Subject: Electrical Science

Subject code:ES-107

L T/P C

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No. of total hours:36

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| S.No. | Topics to be covered | No. of Lectures |
| 1 | DC Circuits: Passive circuit components, Basic laws of Electrical Engineering, Temperature Resistance Coefficients. | 1 |
| 2 | Voltage and current sources, Series and parallel circuits, power and energy, Kirchhoﬀ’s Laws | 1 |
| 3 | Nodal & Mesh Analysis | 1 |
| 4 | delta-star transformation, superposition theorem, Thevenin’s theorem, Norton’s theorem, maximum power transfer theorem | 4 |
| 5 | Time domain analysis of first Order RC & LC circuits. | 1 |
| 6 | AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. | 2 |
| 7 | Analysis of single-phase ac circuits consisting of R, L, C, RL, RC. | 3 |
| 8 | RLC combinations (series and parallel), resonance. | 1 |
| 9 | Three phase balanced circuits, voltage and current relations in star and delta connections. | 3 |
| 10 | D. C. Generators & Motors: Principle of operation of Generators & Motors | 2 |
| 11 | Speed Control of shunt motors, Flux control, Rheostatic control, voltage control, Speed control of series motors. | 2 |
| 12 | A. C. Generators & Motors: Principle of operation, Revolving Magnetic field, Squirrel cage and phase wound rotor, Starting of Induction motors | 3 |
| 13 | Direct on line and Star Delta starters, Synchronous machines. | 2 |
| 14 | Transformers: Construction and principle of operation, equivalent circuit, losses in transformers, regulation and efficiency | 3 |
| 15 | Auto-transformer and three-phase transformer connections | 1 |
| 16 | Measuring Instruments: Electromagnetism, Different Torques in Indicating instruments, | 2 |
| 17 | Moving Iron Instruments: Construction & Principle, Attraction and Repulsion type. | 1 |
| 18 | Moving Coil instruments: Permanent Magnet type, Dynamometer type Instruments. | 2 |