Code No.: **40228**

MR14

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 SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Principles of Electrical Engineering**

Branch: **ECE**

Time: 3 hours **Max. Marks: 75**

PART-A

I. Answer ALL Questions of the following **5x1M=5M**

1. Define Transient Response and Steady state response.
2. Z11=2 Ω, Z12=1 Ω,Z21=6 Ω. Calculate Z22.
3. Define Symmetrical attenuators.
4. What is difference between generator and motor.
5. Define voltage regulation in transformer.

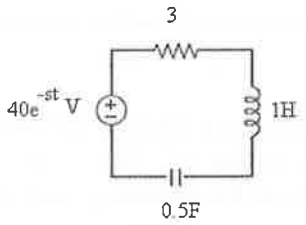
II. Answer ALL Questions of the following **10x2M=20M**

1. Define time constants for series RL and RC circuit.
2. Explain about Laplace transform application to inductor with diagram.
3. Write ABCD parameters in terms of Z and Y parameters.
4. Explain about 2 two-port networks connected in series.
5. Define attenuators. What are different types of symmetrical attenuators.
6. What are different filter networks.
7. Explain different types of losses in DC machine.
8. Define Shaft Torque and give its equation.
9. Draw and explain phasor diagram of single phase transformer on no load.
10. Why is transformer rated in KVA.

PART-B

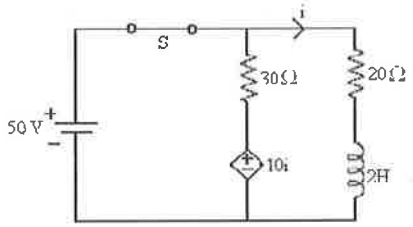
Answer ALL Questions of the following **5x10M=50M**

1. a. Derive complete solution for series RC circuit.
b. Find Complete solution for given circuit for i(0) = 0 and Vc(0) = 0

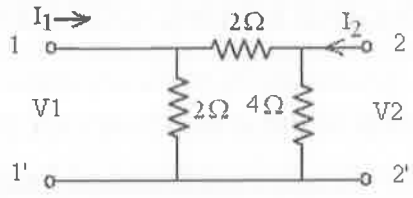


OR

2.a. Derive complete solution for series RLC circuit for various conditions.
b. For the below circuit, find the current in 20Ω when the switch is opened at t = 0.

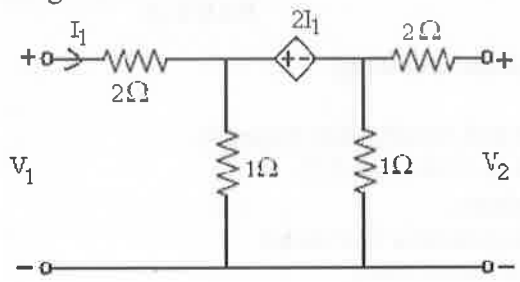


3. Find ABCD and h parameters for the given circuit.



OR

4. **a.** Explain interconnection of two port networks connected in parallel connection.
   b. Derive Y parameters for the given network below.



5. Design a band elimination filter having a design impedance of 600Ω and cut – off frequencies f1 = 2 KHz and f2 = 6 KHZ.

OR

6. **a.** Explain p-type attenuator.
   b. Design a T – type attenuator to give an attenuation of 60dB and to work in a line of 500Ω impedance.

7. **a.** A 250V, 4-pole wave wound DC series motor has 888 conductors on its armature. It has armature and field resistance of 0.8 and 1ohm respectively.The motor takes a current of 80A. Determine i) Speed and ii) Gross torque developed if it has a flux per pole of 28 mWb.
   b. With neat sketch explain operation of DC motor.

OR

8. **a.** Explain different methods for speed control of DC motors.
   b. A 200V long shunt compound generator is delivering 50A.The armature, series and shunt field resistances are 0.15,0.02and 80 Ω respectively. Calculate the induced emf allowing a brush drop of 1V.Also calculate power developed by armature.

9. Explain equivalent circuit of transformer referred to primary side and secondary side .

OR

10. **a.** Open circuit and short circuit tests on a 5 KVA, 220/400V, 50 Hz, single phase transformer gave the following results: OC Test: 220V, 2A, 100W (lv side) SC Test: 40V, 11.4A, 200W (hv side) Determine the efficiency and approximate regulation at full load, 0.9 power factor lagging.
    b. Explain about synchros.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Environmental Studies**

Branch: **Common to ME, ECE & CSE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. What is ecological succession?
2. What are the benefits of dams?
3. Give examples for primary and secondary air pollutants
4. What are the reasons for Global warming?
5. What are acid rains?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Write are biogeochemical cycles?
2. What is carrying capacity?
3. Give examples of renewable and non-renewable energy resources.
4. What is In-Situ and Ex-situ conservation?.
5. Write any two control methods for water pollution.
6. What are the major impacts of modern agriculture on soil?
7. Name the substances that causes ozone depletion.
8. Differentiate EIA and EMP
9. What is meant by crazy consumerism?
10. What are green buildings?

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

Q1. What are food chains and food webs ? Give their significance with examples

(OR)

Q2. Explain the different types of ecological pyramids?

Q3. Briefly discuss droughts and floods with respect to their occurrence and impacts.

(OR)

Q4. a)What are Hot spots of biodiversity?
b) Discuss various threats to the biodiversity

Q5. Discuss briefly the various waste water treatment methods.

(OR)

Q6. Explain in detail about the solid waste management and discuss the adverse effects of solid waste.

Q7. Explain the different types of rain water harvesting techniques employed to conserve water.

(OR)

Q8. Differentiate Kyoto protocol and Montréal Protocol

Q9. Discuss on the following
i) Overexploitation of resources ii) Role of IT in environment

(OR)

Q10 .Explain Concept of Sustainable Development and Threats to Sustainability,

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Electromagnetic Theory and Transmission Lines**

Branch: **ECE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. State the Coulomb's law in SI units
2. Write The Equation of Biot- Savart Law
3. Boundary Conditions for Electromagnetic materials
4. Write the Characteristic Impedance of $\lambda/2$, $\lambda.4$, Lines.
5. state Poisson's and Laplace's Equations

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Explain the following terms: i. Line, surface and volume charge distributions.
2. Derive the boundary conditions for the tangential and normal components of Electrostatic fields
3. Derive Poisson's and Laplace's equations starting from Gauss's law
4. State Ampere's circuital law?
5. Derive Maxwell's equations differential form for time varying fields.
6. What is the inconsistency in Ampere's Law? How it is rectified by Maxwell?
7. Determine the intrinsic impedance of free space.
8. Write expression for attenuation of uniform plane wave
9. Define uniform plane wave.
10. Derive a relation between reflection coefficient and characteristic impedance.

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

1. A circular ring of radius 'a' carries uniform charge ρL C/m and is in xy-plane. Find the Electric Field at Point (0, 0, 2) along its axis.

OR

2. A parallel plate capacitance has 500mm side plates of square shape separated by 10mm distance. A sulphur slab of 6mm thickness with $\epsilon r = 4$ is kept on the lower plate find the capacitance of the setup. If a voltage of 100 volts is applied across the capacitor, calculate the voltages at both the regions of the capacitor between the plates.

3. Obtain an expression for differential magnetic field strength dH due to differential current element I dl at the origin in the positive Z- direction.

OR

4. Derive an expression for magnetic field strength, H, due to a current carrying conductor of finite length placed along the y- axis, at a point P in x-z plane and 'r' distant from the origin. Hence deduce expressions for H due to semiinfinite length of the conductor.

5. Explain the concept of Displacement current was introduced by Maxwell to account for the production of Magnetic fields in the empty space

OR

6. A plane EM wave is normally incident on the boundary between two di- electrics. What must be the ratio of refractive indices of the two media in order that the reflected and transmitted waves may have average Power of equal magnitude?

7. Define and distinguish between the terms perpendicular polarization, parallel polarization, for the case of reflection by a perfect conductor under oblique incidence.

OR

8. Define and differentiate between the terms: Instantaneous average and complex poynting vectors, giving their mathematical expressions

9. List out types of transmission lines and draw their schematic diagrams & Draw the directions of electric and magnetic fields in parallel plate and coaxial lines

OR

10. Give a neat sketch for a smith chart and explain clearly, step by step how would you use this chart to
    i. Calculate the complex reflection coefficient.
    ii. Transfer impedance from one point to other along the line.
    iii. Determine the length and location of a short circuited stub line

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Digital Design Using Verilog HDL**

Branch: **ECE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1M=5 Marks**

1. Explain the significance of "casex" keyword.
2. Write the instantiation of n – input AND gate.
3. What is Non - blocking assignment?
4. What is the use of specify statement?
5. Write the usage of $period in verilog HDL.

II. Answer ALL questions of the following **10x2M=20 Marks**

1. Define Synthesis
2. What are the categories of Data – types
3. Give details of any two tri – state elements used in gate level modeling
4. What are different Equality operators in Data flow level
5. Write about begin – end construct
6. What is the use of forever construct
7. What is conditional pin – to – pin delay
8. Write about edge sensitive paths
9. Write about Feedback model
10. Write about impact model

PART-B

Answer the following questions **5x10M=50 Marks**

1. Write about different lexical tokens that are used in verilog language

OR

2 Write verilog code for n – bit full adder and comment each line of the code

3. Write verilog code and test bench for 1 – bit comparator using gate level model with comments.

OR

4. Write verilog code and test bench for 4 – to – 1 multiplexer using data flow modeling

5. Explain about concept of conditional statements and write verilog code for latch with positive gate

OR

6. With the help of flow chart explain for loop and write Verilog code for Counter that has to count up to seven using for loop.

7. Write in detail about System tasks and functions

OR

8. Write verilog code for CMOS NOR gate in switch level modeling

9. Explain in detail about basic memory elements

OR

10. Explain in detail about Assertion Verification.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Electronic Circuit Analysis**

Branch: **ECE**

Time: 3 hours **Max. Marks: 75**

PART-A

I. Answer ALL questions of the following **5 x 1M=5 M**

1. Based on the output what are the classifications of amplifiers?
2. What is the difference between cascading and cascoding amplifier
3. What is the effect of negative feedback on input resistance of the amplifier?
4. What is the conduction angle of class A power amplifier.
5. What are double tuned amplifiers?

II. Answer ALL questions of the following **10 x 2M=20 M**

1. Given a single stage transistor amplifier with h- parameters as h_{ic} = 1.1 kΩ, h_{rc} = 1, h_{fc} = -51, h_{oc} = 25uA/v. Calculate A_I for common emitter configuration?
2. Given the h-parameters for transistor h_{fe}=100. h_{ie}=2kΩ , h_{re} and h_{oe} negligible with RL-1KΩ. Find the A_I.
3. What is the purpose of Miller theorem in multi stage amplifiers?
4. A Darlington pair is made up of two identical transistors with β =100. What is the overall current gain of cascade pair.
5. Define negative feedback and positive feedback?
6. List the characteristics of an amplifier which are modified by negative feedback.
7. Write the advantages of push pull amplifiers?
8. How cross over distortion is eliminated or minimized?
9. What are the advantages of tuned amplifiers?
10. What are the advantages of double tuned amplifier over single tuned amplifier?

PART-B

Answer ALL questions of the following **5 x 10 M=50 M**

1. a) Derive the expression for the current gain and voltage gain for CS amplifier?

   b) Distinguish among the characteristics of CB, CE, CC amplifiers?

   OR

2. a) For CE amplifier, what is the maximum value of Rs and Ro differs by no more than 10% of its value for Rs = 0. The h-parameters values are h_{fe} =50 h_{ie} = 1.1KΩ, h_{re} = $2.5x10^{-4}$, hoe=25 μ A/V

   b) In a typical single stage CE amplifier Rs =1KΩ, R_L=1.2 KΩ using h_{fe}=50, h_{re} = $2.5x10^{-6}$ A/V hoe = $2.5x10^{-4}$ hie = 1100. Find A_I , Av, R_I and Ro.

3. a) Draw the two stage RC coupled CE amplifier and explain its frequency response?

   b) Write the advantages ,disadvantages ,applications of direct coupled CE amplifier.

   OR

4. Draw Hybrid – π model for a transistor in CE configuration and explain the significance of every component in this model.

5. a) Draw the block diagram and explain in detail about shunt -shunt feedback amplifier .

   b) An amplifier has a midband gain of 125 and a band width of 250kHzs (i) If 4% negative feedback is introduced, find the new bandwidth and gain. (ii)If the bandwidth is to be restricted to 1 MHz, find the feedback ratio.

OR

6. a) Derive the frequency of oscillations for Hartely oscillator with neat sketch. 5M

   b) i) Write the drawbacks of RC phase shift oscillator. 2+3M

   ii) In the RC phase shift oscillator R=1KΩ,C=0.001μF then find the frequency of oscillations.

7. a) With neat sketch explain the operation of class B amplifier.

   b) Write advantages and disadvantages of class B push pull amplifier?

OR

8. a) Explain about transformer coupled class A power amplifier. 6 M

   b) Give brief note on cross over distortion in class B power amplifier. 4M

9. a) What are the benefits of double tuned amplifiers over single tuned amplifiers?A three stage double tuned amplifier system is to have a half power BW of 20kHzs centred on a center frequency of 450kHzs.Assume that all stages are identical ,determine the half power bandwidth of single stage. Assume that each stage couple to get maximum flatness.

   b) What are the requirements for a tuned circuit? Derive the equation for Q-factor of RL circuits.

OR

10. Design a single tuned amplifier for the following specifications Center frequency is 500kHz, bandwidth is 10kHzs. Assume that :Transistor parameters g_m=0.04S, h_{fe}=100,C_{be}=1000Pf, C_{bc}=100Pf.The bias network and input resistances are adjusted so that r_i = 4kΩ,and R_L=510Ω.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Pulse and Digital Circuits**

Branch: **ECE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. Sketch the circuit of a RL low pass filter.
2. State the conditions BJT to be in cut off.
3. List the applications of astable multivibrator.
4. What is bootstrapping?
5. State advantages of TTL over DTL logic family.

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Sketch the frequency response of RC Integrator.
2. Explain condition of RL circuit to work as differentiator.
3. Draw the equivalent circuitsof an ideal diode in forward and reverse bias conditions.
4. Explain the storage and transition times of the diode.
5. Draw the circuit of a self-bias bistable multivibrator.
6. What do you understand by hysteresis.
7. What is frequency division.
8. State the methods of linearity improvements in time base generators.
9. Explain the operation of chopper amplifier.
10. NAND and NOR are universal logic gates. Explain?

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

1. a) Explain the response of RC circuit when a step input signal is applied.
   b) Explain the operation of RL low pass circuit for exponential input.

(OR)

2.a)Explain about RLC Ringing Circuit.
b)Explain RC double differentiator circuit.

3. a)Draw the basic circuit diagram of negative peak clamper circuit and explain its operation.
   b)Explain transfer characteristics of the emitter coupled clipper and derive the necessary equations.

(OR)

4) The input voltage v_i to the two level clipper shown in Fig.1 varies linearly from 0 to 150 V.Sketch the output voltage V_0 to the same time scale as the input voltage.Assume Ideal diodes.

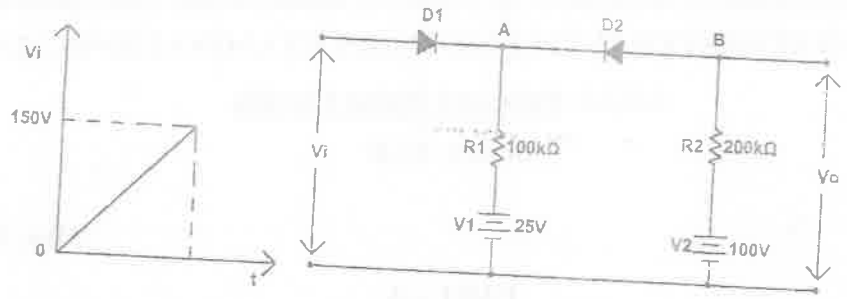

Fig.1

5) Explain how a Schmitt trigger can be used as a comparator and as a squaring circuit.

(OR)

6) With the help of a neat circuit diagram explain the working of an emitter coupled Astable multivibrator and derive an expression for the gate width.

7. a) Explain the significance of integrator in Miller sweep circuit.
   b) Explain how a linearly varying current waveform can be generated from voltage time base generator?

(OR)

8. Derive an expression for Sweep speed error in Bootstrap sweep.

9. a) With neat circuit diagram explain DTL NAND gate.
   b) Explain how to reduce pedestal in a Gate circuit.

(OR)

10.a) Draw the circuit diagram of Emitter-coupled OR gate and explain its operation .
   b) Draw the circuit diagram of negative logic NOR gate and explain its operation .