

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES****Online End Semester Examination, December 2020****Course: Concrete Technology****Semester: III****Programme: B Tech (Civil + ID)****Time: 03 hrs.****Course Code: CIVL 2011****Max. Marks: 100****Instructions: Write your assumptions carefully and attempt all the questions.****SECTION A**

| Sr. No. |  | Marks | CO  |
|---------|--|-------|-----|
| Q1.     | Discuss the importance of curing for concrete. List four methods for curing.   | 5     | CO1 |
| Q2.     | Define segregation and bleeding in fresh concrete. How do these issues of fresh concrete impair the durability of hardened concrete?   | 5     | CO1 |
| Q3.     | Differentiate between setting, flash setting and false setting. How does setting relate to workability of fresh concrete?  | 5     | CO2 |
| Q4.     | List any five methods for transportation of concrete.  | 5     | CO2 |
| Q5.     | Define cement from perspective of modern concrete. List the four main compounds of Portland cement.  | 5     | CO1 |
| Q6.     | Explain all the parameters from the expression; $F_t = F_c + k*s$ and how are they related for design compressive strength of concrete. (You can type the text to explain, and do not have to worry about subscript of the first two terms for your answer.) | 5     | CO3 |

**SECTION B**

|      |   |    |     |
|------|---|----|-----|
| Q7.  | Define (i) Concrete, (ii) Hydration of Cement, (iii) Workability of Concrete and (iv) Durability of Concrete. Discuss the Tremie method of transportation for under water concreting. | 10 | CO1 |
| Q8.  | Discuss the process of manufacturing of cement. Explain each stage in detail in text only, along with the chemical compounds in cement.   | 10 | CO1 |
| Q9.  | Explain in details steam curing of concrete.  | 10 | CO2 |
| Q10. | How does water aggregate ratio, water content and water cement ratio relate to mix design of concrete?  | 10 | CO2 |
| Q11. | Discuss the application of non-destructive testing for repairs and rehabilitation of concrete structures.   | 10 | CO2 |

**SECTION C**

|      |   |    |     |
|------|---|----|-----|
| Q12. | What is concrete mix design? Write the steps involved in the method of mix design (IS 10262-2009)                   | 20 | CO3 |
|      | <b>OR</b>   |    |     |
| Q12. | What is the significance of concrete mix design and what data is required to proceed with the IS 10262-2009 method? | 20 | CO3 |