Hall Ticket No : **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)
III/IV B. Tech I- Semester Regular Examinations Nov - 2017
DATA STRUCTURES
(EEE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1.
i. Define Array, how do you declare an Array and access Array elements?Explain with an example program to find sum of array elements. (6M)
ii. Implement a program to multiply two matrices. (6M)

(OR)

2.
i. what is a string and implement a program to check whether given string is palindrome or not. (6M)
ii. Discuss call by value and call by reference with an example program. (6M)

UNIT-II

3.
i. Explain structure with in structure with an example program.. (6M)
ii. Explain different file handling functions. (6M)

(OR)

4.
Write a program to count number of alphabets, digits and special characters in a given text file. (12M)

UNIT-III

5.
i. What is stack?Explain operations of Stack data structure with neat diagrams. (6M)
ii. Discuss various applications of stack data structure. (6M)

(OR)

6.
What is Dynamic memory allocation. Explain operations of single linked list with neat diagrams. (12M)

UNIT-IV

7.
i. Explain steps to convert general tree to binary tree with an example. (6M)
ii. Write function codes for tree traversals. (6M)

(OR)

8.
i. Write applications of binary trees. (6M)
ii. Construct binary tree using given data. (6M)
Post-order : C F I G B A H E D
In-order : C A F G I B D E H

UNIT-V

9.

i. Discuss alternative ways of representing graphs. (6M)

ii. implement binary search using recursion. (6M)

(OR)

10.

i. Explain prims algorithm by taking an example graph. (6M)

ii. Explain DFS by taking an example graph. (6M)

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Hall Ticket No : **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)
III/IV B. Tech I- Semester Regular Examinations Nov - 2017
ELECTRICAL POWER GENERATION & UTILIZATION
(EEE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1.	a)	What is energy? How the different forms of energies are converted into electricity?	**(4M)**
	b)	Sketch the layout of a modern steam power plant. Explain the function of each part there in.	**(8 M)**
		(OR)	
2.	a)	Explain the sources of energies available to generate electricity in Indian context.	**(4 M)**
	b)	Describe with a neat sketch any one type of cooling tower.	**(8 M)**

UNIT – II

3.	a)	Discuss the classification of various hydro-electric power plants.	**(6 M)**
	b)	Draw the general layout of nuclear power plant and explain the working.	**(6 M)**
4.	a)	Draw the typical layout of hydro station and explain the function of each component.	**(8 M)**
	b)	What is fast breeder reactor? Explain how it works.	**(4 M)**

UNIT – III

5.	a)	Draw and explain the open cycle gas turbine plant.	**(6 M)**
	b)	What is Magneto-Hydro-Dynamic (MHD) generation? Explain the basic principle of such generator with neat diagram?	**(6 M)**
		(OR)	
6.	a)	What are open cycle and closed cycle gas-turbine power plants. Explain the working of closed cycle gas –turbine power plant?	**(6 M)**
	b)	Explain the working of plasma converters (closed cycle) with a neat sketch. Also write the advantages and disadvantages.	**(6 M)**

UNIT – IV

7. a) Explain how the size and number of generator units are decided in a new generating station that is to be built. **(8 M)**

   b) What is tariff? Explain. **(4 M)**
   (i) the power factor tariff and (ii) flat rate tariff

(OR)

8. a) Explain load curve and load duration curve. Explain, how load duration curve is obtained from load curve? **(4 M)**

   b) Explain clearly the following: **(8 M)**

   (i) Diversity factor
   (ii) Maximum demand
   (iii) Demand factor
   (iv) Plant capacity factor
   (v) Plant use factor
   (vi) Connected load
   (vii) Maximum load
   (viii) Load factor

UNIT – V

9. a) What are the different types of electric heating methods? Explain dielectric heating with a neat sketch. **(8 M)**

   b) What are polar curve? Explain the importance as applied to light sources. **(4 M)**

(OR)

10. a) What are the different types of electric welding methods? Explain the flash-butt welding. **(8 M)**

    b) What is stroboscopic effect? How can it be avoided while using fluorescent lamps? **(4 M)**

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Hall Ticket No : **Question Paper Code :**

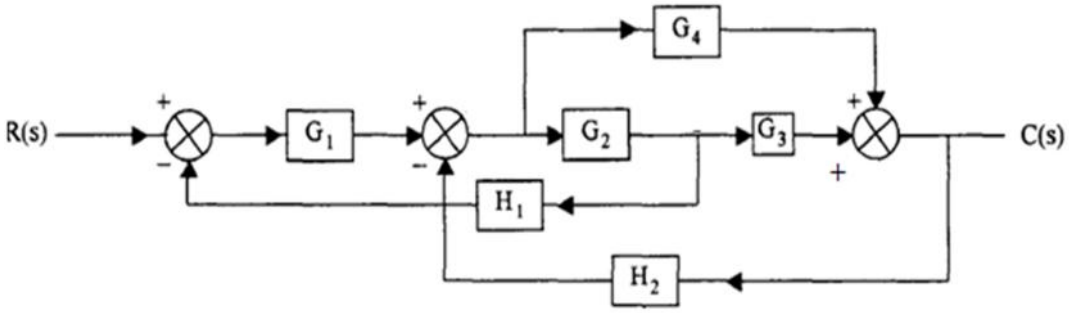
ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)
III/IV B. Tech I- Semester Regular Examinations Nov - 2017
LINEAR CONTROL SYSTEMS
(EEE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

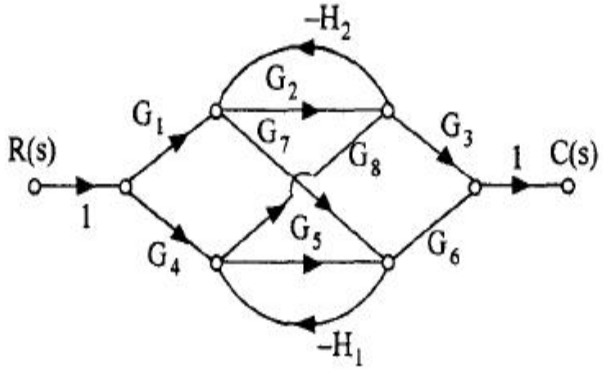
UNIT - I

1. a) Explain the Mason's gain formula. **(6 M)**
   b) By using block diagram reduction techniques, obtain the transfer function $\frac{C(s)}{R(s)}$ for the system shown below. **(6 M)**



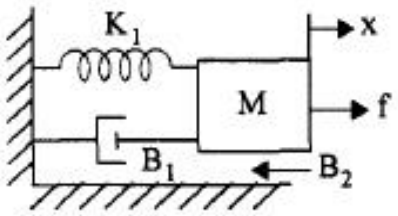
(OR)

2. a) Explain the block diagram reduction rules. **(6 M)**
   b) By using signal flow graph techniques, obtain the transfer function $\frac{C(s)}{R(s)}$ for the system shown below. **(6 M)**

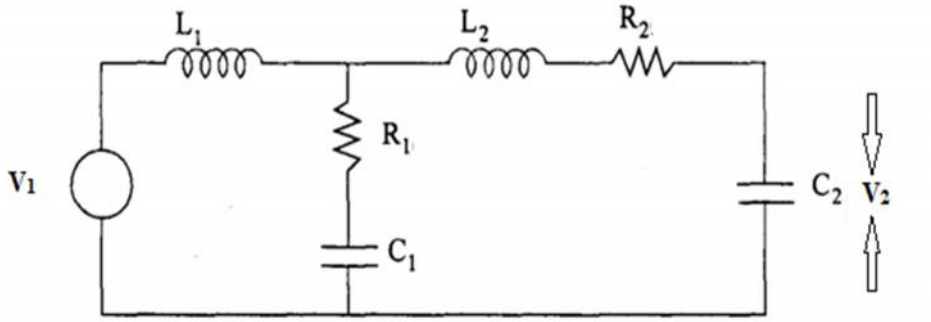


UNIT – II

3. a) Obtain the transfer function $\frac{X(s)}{F(s)}$ for the Mechanical system shown in figure. **(6 M)**

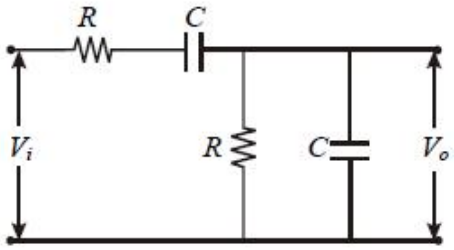


b) Obtain the transfer function $\frac{V_2(s)}{V_1(s)}$ for the Electrical system shown in figure. **(6 M)**

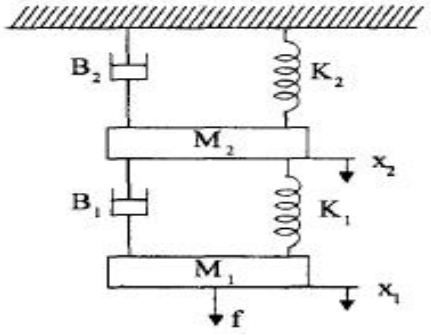


(OR)

4. a) Obtain the transfer function $\frac{V_0(s)}{V_i(s)}$ for the Electrical system shown in figure. **(6 M)**



b) Obtain the transfer function $\frac{X_1(s)}{F(s)}$ for the Mechanical system shown in figure. **(6 M)**



UNIT – III

5. a) Derive the expression for the unit step-response of a second-order under damped system. **(6 M)**

   b) Find the steady state error for unit step, unit ramp and unit acceleration inputs for the following unity feedback system $G(S) = \dfrac{10}{s(0.2s+1)(0.5s+1)}$ **(6 M)**

(OR)

6. a) The open loop transfer function of a unity feedback system is $G(s) = \dfrac{K}{s(1+s^2)}$. By what factor the gain '*K*' should be multiplied so that the damping ratio is increased from 0.2 to 0.8. **(6 M)**

   b) Explain the effect of PD controller of a typical second order system in terms of the time response specifications.. **(6 M)**

UNIT – IV

7. a) The open loop TF of a unity feedback system is $G(s) = \dfrac{K}{s(1+s)(1+2.5s)}$. Find the restriction on 'K', So that the closed loop system is stable. **(6 M)**

   b) Explain about Relative stability of a system. **(6 M)**

(OR)

8. a) Apply Routh criterion to check the stability of system with characteristic equation $S^6 + 9S^5 + 20S^4 + 12S^3 + 8S^2 + 16S + 16 = 0$ Also determine the number of roots on left and right of s-plane. **(6 M)**

   b) Sketch the Root locus and comment upon stability of the system whose open loop transfer function is given below: **(6 M)**

$$G(s)H(s) = \frac{K}{s(s+4)(s+5)}$$

UNIT – V

9. a) Distinguish between time and frequency domain analysis. **(6 M)**

   b) Draw the Bode plot for a unity feedback system characterized by the open loop T/F, $G(s) = \dfrac{100}{s(1+0.5s)(1+0.1s)}$. Also determine gain and phase cross over frequencies and margins. **(6 M)**

(OR)

10. a) Explain briefly about All Pass and Minimum Phase Systems. **(6 M)**

    b) Explain the Nyquist plot. How do you obtain the stability of a system using it? **(6 M)**

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ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

III/IV B. Tech I- Semester Regular Examinations Nov - 2017

Linear ICs and Applications

(EEE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1. a) What is the need for frequency compensation of op-amp circuits? Explain the pole-zero frequency compensation technique and mention its merits and demerits. **(8M)**
   b) Derive the voltage gain for the non-inverting amplifier. **(4M)**

(OR)

2. a) Define slew rate. What are the causes of slew rate in op-amp applications? **(5M)**
   b)Define CMRR. Give methods for improving CMRR **(3M)**
   c) A 741 Op-amp used as an inverting amplifier has R_1=100KΩ,R_f=10MΩ.Calculate maximum output offset voltage caused by input offset voltage and input bias current **(4M)**

UNIT-II

3. a)Realize an instrumentation amplifier with 3 op-amps and derive an equation for its output. **(8M)**
   b) What are the problems of an ideal differentiator and how it can can overcome in practical differentiator. **(4M)**

(OR)

4. a) Draw and explain the circuit of inverting Schmitt trigger with input and output waveforms. **(6M)**
   b)Draw the precision full-wave rectifier and explain its operation with necessary equations and waveforms **(6M)**

UNIT-III

5. a) Briefly explain the working of PLL with neat block diagram. **(8M)**
   b)Draw the PLL circuit as frequency multiplier and explain **(4M)**

(OR)

6. a)Explain the operation of Voltage controlled oscillator and draw the IC diagram of VCO **(8M)**
   b) Explain any two applications of PLL **(4M)**

UNIT-IV

7. a) What is the resolution of a DAC.Explain the R-2R ladder with equations. **(8M)**
   b) A 4 bit R/2R DAC has a reference voltage of 5 volts. What is the analog output for the input code 0101 **(4M)**

(OR)

8. a) Describe the operation of dual slope A/D converter with necessary diagrams. Give some of its advantages & disadvantages **(6M)**
   b) With neat sketch explain the principle and operation of successive approximation ADC **(6M)**

UNIT-IV

9. a) Draw the schematic diagram of a Wien bridge oscillator and explain its working. Also obtain the condition for frequency of oscillations **(6M)**
   b) Design a RC-phase shift oscillator to oscillate at 100Hz by using op-amp. **(6M)**

(OR)

10. a) Explain with neat diagram about Astable multivibrator using 555 Timer and derive its pulse width equation. **(8M)**
    b) What is the function of a regulator?. List and explain the characteristics of three Terminal IC voltage regulators **(4M)**

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ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)
III/IV B. Tech I- Semester Regular Examinations Nov - 2017

PULSES & DIGITAL CIRCUITS

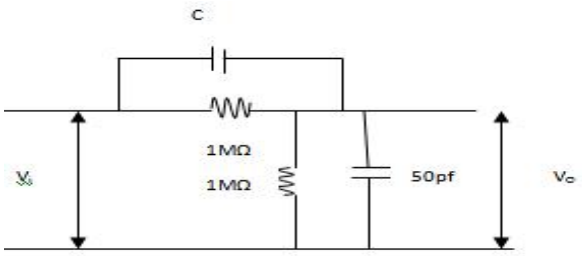
(EEE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1. a) Obtain & sketch the response of RC high pass circuit for a square wave input for different time constants. **(6M)**
   b) Compute and draw to scale the output waveform for i) C=50pf ii) C=75pf iii) C=25pf for an input of 20V step. Comment on each of the above cases. **(6M)**



(OR)

2. a) A symmetrical square wave of ±10V at 1 kHz frequency is applied to an RC circuit having 0.5ms of time constant. Evaluate the equations to calculate & Plot the output waveforms (i) Across the resistance R (ii) Across the capacitance C **(6M)**
   b) Derive the expressions for voltage of an RLC circuit when the input voltage is a Step signal. Also draw the voltage waveforms. . **(6M)**

UNIT-II

3. a) The input voltage V_i to the two level clipper. As shown in fig1. varies sinusoidal from 0 to 150v. Sketch the output voltage Vo. **(6M)**

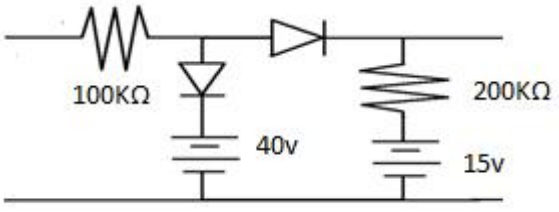


Figure 1

b) Design diode clamper to restore a d.c.level of 3V to an input signal of peak-to-peak value of 10V. Assume drop across the diode as 0.6V. **(6M)**

(OR)

4. a) Draw a two level clipper circuit with i) diodes ii) Zener diodes. Explain its operation with the help of its transfer characteristics. **(6M)**

   b) State and prove clamping circuit theorem and explain the steady state response of a practical clamping circuit to a square waveform. **(6M)**

UNIT-III

5. a) Explain how a BJT can be used as a switch. Explain $\mathbf{T_{ON}}$ and $\mathbf{T_{OFF}}$ times of the switching transistor with the help of relevant waveforms. **(6M)**

   b) What is an astable multivibrator? Explain & derive the expression for the period of oscillations. **(6M)**

(OR)

6. a) Design a collector coupled monostable for the following specifications: Voltage drop across saturated transistors are negligible. For the transistors, hfe(min) =20 and the base emitter cutoff voltage for the normally OFF transistor is -1v. Collector supply voltage is 6V & required collector current= 2mA. The delay time is 3000µs. choose R1=R2. Find Rc, R, R_1, C & V_{BB}. **(6M)**

   b) With the help of a circuit diagram and relevant waveforms, explain the operation of a Schmitt trigger.Give two applications of Schmitt trigger? **(6M)**

UNIT-IV

7. a) Draw the circuit of a UJT relaxation oscillator and explain its operation with waveforms. Derive an expression for the frequency of the output waveform. **(6M)**

   b) Define sweep speed error e_s, transmission e_t and sweep displacement error e_d and derive their relationship. **(6M)**

(OR)

8. a) Draw the circuit of Miller voltage sweep circuit and explain its operation with waveforms. Derive the expression for its sweep error. **(6M)**

   b) Draw the circuit diagram of a linear current sweep generator and explain its operation with waveforms. Also derive the expression for output. **(6M)**

UNIT-V

9. a) With the help of a neat circuit diagram, explain the operation of a TTL NAND gate with totem pole output. **(6M)**

   b) Explain the following terms as referred to logic gates: **(6M)**
   i)Fan-in ii) Fan out iii) Noise margin iv) power dissipation and v) propagation delay vi) Speed power product.

(OR)

10. a) Draw the circuit of CMOS NAND gate and CMOS NOR gate & explain the operation with the help of truth tables. **(6M)**

    b) Draw the circuit of an ECL gate and explain its operation with the help of truth table. **(6M)**

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