SHIKSHA CLASSES

Subject : Physics | **Question Paper** | **Total Marks :25**
Class : XI | **6 : Mechanical Properties of Solids** | **Time : 1 Hour**

SECTION - A

Q.1 : Choose the correct option : 4

i) If the cylinder is stretched by two equal forces applied normal to its area, in this case the stress is called as

a) Longitudinal stress b) Tensile stress
c) Compressive stress d) None

ii) The deformation caused in a object due to plasticity is called as

a) Elastic deformation b) Plastic deformation
c) Both a and b d) None

iii) For small deformation, stress is proportional to strain is called as

a) Newton's law b) Elastic law
c) Hooke's law d) None

iv) The ratio of stress and strain is called as

a) Young's modulus b) Modulus of elasticity c) Elastic constant
d) None

Q.2 : Answer the following : 2

i) What is deformation?

ii) Define plasticity.

SECTION B

: Answer the following : (ANY 3) 6

Q.3 : Define stress and strain. What are their different types?

Q.4 : State and explain Hooke's law.

Q.5 : Derive expression for Poisson's ratio.

Q.6 : A brass wire of radius 1 mm is loaded by a mass of 31.4 kg. What would be the decrease in its radius?

($Y = 9 \times 10^{10}$ N/m^2, Poisson's ratio $\sigma = 0.36$)

Q.7 : Explain the terms : i) Ductile
ii) Malleable

SECTION C

: Answer the following : (ANY 3) 9

Q.8 : State the laws if static friction.

Q.9 : A steel wire having cross sectional area 1.2 mm2 is stretched by a force of 120 N. If a lateral strain of 1.455×10^{-4} is produced in the wire, calculate the Poisson's ratio.

(Given $Y_{steel} = 2 \times 10^{11}$ N/m^2)

Q.10 : What is Young's modulus? Describe an experiment to find out Young's modulus of material in the form of a long string wire.

Q.11 : State and explain longitudinal stress. (Tensile stress and compressive stress)

Q.12 : A wire gets stretched by 4 mm due to a certain load. Id the same load is applied to a wire of same material with half the length and double the diameter of the first wire, what will be the change in its length?

SECTION D

: Answer the following : (ANY 1) 4

Q.13 : Derive an expression for strain energy per unit volume of the material of a wire.

Q.14 : Explain the following terms :

i) Hardness ii) Toughness
iii) Cohesive force iv) Adhesive force

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