

BU-COMMUNITY COLLEGE CONSULTANCY CENTRE

**REVISED SYLLABUS – 2021-22
FOR
DIPLOMA IN ELECTRICAL TECHNICIAN**



**BHARATHIAR UNIVERSITY
COIMBATORE-641046**

BHARATHIAR UNIVERSITY: COIMBATORE

**DIPLOMA IN ELECTRICAL TECHNICIAN
(Community College)**

(for the candidates admitted from the academic year 2021 -22 onwards)

Minimum qualification for admission to Diploma Course in Electrical Technician is a pass in Standard X.

SCHEME OF EXAMINATIONS

S.No	Title of the Course	Credits	Maximum Marks
1	Human Resource Development	4	100
2	Electrical Engineering I	4	100
3	Electrical Engineering II	4	100
4	Electrical Testing and Installation	4	100
5	Electrical Engineering I lab	4	100
6	Electrical Engineering II lab	4	100
7	Electrical Engineering - III Lab	4	100
8.	Internship/ Apprentice/ Teaching Practice/ Project	4	100
	Total	32	800

Question paper Pattern: Theory

Section A: (10 x 2=20 Marks)

Answer ALL the questions

Section B: (5 x 6 = 30 Marks)

Answer ALL the questions either (a) or (b)

Section C: (5 x 10 = 50)

Answer ALL the questions either (a) or (b)

Duration of examinations for all papers is three hours.

*Minimum Pass Mark: 40 Marks

PAPER I**HUMAN RESOURCE DEVELOPMENT**

Unit:1		
HRD-Macro Perspective: HRD Concept, Origin and Need, HRD as a Total System; Approaches to HRD; Human Development and HRD; HRD at Macro and Micro Climate Entrepreneurial Development - Continuous effort to innovate - Everyday development - Developmental needs - Observing the market trend - Cooperative effort.		
Unit:2		
HRD-Micro Perspective: Areas of HRD; HRD Interventions Performance Appraisal, Potential Appraisal, Feedback and Performance Coaching, Training, Career Planning, OD or Systems Development, Rewards, Employee Welfare and Quality of Work Life and Human Resource Information; Staffing for HRD: Roles of HR Developer; Physical and Financial Resources for HRD; HR Accounting; HRD Audit, Strategic HRD.		
Unit:3		
Physical care - Securing and Maintaining the physical ability - Hath yoga – Iyama - Niyama- Asanas - Public Health – Food Health. Mental health care and training – Pranayama – Meditation - Nurturing good thoughts - Cohesion with nature - self realization		
Unit:4		
Communication Skills - Speaking skills - Conversational English - Interpersonal and Intrapersonal skills - Assertiveness Skills		
Unit:5		
Social responsibility - Public Welfare Importance of helping others - our cultural values of giving - knowledge of our legal and constitutional structure - Duties of the responsible citizens		
Reference Books		
1	Yogi Sudhanantha Bharathi (2001) – Thirumanthiram vilakkam – Manickavasakarpublications – Sidhambaram	
2	Technical communication - Principles and practice, Second edition by Meenakshi Raman and Sangeetha Sharma, Oxford Publications New Delhi(2012)	
3	Value Education-Third Edition Compiled by Vision for Wisdom ,World communityservice centre Aliyar. Vethathiri publications(2009)	
4	Introduction to the Constitution of India - 21 st Edition Durga Das Basu , Lexis Nexis Publication (2013)	
5	Nadler, Leonard : Corporat Human Resource Development, Van Nostrand Reinhold, ASTD, New York .	
6	Rao, T.V and Pareek, Udai: Designing and Managing Human Resource Systems, Oxford IBH Pub. Pvt.Ltd., New Delhi , 2005.	
7	Rao, T.V: Readings in HRD, Oxford IBH Pub. Pvt. Ltd., New Delhi , 2004	

PAPER II**ELECTRICAL ENGINEERING – I**

Unit:1	Electrical Circuits	
Ohm's Law – Kirchoff's Laws – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits - Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters) - Dynamometer type - Watt meters and Energy meters.		
Unit:2	DC Machines	
Construction - Principle of Operation - Basic Equations and Applications of DC Generators - DC Motor.		
Unit:3	Transformers	
Sumpners test - Construction - Principle of Operation – Classifications - Open circuit test - Short Circuit test - Auto transformer - Parallel operations of transformers.		
Unit:4	Wiring & Servicing	
House wiring using switches - Stair case wiring - Florescent lamp wiring - Industrial wiring - Winding Types - Fan assembly - Faults and servicing Grinder and Mixie.		
Unit:5	Electrical Safety & Tool Details	
Basic safety rules - First aid equipments - Electrical faults - Protective devices - Tool assists forelectrical servicing - operation details of Megger		
Reference Books		
1	Muthusubramanian R, Salivahanan S and Muraleedharan K A, “Basic Electrical, Electronics and Computer Engineering”,Tata McGraw Hill, Second Edition, (2006).	
2	Jayachandarn.K, Natarjan.S, Balasubramnian.S , “ Trainer on engineering practices lab “,Anuradha Publishers, (2007).	
3	Basic Electrical Engineering - Chandan Chanda, Sudipta Nath, Abhijit Chakrabarti , Publisher Mcgraw Hill Education ,1st Edition (2008)	

PAPER III
ELECTRICAL ENGINEERING - II

Unit:1	AC Machines	
Working of Single Phase and Three Phase Induction motor - Types of starters - speed control methods of Induction motors - Applications of Induction motors in industries.		
Unit:2	Electrical Measurements	
Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters) - Dynamometer type Watt meters and Energy meters - Power factor meter - Tachometer - Tong Tester.		
Unit:3	Basic Electronics	
Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Transistors.		
Unit:4	UPS, Batteries & SMPS	
Working details of on line UPS - Off Line UPS and Hybrid UPS - charging and testing details of Lead Acid Battery - Nickel Cadmium battery - sodium sulphur battery and Aluminium Air battery - working of SMPS		
Unit:5	Servicing of Electronics Appliances	
Identifying Major Faults and rectification techniques – Radio – TV – Fax – Microwave oven -washing machines - Air Conditioners - Fridge		
Reference Books		
1	V.N. Mittle “Basic Electrical Engineering”,Tata McGraw Hill Edition, New Delhi , (1990)	
2	R.S. Sedha, “Applied Electronics” S.Chand & Co, (2006)	
3	Mehta V K, “Principles of Electronics”, S.Chand& Company Ltd, (1994)	

PAPER IV**ELECTRICAL TESTING, INSTALLATION AND SAFETY**

Unit:1	Electrical Works	
Introduction to applicable Indian standards code of practice(Electrical Works),Introduction to wiring symbols used in single and three phase electrical diagrams ,Concept regarding correct techniques of interpreting electrical diagrams regarding electrical circuits, Voltage Gradient of different types of Insulators, Temp Rise permissible.		
Unit:2	Cable Installation	
Standard methods of electrical cable laying at construction site .Checking and selection of materials, fixtures, tools equipments to be deployed Acceptance criteria to be followed while selecting materials, fixtures or tools for cable laying& Method of selecting cable laying path& Activities involved in cable laying and their sequence, Key organizational procedures to be undergone prior and after cable laying activity such as filling of permits, checklists.		
Unit:3	Electrical Circuits & Wiring	
Standard method of electrical isolation and its necessity in electrical installation work ,Selection and adoption of standard method of termination of cables at power source and equipment power terminals,Selection and use of cable lugs, cable jointers and other electrical accessories used for laying, terminating and joining cables ,Required dimensions and safety parameters to be checked for poles or trenches to be used for laying of cable & Types of cables (single/ 3 phase) used as per electrical load,Selection of method and type of Selection of method and type of electrical earthing to be adopted for installed electrical equipment. Sequence to be followed while undertaking cable laying work in a construction site. Selection and use of electrical fixtures such as circuit breakers, starters, relays etc. and their power rating as per circuit voltage requirement		
Unit:4	Safety Principles and Control	
Safety Rules and Principles, Accidents, Types of hazards involved in construction sites, Types of hazards involved in electrical. Emergency safety control measures and actions to be taken under emergency situation, First Aid, Fire extinguisher, Safety drills, Types and use of PPEs as per general and electrical safety norms.		
Unit:5	Process Safety Management- And Protective Devices	
Process safety management (P.S.M) as per OSHA& Standard procedure of handling, storing and stacking material, electrical fixtures and accessories ,What is safe disposal of waste, type of waste and their disposal. Type of electrical protective devices, their power		

ratings and area of application, Basic ergonomic principles as per applicability.	
Reference Books	
1	NFPA® 70E, “Electrical Safety Requirements for Employee Workplaces” 2000 Edition
2	Electrical machine by Ashfaq Hussain.
3	Ertugrul, Nesimi. LabVIEW for electric circuits, machines, drives, and laboratories, Prentice Hall PTR, 2002.
4	Nilsson, James William. Electric circuits. Pearson Education India, 2008.
5	Industrial safety management by L.M. Deshmukh, Tata Megraw Hill publication ,New Delhi, 2006.
6	Industrial safety health and environment Management system by R.K. Jain & Sunil S. Rao, Khanna Publications, 2008.

PAPER V**ELECTRICAL ENGINEERING - I LAB**

1	Verification of ohm's law
2	To trace the magnetic field of two bar magnets with like poles and unlike poles kept nearby with the help of magnetic needle.
3	To trace the magnetic field of a current carrying conductor in both directions and verify the right hand rule and cork screw rule.
4	To verify Kirchoff's 1 st and 2 nd Law.
5	General wiring.
6	To study & find the specifications of various types of wires and cables.
7	To measure the gauge of a given wire with the help of wire gauge.
8	To connect the wires with different electrical accessories.
9	To assemble a regulated power supply.
10	Testing of various accessories used for tube light circuit.
11	Transformer winding & calculations.
12	Study various types of transformers.
13	Study the various parts of small & power transformers
14	Finding of high voltage and low voltage terminal of transformer.
15	Testing of low voltage transformer with and without load.

PAPER VI**ELECTRICAL ENGINEERING - II LAB**

1	Assembly and testing of the above transformer.
2	Fire prevention and protection, causes of industrial fire, prevention and remedies types and use of firefighting equipments.
3	Safety use in electricity, shock treatment methods, safety precautions.
4	Symbols used in electrical circuits.
5	To measure the power of an electric motor by wattmeter.
6	To verify the characteristic of 3 phase balance star and delta connection.
7	To verify the characteristic of 3 phase unbalance star system and to measure current in neutral.
8	To verify the characteristic of 3 phase balance delta connection system
9	To fix the electrical accessories on the board and blocks
10	Connection of voltmeter and ammeter and to measure voltage and current.
11	To make a main switch board for house wiring
12	To test the single & three phases supply for all phase, neutral & earth with help of testlamp and by neon tester.
13	Measure the voltage current and resistance of an electric heater.
14	Demonstrate electrical circuit diagrams related to electrical equipment
15	Calculate/ interpret electrical power rating of electrical circuits installed in the equipments
16	Carry out the earthing of the installed electrical circuits per standard practice
17	Carry out the earthing of the installed electrical circuits per standard practice.
18	Practice Cable laying through conduits

PAPER VII**ELECTRICAL ENGINEERING - III LAB**

1	Practice on wiring of electric motor, control panel
2	Test of different circuit breakers
3	Fault finding practice in wiring
4	Practice on soldering & brazing
5	Practice on installation and overhauling common electrical accessories
6	Drilling practice in hand drilling and power drilling machines
7	Use of PMMC, MI meter, Multi meter
8	Practice on winding of small transformer
9	Practice on armature winding
10	Practice on AC machine winding / DC machine winding
11	Servicing of home appliances (Mixie, Grinder, Electric oven, Washing machine, Fridge, Heater, Iron Box, kettle)