

B.Tech. Civil (Construction Management)

Term-End Examination

June, 2016

00358

ET-204(A) : MATERIALS SCIENCE

Time : 3 hours

Maximum Marks : 70

Note : Answer any *seven* questions. Use of calculator is permitted.

1. (a) What are the four 'P's which act as factors for selection of materials ? Discuss in brief. 5
- (b) Write a note on ceramics and glasses. 5
2. (a) Distinguish between ionic and covalent compounds along with their properties. 5
- (b) Describe the hydrogen bond with examples. 5
3. (a) Describe FCC and BCC structures of crystal with neat sketches and examples. 4
- (b) Define and explain the following : 6
 - (i) Unit cell
 - (ii) Miller indices
 - (iii) Packing fraction
4. With the help of a neat sketch, describe two-component systems of solid solutions. 10

5. Explain edge dislocation and screw dislocation with neat sketches. 10
6. (a) Define Hooke's law and the various elastic constants. 5
- (b) What is deformation ? Explain it with the help of graphical representation. 5
7. Explain the following : 10
- (a) Type-I and Type-II superconductors
- (b) Intrinsic and Extrinsic semiconductors
8. Explain the following mechanical properties : 10
- (a) Ductility
- (b) Resilience
- (c) Toughness
- (d) Hardness
9. Explain the following terms : 10
- (a) Austempering
- (b) Martempering
- (c) Age Hardening
- (d) Annealing
10. (a) What is atmospheric degradation ? 5
- (b) Discuss the effect of corrosion of steel in concrete. 5