1. If d and n are the effectively depth and depth of the neutral axis respectively of a singly reinforced beam the lever arm of the beam is

(a) d

(b) n

(c) $d + \frac{n}{3}$

(d) $d - \frac{n}{3}$

2. Spacing of stirrups in a rectangular beam is

(a) kept constant throughout the length

(b) decreased towards the centre of the beam

(c) increased at the ends

(d) increased at the centre of the beam

3. The radius of a bar bend to form a book should not be less than

(a) twice the diameter

(b) thrice the diameter

(c) four times the diameter

(d) five times the diameter

4. The length of the straight portion of a bar beyond the end of the hook should be at least

(a) twice the diameter

(b) thrice the diameter

(c) four times the diameter

(d) seven times the diameter

5. For M 150 grades concrete (1 : 2 : 4) the moment of resistance factor is

(a) 0.87

(b) 8.50

(c) 7.50

(d) 5.80

6. If the ratio of long and short spans of two way slab with corners held down is r the actual reduction of B.M. is given by

(a) $\frac{5}{6}\ \frac{r}{1+r^2} M$

(b) $\frac{5}{6}\ \frac{r^2}{1+r^2} M$

(c) $\frac{5}{6}\ \frac{r^2}{1+r^3} M$

(d) $\frac{5}{6}\ \frac{r^2}{1+r^4} M$

7. Design of a two way slab simply supported on edges and having no provision to prevent the corners from lifting is made by

(a) Rankine formula

(b) Marcus formula

(c) Rankin Grashoff formula

(d) Grashoff formula

8. A flat slab is supported

(a) on beams

(b) on columns

(c) on beams and columns

(d) on columns monolithically built with slab

9. If the diameter of longitudinal bars of a square column is 16 mm the diameter of lateral ties should not be less than

(a) 4 mm

(b) 5 mm

(c) 6 mm

(d) 8 mm

10. A raft foundation is provided if its area exceeds the plan area of the building by

(a) 30%

(b) 20%

(c) 50%

(d) 40%

11. Total pressure on the vertical face of a retaining wall of height *h* per unit run exerted by the retained earth weighing *w* per unit volume is

(a) $wh\frac{(1-\sin\emptyset)}{(1+\sin\emptyset)}$

(b) $wh^2\frac{(1-\sin\emptyset)}{(1+\sin\emptyset)}$

(c) $\frac{wh^2(1-\sin\emptyset)}{2(1+\sin\emptyset)}$

(d) $\frac{wh^2(1-\sin\emptyset)}{3(1+\sin\emptyset)}$

12. To have pressure wholly compressive under the base of a retaining wall of width b the resulting of the weight of the wall and the pressure exerted by the retaining earth should have eccentricity not more than

(a) $\frac{b}{3}$

(b) $\frac{b}{4}$

(c) $\frac{b}{5}$

(d) $\frac{b}{6}$

13. Cantilever retaining walls can safely be used for a height not more than

(a) 5 m

(b) 4 m

(c) 8 m

(d) 6 m

14. If R and T are rise and treat of a stair spanning horizontally the steps are supported by a wall on one side and by a stringer beam on the other side the steps are designed as beams of width

(a) $R + T$

(b) $T - R$

(c) $\sqrt{R^2 + T^2}$

(d) $\frac{R+T}{2}$

15. An under-reinforced section means

(a) Steel is provided at the underside only

(b) Steel provided is insufficient

(c) Steel provided on one face only

(d)Steel will yield first

16. As per I.S. 456 – 1978 the pH value of water shall be

(a) less than 6

(b) equal to 6

(c) not less than 6

(d) equal to 7

17. A continuous beam shall be deemed to be a deep beam if the ratio of effective span to overall depth is

(a) 2.5

(b) 2.0

(c) less than 2

(d) less than 2.5

18. The ratio of the depth of the parabolic and rectangular portion block at the limit state of collapse of a singly reinforced section is

(a) 1 : 2

(b) 4 : 3

(c) 3 : 4

(d) 4 : 5

19. Yielding of steel in singly reinforced beam concrete crushes at its maximum strain i.e.

(a) 0.35%

(b) 0.30%

(c) 0.25%

(d) 0.20%

20. The ratio of the limiting value of the depth of neutral axis and the depth of the section of a singly reinforced beam

(a) $\frac{0.0035}{0.0055+0.87\frac{\sigma y}{Es}}$

(b) $\frac{0.0055}{0.0035+0.87\frac{\sigma y}{Es}}$

(c) $\frac{0.0035}{0.0035+0.87\frac{\sigma y}{Es}}$

(d) None of these

Q.21 Which of the following relationships is true for the first- angle method of projection?

(a) Object – POP - Observer

(b) Object – observer - POP

(c) POP - observer - object

(d) Observer - Object – POP

Q.22 The front view of an object is projected on the

(a) horizontal plane

(b) vertical plane

(c) profile plane

(d) auxiliary plane

Q23 Two point perspective is also known as

(a) parallel perspective

(b) angular perspective

(c) oblique perspective

(d) atmospheric perspective

Q24 The length-to-height ratio of a closed filled arrow head is

(a) 1:3

(b) 3:1

(c) 1:2

(d) 2:1

Q25 IS 10714 : 2001 refers to

(a) Scales

(b) lines

(c) lettering

(d) projection methods