

ANNEXURE – XIV
KVR Govt. College for Women (A), Kurnool
Re-Accredited with 'A' Grade by NAAC
III Year B.Sc Physics- V Semester
Semester wise Revised Syllabus under CBCS,2020-21
Course 6C: APPLICATIONS OF ELECTRICITY & ELECTRONICS
Skill Enhancement Course (Elective)
[w.e.f. 2022-23]

Work load: 60 hrs per semester

3hrs/week

Unit-I INTRODUCTION TO PASSIVE ELEMENTS

(10 hrs.)

Passive and Active elements-Examples, **Resistor**-Types of Resistors, Color coding - Applications of a Resistor as a heating element in heaters and as a fuse element. **Capacitor**-Types of Capacitors, Color coding, Energy stored in a capacitor, Applications of Capacitor in power supplies, motors(Fans) etc., **Inductor**-Types of Inductors, EMF induced in an Inductor, Applications of Inductor, Application of choke in a fan and in a radio tuning circuit, Series resonance circuit as a Radio tuning circuit.

Unit-II Power Sources (Batteries)

(10 hrs.)

Types of power sources-DC & AC sources, Different types of batteries, Rechargeable batteries – Lead acid batteries, Ni-MH batteries, Li-ion batteries- Li-PO batteries, Series, Parallel & Series-Parallel configuration of batteries, Constant Voltage source-Constant Current Source-Applications of Current sources & Voltage sources, SMPS used in computers.

Unit-III Alternating Currents

(10 hrs)

A.C Power source-Generator, Construction and its working principle, Transformers- Construction and its working principle, Types of Transformers-Step-down and Step-up Transformers, Relation between primary turns and secondary turns of the transformer with emf., Use of a Transformer in a regulated Power supplies, Single phase motor –working principle, Applications of motors(like water pump, fan etc.).

Unit-IV Power Supplies (Skill Based)

(10 hrs.)

Working of a DC regulated power supply, Construction of a 5 volts regulated power supply, Design of a step-down (ex: 220-12V) and step-up (ex: 120-240V) transformers- Simple Design of FM Radio circuit using LCR series resonance (tuning) circuit, Checking the output voltage of a battery eliminator using a MultiMate.(Trouble shooting), Design of a simple 5 volts DC charger, Power supply for computers(SMPS)

Unit-V Applications of Electromagnetic Induction

(10 hrs.)

DC motor –Construction and operating principle, Calculation of power, voltage and current in a DC motor, Design of a simple Motor (for example Fan) with suitable turns of coil-DC generator- Construction, operating principle and EMF equation, Construction of a simple DC generator, Difference between DC and AC generators

References:

- 1.Grob's Basic Electronics by Mitchel Schultz, TMH or McGraw Hill
- 2.Electronic and Electrical Servicing by Ian Robertson Sinclair, John Dunton, Elsevier Publications
- 3.Troubleshooting Electronic Equipment by R.S.Khandapur, TMH
- 4.Web sources suggested by the teacher concerned and the college librarian including reading material.

ANNEXURE – XIV(a)
KVR Govt. College for Women (A), Kurnool
Re-Accredited with ‘A’ Grade by NAAC
III Year B.Sc Physics- V Semester
Semester wise Revised Syllabus under CBCS,2020-21
Course 6C: APPLICATIONS OF ELECTRICITY & ELECTRONICS
Practical Syllabus
[w.e.f. 2022-23]

Workload: 30 hrs

3hrs/week

Minimum of 6 experiments to be done and recorded 1. Acquainting with the soldering techniques

1. Design and Construction of a 5 Volts DC unregulated power supply
2. Construction of a Step down Transformer and measurement of its output voltage. And to compare it with the calculated value.
3. 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.
4. 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.
5. Use the Multimeter to check the functionality of a Diode and Transistor. Also test whether the given transistor is PNP or NPN.
6. 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.
7. 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.
8. Test whether a circuit is a Open circuit or Short Circuit by measuring continuity with a Multimeter and record your readings.

Lab References:

1. Laboratory Manual for Introductory Electronics Experiments by Maheshwari, L.K. Anand, M.M.S., New Age International (P) Ltd.
2. Electricity-Electronics Fundamentals: A Text-lab Manual by **Paul B. Zbar**, Joseph Sloop, & Joseph G. Sloop, McGraw-Hill Education
3. Laboratory Manual Basic Electrical Engineering by Umesh Agarwal, Notion Press
4. Basic Electrical and Electronics Engineering by S.K. Bhattacharya, Pearson Publishers.
5. Web sources suggested by the teacher concerned

ANNEXURE – XV
KVR Govt. College for Women (A), Kurnool
Re-Accredited with ‘A’ Grade by NAAC
III Year B.Sc Physics- V Semester
Semester wise Revised Syllabus under CBCS,2020-21
Course 7C: ELECTRONIC INSTRUMENTATION
Skill Enhancement Course (Elective) [w.e.f. 2022-23]

Work load: 60 hrs per semester 3hrs/week

UNIT-I INTRODUCTION TO INSTRUMENTS (10 hrs)

Types of electronic Instruments- Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity, $3\frac{1}{2}$ display and $4\frac{1}{2}$ display Digital multimeters, Basic ideas on Function generator

UNIT-II OSCILLOSCOPE (10 hrs)

Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (DC and AC), frequency, phase difference, Different types of oscilloscopes and their uses, Digital storage Oscilloscope

UNIT-III TRANSDUCERS (10 hrs)

Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fibre optic sensors

UNIT-IV DISPLAY INSTRUMENTS (10 hrs)

Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers), Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Principle and working of 2×16 display and 4×16 LCD modules, Applications of LCD modules.

UNIT-V BIOMEDICAL INSTRUMENTS (10 hrs)

Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Ventilator (ix) Pulse oxymeter (x) Glucometer, Basic ideas of CT scan and MRI scan: Reference Books:

1. Electronic Instrumentation by H.S. Kalsi, TMH Publishers
2. Electronic Instrument Hand Book by Clyde F. Coombs, McGraw Hill
3. Introduction to Biomedical Instrumentation by Mandeep Singh, PHI Learning
4. Biomedical Instrumentation and Measurements by Leslie Cromwell, Prentice Hall

India.

5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D. Halfrick, A.B., PHI Learning, New Delhi
8. Web sources suggested by the teacher concerned and the college librarian including reading material.

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Semester wise Revised Syllabus under CBCS, 2020-21
Course 7C: ELECTRONIC INSTRUMENTATION
[w.e.f. 2022-23]

Workload: 30 hrs

3hrs/week

Minimum of 6 experiments to be done and recorded

1. 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
2. Measure the AC and DC voltages, frequency using a CRO and compare the values Measured with other instruments like Digital multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by Applying voltages.
5. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.
6. Measurement of body temperature using a digital thermometer and list out the error and corrections.
7. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
8. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks
9. 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.

V. Lab References:

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. VinayKakka, Vayu Education of India .
4. Laboratory Manual For Introductory Electronics Experiments by Maheshwari, NewAge International (P) Ltd., Publishers.
5. Electricity-Electronics Fundamentals: A Text-lab Manual by Paul B. Zbar ,JosephSloop, & Joseph G. Sloop, McGraw-Hill Education.
6. Web sources suggested by the teacher concerned
