

☑ **BYG405-G, general information**

Course code: BYG504

Course name: Høyytelsesmaterialer

Date: 6.12.2019

Duration: 3 timer

Resources allowed:

- Calculator and a bright mind filled with superior knowledge.
- The exam is given in English only. However, you may write your answers in English or Norwegian, as you prefer.

Notes:

Some good advices:

- Start by screening through the complete exam set.
- If your screening reveals that there is something you don't understand, you will have the opportunity to discuss with RT who will pay a visit shortly after the start.
- Start by answering the questions you are best at, but remember to answer precisely what is asked for. (Do not spend time writing all you know that is related to the subjects you are best at.)
- Limit the time spent at each question. You cannot achieve better than "A" on any question, but you can collect points from all – even those who are not your favorites.
- If after completion of all questions you are still in surplus of time; spend it well to make your results perfect!

Good luck!

...and regardless of your results today: thank you for a nice semester. I appreciated getting to know you all and the good class relations you all contributed to :-)

The professors sometimes ask for exam answers to be used for teaching purposes, but in order for this to take place, the university needs your consent.

Do you grant the University of Agder permission such permission?

Select one alternative

- Yes
- No

Attaching sketches to this question?











Use the following code:

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1 BYG405, question 1

Who can adopt (decide) acts/laws in Norway?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | 

Words: 0

Attaching sketches to this question?











Use the following code:

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2 Question 2

In the introduction to this course, we discussed detailed regulations (forskrifter og vedtekter) that are subordinate to some acts. When can such regulations be made valid – and by whom?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 

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Attaching sketches to this question?

Use the following code:










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3 Question 3

Can any supra-national body adopt acts/laws for Norway?

(Please do not limit your answer to merely a "yes" or "no". Elaborate your answer through one or two additional sentences.)

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?










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4 Question 4

Why is it advantageous to comply with standards – when they exist?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ |  | 

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Attaching sketches to this question?










Use the following code:

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5 Question 5

How are European standards (EN) made valid in Norway?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ |  | 

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Attaching sketches to this question?










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6 Question 6

The detailed requirements for the quality management system is given in the NA to NS-EN1990. One of the four types of controls stated, is "Self-checking" (self-inspection). For what types of work should this be implemented?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?









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7 Question 7

How is the term “high performance materials” defined (at least in this course)?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?












Use the following code:

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8 Question 8

According to this definition; how could sprayed concrete be explained as being a “high performance material” – and what is the main measure to obtain these properties?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  | ABC | 

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Attaching sketches to this question?













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9 Question 9

Again according to the stated definition on High Performance Materials; How can UHPC be argued to be within this definition?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | 

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Attaching sketches to this question?











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10 Question 10

Compared to standard concrete; how are the special properties of UHPC achieved?
(Or to rephrase: How is UHPC produced?)

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 

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Attaching sketches to this question?

Use the following code:

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11 Question 11

Give an example on another high performance material by referring to your own term paper. Also, argue why this material is comprised by the definition.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | Ω | | | Σ | ABC |

Words: 0

Attaching sketches to this question?

Use the following code:











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12 Question 12

State the research question(s) from your term paper.

(It needs not be the exact wording, but please make it precisely asked questions covering the same topic(s).)

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 

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Attaching sketches to this question?









Use the following code:

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13 Question 13

Explain briefly the conclusion(-s) in your term paper, answering your own research question(s).

Fill in your answer here

Format - | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?

Use the following code:

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14 Question 14

Explain the terms “Exposure classes” and “Durability classes” (considering the concrete standards).
Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ |  | 

Words: 0

Attaching sketches to this question?










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15 **Question 15**

What are the two main requirements for concrete mixture design, given as a consequence of the durability class?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  | Ω |  |  | Σ | ABC | 

Words: 0

Attaching sketches to this question?











Use the following code:

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16 Question 16

The term “workability” is often divided into three sub-categories. Mention all three and give a short explanation of the meaning of each.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 

Words: 0

Attaching sketches to this question?









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17 Question 17

What is the main reason behind all forms of separation in concrete?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ | ABC | 

Words: 0

Attaching sketches to this question?












Use the following code:

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18 **Question 18**

What is “bleeding” of concrete, what are normal reasons for it to appear, and how can the risk of bleeding be reduced?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  | ABC | 

Words: 0

Attaching sketches to this question?









Use the following code:

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19 **Question 19**

Explain briefly the purpose of the particle-matrix-model of concrete – and how it works.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ | ABC | 

Words: 0

Attaching sketches to this question?










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20 Question 20

What is the purpose of the slump-cone-test, and what are the main strength and limitation of this method?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?

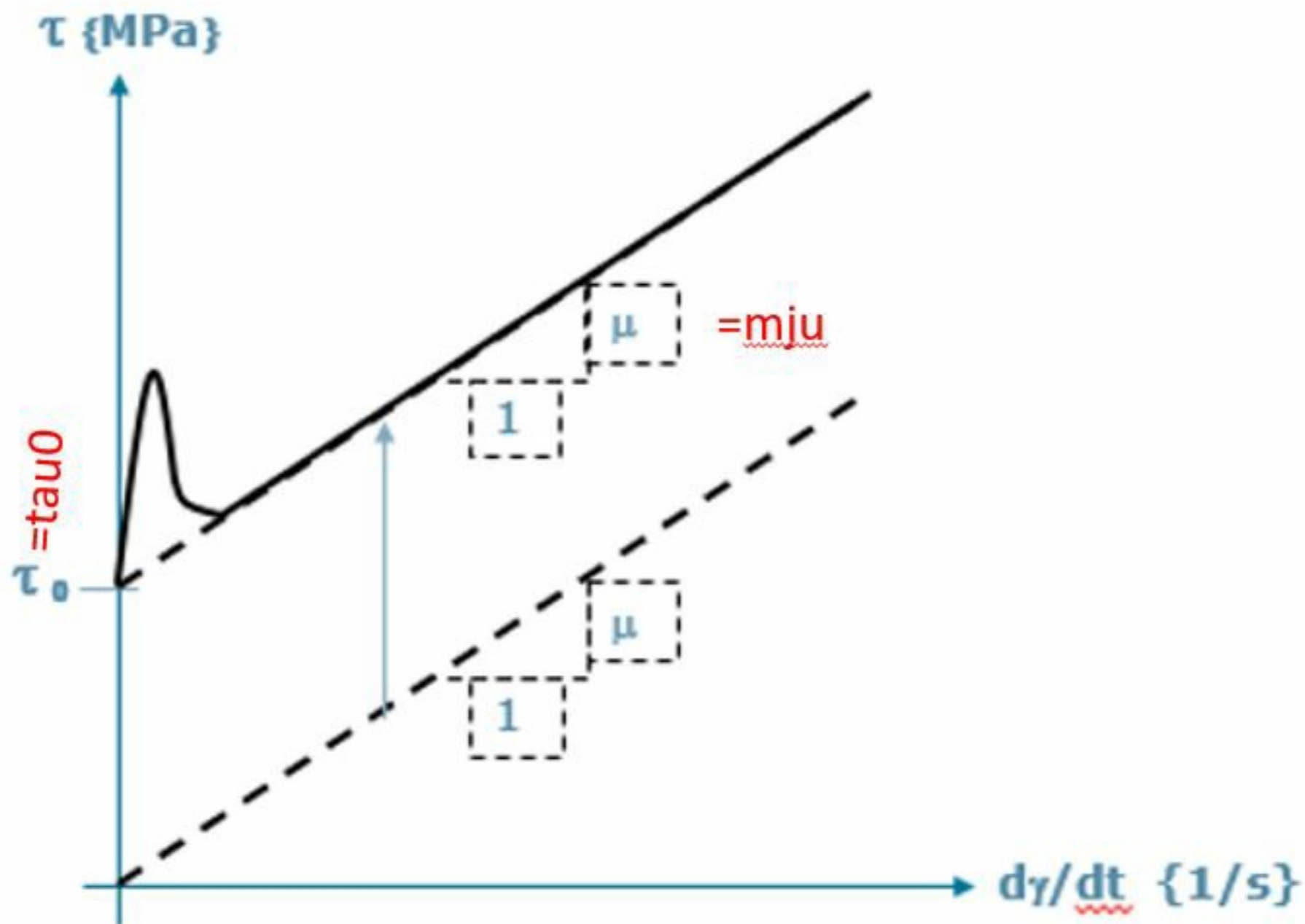
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21 Question 21

Explain the figure below; what does it illustrate (what is represented along the two axis) and what do the "tau0" and the "mju" characterize?

(Sorry for missing out on the Greek alphabet. Inspera does not handle it. Please look to the illustration for explanation.)



Fill in your answer here

Format - | B | I | U | x_2 | x^2 | I_x | | | | | | | | | | | ABC |

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Attaching sketches to this question?

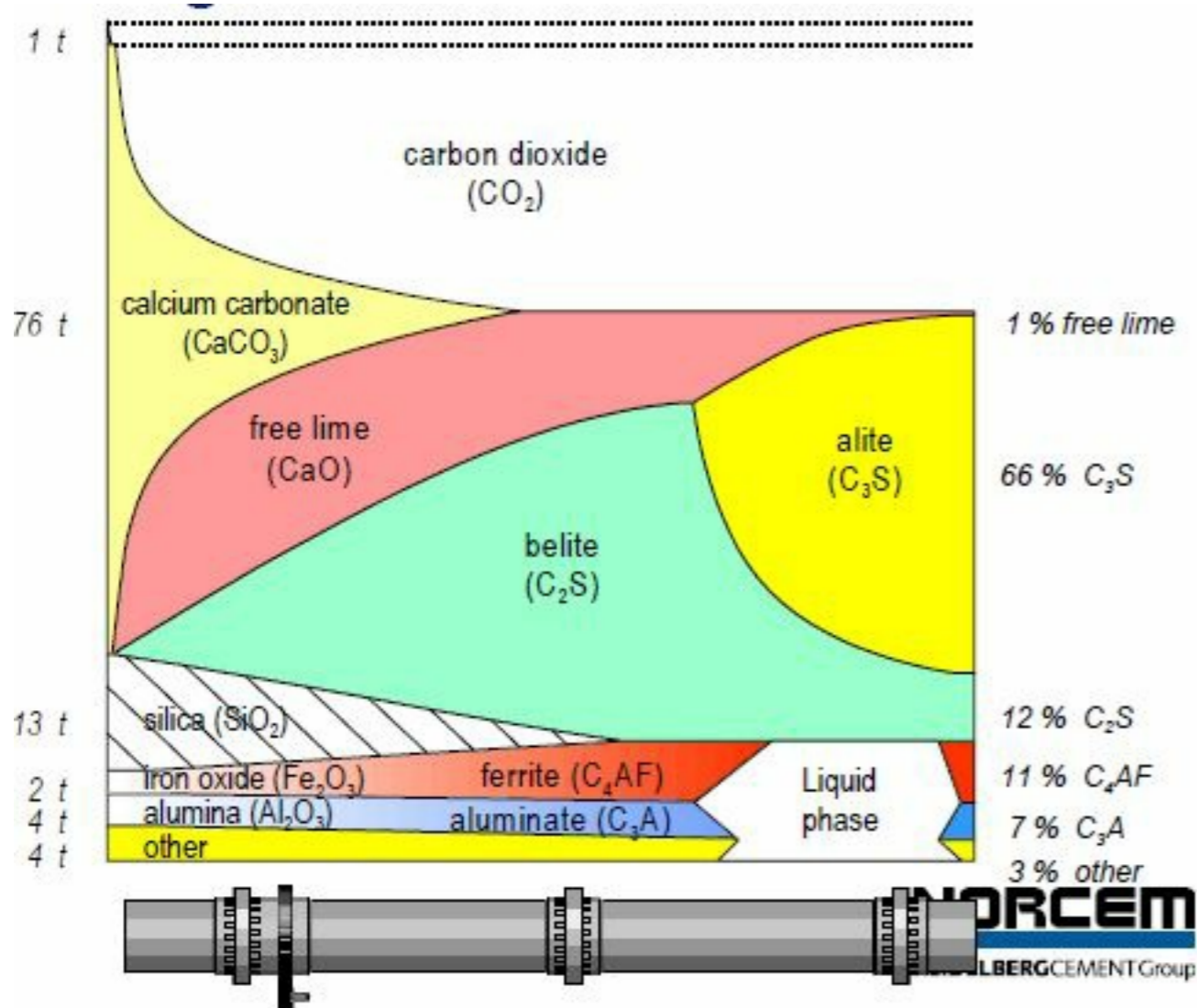
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22 **Question 22**

Below is the phase diagram for the production of cement. Explain:

- what is measured along the X-axis (from left to right), and
- the creation of alite from the left starting point of the yellow area (again while reading along the x-axis from left to right).



Fill in your answer here

Format | **B** | *I* | U | x₂ | x² | I_x | [Icons for undo, redo, list, link, table, eraser, sum, undo, redo] | ABC | [Close]

Words: 0

Attaching sketches to this question?













Use the following code:

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23 Question 23

How does the two mineral phases Alite and Belite (in cement) contribute to development of heat and strength during the hardening of concrete?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | 

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Attaching sketches to this question?










Use the following code:

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24 Question 24

Describe the pozzolan reaction.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?

Use the following code:









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25 **Question 25**

According to Power's model of hydration: What is the pore volume in a concrete made with 380kg cement per m³ (density 3120kg/m³) and having a w/c-ratio=0,55, when the rate of hydration is 75%?

(Tip: It is probably smart to show your calculations. Even if you do some mistakes, you might collect points from what you did right.)

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  | Ω |  |  | Σ | ABC | 

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Attaching sketches to this question?

Use the following code:










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26 **Question 26**

What is the matrix volume of a concrete where the matrix is mixed from 380kg cement (density 3,05), 20kg pozzolan (density 2,2), w/c=0,59 (water having density 1.0), 25 kg fines from aggregate (d<0,125mm, density 2,7) and 3 kg SP (density 1,06)?

(Tip: It is probably smart to show your calculations. Even if you do some mistakes, you might collect points from what you did right.)

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  | Ω |  |  | Σ | ABC | 

Words: 0

Attaching sketches to this question?

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27 **Question 27**

How many kgs of each of the fine and coarse aggregate (both having density 2,7kg/l) should be used in a concrete having 370l matrix and 4% air, and where you assume fine/course aggregate ratio = 60%/40%? NB! You have already assumed that 25kg of the fine aggregate is finer than 0.125mm, and hence are included in the matrix volume.

(Tip: It is probably smart to show your calculations. Even if you do some mistakes, you might collect points from what you did right.)

Fill in your answer here

Format | **B** | *I* | U | \times_2 | \times^2 | \int_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 

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Attaching sketches to this question?

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