

CERTIFICATE COURSE ON
REPAIR AND MAINTENANCE OF ELECTRONIC UPS/INVERTER

SHRIKRISHNA MAHAVIDYALAYA, GUNJOTI

Tq. Omerga, Dist. Osmanabad (M.S.)



Department of Physics



Designed by,

Dr. R. H. Kadam
Professor,
Physics Department,
Shrikrishna Mahavidyalaya, Gunjoti
Tq. Omerga, Dist. Osmanabad

Certificate Course on Repair and Maintenance of Electronic UPS / Inverter

Duration of Modular Training: 30 Hours

Entry Qualification: 10th / 12th Passed

Intake: 20 students.

Learning Outcome

The following are minimum broad learning outcome after completion of the repair and maintenance of Electronic UPS/Inverter course of 30 hrs. duration (Including soft and entrepreneurship skills).

A. GENERIC OUTCOME

1. Recognize and comply safe working practices, environment regulation and housekeeping.
2. Understand and practice soft skills and communicate with required clarity.
3. Demonstrate knowledge of concept and principles of basic arithmetic calculation and apply knowledge of specific are to perform practical operations.
4. Explain time management, entrepreneurship and manage / organize related task in day-to-day work for personal and social growth.

B. SPECIFIC OUTCOME

1. Dismantle and test linear and switch mode power supplies and different components using appropriate tools and measuring instruments.
2. Identify parts / components, front panel controls, install, service, troubleshoot and repair of electronic UPS / Inverter.

SYLLABUS CONTENT WITH TIME STRUCTURE

| Professional Skills | Professional Knowledge |
|--|--|
| Power Supply: <ul style="list-style-type: none"> • Testing of active components. • Practice soldering and desoldering techniques. • Assemble and test half wave, full wave and bridge rectifier circuits with and without filter. • Identify the different types of fixed positive and negative regulator ICs (78/79 series). • Identify the pins • Construct a fixed voltage regulator using 78xx /79xx series ICs. • Construct a variable voltage regulator using LM 723. • Observe the output voltage of different IC regulators by varying the input voltage. | <ul style="list-style-type: none"> ➤ Basic Electronics active components. ➤ Testing of Components. ➤ Working of half wave, full wave and bridge rectifier. ➤ Voltage regulator circuit. ➤ Applications of transistor and uses. ➤ MOSFET-precautions when handling ➤ DIAC, SCR, TRIAC – applications ➤ Identify the pin diagram of voltage regulator ICs. |
| UPS/Inverter <ul style="list-style-type: none"> • Installation of UPS and Inverters. • Maintenance of batteries. • Dismantle the UPS and identify the major parts. • Testing of major components. • Testing of power modules. • Charging, discharging and testing of batteries. | <ul style="list-style-type: none"> ➤ Various types of batteries used in UPS and inverters and their maintenance. ➤ Different types of inverters, UPS ➤ Working principle and specifications ➤ Explanation with the help of block diagram. |
| SMPS <ul style="list-style-type: none"> • Dismantle the given SMPS and find major sections / ICs components. • Measure voltages at vital points • Identify connectors of the given SMPS • Repairing of SMPS, simulating various faults, diagnosing and rectifying it. | <ul style="list-style-type: none"> ➤ Block diagram of Switch mode power supplies and their working principles. |

List of Tools and Equipment's for module: Repair and Maintenance of Electronic UPS/Inverter

| Sr. No. | Name of Equipment / Tool | Quantity |
|----------------|---------------------------------|-----------------|
| 01 | Inverter / UPS | 01 |
| 02 | Battery charger | 04 |
| 03 | Technician tool kit | 01 |
| 04 | Digital Multi-meter | 02 |
| 05 | Soldering Gun | 02 |
| 06 | De Soldering pump | 02 |
| 07 | Hand Glove | 02 |
| 08 | Half wave Rectifier kit | 01 |
| 09 | Full wave rectifier kit | 01 |
| 10 | Bridger rectifier kit | 01 |

Guidelines for instructor for assessment

Following method(s) of training may be adopted

- A) Lecture
 - B) Lesson
 - C) Demonstration
 - D) Practice
 - E) Group discussion
 - F) Discussion with peer group
- ❖ Maximum utilization of latest form of training viz. audio-visual aids, integration of IT etc. may be adopted.
 - ❖ The total hours to be devoted against each topic maybe decided with due diligence to safety and with prioritizing transfer of required skills.
 - ❖ Assessment may be based on following instructions.

| Sr. No. | Question on Different Aspects | Weightage in Percentage |
|----------------|--------------------------------------|--------------------------------|
| 01 | Knowledge | 10 |
| 02 | Understanding | 10 |
| 03 | Practical Execution | 20 |
| 04 | Viva | 10 |

Due weightage to be given to all the topics under the syllabus while assessing.