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

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Analog Electronic 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 at one place only

UNIT-I

1. a) How the Common base amplifier works and gets the 360^{o} phase shift. (4M)
   b) A BJT is found to have hie= 2.5KΩ, hre=10 -3 ,hfe= 120 & hoe=30μA/V. It is used as an CE amplifier with Rs = 2.2KΩ & R_L =10KΩ. Determine for the amplifier
   (i) Ri and Ro (ii) Ais = Io/Is (iii) Avs = Vo/Vs . (8M)

(OR)

2. a) Sketch and explain the small signal model of an FET common source amplifier
   (i) at low frequencies (ii) at high frequencies (8M)
   b) A 15-0-15v (rms) ideal transformer is used with a full wave rectifier circuit with diodes having forward drop of 1v. The load is a resistance of 100 Ω & a capacitor of 0.01F is used as a filter across the load resistance. Calculate the dc load current, voltage & ripple factor. (6M)

UNIT-II

3. a) Draw the circuit diagram of a RC coupled amplifier and explain its operation briefly. (6M)
   b) An RC coupled amplifier has a voltage gain of 200 in the frequency range of 200Hz & 20KHz.On either side of these frequencies ,the gain falls to 141.5 at 25Hz & 40KHz. Determine the bandwidth. (6M)

(OR)

4. a) Explain about the frequency response of RC coupled amplifier & derivations the expressions for lower & upper cutoff frequencies. (7M)
   b) The parameters of the RC coupled amplifier are hie=5 KΩ, hre=0 ,hfe= 330& hoe=0. Calculate the overall voltage gain for mid frequency range when 5 such stages are connected in cascade by RC coupling. Where the Load Resistance (R_L) = 10 KΩ and assume the source resistance is negligible. (5M)

UNIT-III

5. a) Differentiate different types of negative feedback topologies (4M)
   b) Design a current series feedback amplifier for the given specifications: VCC=12V, hfe =150, hie=1.2 KΩ, RS=800Ω, RL=1KΩ, A_V= 30 dB, Rf =100KΩ, Cc=Ce=0.1μf (8M)

(OR)

6. a) What do you understand by feedback in amplifiers? Explain the terms feedback factor & open loop gain. (6M)
   b) An amplifier with negative current feedback has the following specifications: hfe = 100, hie = 2KΩ, R_1 = 15KΩ, R_2 = 5.8KΩ, Re = 1KΩ & R_L = 550Ω. Calculate the values of voltage gain & input resistance of the amplifier with & without feedback. (6M)

UNIT-IV

7. a) Differentiate single tuned, double tuned and stagger tuned amplifiers. (4M)
   b) Draw the circuit diagram for single tuned amplifier & explain its working. (8M)

(OR)

8. a) Mention the reasons of oscillations in a tuned amplifier. (4M)
   b) Briefly explain about the tuned amplifier. (4M)
   c) The tuned amplifier is consists of R = 10KΩ, L = 20mH & C = 0.05μF. Draw the circuit & determine the (i) resonant frequency (ii) Q factor of the tank circuit (iii) bandwidth of the amplifier (4M)

UNIT-V

9. a) Explain the basic principle of an Oscillator. (4M)
   b) A 1 mH inductor is available. Choose the capacitor values in a Colpitts oscillator so that f = 1 MHz and feedback factor = 0.25. (8M)

(OR)

10. a) Describe the operation of RC phase shift oscillator with neat circuit diagram. (6M)
    b) In an oscillator circuit, the feedback network consists of LC circuit with C1=C2=10nF and L=110μH. Find the feedback factor and operating frequency. (6M)

*****

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

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Electrical Measurements

(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 at one place only

UNIT-I

1	a	Explain the working principle of PMMC instruments.	**6M**
	b	Explain the various methods of producing Controlling torques in an indicating instrument.	**6M**

(OR)

2	a	Explain the process of extending the range of an ammeter.	**6M**
	b	Write the differences between analog and digital meters.	**6M**

UNIT-II

3	a	Explain about single phase induction type energy meters.	**6M**
	b	Explain the concept of measurement of three phase reactive power.	**6M**

(OR)

4	a	Explain about power factor meters.	**6M**
	b	Derive the torque expression of a dynamo type wattmeter.	**6M**

UNIT-III

5	a	Explain the working of Kelvin's double bridge and obtain the condition for bridge balance.	**6M**
	b	Describe the working of Wein's bridge with the help of phasor diagram and also derive the balanced condition.	**6M**

(OR)

6	a	Explain the function and working of Wagner's earthing device.	**6M**
	b	Describe the working of Anderson's bridge with the help of phasor diagram and also derive the balanced condition.	**6M**

UNIT-IV

7	a	Describe the use of ballistic galvanometer for the measurement of flux density in a ring specimen.	**6M**
	b	Explain the working principle of Flux meter.	**6M**

(OR)

8	a	Explain the procedure to determine the B-H Curve.	**6M**
	b	How do you determine the leakage factor by using flux meter? Explain.	**6M**

UNIT-V

9	a	Explain the working of DC Crompton's Potentiometer.	**6M**
	b	Explain the working of AC polar Potentiometer.	**6M**

(OR)

10	a	Write the applications of AC and DC Potentiometers.	**6M**
	b	Distinguish between CTs and PTs.	**6M**

*****

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

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Engineering Mathematics-IV

(ECE, 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 at one place only

UNIT-I

1. (a) Find the regular function, whose imaginary part is $e^x Siny$ [6]

   (b) Apply the calculus of residues to evaluate $\int_{-\infty}^{\infty} \frac{1}{x^4+1} dx$ [6]

(OR)

2. (a) If $f(z)$ is an analytic function then prove that $\nabla^2 |f(z)|^2 = 4|f'(z)|^2$ [6]

   (b) Evaluate $\int_C \frac{z}{z^2+1} dz$, where $C: \left|z+\frac{1}{2}\right| = 2$ [6]

UNIT-II

3. (a) Prove with the usual notations that $\left(E^{1/2}+E^{-1/2}\right)(1+\Delta)^{1/2} = 2+\Delta$ [6]

   (b) From the following table, estimate the number of students who obtained marks between 40 and 45 [6]

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

(OR)

4. (a) Show that $\Delta + \nabla = \frac{\Delta}{\nabla} - \frac{\nabla}{\Delta}$ [6]

   (b) Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Evaluate *f(9)*using Newton's divided difference formula [6]

UNIT-III

5. (a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Simpson's 3/8th rule taking *h=1/6* [6]

(b) Given that [6]

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

find $\frac{dy}{dx}, \frac{d^2y}{dx^2}$ at *x=1.1*

(OR)

6.(a) Use Simpson's 1/3rd rule to find $\int_0^{0.6} e^{-x^2} dx$ by taking seven ordinates. [6]

(b) Evaluate $\int_0^1 \frac{dx}{1+x}$ applying Trapezoidal rule [6]

UNIT-IV

7 (a) If $Z(u_n) = \frac{2z^2+3z+4}{(z-3)^3}$, $|z|>3$, then find u_1, u_2, u_3 [6]

(b) Solve $u_{n+2} + 6u_{n+1} + 9u_n = 2^n, u_0 = u_1 = 0$ by Z-transforms. [6]

(OR)

8. (a) Using convolution theorem evaluate the inverse Z-transform of the $\frac{z^2}{(z-1)(z-3)}$ [6]

(b) Solve $u_{n+2} + 6u_{n+1} + 9u_n = 2^n, u_0 = u_1 = 0$ by Z-transforms. [6]

UNIT-V

9. (a) Two independent samples of 7 items respectively had the following values

Sample-I	11	11	13	11	15	9	12	4
Sample-II	9	11	10	13	9	8	10	-

Is the difference between the means of samples of significant? [6]

(b)A die was thrown 264 times with the following frequency results [6]

No. of appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	52

Test whether the die is un-biased?.

(OR)

10. (a) Find the student's –'**t**' for the following variable values in a sample of eight:-4,-2,-2,0,2,2,3,3; taking the mean of the universe to be zero. [6]
(b)A machinist is making engine parts with axle diameter of 0.7inch. A random sample of 10 parts shows mean diameter 0.742 inch with a standard deviation of 0.04inch.On the basis of this sample, would you say that the work is inferior? [6]

*****

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

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Microprocessors and Microcontrollers

(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 at one place only

UNIT-I

1. a.	Explain the Intel 8085 microprocessor architecture with neat diagram.	8M
b.	Write short notes on 8085 instructions in various groups. Give an example of an instruction for each group.	4M
	(OR)	
2. a.	Draw and Explain the timing diagram for memory read and memory write operation.	6M
b.	Explain the pin configuration of Intel 8085 microprocessor.	6M

UNIT-II

3. a.	Discuss various types of addressing modes of Intel 8085 with suitable examples.	8M
b.	Distinguish between the memories mapped I/O and peripheral I/O.	4M
	(OR)	
4. a.	Compare static RAM and dynamic RAM.	4M
b.	Explain the 8085 interfacing circuit to interface EPROM.	6M
c.	What is cache memory?	2M

UNIT-III

5. a.	Draw the architectural diagram of 8086 microprocessors and explain each in detail.	8M
b.	Write brief notes of bus cycle in 8086.	4M
	(OR)	
6. a.	Draw the register organization of 8086 microprocessor and explain its operation.	7M
b.	Explain the memory mapping techniques of 8086.	5M

UNIT-IV

7. a.	Discuss the process of stepper motor interfacing.	6M
b.	Explain the modes of operation of 8253 timer.	6M
	(OR)	
8. a.	Write short notes on 8279 keyboard and display controller.	7M
b.	Explain the block diagram of 8251 (USART).	5M

UNIT-V

9. a.	Draw the pin Diagram of 8051 and explain the function of various signals.	8M
b.	Explain various types of jump instructions in 8051.	4M
	(OR)	
10. a.	Draw the circuit diagram to interface the DAC to micro controller and explain.	6M
b.	How to interface a 7 segment display using 8051 microcontroller.	6M

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

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Performance of Electrical Machines-I

(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 at one place only

UNIT-I

1.a	Draw with suitable sketches, the main parts of DC Machine. Explain the main functions of each part and material with which it is made up of.	**8M**
b	An eight pole DC shunt generator with 778 wave connected armature conductors running at 500 rpm supplies a load of 12.5 ohms resistance at a terminal voltage of 250 volts. The armature resistance is 0.24 ohm and field resistance is 250 ohms. Find the armature current, the induced EMF and flux per pole.	**4M**

(OR)

2.a	What is armature reaction? What are its effects? Explain.	**6M**
b	A station contains four separately excited DC Generators which operate in parallel. Each generator has an armature resistance of 0.1 ohm and each one shares equally a total load of 480 A at 240V. The external load has a constant resistance. If EMF of one of the generators is raised to 260V, others remaining unaltered, determine new load sharing and new terminal voltage.	**6M**

UNIT-II

3.a	Explain with neat sketch, the working of operation of Three Point Starter. Mention its Merits and Demerits.	**6M**
b	A DC Series Motor running a fan at 1000 rpm takes 50 A from 250 V mains. The armature plus series field resistance is 0.6 ohm. If an additional resistance of 4.4 ohms is inserted in series with armature circuit, find motor speed when the field flux is proportional to armature current.	**6M**

(OR)

4.a	Derive an expression for the armature developed torque of a DC Motor.	**6M**
b	A 6-pole dc motor has wave connected armature with 87 slots each containing 6 conductors. The flux per pole is 20 mWb and the armature has a resistance of 0.13 ohm. Calculate the speed when the motor is running on a 240 V dc supply and taking armature current of 80 A. Calculate also the torque developed by armature.	**6M**

UNIT-III

5.a List the classification of Losses occurring in DC Motors. **6M**

b A 500 V DC Shunt motor takes 8 amps on no-load. The armature and field resistances are 0.2 ohm and 250 ohms respectively. Find the efficiency of the machine when run as a motor taking a current of 90 A from the supply. **6M**

(OR)

6.a With the help of neat circuit diagram, explain the procedure to conduct Hopkinson's test on two similar shunt machines. **6M**

b The following data is obtained from Field's test on a pair of DC series machines: **6M**

	Motor	Generator
Armature current (A)	60 A	46 A
Armature Voltage (V)	500 V	450 V
Field winding drop (V)	40 V	40 V

Armature resistance of each machine is 0.25 ohm. Calculate efficiency of motor.

UNIT-IV

7.a Explain the Principle of operation of Single Phase Transformer. Derive the EMF equation of a Single-phase Transformer. **6M**

b The efficiency of a 400 kVA, single phase transformer is 98.77% when delivering full load at 0.8 pf lagging and 99.13% at half load at unity p.f. Calculate (i) Iron Losses and (ii) Full load Copper Loss. **6M**

(OR)

8.a Explain in detail the Equivalent circuit of single phase transformer referred to both primary as well as secondary. **6M**

b Two single phase transformers A and B one of 100 kVA and the other of 50 kVA are connected in parallel to the same bus bars on primary side, their no load secondary voltages being 1000 V and 950 V respectively. Their resistances are 2% and 2.5% respectively and their reactances 8% and 6% respectively. Calculate no load circulating currents in their secondaries. **6M**

UNIT-V

9. Explain the various connections for Three Phase Transformers. **12M**

(OR)

10.a Explain how a 3-ph voltage system can be converted into 2-ph voltage system by Scott Connection. **6M**

b Explain the operation of a Single phase auto-transformer. Derive the expression for saving of copper in auto transformer as compared with an equivalent two winding transformer. **6M**

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

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Signals & 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 at one place only

UNIT-I

1. a.consider the discrete –time signal $x[n] = 1 - \sum_{k=3}^{\infty} \delta[n-1-k]$. (6M)

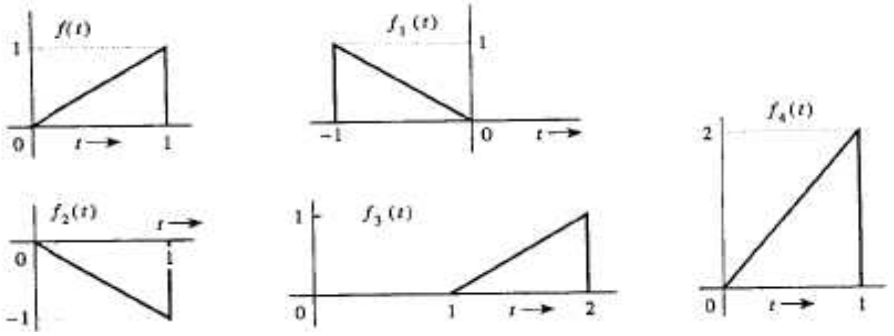
   Determine the values of the integers M and n_0 so that $x[n]$may be expressed as $x[n] = u[Mn - n_0]$.

   b. Consider a periodic signal $x(t) = \begin{cases} 1, & 0 \le t \le 1 \\ -2, & 1 < t < 2 \end{cases}$ with period T=2. The derivative of this signal is related to the "impulse train" $g(t) = \sum_{k=-\infty}^{\infty} \delta(t - 2k)$ with period T=2 . It can be shown that

   $\frac{dx(t)}{dt} = A_1\, g(t - t_1) + A_2 g(t - t_2)$. Determine the values of A_1, t_1, A_2, t_2. (6M)

(OR)

2. a. Check whether the following systems are (1)static/dynamic (2)Linear/nonlinear (3)causal/noncausal (4) time variant/time invariant (5) stable/unstable (i) $y(t)=x(t^2)$
   (ii) $y(n)=x(n)+nx(n-1)$ (6M)
   b.Find the energies of the following signals and Comment on the effect on sign change , time shifting and doubling of the signal?



(6M)

UNIT-II

3. a) Write the properties of Impulse response of An LTI system? (6M)

   b) Find the convolution of the following signals using Graphical method ?
   $x(t) = e^{-2t}u(t)$ and $h(t) = u(t-2)$ (6M)

(OR)

4. a.The impulse Response of a LTI System is $h(n) = a^n u(n)\ with\ -1 < a < 1$. Determine the value of the step response as n $\rightarrow \infty$ (6M)
b)Derive the relation between input and output of the LTI system (6M)

UNIT-III

5. a) state and prove duality property and Find the Fourier transform of the signal $g(t) = \frac{t^2}{4+t^2}$ (6M)
b)Find the exponential fourier coefficients of full wave rectified output waveform? (6M)

(OR)

6. a. Find the Fourier transform of the following and sketch Magnitude and Phase spectrum
x(t)=t $e^{-at}u(t)$ a>0 (6M)
b. obtain inverse laplace transform of the X(s) for all possible ROCs $X(s) = \frac{1}{(s^2+2.5s+1)s}$ (6M)

UNIT-IV

7. a.Find the inverse DTFT of the $Y(e^{i\mu})$ given as $Y(e^{i\mu}) = \left(\frac{1}{1-\sim e^{-j\mu}}\right)^2$ (6M)
b.State and prove initial and final value theorems of Z-Transform (6M)

(OR)

8. a) Find the inverse z-transform of $X(Z) = \frac{1}{1-1.5Z^{-1}+0.5Z^{-2}}$ for ROC: $0.5 < |Z| < 1$ (6M)
b) Solve the following difference equation for y(n) using z-transform and the specified initial condition $y(n) - y(n-1) + \frac{1}{4}y(n-2) = x(n)$; y(-1)=2 and y(-2)=4.
where $x(n) = 2\left(\frac{1}{8}\right)^n$ u(n) (6M)

UNIT-V

9. a.State and Prove Ideal Sampling Theorem for Bandlimited signals? (8M)
b. Consider a signal x(t)= Cos(2000πt)+10Sin(10000πt)+20Cos(5000πt).determine the Smapling Rate ? (4M)

(OR)

10. Discuss About a)band pass Sampling (12M)
b)Natural Sampling
c)Flat Top Sampling.