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PGIIIS 1556 B-15
M.Sc. IIIrd 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 question number clearly

Part - A

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

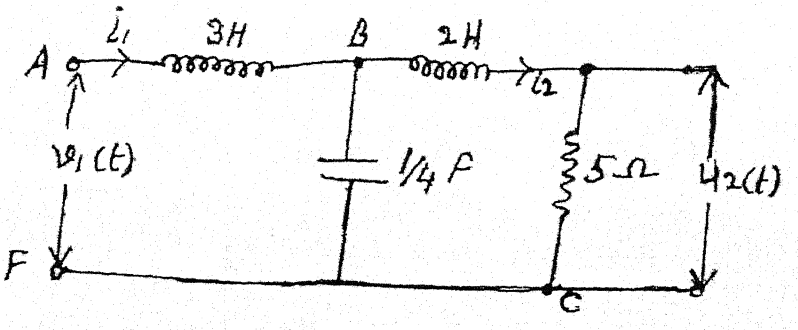
a) Define Z and Y of a network function
b) List the transfer functions of a two port network
c) Define poles and zeros of a network function and draw any two complex conjugate poles on S-plane
d) Define state variables
e) Define state space and state vector
f) What are the advantages of closed loop control system
g) Define transient response of a system
h) Mention the advantages of Mason's gain formula
i) Define absolute and relative stability of a system
j) Define a linear system and signal flow graph

Part - B

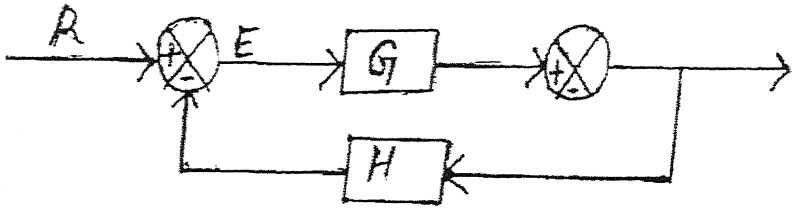
Answer any **Four** questions: (4×7=28)

2 Explain the properties of +ve real function

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



4. Explain the significance of state space representation
5. obtain the time domain response of first order system subjected to unit impulse input
6. Define signal flow graph and draw the signal flow graph of the diagram



7. Explain the general rules for constructing root loci of system

Part - C

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

8. Find the foster I and II form of a network function F(S)= (S+1) (S+3) (S+5)/ S(S+2)(S+4)(S+6)
9. Find the cauer form of the function $F(S)=\left(S^6+5S^4+6.75S^2+2.25\right)/S^5+3S^3+2S)$ and draw the realized network
10. Explain the mason's gain formula for signal flow graph. Give an example to illustrate the use for obtaining closed loop function
11. What is a polar plot? Obtain the root locus plot for the system with G(S)=K/S(S+1)(S+2), where H(S)=1
12. Write short notes on any **two** **(6×2=12)**
    a) Applications of necessary and sufficient conditions for PRF
    b) State transition matrix
    c) Properties of signal flow graph
    d) Nyquist stability criterion

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PGIIIS 1557 B-15
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.

Section - A

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

1. a) Define the characteristic impedance of a transmission line.
   b) Define propagation constant of a transmission line.
   c) List the important factors in selecting a matching network.
   d) Define dB, V/m in microwave measurement
   e) What do you mean by quite zone in Anechoic chamber?
   f) What is a directional coupler? Mention its applications?
   g) What is Smith chart?
   h) Sketch a loop inductor of MIC.
   i) List any two microwave hazards.
   j) Define Q factor of microstrip line

Section - B

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

2. With a neat circuit diagram, explain the working of single stub tuning technique.
3. Discuss the design considerations of microstrip line with an example.

4. A microstrip line is composed of zero thickness copper conductors on a substrate having $\varepsilon_r = 8.4$. tan $\delta = 0.0005$ and thickness = 2.4 mm. If the line width is 1 mm and operated at 10 GHz.

Calculate,

a) Characteristic Impedance.

b) The attenuation due to conductive loss and dielectric loss.

5. With a neat sketch, explain briefly the working of Chebyshev transformer.

6. Explain the working of Large coupler with an illustration.

7. Discuss the propagation of plane electromagnetic wave in Anechoic chamber.

Section - C

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

8. a) Discuss the advantages and disadvantages of microstrip lines.

b) Design a single section quarter wave matching transformer to match a 10 ohm load to a 50 ohm line at 3 GHz. Determine the percent bandwidth for which SWR $\leq$ 1.5.

9. With a neat diagram, explain the working of Wilkinson- power divider in normalized and symmetric form.

10. With a neat sketch, explain the construction and working of coupled line directional coupler with the help of even and odd mode analysis.

11. Discuss in detail the design considerations of microwave broadband amplifier or microwave oscillator.

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

a) Free space attenuation.

b) T- junction power divider.

c) Directional coupler.

d) Microwave biological effects.

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PGIIIS 1558 B-15
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.

Section - A

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

a) Draw block diagram of basic digital communication system.

b) What is the characteristic of synchronous transmission?

c) Draw ASK and FSK wave.

d) Give the mathematical expression for information content of an equiprobable binit.

e) Define PAM and PWM.

f) What is ISI?

g) Define correlative coding.

h) What for eye-pattern issued?

i) Show R2 and NR2 Pulses.

j) What do you understand by coherant binary modulation techniques?

Section - B

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

2) Give an account on probability of bit error in base band transmission.

3) Discuss the operation of matched filter circuit.

4) With the use of block schematic, describe the generation of PCM.

5) What is M-arry encoding? Explain.

6) Give an account on eye-pattern.

7) Write down the comparision of binary and quartenary modulation techniques.

(3×12=36)

Section - C

Answer any **three** questions.

8) Discuss the operation of ASK transmitter and dectector circuits with use of block schematic.

9) With a neat block diagram, Explain the operation of natural PAM modulator. Further, describe the significant features of spectrum of PAM wave.

10) Give detailed account on Nyquist's criterion for distortion less base-band binary transmission.

11) With the use of block schematic, discuss conherent binary modulation techniques.

12) Write short note on any **three** of the following. . **(3×4=12)**

a) QPSK modulator.

b) PPM

c) Base band M-Arry PAM system.

d) Digital modulation formats.

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PGIIIS 1559 B-15
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 the instructions
2) Write the question numbers clearly

Part-A

Answer any **eight** questions **(8×2=16)**

1. a) What is ground wave propagation

b) Explain ionospheric fading

c) Define critical frequency and maximum usable frequency.

d) Define frequency modulation

e) What is transmission efficiency? Explain

f) What is meant by inter-modal dispersion

g) Write the advantages of optical fibre communication

h) What are photo detectors? Explain

i) Convert $(10010.101)_2$ into its decimal equivalent

j) Draw the logic symbols of NAND and NOR gates and explain their truth tables.

Part-B

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

2. Discuss the modes of propagation through various layers of ionosphere

3. Classify optical fibres on index profile and give their advantages

4. Give the qualitative description of microstrip antenna

5. Discuss the various losses in optical fibres

6. Explain the need for modulation in radio communication

7. Explain the conversion of decimal to binary and decimal to hexadecimal numbers with examples.

Part-C

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

8. Explain the construction and working of loop and ferrite antennas

9. With neat diagram explain the generation and detection of AM signals

10. Discuss in detail the various types of light sources

11. Explain the realization of basic gates using universal gates

12. Write short notes on any two

    a) Dish antenna

    b) Comparison of AM and FM

    c) LED

    d) Boolean algebra