Q.73.

Assuming the concrete below the neutral axis to be cracked, the shear stress across the depth of a singly reinforced rectangular beam section

(a) increases parabolically to the neutral axis and then drops abruptly to zero value

(b) increases parabolically to the neutral axis and then remains constant over the remaining depth

(c) increases linearly to the neutral axis and then remains constant up to the tension steel

(d) increases parabolically to the neutral axis and then remains constant up to the tension steel

Q.74.

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

(a) 1.25 (fy Asv)

(b) 1.16 (fy Asv)

(c) 1.00 (fy Asv)

(d) 0.80 (fy Asv)

where fy is yield strength and Asv is cross- sectional area of the stirrup steel.

Q.75.

If a 2-legged 8 mm diameter HYSD bar is used as shear reinforcement for a beam of width 230 mm and effective depth 300 mm, what is the nearest magnitude of the spacing of minimum shear reinforcement?

(a) 420 mm

(b) 390 mm

(c) 350 mm

(d) 320 mm

Q.76. In limit state design, permissible bond stress in the case of deformed bars is more than that in plain bars by

A• 60%

B• 50%

C• 40%

D• 25%

Q.77. Match List I with List II and select the correct answer:

	List-I	List-II
A•	Bond stress	1. Zero at centre of cross section
B•	Thermal stress	2. Circumferential stress
C•	Hoop stress	3. Linear stress
D•	Torsional stress	4. Longitudinal shear stress
		5. Zero on the surface

Codes:

A• A – 5, B – 2, C – 4, D – 1

B• A – 4, B – 3, C – 2, D – 1

C• A – 4, B – 5, C – 2, D – 3

D• A – 1, B – 3, C – 4, D – 5

Q.78. Consider the following statements:

Bars that extend into a simple support must be able to develop their full strength at a designated point '1' so that their moment capacity is more than the bending moment at t at point, The clauses of the code requires that ($\sigma s = 0.85\,\sigma sy$).

1. $L_d \le \frac{1.3M_1}{V} + L_0$

2. $\frac{\Phi\sigma_s}{4\tau_{bd}} \le \frac{1.3M_1}{V} + L_0$

3. $\Phi\frac{4\tau_{bd}}{\sigma_s} \le \left(\frac{1.3M_1}{V} + L_0\right)$

Which of these statements are correct?

(a) 1 and 2

(b) 2 and 3

(c) 1 and 3

(d) 1, 2 and 3

Q.79. 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• LD / 3 into the support
B•	Cantilever beam, tensile reinforcement	2• 6 φ for 1350 bend
C•	Simply supported beam, tensile reinforcement	3• Ld into the support
D•	Beam, shear stirrup	4• Ld from the column face

Codes:

A• A – 1, B – 3, C – 4, D – 2

B• A – 1, B – 2, C – 4, D – 3

C• A – 4, B – 3, C – 1, D – 2

D• A – 4, B – 2, C – 1, D – 3

Q.80. Which one of the following statement is correct?

(a) to provide minimum number of large diameter bars

(b) to provide large number of smaller diameter bars

(c) to increase the cover for reinforcement

(d) to provide additional stirrups

Q.81. The distance between theoretical cut-off point and actual cut-out point in respect of the curtailment of reinforcement of reinforced concrete beams should not be less than

(a) Development length

(b) 12 x dia of bar or effective depth whichever is greater

(c) 24 x dia of bar or effective depth whichever is greater

(d) 30 x dia of bar or effective depth whichever is greater

Q.82.Which one of the following is the correct expression to estimate the development length of deformed reinforcing bar as per IS code in limit state design?

A. $\frac{\Phi\sigma_s}{4.5\tau_{bd}}$

B. $\frac{\Phi\sigma_s}{5\tau_{bd}}$

C. $\frac{\Phi\sigma_s}{6.4\tau_{bd}}$

D. $\frac{\Phi\sigma_s}{8\tau_{bd}}$

φ where is diameter of reinforcing bar, σS is the stress in the bar at a section and τbd is bond stress

Q.83.Which one of the following is correct? When HYSD bars are used in place of mild steel bars in a beam, the bond strength

A. Does not change

B. Increases

C. Decreases

D. becomes zero

Q.84.What is the bond stress acting parallel to the. reinforcement on the Interface between bar and concrete?

A. Shear stress

B. Local stress

C. Flexural stress

D. Bearing stress

Q.85.What is the anchorage value of a standard hook of a reinforcement bar of diameter O?

A. 4 0

B. 8 0

C. 12 0

D. 16 0

Q.86.Lap length of reinforcement in compression shall not be less than.

A. 30 φ

B. 24 φ

C. 20 φ

D. 5 φ

where φ is diameter of bar

Q.87.The development length in compression for a 20 mm diameter deformed bar of grade fe 415 embedded in concrete of grade M 25, whose design bond stress is 1.40 N/mm2, is

A. 1489 mm

B. 1289 mm

C. 806 mm

D. 645 mm

Q.88.The appropriate expression in assessing development length is

A. $L_d = \frac{\Phi\sigma_s}{4\tau_{bd}}$

B. $L_d = \frac{\Phi\sigma_s}{\tau_{bd}}$

C. $L_d = \frac{\sigma_s}{4\tau_{bd}}$

D. $L_d = \frac{\Phi\sigma_s}{8\tau_{bd}}$

Q.89.Torsion resisting capacity of a given RC section

A. Decreases with decrease in stirrups spacing

B. Decreases with increase in longitudinal bars

C. Does not depend upon stirrup and longitudinal steels

D. Increases with the increase in stirrup and longitudinal steels

Q.90.An R.C. structural member rectangular in cross section of width and depth D is subjected to a combined action of bending moment M and torsional moment T. The longitudinal reinforcement shall be designed for a moment Me given by

A. $M_e = M + \frac{T(1+D/b)}{1.7}$

B. $M_e = M + \frac{T(1-b/D)}{1.7}$

C. $M_e = \frac{T(1-D/b)}{1.7}$

D. $M_e = \frac{T(1-b/D)}{1.7}$

Q.91.Torsion reinforcement provided at the corners of a two-way slab

(a) distributes bending moment uniformly

(b) prevents corners from lifting

(c) controls cracking at corners

(d) does not allow any twist at corners