Assignment 1

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2019-02-13, 23:59 IST.

1) Identify the TRUE statement with regard to the chemical composition of portland cement

- Both SiO$_2$ and Al$_2$O$_3$ are present in almost equal amounts
- Both Na$_2$O and K$_2$O are present in small quantities and contribute to the alkali content of the cement
- SiO$_2$ is the highest among all other oxides
- CaO is a minor compound

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both Na$_2$O and K$_2$O are present in small quantities and contribute to the alkali content of the cement

2) Identify the TRUE statement with regard to the workability tests for concrete

- Flow table test is more suitable for highly workable concretes
- Both slump cone and compaction factor tests are recommended for very low workable concretes
- Both Vee-Bee and compaction factor tests are recommended for highly workable concretes
- Both flow table and compaction factor tests are recommended for stiffer concretes

No, the answer is incorrect.
Score: 0

Accepted Answers:
Flow table test is more suitable for highly workable concretes

3) Identify the FALSE statement with regard to the production of portland cement

- Only C$_3$A is produced at temperature above 1000 °C

No, the answer is incorrect.
Score: 0

Accepted Answers:
C$_3$A is produced in the clinkering zone of the kiln at temperature above 1000 °C
4) Identify the FALSE statement with regard to the IS specifications for grades of portland cement

- The initial setting time for the three grades of cement should be higher than 30 minutes
- The final setting time for the three grades of cement should be lower than 10 hours
- The maximum specified fineness for all grades of cement is 225 m²/kg
- The designation of grades is based on compressive strength of mortar cubes achieved at 28 days

No, the answer is incorrect.
Score: 0

5) Identify the TRUE statement with regard to the Interfacial Transition Zone (ITZ) of concrete

- Ingress of deleterious substances in concrete is not possible through ITZ
- w/c is lower in ITZ than in the main body of mortar
- Segregation encourage the formation of ITZ
- The strength of concrete is not affected by ITZ

No, the answer is incorrect.
Score: 0

6) Identify the TRUE statement with regard to the Alkali Aggregate Reaction (AAR) of concrete

- AAR is caused due to the presence of alkali and reactive aggregate
- Increase in the ingress of deleterious substances may be expected with reactive aggregates
- In AAR, cracking initiates on the cement paste
- Total alkali content of concrete (not cement) is usually calculated in terms of Na₂O or K₂O equivalent

No, the answer is incorrect.
Score: 0

7) Identify the TRUE statement with regard to the cooling zone in the production of portland cement

- Rapid cooling of clinker is preferred as it allows MgO to be contained in the crystal phases of compounds as impurities, which can otherwise cause unsoundness
- Slow cooling of clinker is preferred due to better thermal stability attained during the cooling phase
- Reactivity of unhydrated compounds are independent of the rate of cooling
- Slow cooling of clinker produces larger crystals which helps in reducing the energy required to grind the clinker

No, the answer is incorrect.
Score: 0

Accepted Answers:
Rapid cooling of clinker is preferred as it allows MgO to be contained in the crystal phases of compounds.
as impurities, which can otherwise cause unsoundness

8) Identify the **FALSE** statement with regard to the fineness of cement

- Wagner’s turbidimeter is one of the methods used to measure fineness
- Higher specific surface area of cement grains indicates reduced particle size
- Higher cement fineness increases the rate of hydration reaction
- The properties of concrete is independent of the cement fineness

No, the answer is incorrect.
Score: 0
Accepted Answers:
The properties of concrete is independent of the cement fineness

9) Identify the **FALSE** statement with regard to the production process of portland cement

- Significant amounts of carbon-dioxide are evolved in the calcination zone
- C₃S is the first compound that is formed in the ‘Calcination’ zone
- Limestone gets converted to CaO in the ‘Calcination’ zone
- Belite gets converted to Alite in the ‘Clinkering’ zone

No, the answer is incorrect.
Score: 0
Accepted Answers:
C₃S is the first compound that is formed in the ‘Calcination’ zone

10) Figure (1) and Figure (2) given below illustrate two models that can be used to study the response of concrete to applied compressive load. Identify the **FALSE** statement.

- The strain in the mortar and coarse aggregate phases for configuration shown in Figure 1 is the same
- The stress in the mortar and coarse aggregate phases for configuration shown in Figure 2 is the same
- The load carried by the mortar and coarse aggregate phases for configuration shown in Figure 1 is the same
- The load carried by the mortar and coarse aggregate phases for the configuration shown in Figure 2 is the same

No, the answer is incorrect.
Score: 0
Accepted Answers:
The load carried by the mortar and coarse aggregate phases for configuration shown in Figure 1 is the same