

Lesson Plan : Jan-Jun 2024

Sub: Energy management

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Unit	Lecture	Topic	
1	1	Brief overview of present energy scenario in India and worldwide	
	2	Brief overview of present energy scenario in India and worldwide	
	3	Brief overview of present energy scenario in India and worldwide	
	4	brief overview of share (in %age) of various energy sources	
	5	brief overview of share (in %age) of various energy sources	
	6	present energy scenario in India & worldwide	
	7	present energy scenario in India & worldwide	
	8	Basic concept and importance of Energy Management	
	9	Basic concept and importance of Energy Management	
	10	Basic concept and importance of Energy Management	
2	11	Energy Conservation and its Need	
	12	Energy Conservation and its Need	
	13	Energy Conservation opportunities	
	14	energy efficient technologies in domestic and industrial sectors	
	15	energy efficient technologies in domestic and industrial sectors	
	16	Energy Efficient lighting: Methods/Technologies of energy efficient lighting systems.	
	17	Energy Efficient lighting: Methods/Technologies of energy efficient lighting systems.	
	18	Heating: Energy efficient Methods	
	19	Technologies for energy savings in Furnaces	
	20	Technologies for energy savings in Ovens	
	21	Technologies for energy savings in Boilers	
	22	Technologies for energy savings in , Heat Exchangers	
	23	Technologies for energy savings in Cooling Towers, and Pumps	
	24	Cooling Systems : Methods/Technologies for Energy Savings in Ventilating systems	
	25	Cooling Systems : Methods/Technologies for Energy Savings in Air Conditioners (HVAC Systems)	
	26	Energy Efficient Motors	
	27	Soft Starters	
	28	Variable Frequency Drives.	
	29	Variable Frequency Drives.	
	30	Power Factor improvement devices and their significance in energy conservation.	
	31	Amorphous Core Transformers	

Important terms related to rise. ...

Remarks

	32	Amorphous Core Transformers	
3	33	Reactive power compensation	
	34	Reactive power compensation	
	35	Reactive power compensation	
	36	Demand Side Management	
	37	Demand Side Management	
	38	Demand Side Management	
	39	Losses in transmission and distribution system and its minimization	
	40	Losses in transmission and distribution system and its minimization	
	41	Losses in transmission and distribution system and its minimization	
	42	Losses in transmission and distribution system and its minimization	
4	43	Need of Energy Audit	
	44	Need of Energy Audit	
	45	Types of Energy Audit: Preliminary Audit, General or Mini audit	
	46	Types of Energy Audit: Preliminary Audit, General or Mini audit	
	47	Comprehensive Audit	
	48	Energy Audit methodologies/Procedure	
	49	Energy Flow Diagram and its importance.	
	50	Measurements in energy audit	
	51	List of measuring instruments and equipment used in energy audit	
	52	Questionnaires for the energy audit	
	53	Energy audit checklist	
	54	Calculation of payback period	
	55	Case studies of Energy Audit of any Commercial building and Small Industrial installation	
	56	Case studies of Energy Audit of any Commercial building and Small Industrial installation	
5	57	Environment and social concerns related to energy utilization	
	58	Environment and social concerns related to energy utilization	
	59	Environment impact assessment and its need	
	60	Environment impact assessment and its need	
	61	Environmental impact assessment in India	
	62	Environmental impact assessment in India	

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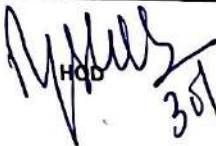
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3/11/24

Introduction to Switchgear

Name of the teacher: Neha Malhotra		Subject: EP-III	Class: ELECTRICAL Engg. (6th sem)	Remarks
S. No.	Lecture	Name of the chapter	Contents to be taught	
1	1	Introduction to	Switchgear: Essential features of Switchgear	
2	2	Introduction to	Switchgear elements and its operation	
3	3	Introduction to	Bus bar arrangements Concept of short circuit	
4	4	Power System Faults	short circuit current Types of faults	
5	5	Power System Faults	symmetrical faults: unsymmetrical faults	
6	6	Power System Faults	Analysis of L to L fault	
7	7	Power System Faults	Analysis of L to G faults	
8	8	Power System Faults	Analysis of L-L to G faults	
9	9	Fuses	Advantages and disadvantages of fuse. Desirable characteristics of fuse element, fuse element materials	
10	10	Fuses	Important terms related to fuse: current rating of fuse element, fusing current, fusing factor	
11	11	Fuses	cut-off current, arcing time and breaking capacity	
12	12	Fuses	Types of fuse: LV fuse and HV fuse	
13	13	Fuses	LV fuse: semi-enclosed rewritable fuse and working	
14	14	Fuses	LV fuse: their construction and working	
15	15	Fuses	V fuse: cartridge type, liquid type, metal clad construction & working	
16	16	Circuit Breakers	Difference between Switch, Isolator and Circuit Breakers, Function of Isolator and Circuit breaker	
17	17	Circuit Breakers	Difference between Fuse and Circuit Breaker	
18	18	Circuit Breakers	Arc phenomenon principles and in circuit breaker methods of arc extinction.	
19	19	Circuit Breakers	Terms related to circuit breaker: arc voltage, re-striking voltage and recovery voltage	
20	20	Circuit Breakers	Construction, working principles, types and applications of Air-Blast Circuit Breaker, Oil Circuit Breaker,	
21	21	Circuit Breakers	Vacuum Circuit Breaker and SF6 Circuit Breaker	
22	22	Circuit Breakers	Comparison between various types of Circuit Breakers in terms of their features and application areas.	
23	23	Circuit Breakers	Circuit breaker rating: breaking capacity, making capacity and short-time rating	
24	24	Circuit Breakers	Circuit breaker rating: breaking capacity, making capacity and short-time rating	
25	25	Protective Relays	Introduction: fundamental requirement of relay, function of relay	
26	26	Protective Relays	Introduction: fundamental requirement of relay, function of relay	
27	27	Protective Relays	Electromagnetic attraction type relay	
28	28	Protective Relays	Electromagnetic attraction type relay	
29	29	Protective Relays	Electromagnetic induction type relays	
30	30	Protective Relays	Electromagnetic induction type relays	
31	31	Protective Relays	Relays Terminology: Pick-up Current, Current Setting, Plug Setting Multiplier	
32	32	Protective Relays	Time Setting Multiplier (TSM), Time/PSM Curve	
33	33	Protective Relays	Distance or Impedance Relay: definite-distance and time distance impedance relay	
34	34	Protective Relays	Distance or Impedance Relay: definite-distance and time distance impedance relay	
35	35	Protective Relays	Differential Relays: current differential and voltage balance differential relay	
36	36	Protective Relays	Differential Relays: current differential and voltage balance differential relay	
37	37	Protective Relays	Brief idea of Static and Microprocessor based relays & their applications	
38	38	Protection Schemes in Power System	Differential Protection Scheme for Alternators	
39	39	Protection Schemes in Power System	Protection Schemes for Transformer, Buchholz relay	
40	40	Protection Schemes in Power System	Merz-price voltage balance protection scheme for bus-bar and transmission line	
41	41	Protection Schemes in Power System	Earth fault or Leakage Protection	
42	42	Over-voltage Protection	Introduction: voltage surge, causes of overvoltage	
43	43	Over-voltage Protection	Lightening, lightening arresters such as rod gap, horn gap, multi-gap, expulsion type and valve type arrester	
44	44	Over-voltage Protection	Lightening, lightening arresters such as rod gap, horn gap, multi-gap, expulsion type and valve type arrester	
45	45	Over-voltage Protection	Brief idea about surge absorber	
46	46	Over-voltage Protection	Transmission Line and substation protection against over-voltages	
47	47	Revision		
48	48	Revision		

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 30/07/24

LESSON PLAN

Name of the teacher: Neha Malhotra

Subject: U.E.E

Class: Elect. Engg. (6th sem)

Sr. No.	Lecture	Name of the chapter	Contents to be taught	Remarks
1	1	Electric Drives	Introduction, Advantages of electric drives.	
2	2	Electric Drives	Types of electric drives Characteristics of different mechanical loads.	
3	3	Electric Drives	Types of motors used as electric drive	
4	4	Electric Drives	Electric braking Plugging, Rheostatic braking	
5	5	Electric Drives	Rheostatic braking Regenerative braking	
6	6	Electric Drives	Methods of power transfer by direct coupling by using devices like belt drive, gear, chain drives etc.	
7	7	Electric Drives	Examples of selection of motors for different types of domestic loads. Selection of drive for applications such as general workshop, textile mill, paper mill, steel mill, printing press, crane and lift etc.	
8	8	Electric Drives	Examples of selection of motors for different types of domestic loads. paper mill, steel mill, printing press, crane and lift etc.	
9	9	Electric Drives	Selection of drive for applications such as general workshop, textile mill,	
10	10	Illumination	Application of flywheel Nature of light, visibility spectrum curve of relative sensitivity of human eye and wave length of light.	
11	11	Illumination	Definition: Luminous flux, solid angle, luminous intensity, illumination, luminous efficiency, depreciation factor, coefficient of utilization, space to height ratio, reflection factor, glare, shadow, lux level.	
12	12	Illumination	Laws of illumination. Different type of lamps,	
13	13	Illumination	construction and working of incandescent and discharge lamps – their characteristics.. fittings required for filament lamp	
14	14	Illumination	Construction and working of Mercury vapour sodium lamp, fluorescent lamp	
15	15	Illumination	Halogen lamp, neon lamp.	
16	16	Illumination	CFL, LED lamps. Main requirements of proper lighting;	
17	17	Illumination	Main requirements of proper lighting; absence of glare, contrast and shadow.	
18	18	Illumination	Illumination required for street lighting, flood lighting, monument lighting and decorative lighting. LED based lighting system, advantages of LED based lighting.	
19	19	Electric Heating	Advantages of electrical heating. Resistance heating – direct resistant heating	
20	20	Electric Heating	Advantages of electrical heating. Resistance heating – indirect resistance heating.	
21	21	Electric Heating	Electric ovens, their temperature range. Properties of resistance heating elements. and applications. Electric arc heating: direct and indirect arc heating.	
22	22	Electric Heating	Induction heating; principle of core type and coreless induction furnace, their construction and applications.	
23	23	Electric Heating	Electric arc heating; direct and indirect arc heating.	
24	24	Electric Heating	Construction, working and applications of arc furnace.	
25	25	Electric Heating	Dielectric heating, applications in various industrial fields.	
26	26	Electric Heating	Infra-red heating and its applications. Microwave heating and its applications.	
27	27	Electric Welding	Advantages of electric welding. Welding methods: Principles of resistance welding, types – spot, projection, seam and butt welding,	
28	28	Electric Welding	Welding equipments. Principle of arc production, electric arc welding.	
29	29	Electric Welding	characteristics of arc; carbon arc, metal arc, hydrogen arc welding method and their applications.	
30	30	Electrolytic Processes	Need of electro-deposition. Laws of electrolysis	
31	31	Electrolytic Processes	process of electro-deposition - clearing, operation, deposition of metals, polishing and buffing. Equipment and accessories for electroplating. .	
32	32	Electrolytic Processes	Factors affecting electro-deposition. Electroplating of non-conducting materials.	
33	33	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	Principle of air conditioning	
34	34	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	Principle of , vapour pressure	
35	35	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	Principle of refrigeration cycle. Eco-friendly refrigerants. Description of Electrical circuit used in Refrigerator, Air-conditioner and Water cooler .	
36	36	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	Principle of air conditioning, vapour pressure, refrigeration cycle. Eco-friendly refrigerants.	
37	37	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	Description of Electrical circuit used in Refrigerator, Air-conditioner and Water cooler .	
38	38	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	Description of Electrical circuit used in Air-conditioner.	

39	39	Electrical Circuits used In Refrigeration, Air Conditioning and Water Coolers	Description of Electrical circuit used in Water cooler .	
40	40	Electric Traction	Requirements of ideal traction system. Different systems of electric traction, DC and AC systems, diesel electric system.	
41	41	Electric Traction	sub-urban, and main line and their speed-time curves.	
42	42	Electric Traction	Advantages of Electric Traction. Different accessories for track electrification; such as overhead catenary wire, conductor rail system, current collector-pentagraph.	
43	43	Electric Traction	Electrical block diagram of an electric locomotive with description of various equipment and accessories used.sed.	
44	44	Electric Traction	Types of motors used for electric traction	
45	45	Electric Traction	Starting and braking of electric locomotives. Introduction to EMU and metro railways.	
46	46	Electric Traction	Modern Electrical Traction system, their features and advantages.	
47	47	Electric Traction	Modern Electrical Traction system, their features and advantages.	
48	48	Revision		

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Lesson Plan : Jan-Jun 2024

Sub: Estimating & Costing in Electrical Engineering

Unit	Lecture	Topic	Remarks
1	1	Estimating, Purpose of estimating and costing	
	2	Estimating, Purpose of estimating and costing	
	3	proforma for making estimates	
	4	catalogue, costing	
	5	price list	
	6	tender document, net price list	
	7	market survey, overhead charges	
	8	labor charges, electrical point method and fixed percentage method	
	9	contingency, profit, purchase system	
	10	enquiries, comparative statements	
	11	orders for supply	
	12	payment of bills	
	13	Tenders – it's constituents, types and procedure.	
	14	Tenders – it's constituents, types and procedure.	
2	15	Cleat, batten	
	16	casing capping and conduit wiring	
	17	comparison of different wiring systems	
	18	selection and design of wiring schemes for particular situation (domestic)	
	19	selection and design of wiring schemes for particular situation (domestic)	
	20	selection and design of wiring schemes for particular situation (Industrial)	
	21	selection and design of wiring schemes for particular situation (Industrial)	
	22	Selection of wires and cables	
	23	Selection of wires and cables	
	24	wiring accessories	
	25	use of protective devices	
	26	fuse, MCB,ELCB	
	27	Use of wire-gauge and tables.	
	28	Use of wire-gauge and tables.	
3	29	Planning of circuits	
	30	sub-circuits and position of different accessories	
	31	electrical layout	
	32	preparing estimates including cost as per schedule rate pattern and actual market rate.	

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	33	preparing estimates including cost as per schedule rate pattern and actual market rate.	
	34	Industrial installations: relevant IE rules and standard practices	
	35	planning, designing and estimation of installation for single phase motors of different ratings	
	36	planning, designing and estimation of installation for single phase motors of different ratings	
	37	electrical circuit diagram, starters	
	38	preparation of list of materials	
	39	estimating and costing exercises on workshop with single-phase motor load	
	40	estimating and costing exercises on workshop with 3-phase motor load	
	41	estimating and costing exercises on workshop with lighting load (3-phase supply system).	
	42	Service line connections estimate for domestic loads from pole to energy meter.	
	43	Service line connections estimate for Industrial loads from pole to energy meter.	
	44	Service line connections estimate for Industrial loads from pole to energy meter.	
	45	Earthing Systems Estimation: IS specifications regarding earthing	
	46	types of earthing	
	47	List of materials required for earthing	
	48	Design of earth wire/strip	
	49	Design of earth electrode for domestic installation.	
	50	Design of earth electrode for industrial installation.	
4	51	Transmission and distribution lines (overhead and underground)	
	52	Transmission and distribution lines (overhead and underground)	
	53	planning and designing of lines with different fixtures	
	54	planning and designing of lines with different fixtures	
	55	Substation: Types of substations	
	56	substation schemes and components	
	57	substation schemes and components	
	58	estimate of 11/0.4 kV pole mounted substation up to 200 kVA rating	
	59	earthing of substations	
	60	Key Diagram of 66 kV/33kV/11kV Substation	
	61	Key Diagram of 66 kV/33kV/11kV Substation	
	62	Revision	
	63	Revision	
	64	Revision	

Signature of Teacher

31/01/24

LESSON PLAN

Name of the teacher: Avnish Paul


Subject: P.L.C.

Class: ELECTRICAL Engg.(6TH sem)

UNIT	LECTURE	TOPIC	REMARKS
UNIT 1. Introduction to PLC	1.	Relays based logic circuits	
	2.	limitations of relays based logic circuit,	
	3.	limitations of relays based logic circuit,	
	4.	Advantages of PLCs over electromagnetic relays based logic circuits	
	5.	Different programming languages used in PLC	
	6.	REVISION : TOPIC 1 TO 3	
	7.	REVISION: TOPIC 4 TO 5	
UNIT 2. Architectural Detail and Working of PLC	8.	Basic operation and principle of working of PLC	
	9.	Architectural details of PLC	
	10.	Input & Output Modules in PLC	
	11.	Opto-isolation Circuit in PLC and its need	
	12.	REVISION : TOPIC 8 TO 12	
UNIT 3. Architectural Detail and Working of PLC	13.	Memory structures in PLC	
	14.	HMI (Human Machine Interface) used in PLC system	
	15.	Power supply requirements in PLC	
	16.	REVISION:TOPIC 13 TO 15	
UNIT 4. Instructions Set	17.	Addressing in PLC: I/O Address	
	18.	Basic instructions: Examine ON, Examine OFF	
	19.	Basic instructions: Examine ON, Examine OFF, Latch/Unlatch, Output Energize, Hold ON	
	20.	Timer instructions: BASICS	
	21.	Timer instructions: Ton & Toff	
	22.	Counter instructions: Up Counter, Down Counter, resetting of Counters	
	23.	Comparison instructions like equal, not equal, greater, greater than equal, less than, less than equal	
	24.	REVISION : TOPIC 17 TO 19	
	25.	REVISION: TOPIC 20 TO 23	
UNIT 5. Ladder Logic Programming	26.	Introduction to Ladder Logic programming	
	27.	Ladder logic programming examples based on basic instructions	
	28.	Ladder logic programming examples based on basic instructions	
	29.	Timer and counter instructions.	
	30.	Description, I/O assignment and ladder logic program for the following applications	

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UNIT 6. Applications of PLCs	31.	Description, I/O assignment and ladder logic program for the following applications/processes 5.1 Forward/reverse control of motor using PLC	
	32.	Doorbell operation Traffic light control 5.2 Process Control (Stirred tank Heating Control)	
	33.	REVISION	
UNIT 7. 8051 Micro Controller - Over View	34.	Difference between Microprocessor & Microcontroller	
	35.	Architectural Detail of 8051 microcontroller	
	36.	Pin details of 8051 microcontroller I/O Port Structure	
	37.	Memory Organization in 8051	
	38.	Special Function Registers	
	39.	REVISION	
	40.	REVISION	
Unit 8. Assembly language programming in 8051 Microcontroller	41.	Instructions in 8051 Microcontroller	
	42.	Addressing Modes in 8051 Microcontroller	
	43.	Timer operation	
	44.	6.10 Interrupts in 8051	
	45.	Assemblers and Compilers	
	46.	Assembler Directives	
	47.	REVISION	
	48.	REVISION	
Unit 9. Design and Interface using 8051 Microcontroller	49.	Keypad interface	
	50.	7-Segment interface	
	51.	Stepper Motor interface	
	52.	Ladder programming-Revise	
	53.	Ladder programming-Revise	
	54.	Instructions in 8051 Microcontroller-Revise	
UNIT 10. Introduction to PIC Microcontroller and Arduino board	55.	Introduction to PIC Microcontroller	
	56.	Arduino board	
	57.	REVISION:UNIT 1 TO 3	
	58.	REVISION:UNIT 3 TO 4	
	59.	REVISION:UNIT 4 TO 6	
	60.	REVISION:UNIT 6 TO 10	


 CLASS TEACHER
 Arvish Paul
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 3/5/17