

Model Viva Questions for “Applied Physics lab”

Common to: **CS ,IT, ET&T 1st sem**

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Title of the practical: **To measure radius of curvature of given curved surface using spherometer**

Q1. Why is a spherometer so called?

A1. It measures radius of curvature of spherical surfaces, hence it is called a spherometer.

Q2. Describe principle of a spherometer.

A2. It works on the principle of micrometer screw.

Q3. What is meant by pitch of spherometer?

A3. The pitch is the distance between two consecutive threads of the screw taken parallel to the axis of rotation or the distance moved by the screw in one complete rotation of the circular scale.

Q4. How can the accuracy of a spherometer be increased?

A4. Smaller is the L.C. is the accuracy of an instrument and vice-versa. The accuracy of the spherometer can be increased by decreasing the pitch or by increasing the number of divisions of circular scale.

Q5. Can you measure the focal length of a lens?

A5. Yes.

Q6. Why are the good spherometers made of gun metal?

A6. To minimize wear and tear.

Q7. Define pitch of a spherometer?

A7. Pitch of Spherometer is linear distance moved by its screw when the circular scale is given one complete rotation.

Q8. What is the value of pitch of a common spherometer?

A8. Generally it is 1mm.

Q9. What is the least count of spherometer?

A9. It is linear distance moved by the screw when it is rotated by one division of circular scale only.

Q10. The spherometer contains three legs, why?

A10. Because it is the minimum number for stable equilibrium of the instrument. Moreover, at least three points are essential to describe a plane.

Title of practical: **To determine the value of “g” using simple pendulum.**

Q1. What is simple pendulum?

Ans . A simple pendulum is a heavy, small metallic bob suspended by a weightless, inextensible thread from a rigid support point, about which it can vibrate.

Q2.Which force is responsible for vibration of a simple pendulum?

Ans.The force of gravity.

Q3. What is gravity?

A3. The force experienced by bodies situated on or near the surface of earth due to the gravitational attraction of earth.

Q4.What is value of acceleration due to gravity?

A4.g=9.8 m/s²

Q5.How g and G are correlated?

A5. $g=GM/R^2$ M=MASS OF EARTH, R –Radius of Earth

Q6.What should be the quality of pendulum bob for determining value of g?

A6 . Pendulum mass should be small in size ,heavy and perfectly spherical so that it may be considered as a point mass and centre of sphere may be taken as its centre of mass.

Q7.Why does oscillating pendulum stop vibrating after some time?

A7. Due to viscous force of air.

Q8.Value of g at surface of earth is 9.81 m/sec² , how g will varies with height and depth of earth?

A8. It's value decreases .

Q9.What is value of g in moon with respect to earth?

A9 . Value of g is 1/6th in moon compared to earth.

Q10 .Does time period of a pendulum depend upon the mass of bob?

A10. No.

Title of practical: **To determine Young's modulus of elasticity of the material of given wire Using Searle's apparatus.**

Q1. What is elasticity?

A1. The property of the body by virtue of which it tends to regain its original configuration when external deforming forces acting on it are removed.

Q2. Define stress.

A2 stress is defined as the internal restoring force per unit area developed in a body when it is deformed by applying external force.

Q3. What is strain?

A3. Strain caused in a body is defined as the ratio of change in a dimension of the body to the original dimension of the body

Q4. What is elastic limit?

A4. Up to which the body behaves as perfectly elastic and on removing the deforming force the body regains its original configuration completely.

Q5. What happens if a metal wire is loaded even beyond its elastic limit?

A5 Beyond elastic limit

(i) the elongation of wire is not directly proportional to the load

(ii) the wire does not regain its original state completely even on removal of the load.

Q6 would you prefer short wire or long wire in Searle's apparatus?

A6 Long wires.

Q7 Why?

A7 So that for a given load elongation is more and we may be able to measure its precisely.

Q8. State Hooke's law.

A8 .Within elastic limit stress is proportional to strain.

Q9. Why is a fixed weight suspended from the compensating wire of Searle's apparatus?

A9. A fixed weight is suspended from the lower end of compensating wire frame so as to keep the wire in taut position.

Q10. Which is more elastic, steel or rubber? Why?

A10. Steel is more elastic than rubber because for a given strain much larger stress is developed in a steel wire.

Title of practical: **To determine surface tension of water by capillary rise method.**

Q1. What is surface Tension?

A1. a property of liquids due to which a free surface behaves like a stretched membrane and tends to acquire least possible surface area.

Q2. How do you measure surface tension?

A2. Surface tension is measured by the force acting per unit length along any line taken in the free liquid film.

Q3. What is the nature of intermolecular force?

A3. Electrostatic in nature.

Q4. What is force of cohesion?

A4. Intermolecular force between identical molecules.

Q5. And what is force of adhesion?

A5. Intermolecular force between different molecules.

Q6. What is capillary tube?

A6. A tube with an extremely fine bore.

Q7. What is capillarity?

A7. Rise or fall of a liquid in a capillary tube as compared to the surroundings is called capillarity.

Q8. Name a liquid whose angle of contact is obtuse?

A8. Mercury.

Q9. What is angle of contact of water in contact with glass?

A9. It is practically taken as zero.

Q10. What is the cause of capillary rise of water?

A10. Existence of pressure difference across a curved water-air interface.

Title of practical: **To determine coefficient of viscosity of a fluid by Poiseuille's method.**

Q1. What is viscosity?

A1. A property of fluids due to which they oppose relative motion between adjacent fluid layers.

Q2. What is the direction of viscous force?

A2. Tangential to the surface but opposite to the direction of relative motion.

Q3. What is coefficient of viscosity?

A3. It is a constant for fluid and is a measure of its viscosity property.

Q4. State Stoke's law.

A4. For a small spherical body of radius r falling down a liquid of coefficient of viscosity η , a viscous force acts whose magnitude is $F = 6\pi \eta r v$.

Q5. What is terminal velocity?

Ans. It is maximum constant velocity with which a small spherical body may fall freely through a fluid.

Q6. On what factors does terminal velocity depend?

Ans. Terminal velocity is directly proportional to the square of the radius of falling body and inversely proportional to the coefficient of viscosity of fluid.

Q7. Do air or gases also possess the property of viscosity?

Ans. Yes, but coefficient of viscosity of gases is less than liquid.

Q8. Which is more viscous, water or glycerine?

Ans. Glycerine.

Q9. What is coefficient of viscosity?

Ans. It is constant for fluid and it is a measure of its viscosity property.

Q10. How does the coefficient of viscosity of a liquid change with change in temperature?

Ans. Coefficient of viscosity of a liquid rapidly decreases with increase in its temperature.

Title of the practical: **To determine refractive index of the material**

of prism using graph.

Q1. What is refractive index ?

Ans. When a ray of light travels from one medium to the other medium then ratio of angle of incidence to the sine of angle of refraction is always constant and it is called refractive index of the second medium with respect to the first medium.

Q2.on what factors the refractive index depends?

Ans. (i) Nature of the pair of media.

(II) Colour of light.

(III) Physical state of the medium and

(IV) Temperature of the medium.

Q3. What is the use of i-delta graph?

A3. This graph is used to determine angle of minimum deviation.

Q4. How is the angle of minimum deviation depends upon the colour light?

A4. It is maximum for the violet and least for the red colour.

Q5. What is the path ray inside the prism in minimum deviation condition?

A5. Inside the prism the refracted ray is parallel to the base

Q6. Why are the good spherometer made of gun metal?

A6. To minimise wear and tear.

Q7.What is an angle of deviation?

A7:The angle between incident ray and emergent ray is called angle of deviation.

Q8.On what factors angle of deviation depends?

A8. It depends upon angle of incidence.

Q9.For which colour refractive index of the material of prism is less, red or violet?

A9 . Red.

Q10. What will happen to the refractive index if prism is cut into two equal parts?

A10. Remain same.

Q.11.Can you find refractive index of a transparent liquid by this method?

A11.Yes

Title of Practical: 1. To determine focal length of concave mirror & convex lens.

2. To determine focal length of combination of two lenses

Q1. What is lens and how many types of lenses do you know?

A1. Lens is a transparent medium which is surrounded by one spherical and other plane or both spherical surfaces.

Lenses are mainly of two types:

(i) convex

(ii) Concave.

Subdivided Convex lens: (i) Plano-convex (ii) Double –convex (iii) Concavo-convex.

Concave lens: (i) Plano-concave (ii) double-concave (iii) Convexo-Concave.

Q2. What is focal length of a lens?

A2. The distance between the optical centre of the lens and its focus is called focal length.

Q3. On what factors does the focal length of a lens depend?

A3. Focal length depends upon:

Radii of curvature of the surfaces.

(i) Refractive index of the medium of lens.

(ii) Colour of rays and

(iii) Media of surroundings.

Q4. What is meant by second focus of a lens?

A4. Light rays incident on lens, parallel to its principal axis, after refraction through the lens, pass through a point or appear to diverge from a point, this point is called the second focus.

Q5. What will be the focal length of lens of refractive index 1.5 in water?

A5. It will be 4 times of its focal length in air.

Q6. When do you get the virtual image by a convex lens?

A6. When the object is placed between the optical centre and focus.

Q7. If an object is placed at the focus of a lens where will its image form?

A7. It will form at infinity.

Q8. What is optical centre of lens?

A8. Optical centre of a lens is that point on its principal axis where from the ray passes through undeviated.

Q9. What is the difference between a convex and a Concave lens?

A9. A Convex lens is thick in its middle portion and goes on becoming thin towards its ends whereas a concave lens is thin in its middle portion and becomes thick towards its both ends.

Q10. Can you determine the focal length of concave lens by u-v or two pin methods?

A10. No, Because a concave lens always gives virtual image

Title of practical: To determine mechanical equivalent of heat by using Joules calorimeter

Q1.What is rate of cooling of body?

A1. Rate of cooling of a body means rate of loss heat by it.

Q2.Who gave the law of cooling?

A2.Newton.

Q3. State Newton's law of cooling.

A3. The rate of loss of heat by a hot body is directly proportional to the temperature difference between the hot body and the surroundings. provided that the temperature difference is small.

Q4.What do you mean by small temperature difference?

A4.the temperature between the hot body and surroundings must be less than 40 degree Centigrade

Q5.In your experiment why do you make the outer surface of calorimeter to be dull black?

A5.So that it becomes a good radiator of heat.

Q6.Why do you fill water in double walled enclosure?

A6.As specific heat capacity of water is very high. Its temperature practically remains constant in spite of the fact that is receiving heat emitted by calorimeter.

Q7.Why do you stir the hot water continuously?

A7.So that temperature of water remains uniform through out.

Q8.What is the limitation of Newton's law of cooling?

A8.It is true only when temperature difference between the hot body and the surroundings is small .for large temperature difference the law fails.

Q9.What is radiation?

A9. Emission of thermal by any hot body, which can travel even through vacuum with a speed of 3×10^8 meter per second.

Q10.What is method of loss of heat for a body?

A10 A hot body may lose heat by conduction, convection or radiation.

Title of practical: To plot magnetic lines of force in N-N and N-S condition

Q1. Can two magnetic lines of force intersect each other? why?

A1 No, two lines of force never intersect each other. If they intersect each other, then at the point of intersection, two tangents can be drawn and thus we have two directions of magnetic field at that point, which is impossible.

Q2. What is neutral point?

A2 The points where net magnetic field due to the bar magnet and horizontal component of earth's magnetic field is zero are called neutral points.

Q3. Why is the compass needle tapped gently at the neutral point?

A3. Because, near the neutral point the field acting on the needle is very weak and not be able to overcome the force due to friction at point of suspension.

Q4.What are the pole of a magnet?

A4 Poles of a magnet are the points where the magnetic property is maximum.

Q5.What is the position of neutral points when North Pole of the magnet points toward geographic north or south?

A5. In this case, the neutral points are obtained on the equatorial line or broadside-on position of the magnet for north.

In this case, the neutral points are obtained on the axial line or end side-on position of the magnet for north.

Q6. What is magnetism?

A6. The Phenomenon of magnet attracting small piece of iron is known as magnetism.

Q7.What are the poles of a magnet?

A7. The poles are magnets are the points where the magnetic property is maximum.

Ans. A magnetic field that is constant both in magnitude and direction at every point is called uniform magnetic field.

Q.9.Why do we say that magnetic lines force are closed loops?

Ans. Because they start from N-pole of the magnet and enter at S-pole outside the magnet. where they move from S-pole to N-pole inside the magnet.

Q.10.Can you have an isolated single pole?

Ans. No, poles of a magnet always occur in pairs