Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

G:\logo and QP Template\logo 3 Feb 2018 final.tif

**End Semester Examination – Nov/ Dec– 2018**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EE2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTRIC CIRCUITS AND NETWORKS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Briefly explain the difference between.  i. Ideal and practical sources  ii. Active and passive elements | CO1 | 6 |
| b. | Find the equivalent resistance between the terminals A and B. | CO1 | 14 |
| OR | | | | |
| 2. | a. | Use mesh analysis technique to determine the current through 10Ω resistor. | CO1 | 15 |
| b. | Explain the need for super nodal analysis | CO1 | 5 |
| 3. | a. | Use Superposition theorem to determine the current through 3Ω  resistor. | CO1 | 10 |
| b. | State Reciprocity theorem and explain it with the help of an  illustration. | CO1 | 10 |
| OR | | | | |
| 4. | a. | Use Millman’s theorem to determine the current through 3Ω resistor. | CO1 | 10 |
|  | b. | State Norton’s theorem and explain it with the help of an illustration. | CO1 | 8 |
| 5. | a. | Determine the frequency at which circuit resonates. Also find the voltage across the capacitor at resonance, and the Q factor of the circuit | CO2 | 10 |
|  | b. | Derive an equation to find the maximum amplification factor of a single tuned coupled circuit. | CO2 | 10 |
| OR | | | | |
| 6. | a. | An impedance of (5+j5) Ω is connected in each phase of a delta connected 3 phase load which is supplied by a 3φ, 400 V supply. Determine the current in each phase and in each line. Calculate also the total power consumed and the power factor of the load. | CO1 | 15 |
| b | Show that three phase power can be measured by two wattmeters. | CO1 | 5 |
| 7. | a | Derive the transient response of an RL circuit when it is switched to  a sinusoidal voltage source at time t=0. Assume that the initial  current through the inductor is zero. | CO2 | 14 |
| b | Design a constant K type high pass filter with the cut off frequency  1KHz and design impedance 500Ω. | CO3 | 6 |
| OR | | | | |
| 8. | a. | The switch in the RC circuit shown in Fig is closed at t = 0. If there  is no charge initially stored in the capacitor, find  i. vR, the voltage across the resistor at t = 10 μs.  ii. Vc, the voltage across the capacitor at t = 20 μs.  iii. The time at which VR reaches 2 V. | CO2 | 14 |
|  | b. | Design a constant K type low pass filter with the cut off frequency  1kHz and design impedance 500Ω. | CO3 | 6 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Obtain the open circuit impedance and short circuit admittance parameters of the network given above. | CO2 | 20 |