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**M.Tech. 1st Semester Civil Engg. Specialisation in
Structural Engg. Examination, December-2017**

MATERIAL TECHNOLOGY

Paper-CE-601/MTSD-101

Time allowed : 3 hours] [Maximum marks : 100

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

1. (a) What do you mean by Portland cement ? What are the compositions of portland cement ? What are the various types of cement ? Explain in brief. 10
- (b) Draw a true stress-strain curve for mild steel in tension. 10
2. Explain following points :
 - (i) Light weight concrete
 - (ii) High density concrete
 - (iii) Shrinkage and creep of concrete
 - (iv) Durability of concrete
 - (v) Fatigue properties. 4×5=20
3. (a) What are the mechanical test of hardened concrete ? Explain in brief all the tests. 10
- (b) Write a short note on measurement of creep and factors affecting creep. 10

23376-P-2-Q-8 (17)

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4. What are the difference between low temperature properties and high temperature properties of concrete ? Establish the creep-stress-time-temperature relations for tension in concrete. 20
5. (a) What are the behaviour of common construction metals in tension and compression ? What are the properties of reinforced concrete ? 10
- (b) What are the theories of failure of fibre reinforced concrete metals ? 10
6. (a) What is the chemical composition test of cement ? What are the manufacturing process of portland cement ? 10
- (b) What test you proceed to determine composition of hardened concrete ? 10
7. (a) Why does cement get hard when it is mixed with water ? What are the impacts of W/C ratio on durability ? 10
- (b) What are the thermal properties of concrete ? Explain in brief. 10
8. (a) Write a short note on statistical quality controls of hardened concrete. 10
- (b) Write a short note on chemical attack of concrete. 10

23376