WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION

TEACHING AND EXAMINATION SCHEME FOR DIPLOMA COURSES

COURSE NAME: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)***

COURSE CODE : ***EEPS***

DURATION OF COURSE : 6 SEMESTERS

SEMESTER: ***FOURTH SEMESTER***

Sl. No.	SUBJECT	PERIODS			EVALUATION SCHEME							CREDITS
	THEORY	L	T	P	SESSIONAL EXAM			ESE	PRACTICAL (SESSIONAL)		TOTAL MARKS	
					TA	CT	TOTAL		(INT.)	(EXT.)		
1	Transfer System of Electrical Power	3	--	2	10	20	**30**	70	25	25	**150**	4
2	Applied & Digital Electronics	3	0	2	10	20	**30**	70	25	25	**150**	4
3	Electrical Machine - II	3	1	3	10	20	**30**	70	50	50	**200**	5
4	Power Plant Engineering	4	--		10	20	**30**	70			**100**	4
5	Power Electronics & its Applications	3	--	2	10	20	**30**	70	25	25	**150**	3
6	Computer aided Electrical Drawing	--	--	3					25	25	**50**	2
7	Development of Life Skill-II	--	--	2					25	25	**50**	2
8	Professional Practices - II	--	--	2					50		**50**	1
	TOTAL	***16***	***1***	***16***	***50***	***100***	***150***	***350***	***225***	***175***	***900***	***25***
							500		**400**			

STUDENT CONTACT HOURS PER WEEK: **33 HRS**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH

ABBREVIATIONS: L - Lecture, T - Tutorial, P – Practical, TA - Teachers Assessment, CT- Class Test, ESE - End Semester Exam, INT-Internal, EXT-External

TA: Attendance & surprise quizzes = 6 marks. Assignment & group discussion = 4 marks.

Total Marks : 900

Minimum passing marks for sessional is 40%, and for theory subject 40%.

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)***	
Name of the Subject : ***Transfer System of Electrical Power***	
Subject Code:	Semester: FOURTH
Duration: one Semester	Maximum Marks: 150
Teaching Scheme	Examination Scheme
Theory: 3 Hrs./Week	Mid Semester Exam.: 20 Marks
Tutorial: nil	Assignment & Quiz: 10 Marks
Practical: 2 Hrs./Week	End Semester Exam.: 70 Marks
Credit:4	Practical Exam.: 50 Marks

Aim:

Sl. No.	
1.	Electrical diploma pass outs should know systems for electrical energy transmission & distribution. They also will be able to identify various components & their functions.
2.	They will be able to measure system performance. They will be able to deal with various aspects of transmission and distribution system at different stages including erection and maintenance. Hence he should be well acquainted with the materials required and the methods employed for erection and maintenance.
3.	On completion the study of transmission & distribution, he/she will be able to work as technician/supervisor in power industry, manufacturing industry & public utilities.

Objective:

Sl. No.	
1.	Know various types of transmission & distribution systems.
2.	Identify various components & Know their functions.
3.	Calculate voltage regulation & efficiency of transmission system.
4.	Calculate voltage drop of distribution system.

Pre-Requisite:

Sl. No.	
1.	Basic Electrical Engineering.
2.	Electrical Power Generation

Contents (Theory)

Unit	Name of the Topics:	Hrs./Unit	Marks
Unit: 1	1. ***Basics Of Transmission.*** 1.1 Layout of a Power System by single line concept. 1.2 Concept of Primary & Secondary transmission & Distribution. 1.3 Advantages and limitations of using high voltage for power transmission. 1.4 Comparison between AC & DC power transmission systems. 1.5 Kelvin's laws for the economic choice of conductor size – related problem.	04	4
Unit: 2	2. ***Transmission Line Components.*** 2.1 Main components of Overhead lines (names & functions only). 2.2 Types of conductors-Copper, Aluminum & state their trade names. 2.3 Solid, Stranded & bundled conductors. 2.4 Types of supports – RCC/PCC poles, steel tower 2.5 Comparison between single circuit and double circuit design conception of ground wire. 2.7 Line insulators – requirements, types, and field of applications. 2.8 Failure of insulators, creepage distance (definition & significance only) 2.9 Distribution of potential over a string of three suspension insulators. - Problems. 2.10 Concept of string efficiency, Methods of improving string efficiency. - Problems. 2.11 Corona – corona formation, advantages & disadvantages, factors affecting corona, important terms related to corona. 2.12 Calculation of Span length & sag Calculation, effect of wind pressure,	12	16

Contents (Theory)

Unit	Name of the Topics:	Hrs./Unit	Marks
	temperature and ice deposition - Problems. 2.13 Stringing chart and its uses. 2.14 Spacing of conductors, length of span, Relevant I.E. Rules.		
Unit: 3	3. ***Transmission Line Parameters*** 3.1 R,L & C of 1-ph & 3-ph transmission line & their effects on line.(No deduction and Problems) 3.2 Skin effect, proximity effect & Ferranti effect. 3.3 Concept of transposition of conductors & necessity.	03	3
Unit: 4	4. ***Underground Cables.*** 4.1 Classification of cables and Comparison with overhead lines. 4.2 Cable construction. 4.3 Description of (i) PVC, (ii) PILC (iii) FRLS (Fire Retardant Low Smoke), (iv) XLPE cables & (v) Gas filled (SF6) cables 4.4 Cable Rating and De-rating factor. 4.5 Cable laying	04	7
Unit:5	5. ***Performance of Transmission Line.*** 5.1 Classification of transmission lines. 5.2 Losses, Efficiency & Regulation of line. 5.3 Performance of single phase short transmission line(Numerical based on it) 5.4 Effect of load power factor on performance. Power Factor Improvement Using Static condenser and Synchronous condenser – related problems. 5.5 Medium transmission lines-End condenser, Nominal T & Nominal Pi Network with vector diagram.- no problem.	09	15
Unit:6	6. ***Extra High Voltage Transmission.*** 6.1 EHVAC Transmission, Reasons for adoption & limitations. 6.2 Regional Grid System (Conception only). 6.3 Concept about FACTS and its applications. 6.4 HVDC Transmission – Advantages, Limitations. 6.5 Discussion on few HVDC system in Indian scenario.	03	5
Unit:7	7. Components Of Distribution System. 7.1 Introduction. 7.2 Classification of distribution system. 7.3 A.C distribution. 7.4 Connection schemes of distribution system. 7.5 Requirements of Distribution systems. 7.6 Design consideration. 7.7 A.C. distribution calculations. 7.8 Methods of solving A.C.-1 phase & 3 Ø -phase connection (balanced) distribution system. (Numerical based on 1-ph & 3-ph balanced distribution system)	08	12
Unit:8	8. Substations. 8.1 Introduction. 8.2 Classification of indoor & outdoor sub-stations. 8.3 Advantages & Disadvantages. 8.4 Selection & location of site. 8.5 Main connection schemes. 8.6 Equipments and circuit element of substations – their symbols & function. 8.6.1 Bus bar's material, types in detail. 8.6.2 Connection diagram and layout of sub-stations with proper notation.	5	8
	TOTAL	**48**	**70**

Contents (Practical)

Sl. No.	Skills to be developed
1.	Intellectual Skills:
	1.1 Identification & selection of components.
	1.2 Making proper connections

Contents (Practical)

Sl. No.	Skills to be developed
2.	Motor Skills:
	2.1 Ability to measure various parameters.
	2.2 Ability to follow standard test procedures.
3.	**LIST OF EXPERIMENTS :**
	3.1 To improve P.f. using static condenser.
	3.2 To study various system faults by D.C. network analyzer.
	3.3 To study active and reactive power flow through transmission lines.
	3.4 To study the supply system from 6.6 KV/400V sub-station to a housing complex using slides/model.
	3.5 To study various types of turbine used in Power station using slides/models.
	3.6 To study different types of excitation system for alternator using slides/models.
	3.7 To study different kinds of insulators (Insulators are required to be available in laboratory)
	3.8 To study PILC, PVC, FRLS and XLPE cables. (Cables are required to be available in laboratory)
	3.9 To measure Solar Radiation with the help of Pyranometer.
	3.10 Study of photo voltaic system used in street lighting – PV module, CCU, Battery, CFL.
	3.11 Study of power generation by wind power – using model / slides.

Text Books:

Name of Authors	Title of the Book		Name of the Publisher
V. K. Mehta	Principles of power system		S. Chand & Company
SoniGupta-Bhatnagar	A Course in electrical power		Dhanpat Rai
J. B. Gupta	Transmission & distribution of electrical energy		S.K. Kataria & Sons.
Nagsarkar & Sukhija	Power System Analysis		Oxford University Press
Tarlok Singh.	Transmission & Distribution of Power		S.K. Kataria & Sons.

Reference Books:

Name of Authors	Title of the Book		Name of the Publisher
A. T. Starr	Generation, Transmission and Utilization of Electric Power		Pitman
C.L.Wadhwa.	Electrical Power System		
H. Cotton	Electrical Technology		

EXAMINATION SCHEME (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3,4	12	TWENTY	ONE	1 X 20 = 20	FOUR	FIVE taking at least TWO from each Group	TEN	10 X 5 = 50
B	5,6,7,8	12				FIVE			

EXAMINATION SCHEME (SESSIONAL)

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Fifth Semester. Distribution of marks: Performance of Job – 15, Notebook – 10.
2. External Assessment of 25 marks shall be held at the end of the Fifth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. Distribution of marks: On spot job – 15, Viva-voce – 10.

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)***	
Name of the course : ***Applied and Digital Electronics***	
Course Code : **EEPS/S4/ADE**	Semester : Fourth
Duration : One Semester	Maximum Marks : 150
Teaching scheme :	**Examination scheme :**
Theory: 3 Hrs./ Week	Mid Semester Exam: 20 Marks
Tutorial: -- Hrs./ Week	Assignment & Quiz: 10 Marks
Practical: 2 Hrs./ Week	End Semester Exam: 70 Marks
Credit: 04	Practical: 50 Marks

Aim:

Sl. No.	
1.	It intends to teach the operating principles and applications of different types of Amplifiers and Oscillators.
2.	The subject also includes the Basic Digital logic circuits and their applications, D/A & A/D converters etc.
3.	Understanding of the subject will provide skill to the students for trouble shooting & testing of some basic Amplifier circuits, Oscillator circuits and Digital logic circuits.

Objective

Sl. No.	Student will be able to:
1.	Describe the Amplifier circuits and Oscillator circuits.
2.	Describe the Digital logic circuits, Flip-flop, Counter, Register, D/A & A/D converter.
3.	Test the Amplifier circuits, Oscillator circuits and Digital logic circuits.

Pre-Requisite:

1.	Knowledge of Basic Electronics.
2.	Knowledge of Analog & Digital Electronics.

Contents (Theory):

		Hrs./Unit	Marks
Unit : 1	***1. Amplifiers:*** **1. Power Amplifiers:** 1.1.1 Classification of power amplifiers – Class-A, Class-B, Class-AB, Class-C operation, Advantage & disadvantages of these amplifiers. 1.1.2 a) Operation of Class-A Push-pull amplifier. b) Operation of Class-B Push-pull amplifier. c) Operation of Class-AB Push-pull amplifier. ***1.2 FET Amplifier:*** 1.2.1 Biasing methods of FET. 1.2.2 Common-Source amplifier - working principle & applications. 1.2.3 Introduction to MOSFET – Types of MOSFET, construction, working principle and applications. 1.2.4 CMOS – construction and application. frequency. ***1.3 Operational Amplifier:*** 1.3.1 Basic differential amplifier circuit using BJT. 1.3.2 Pin diagram of OPAMP IC741& functions of each pin. Definition of offset voltage, input bias current, input offset current, differential mode gain, CMRR, slew rate 1.3.3 OPAMP as Non-inverting and Inverting amplifier. 1.3.4 Instrumentation amplifier – Operating principle using OPAMP, Applications.	**10**	**16**
Unit : 2	***2. Feedback Amplifiers & Oscillators:*** 2.1 Theory of Positive & Negative feedback. 2.2 Types of negative feedback amplifiers –shunt-voltage, series-voltage, shunt-current, series-current feedback. 2.3 Introduction to oscillator, Block diagram of sine wave oscillator, requirement of oscillation, Barkhausen criterion. 2.4 Wien bridge oscillator, Colpitt oscillator – operating principle, frequency of oscillation.	**08**	**14**
Unit : 3	***3. Boolean Algebra & Combinational Logic Circuits:*** 3.1 Number Systems – Decimal, Binary, Octal, Hexadecimal, BCD number system & their inter-conversion. 3.2 Symbolic representation & Truth tables for logic gates -NOT, OR, AND, NAND, NOR, XNOR, XOR. 3.3 Rules & laws of Boolean algebra, Demorgan's Theorems.	**08**	**14**

Contents (Theory):			
		Hrs./Unit	Marks
	3.4 Max. term & Min. term, Simplification of Boolean expression using Karnaugh map (upto 4 variable). 3.5 Realisation of Boolean expression with Logic gates. 3.6 Half adder, Full adder, Half subtractor, Full subtractor, Parity Generator and checker, Digital comparator 3.7 Code converter, Encoder, Decoder, Multiplexer, Demultiplexer		
Unit : 4	***4. Sequential Logic Circuits:*** 4.1 Flip-flops – RS, D, T, JK, JK Master Slave Flip Flops using basic gates, preset and clear signals. 4.2 Counters - Asynchronous & Synchronous Counter, Mod-N counter, Up Down Counter, Ring counter, 4.3 Registers - Shift register, Serial in Serial out, Serial in Parallel out, Parallel in serial out, Parallel in Parallel out.	**10**	**14**
Unit : 5	***5. Data Converters & Memory Devices:*** 5.1 D/A Converter: Basic concepts, Weighted Resistor D/A converter, R-2R Ladder D/A converter. 5.2 A/D Converter: Successive approximation method, Dual slope method. 5.3 Concept of - Static Memory & Dynamic Memory, SDRAM, DDR RAM, PROM, EEROM, EPROM. 5.4 Comparison of Logic families – DTL,TTL and ECL Gates	**12**	**12**
	Total	**48**	**70**

Practical:
Skills to be developed:

Intellectual Skills:
1. To locate the faults in circuits.
2. Interpretation of circuits & corresponding waveforms.

Motor Skills:
1. Ability to draw the circuit diagrams.
2. Ability to interpret the circuits.

List of Practicals:

1. Applied Electronics (Any Three):
1.1 To study RC phase shift oscillator and find out frequency of oscillation.
1.2 To study Colpitt's oscillator and find out frequency of oscillation
1.3 To plot frequency response of FET amplifier.
1.4 To study instrumentation amplifier using OPAMP.
1.5 To construct Adder, Subtractor, Unity gain buffer circuit using OPAMP.
2. Digital Electronics (Any five) :
2.1 To realize OR, AND, NOT and XOR gates using Universal gates.
2.2 To realize Half Adder / Full Adder/ Full Subtractor.
2.3 To verify the function of SR, D, JK and T Flip-flops.
2.4 To implement Encoder and Decoder circuit.
2.5 To implement Multiplexer and Demultiplexer circuit.
2.6 To construct binary Asynchronous or Synchronous counter.
2.7 To design controlled shift register & verify SISO, SIPO, PISO, PIPO operation.
2.8 To study D/A converter using trainer kit.
2.9 To study A/D converter using trainer kit.

List of Text Books:

Sl. No.	Name of Author	Title of the Books	Name of Publisher
1.	Albert Malvino & D.J.Bates	Electronic Principles	T.M.Hill
2.	Y.N.Bapat	Electronic Circuits & Systems	T.M.Hill
3.	R.S.Sedha	Applied Electronics	S.Chand & Co.
4.	Allen Mottershed	Electronic Devices & Circuits	P.H.I. Pvt. Ltd.
5.	J.B.Gupta	Electronics Engineering	S.K.Kataria & Sons.
6.	P.John Paul	Electronic Devices & Circuits	New Age International
7.	Chereku & Krishna	Electronic Devices & Circuits	Pearson Education

8.	Malvino & Leach	Digital Principles & Applications	T.M.Hill
9.	Jain	Modern Digital Electronics	T.M.Hill
10.	V.Kumar	Digital Technology	New Age Publisher

EXAMINATION SCHEME (THEORETICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	**TO BE ANSWERED**	MARKS PER QUESTION	TOTAL MARKS
A	1, 2,3	12	TWENTY	ONE	1 X 20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	4,5	11				FOUR			

EXAMINATION SCHEME (SESSIONAL)

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Fourth Semester. Distribution of marks: Performance of Job – 15, Notebook (Drawing) – 10.
2. External Assessment of 25 marks shall be held at the end of the Fourth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. Distribution of marks: On spot job – 15, Viva-voce – 10.

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)***	
Name of the Subject : ***Electrical Machine – II***	
Course Code : **EEPS/S4/EM II**	Semester : Fourth
Duration : One Semester	Maximum Marks : 200
Teaching scheme :	Examination scheme :
Theory: 3 Hrs./ Week	Mid Semester Exam: 20 Marks
Tutorial: 1 Hrs./ Week	Assignment & Quiz: 10 Marks
Practical: 3 Hrs./ Week	End Semester Exam: 70 Marks
	Practical: 100 Marks
Credit: 5	

Aim:	
Sl. No.	
1.	Students will be able to analyze the performance of 3-phase and single phase A.C motors and 3-phase Alternators both qualitatively and quantitatively.
2.	These machines are used widely in various Industries and Power plants. So knowledge gained by the students will be helpful in their job in industry and power plants.

Objective:	
Sl. No.	Student will be able to:
1.	Know the constructional details & working principles of A.C motors & generators.
2.	Test A.C motors & generators.
3.	Evaluate the performance of A.C machines by conducting different tests.
4.	Decide the suitability of AC machines for particular purpose.
5.	Write specifications of A.C motor & generators as required.
6.	Operate AC motor & generators as per requirement.

Pre-Requisite:	
Sl. No.	
1.	Three phase & single phase A.C fundamentals, Electromagnetism.
2.	Basic electronics engineering.

Contents (Theory)

Unit	Topics	Hrs./Unit	Marks
Unit : 1	**1. Three-Phase Induction Motor:** 1.1 Construction of 3-phase induction motor. 1.2 Production of rotating magnetic field. 1.3 Working principle of 3-phase induction motor. 1.4 Concept of Synchronous Speed & Slip. 1.5 Equation of rotor induced emf, current, frequency, reactance & impedance under standstill and running condition. **(Numerical)** 1.6 Vector diagram (at no-load & running condition). 1.7 Concept of Equivalent circuit (at no-load, at blocked rotor and at running condition).(No Numerical) 1.8 Derivation of Torque equation, Starting torque, Running torque, Maximum torque and condition for maximum torque. **(Numerical)** 1.9 Torque - Slip characteristics, Effect of change in rotor circuit resistance and supply voltage on Torque-Slip characteristics. 1.10 Measurement of slip by – a) Tachometer method. b) Comparing rotor & stator frequency. 1.11 Power stages in 3-phase induction motor and their relation, Losses, Efficiency. **(Numerical)** 1.12 Starting methods of 3-phase induction motor by– **(Numerical)** a) Rotor resistance starter. b) Direct -On-Line starter. c) Autotransformer starter.	**14 +6(T)**	**24**

Contents (Theory)

Unit	Topics	Hrs./Unit	Marks
	d) Star-Delta starter (Manual & Automatic). 1.13 Speed control of 3-phase induction motor by – a) Changing supply frequency. b) Pole changing method. c) Changing Rotor circuit resistance & stator reactance. d) Changing supply voltage. 1.14 Braking of 3-phase induction motor by – a) Plugging. b) Rheostatic method. c) Regenerative method. 1.15 Cogging & Crawling (simple idea) 1.16 Concept of Double cage rotor & Deep-bar rotor. 1.17 Motor enclosures and specification as per I.S Code. 1.18 Industrial applications of 3-phase induction motor.		
Unit : 2	**2. Alternator:** 2.1 Construction of 3-phase alternator, Description of salient & non-salient rotor. 2.2 Methods of excitation systems of 3-phase alternator by – a) Static excitation. b) Brushless excitation. c) DC generator. 2.3 Advantages of Stationary armature and Rotating field system. 2.4 Armature winding – Single layer and multilayer, Concentrated and Distributed (Concept only). 2.5 Derivation of E.M.F. equation of 3-phase alternator, Effect of Coil span factor and Distribution factor on emf, Winding factor. **(Numerical)** 2.6 Factors affecting the terminal voltage of alternator – a) Armature resistive drop b) Leakage reactance drop. c) Armature reaction at various p.f, concept of Synchronous reactance. 2.7 Phasor diagrams of cylindrical rotor alternator at lagging, leading & unity p.f. loads. 2.8 Voltage regulation of 3-phase alternator by – **(Numerical)** a) Synchronous Impedance Method. b) M.M.F method. 2.9 Open circuit characteristics, Short circuit characteristics of alternator and determination of synchronous reactance. 2.10 Active & Reactive power equations in terms of load angle at steady state for non-salient pole alternator. 2.11 Steady-state characteristics of Alternator – a) Terminal voltage vs. Load current, at different p.f, b) Field current vs. Load current at different p.f, c) Active & Reactive Power vs. load angle (non-salient alternator). 2.12 Short circuit ratio (SCR) – concept & significance. 2.13 Method of control of Active & Reactive Power of an alternator. 2.14 Parallel operation of two alternators – Reasons, & Advantages of Parallel operation. 2.15 Synchronization of two or more alternators by - a) Three lamps method. b) Synchroscope. 2.16 Parallel operation of (i) an alternator & infinite bus and (ii) Between two alternators & Load sharing between them.**(Numerical).**	**14+2(T)**	**24**
Unit : 3	**3. Synchronous Motor:** 3.1 Construction and working principle. 3.2 Methods of starting by –	**08+2(T)**	**08**

Contents (Theory)

Unit	Topics	Hrs./Unit	Marks
	a) An auxiliary motor. b) Damper winding. 3.3 Effect of variation of Load – Speed vs. Torque characteristics. 3.4 Effect of variation of excitation at infinite bus (over and under excitation) – V curves & inverted V-curves. 3.5 Hunting, George's phenomenon. 3.6 Applications of synchronous motor, Synchronous condenser.		
Unit : 4	**4. Single phase motors:** 4.1 Double-revolving field theory. 4.2 Construction, Principle of operation and Applications of different types of single-ph Induction motors – a) Split phase (resistance) type. b) Capacitor start type. c) Capacitor run type. d) Shaded pole motors.	**05+1(T)**	**08**
Unit : 5	**5. Special Machines:** 5.1 Linear induction motor. 5.2 Induction generator. 5.3 A.C series motor. 5.4 Reluctance Motor.	**07+1(T)**	**06**
	Total	**48+16(T)**	**70**

Practical:

Skills to be developed:

Intellectual skills:

1. Analytical skills.
2. Identification skills.

Motor skills:

1. Measurement (of parameters) skills.
2. Connection (of machine terminals) skills.

List of Practical:

1. a) To measure the slip of 3-phase induction motor by – (i) Stroboscopic method, (ii) Tachometer. b) To reverse the direction of rotation of 3-phase induction motor.
2. To perform No-load test and Blocked-rotor test on 3-phase induction motor & draw the equivalent circuit from the two tests.
3. To perform the load test on 3-phase induction motor and to study the performance characteristics of the motor.
4. To control the speed of 3-phase Induction motor by– (i) Frequency changing method, (ii) Pole-changing method.
5. To determine the effect of the rotor resistance on the torque-speed curves of an induction motor.
6. To observe the effect of excitation and speed on induced e.m.f of a 3-phase alternator and plot the O.C.C. of the alternator.
7. To find the percentage regulation of 3-phase alternator by synchronous impedance method at various power factors.
8. To synchronise two 3-phase alternator for parallel operation by **-** a) Three lamp method, b) Synchroscope & to study the sharing of load between the alternators.
9. To list and explain various starting methods of 3-phase synchronous motor and applying any one of them to start the synchronous motor. Plot V-curve & inverted V-curve of the same motor.
10. To study the effect of capacitor on the starting and running condition of a single-phase Induction motor, and to determine the method of reversing the direction of rotation.

Text Books:

Sl. No.	Titles of Book	Name of Author	Name of Publisher
1	Electrical Machines	S.K.Bhattacharya	T.M.H Publishing Co. Ltd.
2	Electrical Technology- Vol-II	B.L.Thereja	S.Chand
3	Electrical Machinery	Dr. S.K.Sen	Khanna Publisher
4	Electrical Machines	J.B.Gupta	S.K.Kataria & Sons.
5	The performance and design of Alternating Current machines	M.G.Say	C.B.S Publishers & Distributors
6	Electrical Machinery	P.S.Bhimbra	Khanna Publisher
7	Electrical Machines	M.N.Bandyopadhyay	P.H.I. Pvt. Ltd.
8	Electrical Machines	Ashfaq Husain	Dhanpat Rai & Co.
9	Principles of Electrical Machines and Power Electronics	P.C.Sen	Wiley India
10	Fundamentals of Electrical Machines	B.R.Gupta & V.Singhal	New Age Publisher
11	Electrical Machines	Nagrath & Kothari	T.M.Hill
12	Electrical Technology	H.Cotton	C.B.S. Publisher New Delhi
13	Electrical Machines	S. Ghosh	Pearson Publisher
14	Electrical Machines	M.V.Deshpande	PHI

EXAMINATION SCHEME (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET FIVE FOUR	**TO BE ANSWERED**	MARKS PER QUESTION	TOTAL MARKS
A	1, 4,5	12	TWENTY	ONE	1 X 20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	2,3	11				FOUR			

EXAMINATION SCHEME (SESSIONAL)

1. **Continuous Internal Assessment of 50 marks** is to be carried out by the teachers throughout the Fourth Semester. **Distribution of marks: Performance of Job – 30, Notebook (Drawing) – 20.**
2. **External Assessment of 50 marks** shall be held at the end of the Fourth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 35, Viva-voce – 15.**

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)*** Name of the Subject : ***Power Plant Engineering***	
Course Code: **EEPS/S4/PPE**	Semester: Fourth
Duration: One Semester	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory: 4 Hrs/Week	Mid Semester Exam.: 20 Marks
Tutorial:	Assignment & Quiz: 10 Marks
Practical:	End Semester Exam.: 70 Marks
Credit: 04	

Aim

Sl. No.	
1.	This is a core technology subject. The knowledge of the principle of generation of electricity, methods of generation of electricity & recent trends in generation of electricity is essential for Diploma Engineer.
2.	This subject will provide the basis for further studies in transmission, distribution and power system operation. Also the subject will provide the knowledge about the recent trends in non conventional energy sources & their working principles.

Objective	
Sl. No.	The student will be able to:
1.	Explain the working of different power plants
2.	Identify different components of various systems in generating stations
3.	Select suitable sites for different power stations
4.	Define the terms used in economics of power generation and explain their relation
5.	Select alternative energy sources for given conditions
6.	Explain the working of wind mills and solar systems
7.	Explain working of domestic & commercial D. G. Set
8.	Explain working of Gas Turbine

Pre-Requisite:

Sl. No.	
1.	Energy conversion

Contents

Unit	Topics	Hrs./Unit	Marks
Unit: 1	1.**Basics of Power Generation** 1.1 Importance of electrical power in day today life 1.2 Different forms of energy 1.3 Comparison of sources of energy 1.4 Power crisis in India and Future Trend 1.5 Overview of method of electrical power generation	02	03
Unit: 2	**2. Thermal Power Stations** 2.1 List of thermal power stations in the state with their capacities 2.2 Selection of site for thermal power stations. 2.3 Layout and working of thermal power station with block diagram. 2.4 Operation of following components: 2.4.1 Boiler 2.4.2 Economizer. 2.4.3 Air pre heater 2.4.4 Super-heaters & re-heaters. 2.4.5 Steam prime movers. 2.4.6 Condensers. 2.4.7 Spray ponds & cooling towers. 2.5 Quality of fuel and its effect on quality of power generation. 2.6 Merits and demerits of Thermal Power Plants. 2.7 Simple Problems.	08	08

Contents

Unit	Topics	Hrs./Unit	Marks
Unit: 3	**3. Nuclear Power Stations** 3.1 Selection of site for Nuclear Power plants. 3.2 Nuclear fission process 3.3 Block diagram and working of Nuclear Power station. 3.4 Construction and working of nuclear reactor. 3. 5 Fuels used in Nuclear Power Station 3. 6 Merits and demerits of Nuclear Power Plants 3. 7 List of Nuclear power stations in state & county with their capacities.	06	07
Unit: 4	**4. Hydro Power Stations** 4.1 Selection of site and classification of Hydroelectric Power Plants 4.2 Layout and working of Hydro Power Station. 4.3 Types of Turbines & generators used 4.4 Pumped storage Power Plant 4.5 Merits and demerits of Hydro Power Station 4.6 List of Hydro Power stations with their capacities & number of units in the state. 4.7 Simple Problem.	06	07
Unit: 5	**5. Diesel Electric Power Stations** 5.1 Selection of site for Diesel Electric Power Station. 5.2 Elements of diesel Electric power plants and their working. 5.3 Operation, maintenance & trouble shooting chart of diesel Electric plant. 5.4 Merits, demerits and applications of diesel electric power stations 5.5 Performance and thermal efficiency of Diesel Electric Power Plant.	06	05
Unit :6	**6. Gas Turbine Power Plants** 6.1 Selection of site for Gas Turbine Power Station. 6.2 Fuels for gas turbine 6.3 Elements of simple gas turbine power plants 6.4 Merits, demerits and application Gas turbine power plants.	03	05
UNIT:7	**7. Non-Conventional Energy Sources** 7.1 Types of non-conventional energy sources. 7.2 Solar Energy 7.2.1 Potential of solar energy. 7.2.2 Solar collector (Flat Plate Collector & Concentrating Collector) 7.2.3 Comparison of performances of different collectors. 7.2.4 Solar water heater. 7.2.5 Solar Thermal Power Plant - System block diagram with description & efficiency. 7.2.6 Thermal Storage system (Thermocline storage system, Hot cold system) 7.2.7 Photovoltaic cell : Principle of operation, Types, conversion efficiency, V-I characteristics. 7.2.8 Solar Cell Materials. 7.2.9 Methods of increasing Cell Efficiency. 7.2.10 Photovoltaic system of power generation – Solar PV arrays, solar cell connecting arrangements, storage batteries, inverters, advantages & disadvantages. 7.2.11 Limitation of using solar energy systems. 7.3 Wind Energy. 7.3.1 Selection of site for wind mills 7.3.2 Principle of electricity generation with the help of wind energy 7.3.3 Block diagram and working of Wind energy plant and its applications 7.3.4 List of major wind farms in the state with their approximate capacities 7.4 Bio-mass & Bio-gas energy. 7.4.1 Composition of Bio-gas & its calorific value. 7.4.2 Traditional; non-traditional Biogas plants	20	20

Contents

Unit	Topics	Hrs./Unit	Marks
	7.4.3 Bio-mass based power generation plants & their capacities. 7.5 Geothermal Energy 7.5.1 Introduction 7.5.2 Classification – Vapour dominated & Liquid Dominated (schematic diagram with description of parts) 7.5.3 Operational & environmental problem		
Unit: 8	**8. Economics Of Power Generation** 8.1 Terms commonly used in system operation: connected load, firm power, cold reserve, hot reserve, spinning reserve. 8.2 Terms used in system operation such as Load-curve, load duration curve, integrated duration curve. (Simple numerical based on plotting above curves.) 8.3 Factors affecting the cost of Generation: Average demand, Maximum demand, plant capacity factor & plant use factor, Diversity factor& load factor. (Simple numerical based on above)	08	08
Unit : 9	**9. Interconnected Power Systems** 9.1 Advantages of Interconnection. 9.2 Base load & peak loads, load allocation among various types of power stations 9.3 Load sharing and transfer of load between power stations. 9.4 Inter connection of power stations at state and national level	05	07
	TOTAL	64	70

Text Books:		
Name of Authors	Title of the Book	Name of the Publisher
J.B.Gupta	A course in Power System	S.K.Kataria & Sons
Umesh Rathore	Energy Management	S.K.Katharia & Sons
Dr. R.KSingal	Non-conventional Energy Resources	S.K.Katharia & Sons
Dr. S. L. Uppal	Electrical Power	Khanna Publishers.
Soni–Gupta-Bhatnagar	A course in Electrical Power	Dhanpatrai & Sons
Prof. G. D. Rai	Non conventional Energy sources	Khanna, New Delhi
Prof. Arrora and Dr. V. M. Domkundwar	A course in Power Plant Engineering	Dhanpatrai & Sons

EXAMINATION SCHEME (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3,4,5,6	12	TWENTY	ONE	1 X 20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	7,8,9	11				FOUR			

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)***	
Name of the Subject : **Power Electronics & its Applications**	
Subject Code: EEPS/S4/PEA	Semester: FOURTH
Duration: one Semester	Maximum Marks: 150
Teaching Scheme	Examination Scheme
Theory: 3 Hrs./Week	Mid Semester Exam.: 20 Marks
Tutorial: nil	Assignment & Quiz: 10 Marks
Practical: 2 Hrs./Week	End Semester Exam.: 70 Marks
Credit: 03	Practical Exam.: 50 Marks

Aim:	
Sl. No.	
1.	The field of Electrical Engineering is generally segmented into three major areas - Electronics, Power & Control.
2.	This subject is the combination of these three areas. Nowadays all the industrial drives to run a machine and to control it as per requirement are based on Power Electronics.
3.	Understanding of the subject will provide skill to the students for trouble shooting & testing of Power semiconductor devices, Solid state DC & AC motor drives.

Objective:

SI. No.	Student will be able to:
1.	Describe the Power semiconductor devices & draw their characteristics.
2.	Describe the Inverter, Converter & Chopper circuits.
3.	Explain the operation of the DC motor & AC motor drives

Pre-Requisite:

1.	Knowledge of Applied Electronics.
2.	Knowledge of DC & AC Motor operation to run their drives.

UNIT	CONTENTS	HOURS	Marks
1	**Introduction to Power Electronics** ❖ Necessity of Power generation. conversion ❖ Applications of Power Electronics ❖ Thyristor family ❖ Characteristics and symbolic representation , and list of applications of SCR, DIAC, TRIAC, GTO, SUS, LASCR, IGBT. ❖ SCR: Construction, operation, Two transistor analogy ✓ Triggering methods of SCR • Voltage triggering. • dv/dt triggering. • Light triggering. • Gate triggering ▪ DC gate triggering ▪ AC gate triggering. ▪ Pulse gate triggering. ✓ SCR Turn-off process ✓ SCR Specifications ratings Voltage rating , current rating , Power rating , Temperature rating ✓ SCR selection factors ✓ SCR testing	8	12
2	Converters ❖ Necessity of Convertors ❖ Concept of firing angle and conduction angle ❖ Single phase fully controlled half wave converter ✓ With resistive load ✓ RL load without freewheeling diode. ✓ RL load with freewheeling diode. ❖ Single phase full wave controlled converter ✓ With resistive load	8	12

UNIT	CONTENTS	HOURS	Marks
	✓ With RL load ❖ Single phase fully controlled bridge converter ✓ With resistive load ✓ With RL load ❖ Three phase fully controlled bridge converter ✓ With RL load ❖ Comparison of 3Ø and 1Ø converters on the basis of efficiency, ripple factor , RMS Values and average values ❖ Effect of source impedance on converter operation. ❖ Cycloconverters and cycloinverters: 1Ø and 3Ø- Principle of operation, input and output waveforms.		
3	**Inverters** ❖ Need of Inverter ❖ Classification : ✓ 1Ø and 3Ø inverters. ✓ Line (Natural) commutated Inverters ✓ Forced commutated inverters: Series, parallel and bridge inverters.(circuit, description and waveforms) ❖ Series inverters: Operation of basic series inverter , Modified series inverter, Three phase series inverter. ❖ Parallel inverters: Operation of basic parallel inverter circuit. ❖ Single Phase Bridge Inverter ✓ Half bridge inverter ✓ Full bridge inverter ✓ Mc Murry Full Bridge Inverter ✓ Mc Murry Bedford Inverter ❖ Voltage and frequency control of 1Ø inverter ✓ Necessity of control of output voltage. ✓ Methods for output voltage control: External control of DC voltage, External control of AC voltage and internal control. ✓ Pulse width modulation (PWM) method: Single pulse width modulation, multiple pulse width modulation, Sinusoidal pulse width modulation. ❖ Waveform control (Harmonic Reduction): Single pulse width modulation, transformer connections, using filter (LC, Resonant and OTT filter) ❖ Concept of MOSFET Inverter and comparison with thyristor based inverter ❖ Inverter selection factors	10	14
4	**Choppers** ❖ Chopper principle ❖ Control techniques: Constant Frequency System, Variable Frequency System. ❖ Classification of choppers :Class A, class B, class C, class D, class E ❖ Commutation methods for choppers: Auxiliary commutation, load commutation. ❖ Jones chopper ❖ Step up chopper	8	12
5	**Applications of Power Electronics** ❖ DC Drives ✓ Speed control of DC series motor with 1Ø and 3Ø half and full control converter, step up and step down chopper ✓ DC servo motor(working and Construction): speed control of DC servo motor Close loop speed control method for D C servo motor ✓ AC servo motor(working and Construction): speed control of AC servo motor ❖ AC Drives ✓ Speed control of 3Ø induction motor	14	20

UNIT	CONTENTS	HOURS	Marks
	▪ Variable frequency control : Voltage source inverter, current source inverter, cycloconverter ✓ Stepper motor :Variable reluctance , Permanent magnet- step control Open loop control system for stepper motor, stepper motor specifications ✓ Other applications: Circuit diagram, operation ▪ Static circuit breaker(DC and AC) ▪ Induction heating control ▪ Dielectric heating control ▪ Electric welding control ▪ Battery charger control ▪ Automatic street lighting circuit using SCR ▪ Static VAR compensation system		
	TOTAL	**48**	**70**

	Practical:
	Skills to be developed:
	Intellectual Skills:
	1. Ability to select appropriate devices & instruments.
	2. Ability to test & troubleshoot.
	Motor Skills:
	1. Ability to draw the circuit diagrams.
	2. Ability to interpret the circuits and waveforms.

List of Practical (At least Eight Experiments are to be performed):

1. To understand the V-I characteristics of SCR and to determine the latching current, holding current and the forward break over voltage
2. To understand 1-phase full wave controlled rectifier using SCR and plot input and output waveforms for R and RL load with and without freewheel diode. To learn effect of variation in firing angle .
3. To study 3-phase full wave controlled rectifier with R and R-L load and plot input and output waveforms for R and RL load with and without freewheel diode .
4. To study 1-phase series inverter and to measure the output signal resonance frequency and voltage
5. To study current commutated step down chopper and to observe the change in output voltage.
6. To understand operation of SCR based DC static circuit breaker using SCR.
7. To understand operation of battery charger using SCR and observe change in charging voltage and current
8. To understand the speed control of DC shunt series motor using SCR phase control and plot speed armature voltage characteristics (as D C series motor is not safe under no load condition . It may cause accident)
9. To understand the speed control of 3-phase induction motor using PWM inveter inverter and plot its speed –torque characteristics
10. To understand operation of stepper motor and verify stepping sequence by measuring step angle.
11. To understand the operation of D C servomotor and plot variation in speed with change in reference voltage

List of Text Books:

SI. No.	Name of Author	Title of the Books	Name of Publisher
1.	M.D.Singh, K.B.Kanchandani	Power Electronics	T.M.Hill.
2.	Mohan, Undeland, Robbins	Power Electronics	Wiley India
3.	S.N. Singh	Power Electronics	Dhanpat Rai & Co.
4.	V. Subrahmanyam	Electric Drives - concepts & applications	T.M.Hill
5.	Albert Malvino & D.J.Bates	Electronic Principles	T.M.Hill
6.	V.R.Moorthi	Power Electronics	Oxford
7.	G.K.Dubey	Fundamentals of Electric drives	Narosa Publishing House

List of Text Books:

SI. No.	Name of Author	Title of the Books	Name of Publisher
8.	M.H.Rashid	Power Electronics	P.H.I. Ltd
9.	K.Haribabu	Power Electronics	Scitech Publisher

EXAMINATION SCHEME (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1,2,3	12	TWENTY	ONE	1X20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10X5 = 50
B	4,5	11				FOUR			

EXAMINATION SCHEME (SESSIONAL)

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Fifth Semester. Distribution of marks: Performance of Job - 15, Notebook - 10.
2. External Assessment of 25 marks shall be held at the end of the Fifth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. Distribution of marks: On spot job - 15, Viva-voce - 10.

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)*** Name of the Subject :***Computer aided Electrical Drawing***	
Course Code: **EEPS/S4/ED**	Semester: Fourth
Duration: One Semester	Maximum Marks: 50
Teaching Scheme	**Examination Scheme**
Theory:	Practical : 50 Marks
Tutorial:	
Practical: 03 hrs/week	
Credit: 02	

Aim:

Sl. No.	
1.	Students will be able to be able to know various commands of AutoCAD.
2.	Electrical Drawing indicates the symbolic representation and position of components. It also shows the power flow through them for a given systems. Ability to draw, read and understand the drawing will facilitate the visualization of the complete installation which makes it easy to troubleshooting, maintenance of the system.

Objective

Sl. No.	The students will be able to,
1.	Read electrical drawing for any system to understand the working of the system and its components.
2.	Find the important points in the circuit diagrams or layout for troubleshooting and maintenance.
3.	Use graphic software to draw the circuit for various types of electrical systems.
Skills to be developed	
1.	Intellectual Skills: i) Analytical Skill; ii) Identification skill
2.	Motor Skills: i) Operate various parts of computer properly. ii) Problem solving skill.

Pre-Requisite:	
Sl. No.	
1.	Basic Electrical Engineering

Contents

Sl. No.	
1.	**CAD** : Necessity and its application in Engineering Field
2.	Awareness of commands : Limit, zoom, pan, line, circle, polyline, multiline, arc, text, dimension, hatch, layer, offset, trim, extend, erase, scale, dist, area, fillet, chamfer, array, block, attribute etc.
3.	Draw a sheet of a sample figure (to be provided by the subject teacher) using different edit/modify option of CAD
4.	Draw a sheet of electrical symbols for representation of Electrical machines, Equipments, accessories, switching and protection equipment as per IS 2032 using CAD.
5.	Draw electrical wiring with accessories on a single storied building (3 BHK) plan, showing Energy meter, Main switch, Distribution Board, Light points, Socket outlets using CAD.
6.	A three phase induction motor is to be started and stopped direct on line with the help of two push button. Draw i) Schematic diagram for the control circuit, ii) power circuit, iii) Complete wiring diagram (showing overload and short circuit protection) using CAD.
7.	A three phase induction motor is to be started and stopped direct on line (D.O.L.) from different locations through push buttons such that the motor can be started from one location and stopped from other location or vice versa. Draw i) Schematic diagram for the control circuit, ii) Complete wiring diagram (showing overload and short circuit protection) using CAD.

Text Books:

Name of Authors	Title of the Book	Name of the Publisher
Sham Tickoo & Shafali Pandita	AutoCAD Electrical 2010 for Engineers	Pearson

Text Books:

Name of Authors	Title of the Book	Name of the Publisher
Goutam Pohit & Goutam Ghosh	Machine Drawing with Auto CAD	Pearson
Surjit Singh	Electrical Engineering Drawing (Part I & Part II)	S.K.Kataria & Sons

EXAMINATION SCHEME (SESSIONAL)

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Fourth Semester. Distribution of marks: Performance of Job – 15, Notebook (Drawing) – 10.
2. External Assessment of 25 marks shall be held at the end of the Fourth Semester on the entire syllabus. One Sheet per student from any one of the above is to be drawn. Sheet is to be set by lottery system. Distribution of marks: On spot job – 15, Viva-voce – 10.

Name of the Course : ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)*** Name of the Subject: **Development of Life Skill - II**	
Course code : **EEPS/S4/DLS-II**	Semester: FOURTH
Duration: One Semester (16 hours)	Maximum Marks: 50
Teaching Scheme	**Examination Scheme:**
Theory: -- hrs/week	Internal Sessional: 25
Tutorial: -- hrs/week	External Sessional: 25
Practical: 02 hrs/week	
Credit: 2	

UNITS	CONTENTS	Hours
Unit -1	Interpersonal Relation Importance, Interpersonal conflicts. Resolution of conflicts. Developing effective interpersonal skills - communication and conversational skills. Human Relation Skills (People Skills)	4
Unit - 2	**Problem Solving** I) Steps in Problem Solving (Who? What? Where? When? Why? How? How much?) 1. Identify, understand and clarify the problem 2. Information gathering related to problem 3. Evaluate the evidence 4. Consider feasible options and their implications 5. Choose and implement the best alternative 6. Review II) Problem Solving Technique 1. Trial and Error, 2. BrainStorming 3. Thinking outside the Box	5
Unit - 3	**Presentation Skills** Concept, Purpose of effective presentations. ***Components of Effective Presentations:*** understanding the topic, selecting the right information, organising the process interestingly. Good attractive beginning. Summarising and concluding, adding impact to the ending. **Use of audio-visual aids** - OHP, LCD projector. White board. ***Non-verbal communication:*** Posture, Gestures, Eye-contact and facial expression. Voice and Language - Volume, pitch. Inflection, Speed, Pause, Pronunciation, Articulation, Language Handling questions - Respond, Answer, Check, Encourage, Return to presentation ***Evaluating the presentation*** - Before the presentation, During the presentation. After the presentation	5
Unit - 4	**Looking for a Job** Identifying different sources announcing Job vacancies. Skim, scan and read advertisements in detail, write efficacious CVs,	4

UNITS	CONTENTS	Hours
	write covering letters to accompany CVs, write Job Application Letters - in response to advertisements and self-applications	
Unit - 5	**Job Interviews** ***Prepare for Interviews:*** Intelligently anticipating possible questions and framing appropriate answers, Do's and don'ts of an interview (both verbal and non-verbal). ***Group Discussion:*** Use of Non-verbal behavior in Group Discussion, Appropriate use of language in group interaction, Do's and don'ts for a successful Group Discussion	6
Unit - 6	**Non-verbal - graphic communication** Non - verbal codes: A - Kinesics, B - Proxemics, C- Haptics, D - Vocalics, E- Physical appearance, F- Chronemics, G - Artifacts Aspects of Body Language	4
Unit - 7	**Formal Written Skills:** Memos, E-mails, Netiquettes, Business correspondence - Letter of enquiry. Letter of Placing Orders, Letter of Complaint	4
Total		**32**

Sessional Activities	
Unit-1 Interpersonal Relation	Case Studies: 1.from books 2.from real life situations 3.from students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies
Unit-II Problem Solving	Case Studies: 1.from books 2.from real life situations 3.from students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies
Unit-III Presentation Skills	Prepare a Presentation (with the help of a Powerpoint) on a Particular topic. The students may refer to the Sessional activity (si. No. 8) of the Computer Fundamental syllabus of Semester 1. For engineering subject-oriented technical topics the co-operation of a subject teacher may be sought. Attach handout of PPT in the sessional copy
Unit-IV Looking for a job	Write an effective CV and covering letter for it. Write a Job Application letter in reponse to an advertisement and a Self Application Letter for a job.
Unit-V Job Interviews & Group Discussions	Write down the anticipated possible questions for personal interview (HR) along with their appropriate responses Face mock interviews. The co-operation of HR personnels of industries may be sought if possible. Videos of Mock Group Discussions and Interviews may be shown

Sessional Activities	
Unit-7 Formal Written Skills	Write a memo, Write an effective official e-mail, Write a letter of enquiry, letter of placing orders, letter of complaint

EXAMINATION SCHEME (SESSIONAL)

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Fourth Semester. Distribution of marks: Performance of Job – 15, Notebook – 10.
2. External Assessment of 25 marks shall be held at the end of the Fourth Semester on the entire syllabus. Distribution of marks: On spot job – 15, Viva-voce – 10.

Name of the Course: ***DIPLOMA IN ELECTRICAL ENGINEERING (POWER SYSTEM)*** Name of the Subject : ***Professional Practices II***	
Course Code: EEPS/S4/PF II	Semester: Fourth
Duration: One Semester	Maximum Marks: 50
Teaching Scheme	**Examination Scheme**
Theory:	Practical : 50 Marks
Tutorial:	
Practical: 02 hrs/week	
Credit: 01	

Aim:

Sl. No.	
1.	Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.
2.	While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.
3	The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert l ectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objective:

Sl. No.	The student will be able to
1.	Acquire information from different sources
2.	Prepare notes for given topic
3.	Present given topic in a seminar
4	Interact with peers to share thoughts
5	Prepare a report on industrial visit, expert lecture

Pre-Requisite:

Sl. No.	
1.	Desire to gain comparable knowledge and skills of various activities in various areas of importance.
2.	Eagerness to cohesively participate in group work and to share thoughts with group members.
3.	Knowledge of electrical engineering upto 4th semester.

Activities

Sr . No.	**Activities**	**Hours**
1.	Industrial / Field Visit : Structured Field visits be arranged and report of the same should be submitted by the individual student, to form part of the term work. Visits to **<u>any ONE</u>** (not already visited in 3rd semester) from the list below: i) Electrical machine manufacturing industry ii) Multistoried building for power Distribution iii) Load dispatch center iv) Transformer repair workshop. v) Foundry (to see furnaces and oven) vi) Food Processing industry (overall technical and other activities) vii) An industry automation in manufacturing viii) District Industries Centre (to know administrative set up, activities, various schemes etc) ix) Any loco shed x)Signaling system of a railway station xi) Any captive power plant. xii) Motor rewinding in a motor rewinding shop	**06**
2.	**Guest Lecture by professional / industrial expert**: Lectures by Professional / Industrial Expert to be organized from **<u>any TWO of</u>** the following areas: i) Modern concept of lighting / illumination ii) Viability of electric traction in 21st Century iii) Modern techniques in Power Generation	**4**

Activities

Sr . No.	Activities	Hours
	iv) Role of power factor improvement as a tool in reducing cost of generation v) Digital metering vi) Hydro power generation vii) Functioning of Electricity regulatory Commission. viii)Introduction and application areas for MEMS (Micro Electromechanical System) ix) Interview techniques x)Free and open source software xi) Cyber crime & Cyber laws xii)Social networking – effects & utilities xiii) Ethical Hacking. xiv) Role of micro, small and mediun enterprise. In Indian economy. Individual report of the above lecture should be submitted by the students.	
3.	**Seminar:** Any one seminar on the topics suggested below: Students (Group of 4 to 5 students) have to search / collect informati on about the topic through literature survey/ internet search / visit a nd discussion with expert or concerned persons 1. Water Supply scheme / Problems of drinking water in rural area 2. Schemes of power generation in coming five years 3. Impact of load shedding on rural population 4. Parallel computing 5. Distributed processing 6. Embedded system 7. Computer security 8. Bio – technology 9. Multimedia techniques. 10. Magnetic levitation system	**12**
4.	Students' Activities / mini project:(any one) i) Prepare a report in open software Latex. Report should include text, table, figure, mathematical expression, heading etc. all features of a report. ii) Collect information from market regarding technical specification, identification no, their meaning, manufacturers' names and co st of electronic devices like diode, zener diode, transistors, JFET, MOSFET, ic 555, ic 741, digital ics (All items studied upto 4th semester). Submit the report along with power point presentation. Stu dents are encouraged to use open software iii) Make a list of all items required to assemble an updated version of personal computer. Write technical specification, manufacturer s' names, cost of all the parts and prepare a comparative analysis to arrive at a decision for final combination of items. Also make such list for required external hardware/devices. Prepare a powerpoint presentation alongwith the report. Students are encouraged to u se open softwares for such purpose. iv) Develop a website for your institute. v) Animation project using c, c++, VB vi) make a market survey of all transducers available (studied in fourth semester) their specifications, manufacturers' names, cost e tc. Prepare a power point presentation. Students are encouraged t o use open software for such purpose.	10
	TOTAL	32

EXAMINATION SCHEME (SESSIONAL)

1. Continuous internal assessment of 50 marks is to be carried out by the teachers throughout the fourth semester. Distribution of marks: Project =20, seminar = 10, field visit = 10, guest lecture attendance and report = 10