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Question Paper Code: U8178

B.E. / B.Tech. DEGREE EXAMINATION, APRIL/MAY 2025

One Credit Course

Civil Engineering

21UCE878 – BAR BENDING AND DUCTILE DETAILING

(Regulations 2021)

Duration: 1.30 Hours

Maximum: 50 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. What does the term "ductility" refer to reinforced concrete structures? CO1-U
(a) Strength (b) Flexibility
(c) Durability (d) Stiffness
2. What is the purpose of providing development length in bar bending? CO1-U
(a) Enhance structural aesthetics (b) Ensure proper bar spacing
(c) Achieve bond between steel and concrete (d) Reduce construction time
3. Which material property is crucial for achieving ductility in a structure? CO1-U
(a) Compressive strength (b) Tensile strength
(c) Shear strength (d) Hardness
4. In ductile detailing, what is the purpose of providing adequate lateral support to reinforcement in beams and columns? CO1-U
(a) To prevent sagging (b) To enhance structural stability
(c) To improve aesthetics (d) To increase compressive strength
5. Which seismic force-resisting system is commonly associated with ductile detailing? CO1-U
(a) Unreinforced masonry (b) Moment frames
(c) Timber frames (d) Non-ductile detailing

6. In seismic design, what is the significance of ductility demand over capacity? CO1-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 primary function of seismic links in ductile detailing? CO1-U
 - (a) Increase lateral load resistance
 - (b) Enhance compressive strength
 - (c) Facilitate vertical load transfer
 - (d) Decrease structural stability
8. Which seismic design category is likely to require more stringent ductile detailing requirements? CO1-U
 - (a) Low seismic risk
 - (b) Moderate seismic risk
 - (c) High seismic risk
 - (d) Very high seismic risk
9. What is the recommended spacing of ties or stirrups in reinforced concrete columns? CO1-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
10. 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

PART – B (5 x 2= 10 Marks)

11. Enumerate the significance of confining reinforcement in ductile detailing. CO2 - App
12. List out the key considerations for selecting reinforcing bar materials in ductile detailing. CO2 - App
13. Why is bar bending necessary in construction? CO1 - U
14. Define ductile detailing. CO1 - U
15. Explain the purpose of using a bar bending schedule. CO1 - U

PART – C (2 x 15= 30 Marks)

16. (a) Elaborate the role of bar bending schedule in construction projects. CO1 - U (15)
- Or
- (b) Explain the components of bar bending schedule. CO1 - U (15)
17. (a) Discuss in detail about the ductile detailing for Special Confining Reinforcement for columns and frame members. CO2 - App (15)
- Or
- (b) Elaborate the ductile detailing for flexural members with neat sketches CO2 - App (15)

