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

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

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| **Code :** | **10EI201/12EI201** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **CIRCUIT ANALYSIS AND NETWORKS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Three 10 Ω resistances are connected in parallel. What is the equivalent resistance? | 1 |
| 2. | State Kirchoff’s laws. | 1 |
| 3. | Thevenin Theorem consists of a \_\_\_\_\_ in series with \_\_\_\_\_\_. | 1 |
| 4. | Convert the given voltage source into current source. | 1 |
| 5. | Write the expression for time constant of a series RC circuit | 1 |
| 6. | What is transient response? | 1 |
| 7. | Dot convention in coupled circuits is used to determine the \_\_\_\_\_\_\_\_ of the mutually induced voltage in coils. | 1 |
| 8. | The maximum possible mutual inductance of two inductively coupled coils with self inductances L1=25 mH and L2=100 mH is given by \_\_\_\_\_\_\_\_\_\_. | 1 |
| 9. | Name the parameters that are used in transmission theory and cascade networks. | 1 |
| 10. | List the types of filters. | 1 |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | A voltage source 50V in series with a resistance of 3Ohms is available. Transform it to an equivalent current source. | 3 |
| 12. | Use superposition theorem to find current through the 20 ohms resistor. | 3 |
| 13. | For the given network function draw the pole zero diagram and hence obtain the time domain response.. | 3 |
| 14. | Two inductively coupled coils with L1 = 20mH and L2 = 500mH have a coupling coefficient of 0.5. Find mutual inductance and equivalent inductance when the coils are connected in series opposition mode. | 3 |
| 15. | What are two port networks? | 3 |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | Determine the total current in the circuit shown.  EE1151 | 7 |
| b. | Determine the mesh currents in the circuit shown.  EE1151 | 8 |
| (OR) | | | |
| 17. | a. | Find the voltages at nodes 1 and 2 using Nodal voltage method.  03-004 | 7 |
| b. | Use superposition theorem to find current through the 20 ohms resistor. | 8 |
| 18. |  | Determine the load resistance to receive maximum power from the source. Also find  the maximum power delivered to load in the circuit. | 15 |
| (OR) | | | |
| 19. |  | Determine the Thevenin’s equivalent circuit of the network given below. Also find  the current through a 5 Ω galvanometer connected across AB. | 15 |
| 20. |  | Derive the expression for transient response i(t) for an R-C circuit with a DC input.  Also find the transient voltage across the inductor and resistor. | 15 |
| (OR) | | | |
| 21. | a. | A series RL circuit with R= 100 Ω and L= 20 H has a D.C. voltage of 200 V applied through a switch at t=0. Find (i) the equation for the current and voltages across the different elements. (ii) the current at t= 0.5 Seconds | 7 |
| b. | In the series circuit shown in figure, the switch is closed on position 1 at t = 0. At t = 1 millisecond, the switch is moved to position 2. Obtain the equations for the current in both intervals.  EE1151 | 8 |
| 22. | a. | Two coils with self-inductances L1 and L2 are connected in parallel and are mutually coupled with mutual inductance M. Derive an expression for the equivalent inductance of the coils. | 8 |
| b. | Two coils with inductance in the ratio of 4:1 have K = 0.6. When the coils are connected in series aiding Leq = 44.4 mh. Find L1 and L2. | 7 |
| (OR) | | | |
| 23. |  | Derive an expression for output voltage, output current and amplification of single tuned circuit. | 15 |
| 24. | a. | Obtain the *z* parameters for the network in Fig. as functions of *s*. | 10 |
| b. | For a two port network with Z11 = 2Ω, Z12 = 1Ω, Z21 = 1Ω, Z22 = 3Ω, find the admittance matrix. | 5 |
| (OR) | | | |
| 25. | a. | Give the function of a filter. Classify filters and draw their frequency response. | 8 |
| b. | What is the significance of transfer function of a system? Locate the poles and zeros of the system represented by the equation  H(s) =  Comment on the stability of the system. | 7 |