I.)	40		Note:	
II.)	40			
III.)	40			
Σ	120		Written part (min. 60 points)	< 120 Fail (1) 120 – 144 Pass (2) 145 – 169 Satisfactory (3) 170 – 194 Good (4) 195 – 240 Excellent (5)
Σ	120		Oral part (min. 60 pont)	
Σ	240		Sum (min. 120 pont)	
			Grade	

Rules for the test:

1. Questions can be asked just about the interpretation of the exercises!
2. During the exam, only calculator, pencil and ruler can be used, **no study aid**!
3. **Cell phone must be switched off and put in the bag. Cannot be used even as a calculator or clock!**
4. The room must not be left during the exam, other case the test of the student is finished!
5. The non observence of the rules results the suspension from the exam!
6. Please, work just on the given paper. On the theoretical questions, give straight and compact answers.

By signing this document I declare that I have not used any illegal aid.

Name: **Signature:**	**9th Jan. 2012**
Global - Structures	

I. Theoretical questions

1. If you have an L shape section for a beam, where would you situate the load on not to have torsion effect?

2. What is the difference between the strength of a wall with or without mortar in the vertical joints.

3. Which structural materials have significant effects from creep?

4. The strength or the serviceability is the most important, if
    a. you design a factory for produce glass structures?

    b. you use a new type of separating wall?

5. What is the advantage of the ring edge for support shell structures?

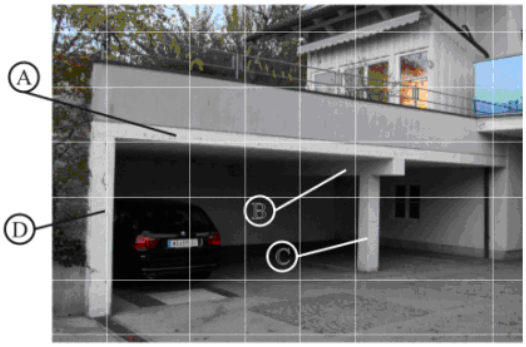
6. Sketch the internal forces in shells, walls and slabs!

7. Sketch the stress distribution of a wall beam at the middle and at the supports!

8. Sketch the internal structure of a cable!

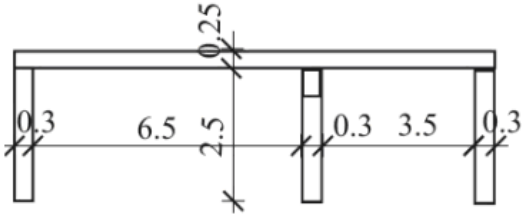
(8x5 pont)

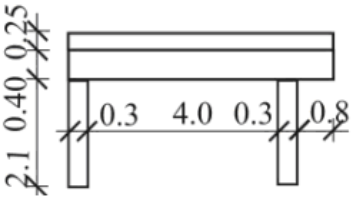
II. Calculations



1. Specify the statical model and the loads of each marked structural element (A, B, C, D)! Design the reinforcement of the beam "B" for the maximum moment! Sketch the reinforcement for the whole beam (without calculation)! *(40 points)*

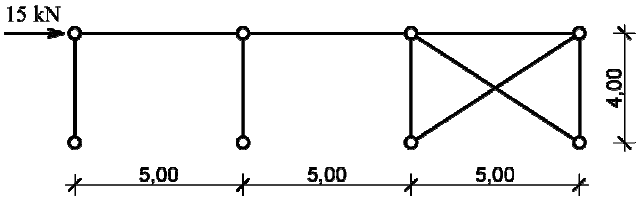
We assume hinge-connections between the elements. The reaction force of the 3 supported slab at the "D" wall is $0{,}4*p*l_1$
Loads: q_k=3,0kN/m^2, g_k=4,0kN/m^2 + dead load
Beam "B": 300mm/400mm
Concrete: f_{cd}=13,3N/mm^2, steel: f_{yd}=435N/mm^2
Longitudinal bars: Φ16 ($A_{s\Phi16}$=201mm^2), link: Φ8, c_{nom}=30mm





III. Calculations

2. Specify the reaction forces and draw the M,N,V diagrams of the given cable-braced structure! (*20 points*)



3. a.) Check the given cable structure, whether each cable remained tensioned! *(15 points)*
The main girders are at t=5m distance, and the pretension is P=300kN in the given cables.
b.) What is the minimum size of the pretension? *(5 points)*