# Unit 7 - Week 5

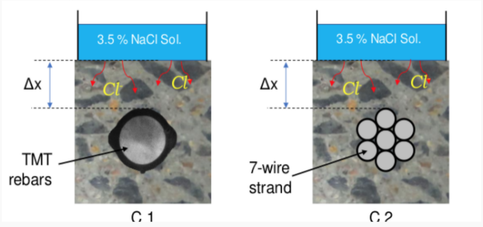


## Assignment 5

**The due date for submitting this assignment has passed.**
**As per our records you have not submitted this assignment.**

**Due on 2020-03-04, 23:59 IST.**

1) Consider that C 1 and C 2 are the cross-section of two concrete prism specimens having same diffusion coefficient exposed to 3.5 % NaCl solution from the top (see figures) ***3 points***




If the chloride threshold value of the TMT bar and the prestressing strand are same, which of the following is/are the possible phenomena/phenomenon that you would expect?

- C 1 would be the second to show visible crack
- C 2 would be the first to show visible crack
- C 1 and C 2 corrodes simultaneously and C 1 will show visible cracks before C 2
- C 1 and C 2 corrodes simultaneously and C 2 to show visible cracks before C 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
*C 1 and C 2 corrodes simultaneously and C 1 will show visible cracks before C 2*

2) A bridge of 1 km span is to be built across a saltwater lake located in the coastal region of Goa. The following are the available data from the tests conducted on the concrete and steel to be used. ***3 points***

1. Surface resistivity of concrete
2. Chloride diffusion coefficient of concrete
3. Aging factor of chloride diffusion coefficient
4. Surface chloride concentration
5. Chloride threshold of the rebar-concrete interface
6. Half-cell potential of the rebar on 28$^{th}$ day
7. Corrosion rate of the steel after the initiation of corrosion


Which of the available data would be required to estimate the corrosion initiation time?

- 3, 4, 5, 6
- 2, 3, 4, 5
- 1, 3, 4, 5
- 1, 2, 4, 6

No, the answer is incorrect.
Score: 0
Accepted Answers:
*2, 3, 4, 5*

3) The beam shown in figure is located in a coastal region, where the relative humidity is > 80%. After visual inspection, it was suggested to patch the area with repair mortar and paint the surface without any additional work. What is your inference about the suggested strategy? ***2 points***

- The strategy suggested is correct
- The root cause of the problem is not identified and addressed appropriately
- No tests need to be conducted before selecting a repair strategy; only visual inspection is sufficient
- Redundancy is zero in this case

No, the answer is incorrect.
Score: 0
Accepted Answers:
*The root cause of the problem is not identified and addressed appropriately*

4) Spalling of cover concrete was observed on the columns of an overpass. What are the performance requirements for selecting a suitable material for a near-surface repair? ***2 points***

- High flexural bond with the substrate
- High impact resistance
- High thermal resistance
- High shear bond with the substrate

No, the answer is incorrect.
Score: 0
Accepted Answers:
*High impact resistance*
*High shear bond with the substrate*

5) To prevent corrosion, polymer modified mortar was used to protect the embedded galvanized steel rebars. What is the redundancy of the adopted strategy? ***1 point***

- 2
- 1
- 0
- 4

No, the answer is incorrect.
Score: 0
Accepted Answers:
*1*

6) Reinforced concrete columns (made with M50 grade concrete) of an industrial building were found inadequate to carry the intended design load. The columns need to be repaired by enlarging their cross-section. Which of the following would be recommended as a repair material? ***2 points***

- Material A: Higher modulus of elasticity than substrate; low creep and shrinkage
- Material B: Similar modulus of elasticity as substrate; low creep and shrinkage
- Material C: Lower modulus of elasticity than substrate; low creep and shrinkage

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Material B: Similar modulus of elasticity as substrate; low creep and shrinkage*

7) See photograph of an expansion joint with severe cracks. What would you consider to enhance the crack resistance of concrete in such cases ***2 points***

- Increase compressive strength alone
- Enhance resistance against fatigue failure
- Use concrete with lower shrinkage resistance
- Enhance toughness by incorporating fibers in concrete
- Ensure that the expansion joint is filled with concrete/sand/dirt/soil

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Enhance resistance against fatigue failure*
*Enhance toughness by incorporating fibers in concrete*