INDUS RANGERS INSTITUTE PVT. LTD
FLUID MECHANICS

1.Two wires the same material have diameter in the ratio 2:1 .If they are stretched by the same force, their elongations will be in the ratio

(a)8:1 (b)1:8 (c)2:1 (c)1:4

2.The following four wires are made of the same material. Which of these will have the largest extension when the same tensions is applied

(a)length =50cm ,diameter =0.5mm

(b)length=100 cm, diameter =1mm

(c)length =200cm,diameter=2mm

(d)length=300cm,diameter=3mm

3.A metal ring of initial radius r and cross-sectional area a is fitted onto a wooden disc of radius R>r. If Young's modulus of the metal is Y then the tension in the ring is

(a)$\frac{AYR}{r}$ (b)$\frac{AY(R-r)}{r}$ (c)$\frac{Y}{A}\left(\frac{R-r}{r}\right)$ (d)$\frac{Yr}{AR}$

4.A metal beam is supported at the two ends is loaded at the centre .If Y is the Young's modulus ,then the depression at the centre is proportional to

(a)$\frac{1}{Y}$ (b)Y (c)$\frac{1}{y^2}$ (d)y^2

5.A rope rubber of density 1.5 x 10^3 kg/m^3 and Young's modulus 5 x 10^6N/m²,8 m in length ,is hung from the ceiling of a room .The increase in length due to its weight is

(a)9.6 x $10^{-2}m$ (b)19.2 x $10^{-7}m$

(c)9.6 x 10^{-3}m (d)9.6 m

6.When a certain weight is suspended from a uniform wire, the length of the wire increase by 1 cm. If the same weight is suspended from another wire of the same material and length but having half the diameter of the first wire, the increase in length will be

(a)0.5 cm (b)2 cm (c)4cm (d)8cm

7.Two steel wires of lengths 1 m and 2 m have diameters 1 mm and 2mm ,respectively .If they are stretched by forces of 40 N and 80 N, respectively elongations will be in the ratio

(a)1:1 (b)1:2 (c)1:4 (c)1:8

8.Energy per unit unit volume of a stretched wire is

(a)(1/2)x load x extension (b)load x stress

(c)stress x strain (d)(1/2) x stress x strain

9.The Young's modulus of a wire of length : L and radius r is Y .If the length is reduced to L/2 and radius to r/2 ,its Young's modulus will be

(a)Y/2 (b)Y (c)2Y (d)4Y

10.A spherical ball contracts in volume by 0.01% when subjected to a normal uniform pressure of 100 atmosphere. The bulk modulus of the material of the ball in dynes /cm² is

(a)1 x 10^{12} (b)10 x10^{12}

(c)100 x 10^{12} (d)2 x 10^{11}

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

(a)16 J (b)8 J (c)4 J (d)(1/4)J

12.Two wires of the same material and same cross-sectional areas has lengths in the ratio 1:2 .If they are stretched by the same force longitudinally ,the ratio of the tension in them will be

(a)1:1 (b)1:2 (c)2:1 (d)4:1

13.Which of the following is most elastic ?

(a)Rubber (b)Wet clay

(c)Plastic (d)Steel

INDUS RANGERS PVT. LTD.

14. The energy stored per unit volume of a stained wire is(Y is he Young's modulus of the material of the wire)

(a)$\frac{1}{2}$ x load x extension (b)$\frac{1}{2}\frac{Y}{(strain)^2}$

(c)$\frac{1}{2}$ x y x(Strain)² (d)stress x strain

15.A wire of length 2m and cross-section area 10^6 m² is made of a material of Young's modulus 2 x 10^{11}N/m².The work done in stretching it through 0.1 mm is

(a)5 x $10^{-1}J$ (b) 5 x $10^{-2}J$

(c) 5 x $10^{-3}J$ (d) 5 x $10^{-4}J$

16.When a weight of 10 kg is suspended from a copper wire of length 3 m and diameter 0.4 mm, its length increase by 2.4cm.If the diameter of the wire is doubled ,then the extension in its length will be

(a)9.6 cm (b)4.8cm (c)1.2 cm (d)0.6 cm

17. Two wires of the same material have length in the ratio 1:2 and radii in the ratio 1:$\sqrt{2}$ .If they are stretched by applying equal forces ,the increase in their length will be in the ratio

(a)2:$\sqrt{2}$ (b)$\sqrt{2}$: 2 (c)1:1 (d)1:2

18. The compressibility of water is 4 x 10^{-5} per unit atmosphere pressure. The decrease in volume of 100cm^3 of water under pressure of 100 atmosphere will be

(a)0.4cm^3 (b)4 x10^{-5} cm^3

(c)0.025cm^3 (d)0.004cm^3

19. For a given material the Young's modulus is 2.4 times the rigidity modulus .The poisson's ratio for this material is

(a)2.4 (b)1.2 (c)0.4 (d)0.2

20.A copper wire and a steel wire of the same diameter and length are connected end and a force is applied which stretches their combined length by 1 cm.Then the two wires have

(a)the same stress and strain

(b)the same stress but different strains

(c)the same strain but different stresses.

(d)different stresses and strains

21.On applying a stress of 20 x 20^8 newton/m²,the length of perfectly elastic wire is doubled .Its Young's modulus is

(a)40 x 10^8N/m² (b)20 x 10^8N/m²

(c)10 x 10^8N/m² (d)5 x 10^8N/m²

22.How much force is required to produce an increase of 0.2% in the length of a brass wire of diameter 0.6 mm?[Young's modulus for brass =0.9 x10^{11}N/m²]

(a)Nearly 17 N (b)Nearly 34 N

(c)Nearly 51 N (d)Nearly 68 N

23.A fluid of volume 1 lit its subjected to a pressure change of 1.0 x 10^7N/m².As a result its volume changes by 0.4cm^3.The bulk modulus of the fluid is

(a)2.5 x 10^{10}N/m² (b)2.5 x 10^{11}N/m²

(c)2.5 x 10^9N/m² (d)1.5 x 10^{11}N/m²

24.The pressure at the bottom of a liquid tank does not depend on

(a)acceleration due to gravity

(b)density of the liquid

(c)height of the liquid

(d)area of the liquid surface

25. Two solids A and B float in water .A floats with half its volume immersed and B floats with 2/3rd of its volume immersed .The densities of A and B are in the ratio

(a)2:3 (b)4:3 (c)3:4 (d)3:2

26.A U-tube is practically filled with water Oil, which does not mix with water ,is next poured into one side until water rises on the other side by 25 cm.If the density of oil is 0.8 ,the oil level will stand higher than the water level by

(a)6.25 cm (b)12.50 cm

(c)31.75 cm (d)62.50 cm

INDUS RANGERS PVT. LTD.

27.A vessel contains oil (density 0.8 g/cm^3).a homogenous sphere floats with half its volume immersed in mercury and the other half in oil. The density of the material of the sphere in g/cm^3 is

(a)3.3 (b)6.4 (c)7.2 (d)12.8

28. An ice berg is floating partially immersed in water .The density of sea-water is 1.03 g/cm^3 and that of ice is 0.92g /cm^3.The fraction of the total volume of the iceberg above the level of sea-water is

(a)8% (b)11% (c)34% (d)89%

29.the reading of a spring balance when a block is suspended from it in air is 60 N. This reading is changed to 40N when the block is submerged in water .The specific gravity of the block is

(a)2 (b)3 (c)6 (d)3/2

30.A ball of volume 1000 cm^3 is suspended from a spring balance .It weight 2 kg in air .It is now suspended in water such that half of it is below the surface of water .The reading of the spring balance will be

(a)1 kg (b)1.5 kg (c)0.5kg (d)1.25 kg

INDUS RANGERS PVT. LTD.