Question : 1 If 'P' is the tensile stress in a rectangular bar of the length 'L' with 'b' and thickness 'd', the volumetric strain is given as:

A : P (1 + 2μ)/E
B : PL (1 - 2μ)/bd
C : P (1 - 2μ)
D : p (1 - 2μ)/E

Question : 2 In a composite system subjected to temperature rise and with ends constrained to remain together, the component having lower value of co efficient of linear expansion will experience

A : Tensile stress
B : Compressive stress
C : Tensile or compression stress depending upon the loading
D : Zero value of stress.

Question : 3 For the same span and loading conditions, the maximum bending moment in a fixed beam compared to a simple supported one, shall be:

A : Higher
B : lower
C : The same
D : Nothing can be said

Question : 4 A steel plate d x b is sandwiched rigidity between two timber joist DxB/2 in section. The moment of resistance of the beam for the same maximum permissible stress σ in timber and steel will be

A : $\sigma(BD^2 + mbd^2)/6D$
B: $\sigma(BD^2+mbd^2)/6D$
C: $\sigma(BD^3+mbd^3)/4D$
D: $\sigma(BD^2+mbd^2)/4D$

Question : 5 Maximum allowable shear stress in a section is 100 kg/cm^2.If bar is subjected to tensile force of 5000 kg and if the section is square shaped, what will be the dimension of sides of the squares?

A : 10 cm
B : 5 cm
C : 12 cm
D : $\sqrt{12cm}$

Question : 6 A rectangular bar has been subjected to torsion.The maximum shear stress will occur___.

A : At the centre
B : At the corner
C : At the middle of longer side
D : Along the diagonal

Question : 7 If the strain energy stored per unit volume in a hollow shaft subjected to a pure torque when it attains maximum shear stress f_s is $(17f_s)/(16N.)$the ratio of the inner diameter to outer diameter is

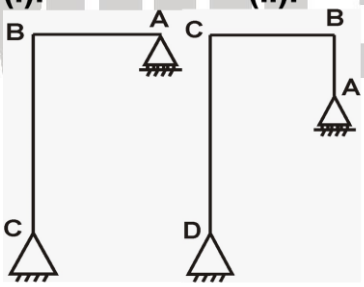
A : 43467
B : 43468
C : 43469
D : 43470

Question : 8 A closed coil helical spring is subjected to a torque about its axis. The spring wire would experience a

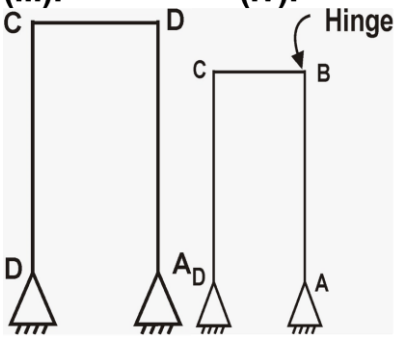
A : Bending stress
B : Direct tensile stress uniform intensity at its cross-section
C : Direct shear stress
D : Torsional shearing stress

Question : 9 Pick up the indeterminate structure from those shown in figure given below:

(i). **(ii).**



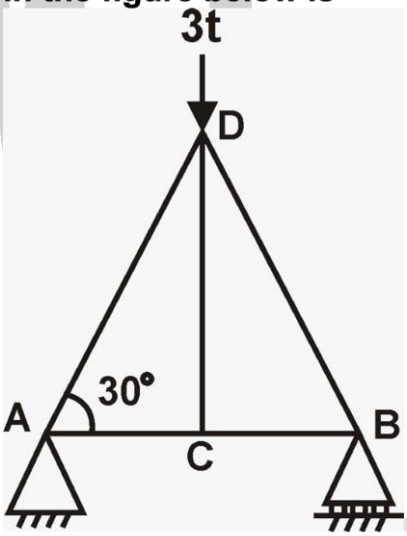
(iii). **(iv).**



options:

A : figure (i)
B : figure (ii)
C : figure (iii)
D : figure (iv)

Question : 10 The force in BC of the truss shown in the figure below is



A : 3.0t compression
B : 3.0t tension
C : (8.75√3)t tension
D : (8.75√3)t compression

Question : 11 What is the function of portal in bridge trusses?

A : To resist lateral forces
B : To resist horizontal forces
C : To provide additional, stability
D : To allow thermal expansion

Question : 12 For reinforced concrete members totally immersed in sea water, the water additional cover thickness recommended by the code is:

A : 25mm
B : 30mm
C : 35mm
D : 40mm

Question : 13 Rise of a jack arch is kept about

A : 1/2 to 1/3 of the span
B : 1/3 to 1/4 of the span
C : 1/4 to 1/8 of the span
D : 1/8 to 1/12 of the span

Question : 14 Pickup the correct statement from the following:

A : The bent up bars at a support resist the negative bending moment
B : The bent up bars at a support resist the shearing force
C : ##The bending of bars near support is generally 45° degree
D : All options are correct

Question : 15 Lap length in compression shall not be less than:

A : Less than 15ϕ
B : Less than 20ϕ
C : Less than 24ϕ
D : Less than 30ϕ

Question : 16 Spacing of stirrup in a rectangular beam is :

A : Increased at the ends.
B : Kept constant throughout the length
C : Decreased towards the centre of the beam.
D : Increased towards the centre of the beam.

Question : 17 The ratio of the breadth to effective depth of a beam is kept

A : 0.25
B : 0.5
C : 0.7
D : 0.75

Question : 18 For a continuous slab supported at ends and carried over intermediate beams

A : Max. sagging BM for the end spans = + $(wl^2)/10$
B : Max hogging BM over penultimate supports is equal to - $(wl^2)/10$
C : Max sagging BM for the interior spans = $(+wl^2)/12$
D : All option are correct

Question : 19 The diameter of transverse reinforcement of columns should be equal to one-fourth of the diameter of the main steel rods but rod less than:

A : 4mm
B : 5mm
C : 6mm
D : 8mm

Question : 20 When RCC footing is not to extend in the plot of the neighbouring house, the type of footing preferred is

A : Cellular flat not footing
B : Inverted flat not footing
C : Strap footing
D : Both (A) and (B) above

Question : 21 If P is the wind pressure in kg/cm^2,v is the velocity in km/hour and k is constant of proportionality then_____.

A : $P=K/v^2$
B : $v=K/P^2$
C : $P=Kv^2$
D : p=Kv

Question : 22 A riveted joint can fail in

A : Tearing of plate only
B : Shearing of rivet only
C : Bearing of plate or rivet only
D : Any of the above

Question : 23 The throat in a fillet weld is:

A : Large side of the triangle of the fillet
B : Hypotenuse of the triangle of the fillet
C : Small side of the triangle of the fillet
D : Perpendicular distance from the root to the hypotenuse

Question : 24 The allowable stress in axial tension is generally kept less if thickness of the member is more than

A : 10 mm
B : 12 mm
C : 15 mm
D : 20 mm

Question : 25 The effective slenderness ratio of laced columns, compared to actual maximum slenderness ratio shall be considered as

A : 1.05 times
B : 1.10 times
C : 1.15 times
D : 1.20 times

Question : 26 For unstiffened flange of a beam in flexural compression, the maximum allowable out stand is equal to_____

A : 20 t
B : 16 t
C : 32 t
D : 14 t

Question : 27 The equivalent axial load may be defined as the load may be defined as the load which produced a stress equal to

A : Maximum stress produced by the eccentric load
B : Maximum stressed fiber
C : Bending stress
D : None of these

Question : 28 In case of a simply supported rectangular beam of span L and loaded with a central load W, the length of elasto-plastic zone of the plastic hinge is

A : $\frac{L}{2}$
B : $\frac{L}{3}$
C : $\frac{L}{4}$
D : $\frac{L}{5}$

Question : 29 The economic of a roof truss depends upon the

A : Cost of purlins and cost of roof coverings
B : Cost of roof covering and dead loads
C : Dead loads and live loads
D : Live loads and cost of purlins

Question : 30 The space between adjacent bents in a roof truss is called:

A : Purlins
B : Bay
C : Knee
D : Braces