

6. What are the principles and Indian Standard guidelines for the following tests : **15**
Schmidt hammer test, pullout test, pulse velocity test ? Explain which you would recommend for deciding the formwork removal time with reasons ? **15**

Section D

7. Define the term coefficient of permeability. What is its significance with reference to durability ? Discuss the factors which effect the permeability of concrete. **15**
8. Discuss the following (any *three*) : **3×5=15**
- (i) Corrosion of steel
 - (ii) Freezing and thawing
 - (iii) Maturity of Concrete
 - (iv) Sulphate attack on concrete.

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Roll No.

AA-562

M. Tech. EXAMINATION, Dec. 2017

(First Semester)

(B. Scheme) (Main & Re-appear)

CE(SE)

CES-505

Advanced Concrete Technology

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks. Any data if missing can be suitably assumed. Use of scientific calculator is allowed. Use of Indian Standard is allowed.

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Section A

1. (a) How you distinguish between specific gravity and bulk density ? With the help of suitable sketches explain the following terms and discuss their significance for aggregates (i) absorption capacity (ii) saturated surface dry condition (iii) damp condition. **10**
- (b) Discuss the major differences in the physical and chemical composition between Ordinary Portland Cement and Sulphate Resisting Cement. **5**
2. Design a mix using Indian Standard IS : 10262 2009 for M40 concrete mix with the following data : **15**
 - (i) Cement ordinary Portland Cement with 28 days compressive strength 56.40 MPa and specific gravity 3.15
 - (ii) Coarse aggregate : Maximum size 20 mm specific gravity 2.76 and bulk density 1840 kg/m³

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- (iii) Fine aggregate : Zone III specific gravity 2.64 and bulk density 1800 kg/m³
- (iv) Concrete is required for the heavily reinforced piles 8 metres in depth under severe exposure. **15**

Section B

3. Discuss the significance of 28 days compressive strength of concrete in terms strength, durability and quality control with the mention of clauses from Indian Standards. **15**
4. Discuss a typical stress strain curve for concrete. From this curve, how would you determine the dynamic modulus of elasticity and the different types of the static elastic modulus. Why modulus of rigidity alone is not sufficient for concrete ? **15**

Section C

5. What do you understand with ready mix concrete ? How can it be produced ? Explain with neat sketches. Discuss the significance of admixtures in ready mixed concrete. **15**

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