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PGIIIS-N 1556 B-2K13

M.Sc. IIIrd Semester (CBCS) Degree Examination

Applied Electronics

(Networks and Systems)

Paper - HCT-3.1

(New)

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 impedance and admittance of a network.

b) When the poles and zeros of a n/w functions are complex conjugate how they are located in the s-plane?

c) Test the function $F(s)= s^4 +s^3 + 2s^2+3s+2$ to be Hurwitz

d) Define state variables.

e) Define state vector and STM.

f) Define transfer function of a system.

g) Define linear time invariant system.

h) Explain unit step function.

i) Define relative stability.

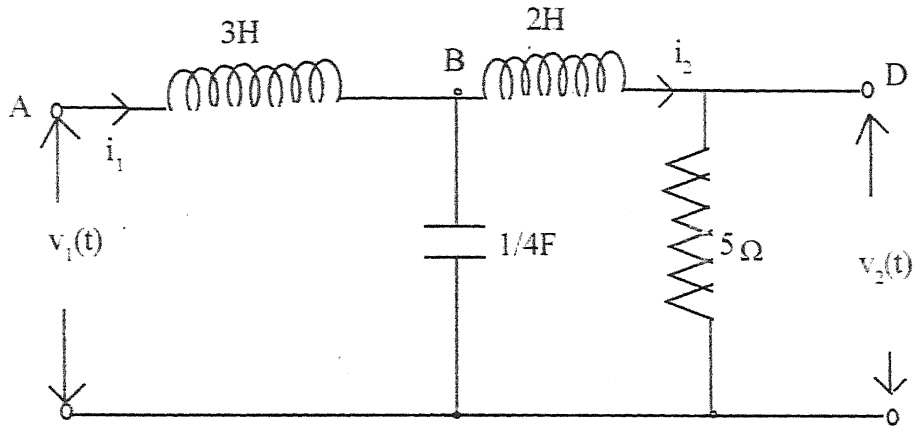
j) Define root locus.

Part - B

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

2. List the properties of positive realness of a network function.

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



4. Explain the procedure of representing the state variables.

5. Obtain the time domain response of a first order system. Subjected to unit step input.

6. Define signal flow graph. Explain signal flow graph representation of a linear system.

7. Discuss the root locus plot of a system represented by

   $G(s) = K/(Ts+1)$, $H(s)=1$

Part-C

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

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

   $F(s) = (s+1)(s+3)(s+5)/s(s+2)(s+4)(s+6)$ and show that in the realized networks the number of elements remains same.

9. Explain the step response of a second order system with the help of neat block diagram.

10. Show the root locus plot of the control system represented by $G(s) = K/s(s+1)(s+2)$ with $H(s)=1$.

11. Define the term stability of a system and find the Routh's stability criteria for the system represented by $s^4+2s^3+3s^2+4s+5=0$.

12. Write short notes on any **two** of the following.

    a) time domain response from pole zero plot. **(2×6=12)**

    b) Block diagram reduction technique.

    c) Linear transformation.

    d) Mason's gain formula.

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PGIIIS-N 1557 B-2K13

M.Sc. IIIrd Semester (CBCS) Degree Examination

Applied Electronics

(Microwave Electronics and Measurements)

Paper - HCT - 3.2

(New)

Time : 3 Hours Maximum Marks : 80

Instructions to candidates:

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

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

a) List the disadvantages of microstrip lines.

b) Define the effective dielectric constant of microstrip line.

c) List the important factors in selecting the matching network.

d) What do you understand by single and double stub matching?

e) Define EMC and EMV.

f) What is Quiet Zone?

g) List any two microwave biological effects.

h) What is the need of multisection? Quarter wave transformer?

i) Sketch the equivalent circuit diagram of microstrip.

j) List any two hazzards of e.m. radiation.

Part - B

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

2. Discuss briefly the various types of microstrip lines.

3. With neat diagram explain the transmission line model of Lossless T-junction.

4. With neat diagram explain briefly the working of the double stub matching.

5. Write a note on Tapered lines.

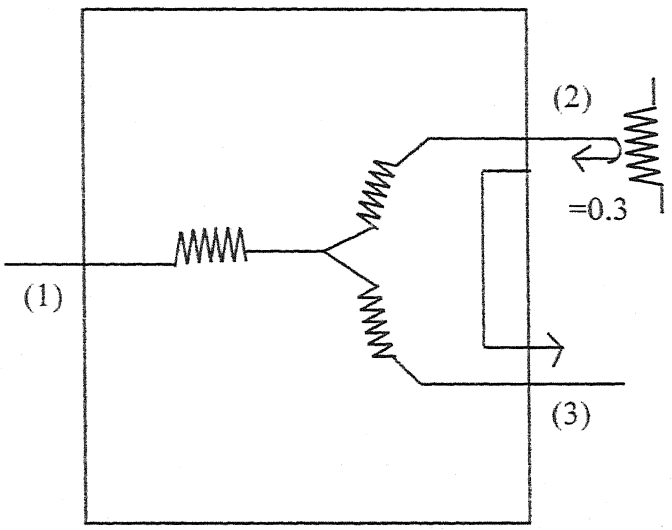
6. Explain the convertion of transmitter and receiver power in microwave measurement.

7. Give the design considerations of broad band amplifier design.

Part - C

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

8. Design a three port resistive divider for an equal power split and a 100Ω system impedance. If port 3 is matched, calculate the change in output power at port 3(in dB) when port 2 is connected either to a matched load or to a load having a mismatch of T=0.3.



9. What is the useful property of Wilkinson power Divider? Explain in detail the working of Wilkinson-Power Divider in a normalised and symmetric form with a neat diagram.

10. Discuss the design considerations of Microwave Oscillator.

11. Sketch the convertable Ancehore chamber. Explain the plane wave propagation on an Ancehore chamber.

12. Write short notes on any **two**:

    a) Lumped elements with MICs.

    b) Quarter wave transformer.

    c) Coupled line Directional coupler.

    d) Comparison of electric and magnetic field lines in stripline and microstrips.

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PGIIIS-N 1558 B-2K13

M.Sc. IIIrd Semester (CBCS) Degree Examination

Applied Electronics

(Modern Digital Communication)

Paper - SCT - 3.1

(New)

Time : 3 Hours Maximum Marks : 80

Instructions to candidates:

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

Part - A

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

a) Define quantization.

b) What is band rate?

c) Define PAM with relevant waveforms.

d) What is linear distortion?

e) Define power and bandwidth efficiency.

f) Write PCM generation steps.

g) Define carrier and symbol synchronization.

h) State Nyquist's criterion.

i) What is level encoding?

j) What is the use of carrier recovery circuits?

Part - B

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

2. What is power spectral density? Plot power spectral density for RZ and NRZ.

3. Discuss the factors affecting the spectrum of an output pulse.

4. What is DC Wander problem? How is it solved in digital communication system?

5. Explain the salient features of synchronous transmission.

6. Draw and explain the block diagram of QPSK transmitter.

7. Write a note on M-ary modulation technique with suitable diagrams.

Part - C

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

8. What is inter-symbol interference in data transmission? Explain how eye patterns are useful in the study of interference?

9. Draw and explain the block diagram of BPSK receiver. Also, draw the constellation diagram.

10. Explain the principle of PCM with example. What is quantization noise? Explain how is it reduced?

11. With a neat block diagram, explain the principle of generation and demodulation of ASK.

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

    a) Manchester coding.

    b) Base-band transmission.

    c) Pulse shaping

    d) Quadrature modulation.

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PGIIIS-N 1559 B-2K13

M.Sc. IIIrd Semester (CBCS) Degree Examination

Applied Electronics

(Power and Industrial Electronics)

Paper - SCT - 3.2

(New)

Time : 3 Hours Maximum Marks : 80

Instructions to candidates:

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

Part - A

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

a) What is an SCR?

b) What is the difference between an SCR and a TRIAC?

c) What is di/dt protection?

d) Draw a Reverse conducting thyristor circuit neatly.

e) What is a DC Chopper? How does it work?

f) What is the principle of operation of a step-down chopper?

g) What are the performance parameters of a chopper?

h) What are DC drives? List their types.

i) What is the magnetization characteristic of dc motors?

j) What is the purpose of a converter in dc drives?

Part - B

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

2. Describe the construction and working of MOS controlled thyristor.

3. How does a light-activated silicon controlled rectifier works? Explain.

4. Explain the operation of single phase full wave bidirectional AC voltage controller.

5. Write a note on three-phase unidirectional (half wave) AC voltage controller.

6. Explain the principle of operation of step-down DC chopper.

7. With neat block diagram and waveform explain the working of single phase full converter drives for DC motors.

Part - C

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

8. Draw a neat labelled V-I characteristics of a thyristor and define the important parameters of the same.

9. Describe the construction and working of single phase cycloconverter.

10. Mention the types of AC drived and explain any one of them in detail.

11. With the help of neat block diagrams explain the working of SMPS.

12. Write short notes on any **two** of the following:

    a) Parallel connection of SCR's

    b) AC voltage controllers with PWM control.

    c) Buck-boost regulators.

    d) Control of stepper motors.

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PGIIIS -N 1560 B-2K13

M.Sc IIIrd Semester (CBCS) Degree Examination

Applied Electronics

(Communication and Digital Electronics)

Paper - OET -3.1

(NEW)

Time : 3 Hours Maximum Marks :80

Instructions to candidates :

*1)Attempt **all** questions as per instructions.*

2)Write questions numbers clearly.

Part - A

1. Answer any **eight** questions **(8x2=16)**

a) What is an antenna?

b) Write the various loop antennas?

c) Write the necessity of modulation in communication systems

d) What is amplitude modulation?

e) Define modulation index in FM

f) Draw the amplitude spectrum for sinusoidal AM wave

g) List the modes of propagation of OFC

h) Define numerical aperture

i) Write the truth tables of basic and universal logic gates.

j) State DeMorgans theorems

Part - B

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

2. Discuss briefly the effect of ionosphere on radio communication

3. Explain the working of yagi - uda antenna.

4. With neat block diagram explain super- heterodyne radio receiver.

5. Write a note on losses in optical fibre cables

6. State Boolean theorems and prove them.

7. Write a note on photo detectors.

Part - C

Answer any **three** questions. **(3x12=36)**

8. Discuss in detail on radiowave propagation

9. Explain construction and working of helical loop antenna

10. Discuss in detail, the generation and detection of AM wave.

11. Explain the propagation of signal in optical fibre and derive the expression for numerical aperture

12. Write short notes on any **two.**

    a) Ferrite rod antenna

    b) Comparison of AM and FM

    c) Light sources

    d) Rs flip flop.

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PGIIIS-O 1561 B-2K13

M.Sc. IIIrd Semester (Non-CBCS) Degree Examination

Applied Electronics

(Networks and Systems)

Paper - AE - 301

(Old)

Time : 3 Hours Maximum Marks : 80

Instructions to candidates:

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

Part - A

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

a) Define driving point impedance and admittance of one port network.

b) When the poles and zeros of a network functions are simple, how they are located in s-plane?

c) Define the term state transition matrix.

d) Draw the block diagram of a closed loop control system.

e) Define linear time invariant system.

f) Define state variables.

g) List the applications of two port passive network.

h) In any time varying response, what does the poles and zeros indicates?

i) Draw the network of RC caller I and II form.

j) Define network analysis and synthesis.

Part - B

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

2. List the properties of positive real functions.

3. Explain the procedure of representing the state variables.

4. List the properties of a linear systems.

5. Check the +ve realness of a function $Z(s) = (s^2 + s + 6)/(s^2 + s + 1)$.

6. Define the condition of a network function $N(s) = (s + \alpha)/(s^2 + \beta s + \gamma)$ to be +ve real.

7. Draw the signal flow graph of a linear system for the equation $X_1 = a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + b_1u_1$ where u is input variable and X_1 is output.

Part - C

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

8. Find the Foster I and II form of the network from the function $F(s) = (s^2 + 0.5)(s^2 + 1.5)(s^2 + 3)/(s)(s^2 + 1)(s^2 + 2)$

9. Explain the network of RC ladder. Realize two port RC network from the function $T(s) = 1/(s + 2)(s + 5)$.

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 the significance of state space approach of a system, and discuss how it can be represented?

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

    a. Properties of RC functions.

    b. Linear transformation.

    c. Block diagram algebra.

    d. Properties of signal flow graph.

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PGIIIS-O 1563 B-2K13

M.Sc. IIIrd Semester (Non CBCS) Degree Examination

Applied Electronics

(Microwave Electronics and Measurements)

Paper - AE -303

(Old)

Time : 3 Hours Maximum Marks :80

Instructions: Answer the questions as per instructions
Write question numbers clearly

Part - A

1. Answer any **eight** of the following. **(8x2=16)**

a) List any two advantages and disadvantages of microstrip lines.

b) List the important factors in selecting the matching network

c) Define EMC and EMV

d) Define HERO and HERF

e) What is Chebyshev transformer

f) Define phase velocity of microstrip line

g) Define and sketch lange coupler

h) Mention two adjustable parameters in single stub matching

i) What do you understand by smith chart

j) Define dB, V/m in microwave measurement

Part - B

Answer any **four** of the following. **(4x7=28)**

2. With a neat diagram, discuss the design considerations of the microstrip line

3. With a neat diagram, explain the electric magnetic field in approximate form on a microstrip

4. Explain the transmission line model of a loss less - T - junction

5. Explain the working of a chebyshev transformer with a shematic

6. Discuss briefly the properties of power divider

7. Write a note on plane wave propagation in Anechoic chamber.

Part - C

Answer any **three** of the following. **(3x12=36)**

8. A lossless - T - junction power divider has a source impedance of 50Ω. Find the output characteristic impedances so that the input power is divided in a 2:1 ratio

9. Design a wilkinson power divider with power division ratio of $P_3/p_2 = 1/3$ and a source impedance of 50Ω

10. Discuss the design considerations of microwave oscillator

11. Describe the set up to measure free space attenuation at microwave frequencies How do you convert dB values on dBm?

12. Write short notes on any **two**

    a) Microwave biological effects

    b) Tapered lines

    c) Quarter wave transformer

    d) Lumped elements for MICs.

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PGIIIS-O 1564 B-2K13

M.Sc. IIIrd Semester (Non-CBCS) Degree Examination

Applied Electronics

(Modern Digital Communication)

Paper - AE - 304

(Old)

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates:

Follow the instructions given, write the question numbers clearly

Part - A

Answer any **eight** of the following **(8×2=16)**

1. a) Give the difference between NRZ and RZ pulse

b) Define line code and level encoding

c) What is linear distortion?

d) Define PCM

e) What is quantization error?

f) What is ASR?

g) Why frame synchronisation is necessary

h) Mention the use of optimal terminal filters?

i) What is meant by QPSK?

j) Define M-array encoding

Part - B

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

2. What is power spectral density? Plot the curve for power spectral density of RZ and NRZ

3. What is bit time recovery? How does it help in synchronizing? Explain.

4. Write the block diagram of basic digital communication system and discuss the same.

5. Show the oscillator method of realizing frequency shift keying

6. With the relevant waveforms, explain PWM

7. Explain the salient features of synchronous transmission

Part - C

Answer any **three** questions. **(3×12=36)**

8. A finite binary sequence 111000 is to be transmitted using the Manchester code. Sketch the waveform and also give its merits and demerits.

9. With the help of neat diagram, explain the working & theory of a carrier recovery circuit.

10. Discuss the methods of modulator and demodulator circuits of Ask wave

11. What is matched filter? Draw the matched filter for rectangular pulses and discuss

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

    a) Optimum terminal filters

    b) PTM

    c) Eye diagrams

    d) Carrier recovery circuits.