



**Chettinad**  
College of Engineering & Technology  
Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

**Department of Mechanical Engineering**  
**CE 8395 – Strength of Materials for Mechanical Engineers**  
**Unit III - MCQ Bank**

1. Resilience is the

- (A) Energy stored in a body when strained within elastic limits
- (B) Energy stored in a body when strained up to the breaking of the specimen maximum strain
- (C) Energy which can be stored in a body
- (D) None of the above**

Answer: Option D

2. A shaft revolving at  $\omega$  rad/s transmits torque ( $T$ ) in Nm. The power developed is

- (A)  $T.\omega$  watts**
- (B)  $2\pi. T.\omega$  watts
- (C)  $2\pi. T.\omega/75$  watts
- (D)  $2\pi. T.\omega/4500$  watts

Answer: Option A

3. The buckling load for a given material depends on

- (A) Slenderness ratio and area of cross-section
- (B) Poisson's ratio and modulus of elasticity
- (C) Slenderness ratio and modulus of elasticity
- (D) Slenderness ratio, area of cross-section and modulus of elasticity**

Answer: Option D

4. When a beam is subjected to a bending moment, the strain in a layer is \_\_\_ the distance from the neutral axis.

- (A) Equal to  
**(B) Directly proportional to**  
 (C) Inversely proportional to  
 (D) Independent

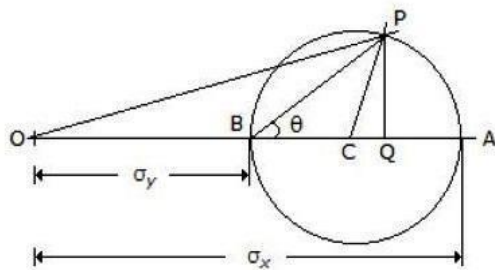
Answer: Option B

5. In the tensile test, the phenomenon of slow extension of the material, i. e. stress increasing with the time at a constant load is called

- (A) Creeping**  
 (B) Yielding  
 (C) Breaking  
 (D) Plasticity

Answer: Option A

6. The given figure shows the Mohr's circle of stress for two unequal and like principal stresses ( $\sigma_x$  and  $\sigma_y$ ) acting at a body across two mutually perpendicular planes. The normal stress on an oblique section making an angle  $\theta$  with the minor principle plane is given by



- (A)  $OC$   
 (B)  $OP$   
**(C)  $OQ$**   
 (D)  $PQ$

Answer: Option C

7. A double strap butt joint with equal straps is

- (A) Always in single shear
- (B) Always in double shear**
- (C) Either in single shear or double shear
- (D) None of these

Answer: Option B

8. The stress induced in a body due to suddenly applied load compared to when it is applied gradually is

- (A) Same
- (B) Half
- (C) Two times**
- (D) Four times

Answer: Option C

9. The rivets are used for fastenings.

- (A) Permanent**
- (B) Temporary
- (C) Semi-permanent
- (D) None of these

Answer: Option A

10. When two plates are butt together and riveted with cover plates with two rows of rivets, the joint is known as

- (A) Lap joint
- (B) Butt joint
- (C) Single riveted single cover butt joint
- (D) Double riveted double cover butt joint**

Answer: Option D

11. A bar of copper and steel form a composite system, which is heated to a temperature of  $40^{\circ}\text{C}$ . The stress induced in the copper bar will be

- (A) Tensile
- (B) Compressive**
- (C) Shear
- (D) Zero

Answer: Option B

12. A boiler shell 200 cm diameter and plate thickness 1.5 cm is subjected to internal pressure of 1.5 MN/m, and then the hoop stress will be

- (A) 30 MN/m<sup>2</sup>
- (B) 50 MN/m<sup>2</sup>
- (C) 100 MN/m<sup>2</sup>**
- (D) 200 MN/m<sup>2</sup>

Answer: Option C

13. When a thin cylindrical shell is subjected to an internal pressure, the volumetric strain is (where  $\varepsilon_1$  = Hoop strain, and  $\varepsilon_2$  = Longitudinal strain)

- (A)  $2\varepsilon_1 - \varepsilon_2$
- (B)  $2\varepsilon_1 + \varepsilon_2$**
- (C)  $2\varepsilon_2 - \varepsilon_1$
- (D)  $2\varepsilon_2 + \varepsilon_1$

Answer: Option B

14. Shear stress induced in a shaft subjected to tension will be

- (A) Maximum at periphery and zero at center
- (B) Maximum at center
- (C) Uniform throughout
- (D) None of the above**

Answer: Option D

15. The relation between equivalent length ( $L$ ) and actual length ( $l$ ) of a column for both ends fixed is

(A)  $L = l/2$

(B)  $L = l/\sqrt{2}$

(C)  $L = l$

(D)  $L = 2l$

Answer: Option A

16. Strain is defined as the ratio of

(A) Change in volume to original volume

(B) Change in length to original length

(C) Change in cross-sectional area to original cross-sectional area

**(D) Any one of the above**

Answer: Option D

17. When a closely-coiled helical spring of mean diameter ( $D$ ) is subjected to an axial load ( $W$ ), the deflection of the spring ( $\delta$ ) is given by (where  $d$  = Diameter of spring wire,  $n$  = No. of turns of the spring, and  $C$  = Modulus of rigidity for the spring material)

(A)  $WD^3n/Cd'$

(B)  $2WD^3n/Cd'$

(C)  $4WD^3n/Cd'$

**(D)  $8WD^3n/Cd'$**

Answer: Option D

18. Percentage reduction of area in performing tensile test on cast iron may be of the order of

(A) 50 %

(B) 25 %

**(C) 0 %**

(D) 15 %

Answer: Option C

19. When a body is subjected to a direct tensile stress ( $\sigma_x$ ) in one plane accompanied by a simple shear stress ( $\tau_{xy}$ ), the maximum normal stress is

(A)  $(\sigma_x/2) + (1/2) \times \sqrt{(\sigma_x^2 + 4 \tau_{xy}^2)}$

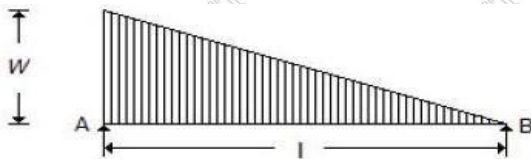
(B)  $(\sigma_x/2) - (1/2) \times \sqrt{(\sigma_x^2 + 4 \tau_{xy}^2)}$

(C)  $(\sigma_x/2) + (1/2) \times \sqrt{(\sigma_x^2 - 4 \tau_{xy}^2)}$

(D)  $(1/2) \times \sqrt{(\sigma_x^2 + 4 \tau_{xy}^2)}$

Answer: Option A

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



(A) A horizontal line

(B) A vertical line

(C) An inclined line

**(D) A parabolic curve**

Answer: Option D

21. The materials which exhibit the same elastic properties in all directions are called

(A) Homogeneous

(B) Inelastic

**(C) Isotropic**

(D) Isentropic

Answer: Option C

22. Modulus of rigidity may be defined as the ratio of

- (A) Linear stress to lateral strain
- (B) Lateral strain to linear strain
- (C) Linear stress to linear strain
- (D) Shear stress to shear strain**

Answer: Option D

23. The ratio of lateral strain to the linear strain within elastic limit is known as

- (A) Young's modulus
- (B) Bulk modulus
- (C) Modulus of rigidity
- (D) Poisson's ratio**

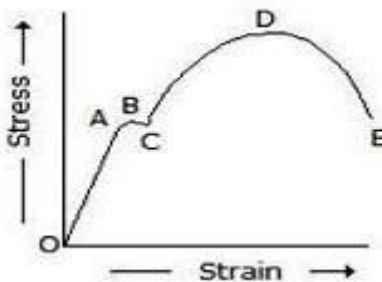
Answer: Option D

24. Shear modulus is the ratio of

- (A) Linear stress to linear strain
- (B) Linear stress to lateral strain
- (C) Volumetric strain to linear strain
- (D) Shear stress to shear strain**

Answer: Option D

25. In the below figure, the plastic range occurs



- (A) Before point A
- (B) Beyond point A**

(C) Between points *A* and *D*

(D) Between points *D* and *E*

Answer: Option B