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Register No. :

Name of the Candidate:

**POST DIPLOMA / DIPLOMA EXAMINATION, 2010**

**(CONCRETE TECHNOLOGY AND DESIGN OF CONCRETE STRUCTURES)**

**(PAPER – I)**

**510. CONCRETE TECHNOLOGY**

*December)*

Maximum: 100 Marks

*(Time: 3 Hours*

*Answer ONE full question from each unit*

*(5×20=100)*

*All questions carry equal marks*

**UNIT- I**

1. Write on any TWO of the following:
  - a) Name the Bogue's compounds with abbreviated formula
  - b) Briefly explain Air-Entraining cement.
  - c) Discuss briefly the setting time test on cement.
  - d) What are the requirements of aggregates suitable for construction purpose
  - e) Discuss briefly the characteristics of water used for concrete.

(OR)

2.
  - a) Compare the contributions of the various compounds in cement to its heat of hydration.
  - b) Explain briefly about the Rapid Hardening cement.
  - c) What are the precautions to be taken for the storage of cement?
  - d) Explain the Impact Value of Coarse Aggregate.
  - e) How will you assess the quality of water used for construction?

**UNIT- II**

3. Write on any TWO of the following:
  - a) Briefly explain the factors affecting the workability of concrete.
  - b) Discuss briefly any two methods for measuring workability.
  - c) Explain "Segregation".

- d) Explain briefly the process of placing and transporting of concrete.
- e) Discuss the methods of batching.

(OR)

4. Write on any TWO of the following:
- a) Explain briefly the process involved in preparation of fresh concrete.
  - b) Why it is important to control the workability of concrete on site?
  - c) Compare internal and external vibration of concrete.
  - d) Write short notes on 'bleeding'.
  - e) What is the influence of mixing time on the strength of concrete? Discuss.

### UNIT- III

5. Write on any TWO of the following:
- a) How do you find the flexural strength of concrete? Explain.
  - b) Explain the term shrinkage.
  - c) Discuss the permeability of concrete.
  - d) What are the factors contributing to the cracks in concrete? Briefly explain.
  - e) Describe briefly about the frost damage of concrete.

(OR)

6. Write on any TWO of the following
- a) Discuss the effects of the degree of compaction and age on strength of concrete.
  - b) Discuss the main factors affecting the creep of concrete.
  - c) Describe a test to determine the depth of carbonation of concrete.
  - d) List out and briefly explain the various types of tests for the tensile strength of concrete.
  - e) Explain the influence of water /cement ratio on strength of concrete.

### UNIT- IV

7. Write on any TWO of the following:
- a) Discuss the advantages and disadvantages of superplasticizers.
  - b) Mention any four pozzolanic admixtures. Discuss briefly.
  - c) Explain the mechanism of action of accelerators.
  - d) Write short notes on damp proofing agents.
  - e) Briefly explain about Polymer concrete.

(OR)

8. Write any TWO of the following:
- a) Discuss about the concreting under water.

- b) What are the precautions generally observed during the cold weather concreting?
- c) Write short notes on gas forming agents.
- d) Briefly explain about “Aerated concrete”.
- e) Discuss in detail about “fibre reinforced concrete”

### UNIT- V

9. Write on any TWO of the following:
- a) What is the difference between ACI and IS method? Explain.
  - b) Briefly explain the various methods of proportioning.
  - c) What are the main factors in designing concrete for durability?
  - d) What are the parameters to be considered while designing a mix?
  - e) Write down the design procedure of Road note No.4 method.

(OR)

10. Design a concrete Mix for  $M_{20}$  concrete for the following data by IS method

Specific gravity of Fire Aggregate = 2.67

Specific gravity of coarse Aggregate = 2.7

Specific deviation = 4 mPA

Fineness Modulus of FA = 2.8

Ordinary Portland Cement Type = I

Slump = 50 mm

Assume any other data if required.

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