Dr. Anil Kuman

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT TEST -3 EXAMINATION- Dec- 2017

B.Tech V Semester

COURSE CODE: 10B11CE512

MAX. MARKS: 35

COURSE NAME: Design of Concrete Structures

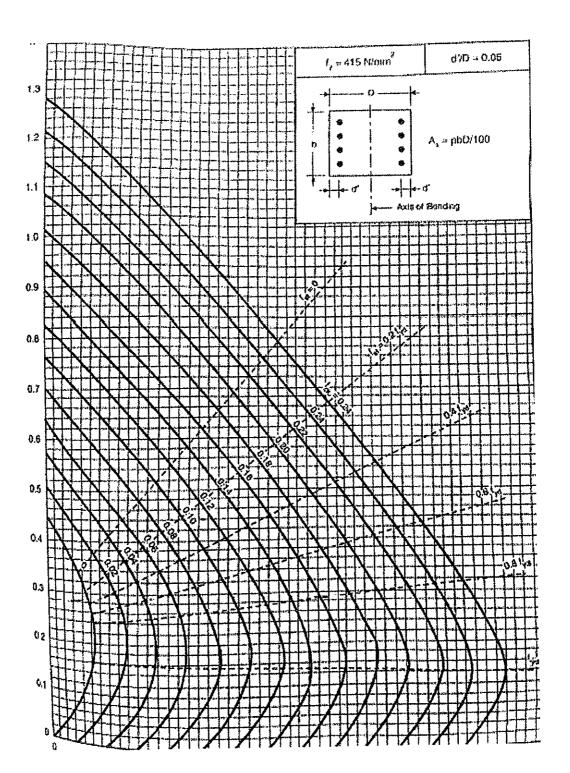
**COURSE CREDITS: 4** 

MAX. TIME: 2 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of IS456:2000 is allowed. Data if required should be suitably assumed.

- Q1. Design a simply supported one way slab on masonry wall to carry a live load of 4kN/m<sup>2</sup>. Clear span is 3m. Use M20/ Fe415. (5)
- Q2. Design a RCC slab for a roof 5m×6m. Slab is simply supported on all the four edges with corners held down and live load of 3kN/m<sup>2</sup> (inclusive of floor finish). Use M20/Fe415. (5)
- Q3. Stating assumptions deduce an equation to find the moment of resistance of a singly reinforced RCC beam. Draw the figure neatly and clearly. (5)
- Q4. Differentiate between balanced, under reinforced and over reinforced section. Which of them would you prefer as a structural engineer in the design and why?

  (5)
- Q5. Determine the bending capacity  $M_u$  for a column of size  $300 \text{mm} \times 500 \text{mm}$  which is reinforced with 6 bars of 20mm diameter arranged on two sides of the column and subjected to an axial load of 800 kN. Use M20/Fe415. Take d'= 50mm. (5)
- Q6. Deduce an equation to find the development length if  $\tau_{bd}$  is the design bond stress in limit state method. (5)
- Q7. A rectangular beam of 250mm×500mm effective depth is provided with tension steel of 5 bars of 28mm diameter and compression steel of 2 bars of 25mm diameter. The effective cover to the compression steel being 50mm. Calculate the ultimate capacity of the section. Use M20/Fe250.



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