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

QUESTION BANK (DESCRIPTIVE)

Subject with Code : BE (13A03701) **Course & Branch**: B.Tech - CE

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

UNIT –II

DECK SLAB BRIDGE

1. Explain the step by step design procedure of the interior deck slab bridge.
2. A RCC deck slab is to be constructed over a channel on a national highway for Class AA tracked vehicles. The effective span is 4.7m. Calculate the net effective width of dispersion for two wheels of class AA tracked vehicle by effective width method.
3. Explain about
   (a). Effective Width Method
   (b). Pigeaud's Coefficient Method.
4. Design a reinforced simply supported deck slab concrete bridge for a state highway to suit the following data:

   Carriage Way (Clear) : 7500 mm Grade of concrete : M25
   Grade of Steel : Fe415 Width of the footpath: 1000 mm on either side.
   Clear Span : 6000 mm Thickness of Wearing Coat: 80 mm
   Width of Bearing : 400 mm Loading: IRC Class AA Tracked Vehicle.
5. Design a reinforced simply supported deck slab concrete bridge for a state highway to suit the following data:

   Carriage Way (Clear) : 7.5 m Grade of concrete : M25
   Grade of Steel : Fe415 Width of the footpath : 0.6 m on either side.
   Clear Span : 5.5 m Thickness of Wearing Coat : 80 mm
   Width of Bearing : 400 mm Loading: IRC Class AA Tracked Vehicle.
6. Design a reinforced concrete slab bridge using the following data: Clear width of road way = 7.8 m clear span = 10 m live load = IRC class AA. Use M 25 grade concrete and Fe 415 steel.
7. Design a reinforced concrete slab bridge using the following data: Clear width of road way = 7.5 m, clear span = 8 m. Use M 20 grade concrete and Fe 415.
8. A reinforced concrete simply supported slab is required for the deck of a road bridge having the data given below: Width of carriage way = 7.5 m Kerbs = 600 mm wide, clear span = 5 m type of loading = IRC class AA tracked vehicle. Use M 20 grade and Fe 415 steel.

9. An RCC deck slab is to be constructed over a channel on a national highway for class AA tracked vehicles. The effective span is 4.3 m. calculate the net effective width of dispersion for two wheels of class AA tracked vehicle by effective width method.
10. A) Write a note on “impact factor” for bridges.
    B) What are general features of deck Slab Bridge?
    C) Write the effective width formula for single concentrated load in solid slabs.
    D) What is meant by shear stress?
    E) Define effective width of dispersion.

Prepared by: **M.MANIKANTAN**.

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1. The Reinforced concrete slab type decks as super structure is economical for spans upto
(A) 10m (B) 8m (C) 12m (D) 15m [ ]
2. For slabs, the diameter and spacing of reinforcing bar shall not exceed ___ respectively as per IRC: 21-2000 [ ]
(A) 25mm & 150mm (B) 30mm &140mm (C) 25mm &180mm (D) 30mm &180mm
3. For a single wheel concentrated load, the effective width may be calculated by using equation
(A) $b_e = kx\left[1-\frac{2x}{L}\right]+b_w$ (B) $b_e = kx\left[1-\frac{x}{L}\right]+b_w$ [ ]
(C) $b_e = kx\left[1-\frac{x}{2L}\right]+b_w$ (D) $b_e = kx\left[1-\frac{x}{L}\right]+2b_w$
4. In solid deck slabs, the tension reinforcement shall not be less than __% of total c/s area using Fe415 grade bars [ ]
(A) 0.12 (B) 0.15 (C) 0.18 (D) 0.20
5. In solid deck slabs, the tension reinforcement shall not be less than __% of total c/s area using Fe240 grade bars [ ]
(A) 0.12 (B) 0.15 (C) 0.18 (D) 0.20
6. For columns, the diameter and spacing of reinforcing bar shall not exceed ___ respectively as per IRC: 21-2000 [ ]
(A) 25mm & 200mm (B) 30mm &250mm (C) 32mm &300mm (D) None of these
7. The dispersion of wheel load may be assumed to be ___ through wearing coat [ ]
(A) 60^0 (B) 45^0 (C) 30^0 (D) 15^0
8. As per IRC: 21-2000, shear stress in deck slabs is given as τ = [ ]
(A) $\frac{2V}{bd}$ (B) $\frac{V}{bd^2}$ (C) $\frac{V}{bd}$ (D) None of these
9. The ground contact width of the IRC classAA tracked vehicle is ____m. [ ]
(A) 1.0 (B) 1.20 (C) 0.85 (D) 0.90
10. The ground contact length of the IRC classAA tracked vehicle is ____m. [ ]
(A) 3 (B) 3.6 (C) 0.85 (D) 0.90
11. The % of impact factor for class AA tracked vehicle, if the length of span is 4.5m [ ]
(A) 30% (B) 35% (C) 25% (D) 20%
12. $b_e = kx\left[1-\frac{x}{L}\right]+b_w$ where, k is a constant which depends upon a ratio of ____ value
(A) $\frac{l}{B}$ (B) $\frac{B}{l}$ (C) $\frac{l^2}{B}$ (D) None of these [ ]
13. In Courbon's method, the span-width ratio is [ ]
(A) 1 to 3 (B) 2 to 4 (C) 2 to 5 (D) 1.5

14. In case of foundations the minimum clear cover shall be ___ mm. [ ]
(A) 60 (B) 65 (C) 70 (D) 75
15. The diameter of longitudinal reinforcements in a column should be not less than __ mm.
(A) 20 (B) 12 (C) 10 (D) 16 [ ]
16. If b=wheel contact width, h= wearing coat thickness then b_w = [ ]
(A) 2b+2h (B) b+h (C) b+2h (D) None of these
17. If D=over all depth of slab, l=length of wheel contact, h= thickness of wearing coat, then effective length of dispersion along the span (l_{ef}) [ ]
(A) l+2(D+h) (B) l+1.5(D+h) (C) l+2(D+1.5h) (D) l+2(D+2h)
18. As per IRC: 21-2000, Poisson's ratio for concrete generally assumed as ___ [ ]
(A) 0.10 (B) 0.12 (C) 0.15 (D) 0.20
19. The moment of distribution reinforcement in perpendicular direction to span is designed for ___ times the live load moment & ___ times the dead load moment (in one way slabs).[ ]
(A) 0.3 & 0.2 (B) 0.4 & 0.3 (C) 0.1 & 0.2 (D) None of these
20. In beam & slab bridges, which method is appropriate one for design of interior slab panels
(A) Hendry Jaegar method (B) Pigeaud's method [ ]
(C) Courbon's method (D) Any one of these
21. In beam & slab bridges, which method is appropriate one for design of longitudinal girders
(A) Rankine-Grashoff method (B) Pigeaud's method [ ]
(C) Courbon's method (D)Anyone of these
22. According to Courbon's method, the longitudinal girders are interconnected by at least __ symmetrically spaced cross girders [ ]
(A) 6 (B) 5 (C) 4 (D) 3
23. The longitudinal girders are spaced at intervals of _____ [ ]
(A) 3m (B) 4 to 5m (C) 2 to 2.5m (D) 5m
24. The cross girders are provided at intervals of _____ [ ]
(A) 3m (B) 4 to 5m (C) 2 to 2.5m (D) 2.5m
25. In T-beam bridges, m1 & m2 are coefficients for moments along the short & long span direction, then moment in the short span direction (M_B) [ ]
(A) W(m2+μm1) (B) W(m1+μm2) (C) W(m2+2m1) (D) W(m1+m2)
26. In T-beam bridges, m1 & m2 are coefficients for moments along the short & long span direction, then moment in the long span direction (M_L) [ ]
(A) W(m2+μm1) (B) W(m1+μm2) (C) W(m2+2m1) (D) W(m1+m2)
27. Reinforced concrete slab type decks is economical for spans upto [ ]
(A) 4m (B) 6m (C) 8m (D) 10m
28. The deck slab is designed ----- to support dead load and live load with impact [ ]
(A) Two way slab (B) one way slab (C) both a&b (D) none
29. For slabs, the diameter and spacing of reinforcing bar shall not exceed [ ]
(A) 35mm & 150mm (B) 45mm & 150mm (C)25mm & 140mm (D)25mm & 150mm
30. For coloumns, the diameter and spacing of reinforcing bar shall not exceed [ ]
(A) 35mm & 300mm (B) 32mm &300mm (C)25mm & 3500mm (D)32mm & 350mm
31. The values of modular ratio 'm' to be used in the computation is---as per IRC:21-2000
(A) 10 (B) 12 (C) 8 (D) 15 [ ]
32. For a single concentrated load, the effective width may be calculated by using ---formula

[ ]

(A) b_c= kx[1-x/L]+b_w (B) b_c= k[1-x/L]+b_w (C) b_c= kx[1-x/L] (D) b_c= kx[1+x/L]+b_w

33. The effective width shall not exceed the actual------ of the slab [ ]

(A)Length (B) depth (C) width (D) breadth

34. In one way slab, the distribution R.F in the perpendicular direction to span is designed for ------ - times the live load moment [ ]

(A) 0. 2 (B) 0.3 (C) 0.4 (D) 0.5

35. In one way slab, the distribution R.F in the perpendicular direction to span is designed for ------ - times the dead load moment [ ]

(A) 0. 2 (B) 0.3 (C) 0.4 () 0.5

36. Poisson's ratio for concrete generally assumed as------as per IRC:21-2000 [ ]

(A) 0.1 (B) 0.2 (C) 0.3 (D) 0.15

37. The dispersion of the wheel (or) track load may be assumed to be-----through wearing coat

(A) 25^0 (B) 35^0 (C) 45^0 (D) 55^0[ ]

38. The bridge loadings are generally specified in the form of------loads [ ]

(A) Wheel (B) track (C) a or b (D) none

39. The slab is analyzed as a thin plate using the------analysis with different boundary conditions

(A) Plastic (B) elastic (C) beam (D) all [ ]

40. The dispersion of the wheel loads is taken up to the -----surface of the slab [ ]

(A) Middle (B) end (C) a&b (D) none

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