* K D - 6 4 0 3 *

KD-6403

B. Arch. - II (Sem. - IV) Examination

December - 2012

Structural Design & Systems - IV

(New Course)

Time : 2 Hours] [Total Marks : 50

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. Arch. - II (Sem. - IV)**

Name of the Subject :

☛ **Structural Design & Systems - IV (New Course)**

☛Subject Code No. : **6 4 0 3** ☛Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Assume suitable data & specifically mention it.

(3) Figures to the right indicate full marks.

(4) Use of Nonprogrammable scientific calculator is permitted.

(5) Use of IS-456, IS-875 and IS-800 is permitted.

1 A singly reinforced rectangular beam section of 300 mm width and 450 mm depth is reinforced with 4- 12 mm diameter bars at bottom. Find out the moment of resistance of a beam if it is subjected to a sagging moment. Use the grade of steel ; Fe – 415 and grade of concrete M -15 **10**

2 Design a beam ' **AB**'; of a school building ,given in **fig-1** . Use M-20 grade of concrete and Fe- 415 grade of steel . Live load on a slab is 3 KN / sq. m . Draw your designed section showing reinforcement detailing **10**

OR

Design a simply supported slab of panel dimension 3.5 m X 4.0 m , for a residential purpose if the grade of steel is Fe – 415 and that of concrete is M-20 . Draw your designed section showing reinforcement detailing

3 Design a shear reinforcements for a simply supported beam of span 4 m. Subjected to a shear force of 300 KN. The beam section is of 230 mm X 650 mm over all depth. Use the grade of steel; Fe – 415 and grade of concrete; M -20. The area of steel required in tension zone is 1710 sq.mm. Draw your designed section showing reinforcement detailing **10**

4 Design a simply supported slab of effective span of 3 m. Building is used for residential purpose. Use M20 & Fe-415 grades of concrete & steel. Draw your designed section showing reinforcement detailing **10**

5 (a) Calculate thickness of load bearing wall for a watchman's cabin of 2 m X 4 m size. Headroom is 3m, footing starts at 1.5 m level from ground. Rcc slab of 100 mm thickness is used. Plinth is 0.45 m from ground level. Le = 4.5 m, he= 3.2 m, Basic compressive stress of masonry is = 0.8 N/mm2 , ks = 0.8, kp= 1, ka =1. **06**

(b) A hall of size 20 m x 10 m is required to design using load bearing structure. Give your comment how you will design it . give some design options **04**

OR

(b) Draw structural plan showing beam ,column , slab for a doglegged staircase. & draw section showing reinforcement detailing for a waist slab.

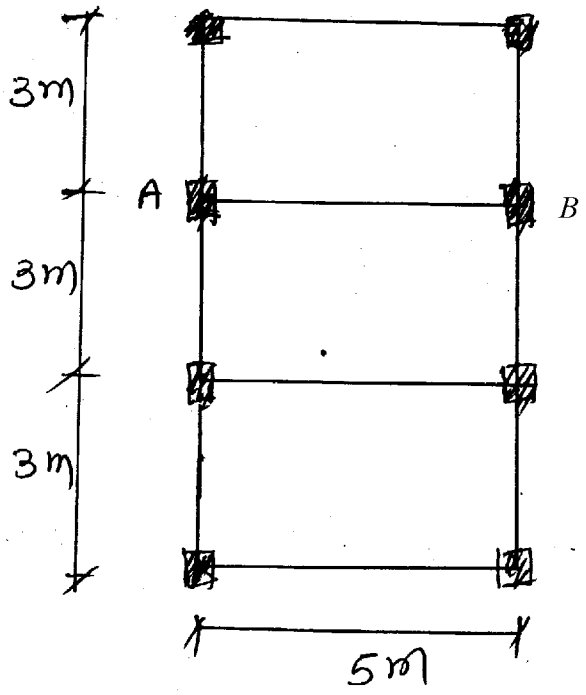

Fig. 1