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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