SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

UNIT –I

1. Using working stress method, find the moment of resistance of a reinforced cement concrete beam 300 mm wide and 500 mm effective depth is reinforced with 3 bars of 16 mm diameter. M 20 concrete and Fe 415 steel are used.
2. A rectangular beam of width 350 mm is subjected to a uniformly distributed load of 15 kN/m over an effective span of 8 m. Determine the depth required for the beam and the area of tensile reinforcement required. Use M 20 concrete and Fe 415 steel. Adopt working stress method.
3. (A) What are the striking differences between working stress method and limit sate method?
   (B) Define under reinforced, balanced and over reinforced sections and mention the criteria to distinguish them in limit state method.
4. (A) State the assumption made in limit state of collapse in bending for the design of a reinforced concrete section.
   (B) Draw the strain and stress distribution for singly reinforced beam and derive expression for depth of neutral axis, leaver arm and moment of resistance with respect to concrete and steel.
5. An RCC rectangle beam is 250 mm wide and 310 mm deep up to the centre of reinforcement. The beam is reinforced with 3 bars of 12 mm diameter at the bottom. Using limit state method, determine moment of resistance of the section.
6. Design a rectangle beam from the method of limit state of collapse to resists a bending moment equal to 75 kNm using M 25 concrete and Fe 415 grade steel. Overall depth to breadth ratio may be assumed as 1.5.
7. Design a rectangle beam for 4 m effective span which is subjected to a dead load of 15 kN/m and a live load of 12 kN/m. Use M 25 mix and Fe 500 grade steel. Adopt limit state method.
8. Design a rectangular beam for an effective span of 6 m. the superimposed load is 60 kN/m and size of the beam is limited to 30 cm x 60 cm overall. Use M20 mix and Fe415 grade steel.
9. Calculate the amount of steel required in a T- beam to develop a moment of resistance of 300 kNm at working loads. The dimensions of the beam are given in Fig.1. Use M 20 mix and Fe 415 grade steel.

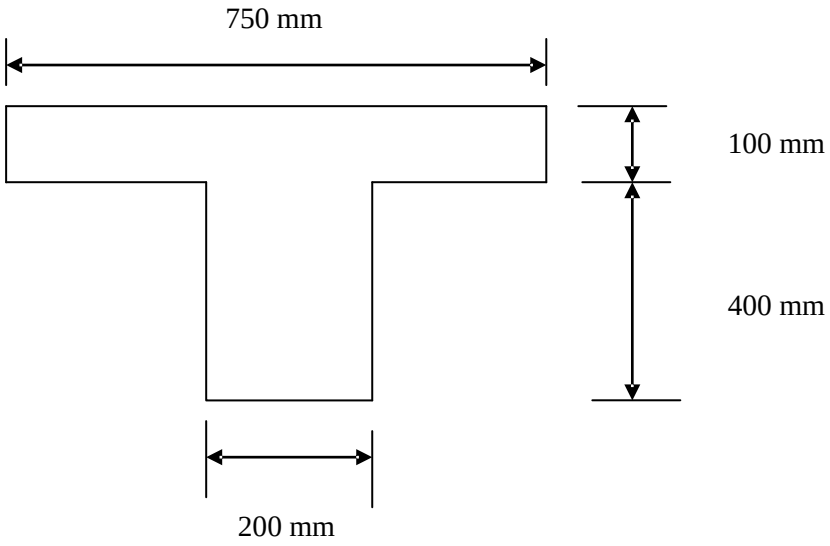


Fig1.

10. Define the following:
    (a) Limit state of collapse and limit state of serviceability
    (b) Characteristic strength and characteristic load
    (c) Partial safety factor for material and partial safety factor for load
    (d) Depth of neutral axis and limiting depth of neutral axis
    (e) Effective depth and overall depth

Prepared by: **Mr. M Prathap Reddy & Mr.C Siva Kumar Prasad**

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (OBJECTIVE)

Subject with Code : DDRCS (16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

1. The modulus of rupture of concrete gives [ ]

A) The direct tensile strength of the concrete

B) The direct compressive strength of the concrete

C) The tensile strength of the concrete in bending

D) The characteristic strength of concrete

2. The yield stress of a twisted bar as compared to an ordinary mild steel bar is nearly [ ]

A) 50% more B) 25% more C) 50% less D) 255 less

3. The ratio of direct tensile strength to compressive strength of concrete is taken as [ ]

A) 0.05 B) 0.15 C) 0.25 D) 0.35

4. The split tensile strength of M15 grade concrete when expressed as a percentage of its compressive strength is [ ]

A) 10 to 15% B) 15 to 20% C) 20 to 25% D) 25 to 30%

5. Compared to mild steel plain bars, high yield strength deformed bars are [ ]

A) Less ductile but more strong B) More ductile but less strong

C) More ductile and strong D) none

6. The ratio of 7 days and 28 days strength is [ ]

A) 0.5 B) 0.6 C) 0.75 D) 0.85

7. Compared to 15 cm cube strength 10cm cube strength is [ ]

A) Less B) More C) Equal D) None

8. As the cube size increases, the strength of concrete reduces due to [ ]

A) Increases in slenderness ratio B) Chances of more weak spots

C) Inferior compaction D) none of the above

9. Approximate value of shrinkage strain of concrete is [ ]

A) $3x10^{-3}$ B) $3x10^{-4}$ C) 0.0035 D) 0.002

10. High yield strength deformed bars have a [ ]

A) A definite yield value

B) chemical composition different from mild steel

C) % elongation less than that of mild steel

D) % elongation more than that of mild steel

11. Tensile strength of concrete is measured by [ ]

A) Direct tension test in the universal testing machine

B) Applying compressive load along the diameter of the cylinder

C) Applying third point load on a prism

D) Applying tensile load along the diameter of the diameter of the cylinder

12. Minimum grade of concrete for water tank is [ ]

A) M_{15} B) M_{20} C) M_{25} D) M_{30}

13. A concrete cube of 15 cm and a cylinder of 15cm diameter and 15cm height are tested for compressive strength the strength of cube compared to cylinder will be [ ]

A) Higher B) lower C) equal D) difficult to assess

14 .The flexure strength of M_{30} concrete as per IS: 456-2000 [ ]

A) 3.83Mpa B) 5.47Mpa C) 21.23Mpa D) 30.0Mpa

15. concrete strength determined from 150 mm dia x 150 mm height cylinder as compared to that of 150dia x 300mm height cylinder is [ ]

A) More B) less C) equal D) varies

16. Flexural strength of M_{25} grade concrete is [ ]

A) 1.5Mpa B) 1.8Mpa C) 2.8Mpa D) 3.5Mpa

17. According to IS 456-2000 the modulus of elasticity of concrete E_C can be expressed as [ ]

A) $E_C = 5700\sqrt{fck}$ B) $E_C = 5000\sqrt{fck}$ C) $E_C = 5700fck$ D) $E_C = 5000fck$

18. In M7.5 nominal mix concrete, if the quantity of water used per 50 kg of cement is 45 kg then that used for same workability will be [ ]

A) <45kg B) equal to 45kg

C)>45kg D) quantity of water has no relation to the grade of concrete

19. The maximum distance between expansion joints in concrete structure as per IS: 456-2000 [ ]

A) 20 m B) 30 m C) 45 m D) 60 m

20. The minimum quantity of cement per meter cube of reinforced concrete for mild exposure is [ ]

A) 150kg B) 250kg C) 350kg D) 300kg

21. The environment exposure condition of concrete buried under aggressive sub soil is classified as

A) moderate B) severe C) very severe D) extreme [ ]

22. The compressive strength of 33 grade cement at 7 days should not be less than [ ]

A) 110kg/cm^2 B)175kg/cm^2 C) 220kg/cm^2 D)275kg/cm^2

23. A reinforced concrete structure has to be constructed along a sea coast. The minimum grade of concrete to be used as per IS 456-2000 is [ ]

A) M_{15} B) M_{20} C) M_{25} D) M_{30}

24. The modulus of rupture of concrete in terms of its characteristic cube strength in Mpa according to IS 456-2000

A) 5000fck B) 0.7√fck C) 5000√fck D) 5700√fck [ ]

25. Which of the following is the effective modulus of concrete [ ]

A) $E_C/ (1+ \theta)$ B) $E_C/ (1+2\theta)$ C) $E_C/ (1+3\theta)$ D) $E_C/ (1+5\theta)$

26. The acceptable limit for the safety and serviceability requirements before failure occurs is called

A) Braking point B) failure point C) limit state D) ductility [ ]

27. The maximum strain in the tension R.F in the section at failure shall not be less than [ ]

A) $0.002+(0.87fy/E_s)$ B) $0.0035+(0.87fy/E_S)$

C) $0.0035+ (fy/1.15E_S)$ D) $0.002+(0.85E_S/fy)$

28. The design strength of steel in limit state design is [ ]

A) fy /1.5 B) fy /0.87 C) 0.87fy D) 1.5fy

29. A simply supported beam carries a working live load of 2.5 kN/m and dead load is 3.5 kN/m. the design load for limit state of collapse is, in kN/m [ ]

A) 9 B) 6 C) 7.2 D) 12

30. For steel of grade fy =500 N/mm^2 the value of x_{umax} / d is [ ]

A) 0.48 B) 0.46 C) 0.53 D) 0.53

31. The partial safety factor to be used in limit state of deflection for strength of concrete is [ ]

A) 1.2 B) 1.5 C) 1.0 D) 0.8

32. The partial safety factor for steel in limit state for serviceability is [ ]

A) 1.2 B) 1.5 C) 1.0 D) 0.8

33. In limit state design of concrete structures, the recommended partial safety factor for steel according to IS 456-2000 is [ ]

A) 1.5 B) 1.15 C) 1.0 D) 0.87

34. An RCC beam is subjected to the following moments; Dead load moment=20kN.m; Live load moment=30kN.m; Seismic load moment =10k.N.m; the design moment is [ ]

A) 60 kN.m B) 75 kN.m C) 72 kN.m D) 80 kN.m

35. In LSM columns, the partial safety factor applied to steel and concrete are [ ]

A) 1.15 for concrete and 1.5 for steel B) 1.15for both steel and concrete

C) 1.5 for concrete and 1.15 for steel D) none

36. The centroid of compressive force, from the extreme compression fibre in limit state design lies at a distance of [ ]

A) 0.36 X_u B) 0.416 X_u C) 0.446 X_u D) 0.573 X_u

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

A) 0.36 fck X_u B) 0.41 fck X_u C) 0.446 fck X_u D) 0.53 fck X_u

38. In limit state design, the limiting value of depth of neutral axis for M15 and Fe250 is **[ ]**

A) 0.53d B) 0.48d C) 0.45d D) 0.43d

39. The lever arm in limit state design is [ ]

A) d-0.446 X_u B) d-0.87 X_u C) d-0.36 X_u D) d-0.416 X_u

40. For a beam reinforced with steel of fy = 250 N/mm^2.The limiting % of steel is given by [ ]

A) 21.97 fck/fy B) 19.82 fck/fy C) 18.87 fck/fy D) none

Prepared by: **Mr. M Prathap Reddy & Mr.C Siva Kumar Prasad**

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code :DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

UNIT – 2

BEAMS & SHEAR, TORSION AND BOND

1. A reinforced concrete beam of rectangular section has a width of 250 mm and an effective depth of 500 mm. The beam is reinforced with 4 bars of 25 mm diameter on the tension side. Two of the tension bars are bent up at 45^o near the support section. In addition the beam is provided with two legged stirrups of 8 mm diameter at 150 mm centers near the support. If f_{ck} = 25 N/mm^2 and f_y = 415 N/mm^2, estimate the ultimate shear strength of the support section.

2. A reinforced concrete beam of rectangular section 300 mm wide is reinforced with four bars of 25 mm diameter at an effective depth of 600 mm. The beam has to resists a factored shear force of 400 kN at support section. Assume f_{ck} = 25 N/mm^2 and f_y = 415 N/mm^2, design vertical stirrups for the section.

3. A simply supported beam is 25 cm x 50 cm and has two 20 mm TOR steel bars going into the support. If the shear force at the centre of support is 110 kN at working loads, determine the anchorage length. Assume M20 mix and Fe 415 grade TOR steel.

4. Determine the shear stress in a 25 mm x 40 mm effective rectangular section if the shear force is 10 kN and torsional moment is 4 kNm at factored loads. Assume M 20 mix and 0.25 % tension steel at the given section. State whether torsional reinforcement is required.

5. (A) Describe the significance of serviceability limit state in the design of RC beams.
   (B) Determine the short term deflection of a simply supported rectangular beam of effective span 4.5 m. The cross-section of the beam is 300mm ×450 mm and is reinforced with 4-16 mm diameter bars in tension. The beam is subjected to imposed service load of 25kN/m. Adopt M 20 grade concrete and Fe 415 steel.

6. The rectangular reinforced concrete beam is simply supported on two masonry walls 230 mm thick and 6 m apart (centre to centre). The beam is carrying an imposed load of 15 kN/m. design the beam with all necessary checks. Use M25 concrete and Fe415 steel.
7. Design a rectangular beam 230 mm x 600 mm over an effective span of 5 m. The superimposed load on the beam in 50 kN/m. Effective cover to reinforcement is taken as 50 mm. Use M20 concrete and Fe415 steel.
8. Design a cantilever beam with a clear span of 2.5 m which carries a superimposed load of 20 kN/m. Use M20 mix and Fe415 steel.
9. A T-beam and floor system consists of 125 mm thick reinforced concrete slab monolithic with 300 mm wide beams. The beams are spaced at 3.6 m center-to-center and supported by 300 mm wide columns. The clear span of the beam is 6 m. Design an intermediate beam, if the slab is subjected to live load of 2.5 kN/m^2 and dead load of 1.5 kN/m^2. Use M 25 concrete and Fe 415 steel.
10. Design a single reinforced beam to carry a live load of 14 kN/m. The clear span of the beam is 5.5 m. The bearing at each end is 300 mm. Use M20 concrete and Fe415 steel.

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (OBJECTIVE)

Subject with Code : DDRCS(16CE2019) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

1. In a rectangular beam maximum shear stress occurs at [ ]
A) At top of the beam B) at bottom of the beam C) at the N.A D) none
2. Diagonal compression failure occurs when [ ]
A) $\tau_v > \tau_c$ B) $\tau_v > \tau_{cmax}$ C) $\tau_v < \tau_c$ D) $\tau_v < \tau_{cmax}$
3. Diagonal tension failure occurs [ ]
A) If shear force is dominant compared to B.M at support B) If B.M is dominant compared to S.F
C) Both (A) and (B) D) neither (A) and (B)
4. Flexural shear cracks occur when [ ]
A) Moment is dominant to S.F B) S.F is dominant to B.M
C) Both (A) and (B) D) neither (A) and (B)
5. Failure of R.C.C beam due to shear can only occurs on account of [ ]
A) Diagonal compression B) diagonal tension C) Web compression D) none
6. If the nominal shear stress τ_v at a section does not exceed the permissible shear stress τ_c [ ]
A) Minimum shear R.F is still provided B) shear R.F is provided to resist the nominal shear stress
C) No shear R.F is provided D) Shear R.F is provided for the difference of the two
7. The permissible shear stress in concrete for beams without shear R.F depends upon [ ]
A) Percentage of tension R.F B) Grade of concrete C) Both (A) & (B) D) none
8. An R.C.C beam of 200mmx300mm (effective) is subjected to a factored S.F 30KN. The maximum nominal shear stress in N/mm^2 [ ]
A) 0.5 B) 0.55 C) 0.75 D) none
9. A rectangular beam of size 200mmx300mm (effective) is subjected to an ultimate S.F of 50KN. The permissible shear stress is 0.2 N/mm^2. The S.F in KN is [ ]
A) 12 B) 38 C) 50 D) none
10. A T-beam of flange width 1000mm rib width 230mm and depth of 450mm is subjected to a shear of 46KN. The nominal shear stress in the beam in N/mm^2 is [ ]
A) 0.5 B) 0.115 C) 0.444 D) none
11. Shear span is defined as the zone where [ ]
A) B.M is zero B) S.F is zero C) S.F is constant D) B.M is constant
12. Distribution of shear stress over a rectangular RC section of a beam follows [ ]
A) Circular curve B) Straight line C) parabolic curve till NA D) an elliptical curve
13. How shear strength be ensured in a beam [ ]
A) By providing binding wire on remaining bars B) By providing HYSD bars instead of mild steel bars C) By providing rounded aggregate D) By providing stirrups

14. When R.F concrete structures loaded, the resistance first broken is [ ]
A) Pure adhesive resistance B) mechanical resistance C) frictional resistance D) none
15. IS code checks the safety of a beam against bond primarily by considering [ ]
A) Flexural bond B) Anchorage bond C) Both (A) &(B) D) none
16. For a bar of diameter'd' the anchorage value of hook is [ ]
A) 2d B) 4d C) 8d D) 16d
17. The bond strength between steel R.F and concrete is affected by [ ]
A) Type of R.F B) Grade of concrete C) Shrinkage of concrete D) all of the above
18. The main reason for providing certain minimum number of reinforcing bars at a support in a simply supported beam is to resist in that zone [ ]
A) Compressive stress B) shear stress C) Bond stress D) Tensile stress
19. For M15 grade concrete and Fe415 steel the development length in tension is------ times the bar diameter [ ]
A) 68.5 B) 58 C) 55 D) 154
20. The lap length for bars in bending tension shall not be less than [ ]
A) Ld or 30φ B) 2Ld or 30 φ C) LD or 24 φ D) 2Ld or 24 φ
21. The lap length in compression is not less than [ ]
A) Ld or 30φ B) 2Ld or 30 φ C) LD or 24 φ D) 2Ld or 24 φ
22. For full anchorage, the stirrups should extend by a length of-------- times diameter of bar when bent at 135^o [ ]
A) 4 φ B) 8 φ C) 12 φ D) 6 φ
23. The length of bar beyond theoretical cut off point shall be [ ]
A) Anchorage length B) development length C) bond length D) dowel length
24. The crack pattern at failure due to torsion is [ ]
A) Vertical B) Diagonal at ends C) spiral D) circular
25. Compatibility torsion occurs in [ ]
A) Edge beams B) Grid system C) Canopy beams D) Both (A) & (B)
26. The transverse torsional R.F in R.C.C beams shall be provided as [ ]
A) Vertical stirrups B) Inclined stirrups C) Bentup bars D) all of theabove
27. The minimum number of torsional longitudinal R.F in R.C.C beam is [ ]
A) 2 B) 4 C) 3 D) any of the above
28. A rectangular beam is subjected to torsion. Side face R.F cement shall be provided if overall depth exceeds -------- mm [ ]
A) 450 B) 750 C) 500 D) more than the depth of flange
29. Longitudinal compression steel shall be designed for a beam subjected to torsion if [ ]
A) $M_t=M_u$ B) $M_t<M_u$ C) $M_t>M_u$ D) $M_t=0$
30. Force on a 500mm deep beam of 300mm wide, subjected to a S.F of 150 KN and torsion 30 KN-m, equivalent shear is [ ]
A) 180KN B) 310KN C) 246KN D) 210KN
31. If N.A lies in the flange, a T-beam can be treated as a rectangular beam of [ ]
A) $b_w d$ B) $d_f d$ C) $b_f d$ D) none
32. If N.A falls in the web and flange thickness larger than 0.2d , and the section is balanced, the stress in the flange will be [ ]
A) 0.446fck uniform B) 0.446fck partly and more than 0.446fck partly

C) 0.36fck partly and less than 0.36fck partly D) 0.446fck partly and less than 0.446fck partly

33. In T-beam the web and flange are more effective in resisting [ ]

A) Bending stress and shear stress respectively B) shear stress and bending stress respectively C) Both bending and shear D) none

34. The effective flange width of T-beams spaced at 3.25m with web depth of 1m, web width of 0.4m spanning 12m with a flange slab of 100mm thickness is [ ]

A) 3m B) 3.25m C) 2.5m D) 2.0m

35. A T-beam behaves as a rectangular beam of width equal to its flange if its N.A [ ]

A) Coincides with centroid of R.F B) coincides with centroid of T-section

C) Remains within the flange D) remains within the web

36. Poisson ratio of concrete [ ]

A)0.1to 0.2 B)0.2to0.5 C)0.3to0.5 D)05to0.4

37. Shrinkage strain of concrete as per IS 456-2000 [ ]

A)0.0003 B)0.002 C)0.2 D)0.5

38. Workability mainly depends on [ ]

A) w/c ratio B) admixtures C) aggregates D) all

39. unit weight of concrete as per IS 456-2000 [ ]

A) 26 kn/mm^2 B) 24 kn/mm^2 C) 28 kn/mm^2 D) 29 kn/mm^2

40. Grade of concrete increases strength of concrete [ ]

A)Increases B) decreases C) constant D) all

Prepared by: **Mr. M Prathap Reddy & Mr.C Siva Kumar Prasad**

.

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

UNIT – 3

SLABS

1. Design a simply supported two way slab for the roof of a room of clear dimensions 3 m x 3 m using M25 grade concrete and Fe415 grade steel. The corners are not prevented from lifting. Width of supporting walls around is 320 mm. Live load on the slab is 1.5kN/m^2 weight of weathering course is 1.75kN/m^2.
2. Design a simply supported roof slab for a room 7.5 m x 3.5 m clear in size. The slab is carrying an imposed load of 5 kN/m^2. Use M20 concrete and Fe415 steel.
3. Design a cantilever slab for an overhanging of 1.2 m . The imposed load on slab consists of 1 kN/m^2 of live load and weight of finishing is 800 N/m^2. Use M20 concrete and Fe415 steel.
4. Design a reinforced concrete slab for a hall measuring 8 m x 16 m. The slab is supported on RCC beams 250 mm wide and spaced at 4 m c/c. The superimposed load is 4 kN/m^2. Use M20 concrete and Fe415 steel. Bearing of beam is 200 mm.
5. Design a one wall continuous slab supported on T- beams spaced 3.25 m c/c. The live load on the slab is 2 kN/m^2. Use M20 concrete and Fe 415 steel.
6. Design a slab over a room 4 m x 6 m as per IS code. The edge of the slab are simply supported and the corner are not held down. The live load on the slab is 3 kN/m^2. The slab has a bearing of 150 mm on supporting walls. Use M20 concrete and Fe415.
7. Design a slab over a room 4.5 m x 6 m as per IS code. The slab are simply supported on masonry walls all round, with adequate restrained at corners are held down. The live load on the slab is 3 kN/m^2. The slab has a bearing of 150 mm on supporting walls. Use M20 concrete and Fe415.
8. Design a simply supported roof slab for a room 8 m x 3.5 m clear in size. If the super imposed load is 5 kN/m^2. Use M20 concrete and Fe415 steel.
9. Design a continuous one way slab having three equal spans of 3 m each with the following data: imposed load = 2.5 kN/m^2, grade of concrete M25 and Fe 500 steel.
10. Design a two way slab for a room 5.5 m x 4 m clear in size. If the super imposed load is 5 kN/m2. Use M25 concrete and Fe 415 steel. Edges of simply supported – corners not held down.

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (OBJECTIVE)

Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R13

1. A reinforced concrete slab is 75mm thick. The maximum size of reinforcement bar that can be used is [ ]
A) 12mm dia B) 10mm dia C) 8mm dia D) 6mm dia
2. In the design of two ways slab restrained at all edges, torsion R.F required is [ ]
A) 0.75 times the area of steel provided at mid-span in the same direction
B) 0.375 times the area of steel provided at mid-span in the same direction
C) 0.75 times the area of steel provided in the shorter span
D) Nil
3. A square slab 4mx4m is a simply supported slab. If it is subjected to a design load of 12kpa (including self weight) the moment capacity required as per IS: 456-2000; use $\alpha_x = \alpha_y = 0.062$
A) 11.9kN-m B) 15kN-m C) 28kN-m D) 35kN-m [ ]
4. The B.M coefficients for continuous RC slabs in IS; 456 is based on [ ]
A) Pigeaud's method B) Marcu's method
C) Yield-line theory D)Westergaarisd's mathematical analysis
5. As per IS: 456-2000 the vertical deflection lior beams may generally be assumed to be satisfied provided that ratio of span to effective depth of a continuous beam of span 12m is not to be greater than [ ]
A) 35 B) 26 C) 21. 67 D) 31.2
6. In case of two-way slab the deflection of the slab is [ ]
A) Primary function of the long span B) primary function of short span
C)Independent of span, short or long D) Most long span but sometimes short span
7. The moment coefficients inIS:456-2000 for simply supported two slabs are based on [ ]
A) Rankine-Grashoff theory B)Rankine-Grashoff theory with Marcus corrections
C) Yield line theory D)Westgaards mathematical analysis
8. The minimum thickness of a flat slab required according to IS:456-2000 is [ ]
A) 125mm B) 150mm C) 100mm D) 200mm
9. The continuous slab designed according to moment coefficients given by IS:456-2000 should be
A) One way slab B) two way slab C) any type D) two way restrained slab [ ]
10. Drops are provided in flat slabs to resist [ ]
A) Bending moment B) shear C) thrust D) torsion
11. For maximum sagging bending moment in a given span of a multiple span beam [ ]
A) Every span as well as alternate spans are loaded
B) adjacent spans are loaded

C) Spans adjoining this span are loaded
D) adjacent spans are unloaded and next spans are loaded
12. The amount of torsion reinforcement required for a two way simply supported slab is where Ast_{xx} ws the main reinforcement in the shorter direction [ ]
A) $3/4Ast_{xx}$ B) $1/4\ Ast_{xx}$ C) $0.75\ Ast_{xx}$ D) Ast_{xx}
13. The nominal cover required for a slab having mid exposure, with a diameter of reinforcing bars used equal to 10mm should be not less than [ ]
A) 20mm B) 25mm C) 20mm D) none
14. A rectangular slab 4mx6m supported on two opposite shorter edges should be designed as [ ]
A) A one way slab spanning along longer edges B) a two way slab
C) A one way slab spanning along shorter edges D) none
15. The negative moment in a two way restrained slab should be provided over [ ]
A) Discontinuous edge B) continuous edge C) both a and b D) none
16. The thickness of slab depends on (I=eff.Length;d=eff.depth) [ ]
A) 1/d radius B) dia of bar used C) spacing of reinforcement D) none
17. The minimum reinforcement in a slab takes care of [ ]
A) Temperature & shrinkage stress B) homogeneity of slab
C) support to main reinforcement D)all the above
18. The moment coefficients given in IS: 456-2000 for simply supported two-way slabs are based on
A) Rankine-Grashoff's method B) westergaarrd's method [ ]
C) johansen's yield line theory D) Bernoulie's theory
19. The main reinforcement in RCC cantilever beam is placed at [ ]
A) Top face along the span B) bottom face along the width
C) Top face perpendicular to width D) bottom face perpendicular to width
20. The bending moment coefficients given in IS456-2000 for two way restrained slab is based on
A) Rankine- Grashoff's method B) westergaarrd's method [ ]
C) Johansen's yield line theory D) plate theory
21. The plaster thickness of the ceiling of slabs [ ]
A) Can be included in the cover to the reinforcement
B) Should not be included in the cover
C) provides nominal cover
D) None of the above
22. The minimum percentage of high yield strength deformed bars in RCC slabs are [ ]
A) 0.4 B) 0.15 C) 0.12 D) 0.23
23. The torsional reinforcement in a two way restrained slab required for a corner with two continuous edges will be [ ]
A) 0.75 times the area of steel provided at midspan in the same direction
B) 0.375 times the area of steel provided at midspan in the same direction
C) 0.75 times the area of steel provided in the shorter span D) nil
24. In a two way restrained slab torsion steel is provided at [ ]
A) Top B) Bottom C) a and b D) none
25. The critical section for shear in a flat slab is at a distance of, (d=effective depth) [ ]

A) Effective depth from the face of a column or column drop
B) d/2 from the periphery of column or capital or drop
C) at the drop panel of a slab
D) at the periphery of the column

26. A simply supported slab of 10m effective span, the minimum effective depth to satisfy the vertical deflection limits should be [ ]
A) 50mm B) 75mm C) 60mm D) 90mm

27. In a two way slab lifting of corners occur due to [ ]
A) Resultant shear force at the ends B) torsional moment on the slab
C) Resultant stress at the ends D) unbalanced moment on the slab

28. The permissible value of deflection foe a two-way simply supported slab with shorter span less than 3.5m and the live load is less than $3kN/m^2$ using deformed bars is [ ]
A) 35 B) 28 C) 40 D) 32

29. Which one of the following statement is correct? Temperature and shrinkage steel is provided in reinforced concrete slabs because [ ]
A) It occupies larger area B) its thickness is less
C) It is a main structural element D) it is a flexure member

30. The maximum diameter of bar in a 200mm thick concrete slab is [ ]
A) 12mm B) 16mm C) 20mm D) 25mm

31.The final deflection of horizontal members below the level of casting should not exceed [ ]
A) span/200 B) span/250 C) span/300 D) span/350

32. The limiting tensile strain of concrete is of the order [ ]
A) 0.0002 to 0.0005 B) 0.0030 to 0.0004 C) 0.002 to 0.003 D) 0.003 to 0.004

33. Secant modulus E_c= [ ]
A) $500\sqrt{fck}$ B) $50\sqrt{fck}$ C) $50000\sqrt{fck}$ D) $5000\sqrt{fck}$

34. Basic value of span to effective depth ratio for continuous beam is [ ]
A) 7 B) 20 C) 26 D) 32

35. The ratio of span to total depth for a singly supported two way slab of short span less than 3.5+m and loading cross upto $3KN/m^2$ using deformed steel is [ ]
A) 35 B) 28 C) 40 D) 22

36. As tension steel increases, the deflections [ ]
A) Increase B) decrease C) doesn't change D) are independent of tension steel

37. As compression steel increases, the deflections [ ]
A) Increase B) decrease C) doesn't change D) are independent of tension steel

38. The maximum deflection for a beam at service condition is---- [ ]
A) Span/250 B) span/350 C) 20mm D) both b & c

39. The young's modulus to determine creep deflection is given by [ ]
A) Effective modulus, E_{ce} B) short term modulus, E_c C) modulus of steel, E_s D) none

40. A simple supported beam of effective span 4m. Minimum deflection with the modification factor for tension steel and compression steels are respectively 1.1 & 1.2 is given by [ ]
A) 150mm B) 200mm C) 115mm D) 60mm

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

UNIT-4

COLUMNS

1. (A) How is the problem be solved if the point of application of load and the centre of gravity of the section do not coincide.
   (b) What is the main difference, in terms of structural behaviour between a 'short column' and a 'slender column'?
2. Design a circular column with helical reinforcement subjected to 1600 kN. The column has unsupported length of 3.6 m and is effectively held in position at both ends but not restrained against rotation. Use M25 grade concrete and Fe415 steel.
3. Design the reinforcement in a column of size 400 mm × 600 mm, subjected to a factored axial load of 2500 kN. The column has unsupported lengths of 3.0 m and is braced against side way in both directions. Use M20 concrete and Fe415 steel.
4. A corner column 275 mm × 600 mm located in the multi storey of a system of braced frame, is subjected to factored loads Pu = 2000 kN, Mux = 150 kN-m and Muy = 75 kN-m. The unsupported length of the column is 3.0 m. Design the reinforcement in the column, assuming M30 concrete and Fe 415 steel.
5. Design a circular column with helical reinforcement subjected to 1600 kN. The column has unsupported length of 4.2 m and is effectively held in position at both ends but restrained against rotation at one end. Use M20 grade concrete and Fe415steel.
6. Design a column 450 mm × 550 mm of effective length 7.2 m and unsupported length 7.8 m is subjected to a factored load of 1500 kN and factored moments about major axis 42 kN-m at top and 30 kN-m at bottom. The factored moments about minor axis are 32 kN-m at top and 22 kN-m at bottom. The column is bent double curvature. Use M 25 concrete and Fe 415 steel.
7. Design a short column, with effect length 3.6 m, capable of safety resisting the following factored loads effects (under uniaxial eccentricity):
   a. Pu = 1665 kN, Mu = 85 kN-m
   b. Pu = 385 kN, Mu = 206 kN-m
   Assume M25 concrete and Fe415 steel. Draw the cross section and elevation details.
8. A short RCC square column is required to carry a factored load of 1900 kN. Design the column. Assume $e_{min} < 0.05D$ and use M20 concrete and Fe415.
9. Design an reinforced concrete square column of 500 mm side to carry an ultimate load of 2000 kN at an eccentricity of 180 mm. Use M20 concrete and Fe415.
10. Design a short column of size 500 mm x 600 mm subjected an axial load P_u = 200 kN and biaxial bending moment as follows:
    M_{ux} = 150 kN-m
    M_{uy} = 120 kN-m
    Use M20 concrete and Fe 415 steel.

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (OBJECTIVE)

Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

1.If a compression member whose effective length is greater than 3 times the least dimension of the member then that is called as [ ]
A) Column B) beam C) pedestal D) beam-column
2. A R.F concrete member is subjected to combined action of compressive axial force and B.M. if 'E_c' is the least compressive strain in the member, 'fy' is the yield stress of steel and 'E_s' the modulus of elasticity of steel, the maximum permissible compressive strain in concrete member will be [ ]
A) 0.002 B) $0.002(fy/1.15E_s)$ C) $0.0035-0.75E_c$ D) 0.0035
3. The allowable compressive load on a long composite R.F concrete column is [ ]
A) 1.05 ($\sigma_{cc}A_c+ \sigma_{sc}A_{sC}$) B) Cr ($\sigma_{cc}A_c+ \sigma_{sc}A_{sC}$) C) 1.1($\sigma_{cc}A_c+ \sigma_{sc}A_{sC}$) D) ($\sigma_{cc}A_c+ \sigma_{sc}A_{sC}$)
4. Which one of the following statements is correct [ ]
A) Maximum longitudinal R.F in an axially loaded short column is 6% of c/s
B) Column with circular section are provided transverse R.F of helical type only
C) Spacing of lateral ties cannot be more than 16 times the diameter of the tie bar
D) Longitudinal R.F bar need not be in contact with lateral ties
5. The maximum compressive strain in an RC column when the minimum strain at one edge is 0.001 should not be [ ]
A) < 0.0035 B) >0.0025 C) <0.00275 D) >0.00275
6. The minimum number of bars in a circular RC column is [ ]
A) 4 B) 6 C) 8 D) 10
7. The thickness of a footing at the edge of should not be less than [ ]
A) 100mm B) 150mm C) 200mm D) 250mm
8. The effective length of a column in building frames given in IS: 456-2000 is based on [ ]
A) Wood's tables B) wreslers's tables C) moh's tables D) bresler's tables
9. The elements that are normally subjected to combined bending and axial force are [ ]
A) Struts in reinforced concrete members B) Space truss members
C) The members in long span bridges D) Columns in framed structures
10. In an axially loaded column the maximum strain in concrete is not exceeding to [ ]
A) 0.002 B) 0.00035 C) 0.0003 D) 0.0035
11. The ratio of effective length to unsupported length of a column when effectively held in position in both ends, to restrained against rotation at one end is [ ]
A) 0.8 B) 0.65 C) 1.2 D) 1.0
12. The use of lateral ties in a column is [ ]
A) To keep main R.F in position B) take care of shear developing due to buckling
C) To give confinement in the core D) to increase ductility to the column
13. The lateral ties in a R.F column under pure axial compression are due to [ ]

A) To avoid buckling of the longitudinal R.F B) to provide adequate shear capacity
C) Provide adequate confinement to concrete D) reduce the axial deformation to the column

14. The effective length of a circular electrical pole of length 'l' and constant diameter erected on ground is, where l is un supported length of the column [ ]
A) 0.8l B) 1.2l C) 1.5l D) 2.0l

15. The axial load carrying capacity of a column of a given material, cross sectional area and length is governed by [ ]
A) Strength of its material only B) its flexural rigidity only
C) Its slenderness ratio only D) both flexural rigidity and slenderness ratio

16. The effective length of a column In a R.F concrete building frame as per IS: 456-2000, is independent of the [ ]
A) Frame type B) Span of the beam C) height of column D) loads acting on frame

17. All columns are designed for a minimum eccentricity of [ ]
A) 5mm B) 15mm C) 20mm D) 25mm

18. The purpose of lateral ties in a short column is to [ ]
A) Increase the load carrying capacity of the columns B) avoid buckling of longitudinal bars
C) Facilitate construction D) Increase shear strength of concrete

19. The load carrying capacity of a helically reinforced column as compared to that of a tied column is about [ ]
A) 5%less B) 10%less C) 5%more D) 10%more

20. A 5m long square RCC column is fixed at one end and hinged at the other end has minimum radius of gravity as 100mm, its slenderness ratio is [ ]
A) 50mm B) 40mm C) 32.5mm D) 20mm

21. Which of the following statement is correct? [ ]
A) Maximum longitudinal R.F in an axially loaded short column is 6% of the c/s
B) Columns with circular section are provided with helical R.F only
C) Circular columns is not useful in concrete
D) Columns designed in RCC are long columns only

22. A column has more c/s area than that required to carry the load, then minimum % of steel is calculated based on [ ]
A) Actual area B) Area required to carry the load C) Area excluding clear covers D) none

23. The maximum limit of 60% of reinforcement for columns is specified in IS456 is based on [ ]
A) Column with more reinforcement than 6% is unsafe
B) Column with more reinforcement will be uneconomical
C) More reinforcement will create difficulties in placing and compaction of concrete
D) None

24) An axially loaded column is of 300mm and square in section. The effective length of the column is 3m.What is minimum eccentricity of the axial load for the column? [ ]
A) 0 B) 10mm C) 16mm D)20mm

25) A square column section of size 350x350mm is reinforced with four bars of 25mm diameter and four bars of 16mm diameter; then the transverse steel should be [ ]
A) 5mmφ@240mmc/c B) 6mmφ@250mmc/c C) 8mm φ@250mmc/c D) 8mmφ@350mmc/c

26).If a compression member whose effective length is greater than 3 times the least dimension of the member then that is called as [ ]

A) Column B) beam C) pedestal D) beam-column

27). The minimum number of bars in a circular RC column is [ ]

A) 4 B) 6 C) 8 D) 10

28. The thickness of a footing at the edge of should not be less than [ ]

A) 100mm B) 150mm C) 200mm D) 250mm

29. The effective length of a column in building frames given in IS: 456-2000 is based on [ ]

A) Wood's tables B) wreslers's tables C) moh's tables D) bresler's tables

30. The elements that are normally subjected to combined bending and axial force are [ ]

A) Struts in reinforced concrete members B) Space truss members

C) The members in long span bridges D) Columns in framed structures

31. In an axially loaded column the maximum strain in concrete is not exceeding to [ ]

A) 0.002 B) 0.00035 C) 0.0003 D) 0.0035

32. All columns are designed for a minimum eccentricity of [ ]

A) 5mm B) 15mm C) 20mm D) 25mm

33. The load carrying capacity of a helically reinforced column as compared to that of a tied column is about [ ]

A) 5% less B) 10% less C) 5% more D) 10% more

34. A 5m long square RCC column is fixed at one end and hinged at the other end has minimum radius of gravity as 100mm, its slenderness ratio is [ ]

A) 50mm B) 40mm C) 32.5mm D) 20mm

35. The effective length of a column In a R.F concrete building frame as per IS: 456-2000, is _____ independent of the [ ]

A) Frame type B) Span of the beam C) height of column D) loads acting on frame

36 .An axially loaded column is of 300 mm and square in section. The effective length of the column is 3 m. What is the minimum eccentricity of the axial load for the column? [ ]

A) 0 mm B) 10 mm C) 16 mm D) 20 mm

37. A square column section of size 350 x 350 mm is reinforced with four bars of 25 mm diameter and four bars of 16 mm diameter; then the transverse steel should be [ ]

A) 5 mm dia @ 240 mm c/c

B) 6 mm dia @ 250 mm c/c

C) 8 mm dia @ 250 mm c/c

D) 8 mm dia @ 350 mm c/c

38. The minimum number of bars in a circular RC column is_____ [ ]

A) 4 B) 6 C) 8 D) 10

39. The effective length of a column in building frames given in IS : 456 – 2000 are based on [ ]

A) Wood's tables

B) Wresler's tables

C) Mohr's tables

D) Bresler's tables

40. In an axially loaded column the maximum strain in concrete is not exceeding to [ ]

A) 0.002 B) 0.00035 C) 0.0003 D) 0.0035

Prepared by: **Mr. M Prathap Reddy & Mr.C Siva Kumar Prasad**

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

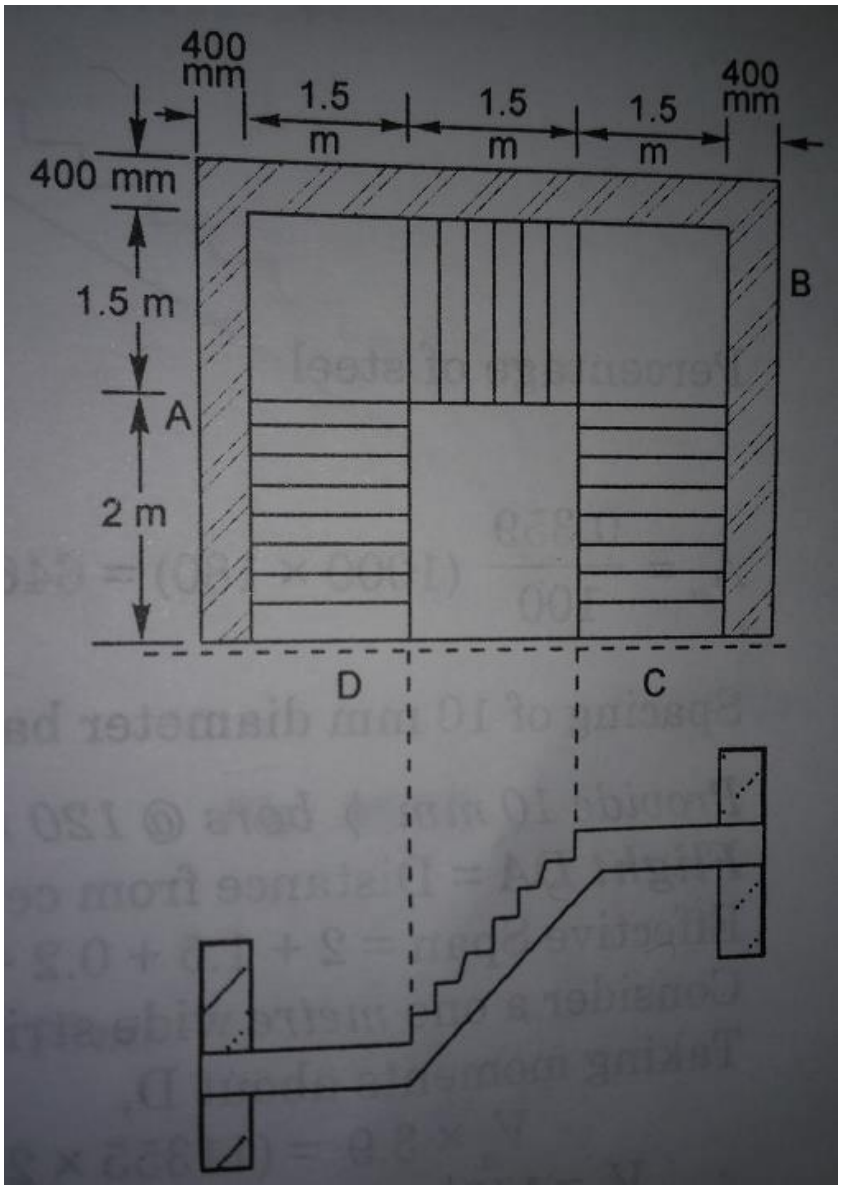
Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

UNIT-5

FOOTINGS & STAIRS

1. Design an isolated footing for a column of size 300 mm × 500 mm subjected to an axil service load of 1250 kN. The safe bearing capacity of the soil is 175 kN/m^2. Use M20 concrete and Fe 415 steel. Draw the cross-section of the column showing the reinforcement details.
2. A square RCC column 400mm x 400mm carries a working load of 650 kN axially. Design a square footing if SBC of soil is 22 5kN/m^2. Use M25 grade concrete and Fe 500 grade steel. Use limit state method.
3. Design an isolated footing for a column of size 300 mm × 450 mm subjected to an axial service load of 1200kN. The safe bearing capacity of the soil is 180 kN/m2. Use M25 concrete and Fe 415 steel. Draw the cross-section of the column showing the reinforcement details.
4. Design an isolated footing for a column of size 400 mm × 500 mm subjected to an axil service load of 1500 kN. The safe bearing capacity of the soil is 190 kN/m^2. Use M25 concrete and Fe 415 steel. Draw the cross-section of the column showing the reinforcement details.
5. Design a rectangular footing of uniform thickness for an axial loaded column of size 300 mm x 600 mm. Load on column is 1150 kN. Safe bearing capacity of the soil is 200 kN/m^2. Use M20 concrete and Fe 415 Steel.
6. Design an isolated footing for a column of size 500 mm × 500 mm subjected to an axial service load of 1500kN. The safe bearing capacity of the soil is 180 kN/m2. Use M20 concrete and Fe 415 steel. Draw the cross-section of the column showing the reinforcement details.
7. Design a suitable dog-legged staircase for a residential building, to be located in a staircase room 6 m long, 3.5 m wide and the floor height is 3.2 m. The live load may be taken as 2.0 kN/m^2. Use M25 concrete and Fe 415 steel.
8. Design a dog legged stair case for an office building in a room measuring 3 m x 6 m clear dimensions. Floor to Floor height is 3.5 m. The building is a public building liable to overcrowding. Stairs are supported on brick wall 230 mm thick at the ends of the landing. Use M20 concrete and Fe415 steel.
9. (A) With neat sketches show various types of shallow footings and briefly explain.
   (B) With a neat sketch show various parts of a quarter space landing open dogged legged stair case.
10. As shown in the figure below an arrangement for a stair case to be provided for an office building. Design the staircase. The risers are 150 mm and the threads are 250 mm. The walls are 400 mm thick and the stairs slab has full bearing on the masonry wall. The supporting beam is 400 mm wide. Use M20 concrete and Fe415 steel.


400 mm
1.5 m
1.5 m
1.5 m
400 mm
400 mm
1.5 m
A
2 m
B
D
C

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (OBJECTIVE)

Subject with Code : DDRCS(16CE119) **Course & Branch**: B.Tech - CE

Year & Sem: III-B.Tech & I-Sem **Regulation:** R16

1. The minimum depth of foundation is [ ]
A) 450mm B) 475mm C) 500mm D) 550mm

2.Given that φ is the angle of internal friction 'p' is the safe bearing capacity and [ ]
ɣ is the unit weight of soil, the minimum depth if foundation of a masonry footing is given by
A) p/ ɣ(1-sinφ/1+sinφ) B) p/ ɣ(1+sinφ/1-sinφ)
C) p/ ɣ(1-sinφ/1+sinφ)^2 D) p/ ɣ(1+sinφ/1-sinφ)^2

3. The minimum thickness required at the edge of a footing according to IS: 456-2000 [ ]
A) 230mm B) 150mm C) 100mm D) 450mm

4.The permissible bearing stress for M20 concrete column resting on a rectangular concrete footing in limit state method of design should not be more than [ ]
A) 10MPa B) 9MPa C) 11MPa D) 20MPa

4. What is the assumed design pressure below a rigid footing resting on sandy soil according to IS456-2000 [ ]
A) Parabolic with concave towards the footing base
B) Parabolic with convex towards the footing base
C) Uniform D) all the above

5. The factor of safety against overturning of a footing according to IS:456-2000 should not be less than [ ]
A) 1.5 B) 1.4 C) 2 D) 1.15

6. Which one of the following statement is correct? In a combined footing for two columns carrying unequal loads, the maximum hogging moment occurs at [ ]
A) Inside face of the heavier column B) a section having maximum shear force
C) A section equidistant from both the columns D) a section having zero shear force

7. The critical section for bending moment of a concrete footing under a masonry wall is a section at
A) The face of the wall [ ]
B) A distance of effective depth of footing from the face of the wall
C) A distance of twice the width of the wall from the face of the wall
D) A distance of half the effective depth of footing from the face of the wall

8. In a combined footing the centre of gravity of footing coincides with resultant of loads, the stress at the base of footing from the soil will be [ ]
A) Purely tensile B) purely compressive C) both tensile and compressive D) none

9. The depth of foundation is computed by [ ]
A) rankine's formula B)culomb's formula C)winkler's formula D)Rankine- grashoff formula

10. The load from the column can be transferred to the foundation by [ ]
A) Dowel bars B) column bars C) both a and b D) either a or b

11. Which of the following statements is/are correct? While designing combined footing, the resultant of the column loads passes through the centre of gravity of the footing slab such that the nest soil pressure obtained is [ ]
A) Parabolic B) trapezoidal C) uniform D) nonuniform
12. How is the depth of footing for an isolated column governed? [ ]
1. By maximum bending moment 2.by shear force 3.by punching shear
Select the correct answer using the code given below:
A) 2 and 3 only B) 1 and 2 only C) 1 and 3 only D) 1,2 and 3
13. What is the minimum nominal percentage longitudinal reinforcement to be provided in a concrete pedestal as per relevant IS code? [ ]
A) 0.4 B) 0.2 C) 0.15 D) 0.1
14. In R.F and plain concrete footings, the thickness at the edge shall not less than -----mm for footing on soil [ ]
A) 150 B) 100 C) 180 D) 175
15. In R.F and plain concrete footings, the thickness at the edge shall not less than -----mm for footing on piles [ ]
A) 350 B) 400 C) 300 D) 500
16. The minimum depth of foundation is [ ]
A) 450mm B) 475mm C) 500mm D) 550mm
17. The minimum thickness required at the edge of a footing [ ]
A) 230mm B) 150mm C) 100mm D) 450mm
18. The depth of foundation is computed by [ ]
A) rankine's formula B) culomb's formula
C) winkler's formula D) Rankine- grashoff formula
19. The load from the column can be transferred to the foundation by
A) Dowel bars B) column bars C) both a and b D) either a or b
20. What is the minimum nominal percentage longitudinal reinforcement to be provided in a concrete pedestal as per relevant IS code? [ ]
A) 0.4 B) 0.2 C) 0.15 D) 0.1
21. The factor of safety against overturning of a footing according to IS: 456-2000 should not be less than [ ]
A) 1.5 B) 1.4 C) 2 D) 1.15
22. The permissible bearing stress for M20 concrete column resting on a rectangular concrete footing in limit state method of design should not be more than [ ]
A) 10MPa B) 9MPa C) 11MPa D) 20Mpa
23. The minimum thickness required at the edge of a footing according to IS : 456 – 2000 is [ ]
(A) 230 mm (B) 150 mm (C) 100 mm (D) 450 mm
24.The permissible bearing stress for M20 concrete column resting on a rectangular concrete footing limit state method of design should not be more than [ ]
(a) 10 Mpa (B) 9 Mpa (C) 11 Mpa (D) 20 Mpa

25. Which one of the following statements is correct ? In a combined footing for two columns carrying unequal loads , the maximum hogging moment occurs at [ ]
(a) Inside face of the heavier column
(b) A section having maximum shear force
(c) A section equidistant from both the columns

(d) A section having zero shear forse

26. In a combined footing the centre of gravity of footing coincides with resultant of loads, the stress at the base of footing from the soil will be [ ]
    (a) Pure tensile
    (b) Purely compressive
    (c) Both tensile and compressive
    (d) None
27. The depth of foundation is computed by [ ]
    (a) Rankine's formula
    (b) Coulomb's formula
    (c) Winklre's formula
    (d) Rankine – grashoff's formula
28. The load from a column can be transferred to the foundation by [ ]
    (a) Dowel bars
    (b) Column bars
    (c) Both a and b
    (d) Either a or b
29. Which one of the following is correct , while designing combined footing , the resultant of the column loads passes through the centre of gravity of the footing slab such that the net soil pressure obtained is [ ]

(A) Parabolic (B) trapezoidal (C) unoiform (D) non – uniform

30. How is the depth of footing for an isolated column governed ? [ ]
    (1) By maximum bending moment
    (2) By shear force
    (3) By punching shear
    Select the correct answer using the code given below :
    (a) 2 and 3 only (B) 1 and 2 only (C) 1 and 3 only (D) 1 , 2 and 3
31 .What is the minimum nominal percentage longitudinal reinforcement to be provided in a concrete pedestal as per relavant IS code ? [ ]
    (a) 0.4 (B) 0.2 (C) 0.15 (D) 0.1
32. The maximum permissible deflection in a cantilever of 10m span after erection of partition walls is

A) 40mm B) 20mm C) 28.6mm D) 10mm [ ]

33. The creep strains are caused due to [ ]

A) DL only B) LL only C) both DL & LL D) independent of load

34. The minimum effective depth of a R.F concrete beam of 15m simple span for deflection control is

A) 0.75m B) 1.125m C) 1.25m D) 1.5m [ ]

35. Deflection can be controlled by using appropriate [ ]

A) Aspect ratio B) modular ratio C) span/depth ratio D) water/cement ratio

36. For the same c/s area which of the following beams deflect more [ ]

A) Circular beam B) I section C) rectangular beam D) T beam

37. The final deflections due to all including effects of temperature, creep and shrinkage measured from as cast level of the supports of floors, roofs, and all other horizontal members of R.F concrete should not normally exceed [ ]

A) span/350 B) span/250 C) span/350 or 20mm whichever is less D) 5/384 of span

38. In coastal region minimum grade of concrete for R.C.C is [ ]

A) M_{15} B) M_{20} C) M_{25} D) M_{30}

39. In LSD of concrete structures the strain distribution is assumed to be [ ]

A) Linear B) Non linear C) parabolic D) parabolic and rectangular

40. Which of the following is not a limit state of serviceability [ ]

A) Deflection B) Cracking C) Torsion D) Durability

Prepared by: **Mr. M Prathap Reddy & Mr.C Siva Kumar Prasad**