Department of Civil Engineering
Institute of Technical Education & Research, SOA University

Re-Mid-Semester Examination, November-2016
Civil Engineering Materials (CVL3211)

Semester: 5^{th} Branch: Civil Engineering
Full mark: 30 Time: 2 Hours

All questions carry equal marks. All bits of each question carry equal marks.

Subject Learning Outcome (Student will able to)	***Taxonomy Level**	**Question number**	**Marks**
Illustrate the behavior of cement based on its raw material and chemical composition.	L2	2(a), 2(b), 2(c), 3(a), 3(b), 3(c)	12
Interpret a material based on its stress-strain behavior and calculate various physical quantities related to stress-strain behavior.	L3	1(a), 1(b), 1(c)	6
Show the effects of different admixtures on properties of cement concrete and compute composition of a concrete mix.	L4	5(a), 5(b), 5(c), 4(a), 4(b), 4(c)	12

*Blooms taxonomy levels: Knowledge (L1), Comprehension (L2), Application (L3), Analysis (L4), Evaluation (L5), Creation (L6)

Answer all five questions.

Question 1		
a.	In Figure 1, Y-axis and X-axis denotes σ_A/σ_Y and number of load cycles (n) respectively. Point out a major flaw.	2
b.	For Figure 2, find Yield stress from extension method.	2
c.	Find modulus of resilience Figure 2.	2
Question 2		
a.	Cement A has more C_3A content than cement B. Assuming only hydration of C_3A, which cement will have more initial setting time? Explain.	2
b.	Cement A passes 6% and Cement B passes 15% from $IS90\mu$ sieve. Which of two will have faster rate of hydration? Explain.	2
c.	Write down a compound which contributes least to cement composition and its positive effect on cement.	2
Question 3		
a.	Cement A has more C_2S content than cement B. Assuming both have same final setting time, which will have more gypsum requirement?Explain.	2
b.	Which property of cement is affected by unreacted CaO present in it? How is it measured in laboratory?	2
c.	How does fly ash affect workability of cement? Explain.	2

Question 4		
a.	If a concrete cube fails at $675KN$ load in compression testing what should be its characteristic strength?	2
b.	If another concrete cube fails at $450KN$ which would have required more curing to counter heat of hydration? Explain.	2
c.	Another cube tested at $495KN$. Find average compressive strength and standard deviation of all three compressive strength.	2
Question 5		
a.	Given M15 mix with air content 3% and water cement ratio of 0.5 and specific gravities of cement sand and aggregates are 3, 2.5 and 2.6 respectively. Find volume of sample without air in a compressive strength testing cube.	2
b.	Write down volume balance equation and find cement weight.	2
c.	Find the weight of ingredients in the mix.	2

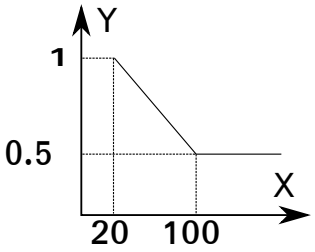

Figure 1: σ_a/σ_y-n curve

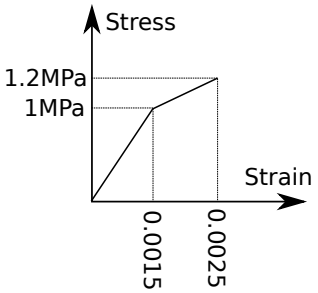

Figure 2: Stress-strain curve