

**Mid Semester Examination – March 2022**

**Subject: Advanced Concrete Technology (CE G562)**

Total marks: 60 (Closed book)

Time: 90 minutes

\*\*\*\*\*

**1) Choose the correct option for the following questions. (For each wrong answer negative 0.5 mark will be given.) (1 × 5 = 5 Marks)**

- a. Silica fume is having hydraulic property. (True/False)
- b. Increased monosulfate formation will decrease the delayed ettringite formation. (True/False)
- c. Which of the following admixture helps to resist freeze-thaw cycles?
  - i.  $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$
  - ii. Proylene glycol
  - iii. Fatty acids
  - iv. Lignosulfonic acid
- d. The progress of hydration reaction increases which of the following artifacts in concrete.
  - i. Air voids
  - ii. Gel pores
  - iii. Capillary pores
  - iv. Entrained air
- e. Which of the following aggregates can be used to prepare lightweight concrete?
  - i. Granite
  - ii. Barite
  - iii. Fly ash pellets
  - iv. Basalt

**2) Answer the following question. (5 × 5 = 25 Marks)**

- a. Distinguish the difference between ‘quick set’, ‘flash set’ and ‘false set’ of cement.
- b. Discuss the properties of aggregates that affect the strength and workability of concrete mix and how they affect?
- c. What are the precautions/approaches can be considered for extreme weather concreting?
- d. Explain in detail with a sketch (10  $\mu\text{m}$  from aggregate boundary) of hydrated cement compounds.
- e. Discuss any one of the mineral admixtures in detail.

**3) Answer the following question. (10 × 3 = 30 Marks)**

- a. Explain the chemical reactions and physical process of hydration using isothermal calorimetry graph.
- b. Write short notes on (a)  $\text{LC}^3$  binder, and (b) Geopolymer.
- c. What are the factors to be accounted for better quality of concrete mix?

-----All the Best-----