Registration No: | | | | | | | | | | |

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