TEST

Practice Test-1 (Topic 13 Deformation in Solids)

10 Questions

10 min

Topics

Mechanical Properties of Solids, Deformation in solids, stress and strain (Hook's Law), Elastic Constants

Start Test

09 : 57

Q 1/10 10 min Hint

Q : When a force is applied on a wire of length '*l*' which results in an increase in length then the stress is known as

A tensile stress

B tensile deformation

C shear stress

D volumetric stress

09 : 56

Q 2/10 10 min Hint

Q : To double the length of an iron wire having 0.5 cm^2 area of cross-section, the required force will be ($Y = 10^{12}$ dyne/cm^2)

A $1.0\times10^{-7}N$

B $1.0\times10^{7}N$

C $0.5\times10^{-7}N$

D 0.5×10^{12}dyne

1 2 3 4 5 6 7

09 : 54

Q 3/10 10 min Hint

Q : Which of given has only Young's modulus

A Bone

B Concrete

C Ice

D Steel

09 : 53

Q 4/10 10 min Hint

Q : A force F is needed to break a copper wire having radius R. The force needed to break a copper wire of same length and radius 2R will be

A F/2

B 2F

C 4F

D F/4

09 : 52

Q 5/10 10 min Hint

Q : A and B are two wires. The radius of A is twice that of B. They are stretched by the same load. Then, the stress on B is

A Equal to that on A

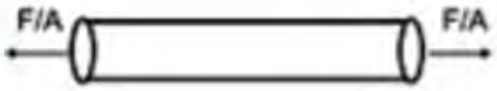
B Four times that on A

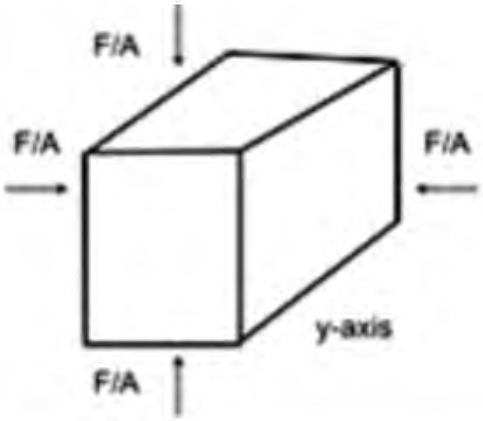
C Two times that on A

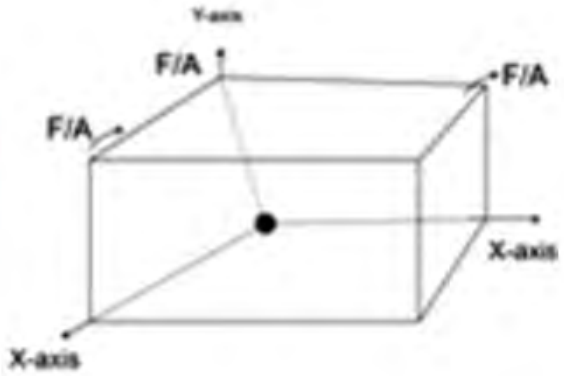
D Half that on A

09 : 48

Q : Which of the following stress is known as shear stress?

A 

B 

C 

D None

09 : 46

Q 7/10 10 min Hint

Q : Which of the following substances possesses the highest elasticity?

A rubber

B glass

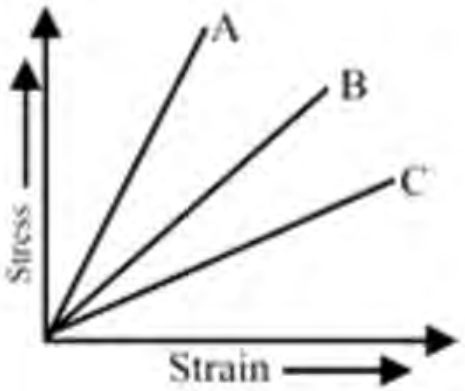
C copper

D steel

1 2 3 4 5 6 7

09 : 34

Q : The strain-stress curves of three wires of different materials are shown in the figure. A, B and C are the elastic limits of the wires. The figure shows that



A elastic modulus of wire B is maximum

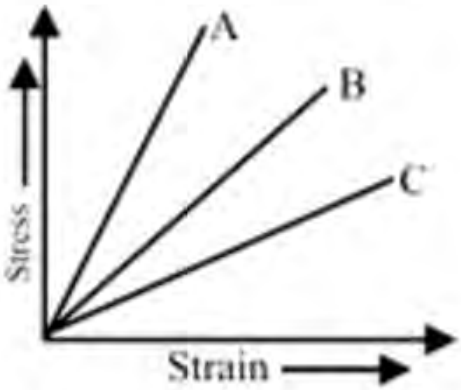
B tensile strength of C is maximum

C elastic modulus of wire A is maximum

D elastic modulus of wire A is

09 : 33

of different materials are shown in the figure. A, B and C are the elastic limits of the wires. The figure shows that



A elastic modulus of wire B is maximum

B tensile strength of C is maximum

C elastic modulus of wire A is maximum

D elastic modulus of wire A is minimum

09 : 27

Q 9/10 10 min Hint

Q : Any alteration produced in shapes, length or volume when a body is subjected to some external force is called

A stiffness

B toughness

C extension

D deformation

09 : 26

Q 10/10 10 min Hint

Q : If a wire is stretched to four times of its length then the strain will be

A zero

B 3

C ½

D double

4 5 6 7 8 9 10

Q : When a force is applied on a wire of length '*l*' which results in an increase in length then the stress is known as

A tensile stress

B tensile deformation

C shear stress

D volumetric stress

Explanation

Definition of tensile stress

Q : To double the length of an iron wire having 0.5 cm^2 area of cross-section, the required force will be ($Y = 10^{12}$ dyne/cm^2)

A $1.0\times10^{-7}N$

B $1.0\times10^{7}N$

C $0.5\times10^{-7}N$

D 0.5×10^{12}dyne

Explanation

$$Y = \frac{\frac{F}{A}}{\frac{\Delta \ell}{\ell}}$$

required force will be (Y = 10 dyne/cm²)

A 1.0×10^{-7}N

B 1.0×10^{7}N

C 0.5×10^{-7}N

D 0.5×10^{12}dyne

Explanation

$$Y = \frac{\frac{F}{A}}{\frac{\Delta\ell}{\ell}}$$

$\Delta\ell = \ell$, $F = AY$ or $F = 0.5 \times 10^{12}$dyne

Correct

Unattempted

Incorrect

Q 3/10

Q : Which of given has only Young's modulus

A Bone

B Concrete

C Ice

D Steel

Q : A force F is needed to break a copper wire having radius R. The force needed to break a copper wire of same length and radius 2R will be

A F/2

B 2F

C 4F

D F/4

Explanation

Breaking force $\propto$ cross-sectional area.
Area is quadrupled

Q : A and B are two wires. The radius of A is twice that of B. They are stretched by the same load. Then, the stress on B is

A Equal to that on A

B Four times that on A

C Two times that on A

D Half that on A

Explanation

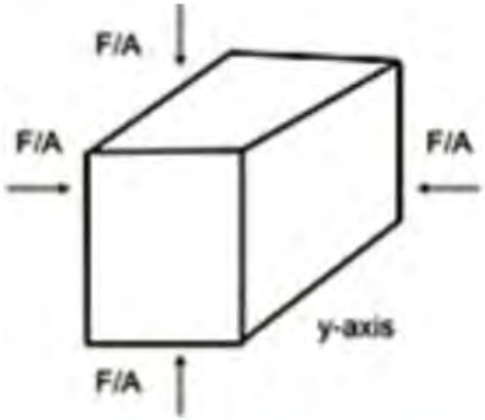
$$\frac{\text{Stress on B}}{\text{Strain on A}} = \frac{rA^2}{rB^2} = \frac{(2r_B)^2}{r_B{}^2} = 4$$

Stress on B = 4 × Stress on A

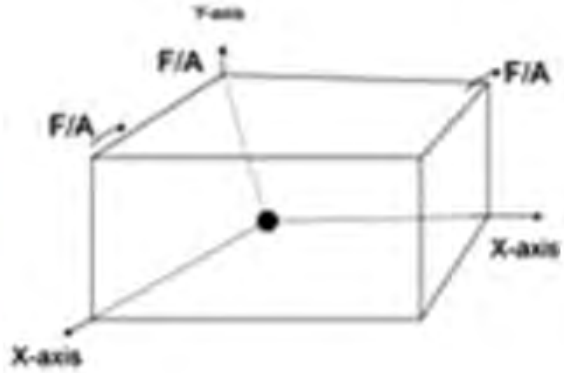
Q : Which of the following stress is known as shear stress?

A

B

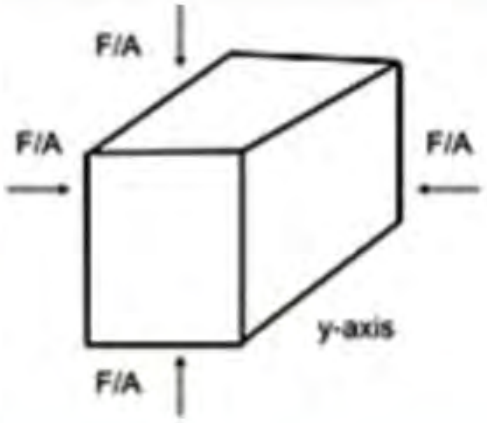


C

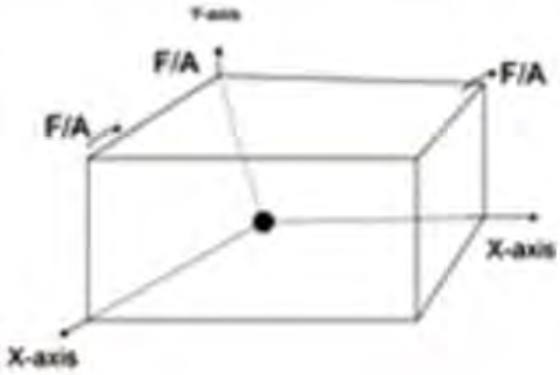


D None

B



C



D None

Explanation

In option c shape is changing due to shear stress

Incorrect

Q 7/10

Q : Which of the following substances possesses the highest elasticity?

A rubber

B glass

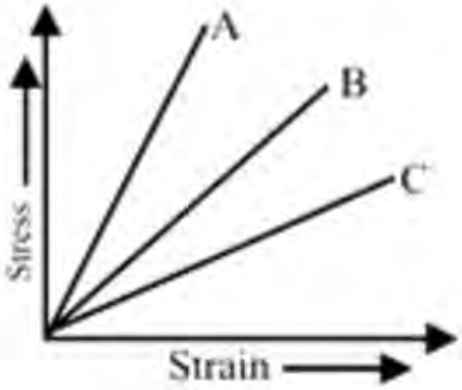
C copper

D steel

Explanation

Young modulus of steel is high.

Q : The strain-stress curves of three wires of different materials are shown in the figure. A, B and C are the elastic limits of the wires. The figure shows that



A elastic modulus of wire B is maximum

B tensile strength of C is maximum

C elastic modulus of wire A is maximum

D elastic modulus of wire A is minimum

A elastic modulus of wire B is maximum

B tensile strength of C is maximum

C elastic modulus of wire A is maximum

D elastic modulus of wire A is minimum

Explanation

As strain is shown on x-axis and stress on y-axis so we can say that

$Y = \frac{\text{stress}}{\text{strain}} = \text{slope}$ so elastic modulus of wire A is maximum.

Q : Any alteration produced in shapes, length or volume when a body is subjected to some external force is called

A stiffness

B toughness

C extension

D deformation

Explanation

$\Delta\ell$, Δa and $\Delta V \Rightarrow$ Deformation

Q : If a wire is stretched to four times of its length then the strain will be

A zero

B 3

C ½

D double

Explanation

$$[\varepsilon] = \frac{\Delta \ell}{\ell} = \frac{4\ell - \ell}{\ell}$$

$$= \frac{3\ell}{\ell} = 3$$

TEST

Practice Test-2 (Topic 13 Deformation in Solids)

10 Questions

10 min

Topics

Elastic limits & yield strength, Strain energy in deformed materials, Energy band theory

Start Test

09 : 57

Q 1/10 10 min Hint

Q : Those substances which have valence electrons tightly bound to their atoms are called

A conductors

B insulators

C super conductors

D semi-conductors

1 2 3 4 5 6 7

09 : 55

Q 2/10 10 min Hint

Q : The energy of valence band is smaller than the energy of conduction band by an amount of order of 1eV. The material could be:

A Conductor

B Semi-conductor

C Insulator

D All of these

09 : 54

Q 3/10 10 min Hint

Q : The product of stress and strain equal

A 2 × energy density

B 2 × work done

C 2 × strain energy

D 2 × elastic energy

09 : 53

Q 4/10 10 min Hint

Q : A wire of length L is stretched by a length ℓ when a force F is applied at one end. If the elastic limit is not exceeded, the amount of energy stored in the wire is

A $F\ell$

B $\frac{1}{2}(F\ell)$

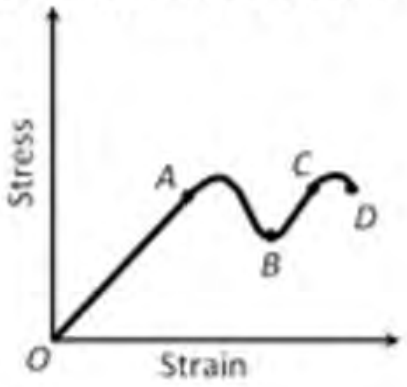
C $F\ell^2/L$

D $\frac{1}{2}Fl^2$

09 : 51

Q 5/10 10 min Hint

Q : A graph is shown between stress and strain for a metal. The part in which Hooke's law holds good is



A AB

B BC

C OA

D CD

1 2 3 4 5 6 7

09 : 50

Q 6/10 10 min Hint

Q : The energy stored per unit volume of a strained wire is (Y is the Young's modulus of the material of the wire)

A $\frac{1}{2} \times \text{load} \times \text{extension}$

B $\frac{1}{2} Y \times (\text{strain})^2$

C $\frac{1}{2} \times Y \times \frac{Y}{(\text{Strain})^2}$

D stress × strain

09 : 49

Q 7/10 10 min Hint

Q : A certain force increases the length of a wire by 1 mm. The force required to increase its length by 2 mm is

A 2F

B 8F

C 4F

D 16F

09 : 48

Q 8/10 10 min Hint

Q : The maximum stress which a body can bear is called

A yield stress

B elastic limit

C plasticity

D UTS

09 : 47

Q 9/10 10 min Hint

Q : If the stress is increased beyond the yield stress and the specimen does not recover its original shape, this kind of behavior is called

A proportional limit

B elastic limit

C plasticity

D UTS

09 : 45

Q 10/10 10 min Hint

Q : The example of brittle substances is

A lead

B glass

C high carbon steel

D both b and c

4 5 6 7 8 9 10

Q : Those substances which have valence electrons tightly bound to their atoms are called

A conductors

B insulators

C super conductors

D semi-conductors

Explanation

Definition of insulators

Q : The energy of valence band is smaller than the energy of conduction band by an amount of order of 1eV. The material could be:

A Conductor

B Semi-conductor

C Insulator

D All of these

Explanation

Book information

Incorrect

Q 3/10

Q : The product of stress and strain equal

A 2 × energy density

B 2 × work done

C 2 × strain energy

D 2 × elastic energy

Explanation

Energy Density = 1/2 stress x strain
2 x Energy Density = stress x strain

length ℓ when a force F is applied at one end. If the elastic limit is not exceeded, the amount of energy stored in the wire is

A $F\ell$

B $\frac{1}{2}(F\ell)$

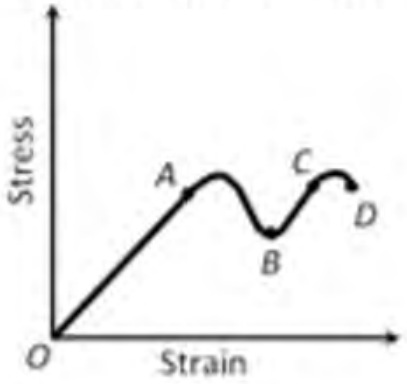
C $F\ell^2/L$

D $\frac{1}{2}Fl^2$

Explanation

$$W = \frac{1}{2}F\ell$$

Q : A graph is shown between stress and strain for a metal. The part in which Hooke's law holds good is



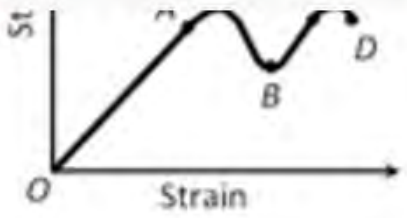
A AB

B BC

C OA

D CD

Explanation



A AB

B BC

C OA

D CD

Explanation

In the region OA, stress μ strain i.e. Hooke's law hold good.

Q : The energy stored per unit volume of a strained wire is (Y is the Young's modulus of the material of the wire)

A $\frac{1}{2} \times \text{load} \times \text{extension}$

B $\frac{1}{2} Y \times (\text{strain})^2$

C $\frac{1}{2} \times Y \times \frac{Y}{(\text{Strain})^2}$

D stress × strain

Explanation

A $\frac{1}{2} \times \text{load} \times \text{extension}$

B $\frac{1}{2} Y \times (\text{strain})^2$

C $\frac{1}{2} \times Y \times \frac{Y}{(\text{Strain})^2}$

D stress × strain

Explanation

$$\frac{E}{V} = \frac{1}{2} \text{Stress} \times \text{Strain}$$

$$\frac{E}{V} = \frac{1}{2} Y \times (\text{Strain})^2$$

Q : A certain force increases the length of a wire by 1 mm. The force required to increase its length by 2 mm is

A 2F

B 8F

C 4F

D 16F

Explanation

Force ∝ extension

If force double then extension also double

Incorrect

Q 8/10

Q : The maximum stress which a body can bear is called

A yield stress

B elastic limit

C plasticity

D UTS

Explanation

Definition.

Q : If the stress is increased beyond the yield stress and the specimen does not recover its original shape, this kind of behavior is called

A proportional limit

B elastic limit

C plasticity

D UTS

Explanation

Definition.

Incorrect

Q 10/10

Q : The example of brittle substances is

A lead

B glass

C high carbon steel

D both b and c

Explanation

Property of material.

TEST

Test Level-1 (Topic 13 Deformation in Solids)

20 Questions

15 min

Topics

Mechanical Properties of Solids, Deformation in solids, stress and strain (Hook's Law), Elastic Constants, Elastic limits & yield strength, Strain energy in deformed materials

Start Test

14 : 58

Q 1/20 15 min Hint

Q : The ratio of diameters of two wires of same material is n : 1. The length of each wire is 4 m. On applying the same load, the increase in length of thin wire will be (n > 1)

A n^2 times

B n times

C 2n times

D (2n + 1) times

14 : 57

Q 2/20 15 min Hint

Q : If the work done in stretching a wire by 1mm is 2 J, the work necessary for stretching another wire of the same material but double the radius and half the length by 1 mm is

A 16 J

B 4 J

C 8 J

D (1/4) J

1 2 3 4 5 6 7

14 : 56

Q 3/20 15 min Hint

Q : The amount of work done in deformed stretched wire is given by

A $\frac{1}{2}[\frac{FA \times l^2}{\Delta L}]$

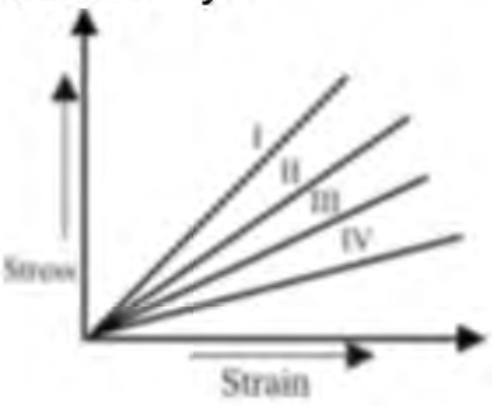
B $\frac{1}{2}[\frac{E \times l^2}{AL}]$

C $\frac{1}{2}[\frac{EA \times l}{L}]$

D $\frac{1}{2}[\frac{EA \times l^2}{L}]$

14 : 54

Q : Stress-strain curves of different substances are shown in the figure. Which of them is having highest modulus of elasticity?



A III

B II

C IV

D I

14 : 53

Q 5/20 15 min Hint

Q : The area method to find energy stored in deformed material is valid for

A Elastic region

B Non-elastic region

C Both a & b

D Elastic for small force

1 2 3 4 5 6 7

14 : 52

Q 6/20 15 min Hint

Q : Which statement is correct:

A elasticity is that property of body which enables the body to regain its original dimension

B elasticity is that property of body that does not allow the body to return to its original shape

C elasticity is that property of body which enables the body to regain its original dimension and original shape after the stress is removed

D elasticity is that property which obeys Hook's law

14 : 50

Q 7/20 15 min Hint

Q : The strain energy can be obtained by considering area under

A force – energy graph

B stress – strain graph

C force-stress graph

D force-extension graph

14 : 49

Q 8/20 15 min Hint

Q : Two wires of the same material and same length but diameters in the ratio 1:2 are stretched by forces F_1 and F_2 respectively, to produce equal elongations. The ratio F_1/F_2 is

A 1/4

B 1/2

C 4

D 2

14 : 48

Q 9/20 15 min Hint

Q : Two wires of same material and cross sectional area have length is the ratio 1:2, if they are stretched by same force, the ratio of tensions in them will be

A 1 : 2

B 2 : 1

C 1 : 4

D 1 : 1

14 : 45

Q 10/20 15 min Hint

Q : If the force constant of a wire is K, the work done in increasing the length of the wire by L is

A $KL^2/2$

B KL

C KL/2

D KL^2

14 : 44

Q 11/20 15 min Hint

Q : Two identical wires of substances A and B are taken. Equal stretching forces are applied on them along the length. It is observed that elongation of A is more than of B. Then

A A is more elastic than B

B B is more elastic than A

C A and B are equally elastic

D A is elastic and B is plastic

14 : 43

Q 12/20 15 min Hint

Q : If the tension on a wire is removed at once, then

A it will break

B its temperature increases

C its temperature will reduce

D there will be no change in its temperature

14 : 42

Q 13/20 15 min Hint

Q : When strain is produced in a body within elastic limit, its internal energy:

A

B

C

D

14 : 41

Q 13/20 15 min Hint

Q : When strain is produced in a body within elastic limit, its internal energy:

A remain same

B decreases

C Increases

D none of these

14 : 40

Q 14/20 15 min Hint

Q : A cube of each of length 3m is subjected to a normal force of 36N. The stress on a cube is

A $12\ Nm^{-2}$

B $4\ Nm^{-2}$

C $2\ Nm^{-2}$

D $8\ Nm^{-2}$

14 : 38

Q 15/20 15 min Hint

Q : Modulus of elasticity for a liquid is

A Young's modulus

B Shear modulus

C bulk modulus

D All of these

14 : 37

Q 16/20 15 min Hint

Q : The change in the shape of a regular body is due to

A Bulk strain

B Shearing strain

C Longitudinal strain

D Metallic strain

14 : 36

Q 17/20 15 min Hint

Q : The breaking stress of a wire depends upon

A length of wire

B shape of cross-section

C material of wire

D none of these

14 : 34

Q 18/20 15 min Hint

Q : When the stress changes the shape it is called

A strain

B stress

C tensile stress

D shear stress

14 : 33

Q 19/20 15 min Hint

Q : The substances undergoing plastic deformation until they break are known as

A brittle substances

B ductile substances

C elastic substances

D plastic substances

14 : 31

Q 20/20 15 min Hint

Q : The value of Young's Modulus for water

A $80 \times 10^9 \ Nm^{-2}$

B zero

C $70 \times 10^9 \ Nm^{-2}$

D $2.2 \times 10^9 \ Nm^{-2}$

Q : The ratio of diameters of two wires of same material is n : 1. The length of each wire is 4 m. On applying the same load, the increase in length of thin wire will be (n > 1)

A n^2 times

B n times

C 2n times

D (2n + 1) times

Explanation

$\frac{F}{}$

A n^2 times

B n times

C 2n times

D (2n + 1) times

Explanation

$$Y = \frac{\frac{F}{A}}{\frac{\Delta \ell}{\ell}} = \frac{F\ell}{A\,\Delta\ell}$$

$$\text{or } Y = \frac{F\ell \times 4}{\pi D^2 \times \Delta\ell} \text{ or } \Delta\ell \propto \frac{1}{D^2} \text{ or } \frac{\Delta\ell_2}{\Delta\ell_1} =$$

Q : If the work done in stretching a wire by 1mm is 2 J, the work necessary for stretching another wire of the same material but double the radius and half the length by 1 mm is

A 16 J

B 4 J

C 8 J

D (1/4) J

Explanation

$$W = \frac{1}{2}\left[\frac{EA \times \Delta\ell^2}{\ell}\right],$$

B 4 J

C 8 J

D (1/4) J

Explanation

$$W = \frac{1}{2}\left[\frac{EA \times \Delta\ell^2}{\ell}\right],$$ Same material

$\Rightarrow E_1 = E_2$

same material $\Rightarrow \Delta\ell_1 = \Delta\ell_2$

$$W \propto \frac{A}{\ell} \Rightarrow \frac{W_1}{W_2} = \frac{A_1\ell_2}{A_2\ell_1} \Rightarrow W_2 = \frac{W_1 A_2 \ell_1}{A_1 \ell_2} =$$

Q : The amount of work done in deformed stretched wire is given by

A $\frac{1}{2}[\frac{FA \times l^2}{\Delta L}]$

B $\frac{1}{2}[\frac{E \times l^2}{AL}]$

C $\frac{1}{2}[\frac{EA \times l}{L}]$

D $\frac{1}{2}[\frac{EA \times l^2}{L}]$

Explanation

1 $FA \times l^2$

stretched wire is given by

A $\frac{1}{2}[\frac{FA \times l^2}{\Delta L}]$

B $\frac{1}{2}[\frac{E \times l^2}{AL}]$

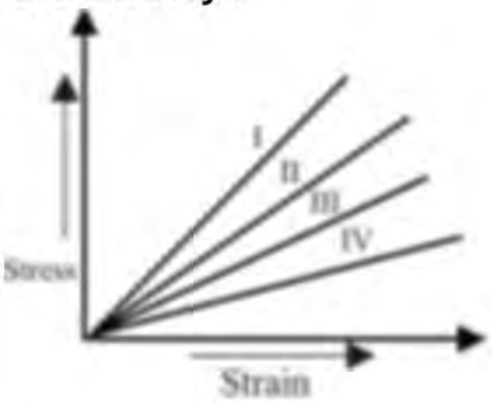
C $\frac{1}{2}[\frac{EA \times l}{L}]$

D $\frac{1}{2}[\frac{EA \times l^2}{L}]$

Explanation

work = $\frac{1}{2}[\frac{EA \times l^2}{L}]$

Q : Stress-strain curves of different substances are shown in the figure. Which of them is having highest modulus of elasticity?

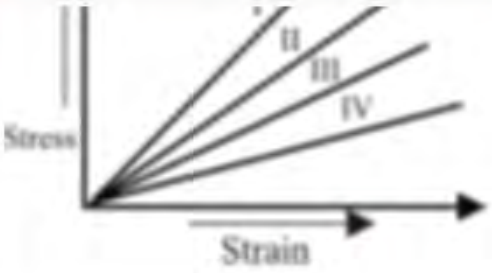


A III

B II

C IV

D I



A III

B II

C IV

D I

Explanation

Stress $\propto$ stran is hook's law.

Q : The area method to find energy stored in deformed material is valid for

A Elastic region

B Non-elastic region

C Both a & b

D Elastic for small force

Explanation

The area method to find energy stored in deformed material is valid for liner (Elastic) and non linear (Non elastic) region.

A elasticity is that property of body which enables the body to regain its original dimension

B elasticity is that property of body that does not allow the body to return to its original shape

C elasticity is that property of body which enables the body to regain its original dimension and original shape after the stress is removed

D elasticity is that property which obeys Hook's law

Explanation

Definition of Elasticity.

Q : The strain energy can be obtained by considering area under

A force – energy graph

B stress – strain graph

C force-stress graph

D force-extension graph

Explanation

Graph is between force and extension
F-x graph.

Q : Two wires of the same material and same length but diameters in the ratio 1:2 are stretched by forces F_1 and F_2 respectively, to produce equal elongations. The ratio F_1/F_2 is

A 1/4

B 1/2

C 4

D 2

Explanation

$$Y = \frac{F/A}{}$$

Explanation

$$Y = \frac{F/A}{\Delta \ell / \ell}$$

$$F = Y \times A \times \frac{\Delta \ell}{\ell}$$

Given $Y_1 = Y_2$, $\ell_1 = \ell_2$, $\Delta \ell_1 = \Delta \ell_2$

$$\frac{F_1}{F_2} = \frac{\pi r_1^2}{\pi r_2^2}$$

$$\frac{F_1}{F_2} = \frac{\left(\frac{d_1}{2}\right)^2}{\left(\frac{d_2}{2}\right)^2}$$

$$\frac{F_1}{F_2} = \left(\frac{d_1}{d_2}\right)^2$$

$$\frac{F_1}{F_2} = \left(\frac{1}{2}\right)^2$$

$$F_1 : F_2 = 1:4$$

Q : Two wires of same material and cross sectional area have length is the ratio 1:2, if they are stretched by same force, the ratio of tensions in them will be

A 1 : 2

B 2 : 1

C 1 : 4

D 1 : 1

Explanation

$$\frac{Y_1}{Y_2} = \frac{F_1}{F_2} \times \frac{\ell_1}{\ell_2} \times \frac{A_2}{A_1} \times \frac{\Delta\ell_2}{\Delta\ell_1}$$ Forces are sa

A 1 : 2

B 2 : 1

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$$\boxed{\frac{1}{1} = \frac{T_1}{T_2}}$$

Q : If the force constant of a wire is K, the work done in increasing the length of the wire by L is

A $KL^2/2$

B KL

C KL/2

D KL^2

Explanation

$K = \frac{F}{l}$ and $W = \frac{1}{2}Fl = \frac{1}{2}Kl \times l = \frac{1}{2}Kl^2$

Q : Two identical wires of substances A and B are taken. Equal stretching forces are applied on them along the length. It is observed that elongation of A is more than of B. Then

A A is more elastic than B

B B is more elastic than A

C A and B are equally elastic

D A is elastic and B is plastic

Explanation

$$\text{Elasticity} \propto \frac{1}{\text{Elongation}}$$

Q : If the tension on a wire is removed at once, then

A it will break

B its temperature increases

C its temperature will reduce

D there will be no change in its temperature

Explanation

Due to tension, intermolecular distance between atoms is increased and therefore potential energy of the wire is increased and with the removal of force interatomic distance is reduced and so

Q : When strain is produced in a body within elastic limit, its internal energy:

A remain same

B decreases

C Increases

D none of these

Explanation

Due to increase in intermolecular distance.

Q : A cube of each of length 3m is subjected to a normal force of 36N. The stress on a cube is

A $12\ Nm^{-2}$

B $4\ Nm^{-2}$

C $2\ Nm^{-2}$

D $8\ Nm^{-2}$

Explanation

$$\sigma = \frac{F}{A} \Rightarrow \sigma = \frac{F}{\ell \times \ell} \Rightarrow \sigma = \frac{36}{3 \times 3} \Rightarrow \sigma = 4\,N$$

Incorrect

Q 15/20

Q : Modulus of elasticity for a liquid is

A Young's modulus

B Shear modulus

C bulk modulus

D All of these

Explanation

Liquids only have Bulk Modulus

Q : The change in the shape of a regular body is due to

A Bulk strain

B Shearing strain

C Longitudinal strain

D Metallic strain

Explanation

Shearing strain causes change in shape of regular body.

Q : The breaking stress of a wire depends upon

A length of wire

B shape of cross-section

C material of wire

D none of these

Explanation

Breaking stress is different for different materials.

Incorrect

Q 18/20

Q : When the stress changes the shape it is called

A strain

B stress

C tensile stress

D shear stress

Explanation

Definition.

Incorrect

Q 19/20

Q : The substances undergoing plastic deformation until they break are known as

A brittle substances

B ductile substances

C elastic substances

D plastic substances

Explanation

Definition.

Incorrect

Q 20/20

Q : The value of Young's Modulus for water

A $80 \times 10^9 \text{ Nm}^{-2}$

B zero

C $70 \times 10^9 \text{ Nm}^{-2}$

D $2.2 \times 10^9 \text{ Nm}^{-2}$

Explanation

There is no length for water.

TEST

Test Level-2 (Topic 13 Deformation in Solids)

30 Questions

25 min

Topics

Physics of Solids

Start Test

24 : 59

Q 1/30 25 min Hint

Q : Which of the following is correct?

A Hook's law is applicable only within elastic limit

B The adiabatic and isothermal elastic constant of gas are equal

C Young modulus is dimensionless

D Stress multiplied by strain is equal to the stored energy

1 2 3 4 5 6 7

24 : 57

Q 2/30 25 min Hint

Q : The substance which break just after elastic limit is reached are called

A poor substances

B ductile substances

C Brittle substances

D Soft substances

24 : 56

Q 3/30 25 min Hint

Q : A wire can sustain a weight of 2.5 kg before breaking. If the wire is cut into two equal parts, then each part can sustain a weight

A 2.5 kg

B 10 kg

C 25 kg

D 100 kg

24 : 55

Q 4/30 25 min Hint

Q : A solid having regular arrangement of molecules throughout its structure is called

A polymeric solids

B glassy solids

C Amorphous solids

D crystalline solids

24 : 54

Q 5/30 25 min Hint

Q : The area under stress and strain graph provides us

A Work done in deforming objects

B Energy per unit volume

C Energy stored in deformed objects

D All of these

24 : 53

Q 6/30 25 min Hint

Q : The units of strain are

A m

B m^{-1}

C Nm^{-2}

D Unit less

1 2 3 4 5 6 7

24 : 52

Q 7/30 25 min Hint

Q : If the stress is increased beyond the yield stress and the specimen does not recover its original shape, this kind of behavior is called

A Proportional limits

B Elastic limit

C Plasticity

D UTS

24 : 50

Q 8/30 25 min Hint

Q : If fracture stress is represented by 'σ_f' and an ultimate tensile strength by 'σ_m' then:

A $\sigma_m > \sigma_f$

B $\sigma_m = \sigma_f$

C $\sigma_m < \sigma_f$

D None of these

Q 9/30 25 min Hint

Q :

Two identical wires of different materials have Young's moduli of elasticity as 22×10^{10} N/m^2 and 11×10^{10} N/m^2 respectively. If these are stretched by equal loads then the ratio of extensions produced in them will be

A 2 : 1

B 1 : 2

C 4 : 1

D 1 : 4

24 : 47

Q 10/30 25 min Hint

Q : Which of given is correct sequence of various limit studied with stress strain graph

A Elastic limit, proportional limit, yield point

B Proportional limit, elastic limit, yield point

C Elastic limit, yield point, proportional limit

D Yield point, elastic limit, proportional limit

24 : 46

Q 11/30 25 min Hint

Q : A wire of length L diameter D is stretched by applying force F shown elongation 1 mm. If another wire of same material and length but half diameter is stretched by same force the extension in it is

A 1 mm

B 0.25 mm

C 0.5 mm

D 4 mm

24 : 45

Q 12/30 25 min Hint

Q : Force 100N is applied on a wire produces extension 5mm in it. Energy stored in it is

A 0.125 J

B 0.250 J

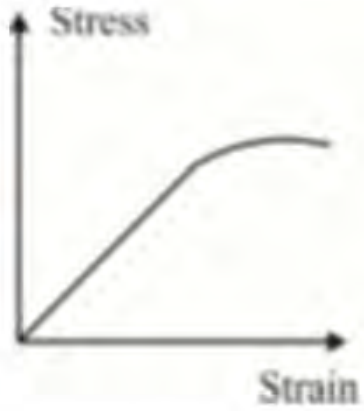
C 0.50 J

D 1 J

24 : 42

Q : Which of given is the stress strain graph is for brittle substance

A



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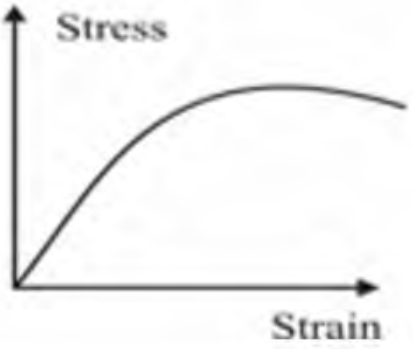

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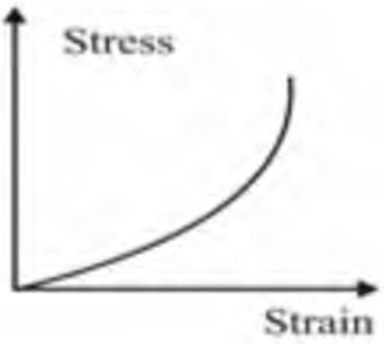
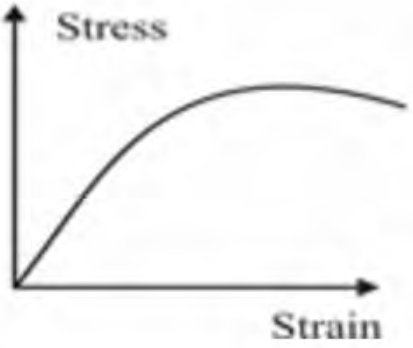


24 : 42

A

B



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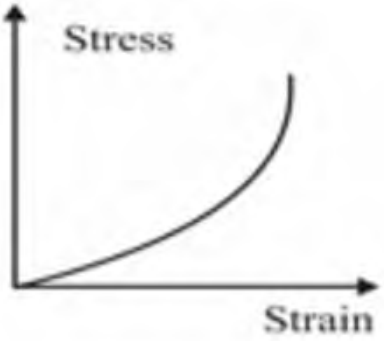

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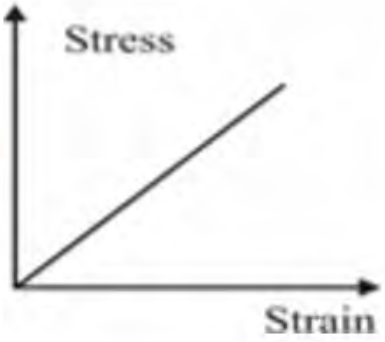

24 : 40

Q 14/30 25 min Hint

Q : A wire of area A and diameter D is stretched by a certain force, extension in the wire is given as

A $\Delta L \propto A$

B $\Delta L \propto \frac{1}{A}$

C $\Delta L \propto \frac{1}{D^2}$

D Both B and C

24 : 37

Q 15/30 25 min Hint

Q : A 1.0m long Cu wire is subjected to stretching force and its length increases by 10cm, percent elongation which the wire undergoes is:

A 1%

B 0.10%

C 20%

D 10%

Q 16/30 25 min Hint

Q : The force required to stretch a steel wire 1 sq. cm in cross section to double its length is (given Y = 2×10^{11} N/m^2)

A 10^7 N

B 2×10^7 N

C 10^{11} N

D 2×10^{11} N

24 : 34

Q 17/30 25 min Hint

Q : Two wires of iron have lengths in the ratio 1:4 and radii in the ratio 8:1. Their Young's moduli are in the ratio

A 1:1

B 1:8

C 8:1

D 1:4

Q 18/30 25 min Hint

Q : A stress of 50 Nm^{-2} changes the length of 5m wire to 5.2m. The energy stored per unit volume in the wire of cross-sectional area $0.2m^2$ is

A $2.5\ Jm^{-3}$

B $1.2\ Jm^{-3}$

C $1\ J\ m^{-3}$

D $12.9\ Jm^{-3}$

Q 19/30 25 min Hint

Q : If the stress strain graph of the materials makes an angle of 30^o and 60^o with x-axis, then the ratio of their modulus of elasticity will be

A 1:3

B 3:1

C $\sqrt{3}:1$

D $1:\sqrt{3}$

24 : 30

Q 20/30 25 min Hint

Q : Which of the following strain can be represented by tan θ

A Shear strain

B Compressive strain

C Tensile strain

D Volumetric strain

24 : 27

Q : Which feature of the following graph represents Young's Modulus?

A Area under graph

B Gradient of the graph

C Reciprocal of the gradient

D Product of gradient area of the curve

24 : 26

Q 22/30 25 min Hint

Q : Strain energy in a deformed material is stored in the form of:

A Electric energy

B Potential energy

C Plastic energy

D kinetic energy

24 : 22

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Q : The electrons in the outer most shell of an atom are called

A valance electrons

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C free electrons

D none of these

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C Newton's law

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Q : Applied force causes one-dimension extension in a material the strain produced is

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B Volume

C Shear

D Ideal

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Q : A copper wire having the area “A” and length “L” is heated. What will be the effect of heating on its young’s modulus?

A Increases

B Decreases

C Remains same

D May increase or decrease

24 : 16

Q 28/30 25 min Hint

Q : Which of the following is most elastic?

A Rubber

B Wet clay

C Plastic

D Steel

24 : 14

Q 29/30 25 min Hint

Q : A wire can sustain a load 100N before breaking if it cuts into two equal parts then each part can sustain a weight

A 50 N

B 200 N

C 100 N

D 500 N

24 : 13

Q 30/30 25 min Hint

Q : A 2 meter long copper wire is subjected to a stretching force and its length is increased by 20 cm. What percentage of tensile strain is in the wire?

A 1%

B 10%

C 5%

D 20%

24 25 26 27 28 29 30

Correct
Unattempted
Incorrect
Q 1/30

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Q 2/30

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Correct | Unattempted

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Correct Unattempted

Incorrect Q 10/30

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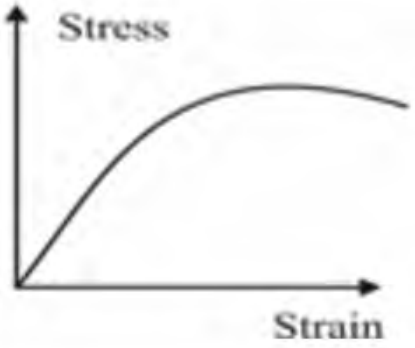
B



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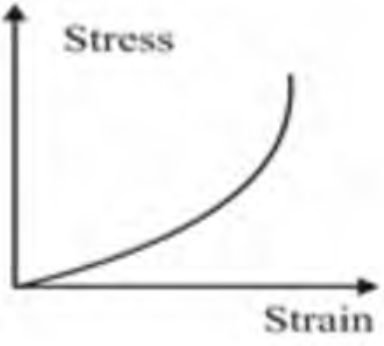
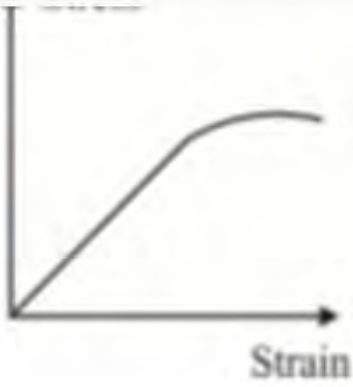


A



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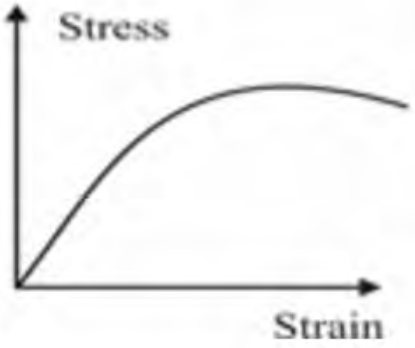

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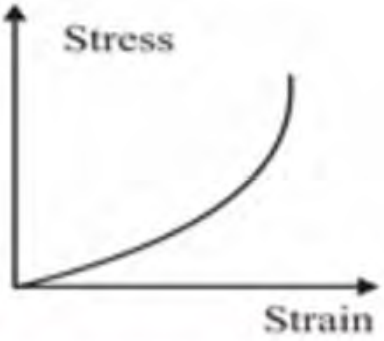

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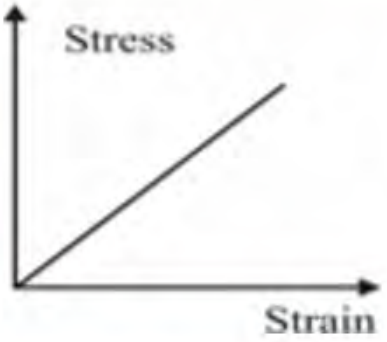

Correct | Unattempted

Incorrect | Q 14/30

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Incorrect

Q 22/30

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Incorrect
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Unattempted
Incorrect
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Correct
Unattempted
Incorrect
Q 30/30

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A 1%

B 10%

C 5%

D 20%