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Department of Physics
Physics Lab Viva Voce Questions and its answers
<u>Laser Parameters</u>

1. What is semi conductor diode laser?

Semiconductor diode laser is a specially fabricated pn junction diode. It emits laser light when it is forward biased.

2. What is LASER?

The term LASER stands for Light Amplification by Stimulated Emission of Radiation. It is a device which produces a powerful, monochromatic collimated beam of light in which the waves are coherent.

3. What are the characteristic of laser radiation?

Laser radiations have high intensity, high coherence, high monochoromation and high directionality with less divergence.

4. Define numerical aperture.

Numerical aperture is defined as the light gathering capability of an optical fiber. It is the sine of the acceptance angle.

$NA = sine\phi_a$

5. What is the principle used in fiber optic communication system?

The principle behind the transmission of light waves in an optical fiber is total internal reflection.

<u>AIR WEDGE</u>

1.What is meant by interference of light?

When the two waves superimpose over each other, resultant intensity is modified. The modification in the distribution of intensity in the region of superposition is called interference.

2.Is there is any energy loss in interference phenomenon?

No, there is only redistribution of energy ie, energy from dark places is shifted to bright places

3.What are interference fringes?

They are alternately bright and dark patches of light obtained in the region of superposition of two wave trains of light.

4.What is the shape of fringes in wedge shaped film?
The fringes in wedge-shaped film are straight line fringes.

5.What type of source is required in division of amplitude?
In division of amplitude a broad source is required so that the whole firm may be viewed together.

ULTRASONIC INTERFEROMETER

1.What are ultrasonics?
The sound waves having frequiencies above the audible range. Ie, frequencies above $20,000H_z$ to $20KH_z$ are known as ultrasonics.

2.What is piezo – electric effect?
When mechanical pressure is applied to one pair of opposite faces of a quartz crystal, then the other pair of opposite faces develop equal and opposite electrical charges on the crystal

3.What is inverse piezo- electric effect?
The piezo electric effect is reversible. If an electric field is applied to one pair of opposite faces of quartz crystal, alternative mechanical expansion or contraction(pressure) is produced across the other pair of opposite faces of the crystal

SPECTROMETER GRATING

1.what is plane transmission diffraction grating?
A plane transmission diffraction grating is an optically plane parallel glass plate on which equidistant, extremely close grooves are made by ruling with a diamond point.

2. In our experiment. What class of diffraction does occur and how?
Fraunhofer class of diffraction occurs. Since the spectrometer is focused for parallel rays, the source and the image are effectively at infinite distances from the grating.

3. How are the commercial gratings are made?
A commercial gratings is made by pouring properly diluted cellulose acetate on the actual grating and drying it to a thin strong film. The film is detached from the original grating and is mounted between two glass plates. A commercial grating is called replica grating. In our experiment we use plane type replica grating.

LEE'S DISC

1.What is thermal conductivity?
It is defined as the quantity of heat conducted per second normally across unit area of cross section of the material per unit temperature difference. It denotes the heat heat conducting power. Its unit is Watt meter^{-1} kelvin^{-1}

2.Does the value of thermal conductivity depend on the dimension of the specimen?
No, it depends only on the material of the specimen.

3.Can this method be used for good conductors?
No, in that case, due to large conduction of heat, the temperature recorded by T1 and T2 will be very nearly the same

4.Is there any reason totake the specimen in the form of a disc?
A thin disc is taken because its area of cross section is large, while thickness is small. It increases the quantity of heat conducted across its faces.

TORSIONAL PENDULUM

1.What is torsional pendulum?
A body suspended from a rigid support by means of a long and thin elastic wire is called torsional pendulum.

2.What is the type of oscillation?
This is of simple harmonic oscillation type.

3.On what factors does the time period?
It depends upon I) moment of inertia of the body II) rigidity of wire i.e., length, radius and material of the wire.

4.How will you determine the rigidity of fluids?
As fluids do not have a shape of their own, hence they do not posses rigidity. Hence there is no question of determining.

YOUNGS MODULUS NON-UNIFORM BENDING

1.what is young's modulus?
Young's modulus is defined as the ratio of longitudinal stress to longitudinal strain.

2. What is a beam?

When the lengths of the rod of uniform cross section is very large compared to its breadth such that the shearing stress over any section of the rod can be neglected, the rod is called beam.

3. How are longitudinal strain and stress produced in your experiment?
Due to depression, the upper or the concave side of the beam becomes smaller than the lower or the convex side of the beam. As a result, longitudinal strain is produced. The change in wave lengthof the beam. These forces will give rise to longitudinal stress.

4.Which dimension- breath, thickness or length of the bar-should be measured very careful and why?
The thickness of the bar should be measured very carefully since its magnitude is small and it occurs in the expression 'E' in the power of three. An inaccuracy in the measurement of the thickness will produce the greatest proportional error in 'E'.

5.Why do you place the beam symmetrically on the knife edges?
To keep the reaction at the knife edges equal in conformity with the theory.

POISEUILLE'S METHOD-VISCOSITY OF A LIQUID

1. What is viscosity and define the coeffient of viscosity?
In the presence of a relative motion to between two layers of a liquid, an opposing tangential forces sets in between the layers to destroy the relative motion. This property of the liquid is termed viscosity and is analogues to friction. The tangential force acting per unit area over two adjacent layers of the liquid for a unit velocity gradient if referred to as the coefficient of viscosity.

2. How does the coefficient of viscosity changes with temperature?
The coefficient of viscosity decreases with rise in temperature in the case of liquids, but for gases it increases with rise in temperature.

3. Can you use this method for all types of liquids?
No this method can be suitably applied for liquids of low viscosity. For highly viscous liquids, stokes's method can be used.

DISPERSIVE POWER OF A PRISM

1.What is spectrometer?
It is an instrument used for analyzing the spectrum of a source of light.

2.Define refractive index.
The ratio of the sine of the angle of incidence to the sine of angle of refraction is constant for any two media is called refractive index.

3.Define dispersive power of a prism.
Dispersive power of a prism indicates the ability of the material of the prism to disperse the light rays. It is defined as the angular dispersion to the deviation of the mean ray.

4.How does refractive index change with wave length?
Higher the wave length, smaller is the refractive index.

5.Does the deviation depend on the angle of prism?
Yes, greater the angle of the prism, more is the deviation.