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| **20EI205**  **Hall Ticket Number:**   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |      |  |  |  | | --- | --- | --- | | **I/IV B.Tech( Supplementary) DEGREE EXAMINATION** | | | | **August,2023** | **Electronics & Instrumentation Engineering** | | | **Second Semester** | **Basic Electrical Engineering** | | | **Time: Three Hours** | | **Maximum:70 Marks** | |  |
| |  |  | | --- | --- | | ***Answer question 1 compulsory.*** | **(14X1 = 14 Marks)** | | ***Answer one question from each unit.*** | **(4X14=56 Marks)** | |  |

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| 1. | a) | |  | | --- | | State superposition theorem. | | CO1,L1 | 1M |
|  | b) | State KVL. | CO1,L1 | 1M |
|  | c) | Write voltage current relationship in inductor. | CO1,L1 | 1M |
|  | d) | Draw norton’s equivalent circuit. | CO1,L3 | 1M |
|  | e) | Define Real power. | CO2,L1 | 1M |
|  | f) | What is meant by power factor? | CO2,L1 | 1M |
|  | g) | What is meant by three phase balanced circuit? | CO2,L1 | 1M |
|  | h) | What is relation between line and phase currents & line and phase voltages in a three phase delta connected systems? | CO2,L2 | 1M |
|  | i) | What is meant by an auto transformer? | CO3,L1 | 1M |
|  | j) | Why single induction motors are not self-starting? | CO3,L1 | 1M |
|  | k) | What is a transformer? | CO3,L1 | 1M |
|  | l) | Write the full forms of ELCB & MCB | CO4,L2 | 1M |
|  | m) | What is the necessity of battery backup? | CO4,L1 | 1M |
|  | n) | What are different types of cables? | CO4,L1 | 1M |
| **Unit –I** | | | | |
| 2. | a) | Apply Thevenin’s theorem to find Vo in the circuit of Fig. | CO1,L3 | 7M |
|  | b) | State and explain Kirchhoff’s laws.. | CO1,L2 | 7M |
| **(OR)** | | | | |
| 3. | a) | Explain time domain analysis of first order RL circuit. | CO1,L1 | 7M |
|  | b) | Determine total current flowing in the circuit. | CO1,L2 | 7M |
| **Unit –II** | | | | |
| 4. | a) | Find rms value of the full-wave rectified sine wave shown in Fig. | CO2,L3 | 7M |
|  | b) | For a load, Vrms = and Irms = Determine: (a) the real and reactive powers, and (b) the power factor and the load impedance. | CO2,L3 | 7M |
| **(OR)**  **P.T.O**  **20EI205** | | | | |
| 5. | a) | A 10V rms, 10kHz signal is applied to a series RL circuit consisting of a 1 kΩ resistor connected in series with a 50 mH coil. Find impedance Z, current I, phase angle θ. | CO2,L2 | 7M |
|  | b) | Derive the expression for average power, current and power factor when a sinusoidal supply is fed to a pure capacitor. | CO2,L1 | 7M |
| **Unit –III** | | | | |
| 6. | a) | Explain the constructional features of three phase induction motor with a neat sketch. | CO3,L2 | 7M |
|  | b) | Describe the working principle of DC motor with a neat sketch. | CO3,L3 | 7M |
| **(OR)** | | | | |
| 7. | a) | What are magnetic materials? Draw the B-H curve and explain its significance. | CO3,L2 | 7M |
|  | b) | Derive the emf equation of a single-phase transformer. | CO3,L1 | 7M |
| **Unit –IV** | | | | |
| 8. | a) | Explain in detail about i) SFU ii) MCCB | CO4,L2 | 7M |
|  | b) | A battery is charged at a potential of 30 Volts for 8 hours when the current flow is 20 A. The battery on discharge supplies a current of 10 A for 15 hours with a terminal voltage of 28 V. Calculate watt hour and quantity efficiency. | CO4,L3 | 7M |
| **(OR)** | | | | |
| 9. | a) | Outline various types of batteries. | CO4,L2 | 7M |
|  | b) | Explain in detail about earthing system. | CO4,L4 | 7M |

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