



SF-6403

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

May/June - 2011

Structural Design & Systems - IV

(New Course)

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

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| नीचे दशांशवैध निशानीवाणी विगतो उत्तरवही पर अवश्य लपवी. Fillup strictly the details of signs on your answer book. | Seat No. : |
| Name of the Examination : | <input type="text"/> |
| B. ARCH. - 2 (SEM. - 4) | <input type="text"/> |
| Name of the Subject : | <input type="text"/> |
| STRUCTURAL DESIGN & SYSTEMS - 4 (NEW COURSE) | <input type="text"/> |
| Subject Code No. : <input type="text" value="6"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="3"/> | Section No. (1, 2,.....): <input type="text" value="Nil"/> |
| Student's Signature | |

- (2) Assume suitable data wherever necessary and specifically mention them.
- (3) Figures to the right of each question indicate full marks.
- (4) Use of IS456, IS 875 and IS 800 is permitted.
- (5) Programmable calculator is not allowed.
- 1 Design a beam 'AB'; of a building, given in fig-1. Use **10**
M-20 grade of concrete and Fe-415 grade of steel. Live
load on a slab is 3.0 kN/sqm.

OR

- 1 Design a rectangular simply supported slab panel of **10**
4m × 5m. If the grade of steel is Fe-415 and that of concrete
is M-20. The live load on a slab is 2 kN/sq.m.
- 2 A singly reinforced cantilever rectangular beam section of **8**
230 mm width and 450 mm effective depth is reinforced
with 4-12 mm diameter bars at top and 2-12 mm diameter
bars at bottom. Find out the limiting moment of resistance
of a beam, if it is subjected to a hogging moment. Use the
grade of steel; Fe-250 and grade of concrete M-15.
- 3 Write whether the statement is true or false ? Justify **12**
your answer :
- (i) What is a difference between a one way slab and a two
way slab ? What do you mean by a restrained slab ?

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[Contd...

- (ii) What is the difference between singly reinforced section and a doubly reinforced section ? Under which condition we prefer doubly reinforced section ?
- (iii) Explain limit state method, working state method and ultimate state method ? Which one is preferable ? Why ?

4 Explain the behaviour of load bearing structure under the effect of Earthquake. Explain how you will go for detailing to resist earthquake and why ? **10**

OR

- 4 Attempt all questions :
- (i) How combination of load bearing and framed structure behaves under earthquake ? Will you go for such combinations, why ? **2**
 - (ii) What is stiffening element ? Why it is required in load bearing wall ? **2**
 - (iii) It is required to build cantilever room, having 3m cantilever in both the direction using load bearing structure. How you will provide ? Discuss various options. **2**
 - (iv) Is required to build a hall of size 15 m × 20 m with 7m head room using load bearing masonry wall. With one wall having glass wall. Discuss various options, how you will build this hall ? **4**

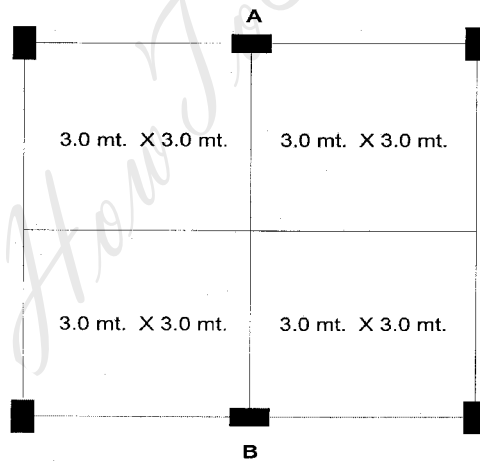


Figure-1

5 Design a shear reinforcements for a simply supported beam of span 5.0 m. Subjected to an 90 kN/m uniformly distributed load in addition to a central point load of 50 kN. The beam section is of 300 mm × 660 mm effective depth. The area of steel required in a tension zone is 1800 sq.mm. Use the grade of steel; Fe-415 and grade of concrete; M-20. **10**