

# ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

V SEMESTER  
PH-E3-5452 (4)  
w.e.f. 20AH Batch

## PHYSICS PHYSIC PRACTICAL – III SYLLABUS

TIME: 5Hrs/week  
Max.Marks:100

### COURSE OBJECTIVES:

- ❖ List out, identify and handle various equipment in Electrical & Electronics laboratory.
- ❖ Learn the procedures of designing simple electrical circuits.
- ❖ Demonstrate skills on the utility of different electrical components and devices.
- ❖ Acquire the skills regarding the operation, maintenance and troubleshooting of various Devices in the lab.
- ❖ Understand the different applications of Electromagnetic induction.

### COURSE OUTCOMES:

- ❖ List out, identify and handle various equipment in Instrumentation Laboratory or Electronic Laboratory.
- ❖ Learn the construction, operational principles of various instruments.
- ❖ Demonstrate skills on handling, Maintenance & trouble shooting of different instruments used in the Labs.
- ❖ Acquire skills in observing and measuring various electrical and electronic quantities.
- ❖ Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc..

### EXPERIMENTS:

**Minimum of twelve experiments to be done and recorded.**

1. Construction of a Step down Transformer and measurement of its output voltage. And to compare it with the calculated value.
2. Connect two or three resistors or capacitors or inductors and measure the Series, Parallel Combination values using a Multimeter and compare the values with the Calculated values.
3. Use the Digital Multimeter and Analog Multimeter to measure the output voltage of an AC & DC power supply and also the voltage and frequency of a AC signal using CRO.
4. Use the Multimeter to check the functionality of a Diode and Transistor. Also test whether the given transistor is PNP or NPN.
5. Construct a series electric circuit with R, L and C having an AC source and study the frequency response of this circuit. Find the Resonance Frequency.
6. Construct a Parallel electric circuit with R, L & C having an AC source and study the frequency response of this circuit. Find the resonant frequency.

7. Test whether a circuit is a Open circuit or Short Circuit by measuring continuity with a Multimeter and record your readings.
8. Familiarisation of digital multimeter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages and for (i) continuity test (ii) diode test and (iii) transistor test
9. Measure the AC and DC voltages, frequency using a CRO and compare the values measured with other instruments like Digital multimeter.
10. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
11. Display the numbers from 0 to 9 on a single Seven Segment Display module by applying voltages.
12. Display the letters a to h on a single Seven Segment Display module by applying voltages.

P.T.O.

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### **Demonstrative Experiments**

1. Acquainting with the soldering techniques.
2. Measurement of body temperature using a digital thermometer and list out the error and corrections.
3. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
4. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks.
5. Observe and understand the operation of a Digital Pulse oxymeter and measure the pulse rate of different people and understand the working of the meter.

### **REFERENCE BOOKS:**

1. Electronic Measurement and Instrumentation by J.P. Navani. ,S. Chand & Co Ltd.
2. Principles of Electronic Instrumentation by A De Sa, Elsevier Science Publ.
3. Electronic Measurements and Instrumentation by S.P.Bihari, YogitaKumari, Dr. Vinay Kakka, Vayu Education of India.
4. Laboratory Manual for Introductory Electronics Experiments by Maheshwari, New Age International (P) Ltd., Publishers.
5. Electricity-Electronics Fundamentals: A Text-lab Manual by Paul B. Zbar ,Joseph Sloop, & Joseph G. Sloop, McGraw-Hill Education.
6. Laboratory Manual Basic Electrical Engineering by Umesh Agarwal, Notion Press.
7. Basic Electrical and Electronics Engineering by S.K. Bhattacharya, Pearson Publishers.
8. Web sources suggested by the teacher concerned.

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