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Question Paper Code: U8178

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

One credit

Civil Engineering

21UCE878 - BAR BENDING AND DUCTILE DETAILING

(Regulations 2021)

(Common to All Branches)

(SP 34 and IS 13920 Codes Are Permitted)

Duration: 1 hour 30mins

Maximum: 50 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. In bar bending schedule, what does the term "stirrups" typically represent? CO1-U
 - (a) Vertical reinforcement
 - (b) Horizontal reinforcement
 - (c) Shear reinforcement
 - (d) Tensile reinforcement
2. Which type of reinforcement is commonly used for resisting bending moments in beams? CO1 -U
 - (a) Stirrups
 - (b) Main bars
 - (c) Ties
 - (d) Links
3. What is the recommended spacing of ties or stirrups in reinforced concrete columns? CO2 -U
 - (a) 100 mm to 150 mm
 - (b) 200 mm to 300 mm
 - (c) 400 mm to 500 mm
 - (d) 600 mm to 700 mm
4. What is the main objective of seismic ductile detailing in buildings? CO2 -U
 - (a) To increase construction cost
 - (b) To minimize earthquake damage and enhance occupant safety
 - (c) To improve visual appeal
 - (d) To decrease structural stability

5. What role does confinement play in ductile detailing of reinforced concrete structures? CO2 -U
- (a) Increases flexibility (b) Enhances strength
(c) Decreases ductility (d) Reduces stability
6. In seismic design, what is the significance of ductility demand over capacity? CO2 -U
- (a) The structure is overdesigned
(b) The structure may fail under seismic loading
(c) The structure is under-designed
(d) The structure is aesthetically pleasing
7. What is the significance of detailing plastic hinges in ductile design? CO2 -U
- (a) Enhances structural rigidity (b) Reduces structural stability
(c) Allows controlled yielding and dissipates energy (d) Increases construction cost
8. What is the primary function of seismic links in ductile detailing? CO2 -U
- (a) Increase lateral load resistance (b) Enhance compressive strength
(c) Facilitate vertical load transfer (d) Decrease structural stability
9. Which seismic design category is likely to require more stringent ductile detailing requirements? CO2 -U
- (a) Low seismic risk (b) Moderate seismic risk
(c) High seismic risk (d) Very high seismic risk
10. Which type of reinforcement is commonly bent into closed stirrups for columns? CO1 -U
- (a) Main bars (b) Longitudinal bars
(c) Distribution bars (d) Ties

PART – B (5 x 2 = 10 Marks)

11. Explain the purpose of using a bar bending schedule. CO1 -U
12. Mention the significance of maintaining proper lap length in bar bending. CO1 -U
13. Mention the primary purpose of providing seismic detailing in reinforced concrete structures. CO2 -U
14. Explain the significance of confining reinforcement in ductile detailing. CO2 -U

15. List out the key considerations for selecting reinforcing bar materials in ductile detailing. CO2 -U

PART – C (2 x 15 = 30 Marks)

16. (a) Explain the process of bar bending in reinforced concrete structures. CO1 -U (16)
Or
(b) Discuss the importance and uses of bar bending schedule. CO1 -U (16)
17. (a) Discuss in detail about the ductile detailing for Special Confining Reinforcement for columns and frame members. CO2 - U (16)
Or
(b) Explain about the ductile detailing for shear walls CO2 - U (16)

