

B.E./B.Tech. (Full Time) DEGREE ARREAR EXAMINATIONS, APRIL / MAY 2011

(Common to Mechanical, Materials Science, Manufacturing, Industrial, Printing and Mining, Aeronautical, Production, Automobile Engineering, Rubber and Plastics Technology)

SECOND SEMESTER

PH - 183 MATERIALS SCIENCE

(Regulations 2004)

Time : 3 Hours

Max. Marks : 100

Answer **ALL** questions

PART-A (10 x 2 = 20 Marks)

1. List the different strengthening mechanisms for the improvement of mechanical properties.
2. Distinguish between brittle and ductile fracture.
3. Evaluate the Fermi function for an energy kT above the Fermi energy.
4. What is meant by effective mass of an electron?
5. What is Bohr Magneton? Mention its unit.
6. What is meant by dielectric loss?
7. Define mass defect.
8. State Einstein's mass energy relation.
9. What are high T_c super conductors? Give example.
10. List any four properties of superconductors.

PART-B (5 x 16 = 80 Marks)

- 11.(i) With a neat diagram, explain the general aspects of a nuclear power reactor. (10)
- (ii) Explain the working of a scintillation counter. (6)
- 12.(a) Explain in detail various crystal imperfections. (16)
- (Or)
- (b) Explain Griffith theory of brittle materials and derive an equation for the applied stress at which fracture occurs due to an pre-existing crack. (16)

p.t.o.