

ACADEMIC LESSON PLAN OF WINTER 2024

Discipline: ELECTRICAL	Semester: 5 TH Sem Sec B	Name of the Teaching Faculty: P K DEV
Subject: ENERGY CONVERSION– II	No. of days/per week class allotted: 4p/week	Semester from: 1 st July 2024 to 08 th Nov 2024 No. of Weeks: 19 weeks
1 st	1 st	Unit-1:ALTERNATOR 1.1 Types of alternator and their constructional features
	2 nd	1.2 Basic working principle of alternator and establish the relation between speed and frequency
	3 rd	1.3 Explain terminology in armature winding, and derive expressions for winding factors (Pitch factor, Distribution factor).
	4 th	1.4 Explain harmonics, its causes and impact on winding factor.
2 nd	1 st	1.5 Derive E.M.F equation. (Solve numerical problems (contd.))
	2 nd	1.5 Derive E.M.F equation. (Solve numerical problems
	3 rd	1.6 Explain Armature reaction and its effect on emf at different pf of load (contd.)
	4 th	1.6 Explain Armature reaction and its effect on emf at different pf of load.
3 rd	1 st	1.7 Draw the vector diagram of loaded alternator. (Solve numerical problems)
	2 nd	1.8 State and explain testing of alternator (open circuit and short circuit methods) (Solve numerical problems).(contd.)
	3 rd	1.8 State and explain testing of alternator (open circuit and short circuit methods) (Solve numerical problems).
	4 th	1.9 Determination of voltage regulation of Alternator by direct loading and synchronous impedance method
4 th	1 st	1.10 Explain parallel operation of alternator using synchro-scope, dark and bright lamp method
	2 nd	1.11 Explain distribution of load by parallel connected alternators
	3 rd	Unit-2:SYNCHRONOUS MOTOR 2.1 Explain constructional feature of Synchronous Motor. 2.2 Explain principles of operation, concept of load angle.
	4 th	2.3 Explain effect of varying load with constant excitation(contd.)
5 th	1 st	2.3 Explain effect of varying load with constant excitation
	2 nd	2.4 Explain effect of varying excitation with constant load.
	3 rd	2.5 Derive torque, power developed(contd.)
	4 th	2.5 Derive torque, power developed. 2.6 Explain power angle characteristics of cylindrical rotor motor.
6 th	1 st	2.7 Explain effect of excitation on Armature current and power factor. 2.8 Explain Hunting & function of Damper Bars.
	2 nd	2.9 Describe method of starting of Synchronous motor.(contd.)
	3 rd	2.9 Describe method of starting of Synchronous motor.
	4 th	2.10 State application of synchronous motor Unit-3: THREE PHASE INDUCTION MOTOR
7 th	1 st	3. 1 Explain and derive production of rotating magnetic field.
	2 nd	3. 2 Explain constructional feature of Squirrel cage and Slip ring induction motor.
	3 rd	3. 3 Explain principles of operation of 3-phase Induction motor.
	4 th	3. 4 Explain slip speed, slip and slip relation with rotor quantities 3. 5 Derive Torque during starting and running and conditions for maximum torque. (solve numerical problems) (contd.)
8 th	1 st	3. 5 Derive Torque during starting and running and conditions for maximum torque. (solve numerical problems)
	2 nd	3. 6 Derive Torque-slip characteristics
	3 rd	3. 7 Derive relation between full load torque and starting torque etc. (solve numerical problems).
	4 th	3. 8 Determine the relations between Rotor Copper loss, Rotor output and Gross Torque, and relationship of slip with rotor copper loss. (solve numerical problems)
9 th	1 st	3. 9 Explain and state Methods of starting and different types of starters
	2 nd	3. 10 Explain speed control by Voltage Control, Rotor resistance control, pole changing, frequency control methods.
	3 rd	3. 11 Describe plugging applicable to three phase induction motor
	4 th	3. 12 Describe different types of motor enclosures

10 th	1 st	3. 13 Explain principle of Induction Generator and state its applications
	2 nd	Unit-4:SINGLE PHASE INDUCTION MOTOR. 4.1 Explain Rotating – field theory of 1-phase induction motor.
	3 rd	4.2 Explain Ferrari's principle.
	4 th	4.3 Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors 4.3.1 Split phase motor.
11 th	1 st	4.3.2 Capacitor Start motor.
	2 nd	4.3.3 Capacitor start, capacitor run motor
	3 rd	4.3.4 Permanent capacitor type motor
	4 th	4.3.5 Shaded pole motor
12 th	1 st	4.4 Explain the method to change the direction of rotation of above motors
	2 nd	Unit-5:COMMUTATOR MOTORS 5.1 Explain construction, working principle, running characteristic and application of singlephase series motor (contd.)
	3 rd	5.1 Explain construction, working principle, running characteristic and application of singlephase series motor.
	4 th	5.2 Explain construction, working principle and application of Universal motors. (contd.)
13 th	1 st	5.2 Explain construction, working principle and application of Universal motors.
	2 nd	5.3 Explain working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.(cont..)
	3 rd	5.3 Explain working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.
	4 th	Unit-6:SPECIAL ELECTRICAL MACHINE 6.1 Principle of Stepper motor.
14 th	1 st	6.2 Classification of Stepper motor. 6.3 Principle of variable reluctant stepper motor.
	2 nd	6.4 Principle of Permanent magnet stepper motor.
	3 rd	6.5 Principle of hybrid stepper motor.
	4 th	6.6 Applications of Stepper motor.
15 th	1 st	Unit-7: THREE PHASE TRANSFORMERS 7.1 Explain Grouping of winding, Advantages
	2 nd	7.2 Explain parallel operation of the three phase transformers.
	3 rd	7.3 Explain tap changer (On/Off load tap changing
	4 th	7.4 State maintenance of Transformers
16 th	1 st	REVISION CLASS
	2 nd	REVISION CLASS
	3 rd	REVISION CLASS
	4 th	REVISION CLASS
17 th	1 st	REVISION CLASS
	2 nd	REVISION CLASS
	3 rd	REVISION CLASS
	4 th	REVISION CLASS
18 th	1 st	REVISION CLASS
	2 nd	REVISION CLASS
	3 rd	REVISION CLASS
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19 th	1 st	REVISION CLASS
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	3 rd	REVISION CLASS
	4 th	REVISION CLASS



Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF WINTER 2024

Discipline: ELECTRICAL	Semester: 3 rd sem (Sec-A)	Name of the Teaching Faculty: P K Dev
Subject: Environmental Studies	No. of days/per week class allotted:4p/week	Semester From: 1 st July 2024 to 08 th Nov 2024 No. of Weeks: 19 weeks
Week	Class Day	Theory Topics
1 st	1 st	1. The Multidisciplinary nature of environmental studies: 1.1 Definition, scope and importance.
	2 nd	1.2 Need for public awareness.
	3 rd	1.2 Need for public awareness.(contd.)
	4 th	2.1 Natural resources and associated problems.
2 nd	1 st	2.1 Natural resources and associated problems. 2.1.1. Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction mining, dams and their effects on forests and tribal people.
	2 nd	2.1.2. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
	3 rd	2.1.2. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems. .(contd.)
	4 th	2.1.3. Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.
3 rd	1 st	2.1.4. Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity.
	2 nd	2.1.4. Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity.(contd.)
	3 rd	2.1.5. Energy Resources: Growing energy need, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
	4 th	2.1.6. Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification.
4 th	1 st	2.2 Role of individual in conservation of natural resources.
	2 nd	2.3 Equitable use of resources for sustainable life styles.
	3 rd	3.1. Concept of an eco system.
	4 th	3.2. Structure and function of an eco system. 3.3. Producers, consumers, decomposers.
5 th	1 st	3.4. Energy flow in the eco systems.
	2 nd	3.5. Ecological succession. 3.6. Food chains, food webs and ecological pyramids.
	3 rd	3.7. Introduction, types, characteristic features, structure and function of the following eco system
	4 th	3.8. Forest ecosystem.
6 th	1 st	3.9. Aquatic eco systems (ponds, streams, lakes, rivers, oceans)
	2 nd	4.1. Introduction-Definition: genetics, species and ecosystem diversity.
	3 rd	4.2. Biogeographically classification of India.
	4 th	4.3. Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and optin values.
7 th	1 st	4.4. Biodiversity at global, national and local level. (Conti...)
	2 nd	4.4. Biodiversity at global, national and local level.
	3 rd	4.5. Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts
	4 th	5.1. Definition Causes, effects and control measures.
8 th	1 st	5.1.1 Air pollution.

	2 nd	5.1.2 Water pollution.
	3 rd	5.1.3 Soil pollution
	4 th	5.1.4 Marine pollution.
9 th	1 st	5.1.5 Noise pollution.
	2 nd	5.1.6 Thermal pollution.
	3 rd	5.1.7 Nuclear hazards.
	4 th	5.2. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. (Conti...)
10 th	1 st	5.2. Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
	2 nd	5.3. Role of an individual in prevention of pollution.
	3 rd	5.4. Disaster management: Floods, earth quake, cyclone and landslides.
	4 th	6.1. Form unsustainable to sustainable development.
11 th	1 st	6.2. Urban problems related to energy.
	2 nd	6.3. Water conservation, rain water harvesting, water shed management.
	3 rd	6.4. Resettlement and rehabilitation of people; its problems and concern.
	4 th	6.5. Environmental ethics: issue and possible solutions.
12 th	1 st	6.6. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. (Conti...)
	2 nd	6.6. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.
	3 rd	6.7. Air (prevention and control of pollution) Act.
	4 th	6.8. Water (prevention and control of pollution) Act.
13 th	1 st	6.9. Public awareness.
	2 nd	7.1. Population growth and variation among nations. (Conti...)
	3 rd	7.1. Population growth and variation among nations.
	4 th	7.2. Population explosion- family welfare program.
14 th	1 st	7.3. Environment and human health. (Conti..)
	2 nd	7.3. Environment and human health.
	3 rd	7.4. Human rights.
	4 th	7.5. Value education
15 th	1 st	7.6. Role of information technology in environment and human health. (Conti..)
	2 nd	7.6. Role of information technology in environment and human health.
	3 rd	7.7 Discussion about population explosion effects on environment
	4 th	7.7 Discussion about population explosion effects on environment(Conti..)
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	3 rd	Revision
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