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



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

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| **Code :** | **18EE2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NETWORK THEORY** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | | |
| 1. | Find the effective resistance when three resistors are connected in parallel. | CO2 | 1 |
| 2. | Find the equivalent current source for a voltage source of 100V with series resistance of 2Ω. | CO2 | 1 |
| 3. | Which theorem states that the response of a linear circuit with multiple sources is given by algebraic sum of responses due to individual sources acting alone? | CO2 | 1 |
| 4. | List the linear network theorems. | CO2 | 1 |
| 5. | List the power formula in 3-Φ star connected system. | CO3 | 1 |
| 6. | Define power factor. | CO3 | 1 |
| 7. | Define driving point functions. | CO5 | 1 |
| 8. | Define Quality factor. | CO5 | 1 |
| 9. | Write down the current transient equation for DC response of an R-L circuit. | CO5 | 1 |
| 10. | Find the time constant of series RL circuit having R=10 Ω and L=0.1 mH | CO5 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | From the circuit given below, find the current I and voltage drop across 30 Ω.  (all resistance are in ohms) | CO2 | 3 |
| 12. | Explain Compensation Theorem with neat diagram. | CO2 | 3 |
| 13. | Write the nodal equation for the following circuit. | CO1 | 3 |
| 14. | List the properties of Laplace Transform used in network theory. | CO4 | 3 |
| 15. | Determine the quality factor of a coil, resonance frequency for the series circuit consisting of R=10Ω, L=0.1H and C=50µF. | CO5 | 3 |
| 16. | Write the formula for h11, Z21, Y22, and h21. | CO5 | 3 |

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| **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | |
| 17. |  | Solve the circuit using mesh analysis and find the current in each loops.  http://sub.allaboutcircuits.com/images/00209.png | CO1 | 12 |
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| 18. |  | Determine the maximum power delivered to the RL load for the circuit given below. Assume VS=50V, R1=10 Ω , R2=2Ω , R3=3Ω , R4=5Ω . | CO2 | 12 |
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| 19. |  | A three phase balanced delta load connected to load (4+j8)Ω is connected across a 400V, three phase balanced supply. Determine the phase currents and line currents and voltage drop across the impedances. Also calculate the power drawn by the load. | CO3 | 12 |
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| 20. |  | Transform the circuit in to s-domain and find the total current I in the circuit. Assume the initial value of the voltage across the capacitor and initial current through the inductor is zero. | CO4 | 12 |
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| 21. |  | Obtain the expression for i1 and i2 in the circuit, when the DC voltage is applied suddenly. Assume the initial energy stored in the circuit is zero. (all resistance are in ohms) | CO5 | 12 |
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| 22. |  | Derive the current expression for R-C series circuit when DC excitations are applied through a switch at t = 0. Find (i) the equation for the current and time constant (ii) also calculate the voltage drops and power across each components. | CO5 | 12 |
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| 23. |  | Using superposition theorem, find the current in 3Ω resistor shown in the figure.    5Ω  10Ω  3Ω  5A  20V  I | CO2 | 12 |
|  | **Compulsory:** | | | |
| 24. |  | Determine the open circuit impedance parameters of the π network given below. All resistance are in ohms.  C:\Users\ALFRED KIRUBARAJ\Desktop\ECA_CBCS\p_2\3_4.png | CO6 | 12 |