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Total Number of Pages: 02

B.Tech
PCI3D001

3rd Semester Regular/Back Examination 2017-18

Concrete Technology

BRANCH: CIVIL

Time: 3 Hours

Max Marks: 100

Q.CODE: B1219

Answer Question No.1 and 2 which are compulsory and any four from the rest.

The figures in the right hand margin indicate marks.

- Q1** Answer the following questions: *multiple type or dash fill up type* (2 x 10)
- a) In terms of oxide composition, the maximum percentage of ingredient in the cement is (a) Lime (b) Iron oxide (c) Alumina (d) Silica
 - b) Total heat of hydration of cement is independent of (a) composition of cement (b) fineness of cement (c) temperature (d) all of the above
 - c) The nominal size of particles of graded aggregate is said to be 12.5 mm, when most of it passes through a -----mm IS sieve and is retained in a ----- mm IS sieve.
 - d) Following compounds can be used as accelerators except (a) CaCl_2 (b) CaSO_4 (c) NaCl (d) Na_2SO_4
 - e) A compacting factor of 0.88 for a fresh concrete sample indicates a mix of (a) high workability (b) medium workability (c) low workability (d) none of the above
 - f) According to IS specification, the maximum compressive strength of normal concrete can be (a) 15 MPa (b) 20 MPa (c) 30 MPa (d) 40 MPa
 - g) The unit weight of plain concrete(in kN/m^3) is generally taken as (a) 20 (b) 24 (c) 25 (d) 30
 - h) The nominal mix corresponding to M_{15} grade concrete is (a) 1:1:2 (b) 1:1.5:3 (c) 1:2:4 (d) 1:3:6
 - i) Light weight aggregates are produced by (a) bloating clays with or without additives (b) using blast furnace slag (c) sintering fly ash (d) any one
 - j) Lower water cement ratio in concrete (a) increases the compressive strength (b) improves the frost resistance of concrete (c) reduces the shrinkage and creep (d) all of the above
- Q2** Answer the following questions: (2 x 10)
- a) Differentiate between poorly graded and well graded aggregates.
 - b) What do you mean by *grade* of cement? List any three grades of cement with their strength.
 - c) What do you mean by *bulking* of sand?
 - d) Name any two harmful constituents of cement.
 - e) Define segregation of concrete. How it can be avoided?
 - f) What are the different ways of water curing of concrete?
 - g) State Abram's law.
 - h) What are the various factors to be considered for mix design?
 - i) What are the factors affecting strength of hardened concrete?
 - j) Define dynamic modulus of elasticity.
- Q3**
- a) Explain setting time of cement and factors effecting setting time of cement. (8)
 - b) Explain heat of hydration and hydration process of cement in detail. (7)

- Q4** a) What is fineness modulus of aggregate? How the fineness modulus is determine? (10)
b) What do you mean by soundness of aggregate? Explain briefly. (5)
- Q5** What are the different tests conducted to determine the workability of concrete? Explain any two of them. (15)
- Q6** Differentiate among: compressive strength and tensile strength of concrete. Explain the factors affecting strength of concrete. (15)
- Q7** a) Explain ultrasonic pulse velocity test. State the factors affecting the measurement of ultrasonic pulse velocity test. (10)
b) Explain the factors influencing creep of concrete. (5)
- Q8** What do you mean by *mix design of concrete*? Explain the IS method of mix design of concrete briefly. (15)
- Q9** **Write short notes on any THREE.** (5 x 3)
a) Self compacting concrete
b) Workability of concrete
c) Quality control of concrete
d) Types of admixures
e) Cellular concrete