Q1. In an experiment it is found that the bulk modulus of a material is equal to it shear modulus. The poisson's ratio is

a. 0.125
b. 0.250
c. 0.375
d. 0.500

Q2. A mild steel bar is in two parts having equal lengths . The area of cross-section of part-I is double that of part-II . If the bar carries an axial load 'P' then the ratio of elongation in part-I to that in part-II will be

a. 2
b. 4
c. 1 / 2
d. 1 / 4

Q3. High yield deformed bars have a

a. Definite yield value
b. Chemical composition different from mild steel
c. Percentage elongation less than that of mild steel
d. Percentage elongation more than that of mild steel

Q4. Match List-I (Material) with List-II (Characteristic) and select the correct answer

List –I	List –II
A. Inelastic material B. Rigid plastic material C. Ductile material D. Brittle material	1-No plastic zone 2-Large plastic zone 3-Strain in not recovered after unloading 4-Strain is zero upto a stress level and then stress remains constant

Codes :

a. A – 3, B – 4, C – 2, D – 1
b. A – 3, B – 4, C – 1, D – 2
c. A – 4, B – 2, C – 2, D – 1
d. A – 4, B – 2, C – 1, D – 2

Q5. A round bar made of same material consists of 3 parts each of 100 mm, length having diameter of 40 mm, 50 mm and 60 mm respectively, if the bar is subjected to an axial load of 10 kN, the total elongation of the bar would be (E is modulus of elasticity in kN / mm^2)

a. $\frac{0.4}{\pi E}\left(\frac{1}{16}+\frac{1}{25}+\frac{1}{36}\right) mm$

b. $\frac{4}{\pi E}\left(\frac{1}{16}+\frac{1}{25}+\frac{1}{36}\right) mm$

c. $\frac{4\sqrt{2}}{\pi E}\left(\frac{1}{16}+\frac{1}{25}+\frac{1}{36}\right) mm$

d. $\frac{40}{\pi E}\left(\frac{1}{16}+\frac{1}{25}+\frac{1}{36}\right) mm$

Q6. If a member is subjected to tensile stress of p_x compressive stress of p_y and tensile stress of p_z along the x, y and z directions respectively , then the resultant strain '$e_{x'}$' along the 'x' direction would be (E is young 's modulus of elasticity, µ is poisson's ratio)

a. **$1 / E (p_x + \mu p_y - \mu p_z)$**
b. **$1 / E (p_x + \mu p_y + \mu p_z)$**
c. **$1 / E (p_x - \mu p_y + \mu p_z)$**
d. **$1 / E (p_x - \mu p_y - \mu p_z)$**

Q7. A cylindrical bar of 20 mm diameter and 1 m length is subjected to a tensile test. Its longitudinal strain is 4 times that of its lateral strain. If the modulus of elasticity is 2 x 10^5 mm^2 , then its modulus of rigidity will be

a. **8 x 10^6 N / mm^2**
b. **8 x 10^5 N / mm^2**
c. **0.8 x 10^4 N / mm^2**
d. **0.8 x 10^5 N / mm^2**

Q8. Match List-I with List-II and select the correct answer

List –I	List –II
A. Tenacity B. Plasticity C. Ductility D. Malleability	1-Continues to deform without much increase of stress 2-Ultimate strength in tension 3-Extension in a direction without rupture 4-Ability to be drawn out by tension to a small section without rupture

Codes :

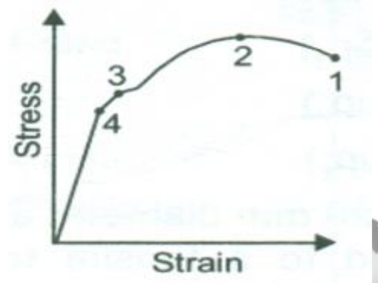
a. A – 2, B – 1, C – 4, D – 3
b. A – 2, B – 1, C – 3, D – 4
c. A – 1, B – 2, C – 4, D – 3
d. A – 1, B – 2, C – 3, D – 4

Q9 Match List-I with List-II and select the correct answer

List –I	List –II
A-Young's modulus B-Poisson's ratio C-Bulk modulus D-Rigidity modulus	1-Lateral strain to linear strains within elastic limit 2-Stress to strain within elastic limit 3-Shear stress to shear strain within elastic limit 4-Direct stress to corresponding volumetric strain

Codes :

a. A – 3, B – 4, C – 1, D – 2
b. A – 4, B – 3, C – 1, D – 2
c. A – 3, B – 4, C – 2, D – 1
d. A – 4, B – 3, C – 2, D – 1

List –II	List –I
	A-Yield point B-Proportional limit C-Rupture strength D-Ultimate strength

Q10 For a linear, elastic ,isotropic material, the number of independent constant is

a. 1
b. 2
c. 3
d. 4

Q11 Creep is the gradual increase of

a. Plastic strain time at constant load
b. Elastic strain time at constant load
c. Plastic strain time at varying load
d. Elastic strain time at varying load

Q12 Match List-I (Properties) with List-II (Stress points labelled 1, 2, 3 and 4) and select the correct answer

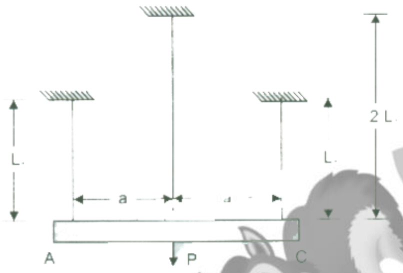
Codes :

a. A – 3, B – 4, C – 1, D – 2
b. A – 4, B – 3, C – 1, D – 2
c. A – 3, B – 4, C – 2, D – 1
d. A – 4, B – 3, C – 2, D – 1

Q13 The bulk modulus of elasticity of a material is twice its modulus of rigidity . The Poisson's ratio of the material is

a. 1 / 7
b. 2 / 7
c. 3 / 7
d. 4 / 7

Q14 A rigid bar AC is supported by three rods of same material and of equal diameter. The bar AC is initially horizontal. A force P is applied such that the bar AC continues to remain horizontal. Forces in each of the shorter bars and in the longer bar are, respectively



a. 0.4 P, 0.2 P
b. 0.3 P, 0.4 P
c. 0.2 P, 0.6 P
d. 0.5 P, zero

Q15 A member having length L, cross-sectional areas A and modulus of elasticity E is subjected to an axial load W. the strain energy stored in this member is

a. WL^2 / AE
b. $WL^2 / 2AE$
c. $W^2 L / 2AE$
d. $W^2 L / AE$

Q16 Elastic limit is the point

a. Up to which stress is proportional to strain
b. At which elongation takes place without application of additional load
c. Up to which if the load is removed , original volume and shape are regained
d. At which the toughness is maximum

Q17 Match List-I with List-II and select the correct answer

List –I I	List –I
A-Isotropic B-Homogeneous C-Viscoelastic D-Brittle	1-Time dependent stress strain 2-No plastic zone 3-Identical properties in all directions 4-Similar properties throughout the volume

Codes :

a. A – 3, B – 1, C – 2, D – 4
b. A – 4, B – 1, C – 2, D – 3
c. A – 3, B – 4, C – 1, D – 2
d. A – 4, B – 3, C – 2, D – 1

Q18 As per the elastic theory of design, the factor of safety is the of

a. **Working stress to stress at the limit of proportionality**
b. **Yield stress to working stress**
c. **Ultimate stress to working stress**
d. **Ultimate load to load at yield**