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: **Electronic Circuits**

Branch: EEE

Time: 3 hours   **Max. Marks: 75**
Answer any FIVE questions of the following   5x15M=75 Marks

1. a) Using the approximate model derive expression for current gain, voltage gain, input impedance and output impedance of CC amplifier.

    b) Explain the operation of common source FET amplifier.   [8+7]

2. a) Draw the equivalent circuit of Common Source amplifier at high frequencies and derive the expressions for Voltage gain, Input admittance and output admittance.   [8+4+3]

    b) A three stage amplifier has a first stage Voltage gain of 30, second stage Voltage gain of 200, third stage Voltage gain of 400. Find the total Voltage gain in dB.

    c) How does a time constant T and rise time t_r influence the bandwidth of amplifiers.

3. a) Classify amplifiers based on feedback topology. Explain the topology based on block diagram and equivalent circuit.   [10+5]

    b) An amplifier has a value of R_{in}= 4.2KΩ, A_v=220 and β = 0.01, determine the value of input resistance with feedback.

4. a) A crystal has the parameters as L= 0.5 H, Cs= 0.06 pF and R= 5 KΩ. Find the series and parallel resonant frequencies and Q -factor of the crystal.   [8+4+3]

    b) Find the value of C in the RC phase shift Oscillator using BJT designed for a frequency of 1 kHz having the value of R of 10KΩ.

    c) Explain the main difference between an amplifier and an Oscillator.

5. a) If the ideal push-pull amplifier operates at maximum dissipation, show that its efficiency is 50%.   [8+7]

    b) For a given transistor, the thermal resistance is 8°c/w and for the ambient temperature T_A is 27°c. If the transistor dissipates 3W of power, calculate the junction temperature T_j

6. a) What is a Clamper? With the help of circuit diagram and waveforms explain the operation of a clamping circuit.   [7+8]

    b) Describe the operation of biased clamper with the help of circuit diagram.

7. a) Explain the operation of Punch through Breakdown Mechanism in transistor.   [8+7]

    b) Explain the switching times of a transistor.

8. a) Explain the operation of fixed bias Bistable Multivibrator.   [7+8]

    b) For the fixed bias bistable multivibrator hfe=50, Vcc=5v, $-V_{BB}$ = -5V, Rc= 1.2 KΩ, R_1 = 6.8 KΩ, R_2 = 47KΩ. Determine the stable state voltages and currents.

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

Subject: **Network Theory**

Branch: EEE

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

Answer any **FIVE** Questions of the following   5x15M=75M

1. a) Write the relation between Line & Phase voltages & currents in a star connection for a 3-ϕ balanced AC system.

   b) A Three-phase balanced delta-connected load with line voltage, of 200V, has line currents as $I_1=10\angle 90°$, $I_2=10\angle -150°$ and $I_3=10\angle -30°$ (i) What is the phase sequence? (ii) What are The impedances?

2. a) Derive the necessary equations for voltage rise in an RC series circuit when it is connected to a DC source.

   b) A source free RC circuit shown in figure when initial value of voltage across the capacitor is 3V, find the value of capacitor voltage Vc, capacitor current Ic and voltage across 2 ohms resistor.
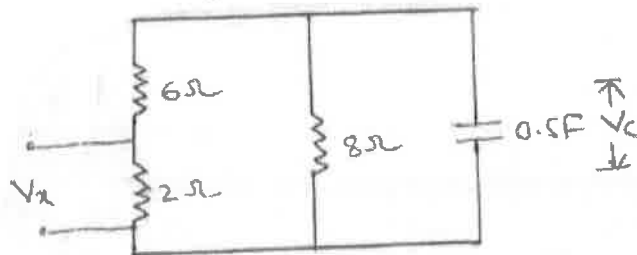
3. a) Derive impulse response of series RL network.

   b) A series RL circuit with R=50 ohms and L=0.2H has a sinusoidal voltage source v = 150 Sin (500t+φ) volts applied at a time when y = 0. Find the expression for total current.

4. a) Briefly explain a transfer function.   [5]

   b) For the given network function, draw the pole zero diagram and hence obtain the domain response verify the result analytically. $V(S) = \dfrac{5(s+5)}{(s+2)(s+7)}$ [10]

5. a) In what respect are the transmission parameters different from Admittance parameters.

   b) Obtain ABCD parameters in terms of Hybrid parameters.

6. a) What type of parameters are suitable to describe series connection of Two-port Network and drive the expression for resulting parameters.

   b) Two networks shown in figures (a) and (b) are connected in series. Obtain the Z parameters of the combination. Also verify by direct calculation.
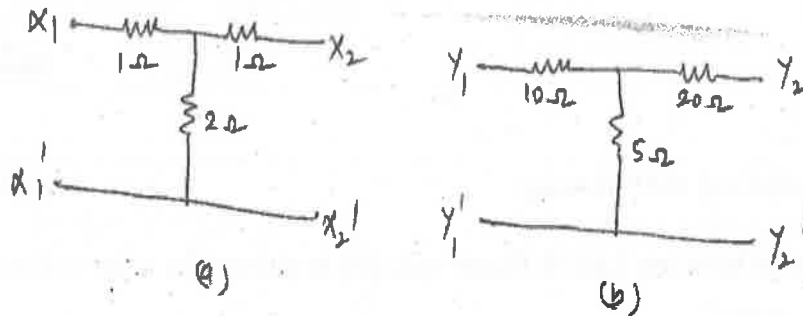
7. a) What is High-pass filter, and explain the prototype High-pass filer design.

   b) Design a High-pass, constant-k type filter with T-section and π-section, when the cut-off frequency is 8 KHz and the nominal characteristic impedance is 500Ω also determine the attenuation and phase constant for frequencies (i) 5KHz (ii) 20 KHz.

8. Derive transient response in series RLC circuit with sinusoidal excitation.