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

PGIIIS-1558 B-17
M.Sc. III Semester Degree Examination
APPLIED ELECTRONICS
(Modern Digital Communication)
Paper : SCT 3.1

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates :

i) Write the Q. No. clearly.

ii) Draw neat figures wherever necessary.

PART - A

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

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

b) Define DC wander.

c) Draw an AMI line code for a binary sequence 1010100111.

d) Define pulse modulation.

e) Define Nyquist criterion for pulse modulation.

f) What is meant by probability of bit error?

g) Define synchronous transmission.

h) Mention three basic forms of binary modulation.

i) Define coherent and non-coherent binary modulations.

j) Give the significance of signal space diagram.

PART - B

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

2. Describe M-ary encoding.

3. Explain the basic TDM/PCM system.

4. Discuss the importance of ISI.

5. Explain non-coherent binary PSK.

6. Write a brief note on carries recovery circuits.

7. Explain the concept of differential encoding. Give example.

PART - C

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

8. Define pulse shaping. Explain its importance in detail.

9. Discuss sigma-delta A/D conversion technique used in digital system.

10. With a neat labelled sketch, describe the importance of an eye diagram.

11. Describe the coherent binary FSK transmitter and receiver.

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

    a) HDB3 code

    b) Raised consign response

    c) Matched filter

    d) QPSK

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PGIIIS-1556 B-17
M.Sc. III Semester Degree Examination
APPLIED ELECTRONICS
(Networks and Systems)
Paper : HCT 3.1

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates :

i) Answer the questions as per the instructions.

ii) Write question number cearly.

PART-A

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

a) Define impedance and admittance of a network function.

b) Define poles and zeros of a network function and show the location of simple and complex conjugate poles and zeros in S plane.

c) Test the polynomial P (S) = $S^4 + S^3 + 2S^2 + 3S + 2$ is Hurwitz or not.

d) Define the terms state space and state vector.

e) What do you understand by the term state transition matrix?

f) Define transfer function of a system.

g) Give the definition of a linear time invariant system.

h) Define transient response of a system.

i) Define steady state error of a system.

j) Define root locus of a system.

PART-B

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

2. Discuss the time domain behavior of pole zero plot.

3. The transfer current $I(s) = \frac{2s}{(s+1)(s+2)}$ plot its Pole zero pattern in S-plane and hence obtain the time domain response i(t).

4. A two terminal network consists of a coil having an inductance L and resistance R shunted by capacitor C. The poles and zeros of the driving point function Z(s) of this network are:

poles at $-\left[\frac{1}{2}+j\frac{\sqrt{3}}{2}\right],-\left[\frac{1}{2}-j\frac{\sqrt{3}}{2}\right]$ and zeros at $-(1+jo)$. If $Z(j0)=1$ determine the values of R, L and C.

5. Explain the procedure of realization of a RC network.

6. Derive the signal flow graph of a linear system given by $X_1 = a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + b_1u_1$ here u is input and X_1 is output.

7. Derive the root locus plot of a system $G(s)=\frac{k}{(Ts+1)}$ when H(s) = 1.

PART - C

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

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

$$F(s)=\frac{(s^2+0.5)(s^2+1.5)(s^2+3)}{s(s^2+1)(s^2+2)}.$$

9. With the help of block diagram explain in detail the step response of a second order system.

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

$$G(s)=\frac{k}{s(s+1)(s+2)} \text{ when } H(s)=1$$

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

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

a) Significance of state variable approach.

b) Properties of RC functions.

c) Block diagram algebra.

d) Control system applications.

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PGIIIS-1559 B-17
M.Sc. III Semester (CBCS) Degree Examination
APPLIED ELECTRONICS
(Communication and Digital Electronics)
Paper : OET 3.1

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates :

i) Answer the questions as per instruction.

ii) Write the question numbers clearly.

PART - A

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

a) What are radio waves?

b) Define skip distance and critical frequency.

c) Sketch Yagi Uda antenna and label the parts.

d) Define Modulation.

e) Define refractive index.

f) List the advantages of FM over AM.

g) List the types of losses in optical fiber.

h) Define cladding in optical fiber.

i) Convert decimal number 25.65 into binary equivalent.

j) Define flip flop and draw its logic symbol.

PART - B

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

2. Discuss the characteristic features of surface waves.

3. Draw the basic geometry of microstrip antenna and mention its applications.

4. Write a brief account on fibre index profile.

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

6. With the help of examples, explain the conversion of binary to decimal and decimal to binary numbers.

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

PART - C

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

8. Discuss in detail the effect of ionosphere on radio waves.

9. Obtain an expression for modulation index of an AM wave.

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

11. With a neat diagram, explain the construction and working of RS flip flop and draw its truth table.

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

    a) Ferrite rod antenna.

    b) Ionosphere fading.

    c) Types of light sources.

    d) Boolean algebra.

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PGIIIS-1557 B-17

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 :

i) Write the question numbers clearly.

ii) Answer the questions as per instructions.

Part - A

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

a) What do you understand by Micro Strip lines?

b) Define the Guide wavelength of a microstrip line.

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

d) What do you understand by stub tunning?

e) Sketch the loop inductor of MIC.

f) With neat sketch mention the input & output of a power combining circuit.

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

h) Define EMI & EME.

i) Mention any two microwave hazards.

j) What is an Anechoic Chamber?

Part - B

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

2. With a neat diagram explain in brief the electric & magnetic fields in approximate form on a stripline.

3. With a neat diagram explain in brief the working of double Stub matching.

4. Explain in brief the working of Chebyshev transformer.

5. Write a note on broadband amplifier design.

6. Write a note on T-junction power divider.

7. An X-band equipment has a CW radiation power of 4kW. Determine:

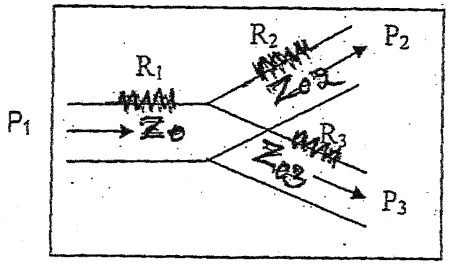
   a) The power density in milliwatts per square centimeter at a distance of 2 m.

   b) The electric field intensity in volts per meter & magnetic field intensity in ampers per meter at the same distance.

Part - C

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

8. Consider the general resistive divider shown below. For any arbitrary power division ratio $\alpha = P_2/P_3$, derive the expressions for the resistors R_1, R_2 & R_3 and the output characteristic impedances Z_{02} & Z_{03} so that all the ports are matched assuming that the source impedance is Z_0.



9. With a neat diagram explain the Working of Wilkinson Power Divider in normalized & Symmetric form. Draw its equivalent transmission line Circuit.

10. With a neat diagram explain the coupled line directional couplers with even & odd mode excitations.

11. With a neat diagram explain the plane wave propagation in an Anechoic Chamber.

12. Write short notes on any Two.

   a) Matching with Lumped elements

   b) Tapered Lines

   c) Oscillator Design

   d) Microwave Enclosure Hazards

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