Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2201

II B.Tech II Semester Regular Examinations, April - 2018

SWITCHING THEORY AND LOGIC DESIGN

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Convert $(25B)_H$ to its octal equivalent?
   (b) Why are NAND and NOR gates are called as universal gates?
   (c) What are multiplexers?
   (d) Write the demerits of PROM
   (e) What is a state diagram?
   (f) Write the difference between Mealy and Moore machines

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Find the 2's complement of the following numbers
   i) 01100100 ii) 10010010 iii) 11011000
   (b) Convert the given Gray code number to its equivalent binary
   i) 001001011110010 ii) 110011101111000

3. (a) Reduce the following function using K-map technique and implement using basic gates
   F (A, B, C, D) = A'B'D+ABC'D'+A'BD+ABCD'
   (b) Reduce the expression using Quine - Mc Cluskey or tabulation method.
   F (A, B, C, D) = $\Sigma_m(0,1,3,7,8,9,11,15)$.

4. (a) Implement the following Boolean function using 8:1 multiplexer
   F(A,B,C,D) = Σ m(0,2,6,10,11,12,13)
   (b) Design Full adder with minimum number of NAND gates?

5. (a) Implement the following Boolean functions using PLA.
   (i) F1= Σ (0, 1, 2, 4) (ii) F2= Σ (0, 5, 6, 7)
   (b) Clearly differentiate between Programmable Logic Array and Programmable Array Logic with examples.
6. (a) Realize T flip flop using JK flip flop. Give the truth table.
   (b) Construct a 4-bit bidirectional shift register using D flip flops and explain its operation?

7. (a) What are the capabilities and limitations of finite state machines? Discuss
   (b) Draw the state diagram of a sequence detector which can detect 110101.

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Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2202

II B.Tech II Semester Regular Examinations, April – 2018

ELECTRONIC CIRCUIT ANALYSIS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What are the benefits of h – parameters?
   (b) Define Hybrid – π Capacitances.
   (c) Classify the various amplifiers.
   (d) What are the advantages and disadvantages of negative feedback amplifiers?
   (e) Why LC oscillators are not used at low frequencies?
   (f) What are the advantages of push-pull power amplifiers? **[2+2+2+2+2+2]**

PART-B

4 X 12 = 48

2. a) Derive the equations for voltage gain, current gain, input impedance and output admittance for a BJT – CE amplifier using low frequency h - parameter model. [6]

   b) The h-parameters of the transistor used in CE amplifier are h_{fe} = 50, h_{ie} =1.1K Ω, h_{re} = 2.5×10^{-4}, h_{oe} = 24μ A/V. Find out current gain and voltage gains with and without source resistance, input and output impedances, given that RL= 10 K Ω and RS= 1 K Ω. [6]

3. (a) Derive the expression for the CE short circuit current gain A_i as a function of frequency using Hybrid - π model. [6]

   (b) A single-stage CE amplifier is measured to have a voltage - gain bandwidth f_H of 5 MHz with R_L = 500 ohms. Assume h_{fe} = 100, gm=100 mA/V, $r_{bb}{}^1$ = 1000, Cc = 1pF, and f_T = 400 MHz. Find the value of the source resistance that will give the required bandwidth. [6]

4. (a) Draw the Circuit diagram of Darlington emitter follower. Explain why the input impedance is higher than that of single-stage emitter follower. [6]
   (b) When two stages of identical amplifiers are cascaded, obtain the expression for overall voltage gain and power gain. [6]

5. Explain the nature of feedback in an emitter follower circuit. State the advantages of this circuit and mention its use. Can this circuit be used as a voltage amplifier? [12]

6. (a) Sate and explain Barkhausen criterion. [6]
   (b) Derive the expression for frequency of oscillation in a Hartley Oscillator. [6]

7. Draw the push-pull power amplifier circuit. Derive the expression for the output current in push-pull amplifier with base current as $I_b = I_{bm} \sin \omega t$. [12]

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2203

II B.Tech II Semester Regular Examinations, April-2018.

PULSE AND DIGITAL CIRCUITS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Determine the response of an RC high pass filter to a step input
   (b)What is Hysteresis Voltage? Explain how Hysteresis can be eliminated in a Schmitt Trigger
   (c) Draw and Explain the circuit diagram of DTL gate
   (d) What are the drawbacks of two diode sampling gates?
   (e) Explain the meaning of transmission region and attenuation region in clipping circuits
   (f) Define the types of states in multivibrator.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Analyze the low pass RC circuit for the squarewave input with help of waveforms. **[6M]**
   (b) A 1 KHz square wave output from an amplifier has rise time t_r = 350ns and tilt = 5%. Determine the upper and lower 3-db frequencies. **[6M]**

3. (a) With neat diagram explain different types of clipper circuits and their operation with the aid of transfer characteristics. **[6M]**
   (b) Design a diode clamper to restore the negative peaks of the input signal to zero level. Use a silicon diode with R_f = 50 Ω and R_r = 400 KΩ. The frequency of the input signal is 5 Khz. **[6M]**

4. (a) Explain about transistor switching times. **[6M]**
   (b) Draw the circuit diagram of Inverter using CMOS logic and explain its operation. **[6M]**

5. (a) Discuss the design of fixed bias Bistable multivibrator **[6M]**
   (b) Design a Bistable multivibrator to meet the following specifications $V_{cc} = V_{bb}$ = 12 V, $I_{c(sat)}$ = 6 mA, $h_{fe(min)}$ = 25. Maximum trigger frequency = 25 KHz **[6M]**

6. (a) Design an Astable multivibrator to generate 5KHz square wave. The supply voltage V_{cc} = 10V, $I_{c[sat]}$ = 10 mA, h_{fe} = 50 and assume Si transistors. **[6M]**
   (b) Derive expression for the pulse width of a monostable multivibrator. **[6M]**

7. (a) Explain the basic principle of a Bootstrap sweep generator. Draw the circuit and explain its operation. Derive the expression for its slope error. **[6M]**
   (b) How to cancel the pedestal in a sampling gate? Discuss with suitable circuit diagram. **[6M]**

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2204

II B.Tech II Semester Regular Examinations, April-2018.

ANALOG COMMUNICATIONS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Explain the main advantages of modulation?
(b) Draw the spectrum of SSB signal
(c) What is Carson's rule? Why it is used?
(d) List out the types of noises in communication systems?
(e) Explain image frequency and its Rejection
(f) Discuss the types of pulse Modulation.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Describe an expression for AM wave and sketch its frequency spectrum. 8M
(b) An amplitude modulated signal in time domain as 4 Cos (1800πt) + 10 Cos(2000πt). Sketch the spectrum and calculate the band width and total power? 4M

3. (a) Prove that the balanced modulator produces an output consisting of sidebands only with the carrier removed. 6M
(b) Discuss the process of generation of VSB waves. 6M

4. (a) An FM signal is represented in time domain as s (t) = 10 Cos ($2\pi 10^6 t$ + 5 Sin $8\pi 10^3 t$). Calculate the frequency deviation, modulation index, power and band width. 6M
(b) Generate PM wave using FM modulator similarly FM wave from PM Modulator? 6M

5. (a) Calculate the figure of merit for a DSB-SC system. 8M
(b) Discuss the noise performance of AM system using envelop detection. 4M

6. (a) List out the advantages and disadvantages of TRF receivers. 6M
(b) Discuss the factors influencing the choice of intermediate frequency (IF) for a radio receiver 6M

7. Write short notes on
i) TDM Vs. FDM 4M
ii) Generation of PWM 4M
iii) Double polarity PAM 4M

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2205

II B.Tech II Semester Regular Examinations, April-2018.

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define Electric Field Intensity, Give the relation between Electric Field Intensity and Electric Flux Density?
   (b) Define vector magnetic potential and magnetic scalar potential.
   (c) What is Transformer e.m.f? Explain.
   (d) Define Poynting Theorem and Poynting Vector.
   (e) Define Brewster angle?
   (f) Write about the different types of transmission lines.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) State Gauss Law and give the applications of with respect to a) point charge b) infinite line charge.
   (b) Point charges 4 mC and -3 mC are located at (2, 1, -3) and (-1, -2, 4) respectively. Calculate the electric force on a 12 nC charge located at (0, 3, 1) and the electric field intensity at that point.

3. (a) State and explain the Biot-Savart's law relating magnetic field produced at a point due to the current in a small elemental wire.
   (b) State Ampere's circuit law. What are its applications?

4. (a) Write the Maxwell's equations for time varying fields in integral and differential forms with their word statements.
   (b) What is inconsistency of Ampere's law? Explain how Maxwell modified this law.

5. (a) Define uniform plane wave and derive the general solution of uniform plane wave equation.
   (b) Prove that the intrinsic impedance of the Uniform plane wave is 377Ω.

6. (a) Derive the expression for Reflection and Transmission coefficients of an EM wave when it is incident normally on a dielectric.
   (b) Prove that $E_I = -E_r$ when the wave is normal incidence on a perfect Conductor.

7. (a) Write short notes on reflection coefficient and VSWR? Derive the relation between them.
   (b) A low transmission line of 100Ω characteristics impedance is connected to a load of 400Ω. Calculate the reflection coefficient and standing wave ratio.

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2206

II B.Tech II Semester Regular Examinations, April-2018.

DATABASE MANAGEMENT SYSTEMS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. [2+2+2+2+2+2]

a) Explain network data model.

b) Give syntaxes to Create and Alter a table

c) List aggregate functions supported by SQL.

d) Define 2 NF.

e) Illustrate transaction properties.

f) Write types of attribute in ER-Model.

PART-B

2. a) What is data independence? Discuss three tire schema architecture of data independence. [8]

   b) Explain DBMS applications. [4]

3. a) Explain the following terms:
   (i) Entity and entity set.
   (ii) Attribute and attribute sets.
   (iii) Relationship and relationship sets. [8]
   b) Differentiate aggregation and Inheritance. [4]

4. a) Give syntax for DML commands? Show their operations with an example? [8]
   b) Explain the role of views. What are the problems in view updating? [4]

5. a) What is meant by referential integrity? Explain. [6]

   b) Explain the importance of Null values in Relational Model. [6]

6. a) Explain 3NF with example and Compare 2NF and 3NF. [7]

   b) What is transaction? Mention the desirable properties of a transaction. [5]

7. a) Briefly discuss about various lock based mechanisms used in concurrency control. [6]

   b) What is an index? Explain its role in improving database access. [6]

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