* R M - 6 4 0 3 / 1 0 0 *

RM-6403

B. Arch. - II (Sem. - 4) Examination

May / June – 2010

Structure - IV

Time : **3** Hours] [Total Marks : **100**

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. - 2 (SEM. - 4)

Name of the Subject :

☛ STRUCTURE - 4

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

Seat No. :

Student's Signature

(2) Assume suitable data wherever necessary and specially mention them.
(3) Figures to the right of each quesiton indicate full marks.
(4) Use of IS456, IS 875 and IS 800 is permitted.
(5) Programmable calculator is not allowed.

Q – 1 **12**

A singly reinforced rectangular beam section of 300 mm width and 600 mm Over all depth is reinforced with 3 - 25 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 – 250 and grade of concrete ; M -15.

Q – 2 **15**

Write whether the statement is true or false ? Why ?

1. A concrete grade M-20 means concrete mix 1:1.5 : 3.
2. Ultimate State Method of Design Gives Most economical Design .
3. We Must always design an Over reinforced Section .
4. A steel Grade Fe -250 means ,the design stress of steel for limit stress method is 150 N / mm2 .
5. Another name of working stress method of design is Limit stress of design.

Q – 3 **12**

Design a simply supported slab of panel dimension 4 m X 4.5 m , for a residential purpose . If the grade of steel is Fe – 415 and that of concrete is M-20 .

OR

Q-3 **12**

Design a simply supported slab of Panel dimension 3.5 m x 8 m . The live load on a slab is 3 Kn / Sq.m. Use M-20 & Fe-415 Grade of concrete & steel.

Q –4 **15**

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 4 Kn/ sq. m

Q –5 **12**

A rectangular beam section of 230 mm width and 500 mm depth is reinforced with 5 - 16 mm diameter bars at bottom and 3 - 16 mm diameter bars at top. Find out the moment of resistance of a beam . Use the grade of steel; Fe – 415 and grade of concrete; M -15

Q –6 **12**

Answer the following Questions.

1. Calculate all moments required to design a slab panel "ABCD"given in **fig.-** 1, If the design total load , including the self weight ; on a slab is 8.25 Kn/ sq.m .
2. Under which circumstances ,We Design a Doubly reinforced Section?
3. How many limit states are there ? For which limit state we design a section?
4. In R.C.C. ,Why we use steel as an reinforcement?

Q – 7 **08**

For a doglegged staircase shown in **fig-2** locate position of column & beam in plan & draw necessary sections passing through waist slab. Draw reinforcement detailing in waist slab. Also explain load transfer.

OR

Q -7

Draw a typical plan & a section of a Two way Slab .

Q – 8 **14.**

Design a shear reinforcements for a simply supported beam of span 5 m. Subjected to a shear force of 200 KN. The beam section is of 230 mm X 600 mm over all depth. Use the grade of steel; Fe – 415 and grade of concrete; M -20.

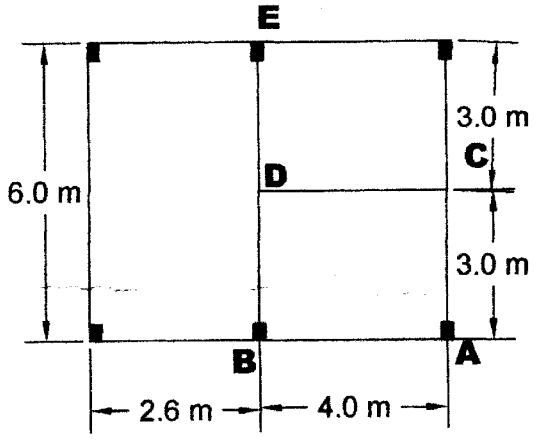
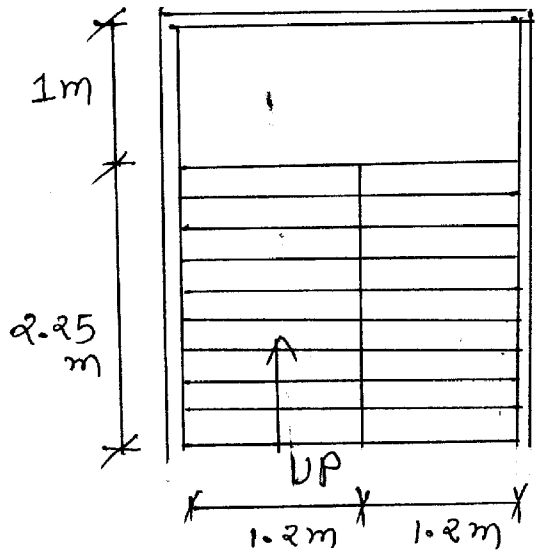


fig. 1



T = 0.25 m

R = 0.15 m.

Head Room = 3 m

FIG- 2
