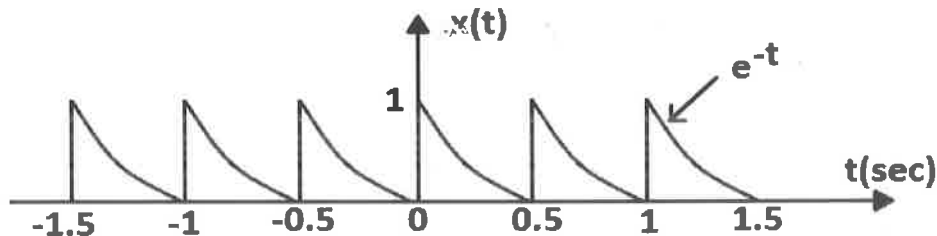


**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**Subject: Linear System AnalysisBranch: **EEE**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2Mark=10 Marks**

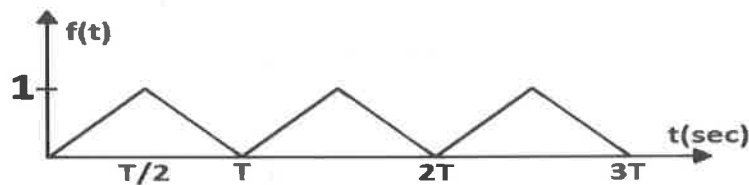
1. Find and sketch the even and odd components of  $tu(t)$ .
2. What are the types of Fourier series and write them?
3. If unit step response of a network is  $e^{-3t}u(t)$ , What is the impulse response?
4. Find the Nyquist rate and the Nyquist interval for the signal  $\sin(100\pi t) + \sin(50\pi t)$ .
5. Differentiate continuous and discrete time signals.

**PART-B**Answer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

1. Explain about the step signal and draw the waveforms represented by following step function. (i)  
 $f_1(t) = 5U(t-1)$  (ii)  $f_2(t) = -5U(t-2)$   
 (iii)  $f(t) = f_1(t) + f_2(t)$  (iv)  $f(t) = f_1(t) - f_2(t)$ .
2. Explain the classification of continuous time systems.
3. Find Trigonometric Fourier Series for the periodic signal shown in below figure.



4. a) List the Dirichlet Conditions in Fourier series.  
 b) Write the relationship between Fourier Transforms and Laplace Transforms.
5. a) Find the Laplace transform of the periodic signal shown in below figure.



- b) Find the Laplace inverse of  $1/[s(s+4)]$  using convolution integral.
6. a) Explain the advantage of using Laplace transform method.  
 b) Evaluate the convolution of the functions  $f_1(t) = u(t)$  &  $f_2(t) = e^{-t}u(t)$ . Also compare the results with the inverse transform of  $F_1(s)F_2(s)$ .
7. a) Write short notes on Physical interpretation of power density function.  
 b) Explain the effects of under sampling of a signal.
8. a) Write short notes on Differentiation property in Z – domain.  
 b) Explain the energy density spectrum [ESD]



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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**Subject: Power Generation & DistributionBranch: **EEE****Time: 3 hours****Max. Marks: 60****PART – A****Answer ALL questions of the following****5x2M=10 Marks**

1. What is the function of moderator
2. List out the advantages and disadvantages of ring mains
3. What is the Utility of instrument transformers in sub stations
4. Explain, why a consumer having low power factor is charged at higher rates
5. Define the terms load factor and diversity factor.

**PART – B****Answer any FIVE questions of the following****5x10M=50 Marks**

1. a) Describe the fast breeder reactor with neat sketch? Discuss its merits.  
b) What is the role of Super Heater & Economizer in Thermal Power Plant?
2. a) Explain briefly about ash handling mechanism in a thermal plant.  
b) Discuss about the nuclear waste disposal mechanism in a nuclear power plant.
3. a) Describe briefly the different types of D.C distribution  
b) A three phase ring main PQRS fed at P of 11 kV, supplies balanced loads of 50A at 0.8 p.f lagging at Q, 120A at unity p.f at R and 70A at 0.866 lagging at S, the resistances being referred to the various sections are: Section PQ =  $(1+j0.6)$  ohm; section QR =  $(1.2+j0.9)$  ohm; section RS =  $(0.8+j0.5)$  ohm; section SP =  $(3+j2)$  ohm. Determine the currents in various sections and station bus-bar voltages at Q, R and S.
4. A DC distributor cable is 1000m long and is loaded as under distance from

feeding point A (mts) :	250	750	1000
load (Amps) :	100	200	300

The resistance of each conductor is 0.025 per km. Find the voltage at each load point if the voltage at the feeding point A is maintained at 250V.

5. a) Find the thermal efficiency of Steam power station?  
b) Draw the single line diagram of Gas insulated substation.

6. a) Explain about Radial distributor and ring main distributor in a distribution system.
- b) A 500 m long single phase AC distributor has a total impedance of  $(0.02 + j0.04)$  ohms and is fed from one end at 230V. It is loaded as follows: 50A at UPF, 200 m from feeding point, 100A at 0.8 p.f lag, 300 m from feeding point, 50A at 0.7 p.f lag at the far end. Calculate the total voltage drop and voltage at the far end.
7. Explain the following Voltage Control methods
- Shunt Capacitor
  - Synchronous Capacitor
8. a) What do you understand by “economics of power generation”? Write short notes on cost analysis of power generation.
- b) A power station has the following daily load cycle

Time in hours	6-8	8-12	12-16	16-20	20-24	24-6
Load in MW	20	40	60	20	50	20

Plot the load curve and load duration curve. Also calculate the energy generated per day.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**II B.TECH II SEMESTER REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-2018**Subject: Special Functions and Complex Analysis

Branch: Common to EEE &amp; ECE

Time: 3 hours

Max. Marks: 60

**PART-A**

Answer ALL questions of the following

5 x 2 M=10 M

1. Evaluate  $\int_0^1 \frac{x^2 dx}{\sqrt{1-x^4}}$  using  $\beta$ ,  $\Gamma$  functions.
2. Evaluate  $\int x^3 J_0(x) dx$
3. Prove that the real and imaginary parts of an analytic function  $f(z) = z^2$  satisfy Cauchy-Riemann equations.
4. Expand  $\log(1+z)$  by Taylor series about  $z=0$
5. Under the transformation  $w = \frac{z-i}{1-iz}$ , find the image of the circle  $|w|=1$ .

**PART-B**

Answer any FIVE questions of the following

5 x 10 M=50 M

1. Using the Frobenius method find the series solution of the differential equation  $x^2 y'' - xy' + (1-x)y = 0$  about its regular singular point.
2. Solve in series the equation  $\frac{d^2 y}{dx^2} + x^2 y = 0$
3. a) Express  $P(x) = x^4 + 2x^3 + 2x^2 - x - 3$  in terms of Legendre Polynomials  
b) Prove that  $\int_{-1}^1 x P_n(x) P_{n-1}(x) dx = \frac{2n}{4n^2 - 1}$
4. a) Prove  $\int_0^1 p_n(x) dx = 0$ , when  $n$  is even  
b) Prove that  $x J_n'(x) = n J_n(x) - x J_{n+1}(x)$
5. Show that the function  $f(z) = \begin{cases} \frac{z^5}{|z|^4}, & z \neq 0 \\ 0 & z = 0 \end{cases}$  satisfied the Cauchy - Riemann equations but  $f(z)$  is not differentiable at 0.
6. a) Evaluate  $\int_C \frac{dz}{z^2+9}$  where  $C$  is circle  $|z-3i|=4$   
b) Use Cauchy integral formula to evaluate  $\int_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} dz$ , where  $C$  is the circle  $|z|=3$
7. a) Find the poles of the function  $f(z) = \frac{1}{(z+1)(z+3)}$  and residues at these points.  
b) Evaluate  $\int_C \frac{ze^z}{z^2+9} dz$  where  $C$  is  $|z|=5$  by Cauchy's Residues theorem.
8. a) Show that the image of the hyperbola  $x^2 - y^2 = 1$  under the transformation  $w = \frac{1}{z}$  is the lemniscate  $p^2 = \cos(2\varphi)$ .  
b) Find the image of the circle  $|z-2i|=2$ , under the transformation  $w = \frac{1}{z}$



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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**Subject: Digital ElectronicsBranch: **EEE (Readmitted Students)**

Time: 3 hours

Max. Marks: 60

**PART-A**

Answer ALL questions of the following

5 x 2 M=10 M

1. Perform the subtraction of the following unsigned numbers using 2's complement method  
110100-10101
2. State the limitation of K – map.
3. Draw the logic diagram of a half adder using basic gates.
4. Draw a 4-bit ring counter using DFFs
5. State FSM compatibilities.

**PART-B**

Answer any FIVE questions of the following

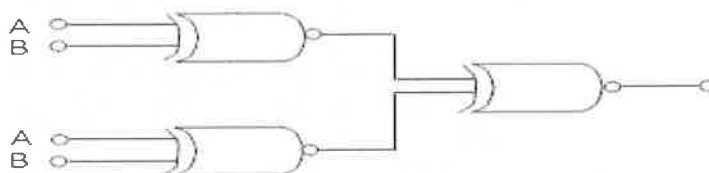
5 x 10 M=50 M

1. a) Construct a table for 4-3-2-1 weighted code and write 9154 using this code  
b) Given that  $(292)_{10} = (1204)_b$ . Determine  $b$
2. a) Use Hamming Codes and ODD parity to say whether the following transmissions are correct. If they are not, calculate the correct bit pattern: [6M]

Position	1	2	3	4	5	6	7
Bit	1	1	0	0	1	1	1

Position	1	2	3	4	5	6	7
Bit	1	1	1	0	1	0	1

- b) Find the 9's complement of decimal 5.137 and express it in 2421 code. [4M]
3. a) Using the Quine-McCluskey method of tabular reduction, minimize the given combinational single-output function  $f(w,x,y,z) = \sum m(0,1,5,7,8,10,14,15)$ . [8M]  
b) Find the output of the circuit shown in fig. [2M]



4. a) Simplify the function using Karnaugh map method  $F(A,B,C,D) = \sum (4,5,7,12,14,15) + \sum d(3,8,10)$ .  
b) Simplify using K-map  
 $F(A,B,C,D) = \sum (0,1,2,3,4,8,9,12)$

5. a) Design a combinational circuit for an octal to binary encoder.  
b) Implement the following Boolean functions using PAL.  
 $w(A,B,C,D) = \sum(0,2,6,7,8,9,12,13)$   
 $x(A,B,C,D) = \sum(0,2,6,7,8,9,12,13,14)$   
 $y(A,B,C,D) = \sum(2,3,8,9,10,12,13)$   
 $z(A,B,C,D) = \sum(1,3,4,6,9,12,14)$
6. a) Design 4x16 decoder using 3x8 decoders  
b) Design a 4-bit magnitude comparator using logic gates.
7. a) Design a left – shift and right – shift register.  
b) Convert a D ff to i) JK ii) SR iii) T
8. Design a sequence detector to detect a sequence of 110 using Moore Machine.



**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajigiri (Dist), Hyderabad**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**Subject: Control SystemsBranch: **EEE**

Time: 3 hours

Max. Marks: 60

**PART-A**

Answer ALL Questions of the following

5x2M=10M

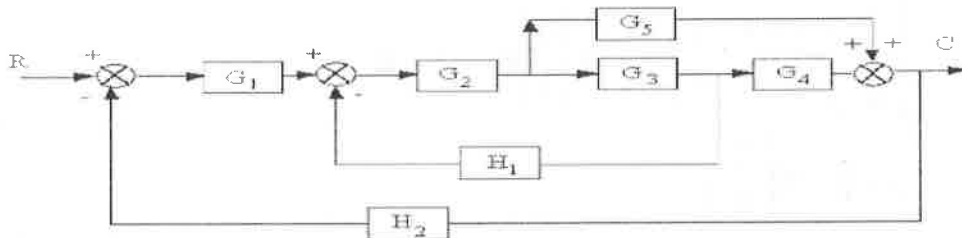
1. Define transmittance, sink and source.
2. What is the difference between steady state response and transient response of a control system?
3. Define the terms (i) Absolute Stability (ii) Marginal Stability.
4. Discuss the frequency response? What are the advantages of frequency response analysis?
5. What is State, State variable and State vector?

**PART-B**

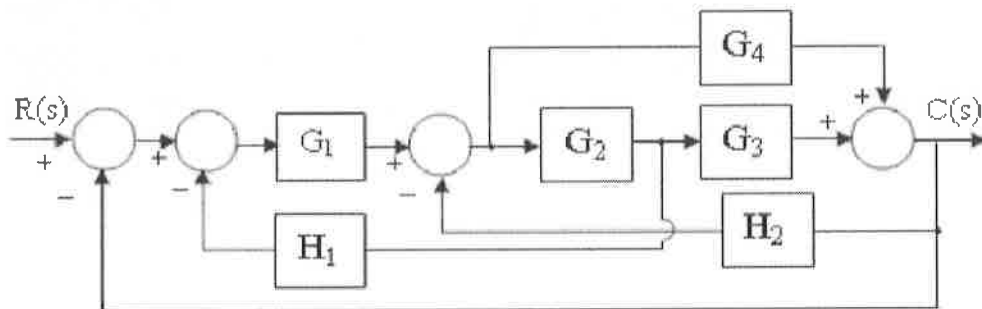
Answer any FIVE Questions of the following

5x10M=50M

1. a) Discuss the effect of feedback on Gain and Stability. 4M  
b) Determine the overall transfer function  $C(s)/R(s)$  for the system shown in Fig. 6M



2. a) What do you mean by the sensitivity of the control system and discuss the effect of feedback on sensitivity 3M  
b) Convert the block diagram to signal flow graph and determine the transfer function using masans gain formula. 7M



3. a) Define steady state error constant  $K_p$ ,  $K_v$  and  $K_a$ . Give the values of these error constants for type-0, type-1, and type-2 systems?  
 b) A unity feedback system has  $G(s) = 1/s(1+s)$ , the input to the system is described by  $r(t) = 4 + 6t + 2t^3$ . Find the generalized error coefficients and steady state error.
4. a) What are P, I and D controller? Why D controller is not used in control system?  
 b) What are generalized error constants? State the advantages and significance of generalized error constants.
5. The open loop transfer function of a control system is given by  $G(s)H(s) = \frac{K}{s(s+6)(s^2+4s+13)}$ . Sketch the complete root-locus.
6. Explain the steps for construction of root locus and from the given root locus plot how can we find the gain margin and phase margin for the specified value of 'K'.
7. For a certain control system  $G(s)H(s) = \frac{K}{s(s+2)(s+10)}$ . sketch the Nyquist plot.
8. A system is characterized by the following state space equations.

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u; \quad t > 0$$

$$y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

- i) Find the transfer function of the system, ii) Compute the state transition matrix and
- iii) Solve the state equation for the unit step input under zero initial conditions.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**II B.TECH II SEMESTER REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-2018**Subject: **DC Machines & Transformers**Branch: **EEE**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2Mark=10 Marks**

1. On what factors, the EMF induced in a coil rotating in a magnetic field is depending.
2. An 8-Pole, 250V WAVE wound DC Generator has 400 Conductors, if the generator is to be LAP wound, calculate the no of conductors required.
3. What do you mean by “back emf” in DC motor
4. Draw the diagram of core & shell type transformer.
5. Specify the applications auto transformer

**PART-B**Answer any **FIVE** questions of the following**5x10 Marks= 50Marks**

1. a) What are the special applications where the electric field is used as a coupling medium for electromechanical energy conversion?  
b) Explain the distribution of mmf of the distributed windings.
2. a) Discuss about Magnetically induced EMF in rotating machines  
b) Derive the expressions for torque in a singly excited magnetic system.
3. a) Draw and explain Load characteristics of DC Shunt and DC Series Generators.  
b) Explain commutation of DC Machine with neat diagrams.
4. a) Explain the complete characteristics of long shunt and short shunt compound generator .  
b) Enumerate various causes of failure of voltage build up of dc generators and suggest the necessary remedial measures. [6+4]
5. a) Derive an expression for torque of the motor.  
b) A 200 V dc shunt motor runs at 1000 rpm at no-load and draws 4 A. The armature and field resistances are 0.2 ohm and 200 ohm respectively. Calculate the speed, torque and efficiency of the motor, when it is loaded taking a current of 40 A.
6. a) Explain with diagram how Hopkinson’s test is performed in dc machines. What are the advantages and disadvantages of this test?  
b) A 250 V, 15 kW shunt motor has a maximum efficiency of 88% and a speed of 700 rpm when delivering 80% of its rated output. The resistance of the field winding is 100  $\Omega$ . Determine the efficiency and speed when the motor draws a current of 78 A from the mains.

7. a) State the condition for conducting Sumpner's test on a transformer. [4]  
 b) The following data were obtained for a distribution transformer tested at 20-kVA, 60-Hz, 2400/240V

	Voltage(V)	Current(A)	Power(W)
With high-voltage winding circuited open	240	1.038	122
With low-voltage terminals circuited short	61.3	8.33	257

- i) Compute the efficiency at full-load current and the rated terminal voltage at 0.8 power factor.
- ii) Assume that the load power factor is varied while the load current and secondary terminal voltage are held constant. Use a phasor diagram to determine the load power factor for which the regulation is greatest. [6]
8. A 500-kVA, 3-phase, 50-Hz, transformer has a voltage ratio (line voltages) of 33/11 – kV and is delta/star connected. The resistance per phase are: high voltage 35 ohm, low voltage 0.876 ohm and the iron loss is 3050 W. calculate the value of efficiency at full load and one-half of full –load respectively (a) at unity p.f and (b) 0.8 p.f.

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**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**

Subject: Environmental Sciences

Branch: Common to CE, ME, Mining & EEE (Readmitted Student only)

Time: 3 hours

Max. Marks: 60

**PART – A**

Answer ALL questions of the following

5x2Mark=10 Marks

1. Explain energy pyramid with help of sketch
2. What is an aquifer? Discuss its types.
3. Distinguish between point and non point sources of pollution.
4. Give the reactions involved in the formation of ozone layer
5. Write a note on Clean Development Mechanism.

**PART-B**

Answer any FIVE questions of the following

5x10 Marks= 50Marks

1. a) Discuss the different types of ecological pyramids.  
b) Explain the concept of food chain and food web in ecosystems with help of examples.
2. a) Write short notes on Pound eco-system.  
b) Give a brief account on classification of ecosystems.
3. a) Explain the environmental issues related to thermal power stations.  
b) Explain the causes for droughts and floods discuss the environmental impacts of droughts and floods.
4. Explain about the use and over utilization of surface and ground water.
5. a) Write short notes on Marine pollution.  
b) Write short notes on Automobile pollution.
6. Enumerate various methods for control of air pollutants.
7. a) Discuss about ODS.  
b) Write a short note on earth summit.
8. Considering population growth trends into consideration, explain the reasons of population.  
Also highlight the methods adopted for controlling growth of population.



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**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**Subject: Pulse And Digital Circuits

Branch: Common to EEE &amp; ECE

Time: 3 hours

Max. Marks: 60

**PART – A****I. Answer ALL questions of the following****5x2Mark=10 Marks**

1. Explain Balanced Attenuator
2. Explain the negative clamper circuit.
3. List the applications of Bi stable multivibrator.
4. Realize 2 input AND gate under DTL family?
5. What are the various methods of generation sweep voltages?

**PART-B****Answer any FIVE Questions of the following****5x10 Marks= 50Marks**

1. A 1kHz symmetrical square wave of  $\pm 12V$  is applied to RC circuit having 1ms time constant. Calculate and plot the output for the RC configuration as
  - i) High pass circuit
  - ii) Low pass circuit
2. a) Write a short note on Compensated attenuator  
b) Obtain the response of a high pass RC circuit for exponential input.
3. a) Write a short note on Clamping theorem.  
b) Explain positive clamper with neat diagram and wave forms.
4. Explain how to eliminate hysteresis in the regenerative comparator.
5. a) Write a short note on Schmitt Trigger  
b) Write a short note on Collector Catching diodes.
6. a) Write a short note on Triggering Techniques.  
b) Write a short note on Commutating capacitors.
7. a) Sketch the circuit of XOR gate using basic gates and explain its truth table.  
b) Draw the diagram of OR gate using diode and transistors and explain the operation.
8. Explain the principle of synchronization in sweep circuits and describe how frequency division synchronization is done in Astable relaxation circuits.





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**II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018**

Subject: Human Values and Professional Ethics

Branch: **EEE**

**Time: 3 hours**

**Max. Marks: 60**

**PART – A**

**Answer ALL questions of the following**

**5x2Mark=10 Marks**

1. How an 'empathetic' individual understands others very well?
2. List out few variety of Moral Issues.
3. How do you differentiate Right and Wrong?
4. Discuss the importance of Understanding Self.
5. Discuss briefly about Intellectual Property Rights.

**PART-B**

**Answer any FIVE Questions of the following**

**5x10 Marks= 50Marks**

1. Why you need to have courage to be honest in the profession and society?
2. Write the differences between integrity and honesty.
3. a) Distinguish between Consensus and Controversy.  
b) Write short notes on Customs and Religion.
4. Discuss the theory of Moral Development formulated by Lawrence Kohlberg and brief on customs and religion role in development of ethics in Individuals professional life.
5. a) What role 'Commitment' plays in maintaining good relationships?  
b) Define principle of 'Cooperation'.
6. Discuss the following briefly.  
a) Sense of Humour  
b) Commitment
7. Write an essay on Humanistic Universal Order.
8. Write short notes on  
a) Collective bargaining.  
b) Discrimination.

