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M.Tech. 1st Semester (Civil Engg.)

Examination, December-2018

MATERIAL TECHNOLOGY

Paper- CE-601 / MTSD-101

Time allowed : 3 hours]

[Maximum marks : 100

Note: Attempt any five questions. Assume missing data, if any suitable. All questions carry equal marks.

1. Write a short note on following: 4×5=20
 - (i) Permeability of concrete.
 - (ii) Structure of hydrated cement.
 - (iii) Air entrained concrete
 - (iv) Mix design
 - (v) Heat of hydration.
2. (a) What are the mechanics of creep in tension and creep properties of concrete? 10
(b) Write a short note on structure of materials and their imperfections. 10
3. (a) What do you mean by fatigue properties? Explain the factors affecting fatigue strength. 10
(b) Discuss "Fatigue strength with superimposed static stress" in detail. 10

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4. (a) Describe fibre reinforced concrete. Explain the factors influencing the fibre reinforced concrete. 10
(b) Write a short note on water requirements for hydration. 10
5. Explain the following: 20
 - (i) Factors affecting the strength of concrete.
 - (ii) Mix design of concrete.
 - (iii) Theories of failure and yield surface of concrete.
 - (iv) Mechanical strength of cement gel.
6. (a) How are the properties of cement and concrete related to its structure? 10
(b) Explain I.S. recommendation method of concrete mix design. 10
7. (a) What are the thermal properties of concrete? 10
(b) Write a short note on following: 10
 - (i) Biaxial strength of concrete.
 - (ii) Curing of concrete.
8. (a) What do you mean by true stress strain curve? Explain this curve for mild steel in simple tension. <http://www.HaryanaPapers.com> 10
(b) Write a short note on theory of dislocations. 10