Paper-IV: 1164 PHYSICS PRACTICALS

Note: Students are expected to perform sixteen experiments in all taking the eight experiments from each section. One experiment from section A and one from section B will be set in the examination paper.

 The distribution of marks in the practical examination will be as follows:

(i) Two experiments 48 Marks

For each experiment, distribution of marks will be as follows:

> Figure : 3
>
> Formula/Theory : 3
>
> Observation : 10
>
> Calculation (including error) and Result : 6
>
> Precautions : 2

(ii) Viva voce 12

(iii) Records 15

Total 75 Marks

LIST OF EXPERIMENTS

Important Note:

(i) Before starting experiments, students should be taught errors in measurement, propagation of errors, importance of significant figures, identifying variables in experiment, importance of graphical presentation of data. Results without quoting errors should not be approved.

Section-A

1. Determination of elastic constants Y, η,σ and K by Searle's method.

2. Determination of thermal conductivity 'K' of a bad conductor by Lee's method.

3. Determination of J by Callender and Barne's method.

4. Study of temperature variation of surface tension by Jaegers method.

5. Study of free fall of a body: use of a digital timer to get time and velocity at different depth and analysis.

6. Study of collision in two dimension

7. Kater's pendlum , precise setting ,analysis and determination of value of acceleration due to gravity 'g' at a place.

8. Study of damping of a bar pendulum under various kinds of damping mechanisms.

9. To determine coefficient of damping k ,relaxation time T and quality factor of a damped SHM using a simple pendulum.

10. Study of dependence of period of oscillations of a spring or rubber band on mass and spring constant.

11. To determine the velocity of sound in air at room temperature with Kundt's tube.

12. Using scattering to deduce the nature of potential hump or well(two dimensional)

13 Study of laws of parallel and perpendicular axes for estimation of moment of inertia.

14. Computer simulation   of equations of motion for a system of particles.

15. Computer simulation of molecular   rotations, as rigid bodies.

16. Study of motion of a top and a gyroscope.

17. Study of torsion of a wire ; dependence on radius, length, torque and material(static method)

18. To determine the modulus of rigidity of the material of a wire by statistical method using Bortan's apparatus

19. To determine the value of modulus of rigidity of the material of a given wire by dynamical method using Maxwell's needle

 20 .Study of flow of liquids through capillaries: laminar and turbulent flow stages, capillaries

21. To determine the coefficient of viscosity of water by Poisevill's method

22.Studying the fall of solids through a liquid.

23 To determine the coefficient of viscosity of a liquid (glycerin or castor oil) by Stoke's method

23. Study of air flow through a capillary: U- tube with a long capillary fitted on one arm, mercury level difference pushing air.

24. To determine Poisson's ratio of rubber

25. Measurements of length (or diameter) using vernier caliper, screw gauge and traveling microscope.
26. To determine the Height of a Building using a Sextant.
27. To determine the Moment of Inertia of a Flywheel.
28. To determine the Young's Modulus of a Wire by Optical Lever Method.
29. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.

30. To determine the Elastic Constants of a Wire by Searle's method.
31. To determine g by Bar Pendulum.
32. To determine g by Kater's Pendulum.
34. To determine g and velocity for a freely falling body using digital timing technique
35. To study the Motion of a Spring and calculate (a) Spring Constant (b) Value of g

SECTION -B

1. Calibration of Carey Fosters bridge wire and determination of the specific resistance of the material of the given wire.

2. Measurement of thermo e.m.f.

3. To study growth and decay of current in R.C. circuit and determine the time constant.

4. To determine impedance of L-R circuit and find phase relation ship in current and voltage.

5. To determine the constants of a ballistic galvanometer. Current and charge sensitivity, time period, log decrement and galvanometer resistance.

6. To determine intensity of magnetic field using search coil and ballistic galvanometer.

7. To determine high resistance by method of leakage. Measure leakage resistance of a condenser.

8. To determine low resistance by Kelvin's double bridge.

9. Determination of dielectric constant of a given liquid.

10. To determine inductance of a coil using Anderson's method.

11. Desauty's bridge method for comparison of two capacitors.

12. To determine mutual inductance by Carry Foster's Method

13. Study of the impedance of a capacitor of varying frequencies to measure C.

14. Response curve for LCR circuits series resonance.

15. Study of a discrete LC transmission line.

16. Response curve for LCR circuit parallel resonance

17. Measurements of electric charge and related quantities using an electrometer.

18. Study of potential distribution in a given geometrical configuration.

19. Mapping of electric fields for specified configurations.

20. To verify the Superposition, and Maximum Power Transfer Theorem

21 Study of the rise and decay of current in a RL circuits.

22. Characteristics of a choke.

23. Study of the impedance of an inductor at varying frequencies   to measure R and L

24. To use a Multimeter for measuring
- Resistances,
- AC and DC Voltages,
- DC Current
- checking electrical fuses.

24. Ballistic Galvanometer:
- Measurement of charge and current sensitivity
- Measurement of CDR
- Determine a high resistance by Leakage Method
- To determine Self Inductance of a Coil by Rayleigh's Method.

25. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx).

26. To verify the Thevenin and Norton theorem