

"PVC" NSSK Govt Polytechnic Bilaspur
Electrical Engineering Department
Lesson plan (for odd-semester as per study scheme)

Name of Faculty	Sandeep Kumar
Discipline	Electrical Engineering
Semester	3 rd (odd- semester)
Subject	Electrical and Electronics Engineering Materials

Week	Day	Topics
1 st	1	Introduction to Classification of materials
	2	Classification of Conducting, semiconducting and insulating materials based on atomic structure
	3	Classification based on energy bands
	4	Revision and Class test of 1 st unit
2 nd	1	Introduction to Conducting Materials Resistance and factors affecting it Such as alloying and temperature
	2	Classification of conducting material as low resistivity and high resistivity materials
	3	low resistance materials Copper: General properties as conductor resistivity, temperature coefficient and density
	4	Mechanical properties of hard-drawn and annealed copper corrosion, contact resistance
3 rd	1	Application of copper in the field of electrical engineering.
	2	Aluminium: General properties as resistivity, temperature coefficient, density
	3	Mechanical properties of hard and annealed aluminium, solderability, contact resistance
	4	Applications in the field of electrical engineering.
4 th	1	Steel: Mechanical properties of steel
	2	Applications in the field of electrical engineering.
	3	Introduction to bundle conductors and its applications
	4	Low resistivity copper alloys Brass, Bronze and their applications
5 th	1	Applications of special metals e.g. Silver, Gold, Platinum etc
	2	High resistivity materials and their applications manganese, constantan,
	3	Nichrome, mercury, platinum, carbon and tungsten

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	4	Superconductors and their applications
6 th	1	Revision and problem related to 2 nd unit
	2	Class Test of 2 nd unit
	3	Review of Semi-conducting Materials, Semi-conductors and their properties
	4	Materials used for electronic components like resistors, capacitors, diodes, transistors and inductors etc
7 th	1	Revision and problem related to 3 rd unit
	2	Class Test of 3 rd unit
	3	Insulating materials; General Properties
	4	Electrical Properties: Resistivity, surface resistance, dielectric loss, dielectric strength
8 th	1	Physical Properties Hygroscopicity, tensile and compressive strength, abrasive resistance, brittleness
	2	Thermal Properties: Heat resistance, classification according to permissible temperature rise

	3	Chemical Properties: Solubility, chemical resistance, weather ability
	4	Mechanical properties, mechanical structure, tensile structure
	1	Revision and problem related to 4 th unit, 1st Sessional Test
	2	Class Test of 4 th unit
9 th	3	Introduction to Insulating Materials and their applications
	4	Plastics Definition and classification
	1	Thermosetting materials: Bakelite, amino resins, epoxy resins their important properties and applications
	2	Thermo-plastic materials: PVC, Polyethylene, silicones, their important properties and applications
10 th	3	Natural insulating materials, properties and their applications
	4	Mica and Mica products, Asbestos and asbestos products, Ceramic materials
	1	Glass and glass products Cotton, silk, jute, paper, Rubber, Bitumen
	2	Mineral and insulating oil for transformer, insulating varnish for coating and impregnation
11 th	3	Gaseous materials; Air, Hydrogen, Nitrogen, SF their properties and applications
	4	Revision and problem related to 5 th unit
	1	Class Test of 5 th unit

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13 th	2	Magnetic Materials: Introduction, Ferromagnetic materials, permeability
	3	B-H curve, magnetic saturation, hysteresis loop including coercive force and residual magnetism
	4	Concept of eddy current and hysteresis loss, Curie temperature, magnetostriction effect.
	1	Soft Magnetic Materials: Alloyed steels with silicon: High silicon alloy steel for transformers
14 th	2	low silicon alloy steel for electric rotating machines
	3	Cold rolled grain oriented steels for transformer, Non-oriented steels for rotating machine, Nickel-iron alloys, Soft Ferrites
	4	Hard magnetic materials Tungsten steel, chrome steel, hard ferrites cobalt and Steel applications. 2nd Sessional test.
	1	Revision and problem related to 6th unit
	2	Class Test of 6th unit
	3	Special Materials Thermocouple, bimetal
	4	leads soldering and fuses material and their applications

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Approved	HOD Sign.
Date:-	

31/08/2022

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