

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST -1 EXAMINATION- 2015

## B.Tech V Semester

COURSE CODE: 10B11CE512

MAX. MARKS: 15

COURSE NAME: DESIGN OF CONCRETE STRUCTURES

COURSE CREDITS: 4

MAX. TIME: 1 HR

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. a) The unit weight of Reinforced cement concrete is \_\_\_\_\_. (0.5 x 10 = 5)  
 b) HYSD bars are also known as \_\_\_\_\_ steel.  
 c) The limit state corresponding to maximum load carrying capacity is known as \_\_\_\_\_.  
 d) \_\_\_\_\_ Code gives the values of different types of loads.  
 e) Maximum strains in an extreme fibre in concrete and in the tension reinforcement (Fe-500 grade and  $E_s = 200 \text{ kN/mm}^2$ ) in a balanced section at limit state of flexure are \_\_\_\_\_.  
 f) Reinforced cement concrete structures are heavier than steel structures. (True/ False)  
 g) TMT bars have excellent ductility. (True/ False)  
 h) High strength is more ductile than mild steel. (True/ False)  
 i) Limit state assumes linear stress distribution. (True/ False)  
 j) The moment of resistance of balanced section is less than that of under reinforced section.
2. A 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 the necessary checks. Use M25 and Fe 415 steel. (3)
3. A doubly reinforced rectangular concrete beam has a width of 300 mm and an effective depth of 500 mm. The beam is reinforced with  $2200 \text{ mm}^2$  of steel in tension and  $628 \text{ mm}^2$  of steel in compression. The effective cover for compression steel is 50 mm. Assume that both tension and compression steel yield. The grades of concrete and steel used are M20 and Fe 250, respectively. The stress block parameters for concrete shall be as per IS: 456-2000. Determine the depth of neutral axis and moment of resistance of the section. (3)

4. A T-beam floor system has 120 mm thick slab supported on beams. The width of beam is 300 mm and effective depth is 580 mm. The beam is reinforced with 8 bars of 20mm diameter. Use M20 grade of concrete and Fe 415 steel. The beams are spaced 3m centre to centre. The effective span of beam is 3.6m. (4)

21/SEP/2015