Board of Intermediate Education Karachi

OBJECT OF PHYSICS PRACTICAL EXAMINATION – I   2025

EXPERIMENT NO. 1

Using Vernier Caliper determine the volume of a given solid cylinder and capacity of a hollow cylinder.

i)   Write down least count of Vernier Caliper. (01)
ii)   Find zero error of Vernier Caliper. (01)
iii) Take two observations for diameter and length of the solid cylinder. Calculate radius "r" of solid cylinder. (02)
iv) Take two observations of inner diameter and depth "d" of hollow cylinder. Calculate radius "R" of hollow cylinder. (02)
v)   Calculate the volume 'V' of solid cylinder and capacity 'C' of a hollow cylinder usin formula $V=\pi r^2 L$ and $C= \pi R^2 d$ (02)
vi) Write down the results with proper units. (01)

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EXPERIMENT NO. 2

You are given micrometer screw gauge and three small spheres (ball bearing) of different size.

i)   Write down the least count of screw gauge. (01)
ii)   Find zero error of screw gauge. (01)
iii) Take two observations for diameter and calculate radius "r" of each sphere. (03)
iv) Calculate the volume of each sphere using formula.

$$V=\frac{4}{3}\pi r^3$$
(03)

v) Write down the results with proper units. (01)

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EXPERIMENT NO. 3

You are given spherometer, glass plate/smooth surface, concave lens and convex lens.

i)   Write down the least count of spherometer. (0.5)
ii)   Find mean distance "a" between the legs of spherometer. (01)
iii) Take two observations for plane glass sheet. (01)
iv) Take two observations for convex lens. (1.5)
v)   Take two observations for concave lens. (1.5)
vi) Find spherical height "h" of convex lens and depth "d" of concave lens. (0.5)
vii) Calculate the radius of curvature of given convex lens and concave lens using formulas

$$R= \frac{a^2}{6h}+\frac{h}{2} \text{ and } R= \frac{a^2}{6d}+\frac{d}{2}$$
(02)

viii)   Write down the results with proper units. (01)

EXPERIMENT NO. 4

Verify that the time period of the simple pendulum is directly proportional to the square root of its length and hence find the value of 'g' from the graph.

i) Determine time for 10 oscillations twice for each length given below: (05)
   80, 90, 100, 110 and 120cm. Find time period "T" and T^2.

ii) Plot a graph between L (along x – axis) and T^2 (along y – axis). (01)

iii) Determine the slope of the graph by taking a point on the graph other than the plotted

   one using formula (Slope $= \frac{T^2}{L}$) (01)

iv) Calculate the value of 'g' using formula $g = \frac{4\pi^2}{slope}$ (01)

v) Write down the result with proper units. (01)

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EXPERIMENT NO. 5

Determine the wavelength of sound in air and calculate the speed of sound using resonance tube.

i) Note down the room temperature "t" and frequencies "f" of tuning forks. (01)

ii) Note down the internal diameter "D" of resonance tube. (0.5)

iii) Record the first resonating length L for three different tuning fork. (03)

iv) Calculate wave length λ, speed of sound at room temperature V_t and speed of sound

at 0°C V_o for each tuning fork using formula: $\frac{\lambda}{4} = L + 0.3D$; $V_t = f\lambda$ & $V_o = V_t - 61t$ (03)

v) Write down the results with proper units. (1.5)

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EXPERIMENT NO. 6

Investigate the downward force, along an inclined plane, acting on a roller due to gravity and study its relationship with the angle of inclination by plotting a graph between force and sinθ.

i) Find or note down the mass of the roller 'M_1' (0.5)
ii) Find or note down the mass of the pan 'M_2' (0.5)
iii) Take five observations by changing the angle of inclination of inclined plane. (05)
iv) Plot the graph between sinθ (along x-axis) and downward force "w"
   (along y-axis) (02)
v) Write down the behavior of the graph. (01)

EXPERIMENT NO. 7

Verify the two conditions of equilibrium using a meter rod.
i) For 1st condition of equilibrium, suspend a meter rod by two spring balances.
ii) Suspend some weight at the centre of the rod.
iii) Note down the reading of spring balances and suspended weight.   (04)
iv) Repeat the experiment by changing the weight suspended at the centre of the rod.
v) Using formula $\Sigma Fy = F_1 + F_2 - F_3$, calculate the resultant force.
vi) For 2nd condition of equilibrium, place the meter rod at a wedge or suspend the rod from its centre of gravity.
vii) Suspend two or three weights from the rod so that the rod is balanced.   (04)
viii) By changing the weights, repeat step (vii).

ix) Using formula of 2nd condition of equilibrium, find total torque.
x) Write down the results with proper units   (01)

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EXPERIMENT NO. 8

Determine the value of 'g' by oscillating a metal lamina (bar pendulum) suspending from different points.
i) Write down the least count of stop watch.   (0.5)
ii) Note down the time of 10 oscillations when suspended from various holes of end A and find time period for each length.   (01)
iii) Repeat step (ii) when the bar pendulum is suspended from end B.   (01)
iv) Draw a graph between length (along x-axis) and time period (along y-axis).   (02)
v) With the help of graph, find approximate length of the pendulum and time period.   (02)
vi) Using formula find the value of "g" and its mean value.   (02)
vii) Write down the result with proper units.   (0.5)

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EXPERIMENT NO. 9

Investigate the value of 'g' by free fall method using electronic timer.
i) Determine the time "t" for different height "h" of free fall. Take five readings.   (05)
ii) Calculate the value of 'g' for each observation by using formula, $g = \frac{2h}{t^2}$

Find mean value of "g".   (03)
iii) Write down the result with proper units.   (01)

EXPERIMENT NO. 10

Determine resistance of a wire by slide wire bridge.

i)	Draw circuit diagram.	(01
ii)	Take two observations when the wire is in right gap and two observations when the wire is in left gap.	(04
iii)	Calculate the resistance of wire using formula $X = R\frac{L_x}{L_R}$ and its mean value.	(03
iv)	Write down the result with proper unit.	(01

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EXPERIMENT NO. 11

Determine resistance of voltmeter by drawing a graph between R and $\frac{1}{V}$.

i)	Draw the circuit diagram.	(01
ii)	Note down the least count of voltmeter and emf of the battery.	(01
iii)	Take eight observations by changing resistance from resistance box.	(04
iv)	Plot graph between R and $\frac{1}{V}$.	(01
v)	Determine the resistance of the voltmeter by graph.	(01
vi)	Write down the result with proper unit.	(01

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EXPERIMENT NO. 12

Determine the relation between current and capacitance when different capacitors are connected is series and parallel combinations in AC circuit.

i)	Draw circuit diagram.	(01
ii)	Note down the least count of voltmeter and ammeter.	(01
iii)	Take five observations for series combination.	(2.:
iv)	Take five observations for parallel combination.	(2.:
v)	Plot a graph between Capacitance C(along x–axis) and current I (along y–axis)	(01
vi)	Discuss the behavior of graph.	(01

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EXPERIMENT NO. 13

Investigate the relationship between current passing through a tungsten filament lamp the potential applied across it.

i)	Draw circuit diagram.	(01
ii)	Note down the least count of voltmeter and ammeter.	(01
iii)	Take eight observations by changing voltage or current.	(04
iv)	Plot a graph between V(along x – axis) and I(along y – axis)	(02
v)	Write down the result.	(01

EXPERIMENT NO. 14

Determine e.m.f of a cell using potentiometer.

i)   Draw circuit diagram.   (01)

ii) Note down the e.m.f of known cell.   (0.5)

iii) Connect the cell of known emf in the circuit and find length L_S of potentiometer wire when galvanometer gives no deflection.
     Now connect the cell of unknown emf in the circuit and find length L_X of potentiometer wire when galvanometer gives no deflection.
     Take set of four observations by change the position of rheostat.   (04)

)   Calculate the e.m.f of unknown cell by using formula.

$$E_x = E_s \times \frac{L_x}{L_s} \text{ and its mean.}$$ (2.5)

     Write down the result with proper unit.   (01)

EXPERIMENT NO. 15

rmine time constant by charging and discharging a capacitor through a resistor.

Draw circuit diagram.   (01)

Note down the least count of stop watch and voltmeter.   (01)

Note down the resistance of the resistor and capacity of the given capacitor.   (01)

Take five observations of charging and discharging of the capacitor.   (05)

Write down the result.   (01)

EXPERIMENT NO. 16

nine internal resistance of a cell using potentiometer.

raw the circuit diagram.   (01)

ke five observations.   (05)

Iculate the internal resistance by using formula: $r = \left(\dfrac{L_1 - L_2}{L_1} \right) R.$ (02)

ite down the result with proper unit.   (01)

EXPERIMENT NO. 17

Determine the emf and internal resistance of a cell by plotting a graph between V and I.

i)	Draw circuit diagram.	(01)
ii)	Note down the least count of voltmeter and ammeter	(01)
iii)	Take six observations.	(06)
iv)	Write down the result.	(01)

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EXPERIMENT NO. 18

Determine the wavelength of light by using a diffraction grating and spectrometer. (09)

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EXPERIMENT NO. 19

Convert a galvanometer into voltmeter of range 0 – 3V (09)

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EXPERIMENT NO. 20

Observe the line spectrum of mercury with diffraction grating and spectrometer to determine the wave length of several different lines. Draw a conclusion about the width of visible spectrum. (09)

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