

RAMS INSTITUTE MADURAI
CIVIL MODEL-6.7.25

1. The negative skin friction on a pile develops when

- (A) the soil in which it is driven is sandy soil
- (B) the ground water table rises
- (C) the soil near the tip is clay
- (D) the soil surrounding it settles more than the pile

2. The effective length of the fillet weld is

- (A) total length - (2x throat size)
- (B) total length - (2 x weld size)
- (C) 0.7 x total length
- (D) total length - weld size/ $\sqrt{2}$

3. P is the pre-stressed force applied to the tendon of rectangular pre-stressed beam whose area of cross section is A and sectional modulus is Z . The maximum stress f in the beam, subjected to a maximum bending moment M , is

- (A) $f = P/A + M/Z$
- (B) $f = P/A - M/Z$
- (C) $f = A/P + M/Z$
- (D) $f = A/P + M/6Z$

4. A steel plate is 30cm wide and 10mm thick. A rivet of nominal diameter 18mm is driven, The net sectional area of the plate is

- (A) 18 cm²
- (B) 28.20 cm²
- (C) 28.05 cm²
- (D) 32.42 cm²

5. Consider the following statements regarding tensile test diagrams for carbon steels with varying carbon contents:

As the carbon content increases

- (i) the ultimate strength of steel decreases
- (ii) the elongation before fracture increases
- (iii) the ductility of metal decreases
- (iv) the ultimate strength increases

Of these statements

- (A) (iii) and (iv) are correct
- (B) (i) and (iii) are correct
- (C) (i), (ii), (iii) are correct
- (D) none

6. The population equivalent factor for BOD is

- (A) 0.08 kg of BOD₅/day/person
- (B) 0.06 kg of BOD₅ /day/person
- (C) 0.8 kg of BOD₅/day/person
- (D) 0.6 kg of BOD₅/day/person

7. If c , γ and H_c are cohesion, unit weight of soil and critical height of slope, the stability number is given by

- (A) $C/\gamma H_c$
- (B) $H_c/C\gamma$
- (C) $\gamma H_c/C$
- (D) $C\gamma/H_c$

8. A short column of external diameter D and internal diameter d carries an eccentric load W . The greatest eccentricity which the load can have without producing tension on the cross section of the column would be

- (A) $(D+d)/8$
- (B) $(D^2+d^2)/8d$
- (C) $(D^2+d^2)/8D$
- (D) $\sqrt{[(D^2+d^2)/8]}$

9. According to the working stress method, the modular ratio between steel and concrete is

- (A) $280/3\sigma_{cbc}$
- (B) $280/0.45\sigma_{cbc}$
- (C) $280/5\sigma_{cbc}$
- (D) $250/0.45\sigma_{cbc}$

10. Match List I with List II and select a suitable answer by using the codes given below the list

List I

- a. Modulus of subgrade reaction
- b. Relative density and strength
- c. Skin friction and point bearing
- d. Elastic constants

List II

- 1. Cyclic pile load test
- 2. Pressure meter test
- 3. Plate load test
- 4. Standard penetration test

Codes:

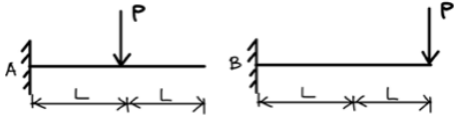
- (A) 3 4 2 1
- (B) 1 3 2 4
- (C) 2 4 1 3
- (D) 3 4 1 2

11. BOD exerted of waste water _____ with time, while BOD remaining _____ with time

- (A) Decrease, decrease
- (B) Increase, decrease
- (C) Decrease, increase
- (D) Increase, increase

12. The two cantilevers A and B shown in the figure have the same uniform cross section and the same material. Free end deflection of cantilever 'A' is Δ .

The value of mid span deflection of the cantilever 'B' is



- (A) $\Delta/2$
- (B) $2\Delta/3$
- (C) Δ
- (D) 2Δ

13. In limit state design of concrete for flexure, the area of stress block is taken as

- (A) $0.530 f_{ck} \cdot X_u$
- (B) $0.446 f_{ck} \cdot X_u$
- (C) $0.420 f_{ck} \cdot X_u$
- (D) $0.360 f_{ck} \cdot X_u$

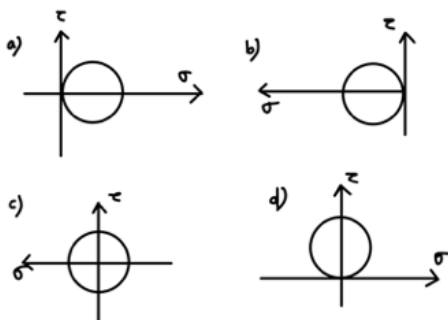
14. Two pipe system of providing building drainage consists of :

- (A) one soil pipe + one wastepipe + one vent pipe + one sullage pipe
- (B) one soil pipe + one waste pipe + two vent pipes
- (C) two soil pipes + two waste pipes
- (D) two soil pipes only.

15. In a two-dimensional problem, the state of pure shear at a point is characterized by

- (A) $\epsilon_x = \epsilon_y$ and $\gamma_{xy} = 0$
- (B) $\epsilon_x = -\epsilon_y$ and $\gamma_{xy} \neq 0$
- (C) $\epsilon_x = 2\epsilon_y$ and $\gamma_{xy} \neq 0$
- (D) $\epsilon_x = 0.5 \epsilon_y$ and $\gamma_{xy} \neq 0$

16. Which one of the following Mohr's circles represents state of pure shear



- (A) a
- (B) b
- (C) c
- (D) d

17.

For $\phi = 0$, the Terzaghi bearing capacity factors are

- a) $N_c = 1, N_q = 5.7, N_\gamma = 0$
- b) $N_c = 0, N_q = 5.7, N_\gamma = 1$
- c) $N_c = 5.7, N_q = 1, N_\gamma = 0$
- d) $N_c = 1, N_q = 0, N_\gamma = 5.7$

(A) a

(B) b

(C) c

(D) d

18. Maximum shear stress in a solid shaft of diameter D and length L twisted through an angle θ is τ . A hollow shaft of same material and length having outside and inside diameters of D and $D/2$ respectively is also twisted through the same angle of twist θ . The value of maximum shear stress in the hollow shaft will be:

(A) $16/15 \tau$

(B) $8/7 \tau$

(C) $4/3 \tau$

(D) τ

19. A floor slab of thickness t , is cast monolithically transverse to a rectangular continuous beam of span L , and width B . If the distance between two consecutive points of contra flexure is L_0 , the effective width of compression flange at a continuous support is

(A) B

(B) $L/3$

(C) $B + 12t$

(D) $B + 6t + L_0/6$

20. Minimum pitch of the rivets shall not be less than

(A) $1.5d$

(B) $2.0d$

(C) $2.5d$

(D) $3.0d$

where d is gross diameter of rivet