

## **SUB :UTILISATION OF ELECTRICAL ENERGY AND TRACTION (TH-4)**

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

Month	Sep	Oct	Nov	Dec	Jan	Total
Month wise no of Academic days available	07	10	22	25		64
Month wise no of period Available						

### **TOPIC WISE DISTRIBUTION OF PERIODS**

SL NO.	Chapter	Topics	Periods as per Syllabus	Periods actually needed	Expected marks
1	CHPT-01	ELECTROLYTIC PROCESS	08	08	20
2	CHPT-02	ELECTRICAL HEATING	08	07	15
3	CHPT-03	Principles of arc welding	08	08	15
4	CHPT-04	ILLUMINATION	12	11	10
5	CHPT-05	INDUSTRIAL DRIVES	10	06	20
6	CHPT-06	ELECTRIC TRACTION	14	13	20
		<b>TOTAL</b>	<b>60</b>	<b>53</b>	<b>100</b>

Sign of Lect.

Sign of HOD.

Sign of AIC

Sign of Vice Principal

## CHAPTER 1.0

### ELECTROLYTIC PROCESS

Article No.	Name of the Articles	Required periods	Lect.sign with Date	Authenticity duly verified by H.O.D.	Remark By V.P
1.1	Definition and Basic Principle of electro deposition	01			
1.2	Important terms regarding electrolysis				
1.3	Faradays laws of electrolysis	01			
1.4	Definition of Current efficiency, energy efficiency	01			
1.5	principle of electro deposition				
1.6	Factors affecting the amount of electro deposition	01			
1.7	Factors governing the Better electro deposition	01			
1.8	State simple Examples of extraction of metals	01			
	Cont.	01			
1.9	Application of electrolysis	01			
	<b>TOTAL</b>	<b>08</b>			
	<b>Short Question with answer and Long question with hints</b>				

## CHAPTER 2.0

### ELECTRICAL HEATING

Article No.	Name of the Articles	Required periods	Lect.sign with Date	Authenticity duly verified by H.O.D.	Remark By V.P
2.1	Advantage of electrical heating	01			
2.2	Explain Mode of heat transfer &stephens law				
2.3	Discuss principle of resistance heating	01			
	direct resistance heating indirect resistance heating	01			
2.4	Explain working principle of direct arc furnace and indirect arc furnace				

2.5	principle of induction heating	01			
2.5.1	Working principle of direct core type, vertical core type & indirect core type induction furnace	01			
2.5.2	principle of coreless induction furnace & skin effect	01			
2.6	principle of dielectric heating & its application	01			
2.7	principle of microwave heating & its application				
	<b>TOTAL</b>	<b>07</b>			
	<b>Short Question with answer and Long question with hints</b>				

### CHAPTER 3.0

### PRINCIPLES OF ARC WELDING

Article No.	Name of the Articles	Required periods	Lect.sign with Date	Authenticity duly verified by H.O.D.	Remark By V.P
3.1	Explain Principle Of arc welding	01			
3.2	Discuss DC arc phenomena	01			
	Discuss AC arc phenomena	01			
3.3	DC arc welding plants of single and multi operation type	01			
	AC arc welding plants of single and multi operation type	01			
3.4	Types of arc welding	01			
3.5	Explain Principle of resistance welding	01			
3.6	Descriptive Study of different resistance welding methods				
	<b>TOTAL</b>	<b>08</b>			
	<b>Short Question with answer and Long question with hints</b>				



## CHAPTER-5.0

### INDUSTRIAL DRIVES

Article No.	Name of the Articles	Required periods	Lect.sign with Date	Authenticity duly verified by H.O.D.	Remark By V.P
5.1	State Group drive & individual drive	01			
5.2	Method of Choice of electric drives				
5.3	Explain Starting & running characteristics of DC motor	01			
	Starting & running characteristics of AC motor	01			
5.4	State Application of	01			
5.4.1	DC motor				
5.4.2	State Application of 3phase induction motor	01			
5.4.3	Application of 3phase synchronous motor	01			
5.4.4	Application of 1phase induction motor				
	Application of series motor, universal				
	Application of repulsion motor				
	<b>TOTAL</b>	<b>06</b>			
	<b>Short Question with answer and Long question with hints</b>				

## CHAPTER 6.0

### ELECTRIC TRACTION

Article No.	Name of the Articles	Required periods	Lect.sign with Date	Authenticity duly verified by H.O.D.	Remark By V.P
6.1	Explain System of traction	01			
6.2	System of track electrification	01			
	6.3	Running characteristics of DC and AC traction motor	01		
6.4	Explain control of motor Tapped field control	01			
6.4.1					
6.4.2	Rheostat control	01			
6.4.3	Series parallel control	01			

6.4.4	Multi-unit Control	01			
6.4.5	Metadyne control	01			
6.4.5	Metadyne control	01			
6.5	Explain braking of the following types	01			
6.5.1	Regenerative braking				
6.5.1	Cont.	01			
6.5.2	Braking with 1phase series motor	01			
6.5.3	Magnetic braking	01			
	Total	13			
	<b>Short Question with answer and Long question with hints</b>				

### Syllabus Covered up to I.A. Ch-1,2,3& 4.

#### Learning Resources:

Sl No	Title of Book	Author	Publisher
1	Utilization of Electrical Energy by Traction	G.C Garg	Khanna Publisher
2	Utilization of Electrical Energy	E.I.Taylor	TMH
3	A Text Book of Power System Engineering	Soni,Gupta, & Bhatnager	Dhanpat Rai & Sons