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



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

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| **Code** | **:14EE2001** | **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. | State and illustrate Kirchoff’s voltage law and Kirchoff’s current law with suitable examples. | CO1 | 10 |
| b. | Determine current I. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Identify the meshes in the given circuit and determine the mesh currents. | CO1 | 10 |
| b. | Determine the voltage across 10Ω resistor using Node voltage analysis technique. | CO1 | 10 |
| 3. | a. | State the Superposition theorem and illustrate it with a suitable example. | CO1 | 10 |
| b. | Determine the value of the load resistor at which maximum power will be transferred to the load. Also determine the maximum power that will be transferred. | CO1 | 10 |
| **(OR)** | | | | |
| 4. | a. | Obtain Thevinin’s equivalent circuit with respect to the terminals A and B. | CO1 | 10 |
| b. | State Norton’s theorem and illustrate it with the help of a suitable example. | CO1 | 10 |
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| 5. | a. | A series RLC circuit with R = 20 Ω, L = 50 mH and C = 60 µF has an applied voltage of 150 V, determine the value of;  (i) resonant frequency (ii) current at resonance  (iii) Q-factor (iv) Bandwidth. | CO2 | 10 |
| b. | Obtain the condition for the optimum coupling in a single tuned  coupled circuit.. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | A 3 phase, balanced, star connected load of 5+j4 ohm is supplied from a balanced, three phase supply of 400V (line to line). Determine the phase and the line currents. Also determine the power  Consumed by the circuit. | CO2 | 12 |
| b. | State Dot rule for couple circuits. Use Dot rule to find the equivalent inductance of two coupled coils in series. | CO2 | 8 |
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| 7. | a. | Determine the transient current through the circuit. Also calculate the time constant of the circuit. | CO2 | 10 |
| b. | Derive an equation to find the transient current response of a series RC circuit if a step voltage is applied across it at time t=0. Also derive equation to find the volge response across the resistor and capacitor. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | A series RL circuit with R = 50Ω and L = 5 h has an A.C. voltage of 200 volts(rms) applied across it through a switch at t = 0. Find a) the transient current and voltage across the elements. | CO2 | 10 |
| b. | Derive an equation to find the transient current through a series RLC circuit when a step voltage is applied across it. | CO2 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Determine the open circuit impedance parameters of the network. | CO3 | 10 |
| b. | Define image parameters. Derive an equation to find the image parameters of two port networks. | CO3 | 10 |