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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17EE2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTRIC CIRCUITS AND NETWORKS** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Find the values of unknown currents I3, I4 and I5. | CO2 | 6 |
| b. | Find the equivalent resistance between the terminals A and B. | CO2 | 14 |
| **(OR)** | | | | |
| 2. | a. | Identify the meshes and use mesh analysis technique to determine the branch currents. | CO3 | 15 |
| b. | Explain the significance of source transformation technique in electric Circuit analysis. | CO2 | 5 |
| 3. | a. | Two batteries in parallel with the following specifications provide power to a UPS which is used in a computer centre.  Battery 1 - Terminal voltage: 80V, Internal resistance :5 Ω  Battery 2 - Terminal voltage :100V, Internal resistance: 10Ω.  Use an appropriate network theorem to determine the input voltage to the UPS when the load draws a current of 2 A. | CO3 | 12 |
| b. | State Reciprocity theorem and explain it with the help of an illustration. | CO2 | 8 |
| **(OR)** | | | | |
| 4. | a. | Use superposition theorem to determine the current through the 100 Ω resistor. | CO3 | 12 |
| b. | Create Thevinin’s equivalent circuit of the circuit given in figure with respect to the terminals A and B. | CO6 | 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 (8+j4)Ωis 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. | CO4 | 12 |
| b. | Show that three phase power can be measured by twowattmeters. | CO2 | 8 |
| 7. | a | Determine the open circuit impedance parameter of the network | CO3 | 12 |
| b. | Design a constant K type high pass filter with the cut off frequency  1kHz and design impedance 500Ω. | CO6 | 8 |
| **(OR)** | | | | |
| 8. | a. | Determine the transmission parameters of the given network. | CO3 | 10 |
| b. | Design a constant K type low pass filter with the cut off frequency  1kHz and design impedance 500Ω. | CO6 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | 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   1. vR, the voltage across the resistor at t = 50 μs. 2. Vc, the voltage across the capacitor at t = 100 μs. 3. The time at which vR reaches 2 V. | CO4 | 12 |
| b. | Derive an expression to find the transient current through a series RL circuit when a unit step voltage is applied across it at t=0 sec. | CO2 | 8 |