

**MNPE-09425068494**

**In Collaboration with**

**Karnataka State Open  
University**

**Manasagangotri, Mysore-6**

**Syllabus**  
**Certificate in Electrical Technician**

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## Certificate in Electrical Technician Program Structure (Face to Face)

**ELIGIBILITY:** 10th Class pass under 10+2 system.

**COURSE PERIOD:** SIX MONTHS

**TOTAL MARKS:** 600

**TOTAL SEMESTER:** 1

SUBJECT TITLE	SUBJECT CODE	MARKS		
		Theory	Practical	Total
BASIC ELECTRICAL WORKS	CET-101	50	50	100
HOME APPLIANCES REPAIRING	CET-102	50	50	100
HOUSE WIRING	CET-103	50	50	100
TRANSFORMER & ARMATURE WINDING	CET-104	50	50	100
WORKSHOP CALCULATION & SCIENCE	CET-105	50	50	100
PRACTICAL	CET-106		100	100

1 <sup>ST</sup> SEMESTER		
CODE	COURSE TITLE	CREDITS
CET101	BASIC ELECTRICAL WORKS	3
CET 102	HOME APPLIANCES REPAIRING	3
CET 103	HOUSE WIRING	3
CET 104	TRANSFORMER & ARMATURE REPAIRING	3
CET 105	WORKSHOP CALCULATION & SCIENCE	3
CET 106	PRACTICAL	3
<b>TOTAL CREDIT :</b>		<b>18</b>

## DETAILED SYLLABUS

### CET101- BASIC ELECTRICAL WORKS

**Total Credit: 3**

#### **Block-1**

##### Unit - 1

- Safety practice –
  - Lifting and handling loads.
  - Heavy Equipments

##### Unit - 2

- Safety practice –
  - Fire extinguishers
  - Types of fire extinguishers
- Safety practices – Fire fighting

##### Unit - 3

- Identification of trade-hand tools specifications
- General safety of tools and equipments

##### Unit - 4

- Electrical safety-
  - Rescue a person who is in contact with live wire.
  - Treat a person for electric shock/injury.

#### **Block – 2**

##### Unit - 1

- Introduction to Electricity
- Conductors and types of conductors
- Insulators and types of insulators

##### Unit -2

- Crimping & crimping tool
- Soldering
- Prepare Terminations
  - Skinning Different types of cable ends
  - Make various joints in cable
  - Crimping cable ends.
  - Soldering the cable lugs

##### Unit -3

- Define simple electrical terms like voltage, current, resistance and their units ohm's law.
- Electrical power and energy

- Simple electrical connections using voltmeter, ammeter, multi-meter, wattmeter & energy meter.

#### Unit - 4

- Simple series and parallel circuits
- Connecting number of lamps in series connection.
- Connecting number of lamps in parallel connection.

### **Block -3**

#### Unit - 1

- Direct current and testing the polarity
- Alternating current and identifying phase, neutral and earth terminals
- Testing the polarity of DC supply.
- Identification of phase and neutral in single phase supply

#### Unit -2

- Cells and Battery :-  
Types of cells, rechargeable battery, care and maintenance of cell, battery charger, grouping of cells.

#### Unit - 3

- Purpose of Earthing
- Types of Earthing.
  - Pipe Earthing
  - Plate Earthing
- Carry out of pipe earthing & plate earthing

#### Unit -4

- Common electrical accessories their specification – explanation of switches, lamp holders, plugs and sockets. Development of domestic circuits, alarm & switches, lamp, fan, with individual switches. Two way switches, Fuse & MCB.

## **CET 102: HOME APPLIANCES REPAIRING**

**Total Credit: 3**

### **Block – 1**

#### Unit – 1

Safety precaution and introduction of trade tools  
Install, service and repair all kinds of electrical home appliances

#### Unit – 2

General repair of heating iron, kettle, ceiling fan, table fan, hot plate, heat connector, geyser, coolers etc.

#### Unit – 3

Test the fan capacitors, regulator & both fan  
Clean and lubricate the bearing of ceiling and table fan, and check the speed.

#### Unit – 4

Repair and rectification of an automatic electric iron, servicing and repairing of mixer, ceiling and table fan.

- Measure the insulation resistance between the terminals and body of the appliance
- Check the oscillator mechanisms of table fan

### **Block – 2**

#### Unit – 1

Assemble and install a fluorescent lamp.  
• Select the fuse size according to the load of circuit

#### Unit – 2

Thermostat heat controls of Automatic electric iron, steam iron, spray irons.

#### Unit – 3

Understand home appliances like heater, iron, kettle ceiling fan, table fan, washing machine etc.  
• Dismantle and reassemble automatic iron, ceiling fan table fan cooking range, storage heater, washing machines, and wet grinders etc.

#### Unit – 4

Maintenance of decorative serial lamp for a required supply voltage  
• Determine the number of lamps to be connected in series for particular supply voltage for making decorative

## **Block – 3**

### Unit – 1

Assemble, connect and install a twin fluorescent lamp with accessories

- Check the internal connections of cooking range selector switch and circuits.

Connections in different temperature arrangements

### Unit – 2

Repair and service technique of cooking range, storage water heater, washing machines, wet grinders. Replace the heating element in a soldering.

### Unit – 3

- Check the simple mechanical timer, small water pump of washing machines and regular service and faults.

### Unit – 4

Repair and service technique of voltage stabilize, emergency light, vacuum cleaner.

## **CET 103: HOUSE WIRING**

### **Block- 1**

**Total Credit : 3**

#### Unit-1

Safety precaution

Safety equipments that should be available with an electrician working on line electrical installation.

#### Unit-2

Common hand tools, their uses, care and maintenance.

#### Unit-3

ISI rules related to wiring (General)

#### Unit-4

Identify the wiring accessories as per symbols.

## **Block- 2**

### Unit-1

Introduction to electricity, Conductor & Insulator.

### Unit-2

Joint in electrical conductor. Straight joint, Tee joint, Married joint, Britannia, union joint

### Unit-3

Wiring systems:-  
Tree system and distributed system

### Unit-4

Accessories used in house wiring

## **Block- 3**

### Unit-1

Diagram and systems used in domestic wiring installation cheat wiring, CTS wiring, lead wiring, casing-coping wiring, conduit pipe wiring

### Unit-2

Earthing – Types.  
Earthing domestic installation as per IE rule meggar, measurement of earth resistance

### Unit-3

IE rule for Energy meter Installation.  
Prepare are mount energy meter board and its installation

### Unit-4

Carryout domestic installation testing polarity test, short circuit test, open circuit test circuit continuity test, earth continuity test. Faults likely to occur in wiring.

## **CET 104 :TRANSFORMER & ARMATURE WINDING**

**Total Credit: 3**

### **Block-1**

#### Unit-1

Identification of phase and neutral in single-phase A/C. supply,  
• Testing the supply using test lamp with different wattage lamps.  
Test a single-phase transformer for its continuity and insulation.  
• Take the dimensions of a bobbin and prepare the bobbin from suitable materials

#### Unit-2

Measuring a enameled winding wire with Standard wire gauge.

- Measure and also determine the size of winding wire for primary and secondary

Wind/rewind a small transformer

- Dismantle /reassemble the transformer cores
  - Wind the primary and secondary winding layer by layer.

#### Unit-3

Use & Operation of hand operated and motorized coil winding machine.

#### Unit-4

Impregnation Varnish after testing the transformer – its advantages.

- Familiarization and operation with the motorized coil winding machine
- General maintenance to be done
- Test the transformer for insulation, transformation ratio and performance

### **Block-2**

#### Unit-1

Type of DC winding like lap and wave winding.

#### Unit-2

Introduction to armature winding

#### Unit-3

Method of dismantling the burnt winding wire.

- Study the parts of armature.
- Check and test the armature.

#### Unit-4

Strip the old winding from the armature

Terminology used in winding like pole pitch, coil pitch back and front pitch progressive and Retrogressive winding etc.

- Record the winding data

### **Block-3**

#### Unit-1

A/C/DC armature winding.

- Prepare the armature for rewinding

#### Unit-2

Preparation of winding data for given armature.

- Wind the coils by hand insulate them
  - Connection of armature leads on raiser.



Unit-3

Preparation of winding table, connection diagram, winding diagram for given armature.

- Understand end connection, electrical and distinguishing start and finish of each

Unit-4

Impregnation methods of armature after rewinding and testing.

- Varnish the armature winding

**CET 105 : WORKSHOP CALCULATION & SCIENCE**

**Total Credit : 3**

**Block -1**

Unit - 1

Units- Introduction--Definition--classification of units—inter relationship between Metric and British System of units.

Unit - 2

Simplification- Introduction--fractions--decimal fractions--lowest common multiple, LCM.

Unit - 3

Square Root - Square and square root--symbol of root--method of finding out the square root of a number- factorization method--division method.

Unit - 4

Ratio & Proportionate- Introduction--ratio—proportion.

**Block -2**

Unit - 1

Percentage - Introduction--percentage method

Unit - 2

Algebra - Introduction-careful consideration of subject items--addition and subtraction--multiplication and division--algebraic formula-factorization--equations

Unit - 3

Menstruation - Introduction-rectangle--square--parallelogram— rhombus--trapezium-  
-triangles—circle.

Unit - 4

Trigonometry - definition--formula--measurement of angles.

### **Block -3**

#### Unit-1

Electricity- Introduction--uses of electricity--molecule--atom--atomic structure- -electric current-AC. -DC.--ampere--EMF.--resistance--conductor--insulator--circuit

#### Unit-2

Electrical Power & Energy- Electric power--electric energy—

#### Unit-3

Effect of Electrical Current : Introduction---resistance --specific resistance— heating effect of electric current.

#### Unit-4

Electrical Machine - Introduction---DC. Generator--DC. Motor ratio of transformer

### **CET 106: PRACTICAL**

**Total Credit: 3**

#### **Block-1**

##### Unit-1

- Measurement sizes of diff. wire using standard wire gauge
- Removal of insulation of wires and cables
- Soldering practice on joints Thimble and terminals

##### Unit-2

- Preparation of test lamp and series parallel board.
- Testing of polarity of AC and DC supply.
- Mounting of different accessories on wooder board and making their connection.

##### Unit-3

- Connection of ammeter and voltmeter with load and measurement of their current and voltage.
- Verification of ohm's law
- Connection of wattmeter with loads and measurement of their power.

##### Unit-4

- Making various types of series and parallel circuits.
- Charging of battery using Battery charger
- Preparation of electrolyte for load acid battery and measure of its specific gravity by hydrometer.

#### **Block-2**

##### Unit-1

- Measurement of resistance and voltage using multimeter.

#### Unit-2

- Preparation of heating elements.

#### Unit-3

- Assembling and installation of florescent lamp.
- Assembling and installation of fan.

#### Unit-4

- Troubleshooting of various electrical home appliances like, heater, geezer, electric iron, ceiling fan, heat connector, vacuum cleaner, washing machine, hot plate, voltage stabilizer and emergency light

### **Block-3**

#### Unit-1

- Making various joint in wire and cable such on T-joint, straight joint, union joint, married joint, Britannia joint
- Controlling of lamps from one switch, two switches and three switches
- Preparation of simple house wiring circuits
- Preparation of distribution board
- Preparation of stair core wiring

#### Unit-2

- Cutting, holding and threading of conduit pipes.
- Carry out plate earthing and pipe earthing
- Connection of energy meter, MCB, ELCB in domestic wiring installation

#### Unit-3

- Testing of polarity and terminals of transformer
- Winding and rewinding of transformer
- Dismantle/resemble of transformer core
- Testing the transformer for insulation

#### Unit-4

- Dismantle of winding from dc armature
- Rewinding of single phase fan motor
- Rewinding of single phase motors
- Varnish of armature winding