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| Name of the Faculty: Sh Naveen Sharma  Discipline : Electrical Engineering  Semester : 3rd  Subject : ELECTRICAL ENGINEERING MATERIALS  Lesson Plan Duration : 15 weeks(from 4th August, 2025 to 30 Nov,2025)  Work Load (Lecture/Practical)per week(in Hours) : L– 03, P-00 | | |
| Week | Theory | |
| Day | Topic |
| 1 | 1 | Introduction Of The Subject, Its Need, Applications |
| 2 | **Introduction to Materials** |
| 3 | Classification of materials such as conducting, semi conducting, insulating materials, magnetic material. |
| 2 | 4 | Atomic theory, Energy band theory. Classifications of materials on the basis of atomic structure and energy bands. |
| 5 | Characteristics of materials. |
| 6 | **Conducting and Semi-Conducting Materials** |
| 3 | 7 | Types of conducting material such as low resistivity and high resistivity materials. |
| 8 | Properties and applications of different low resistivity materials such as silver, Gold, copper (hard drawn, annealed copper), aluminum, steel, |
| 9 | ACSR and its alloys like copperalloy (brass, bronze) etc. |
| 4 | 10 | Properties and applications of different high resistivity material such as carbon, tungsten, platinum, mercury, lead, and its alloys like Constantan or eureka, Brass phosphor bronze, nichrome, manganin, tin-lead alloy etc. |
| 11 | Semi-conductors Materials and their Applications |
| 12 | Commonly used semiconducting material Germanium and silicon and their properties. |
| 5 | 13 | Types of Semiconductor etc. |
| 14 | **Insulating Materials** |
| 15 | Characteristics of good Insulating material |
| 6 | 16 | Electrical, thermal, chemical, visual, mechanical, |
| 17 | physical properties of Insulating materials. |
| 18 | Types of Insulating materials. |
| 7 | 19 | classification of insulating material on the basis of temperature. |
| 20 | Gaseous Insulating Materials: |
| 21 | Properties and applications of air, nitrogen and sulphur hexafluoride (SF-6) gases. |
| 8 | 22 | Liquid Insulating Materials: |
| 23 | Properties and applications of Mineral and Insulating oil for transformers (mineral oil), switchgears etc, synthetic insulating liquid (Pyranol). |
| 24 | Solid Insulating Materials: |
| 9 | 25 | Properties, types and applications of Plastics such as polyvinyl chloride (PVC), Polyethylene, polystyrene, epoxy resin, Bakelite, Melamines, silicon resins etc. |
| 26 | Natural Insulating materials, properties and their applications: |
| 27 | Mica, asbestos, ceramic materials (porcelain and steatite), Glass, Cotton, Silk, Jute, Paper (dry and impregnated) Rubber, Bitumen, Teflon, Silicon Grease , |
| 10 | 28 | Insulating varnishes for coating and impregnation, Enamels for winding wires, wood etc. |
| 29 | Copy checking |
| 30 | Revision of 1st chapter |
| 11 | 31 | Revision of 2nd chapter |
| 32 | Queries taken from previous topics from students |
| 33 | Assignment no.2 |
| 12 | 34 | Class test no.2 |
| 35 | **Magnetic Materials** |
| 36 | Characteristics and types of magnetic material, Properties of soft magnet material like Iron silicon alloy, Nickel iron alloy, Mu metal, soft ferrites, grain orientation, Cold rolled grain oriented silicon steels (C.R.G.O) etc. and their applications |
| 13 | 37 | Properties of hard magnet material like Tungsten steel alloy, chromium steel, cobalt steel, Hard ferrites etc. and their applications. |
| 38 | **Special Purpose Materials** |
| 39 | Thermocouples, Bimetals, soldering, fuse, materials and their applications. Material used in fabrications of electrical machines such as motors, generators, transformers etc |
| 14 | 40 | Copy checking |
| 41 | Revision of 1st and 2nd chapters |
| 42 | Revision of 3rd and 4th chapters |
| 15 | 43 | Queries taken from previous topics from students |
| 44 | Assignment no.3 |
| 45 | Class test no.3 |