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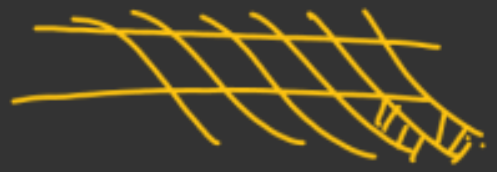
Q: 1) Yield stress of ordinary mild steel bars after twisting to a pitch of about 9 to 12 diameters



A : Increases by about 50%

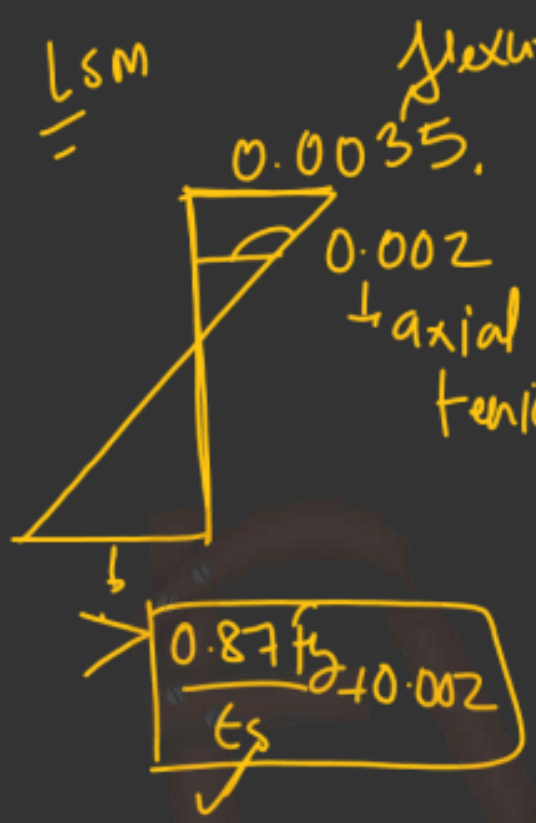
B : Decreases by about 30%

C : Increases by about 20%

D : Decreases by about 10%

↳ 50 to 100% yield stress increase

A.



Q: 2) Consider the following statements concerning both the working stress design and ultimate strength design of reinforced concrete

1. Plane section before bimgending remains plane after bending

2. The tensile strength of concrete is ignored

Of these statements

A : 1 alone is correct

B : 2 alone is correct

C : Both 1 and 2 are correct

D : Both 1 and 2 are false

Q: 3) The final def;ection due to all loads including the effects of temperature, creep and shrinkage and measured from as-cast level of supports of floors, roofs and all other horizontall members should not exceed

A : Span/350

B : Span/300

C : Span/250

D : Span/200

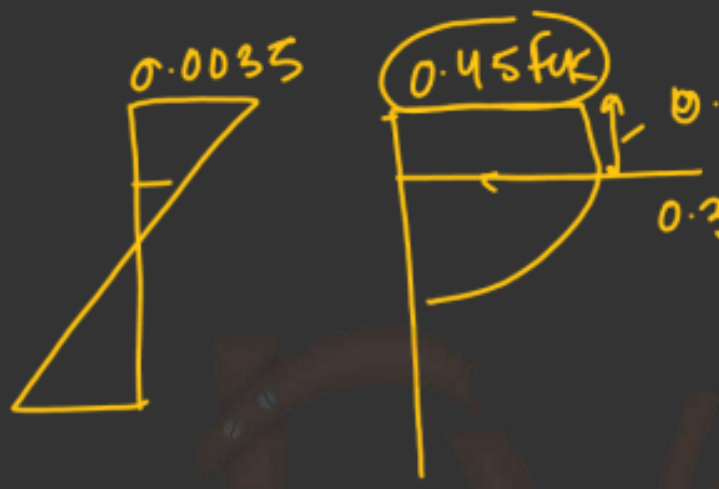
Q: 4) As per IS : 456-1978, the ratio of stress in concrete to its characteristic strength at collapse in flexure for design purposes is taken as

A : 0.67

B : 0.576

C : 0.447

D : 0.138



$\frac{0.45 f_{ck}}{f_{ck}} = 0.45$

2000

A

ESE

fck → characteristic st.

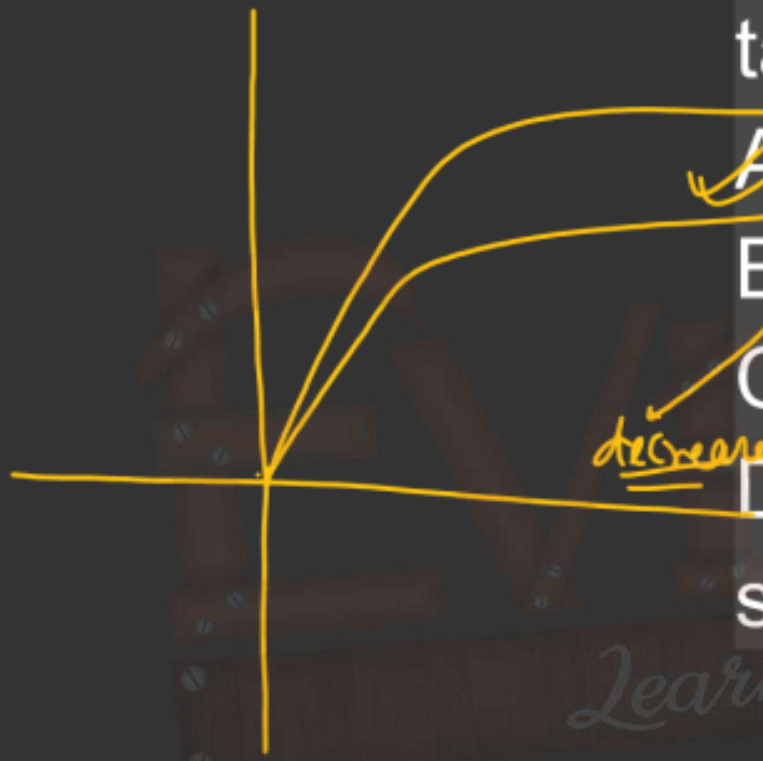
$\frac{2}{3} f_{ck}$ S.F = $0.67 f_{ck}$

IS:456:2000

$\frac{0.67 f_{ck}}{1.5} = 0.445 f_{ck}$

$\frac{0.67 f_{ck}}{f_{ck}} = 0.67$

Q: 5) As compared to working stress method of design, limit state method takes concrete to



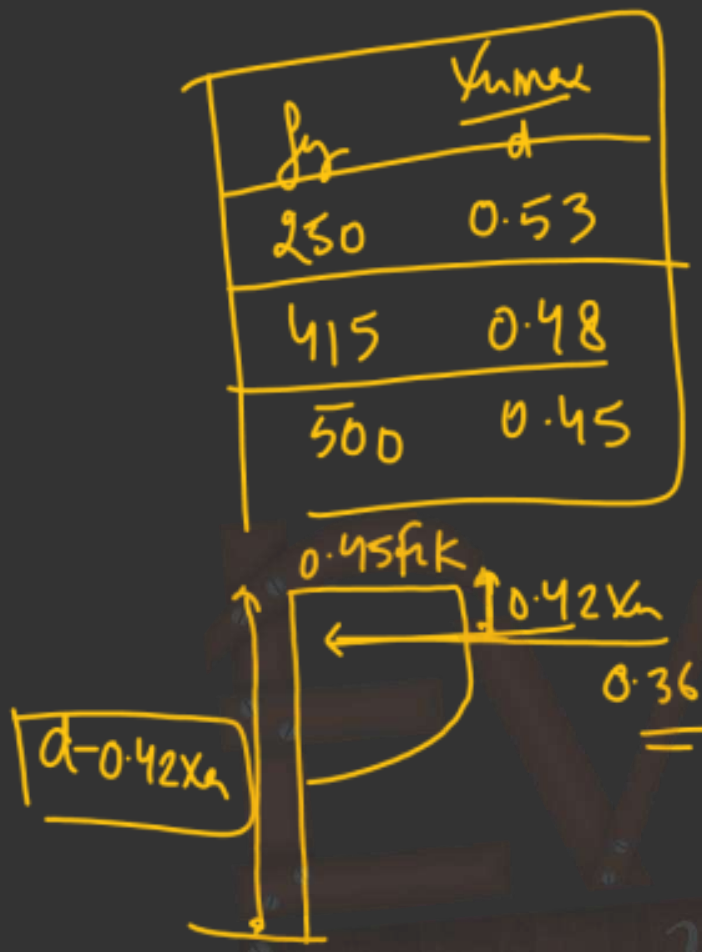
A : A high stress level

B : A lower stress level

C : The same stress level

D : Sometimes higher but generally lower stress level

A



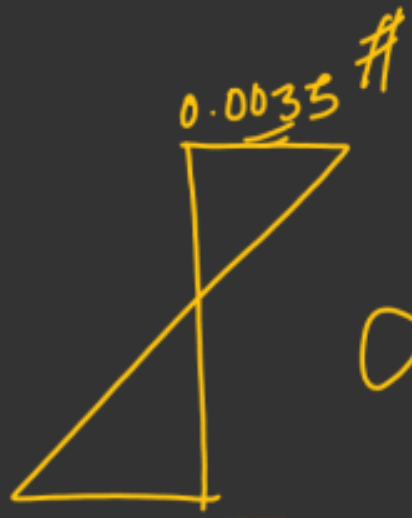
Q: 6) As per IS : 456, for a singly reinforced rectangular section,

A : $x_{u,max}/d$

B : The depth of centroif of compression is 0.43 $x_{u,max}$

C : The depth of the rectangular portion of the stress block is 0.38 $x_{u,max}$

D : The maximum value of lever arm d-$x_{u,max}$



Q: 7) Consider the following statements: The deign for the limit state of collapse in flexure is based on the following assumptions

1. Plane sections normal to the axis remain plane after bending
2. The maximum strain in concrete at the outermost tension fibre is 0.0035
3. The relationship between the compressive stress distribution in concrete and the strain in concrete may be assumed to be rectangular, trapezoidalm parabolic or any other shape which results in prediction of strength in substantial agreement with the results of tests.

Select the correct answer using the codes given below

A : 1 and 3

B : 1, 2 and 3

C : 2 and 3

D : 1 and 2

design load. (1)

design stangth.

$= P > P_u$

stress in concrete < fck

$0.95 \times 0.05 + 0.05 \times 0.95 + 0.05 \times 0.05$

$= 0.0975$ $= 9.75 \times 10^{-2}$

Q: 8) The porbability of failure implied in limit state design is of the order of

A : 10^{-2}

B : 10^{-3}

C : 10^{-4}

D : 10^{-5}

A. 10^{-2}

Q: 9) Consider the following statements Under-reinforced concrete flexural members

1. Are deeper
2. Are stiffer
3. Can undergo larger deflection

Which of these statements is/are correct?

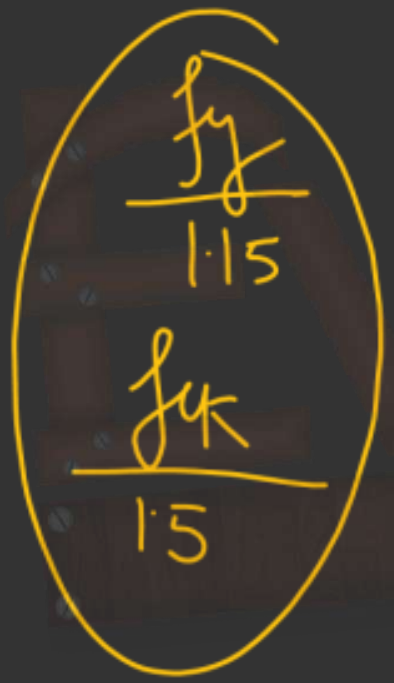
A : 1, 2 and 3

B : 1 and 2

C : 2 only

D : 1 and 3

Limit state of Collapse → permissible limit

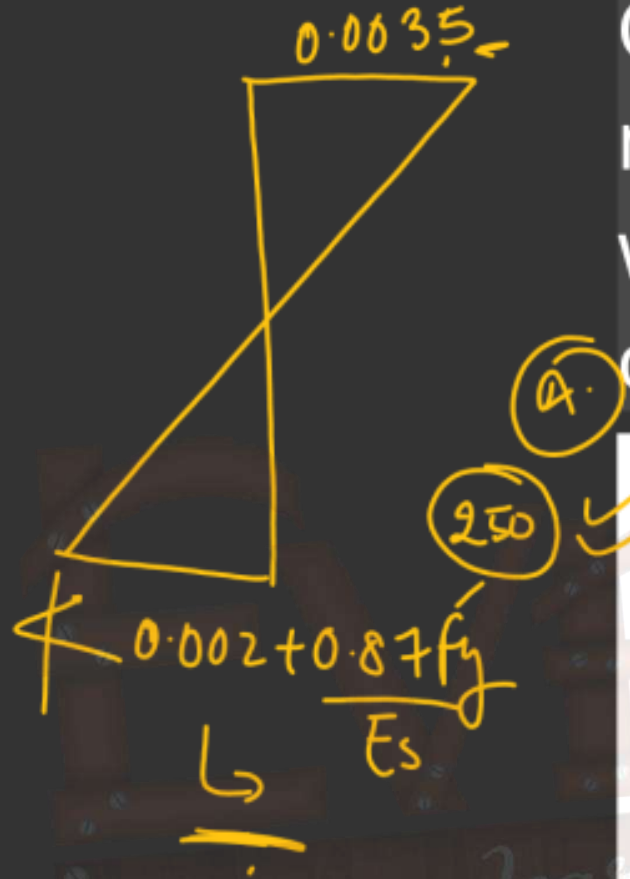


Q: 10) Consider the following statements

1. The limit sate of collapse is defined as the acceptable limit for the stresses in the materials.
2. Limit state method is one that ensures adequate safety of structure against collapse
3. In the limit state design methid, actual stresses developed at collapse differ considerably from the theoretical values

Which of the above statements is/are correct?

A : 1 and 2
B : 1 and 3
C : 2 and 3
D : None



Q: 11) The maximum strain in the tension reinforcement in the sectuin at failure when designed for the limit state of collapse should be

A : $> \left(\frac{f_y}{1.15E_s} + 0.002 \right)$

B : $< \left(\frac{f_y}{1.15E_s} + 0.002 \right)$

C : Exactly equal to $\left(\frac{f_y}{1.15E_s} + 0.002 \right)$

D : < 0.002

Everexam Tech.

Q: 12) Which one of the following is employed to determine strength of hardened existing concrete structrue?

A : Bullet test

B : Kelly ball test

C : Rebound hammer test

D : Cone penetrometer

(NDT)

Non distruphn Teting

UPV

$m = \frac{E_s}{E_c}$

Short term modulus

$f_{cr} = 0.7\sqrt{f_{ck}}$

Q: 13) Consider the following statements:

1. In reinforced cement concrete, modular ratio is defined by the ratio (modulus of elasticity of steel)/(modulas of elasticity of concrete).
2. Modulus of rupture of cement concrete is a function of its characteristic compressive strength
3. The characteristic compressive strength of M 20 grade cement concrete at 7 days is 20 N/mm2

Which of the statements given above are correct?

2 & days st.

B

A : 1, 2 and 3

B : 1 and 2 only

C : 2 and 3 only

D : 1 and 3 only

1 2 3, 4 5 6 7 8

Q: 14) What is the minimum value of infividual test results (in N/mm2) for compressive strength compliance requirement for concrete M20 as per codal provision?

A : f_{ck}-1

B : f_{ck}-3

C : f_{ck}-4

D : f_{ck} - 5

B

IS code Recomendation:
=> M15 and abon
4 Nonoverlapping Individual
$f_{ck}+0.825\sigma$
or
$(f_{ck}-3)$ N/mm^2
$(f_{ck}+3)$ N/mm^2

m = 13, M20
fy = 415

$\frac{x_c}{d} = \frac{m\sigma_{cbc}}{m\sigma_{cbc} + \sigma_t}$

Working stress M20

$\sigma_{cbc} = 7 N/mm^2$

$\sigma_t = 230 N/mm^2$

$\frac{x_c}{d} = \frac{13 \times 7}{13 \times 7 + 230}$

Q: 15) Consider modular ratio as 13, grade of concrete as M20 and grade of steel as 415, what is the ratio of balanced depth of neutral axis as per working stress method to the balanced depth of neutral axis as per limit state method?

A : 44754

B : 44631

C : 44902

D : 44868

$\frac{x_{umax}}{d} = 0.479$

Q: 16) Match List-I with List-II and select the correct answer using the code given below the lists:

List-I	List-II
A. Moment & Shear	1. Durability Coefficients
B. Fire resistance	2. Stability
C. Sliding	3. Analysis of structures
D. Span to depth	4. Deflection limit

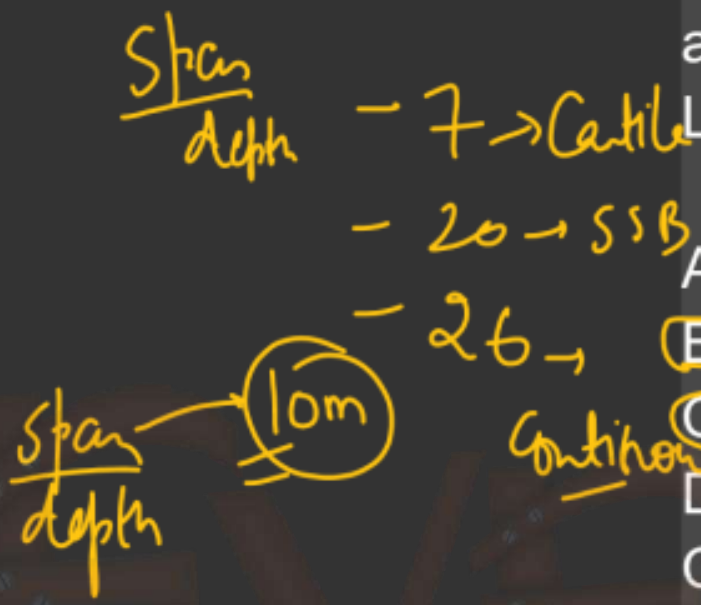
Code:

A : 4, 2, 1, 3

B : 3, 2, 1, 4

C : 4, 1, 2, 3

D : 3, 1, 2, 4



A-3, B-1, C-2, D-4

D.

$P_{t\lim} = 41.38 \frac{f_{ck}}{f_y} \frac{x_{u\lim}}{d}$

$\frac{x_{u\lim}}{d} = 0.53$ — Fe 250

0.48 — 415

0.46 — 500

$E_s = 2 \times 10^5$

Q: 17) Consider the following statements Percentage of steel for balanced design of a singly reinforced rectangular section by limit state method depends on

1. Characteristic strength of concrete
2. Yield strength of steel
3. Modulus of elasticity of steel
4. Geometry of the section

Which of these statements are correct?

A : 2, 3 and 4

B : 1, 3 and 4

D.

C : 1, 2 and 4

D : 1, 2 and 3

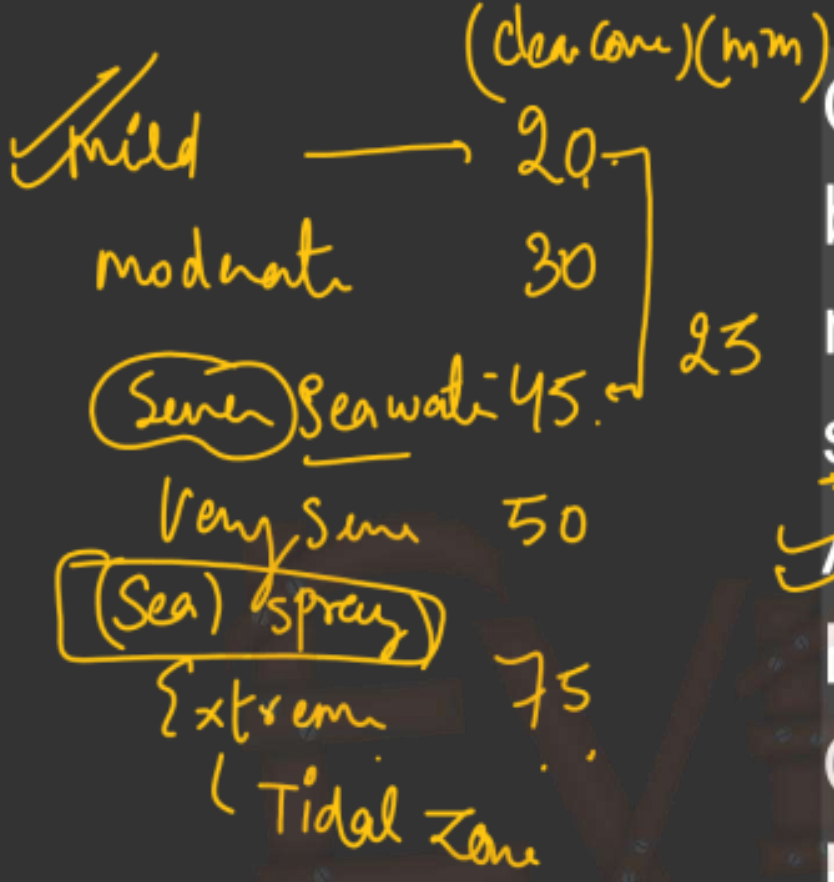
Q: 18) In a R.C. section under flexure, the assumption that 'a plane section before bending remains plane after bending" leads to

A : Strain distribution being linear across the depth

B : Stress distribution being linear across the depth

C : Both stress and strain distribution being linear across the depth

D : Shear stress distribution being uniform along the dept



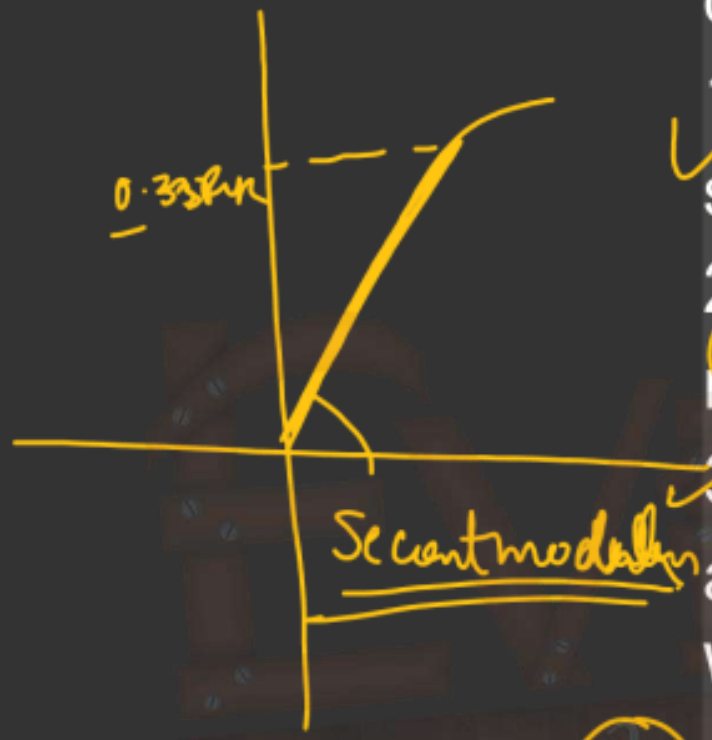
Q: 19) The additional cover thickness to be provided in reinforced concrete members that are totally immersed in seawater is

A : 25 mm

B : 30 mm

C : 35 mm

D : 40 mm



Q: 20) Consider the following statements concerning 'elasticity of concrete'.

1. Stress-strain behaviour of concrete is a straight line up to 10% of ultimate stress
2. Strain determination is obtained from tangent modulus
3. Modulus of elasticity of concrete is also called as secant modulus

Which of the above statements are correct?

B

A : 1, 2 and 3

B : 1 and 3 only

C : 1 and 2 only

D : 2 and 3 only

ductile failure
Under R/F section

$x_u < x_{u\,limit}$

Q: 21) If any tension reinforcement in an RC beam attains its yield stress during laoding before the concrete in the compression zone fails due to crushing, the beam is said to be

A : Under-reinforced

B : Over-reinforced

C : Balanced

D : None-homogeneous

Q: 22) The permissible bending compressive strength for M25 grade of concrete is 8.5 N/mm2.

Its short-term and long-term modular ratios are, nearly

A : 8 and 11

B : 8 and 8

C : 11 and 11

D : 11 and 6

Short term modular Ration

$m = \frac{E_s}{E_c} = \frac{2 \times 10^5}{5000\sqrt{f_{ck}}}$

$f_{ck} \rightarrow 25$

$= 8$

Long term modular Ratio

$m = \frac{280}{3\sigma_{bc}}$

$= \frac{280}{3 \times 8.5} = 11$

A

Q: 23) As per IS - 456 : 2000, cracking of concrete in tension zone cannot be avoided but can be limited by

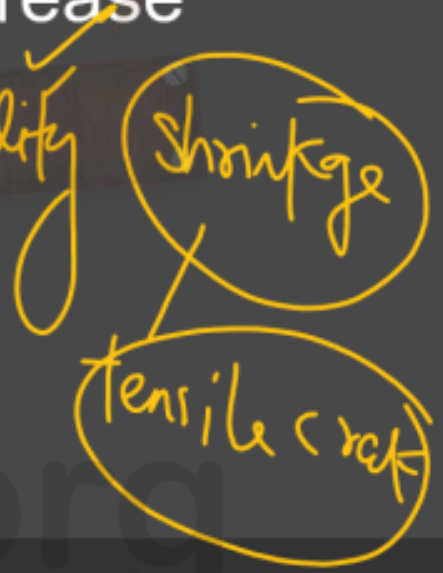
1. Adhering to the codal requirements of minimum steel area
2. Proper and prolonged curing of concrete
3. Increasing water cement ratio to increase workability

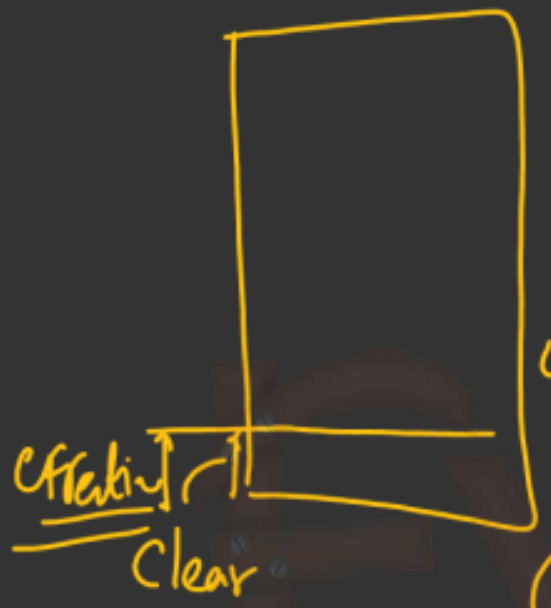
A : 1 and 2 only

B : 1 and 3 only

C : 2 and 3 only

D : 1, 2 and 3

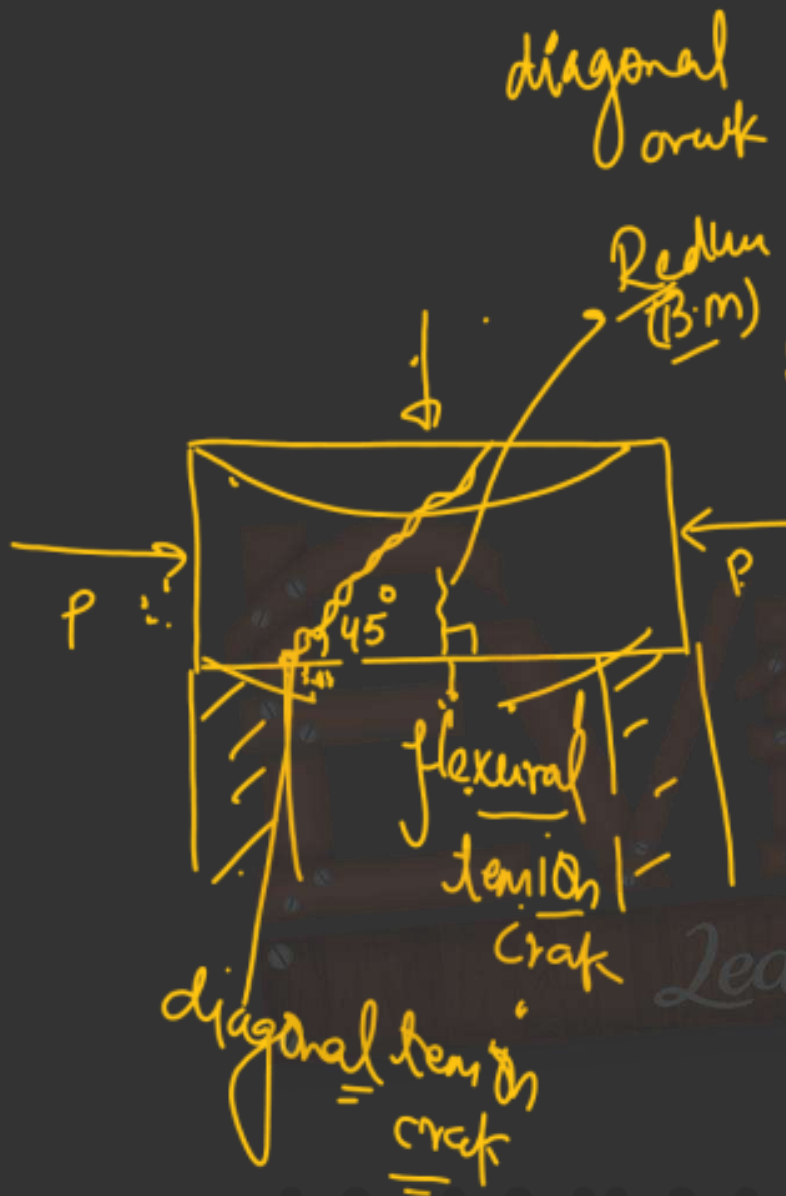




Q: 24) Which of the followingare correct for cover to reinforcement?

1. The reinforcement shall have a minimum clear cover of 20 mm or diameter of such bar whichever is more
2. At each end of reinforing bar not less than 25 mm nor less than twice the diameter of such bar
3. Increased cover thickness may be provided when surface of concrete is exposed to the action of harmful chemicals

A : 1, 2 and 3
B : 1 and 2 only
C : 1 and 3 only
D : 2 and 3 only



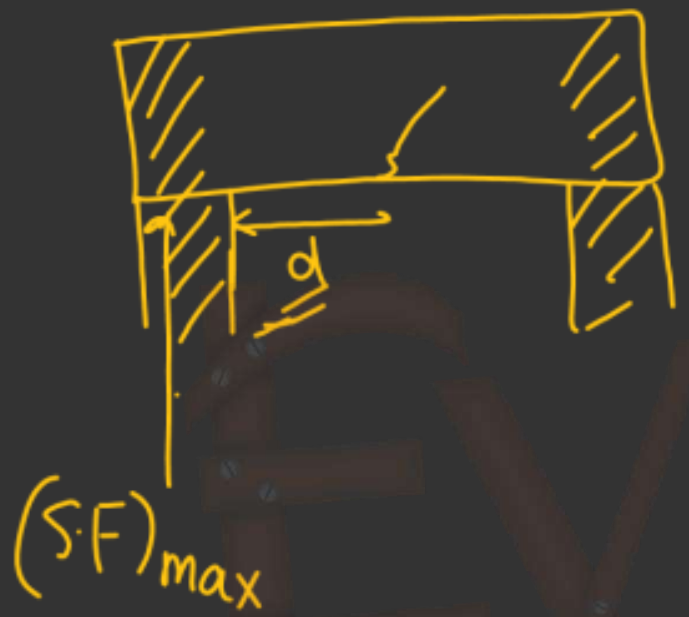
Q: 25) The chances of diagonal tension cracks in R.C.C member reduce when

A : Axial compression and shear force act simultaneously

B : Axial tension and shear force act simultaneously

C : Only shear force act

D : Flexural and shear force act simultaneously



Q: 26) Which one of the following statement is correct?

The critical section for computing design shear force in an R.C. beam where the supports exert a compressive reaction is at

A : The centre of support

B : The face of support

C : A distance of half of effective depth from the face of support

D : A distance of effective depth from the face of support

τ_c — Ast, f_{ck} — compressive S.t. of Concrete

τ_c

Q: 27) Shear strength of concrete in a reinforced concrete beam is a function of which of the following:

1. Compressive strength fo concrete
2. Percentage of shear reinforcement
3. Percentage of longitudinal reinforcement in tension in the section
4. Percentage total longitudinal reinforcement in the section

Select the correct answer using the code given below:

A : 1, 2 and 4

B : 1, 2 and 3

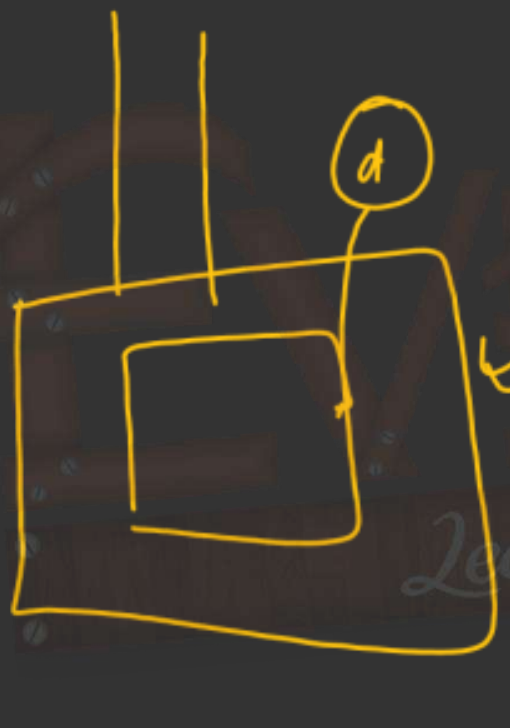
C : Only 1 and 3

D : Only 1 and 4

C

$0.87 f_y \phi$

$4 \tau_{bd}$



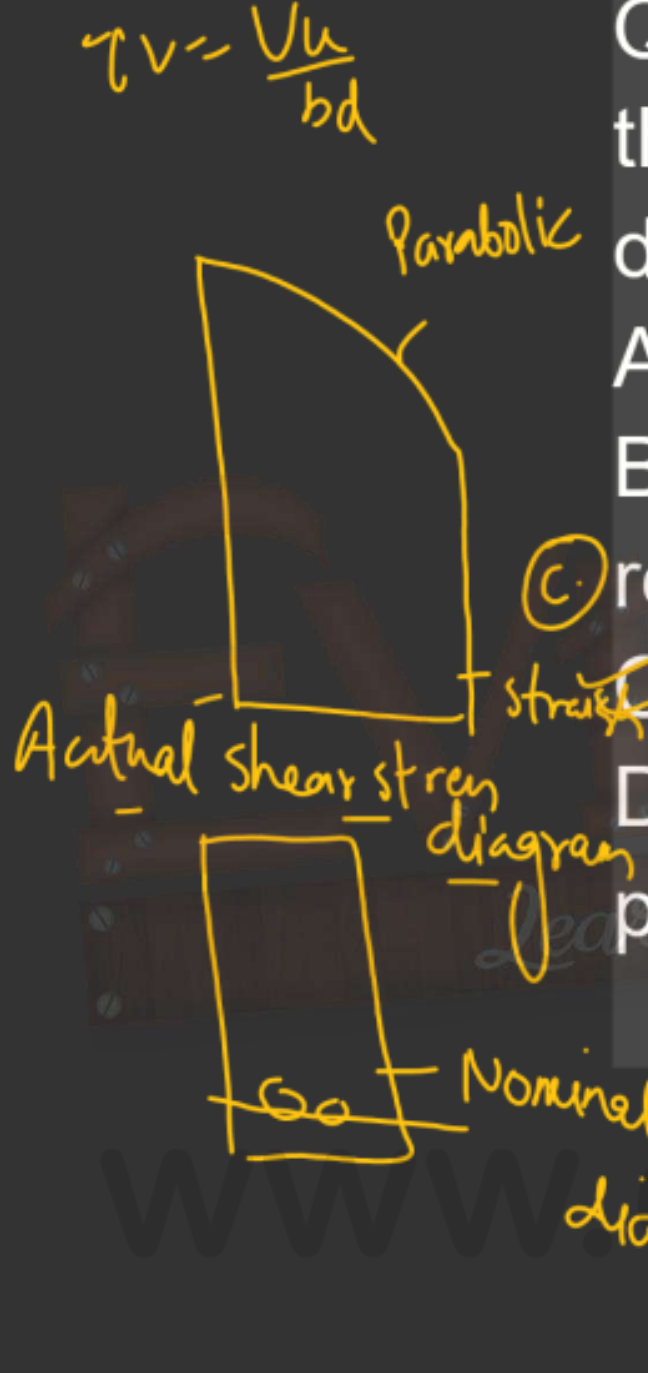
Q: 28) A beam is designed for uniformly distributed loads causing compression in the supporting columns. Where is the critical section for shear? (d is effective depth of beam the Ld is development length)

A : A distance Ld /3 from the face of the support

B : A distance d from the face of the support

C : at the centre of the support

D : At the mid span of the beam



Q: 29) In a reinforced concrete section, the shape of the nominal shear sterss diagram is

A : Parabolic over the full depth

B : Parabolic above the neutral axis and rectangular below the neutral axis

C : Rectangular over the full depth

D : Rectangular above the niutral axis and parabolic below the neutral axis

Q: 30) If the stirrup spacing is equal to 0.75 times the effective depth of an RC beam, then the shear capacity of stirrup steel is equal to

$0.87 f_y A_{sv} \frac{d}{s_v}$

$0.75d$

$\frac{0.87 f_y A_{sv} d}{0.75d}$

$= 1.16 f_y A_{sv}$

(B)

A : $1.25(f_y\ A_{sv})$

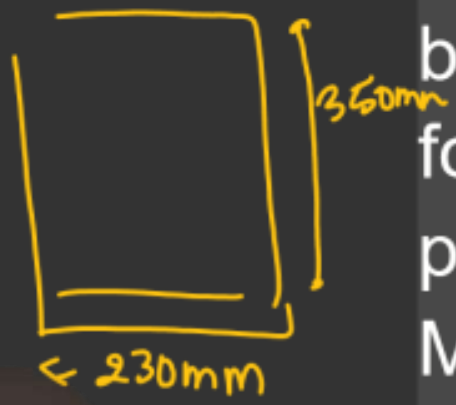
B : $1.16(f_y\ A_{sv})$

C : $1.00(f_y\ A_{sv})$

D : $0.80(f_y\ A_{sv})$

Where f_y is yield strength and A_{sv} is cross sectional area of the stirrup steel.

$V_u = 80 KN$



Q: 31) A rectangular 230 mm × 350 mm beam is (effective depth). The factored shear force acting at a section is 80 kN. If the permissible shear stress in concrete is 0.25 MPa, the design shear force is nearly

A : 100 kN

B : 80 kN

C : 60kN

D : 20 kN

Shear force Resisted by Concrete section

$V_c = 0.25 \times 230 \times 350$

$V_d = V_u - V_c$

$\tau_v = \frac{V_u}{bd}$

$\tau_c = \frac{V_c}{bd}$

Curtailment

Q: 32) Consider the following statememnts

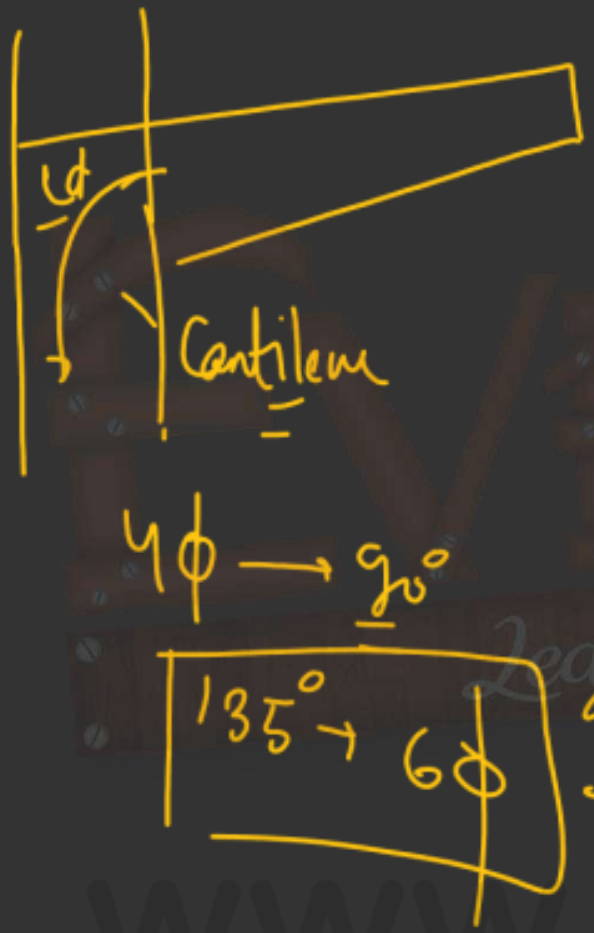
1. Reinforcement that is no longer required for flexure beyond a certain section, shall however be extended by d or , whichever is greater, before being curtailed
2. At least half the bars should be bent up at the cut-off point
3. The shear capacity at cut off point should at least be 1.5 times the shear force at the section

Which of the statements given above are correct?

B

A : 1 and 2
B : 1 and 3
C : 2 and 3
D : 1, 2 and 3

Q: 33) Match List-I (Reinforcement Type) with List II (Anchorage requirement) and select the correct answer using the codes given below the lists



List-I	List-II
A. Footing slab, tensile reinforcement	1. $L_d/3$ into the support
B. Cantilever beam, Tensile reinforcement	2. 6ϕ *for* 135^o *bend*
C. Simply supported beam, tensile reinforcement	3. L_d into the support
D. Beam, shear stirrup	4. L_d from the columne face

Codes:

A : 1, 3, 4, 2

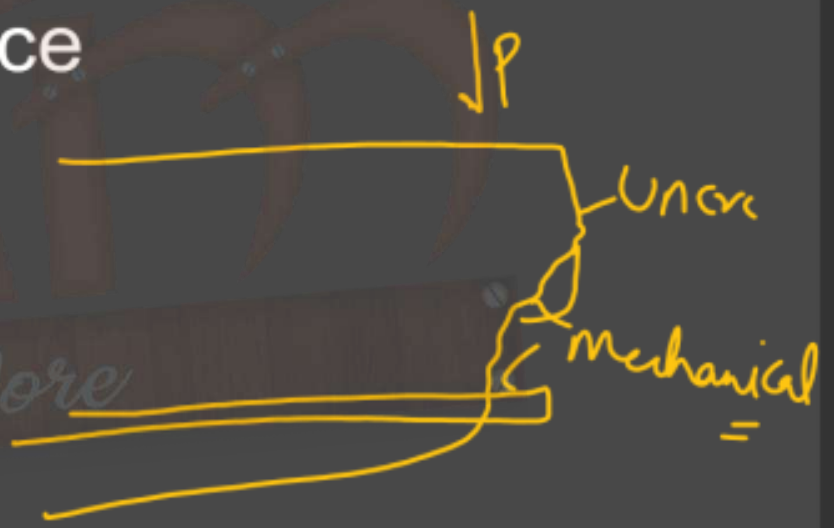
B : 1, 2, 4, 3

C : 4, 3, 1, 2

D : 4, 3, 2, 1

Q: 34) The bond between steel and concrete is mainly due to

1. Mechanical resistance
2. Pure adhesive resistance
3. Frictional resistance



A : 1 and 2 only

B : 1 and 3 only

(D) C : 2 and 3 only

D : 1, 2 and 3

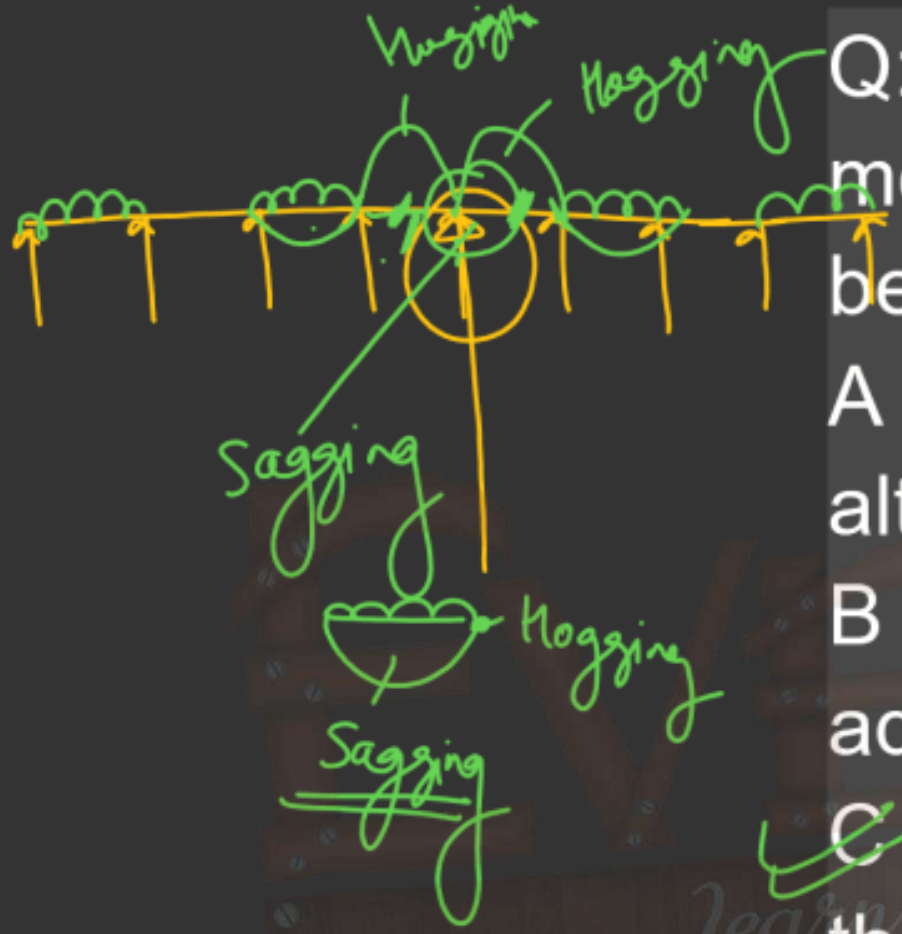
Q: 35) If a beam is likely to fail due to high bonding stresses, then its bind strength can be increased most economically by

A : Providing vertical stirrups

B : Increasing the depth of the beam

C : Using smaller diameter bars in corresponding more numbers

D : Using higher diameter bars by reducing their numbers



Q: 36) For maximum sagging bending moment at support in a contunuous RC beam, live load should be placed on

A : Spans adjacent to the support plus alternate spans

B : All the spans except the spans adjacent to the support

C : Spans next to the adjacent spans of the support plus alternate spans

D : Spans adjacent to support only

Q: 37) Consider the following statements: The reinforcement in reinforced concrete shall have concrete cover, the thickness of such cover shall be not less than

1. 25 mm
2. The diameter of bar
3. The spacing between bars
4. 5 mm

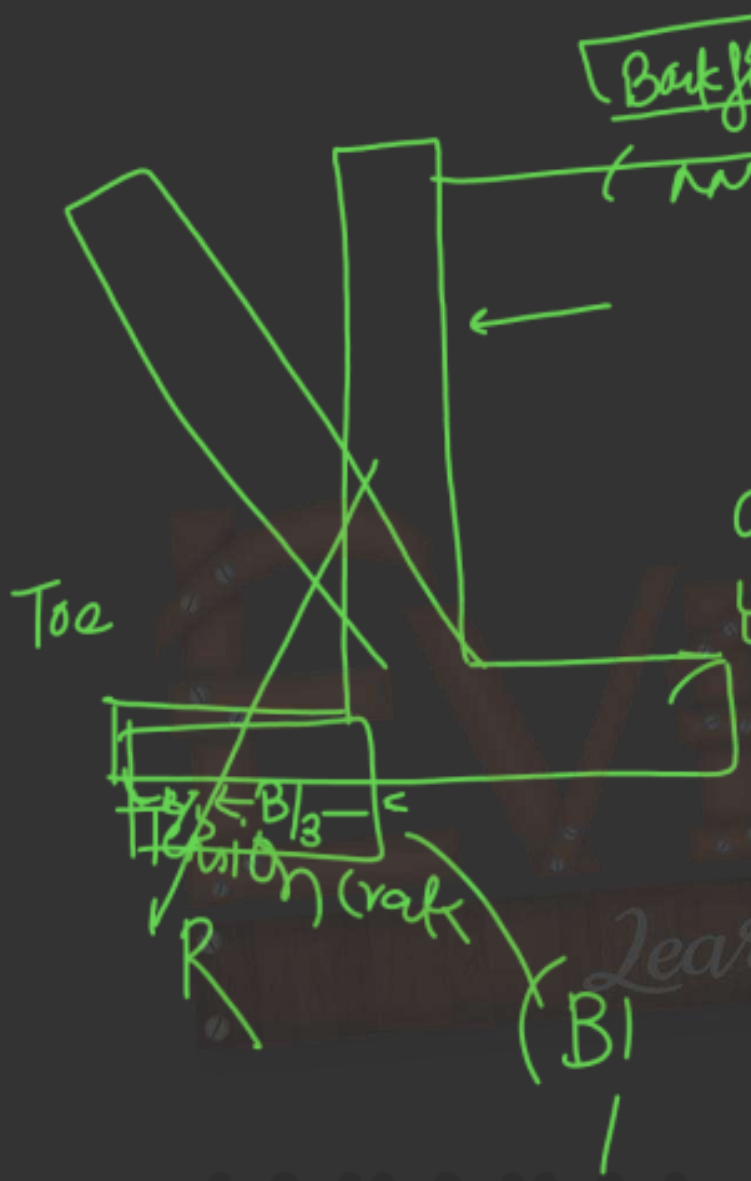
Which of these statements are correct?

A : 2 and 4

B : 1 and 4

C : 2 and 3

D : 1 and 2



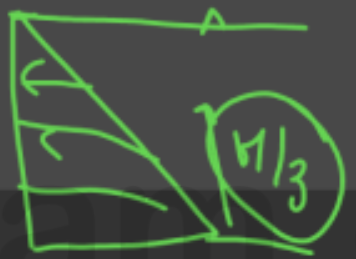
Q: 38) In the design of as masonry retaining wall, the

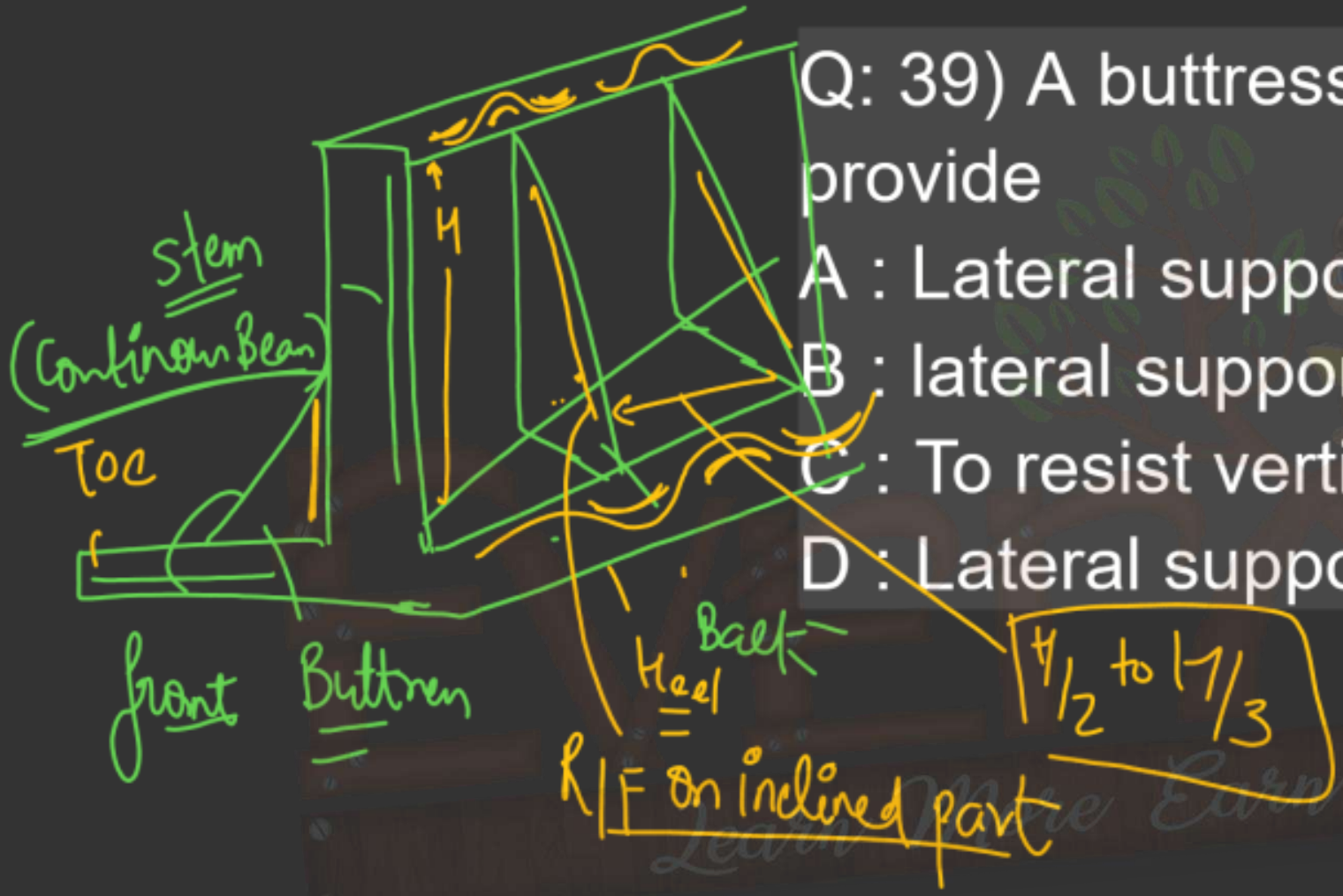
A : Vertical load should fall within the middle-third of base width

B : Horizontal thrust should act as h/3 from base

C : Resultant load should fall within a distance of one-sixth of base width on either side of its midpoint (C)

D : Resultant load should fall within a distance of one-eight of base width on eithe rside of its midpoint





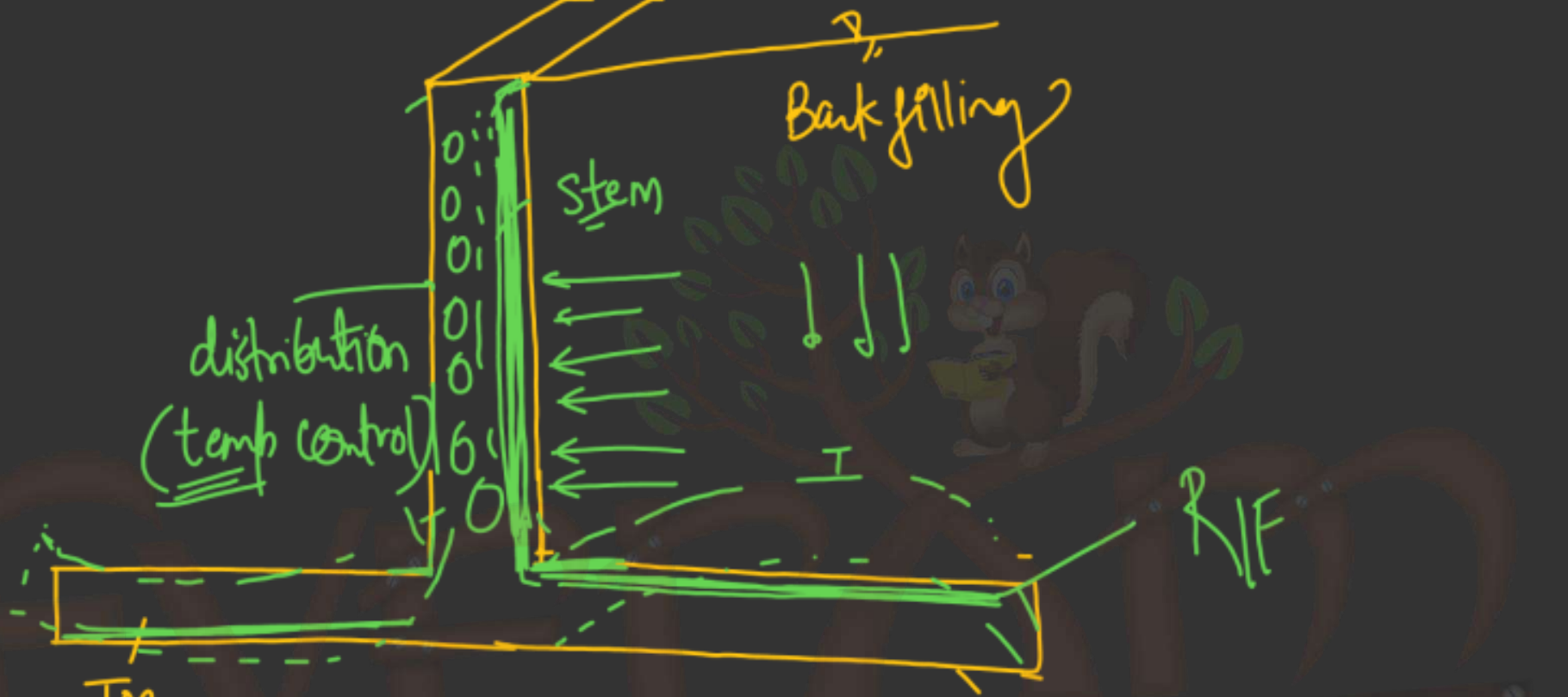
Q: 39) A buttress in a wall is intended to provide

A : Lateral support to roof slab only

B : lateral support to wall

C : To resist vertical loads only

D : Lateral support to roof beams only



all toe, Heel & stem are design as Cantilever Beam

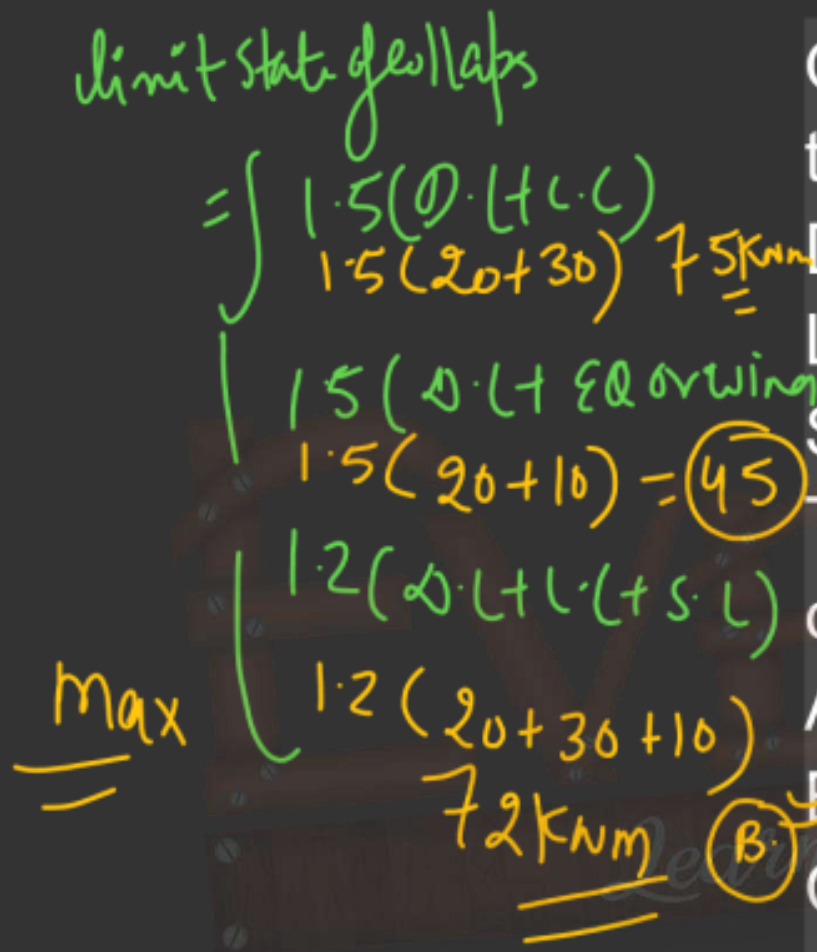
Q: 40) Shrinkage in a concrete slab

A : Causes shear cracks

B : Causes tension cracks

C : Causes compression cracks

D : Does not cause any cracking



Q: 41) A reinforced concrete beam is subjected to the following bending moments:

Dead load 20 kNm

Live load 30 kNm

Seismic load 10 kNm

The design bending moment for limit state of collapse is

A : 60 kNm

B : 75 kNm

C : 72 kNm

D : 80 kNm

Q: 42) match List-I (Beam Variable) with List-II (Design provision) and select the correct answer using the codes:

List-I	List-II
A. Flexure	1. Minimum depth of section
B. Shear	2. Longitudinal steel reinforcement
C. Bond	3. Stirrups
D. Deflection	4. Anchorage in support

Codes

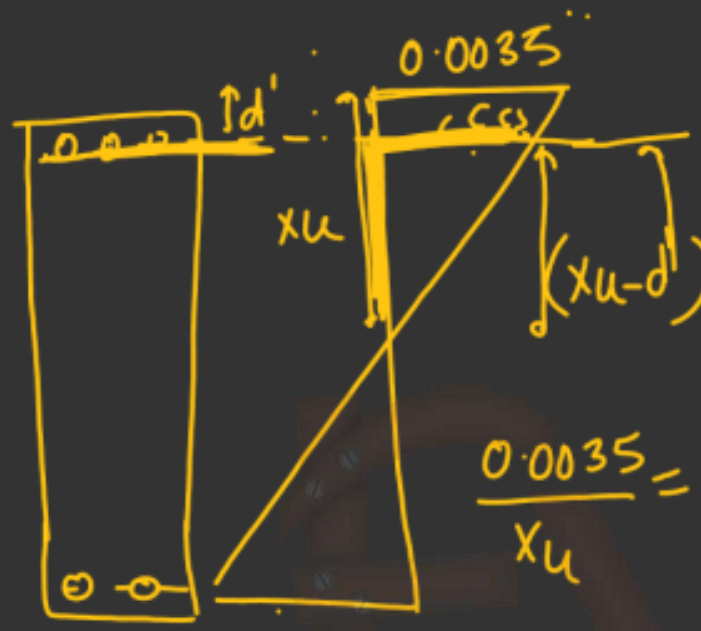
A : 3, 2, 1, 4

B : 2, 3, 1, 4

C : 3, 2, 4, 1

D : 2, 3, 4, 1

Q: 43) Consider the following statements?
The main reinforcement in the counterfort in a counterfort retaining wall of RCC is provided on the
1. Inclined face in front of counterfort
2. Bottom face in back counterfort
3. Inclined face in back counterfort
4. Bottom face in front counterfort
Select the correct answer using the code given below:
A : 1 and 2
B : 2 and 3
C : 3 and 4
D : 2 and 4



$$\frac{0.0035}{x_u} = \frac{\epsilon_{cs}}{x_u - d'}$$

$$0.0035\left(\frac{x_u - d'}{x_u}\right) = \epsilon_{cs}$$

$$0.0035\left(1 - \frac{d'}{x_u}\right)$$

Q: 44) A doubly reinforced concrete beam has effective cover d' to the centre of compression reinforcement xu is the depth of neutral axis, and d is the effective depth to the centre of tension reinforcement. What is the maximum strain in concrete at the level of compression reinforcement?

A : 0.0035 (1 - d'/d)

B : 0.0035 (1 - d'/xu) B

C : 0.002 (1 - d'/xu)

D : 0.002 (1 - d'/d)

Homework

Q: 45) A T-beam roof section has the fooloing particulars:

bw =

List-I	List-II
Thickness of slab	100 mm
Width of rib	300 mm
Depth of beam	500 mm
Centre to centre distance of beams	3.0 m
Effective span of beams	6.0 mm
Distance b/w points of contraflexure	6.0 mm

What is the effective flange width of the T beam?

A : 3000 mm

B : 1900 mm

C : 1600 mm

D : 1500 mm

$\tau_v = \frac{V_u}{bd}$

List-I	List-II
A. V_U/bd	1. MOdulus of rupture
B. $0.7\sqrt{f_{ck}}$	2. Development length
C. $5000\sqrt{f_{ck}}$	3. Nominal shear stress
D. $\phi f_s/4\tau_b$	4. Hook anchorage value
	5. Modulus of concrete

E_c : modulus of elasticity of con

select t
en belov

Codes:

~~A~~ : ~~3~~, 1, 5, 2

B : 2, 1, 4, 3

C : 3, 5, 1, 4

D : 2, 4, 1, 3

Q: 47) What shall be the maximum area of reinforcement (i) in compression and (ii) in tension to be provided in an RC beam, respectively, as per IS 456?

A : 0.08% and 2%

B : 2% and 4%

C : 4% adn 2%

D : 4% and 4%

List-I	List-II
A. At end support, for imposed load not fixed)	1. 0.5
B. At inside support, next inner to end support, for imposed load (fixed)	2. 0.55
C. At end support, for dead load and (Fixed) imposed load	3. 0.60
D. At all other interior supports (other than at 'B') for imposed load (fixed)	4.0 0.45 5.0 0.4

Codes:

A : 5, 3, 2, 4

B : 4, 2, 5, 1

C : 1, 2, 3, 4

D : 5, 3, 2, 1

Type of load	At End support	At support Next to End support		At all other Interior support
		outer side	inner side	
(a) DL + imposed (fixed)	0.4	0.6	0.55	0.5
(b) imposed load (not fixed)	0.45	0.6	0.6	0.6

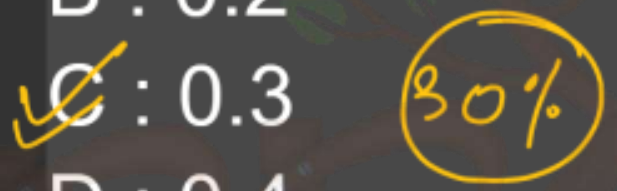
Q: 49) The maximum percent of moment redistribution allowed in RCC beams is

A : 0.1

B : 0.2

C : 0.3

D : 0.4



Q: 50) A simply supported ebam has an effective span of 16 m. What shall be the limiting ratio of span to effective depth as per IS 456-2000?

A : 26

B : 20

C : 12.5

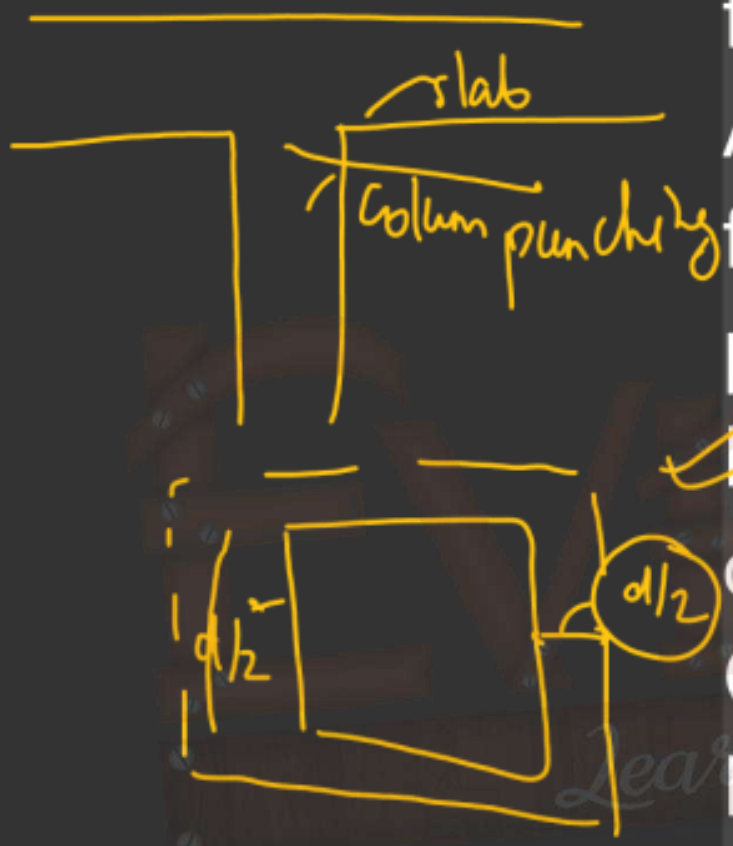
D : 7

$\frac{\text{Span}}{d} = 20$

$\frac{20 \times 10}{\text{span}}$

$= \frac{20 \times 10}{16}$

$= 12.5$



Q: 51) Critical section for shear in case of flat slabs is

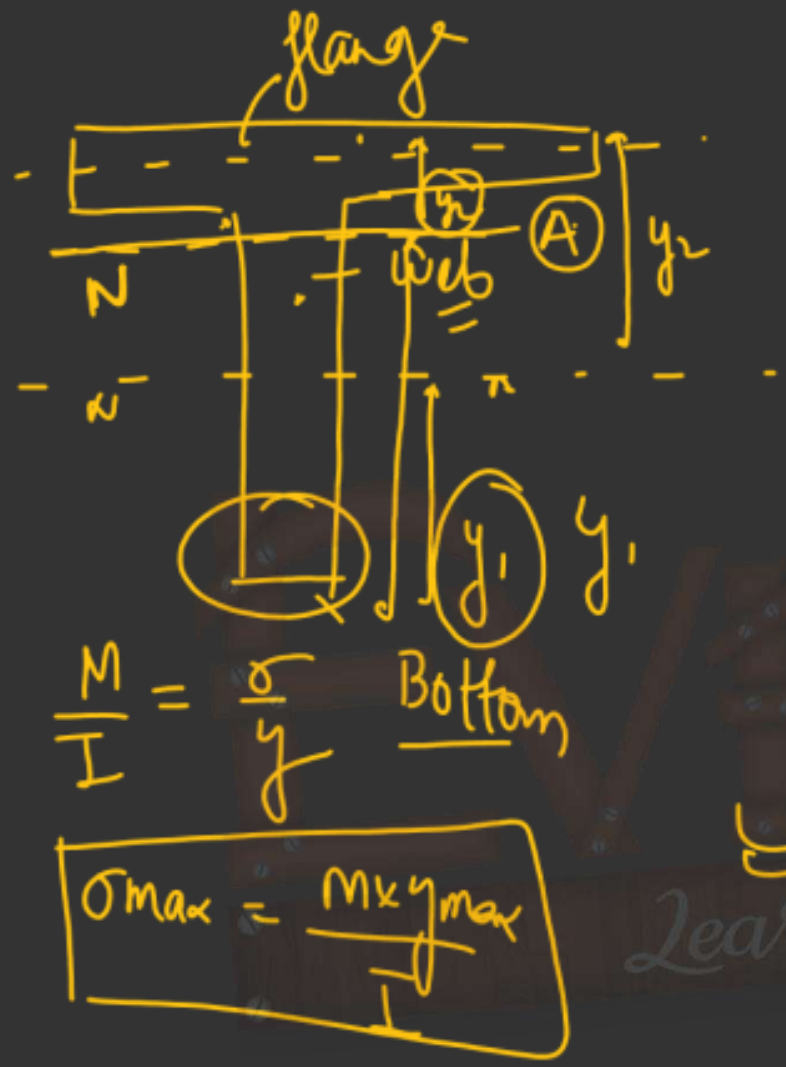
A : At a distance of effective depth of slab from the periphery of the column/the drop panel (B)

B : At a distance of d/2 from the periphery of the column/the capital/the drop panel

C : At the drop panel of the slab

D : At the periphery of the column

[Adopting standard notations]



Q: 52) The bending stress in a T-beam section is maximum

1. At top fibre
2. At centroidal fibre
3. At bottom fibre

A : 1 only

B : 2 only

C : 3 only

D : At a level which is dependent on the loading condition

Table 12 in IS:456:2000

Bending moment Coefficient for dead load = $\pm \frac{1}{12}$

(A)

Bending moment Coefficient for live load = $\pm \frac{1}{10}$

Near middle end of span

Q: 53) The positive bending moment coefficient at the middle of the end-span of a continuous one way slab is

A : $\left(\frac{Wl}{10} + \frac{W_d}{12} \right) L^2$

B : $\left(\frac{Wl}{9} + \frac{W_d}{10} \right) L^2$

C : $\left(\frac{Wl}{12} + \frac{W_d}{16} \right) L^2$

D : $\left(\frac{Wl}{9} + \frac{W_d}{12} \right) L^2$

Where, wl = Live laod ; W_d = Dead load

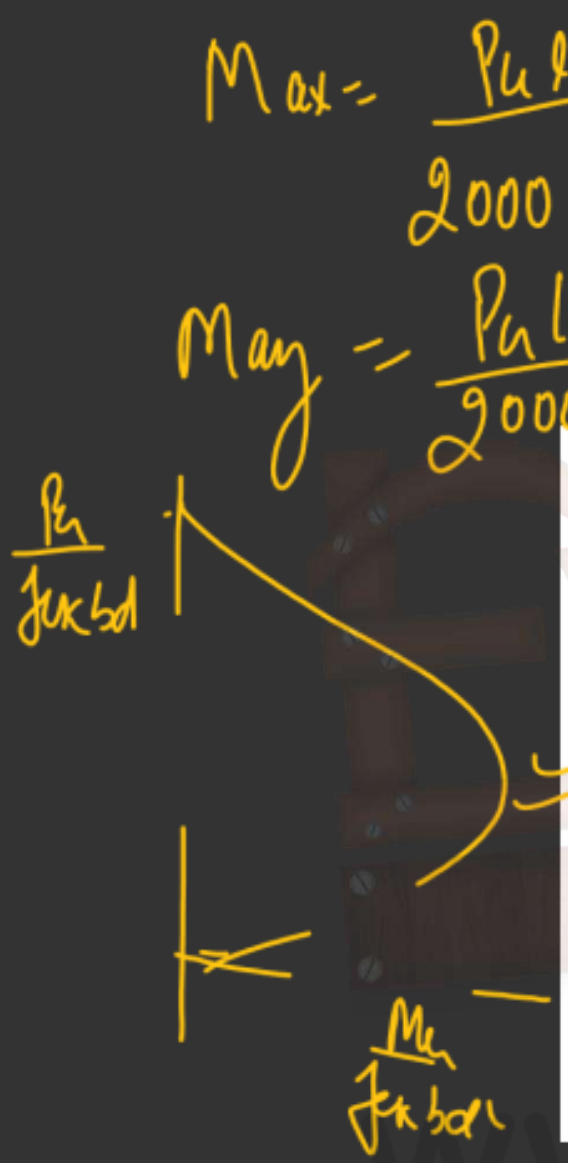
Q: 54) In an axial laoded spirally reinforced short column, the concrete inside the core is subjected to

A : Bending and compression

B : Biaxial compression

C : Triaxial compression

D : Uniaxial compression



Q: 55) Which of the following are the additional moments considered for design of slender compression member in lieu of deflection in x and y directions?

A : $\frac{P_u l_{ex}^2}{2000D}$ and $\frac{P_u l_{ey}^2}{2000D}$

B : $\frac{P_u l_{ex}}{2000}$ and $\frac{P_u l_{ey}}{2000}$

C : $\frac{P_u l_{ex}^2}{2000D}$ and $\frac{P_u l_{ey}^2}{2000b}$

D : $\frac{P_u l_{ex}^2}{200D}$ and $\frac{P_u l_{ey}^2}{200D}$

(Where P_u is axial load; l_{ex} and l_{ey} are effective lengths in respective directions ; D depth of section perpendicular to major axis, b width of the member)

m = 280

List-I	List-II
A. Modular ratio	1. Increase of permissible stresses
B. Seismic forces	2. Minimum eccentricity
C. Pedestal	3. Limit state method
D. Composite column	4. Metal core ≤ 20%
	5. Permissible compressive stress due to bending in concrete

(A) Codes:

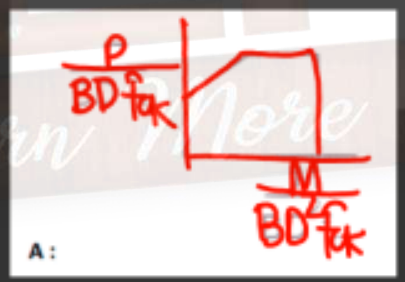
A : 5, 1, 2, 4

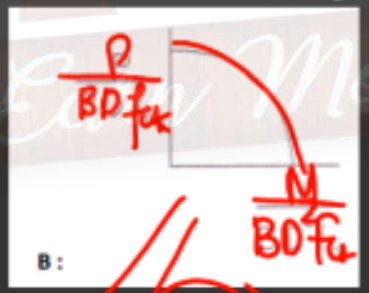
B : 4, 2, 3, 5

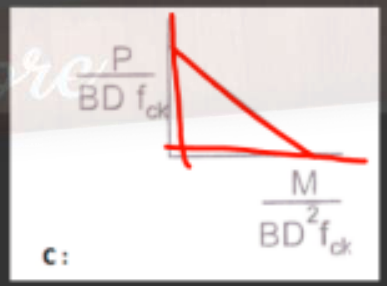
C : 5, 2, 3, 4

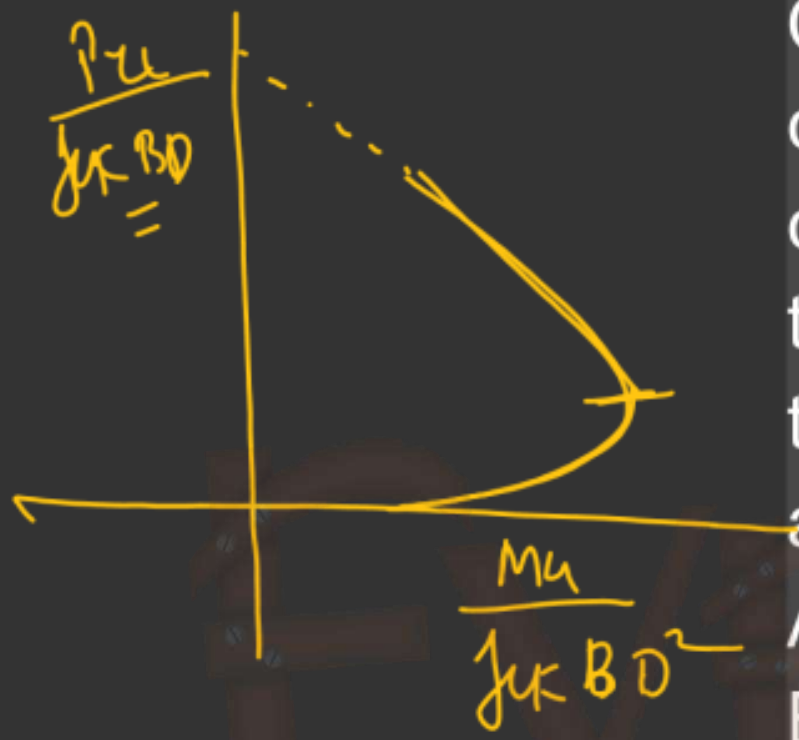
D : 4, 1, 2, 5

Q: 57) A rectangular reinforced column (B × D) has been subjected to uniaxial bending moment M and axial laod P. Characteristic strength of concrete = fck . Which one among the following column design curves shows the relation between M and P qualitatively?









Q: 58) If the load acting on a commonly conventional sized RC column increases continuously from zero to higher mangnitudes, the magnitude of the uniaxial ultimate moment that can be
allowed on the column

A : Increases

B : Decreases

C : Increases and then decreases

D : Remains constant

$\frac{V_h}{V_c} = 0.36\left(\frac{A_g}{A_c} - 1\right)\frac{f_{ck}}{f_y}$

Q: 59) Which one of the following represents the ratio of volume of helocal reinforcement to volume of core?

A

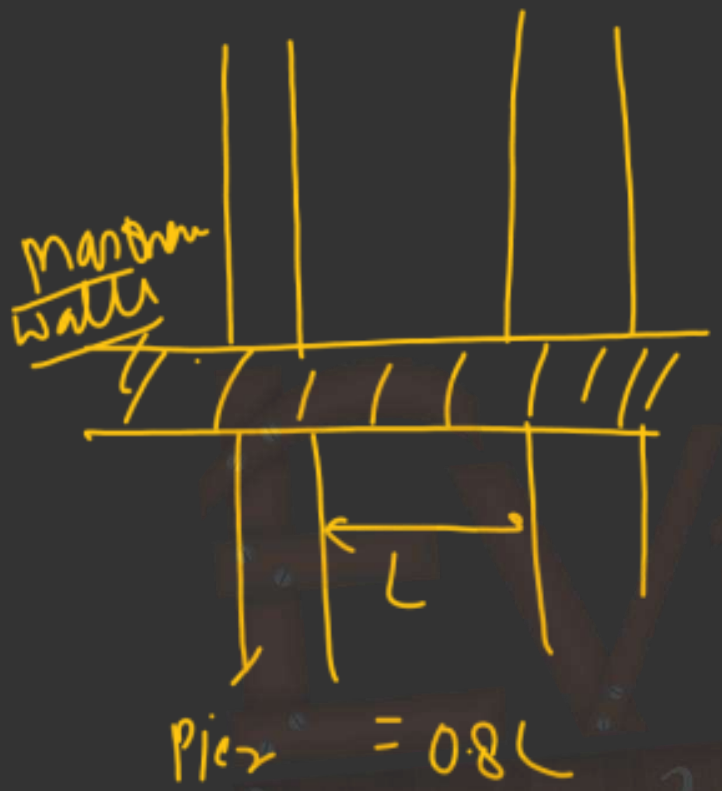
A : $0.36\left(\frac{A_g}{A_c} - 1\right)\frac{f_{ck}}{f_y}$

B : $0.36\left(\frac{A_g}{A_s} - 1\right)\frac{f_{ck}}{f_y}$

C : $0.36\left(\frac{A_s}{A_c} - 1\right)\frac{f_{ck}}{f_y}$

D : $0.36\left(\frac{A_c}{A_s} - 1\right)\frac{f_{ck}}{f_y}$

Where A_g, A_s and A_c are gross cross-sectional area of the member, area of steel and core area; and f_{ck} and f_y are characteistic strength of concrete and steel respectively.



Q: 60) The effective length of masonry wall stiffened by buttresses on both ends and continuing beyond these buttresses at both ends is

A : 1.0L

B : 2.0L

C : 0.9L

D : 0.8L

Where L is the c/c length of the wall between successive buttresses

Q: 61) Design strength for M25 concrete in direct compression, bending compression and flexural tension are, respectively

A : 10 MPa, 11.15 MPa and 3.5 MPa

B : 25 MPa, 11.15 MPa and 3 MPa

C : 10 MPa, 12.5 MPa and 3.5 MPa

D : 25 Mpa, 11.15 MPa and 2.57 MPa

Direct compression
$= 0.4 f_{ck}$
$= 0.4 \times 25$
$= 10 mpa$

Bending compression
$= 0.45 f_{ck}$
0.45×25

$f_{flexural} = 0.7\sqrt{f_{ck}} = 3.5$

Q: 62) The splicing of a column becomes necessary, where

A : The available length of structural steel section is less than the required length of the column

B : Section remains same throughout at all floors

C : Only riveted columns are to be designed

D : Splices should be designed to carry axial loads only

Assumption

1. Long Column
2. EI Uniform isotropic
3. Load are purly axial
4. Shaft axially Rigid.

Q: 63) Which of the following assimptions are made with respect to Euler's theory applied to columms?

1. The section of the column is uniform
2. The length of the column is very large compared to the lateral dimensions
3. The direct stress is large when compared with the bending stress

A : 1, 2 and 3
B : 1 and 3 only
C : 2 and 3 only
D : 1 and 2 only

D.

Q: 64) Given that 'delta'is angle of internal friction, 'p' is the safe bearing capacity and ' gamma' is the unit weight of soil, the maximum depth of foundation of a masonry footing is given by

A : $\frac{p}{\gamma}\left(\frac{1+sin\phi}{1-sin\phi}\right)$

B : $\frac{p}{\gamma}\left(\frac{1-sin\phi}{1+sin\phi}\right)$

C : $\frac{p}{\gamma}\left(\frac{1+sin\phi}{1-sin\phi}\right)^2$

D : $\frac{p}{\gamma}\left(\frac{1-sin\phi}{1+sin\phi}\right)^2$

$h = \frac{p}{\gamma}\left(\frac{1-\sin\phi}{1+\sin\phi}\right)^2$

(D.)

Q: 65) The critical section for two-way shear of footing is at the

A : Face of the column

B : Distance d from the column face

C : Distance d/2 from the column face

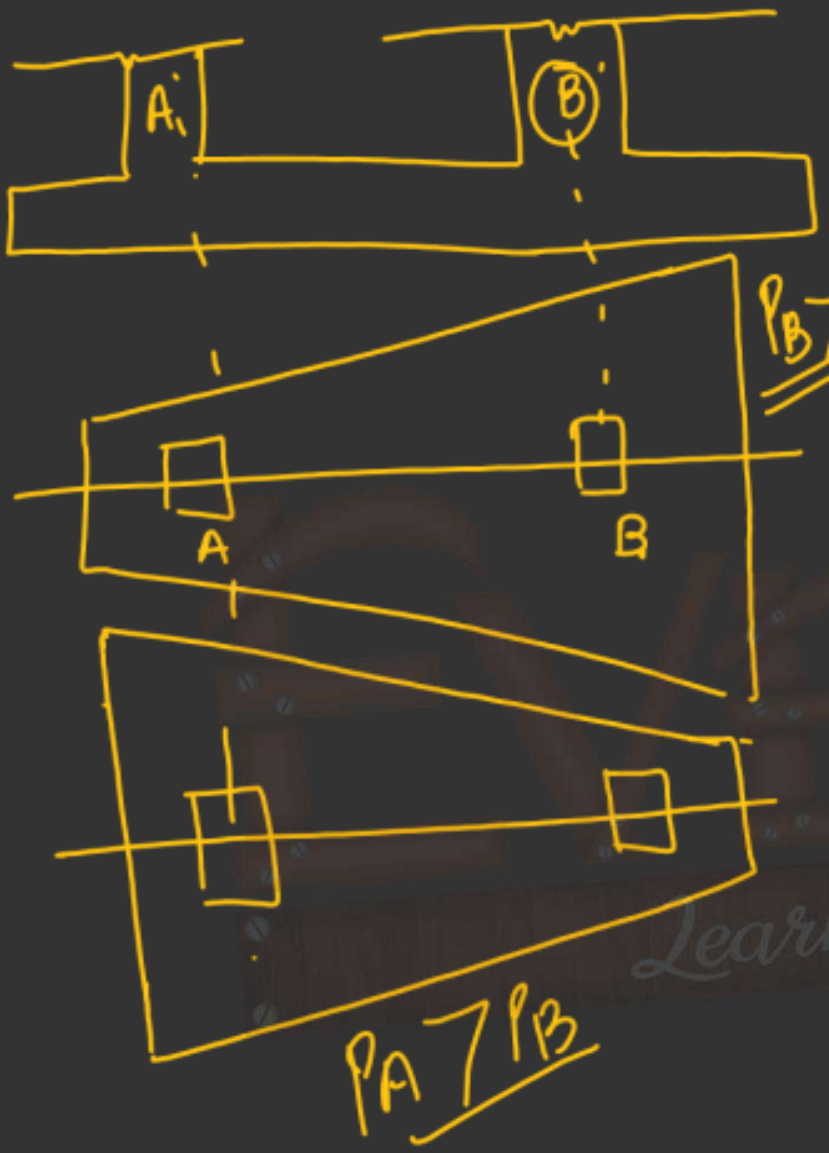
D : Distance 2d from the column face

(Where d is the effective depth of the footing)

Punching shear

Single shear

Face of the column in Bending



Q: 66) A trapezoidal combined footing for two axially laoded columns is provided when

1. Width of the footing near the heavier column is restricted
2. Length of the footing is restricted
3. Projections of the footing beyond the heavier columns are restricted

Select the correct answer using the codes given below:

A : 1 and 2

B : 1 and 3

C : 2 and 3

D : 1, 2 and 3

Q: 67) In the case of isolated square concrete footing, match the locations at which the stress resultants are to be checked, where d is effective depth of footing and sleect the correct answer using the code given below the lists:

1, 3, 2

Stress Resultant	Location
A. Bending moment	1. At face of column
B. One way shear	2. At d/2 from face pf column
C. Punching shear	3. At d from face of column

Codes:

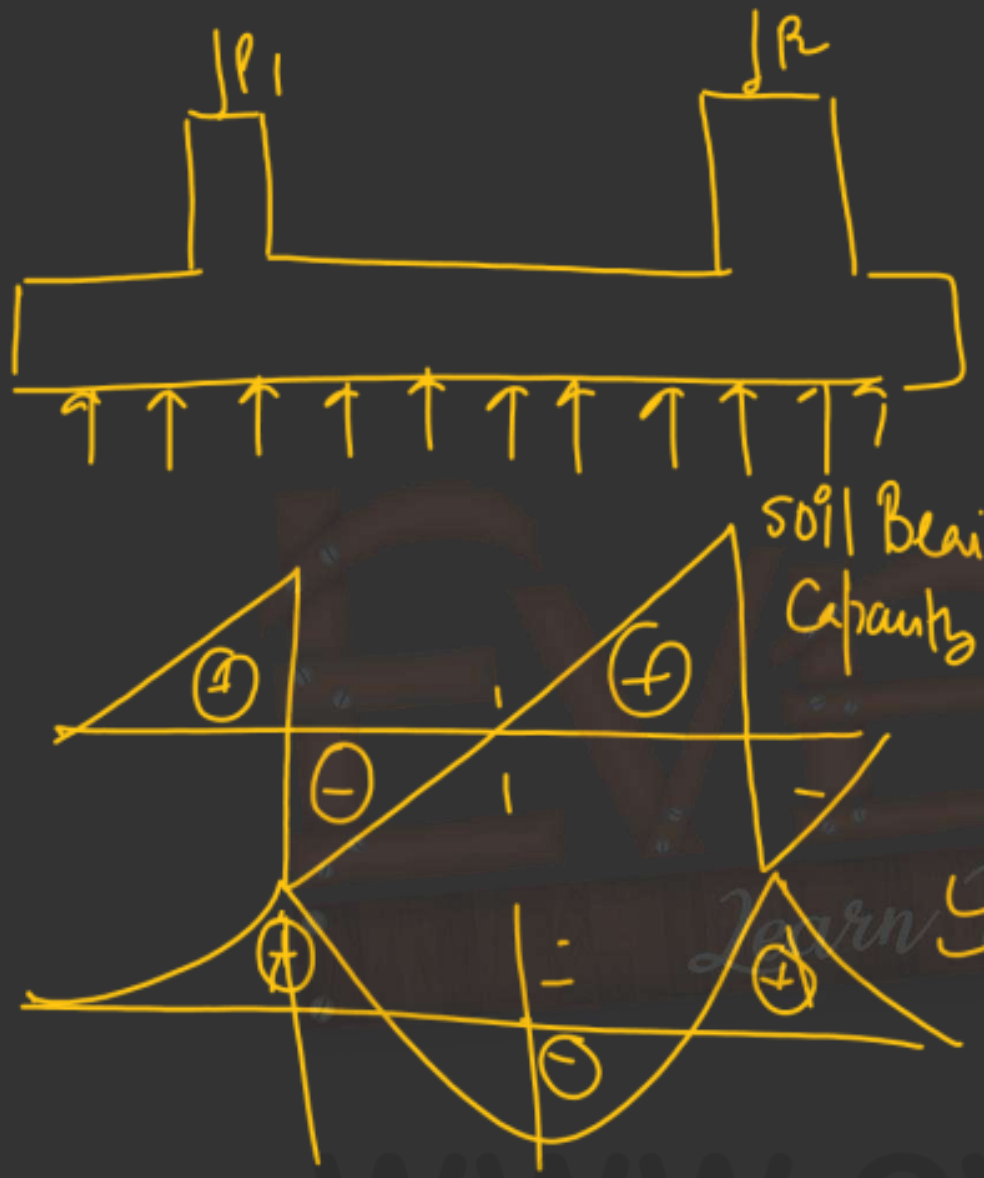
A : 1, 2, 3

B : 3, 1, 2

C : 1, 1, 3

D : 1, 3, 2

Q: 68) Consider the following statements:
The design depth of the footing for an isolated column is governed by
1. Maximum bending moment
2. Maximum shear force
3. Punching shear
Which of the above statements are correct?
A : 1 and 2 only
B : 1 and 3 only
C : 1, 2 and 3
D : 2 and 3 only



Q: 69) In a combined footing for two columns carrying unequal loads, the maximum hogging moment occurs at

A : The inside face of the heavier column

B : A section equidistant from both the columns

C : A section subjected to maximum shear force

D : A section subjected to zero shear force

D

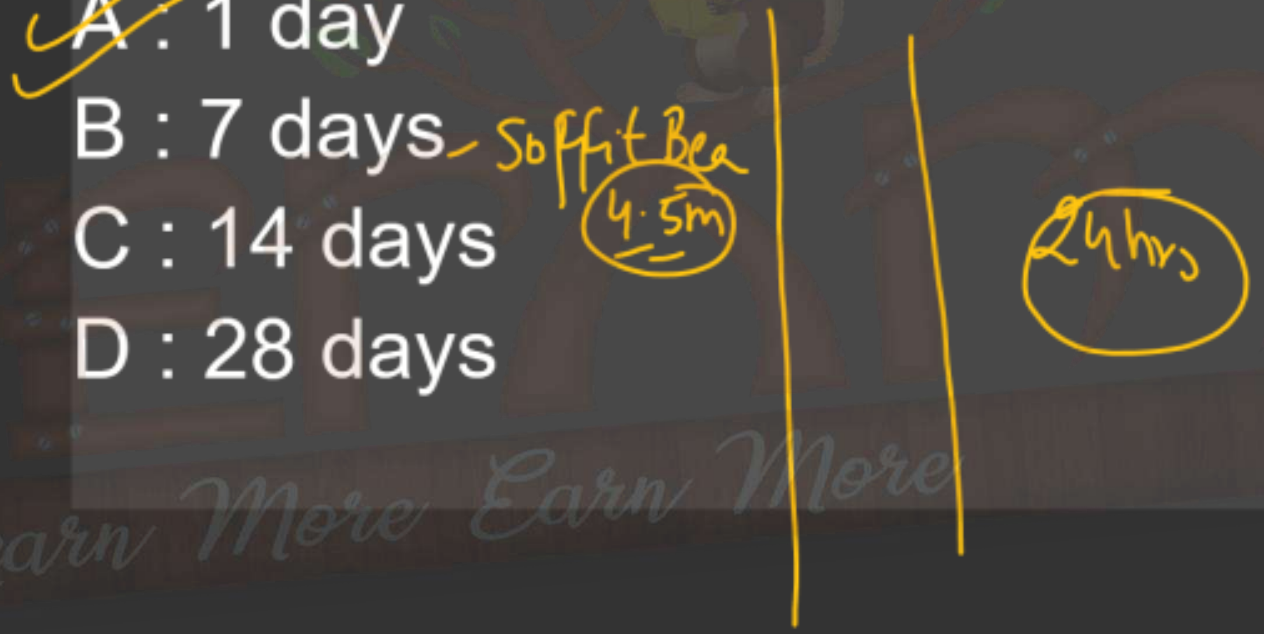
Q: 70) As per IS 456 : 2000, minimum period before striking formwork for vertical surface of the columns

A : 1 day

B : 7 days

C : 14 days

D : 28 days



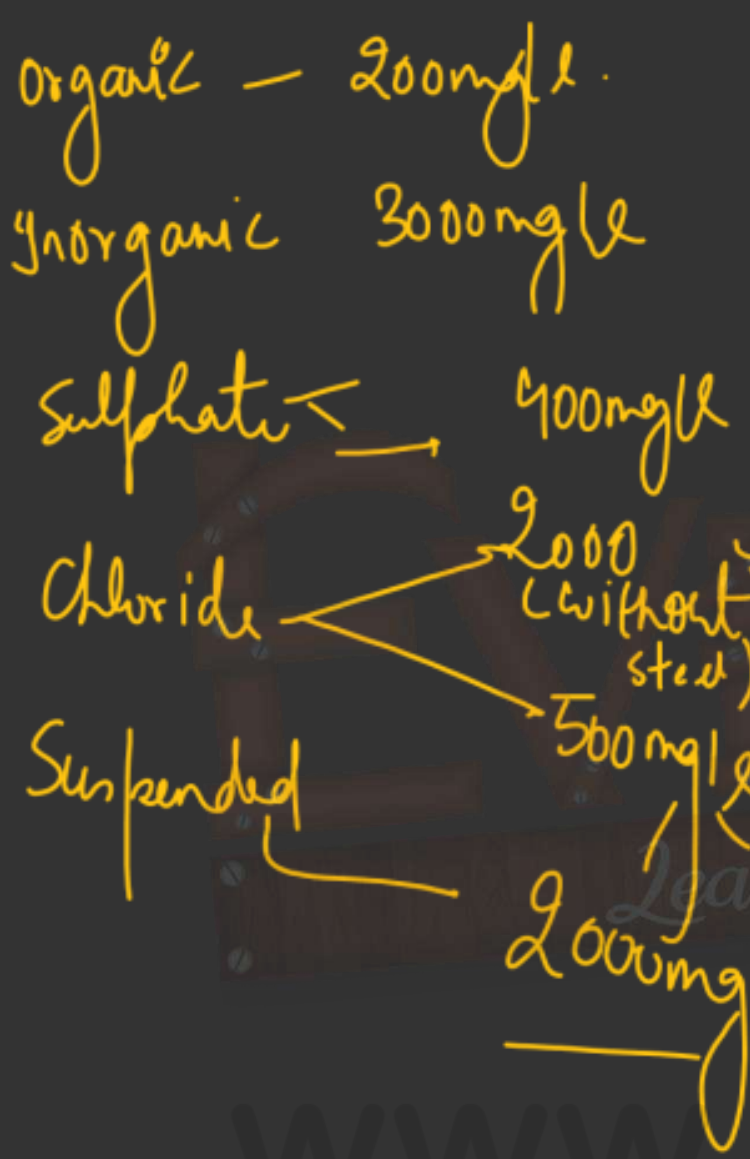
Q: 71) The nominal cover requirements for meeting the durability requirement of mild, very severe, severe, moderate, extreme types of exposure are respectively in mm

A : 20, 30, 45, 50, 75

B : 20, 45, 30, 50, 75

C : 20, 50, 45, 30, 75

D : 20, 75, 50, 30, 45



Q: 72) As per IS 456 : 2000 the limit of suspended matter in water to be used for construction is

A : 200 mg/l

B : 300 mg/l

C : 2000 mg/l (C)

D : 3000 mg/l

Q: 73) In T-shape RCC retaining wall, the main reinforcement in the stem is rovided on

A : The front face in one direction

B : The front face in both direction

C : The inner face in one direction

D : The inner face in both direction

Q: 74) The width of stem in cantilever retaining wall is usually kept as ..... mm.

A : 100

B : 200

C : 230

D : None of these

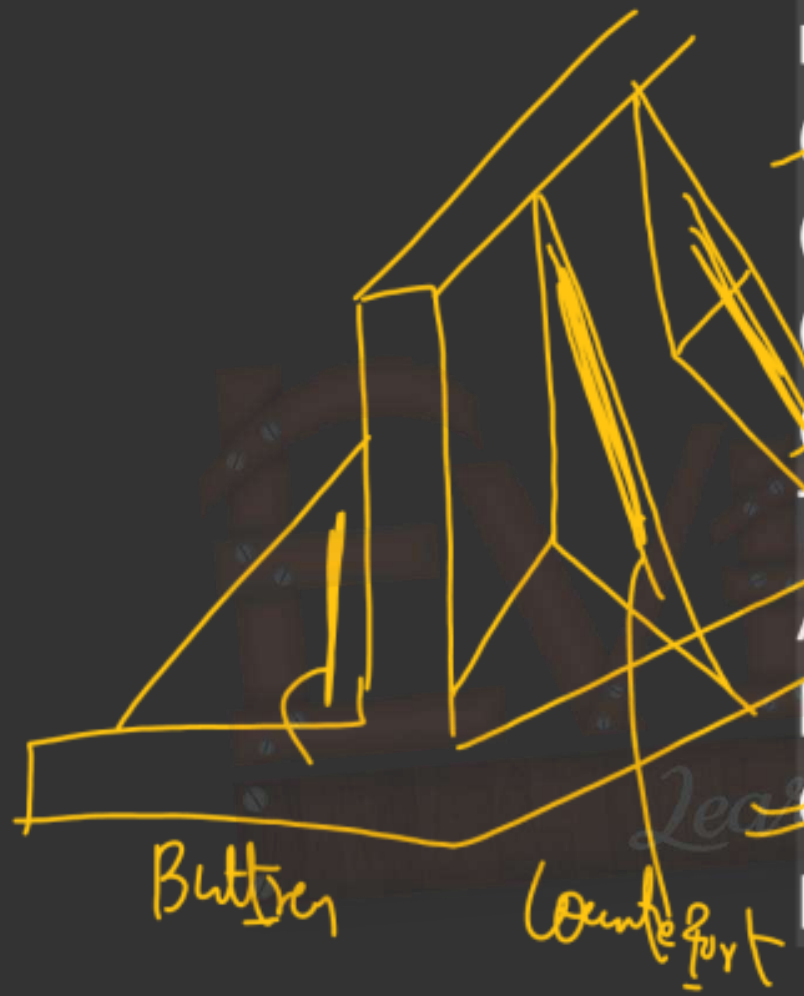
Q: 75) The vertical retaining wall of the RCC counterfort is designed as a _____.

A : Cantilever

B : Simply supported slab

C : Continuous slab

D : None of these



Q: 76) In a counterfort retaining wall, the main reinforcement is provided on the-

(i) Bottom face in front counterfort

(ii) Inclined face in front counterfort

(iii) Bottom face in back counterfort

(iv) Inclined face in back counterfort

The correct answer is

A : (i) and (ii)

B : (ii) and (iii) (C)

C : (i) and (iv)

D : (iii) and (iv)

Q: 77) The functionality of a wall, retaining wall and a shear wall in order is_____

i. Resist predominantly vertical laods

ii. Resist lateral loads perpendicular to the plane of wall

iii. Resist lateral loads in the plane of wall

A : ii, iii, i

B : i, ii, iii

C : iii, ii, i

D : ii, i, iii

Q: 78) Considering the concept of durability of water tanks, the minimum grade of concrete shall be:

A : M10

B : M20

C : M30

D : M40

Q: 79) Maximum width of crack in RC water retaining structures is restricted to

A : 0.05 mm

B : 0.30 mm

C : 0.01 mm

D : 0.20 mm

Q: 80) Direction : Match List I with List II and select the correct answer using code given below the two list in each question.

List I	List II (Slump in mm)
A. Pre cast work	1. 90
B. Footing	2. 75
C. Columns	3. 50
D. Beams	4. 25

25 mm
50mm
75mm
90mm

A-4, B-3, C-2, D-1

Code:

A : 1, 2, 3, 4

B : 3, 4, 1, 2

C : 2, 3, 1, 4

D : 4, 3, 2, 1

(D)

Q: 81) Splicing of reinforcement in flexure members is taken-up at a lcoation where bending moment is less than _____ the moment of resistance at that section and not mroe than _____ of bars are spliced at any particular section.

A : 75%, 50%

B : 50%, 75%

C : 25%, 50%

D : 50%, 50%

Column & Beam
+12mm - 6mm

Footing + 50mm - 12mm

(B)

Q: 82) Permissible deviation from specified dimensions of cross-section of column & beams as per IS standards is _____ mm

A : +10 mm - 4 mm

B : +12 mm - 6 mm

C : +14 mm - 8 mm

D : None

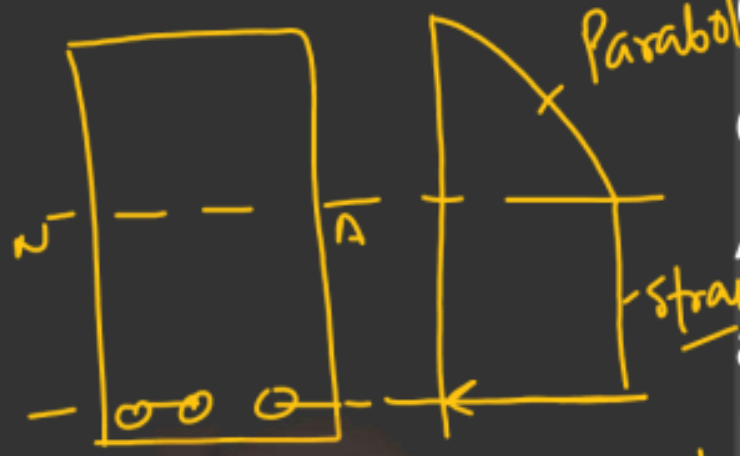
Q: 83) The maximum deflection due to laod in RCC beams in buildings in limited to:

A : $\frac{Span}{100}$

B : $\frac{Span}{250}$

C : $\frac{Span}{350}$

D : $\frac{Span}{500}$



Q: 84) In a reinforced concrete beam the distribution of shear stress is

A : Parabolic cover and below the neutral axis

B : Parabolic over neutral axis and rectangular below neutral axis

C : Recatngular over neutral axis and parabolic below neutral axis

D : Rectangular over and below neutrak axis

Q: 85) What is the maximum permissible acid soluble chloride content (kg/cum) for reinforced concrete?

A : 1.5

B : 0.6

C : 0.4

D : 3

Q: 86) According to IS 456:2000, the dosages of retarders, plasticizer and super plasticizer by weight of cementations materials respectively are restricted to:

A : 0.5%, 0.5% and 1.0%

B : 0.5%, 1.0% and 2.0%

C : 1.0%, 0.5% and 2.0%

D : 1.1%, 0.5% and 2.0%

Q: 87) The individual variation between test strength of sample should not be more than

A : ±5% of average

B : ±10% of average

C : ±15% of average

D : ±20% of average

Q: 88) For RC braced frames maximum redistribution of moment allowed is

A : 0.3

B : 0.4

C : 0.2

D : 0.1

Type of work	Slump Rang
Road pavement	(25-75)
Underwater Concrete work	100-150
Column & foundation	25-75mm
Bridge	25-75m
Mass Concrete	25-50mm
Dense Concrete	50-100mm

Q: 89) A concrete mix of grade M40 is to be used for pavements using paver machine. The recommended slump range as per IS : 456-2000 is:

A : 25 - 75 mm (A)

B : 50 - 100 mm

C : 75 - 100 mm

D : 100 - 150 mm

2 bar bundle → 10%

3 bar bundle → 20%

4 bar bundle → 33%

Q: 90) The development length of each bar of three ars bundled together is increased by:

A : 0.1

B : 0.2

C : 0.33

D : 0.5

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