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

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

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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. | Use Current division rule to find the current I. | CO3 | 10 |
| b. | Find the equivalent resistance between the terminals A and B. | CO2 | 10 |
| OR | | | | |
| 2. | a. | Use nodal analysis technique to determine VAB | CO3 | 15 |
| b. | Explain the voltage division rule with the help of an illustration. | CO2 | 5 |
| 3. | a. | .  Verify the principle of Superposition by determining the current I. | CO3 | 10 |
| b. | Two batteries in parallel with the following specifications provide power to a UPS which is used in a computer centre.  Battery 1 - Terminal voltage: 90V, Internal resistance :5 Ω  Battery 2 - Terminal voltage :100V, Internal resistance: 8Ω.Use an  appropriate network theorem to determine the input voltage to the UPS when the load draws 1A current. | CO3 | 10 |
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| 4. | a. | Use Thevinin’s theorem to determine the current I. | CO3 | 15 |
| b. | Prove with the help of an example that the Norton’s equivalent circuit of a network can be obtained by the source transformation of the Thevinin’s equivalent circuit of the network.. | CO2 | 5 |
| 5. | a. | Determine the equivalent inductance of the circuit | CO3 | 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 (4+j3) Ω is connected in each phase of a star connected 3 phase load which is supplied by a 3φ, 400 V (line to line) 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 | 15 |
| b | Three phase power in a balanced three phase circuit is measured by  two wattmeter method. If one of the wattmeter read as zero, find the  power factor of the load in each phase. | CO2 | 5 |
| 7. | a | Determine the short circuit admittance parameter of the network | CO3 | 12 |
| b | Design a constant K type low pass filter with the cut off frequency  1.5 kHz and design impedance 600Ω. | CO6 | 8 |
| OR | | | | |
| 8. | a. | Determine the hybrid parameters of the given network | CO3 | 10 |
| b. | Design a constant K type high pass filter with the cut off frequency  1.5 kHz and design impedance 600Ω. | CO6 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | A series RL circuit with R = 100 Ω and L = 10 H has a DC voltage  of 150 V applied through a switch at t = 0. Find (i) the equation for the current and voltages across the different elements. (ii) the current value at t= 0.2 Seconds. | CO4 | 12 |
| b. | Derive an expression to find the transient current through a series RC circuit when a unit step voltage is applied across it at t=0 sec. | CO2 | 8 |