Structural Design - 1

Multiple Choice Questions

Q1 The maximum area of tension reinforcement in beams shell not exceed

A. 0.15%.

B. 1.5%.

C. 4%.

D. 1%.

Q2 The minimum number of main steel bars provided in R.C.C

A. Rectangular Column is 4.

B. circular Column is 6.

C. Octagonal Column is 8.

D. All the above.

Q3 An R.C.C column is treated as long if its slenderness ratio is greater than

A. 30   B. 35   C. 40   D. 50

Q4 The width of the flange of a T-beam should be less than.

A. One-third of the effective span of T-beam

B. distance b/w the centres of T-beam

C. breadth of the rib plus twelve times the thickness of the slab.

D. least of the above.

Q5 For M 150 mix concrete, A/c to I.S specifications, local bond stress, is

(A) 5 kg/cm²   (B) 10 kg/cm²   (C) 15 kg/cm²   (D) 20 kg/cm²   (E) 25 kg/cm²

Q6 The diameter of a longitudinal bars of a column should never be less than

A. 6mm   B. 8mm   C. 10mm   D. 12mm   E. None of the above

Q7) The design of a retaining wall assumes that the retained earth
A) is dry   B) is free from moisture   © is not cohesives   D) All the above-

Q8) The effective span of a s/s beam is
A. distance b/w centres of bearings.
B. Clear distance between the inner faces of the wall plus twice the thickness of the wall.
C. Clear span plus effective depth of the slab.
D. none-of these.

Q9) The number of tread in a flight is equal to
A. risers in the flight.
B. risers plus ore.
C. risers minus ore.
D. none-of these.

Q10) A short column 20cm×20cm in section is reinforced with 4 bars whose area of cross section in 20 sq. cm. If permissible compressive stresses in concrete and steel are 40 kg/cm² and 300 kg/cm², the safe load on the column, should not exceed.
(A) 41 20 kg   (B) 41 200 kg   © 412 000 kg   D none of these.

Q11) The percentage of minimum reinforcement of the gross sectional area in slab is
(A) 0.10%   (B) 0.12%   © 0.15%.   D 0.18%   (E) 0.20%.

Q12) In reinforced concrete structure, the steel reinforcement consists of
(a) deformed bars   (b) cold twisted bars   © mild steel   (d) all of the above.

Q13) A twisted bar has about ____ more yield than an ordinary mild steel bar,
(a) 10%.   (b) 20%.   © 35%.   (d) 50%.

Q14) In singly reinforced beam, steel reinforcement is provided in
(a) tension zone   (b) compression zone   © both   (d) neutral zone

Q15) In a singly reinforced beam, the effective depth is measured from the compression edge to the

(a) tensile edge   (b) centre g tensile reinforcement

(c) neutral axis   (d) none g these.

Q16) Analysis g reinforced concrete can be done by

(a) straight line theory   (b) elastic theory   (c) ultimate load theory

(d) all g these.

Q17) In case g cantilever beam, the tension zore is above neutral axis

(a) True   (b) False.

Q18) In a SRB singly reinforced beam, if load is very small

(a) Only concrete will resist tension   (b) Only steel bar resist

(c) both steel & Concrete resist tension   (d) both steel & concrete resist compression

Q19) The modular ratio is

(a) $\dfrac{280}{3\sigma cbc}$ (b) $\dfrac{280}{46cbc}$ (c) 19   (d) 23.

Q20) The moment of Resistance is

(a) compressive force developed in concrete   (b) tensile force developed in steel

(c) both a & b   (d) none g these.

Q21) In RC beam the shape g shear stress diagram is

(a) parabolic over the whole section

(b) Parabolic above the neutral section and rectangular below N.A

(c) linearly variable from N.A

(d) dependent on magnitude g shear reinforcement.

22) The c/c spacing of vertical stirrups in rectangular beam is
  ⓐ increased towards the centre g span
  ⓑ decreased " the centre g span
  ⓒ increased at the ends
  ⓓ none g these.

23) Value g of Modulus g Elasticity g concrete?
  ⓐ ~~5200~~ $E_c = 5000\sqrt{fck}$ ⓑ $500\sqrt{fck}$ ⓒ $50000\sqrt{fck}$
  ⓓ $25000\sqrt{fck}$

24) Unit weight of reinforced concrete is
  ⓐ ~~23 KN/m~~   ⓑ ~~24 KN/m³~~   ⓒ ~~25 KN/m~~
  ⓐ 23 KN/m   ⓑ 24 KN/m   ⓒ 25 KN/m   ⓓ 26 KN/m

25) The limiting value g depth g neutral axis in HYSD reinforcement g Fe 415 is
  ⓐ 0.48d   ⓑ 0.53d   ⓒ 0.46d   ⓓ 0.44d

26) Basic span to effective depth ratio g s/s beam is
  ⓐ 7   ⓑ 20   ⓒ 26   ⓓ 30

27) How development length is calculated
  ⓐ $Ld = \dfrac{\phi \sigma_y}{4\tau_{bd}}$ ⓑ $Ld = \dfrac{\phi \sigma_c}{5\tau_{bd}}$ ⓒ $Ld = \dfrac{\phi \sigma_s}{4\tau_{bd}}$
  ⓓ $Ld = \dfrac{\phi \sigma_s}{3\tau_{bd}}$

28) Minimum shear reinforced in vertical stirrup is
  ⓐ 0.4 N/mm²   ⓑ 0.5 N/mm²   ⓒ 0.6 N/mm²   ⓓ 0.2 N

29) The longitudinal shearing stresses acting on surface betwe steel & concrete are
  ⓐ bond stresses   ⓑ tensile stresses   ⓒ compressive
  ⓓ none g these.

30) The bond between steel and concrete is due to
    (a) pure adhesive resistance   (b) frictional resistance
    (c) mechanical resistance   (d) all of these.

31) The term 'bond' is used to between steel & concrete
    is prevented by
    (a) resistance   (b) crack   (c) slip.

32) Permissible value of bond stress for M10 grade
    concrete is
    (a) $0.5 \, N/mm^2$ (b) $1 \, N/mm^2$ (c) $1.5 \, N/mm^2$ (d) $2 \, N/mm^2$

33) Bars of tensile reinforcement of a rectangular beam
    is
    (a) are curtailed when not required to resist the bending
    moment.
    (b) are bent up at suitable places to serve as shear reinfor-
    cement.
    (c) are maintained in the bottom to provide at least
    bond stress
    (d) all of the above.

34) The max^m value of spacing of vertical reinforcement should
    not exceed by ___ the thickness of wall
    (a) equal to   (b) 1.5 times   (c) 2 times   (d) 3 times.

35) Which of the following statement is true?
    (a) The anchorage value of hook is assumed 16 times the dia of bar
    if $\theta = 45°$
    (b) steels bars are generally connected together to get grea-
    ter length than the standard length
    (c) For mild steel it should be U-shaped
    (d) all of the above.

36) The section of the beam having greater width at the top in comparision to width below N-A is
@ Critical section ⓑ T-section © L-section ⓓ none of these.

37) The breadth of web of T-beam should atleast be equal to ___ the depth of web.
ⓐ $\frac{1}{2}$ · ⓑ $\frac{1}{3}$rd © $\frac{1}{4}$th ⓓ $\frac{1}{6}$th

38) The assumed overall depth of T-beam is
ⓐ $\frac{1}{10}$ to $\frac{1}{12}$ ⓑ $\frac{1}{12}$ to $\frac{1}{15}$ © $\frac{1}{15}$ to $\frac{1}{20}$ ⓓ $\frac{1}{20}$ to $\frac{1}{25}$

39) The N-A of T-beam falls
ⓐ within the flange ⓑ outside the flange
© either (a) or (b) ⓓ none of these.

40) The transverse reinforcement provided at right angle to main reinforcement
ⓐ Distribution of load ⓑ Resict the temperature stress
© Resist the shrinkage stress ⓓ All of the above.

41) R.C.C column is called of Short column if slenderness ratio is less than
ⓐ 30 ⓑ 35 © 40 ⓓ 50

42) If R is Rise, T is Tread & W is weight on waist slab on the slope, then equivalent weight on horizontal place is
ⓐ $W\frac{R+T}{T}$ ⓑ $\frac{W\cdot T}{R+T}$ © $\frac{W\sqrt{R^2+T^2}}{T}$ ⓓ $\frac{W\sqrt{R^2+T^2}}{R}$

43) The area of longitudinal steel reinforcement in columns should not be
ⓐ less than 0.8% of gross area
ⓑ more than 6% of gross sectional area.
© either a & b
ⓓ both a & b

44) The ese tranverse reinforcement is taken in slab is

ⓐ 0.15 % of gross concrete area

ⓑ 0.3 % of gross concrete area

ⓒ 0.45 % of gross concrete area

ⓓ 0.6 % of gross concrete area.

45) The dia in longitudional bar in column should not be less than

ⓐ 4mm   ⓑ 8mm   ⓒ 12mm   ⓓ 16cm

46) The pitch of transverse reinforcement should not be more than

ⓐ least lateral dimention of column

ⓑ 16 Dia of 16 times dia of bar

ⓒ 48 times dia of transverse reinforcement

ⓓ minimum of above.

47) A very comfortable type of stair is

ⓐ straight   ⓑ Dog-legged   ⓒ geometrical

ⓓ Newel

48) The distribution reinforcement is also called —

ⓐ longitudional   ⓑ transverse