PHYDSC152P

LAB: MECHANICS AND ELECTRICITY

Contact Hours: 60

Full Marks = 100

Course objective: *In this course, the students will learn to use various instruments, estimate various physical parameters for every experiment performed and report the result of experiment related to mechanics and electricity magnetism. This course also aims at study and analysis of various electrical circuits using network theorems and various bridges.*

Two Experiments are to be performed – one from each part

Part-A: Mechanics

1. To determine the Moment of Inertia of a regular body by torsional pendulum.
2. To determine the Young's Modulus of a Wire by Searle's Method.
3. To determine the Modulus of Rigidity of a Wire by Statical method.
4. To determine g by Bar Pendulum.
5. To determine g by Kater's Pendulum.
6. To determine the co-efficient of viscosity of water by suitable method.
7. To study the motion of spring and calculate (a) spring constant (b) 'g'.
8. To determine the height of a building using a sextant.

Part-B: Electricity

1. To determine the specific resistance of the material of a given wire by meter bridge.
2. To determine an unknown low resistance using Carey Foster's bridge.
3. To determine an unknown low resistance using potentiometer.
4. To verify laws of series and parallel resistances by P.O. Box
5. To compare the magnetic moments of two given bar magnets by deflection magnetometer.
6. To convert a given galvanometer into an ammeter and to calibrate it using copper voltameter
7. To determine the resistance of a given galvanometer by half deflection method.
8. To determine the strengths of the magnetic field produced at the centre of the tangent galvanometer coil due to a current flowing in it and hence to determine the horizontal component of the earth's magnetic field.
9. To determine the value of 'J' by Joule's electrical calorimeter.

10. To verify Thevenin's/Norton's/maximum power transfer theorem.
11. To study response curve of a series LCR circuit and determine its (a) Resonant frequency (b) Impedance at resonance (c) Quality factor Q (d) Band width.

Expected learning outcomes: *At the end of the above course the students will have hands-on knowledge and overview of various experiments related to various key aspects of mechanics and electricity.*

Reference books:

i. Advanced Practical Physics for students, B.L.Flint and H.T.Worsnop, 1971, Asia Publishing House.
ii. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
iii. Engineering Practical Physics, S.Panigrahi & B.Mallick,2015, Cengage Learning India Pvt. Ltd.
iv. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
v. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
vi. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
vii. Engineering Practical Physics, S.Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
viii. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.