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CVG 2141 – CIVIL ENGINEERING MATERIALS

Quiz III
Dr. Leandro F. M. Sanchez **October 7th, 2020**

1. **Why is it essential to decrease Portland cement (PC) in concrete?**
2. **Describe briefly the manufacturing process of PC.**
3. **Which of the following components is not part of the clinker?**
   (a) C_3S (b) C_2S
   (c) C_4AF (d) Gypsum.
4. **Which of the following components contribute to the development of concrete strength?**
   (a) C_3S and C_3A (b) C_3A and C_2S
   (c) C_3S and C_2S (d) C_3A and C_4AF
5. **Why do one normally consider the concrete strength at 28 days for structural purposes?**
6. **What are the main hydrated components of PC? Cite their names and functions.**
7. **Describe briefly the 5 phases of PC hydration.**
8. **Explain the difference between a "hydraulic" and "pozzolanic" reaction. In other words, why a product is classified as a "binder" instead of a "supplementary cementing material (SCM)"?**
9. **You work for a consulting company that is participating in a project with a contractor to build a concrete tunnel (total thickness: 60 cm; concrete cover: 10 cm). You were told that the structure will be in contact with a soil in presence of a high amount of sulphates. Moreover, the service life (i.e. life span) of the structure should be 75 years or more. What are the advices you would provide the contractor with regarding the materials selection? Please, discuss on the selection of the following materials:**
   a) Coarse and fine aggregates to be used (see the course of aggregates);
   b) Cement type or supplementary cementing materials to be used.