

# **ELECTRICAL INSTALLATION AND ESTIMATING (Th. 01)**

Date of Commencement of classes: 14.02.2023

Date of Closing of classes: 23.05.2023

## **LIST OF WEEK/ MONTH WISE AVAILABLE DAYS/ PERIODS**

Sl. No.	Month	Week-wise no. of academic days available					Total no. of academic days
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	33	6	5	--	--	14
<b>Total</b>		<b>10</b>	<b>15</b>	<b>12</b>	<b>15</b>	<b>11</b>	<b>68</b>

## **NO. OF AVAILABLE CLASSES PER WEEK/MONTH**

Sl. No.	Month	Week-wise no. of academic periods available					Total no. of academic periods
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	3	6	5	--	--	14
<b>Total</b>		<b>10</b>	<b>15</b>	<b>12</b>	<b>15</b>	<b>11</b>	<b>68</b>

## **CHAPTER-WISE DISTRIBUTION OF PERIODS**

Sl. No.	Sl no of chapter	Name of the Chapter	Periods as per Syllabus	Actually period needed	Expected Marks
01	01	INDIAN ELECTRICITY RULES	06	05	10
02	04	OVERHEAD INSTALLATION (HT)	12	07	10
03	06	ESTIMATE FOR DISTRIBUTION SUBSTATIONS	06	06	15
04	05	OVERHEAD SERVICE LINES	12	11	20
05	02	ELECTRICAL INSTALLATIONS	12	09	20
06	03	INTERNAL WIRING	12	15	15
<b>TOTAL</b>			<b>60</b>	<b>53</b>	<b>100</b>

**Lesson Plan By –SAMARENDRA PRADHAN**

## LESSON PLAN

Name of the Month	Week No.	Class day	Art. No.	Theory Topics
F E B R U A R Y	3 <sup>rd</sup>	1 <sup>st</sup>	1.1	<b><u>CHAPTER-01 (INDIAN ELECTRICITY RULES)</u></b> Definitions, Ampere, Apparatus, Accessible, Bare, cable, circuit, circuit breaker, conductor voltage (low, medium, high, EH), live, dead, cut-out, conduit, system, danger, Installation, earthing system, span, volt, switch gear, etc
		2 <sup>nd</sup>	1.2	General safety precautions, rule 29, 30, 31, 32, 33, 34, 35, 36, 40, 41, 43, 44, 45, 46
		3 <sup>rd</sup>	1.3	General conditions relating to supply and use of energy: rule 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 59
		4 <sup>th</sup>	1.3	Continuation of General conditions relating to supply and use of energy: 60, 61, 62, 63, 64, 65, 66, 67, 68, 70
	4 <sup>th</sup>	1 <sup>st</sup>	1.4	OH lines: Rule 74, 75, 76, 77, 78, 79, 80, 86, 87, 88, 89, 90, 91
		2 <sup>nd</sup>	4.1	<b><u>CHAPTER NO-04 (OVER HEAD INSTALLATION)</u></b> Main components of overhead lines, line supports, factors Governing Height of pole, conductor materials, determination of size of conductor for overhead transmission line, cross arms, pole brackets and clamps, guys and stays, conductors' configurations
		3 <sup>rd</sup>		Spacing and clearances, span lengths, overhead line insulators, types of insulators, lighting arresters, danger plates, anti-climbing devices, bird guards, beads of jumpers, jumpers, tee-offs, guarding of overhead lines.
		4 <sup>th</sup>	4.4	<b>1<sup>st</sup> Problem:</b> Prepare an estimate of materials required for HT distribution line (11 KV) within 2 km and load of 2000 KVA maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consider action using ACSR.
		5 <sup>th</sup>		<b>2<sup>nd</sup> Problem:</b> Problems based on bending, Road crossing & End point
		6 <sup>th</sup>		<b>3<sup>rd</sup> Problem:</b> Problems while crossing a telephone line, besides the building & no space for stay installation.
	5 <sup>th</sup>	1 <sup>st</sup>	4.2	<b>4<sup>th</sup> Problem:</b> Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR
		2 <sup>nd</sup>	4.3	<b>3<sup>rd</sup> Problem:</b> Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR

		3 <sup>rd</sup>		<b><u>CHAPTER NO-06 (ESTIMATING FOR DISTRIBUTION SUBSTATIONS)</u></b>
M A R C H	1 <sup>st</sup>	1 <sup>st</sup>	6.1	Prepare one material estimate for pole mounted substation
		2 <sup>nd</sup>	6.1.1	<b>Problem-1</b> Preparation of list of materials for a 100KVA T/F with neat sketch indicating LT Box.
	2 <sup>nd</sup>	1 <sup>st</sup>	6.1.2	Prepare one material estimate for plinth mounted substation
		2 <sup>nd</sup>		<b>Problem-1:</b> Preparation of list of materials for a 100KVA T/F with neat sketch indicating LT Box.
		3 <sup>rd</sup>	5.1	<b><u>CHAPTER-05 (OVER HEAD SERVICE LINES)</u></b> Components of service lines, service line (cables and conductors), bearer wire, lacing rod. Ariel fuse, service support, energy box and meters etc
		4 <sup>th</sup>		
	3 <sup>rd</sup>	5 <sup>th</sup>		
		1 <sup>st</sup>	5.2	Prepare and estimate for providing single phase supply of load of 5 KW (light, fan, socket) to a single stored residential building.
		2 <sup>nd</sup>		
		3 <sup>rd</sup>	5.3	Prepare and estimate for providing single phase supply load of 3KW to Ground floor of a double stored building having separate energy meter.
	4 <sup>th</sup>	Prepare and estimate for providing single phase supply load of 3KW to First floor of a double stored building having separate energy meter.		
	4 <sup>th</sup>	1 <sup>st</sup>	5.4	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire
		2 <sup>nd</sup>		
		3 <sup>rd</sup>	5.5	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using bare conductor and insulated wire combined.
		4 <sup>th</sup>		<b>Problem-1A</b> 3- $\phi$ service connection to a farmer pump house 500m away from the existing 3-ph pole
	5 <sup>th</sup>	1 <sup>st</sup>		
		2 <sup>nd</sup>	2.1	<b><u>CHAPTER-02 (ELECTRICAL INSTALLATIONS)</u></b> Electrical installations, domestics, industrial, Wiring System, Internal distribution of Electrical Energy. Methods of wiring, systems of wiring, wire and cable, conductor materials used in cables, insulating materials mechanical protection. Types of cables used in internal wiring, multi-stranded cables, voltage grinding of cables, general specifications of cables
		3 <sup>rd</sup>	2.2	ACCESSORIES: Main switch and distribution boards, conduits, conduit accessories and fittings,
		4 <sup>th</sup>		lighting accessories and fittings, fuses, important definitions, determination of size of fuse – wire, fuse units
		5 <sup>th</sup>		Earthing conductor, earthing, IS specifications regarding earthing of electrical installations, points to be earthed.
6 <sup>th</sup>		Determination of size of earth wire and earth plate for domestic and industrial installations. Material required for GI pipe earthing		
1 <sup>st</sup>	1 <sup>st</sup>	2.3	LIGHTING SCHEME: Aspects of good lighting services	
	2 <sup>nd</sup>		Types of lighting schemes, design of lighting schemes, factory lighting	
	3 <sup>rd</sup>		public lighting installations, street lighting, general rules for	

A P R I L				wiring, determination of number of points (light, fan, socket, outlets)
		4 <sup>th</sup>		determination of total load, determination of Number of sub circuits
		5 <sup>th</sup>	3.1	<b><u>CHAPTER NO-03 (INTERNAL WIRING)</u></b> <b>Type of internal wiring:</b> <ol style="list-style-type: none"> <li>cleat wiring their advantages, dis-advantages &amp; applications</li> <li>CTS wiring their advantages, dis-advantages &amp; applications</li> <li>wooden casing capping their advantages, dis-advantages &amp; applications</li> <li>metal sheathed wiring their advantages, dis-advantages &amp; applications</li> <li>conduit wiring, their advantage and disadvantages comparison and applications.</li> </ol>
		1 <sup>st</sup>		
	2 <sup>nd</sup>			
	3 <sup>rd</sup>			
	4 <sup>th</sup>			
	2 <sup>nd</sup>	4 <sup>th</sup>	3.2	Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m <sup>2</sup> with given light, fan & plug points.
		1 <sup>st</sup>	3.3	Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandah within 25 m <sup>2</sup> with given light, fan & plug points
		2 <sup>nd</sup>		
		3 <sup>rd</sup>		
	3 <sup>rd</sup>	4 <sup>th</sup>	3.4	Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m <sup>2</sup> with given light, fan & plug points.
		1 <sup>st</sup>		
		2 <sup>nd</sup>		
		3 <sup>rd</sup>		
4 <sup>th</sup>				
4 <sup>th</sup>	5 <sup>th</sup>	3.5	Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m <sup>2</sup> and load within 10 KW	
	4 <sup>th</sup>			
	5 <sup>th</sup>			
5 <sup>th</sup>	1 <sup>st</sup>		Preparation of list of materials of 2BHK as per the civil plan	
	2 <sup>nd</sup>		Chapter-1 Revision	
M A Y	1 <sup>st</sup>	1 <sup>st</sup>		Chapter-2 Revision
		2 <sup>nd</sup>		Chapter-3 Revision
		3 <sup>rd</sup>		Chapter-4 Revision
	2 <sup>nd</sup>	1 <sup>st</sup>		Chapter-5 Revision
		2 <sup>nd</sup>		Chapter-6 Revision
		3 <sup>rd</sup>		Previous Years Question Answer Discussion
		4 <sup>th</sup>		Previous Years Question Answer Discussion
		5 <sup>th</sup>		Previous Years Question Answer Discussion
		6 <sup>th</sup>		Previous Years Question Answer Discussion

Coverage of Chapters up to the internal assessment ( 2<sup>nd</sup> week of May 2022): **ALL.**

### ***Learning Resources:***

Sl. No.	Name of the Book	Author Name	Publisher
01	Surjit Singh	Electrical Installation & Estimating	Dhanpat Rai& Sons
02	J.B.Gupta	A Course in Electrical Installation, Estimating & costing.	S.K.Kataria & Sons
03	N. Alagappan S.Ekambaram	Electrical Estimating& costing.	TATA Mc GRAW HILL