



COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)
SHIVAJI NAGAR, PUNE - 411 005

END Semester Examination **16-201-10** ILOE- Advance Engineering Materials

Course: B.Tech

Branch: Applied Science

Semester: Sem I

Year: 2014-2015

Max.Marks:60

Duration: 3 Hours Time:- 10.00-1.00 **pm**

Date:20/11/2014

Instructions:

MIS No.

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1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper

Q.1 Solve any Two (10)

- a) Give Two examples each of following material classes: Biomedical, Electronic, Energy and environment, smart , photonics with their specific application area.
- b) Which instrumental method is used for determination of structure of crystalline solids? What is the basis for determination of crystal structure? State different crystal classes on the basis of lattice parameters and occupancy.
- c) Define stress, strain, elastic strain, plastic deformation, impact loading with suitable figure.

Q.2 Solve any Two (10)

- a) Explain wet chemical route for synthesis of ceramics with suitable example.
- b) What are ferrofluids? What are the application areas where they find applications? Which property makes them useful?
- c) With suitable diagram explain magnetostriction and electrostriction effect? Which materials make use of these effect? Give one example each?

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- Q.3 Solve any Two (10)
- Comment on different allotropic forms of carbon
 - What is concrete cloth? How it is manufactured? What are the application areas where it is used?
 - Which materials are called as nano materials? Why material properties change when a material becomes nano material? What are the applications of nano materials?
- Q.4 Attempt any Two (10)
- What are the materials used for under-hood components? What are the important considerations for deciding such materials?
 - Describe one method used for synthesis of single crystal with suitable figure.
 - List various causes for failure of materials.
- Q.5 Solve any Two (10)
- What are meta materials? Which property is responsible for the most important effect shown by meta material? What are major applications possible?
 - What is the main function of a dielectric material? What do you understand by a non linear dielectric? What are the broad application areas?
 - Write a note on various magnetic behaviors observed in different materials? Give one example each? Give applications of hard and soft magnetic materials?