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**Fourth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Concrete Technology**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.**  
**2. Use of code Book IS10262-2009 is allowed.**

**PART – A**

- 1 a. List at least Five of the various cement types being used in practice. Give their field application. (10 Marks)
- b. Describe the following terms with respect to cement :
  - i) Normal consistency
  - ii) Water cement ratio
  - iii) Initial setting time
  - iv) Soundness. (10 Marks)
- 2 a. Explain the laboratory procedure to determine the SP. Gravity of coarse Aggregate sample. State the importance of size and shape of aggregate in concrete. (10 Marks)
- b. Give the procedure to determine the Bulk density of fine aggregate sample. Describe the importance of the same. (10 Marks)
- 3 a. Define workability. Explain how
  - i) Mix proportion and
  - ii) Size of aggregate affect workability. (10 Marks)
- b. What are the tests adopted in laboratory to determine workability of concrete mix? Brief the Advantages of slump test over compaction factor test. (10 Marks)
- 4 a. State the function of an 'Admixture' in concrete mix. Differentiate between chemical and mineral Admixtures. (10 Marks)
- b. Describe the effect of fly ash on fresh concrete. (10 Marks)

**PART – B**

- 5 a. List the tests conducted to determine the properties of Hardened concrete. Explain how water cement ratio influences the strength of Hardened concrete. (10 Marks)
- b. Brief the stress-strain behaviour of concrete under compression. How do you determine the modulus of elasticity of given concrete sample? (10 Marks)
- 6 a. Define the terms with respect to concrete:
  - i) Poisson's ratio
  - ii) Shrinkage
  - iii) Creep
  - iv) Elasticity
  - v) Compression strength. (10 Marks)
- b. State the types of Shrinkage occurring in concrete. Explain plastic Shrinkage. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Define the term permeability of concrete. Explain the factors that influence permeability of concrete. (10 Marks)
- b. Discuss the process of disintegration of concrete due to acids. Suggest remedies to control sulphate attack. (10 Marks)
- 8 a. Brief the importance of mix design in "Concrete Technology". (05 Marks)
- b. Obtain the first trial mix of M<sub>20</sub> grade as per IS 10262 for the following requirements
- |                                      |                  |         |
|--------------------------------------|------------------|---------|
| Max size of aggregates angular shape | –                | 20mm    |
| Degree of workability                | –                | 0.90    |
| Degree of quality control            | –                | Good    |
| Types of Exposure                    | –                | Mild    |
| Properties of material available : – |                  |         |
| Cement specific gravity              | –                | 3.15    |
| Specific gravity of coarse aggregate | –                | 2.60    |
| Specific gravity of fine aggregate   | –                | 2.60    |
| Free moisture content                | Coarse aggregate | – Nil   |
|                                      | Fine aggregate   | – 20%   |
| Water absorption                     | Coarse aggregate | – 0.50% |
|                                      | Fine aggregate   | – 1.0%  |

(15 Marks)

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