Sample Question Bank SOM For Exam 2020

1. The property of a material by which it can be drawn to a smaller section, due to tension, is called
   (A) Plasticity
   (B) Ductility
   (C) Elasticity
   (D) Malleability

2. If Z and I are the section modulus and moment of inertia of the section, the shear force F and bending moment M at a section are related by
   (A) F = My/I
   (B) F = M/Z
   (C) F = dM/dx
   (D) F Mdx

3. The value of Poisson's ratio always remains
   (A) Greater than one
   (B) Less than one
   (C) Equal to one
   (D) None of these

4. When equal and opposite forces applied to a body, tend to elongate it, the stress so produced, is called
   (A) Shear stress
   (B) Compressive stress
   (C) Tensile stress
   (D) Transverse stress

5. The property of a material by which it can be beaten or rolled into thin plates, is called
   (A) Malleability
   (B) Ductility
   (C) Plasticity
   (D) Elasticity

6. The shape of the bending moment diagram over the length of a beam, carrying a uniformly increasing load, is always
   (A) Linear

(B) Parabolic
(C) Cubical
(D) Circular

7. A force is completely defined when we specify
   (A) Magnitude
   (B) Direction
   (C) Point of application
   (D) All of the above

8. While testing a cast iron beam (25 mm × 25 mm) in section and one metre long simply supported at the ends failed when a 1000 N weight is applied at the centre. The maximum stress induced is:
   (A) 96 N/mm2
   (B) 98 N/mm2
   (C) 100 N/mm2
   (D) 120 N/mm2

9. A simply supported beam of span L carries a concentrated load W at its mid-span. The maximum bending moment M
   (A) WL/2
   (B) WL/4
   (C) WL/8
   (D) ZERO
10. Shear force for a cantilever carrying a uniformly distributed load over its length, is
    (A) Triangle
    (B) Rectangle
    (C) Parabola
    (D) Cubic parabola
11. In a loaded beam, the point of con-traflexture occurs at a section where

    A. bending moment is minimum
    B. bending moment is zero or changes sign
    C. bending moment is maximum
    D. shearing force is maximum

12. The number of points of contraflexure in a simple supported beam carrying uniformly distributed
    load, is
    (A) 0

(B) 1
(C) 2
(D) 3

13 Along the principal plan subjected to maximum principal stress
(A) Maximum shear stress acts
(B) Minimum shear stress acts
(C) No shear stress acts
(D) None of these
Answer: Option C

14 A circular rod of 10 mm diameter and 1 metre long applied 100 kN force in Pull nature .What will be deformation is ,E=100 GPa
a)7.5 Mpa
b)8 MPa
c) 10 MPa
d) 9MPa

15.A cantilever beam of 2 m length fixed at one end and free at other end . It heated at 50 degree Celsius what will be stress developed in that
E=200Gpa and $\alpha = 2 \times 10^{-6} /^{0}c$

a) Zero
b) 20 MPa
c) 0.2 MPa
d) 20GPa

16. Calculate Section modulus for Hollow circular section whose external diameter is 100 mm and internal diameter is 50 mm
a) 4.60×10^{6} mm^4
b) 92.03×10^{3} mm^4
c) 78.30×10^{6} mm^4
d) 85.30×10^{3} mm^4

17. The ratio of Young's modulus to Modulus of rigidity for a material having Poisson's ratio 0.3 is
12/5
5/12
5/13
13/5

18. Factor of safety is for ductile materials is :
(A) the ratio of maximum stress and safe stress
(B) the ratio of safe stress and maximum stress
(C) the ratio of maximum stress and maximum strain
(D) none of the above

19. When a rectangular bar is uniaxially loaded, the volumetric strain (ev) is given as _____

a. σx / E(1- μ)
b. σx / E(1+ μ)
c. σx / E(1- 2μ)
d. σx / E(1+2μ)

20. Bulk Modulus is defined as the ratio of
a) Direct stress and volumetric strain
b) Lateral stress and lateral strain
c) Longitudinal stress and longitudinal strain
d) Shear stress to shear strain

21.. A long vertical member, subjected to an axial compressive load, is called

a) A column

B) A strut

C) A tie

D) A stanchion

20. The tensile force required to cause an elongation of 0.045 mm in a steel rod of 1000 mm length and 12 mm diameter, is (where E = 2 × 106 kg/cm2)
(A) 166 kg
(B) 102 kg
(C) 204 kg
(D) 74 kg

21. What is the relation between actual length and effective length while determining crippling load for a hollow rectangular cast iron column having both ends hinge ? (where L= actual length and Le =effective length)

a. Le = L
b. Le = L/2
c. Le = 2L
d. Le = 4L

22. Euler's formula states that the buckling load 'P' for a column of length 'l', both ends hinged and whose least moment of inertia and modulus of elasticity of the material of the

column are ‘I’ and ‘E’ respectively, is given by the relation

A) $P = \pi^2 EI/l^2$

B) $P = \pi l^2/EI$

C) $P = \pi EI/l^2$

D) $P = \pi^2 EI/l^3$

23. A square column 300 x 300 carrying a load of 500 kN exactly passing through its C.G. Length of column is 5 m . Calculate the maximum stress develop in the column

a) 6 MPa

b) 5.55 MPa

c) 7 MPa

d) 7.5 MPa

24. A solid circular shaft of diameter 150 mm ,when transmit power of 150 kW at 180 rpm Calculate torque generated

A) 7957 k Nm
B) 7888 k Nm
C) 2827 k Nm
D) 3012kNm

25.Summation of all vertical forces either right to left of section is called as
a) Shear force
b)Bending Moment
c) Shear stress
d) Twisting force

25.The rectangular bar having cross section 75 x 50 and length is 1 m applied a tensile load of 100 kN .It will deform 1 mm .what will be the modulus of elasticity of material

A)75 MPa

B) 99 GPa

C) 33 MPa

D) 66 MPa

26.The relation between Young's modulus (E) and Modulus of rigidity (G) is given by

E= 2G(1+μ)
E = 2G(1- μ)
E=3G(1+2 μ)
E= 2G(1+2 μ)

27.The principal stresses at at point are 200 MPa and 20MPa .The maximum shear stress will be

A) 110 MPa
B) 120 MPad
C) 90 MPa
D.) 60 MPa

28.When a rectangular bar of length l, breadth b and thickness t is subjected to an axial pull of P, then linear strain (ε) is given by (where E = Modulus of elasticity)

$$\varepsilon = \frac{P}{b.t.E}$$

$$\varepsilon = \frac{b.t.E}{P}$$

$$\varepsilon = \frac{b.t}{P.E}$$

$$\varepsilon = \frac{P.E}{b.t}$$

29.A thin cylindrical pressure vessel 3.2 m long is having 1. 2 m internal diameter and 15 mm thick and it is subjected to an water pressure of is 1.6 ,Calculate Hoop stress and Longitudinal stress

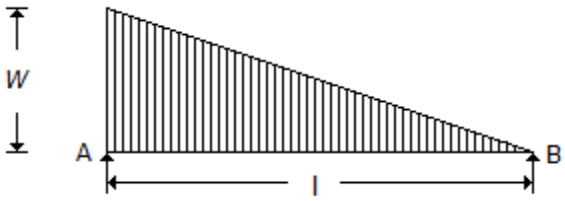
a)64 MPa, 32 MPa

b)32 MPa,64 MPa

c) 50 MPa, 100 MPa

d)100 MPa, 50 MPa

30. For the beam shown in the below figure, the shear force diagram between A and B is



a horizontal line

b .vertical line

c. an inclined line

d. parabolic curve