DEPARTMENT OF

ELECTRICAL AND ELECTRONICS ENGINEERING

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| Date | 19.01.2023 | Maximum Marks | 10 +50 |
| Course Code | 21ES14D | Duration | 110 Mins |
| Sem | 1st Semester | CIE-I | |
| Basics of Electrical Engineering | | | |

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| **Q.No** | Part A – Quiz Questions | **Marks** | **COs** | **BT** |
|  | The total power consumed by the network shown below is 15W. Find (i) the value of R (ii) the total current I and the voltage across R. | 2 | 1 | 1 |
|  | In the figure given below**,** f**ind the magnitude and direction of the unknown currents using KCL. Given i1 = 10A, i2 = 6A, i5 = 4A.** | 1 | 1 | 1 |
|  | A current of 20A flows through two ammeters A and B connected in series. Across A the potential difference is 0.2 V and across B it is 0.3 V. Find how the same will be divided between A and B when they are connected in parallel. | 2 | 1 | 2 |
|  | Draw the network showing each element for the following mesh equations.  3i1-2i2 - i3= 5  -2i1+5i2 -3i3= -10  - i1-3i2 +8i3= 0 | 1 | 2 | 2 |
|  | Thevenin resistance is found by \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_. | 1 | 1 | 1 |
|  | The Maximum Power drawn by the load RL in the above Circuit will be? | 1 | 2 | 2 |
|  | A 50Hz sinusoidal current has peak factor 1.4 and form factor 1.1. Its average value is 20A. The instantaneous value of current is 15A at t=0. Write the equation of current. | 1 | 2 | 2 |
|  | A sine wave has frequency of 50Hz. Its angular frequency is \_\_\_\_ radian per second. | 1 | 1 | 1 |

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| **Q.No** | **PART – B Test Questions** | **Marks** | **COs** | **BT** |
| 1. a)   b) | In the circuit shown below, determine VAB and voltage across 8 ohms resistor such that voltage drop across 15 ohms resistor is 45V, when switch S is open.    Find v by mesh method such that the current through the 5V source is zero. | 5  5 | 1  2 | 2  2 |
| 1. a)   b) | A Piece of Silver wire has a resistance of 1 ohm. Wat will be the resistance of a manganin wire half the length and half the diameter, if the specific resistance of manganin is 30 times that of silver?  In figure given below, find voltage drop across x-y terminals. | 5  5 | 1  2 | 2  2 |
| 1. a)   b) | **What resistance should be connected across x-y in the circuit shown in figure below such that maximum power is developed across this load resistance? What is the amount of this maximum power?**    Calculate the current through the resistor of resistance 6 Ω by Thevenin’s Theorem. | 5  5 | 3  3 | 3  3 |
| 1. a)   b) | An alternating current varying sinusoidally has an RMS value of 20A, 50Hz Frequency. Write the   1. instantaneous value equation 2. current 2.5ms and 12.5ms after passing through first positive maximum value.   At what time will the instantaneous value be 14.14A measured from first positive maximum.  Derive an expression for Effective value and Average Value of an alternating quantity. | 5  5 | 3  3 | 3  3 |
| 5. a)      b) | Prove that Power consumed by an ideal Inductor is zero and derive the phase relation between voltage and current in an ideal inductor with appropriate waveforms.  Prove that Maximum Power Transferred to the load is Pmax = Vg2/4RL. | 5  5 | 2  3 | 2  3 |

Blooms Taxonomy, CO-Course Outcomes, M-Marks

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| Marks Distribution | Particulars | | CO1 | CO2 | CO3 | CO4 | L1 | L2 | L3 | L4 | L5 | L6 |
| Test | Max Marks | 17 | 18 | 25 | - | 5 | 30 | 25 | - | - | - |

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