



P.B. Siddhartha College of Arts & Science, Vijayawada-10

Course Code: ELESET01

Offered to: B.Sc. (M.E.Cs,CA.M.E)

Domain Subject: ELECTRONICS

Semester – V

Max. Marks: 100 (CCIA: 25+ SEE: 75)

Theory Hrs./Week: 3

Course 6B: INDUSTRIAL ELECTRONICS

Type of the Course : Skill Enhancement Course (Elective: Theory), Credits: 04

Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Identify various facilities required to set up a basic Instrumentation Laboratory

CO2: Acquire a critical knowledge of various Electrical Instruments used in the Laboratory

CO3: Demonstrate skills in using instruments like Rectifiers, Multimeters, Power supplies,

CO4: An Voltage Regulators etc. through hands-on experience.

CO5: Understand the Principle and operation of different Electronic Heating devices

UNIT-I (09 hours)

Rectifiers and filters: Rectifiers– Half wave, full-wave and bridge rectifiers- Efficiency- Ripple factor- Regulation – Harmonic components in rectified output – Types of filters- Choke input (inductor) filter-Shunt capacitor filter- L section and π section filters. Voltage Regulators: Transistor Series voltage regulator - Transistor Shunt voltage regulator – Three terminal regulators (78XX and 79XX).

UNIT-II (09 hours)

Power Supplies: Block diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of switch mode power supply (SMPS).

UNIT-III (09 hours)

Voltage Multipliers: Half wave voltage doubler, Full wave voltage doubler, Voltage Tripler circuit diagram and working mentioning of applications of voltage multipliers.

UNIT-IV (09 hours)

Controlled rectifiers: SCR Half wave rectifier circuit, working with wave forms, mathematical analysis for resistive load - SCR Full wave rectifier circuit, working with wave forms, mathematical analysis for resistive load – SCR as inverter parallel and series circuits.

UNIT-V (09 hours) :

Heat effects: Resistance, inductance and dielectric heating. Principle of operations and its applications.

Text Books:

1. Unified Electronics Volume II by J.P Agarwal and Amit Agarwal.
2. Industrial Electronics, S.B. Biswas, Dhanapur Rai & Sons.
3. Industrial Electronics, G.K. Mithal, Khanna Publishers.

Reference Books:

1. Electronic Devices and Circuits – G.K. Mithal.
2. Electronic Devices and Circuits-Millman and Halkias- Tata Mc Graw Hill (TMH)
3. Microelectronics- J. Millman and A. Grabel – TMH

Course Delivery method: Face-to-face / Blended

Course has focus on: Foundation and Skill Development

Websites of Interest: <https://www.etcourse.com/news-blog/what-industrial-electronics-and-what-does-it-look-2022>

Co-curricular Activities: Assignments, PPT's, Major projects



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Model Question Paper

TITLE: INDUSTRIAL ELECTRONICS

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Maximum Marks:

75M

Time: 3 Hours

Pass Minimum: 30M

SECTION-A

Answer any FIVE of the following:

5x5=25M

1. Write about shunt capacitor filter (CO1)-L1
2. Explain simple regulated transistorized power supply (CO2)-L1
3. Discuss about power supplies (CO2)-L1
4. Write about voltage multipliers (CO3)-L1
5. Write a short note on controlled rectifiers (CO3)-L1
6. Write about mathematical analysis for resistive load of SCR full wave rectifier? (CO4-L1)
7. Explain about resistive heat effect and inductive heat effect. (CO4)-L1
8. Write about voltage regulators. (CO5)-L1

SECTION-B

Answer the following:

5x10=50M

- 9.a) Discuss about different types rectifiers (CO1)-L1
(or)
b) Define filter and discuss various types of filters? (CO1)-L1
10. a) Discuss briefly about SMPS and description of each block. (CO2)-L1
(or)
b) Draw the block diagram of regulated power supply(RPS). (CO2)-L1
11. a) Explain half wave voltage doubler and full wave voltage doubler (CO3)-L1
(or)
b) What are the applications of voltage multipliers.(CO3)-L1
12. a) Discuss briefly about SCR half wave rectifier circuit with wave forms (CO4)-L1
(or)
b) Discuss briefly about SCR full wave rectifier circuit and write about mathematical analysis for resistive load. (CO4)-L1
- 13.a) Explain different types of heat effects and its operations? (CO5)-L1
(or)
b) Define heat effect and discuss about dielectric heating. (CO5)-L1