1. Stress is

(a)External force

(b)Internal resistive force

(c)Axial force

(d)Radial force

2. Following are the basic types of stress except

(a)Tensile stress

(b) Compressive stress

(c)Shear stress

(d)Volumetric stress

3. Which of the following is not a basic type of strain?

(a)Compressive strain

(b)Shear strain

(c)Area strain

(d)Volume strain

4. Volumetric Strain is

(a)Increase in length / original length

(b)Decrease in length / original length

(c)Change in volume / original volume

(d)All of the above

5. Young's Modulus of elasticity is

(a)Tensile stress / Tensile strain

(b) Shear stress / Shear strain

(c)Tensile stress / Shear strain

(d)Shear stress / Tensile strain

6. Modulus of rigidity is

a) Tensile stress / Tensile strain
b) Shear stress / Shear strain
c) Tensile stress / Shear strain
d) Shear stress / Tensile strain

7. Factor of safety is

a. Tensile stress / Permissible stress

b. Compressive stress / Ultimate stress

c. Ultimate stress / Permissible stress

d. Ultimate stress / Shear stress

8. Poisson's ratio is

a. Lateral strain / Longitudinal strain

b. Shear strain / Lateral strain

c. Longitudinal strain / Lateral strain

d. Lateral strain / Volumetric strain

9. A rod, 120cm long and of diameter 3.0 cm is subjected to an axial pull of 18 kN. The stress in N/mm2 is.

a. 22.57

b. 23.47

c. 24.57

d. 25.47

10. The total extension in a bar, consists of 3 bars of same material, of varying sections is

a. P/E(L1/A1+L2/A2+L3/A3)

b. P/E(L1A1+L2A2+L3A3)

c. PE(L1/A1+L2/A2+L3/A3)

d. PE(L1/A1+L2/A2+L3/A3)

Where P=Load applied, E=young's modulus for the bar, L1,2,3=Length of corresponding bars, A1,2,3=Area of corresponding bars

11. The relationship between Young's modulus (E), Modulus of rigidity (C) and Bulk modulus (K) is given by

a. E=9CK/(C+3K)

b. E=9CK/(2C+3K)

c. E=9CK/(3C+K)

d. E=9CK/(C-3K)

12. The deformation per unit length is called

(a) Strain

(b) Stress

(c) Elasticity

(d) None of these

13. The ability of the material to deform without breaking is called

(a) Elasticity

(b) Plasticity

(c) Creep

(d) None of these

14. Every material obeys the Hooke's law within

(a) Elastic limit

(b) Plastic limit

(c) Limit of proportionality

(d) None of these

15. The ratio of lateral strain to linear strain is called

(a) Modulus of Elasticity

(b) Modulus of Rigidity

(c) Bulk Modulus

(d) Poisson's Ratio

16. The bending moment at the fixed end of a cantilever beam is

(a) Maximum

(b) Minimum

(c) Wl/2

(d) Wl

17. For a simply supported beam of span L, with point load W at the centre, the maximum B.M. will be

(a) WL

(b) WL/2

(c) WL/4

(d) WL/8

18. For a simply supported beam of span L, loaded with U.D.L. w/m over the whole span, the maximum B.M will be

(a) wL/4

(b) wL2 /8

(c) wL2 /4

(d) WwL2 /2

19. At the point of contra flexure

(a) B.M is minimum

(b) B.M is maximum

(c) B.M is either zero or changes sign

(d) None of these

20. The Point of contra flexure occurs in case of

(a) Cantilever beams

(b) Simply supported beams

(c) Over hanging beams

(d) All types of beams

21. The rate of change of bending moment is equal to

(a) Shear force

(b) Slope

(c) Deflection

(d) None of these

22. At a point in a simply supported or overhanging beam where Shear force changes sign and = 0, Bending moment is

(a) Maximum

(b) Zero

(c) Either increasing or decreasing

(d) Infinity

23. The concavity produced on the beam section about the centre line when downward force acts on it is called as

(a) Hogging or positive bending moment

(b) Hogging or negative bending moment

(c) Sagging or positive bending moment

(d) Sagging or negative bending moment

24. A continuous beam is one which has

(a) One support

(b) Two supports

(c) Three supports

(d) None

25. What is the moment of inertia acting on a circle of diameter 50 mm?

a. 122.71 x 103 mm4

b. 306.79 x 103 mm4

c. 567.23 x 103 mm4

d. 800 x 103 mm

26. Which of the following relations is used to represent theorem of perpendicular axes? (H = Vertical axis, I = Moment of inertia and K = Radius of gyration)

a. IPQ = Ixx + AH2

b. IPQ = Ixx + Ak2

c. Izz = Ixx + Iyy

d. Izz + Ixx + Iyy = 0

27. A uniformly distributed load of 20 kN/m acts on a simply supported beam of rectangular cross section of width 20 mm and depth 60 mm. What is the maximum bending stress acting on the beam of 5m?

a. 5030 Mpa

b. 5208 Mpa

c. 6600 Mpa

d. Insufficient data

28. The bending formula is given as _____

a. (M/E) = (σ/y) = (R/I)

b. (M/y) = (σ/I) = (E/R)

c. (M/I) = (σ/y) = (E/R)

d. none of the above

29. Neutral axis of a beam always coincides with

a. Axis passing through bottom of beam

b. Axis passing through height h/2 from bottom

c. Axis passing through height h/3 from bottom

d. Axis passing through centroid

30. Shear stress is zero at the

(a) Outermost fiber

(b) Central fiber

(c) Neither outermost nor central fiber

(d) None

31. The relation governing the torsional torque in circular shafts is

a. $T/r=\tau/l=G\theta/J$

b. $T/J=\tau/r=G\theta/l$

c. $T/J=\tau/l=G\theta/r$

d. $T/l=\tau/r=G\theta/J$

32. Torsional rigidity of a shaft is defined as

a. G/J

b. GJ

c. TJ

d. T/J

33. Maximum shear stress of a solid shaft is given by

a. $16T/\pi d$

b. $16T/\pi d2$

c. 16T/πd3

d. 16T/πd4

33. For two shafts joined in series, the ---------- in each shaft is same.

a. shear stress.

b. Angle of twist

c. torque

d. torsional stress.

34. The angle of twist is ---------- proportional to the twisting moment.

a. directly.

b. inversely

. c. indirectly.

d. reversely.

35. In power transmission equation, P=2ΠNT/60×1000

a. P is in kw and T is maximum torque

b. P is in NM/sec and T is maximum torque

c. P is in NM/sec and T is mean torque

d. P is in kw and T is mean torque

36. The unit of Torque in SI units

(a) kg-m

(b) kg-cm

(c) N-m

(d) N/m2

37. .The product of the tangential force acting on the shaft and radius of shaft known as

(a) Torsional rigidity

(b) Flexural rigidity

(c) Bending moment

(d) Twisting moment

38. The polar moment of inertia of a solid circular shaft of diameter (d) is

(a)πd2 /16

(b) πd3 /32

(c) πd4 /32

(d) πd4 /64

39. In the relation (T/J = Gθ/L = τ/ R), the letter G denotes modulus of _____

a. elasticity

b. plasticity

c. rigidity

d. resilience

40. The design of shafts made of brittle materials is based on

(a) Guest's theory

(b) Rankine's theory

(c) St. Venant's theory

(d) Von Mises Theory

41. The load at which a vertical compression member just buckles is known as

(a) Critical load

(b) Crippling load

(c) Buckling load

(d) Any one of these

42. Cylinder having inner diameter to wall thickness ratio less than 15 are

a) Thin cylinders

b) Thick Cylinders

c) Moderate cylinders

d) none of the above

43. Spring is an

(a) Elastic device

(b) Plastic device

(c) Elastic as well as plastic device

(d) None

44. Wahl's stress concentration factor is

(a) [(4C—1)/(4C—4)] +0.615/C

(b) [(4C—1)/(4C—4)] +0.625/C

(c) [(4C—1)/(4C—4)] +0.635/C

(d) None

45. Shear stress in a close coiled helical spring is

(a) 16WD/π d3

(b) 32WD/π d3

(c) 8WD/π d3

(d) None

46. Strain energy in a close coiled helical spring is

(a) τ2 /8G

(b) τ2 /16G

(c) τ 2 /4G

(d) None

47. Resilience of spring is

(a) Strain energy per unit length

(b) Strain energy per unit area

(c) Strain energy per unit mass

(d) None

48. A closed helical spring under axial load is designed on the basis of

(a) Shear

(b) Compression

(c) Bending

(d) None

49. Two shafts will have equal strength, if

(a) diameter of both the shafts is same

(b) angle of twist of both the shafts is same

(c) material of both the shafts is same

(d) twisting moment of both the shafts is same

50. A perfectly elastic body

(a) Can move freely

(b) Has perfectly smooth surface

(c) Is not deformed by any external surface

(d) Recovers its original size and shape when the deforming force is removed.