effect in waveforms **(4)**

   b) Write a brief note on correlative coding **(3)**

6. a) Discuss baseband M-ary PAM systems **(4)**

   b) Describe AWgN in binary modulation **(3)**

7. a) Explain coherent binary FSK **(4)**

   b) Draw a block diagram of binary FSK transmitters and receivers **(3)**

Part-C

Answer any **Three** questions **(3x12=36)**

8. Describe pulse shaping to avoid ISI with a suitable illustration. Mention the factors affecting the spectrum of an output pulse

9. Explain the salient features of -OOK, CPFSK, MSK, QPSK and DPSK

10. Discuss in detail an adaptive equalization for data transmission

11. Compare binary and quadrature modulation techniques

12. Write short note on any **three** of the following (3x4=12)

    a) M-ary encoding

    c) Probability bit error function

    d) Matched filter

    e) Baseband shaping

    f) Applications of digital modulation

Roll No. _____ [Total No. of Pages : 2

PGIIIS 1563
M.Sc. IIIrd Semester (CBCS)Degree Examination
Applied Electronics
(Microwave Electronics and Measurements)
Paper - HCT - 3.2

Time : 3 Hours Maximum Marks : 80

Instructions to candidates:

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

Part-A

I. Answer any **Eight** Questions **(8x2=16)**

a) Mention types of microstrip lines

b) Define the guide wavelength of microstrip line

c) List the important factors in the selection of a particular matching network

d) What do you understand by double stub tuning

e) Sketch a loop inductor of MIC

f) With neat sketch mention the inputs & outputs of a power combining

g) Sketch the power divider of H-plane waveguide Tee.

h) Define EMI and EME

i) List any two microwave biological effects

j) Define quiet zone in Anechoic chamber

Part-B

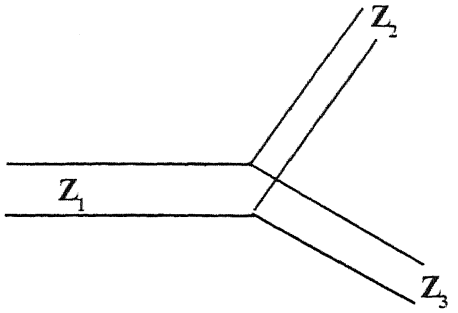
Answer any **four** questions **(4x7=28)**

2. Explain clearly the structure of field lines in strip lines and microstrip lines **(4)**

3. Discuss the various aspects of designing a microstrip antenna

4. With neat diagram explain briefly about single stub tuning with series stub

5. Consider a T-junction of three lines with characteristic impedance Z1, Z2 Z3. show that it is impossible for all the three lines to be matched when looking forward the junction



6. Discuss briefly about design consideration of oscillator

7. Explain briefly about salety standard of microwave radiation

Part-C

Answer any **Three** questions **(3×12=36)**

8. With a neat diagram explain the working of coupled line directional coupler with the help of even mode and add mode analysis

9. Discuss the design consideration of quarter wave transformer

10. With a neat diagram, explain in detail the plane wave propagation in anechoic chamber. Narrate the importance of quiet zone

11. Discuss the design consideration of broad wave amplifier

12. Write short notes on any **two** **(2×6=12)**
    a) Tapered lines
    b) Lange coupler
    c) Free space attenuation
    d) Wilkinson power divider

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PGIII S 1566 B-14
M.Sc. IIIrd Semester (CBCS) Degree Examination
Applied Electronics
(Communication and Digital Electronics)
Paper : OET 3.1

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates:

1) Answer the questions as per instructions.

2) Write question numbers clearly.

PART - A

1. Answer any Eight questions: **(8 × 2 = 16)**

a) What are surface waves?

b) What is skip distance?

c) Draw and label Yagi Leda antenna.

d) Write the necessity of modulation in communication.

e) Define modulation index in AM.

f) Compare and contrast AM and FM.

g) List the losses in optical fiber.

h) What is meant by cladding in optical fibers.

i) Convert decimal number 25.65 into binary equivalent.

j) Name the universal gates.

PART - B

Answer any **Four** questions. Each question carries **Seven** marks. **(4 × 7 = 28)**

2. Discuss the effect of ionosphere on radio waves.

3. Give an account on microstrip antenna.

4. Explain with neat diagram and waveforms, the process of frequency modulation.

5. Write a note on generation and detection of AM waves.

6. With necessary diagram explain the transmission of light through optical fibers.

7. Explain the operation of basic gates with relevant truth table.

PART - C

Answer any **Three** questions. Each question carries **12** marks. **(3 × 12 = 36)**

8. Discuss in detail, the sky wave propagation.

9. Draw the super heterodyne receiver circuit and explain its operation.

10. Explain the various modes of propagation in optical fibers.

11. State and prove De Morgan's theorems with examples.

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

    a) Ferrite rod antenna.

    b) Ionospheric fading.

    c) Types of light sources.

    d) RS flip flop.