

B-17

CEL768 - Recent advances in construction materials

2013-2014 - Semester II - Minor 2 (60 minutes)

No extra sheet will be provided. Please give to the point answers. Use pencils for drawings.

Question 1 (10 marks): Indicate with reasons whether the following statements are true or false (No marks without correct reasons. Give concise 1 line reasons and answer in the correct order.):

- a) Water reducing agents do not work well with geopolymers.
- ✓ b) Superplasticizers reduce bleeding.
- c) Water reducers reduce strength when they are not used to reduce the water to cement ratio. $w/c = \text{constant}$
- ✓ d) Air entrainment increases cohesion in concrete.
- ✓ e) Spraying of lithium compounds can reduce alkali silika reaction.
- ✓ f) Calcium nitrate is a safer accelerator than calcium chloride.
- ✓ g) Drying shrinkage can increase the risk of corrosion in concrete.
- ✓ h) Shrinkage stresses are higher in concretes containing finer powders.
- i) Rapid chloride penetration test relates current to permeability.
- ✓ j) Concretes with finer cements may give poor durability compared to concretes of the same grade using coarser cements.

Question 2 (5 marks): Discuss the process of shrinkage in a concrete being cured under ambient conditions.

Question 3 (5 marks): Using a diagram or a table, explain which main elements must be considered for the durable design of a structure.