

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Winter 2019 - 20 Examination

Semester: 1**Subject Code: 203208134****Subject Name: Material Technology****Date: 19/12/2019****Time: 10:30 am to 1:00 pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1** A) Narrate the material properties required for cylindrical liner situated in Internal Combustion Engine. Justify your answer. (05)
B) Discuss the importance of smart materials in the area of defense, health and structural engineering. (05)
C) List the mechanical properties required for functioning of Automobile Valve spring. Explain them in brief. (05)
- Q.2 Answer the following questions.** (Attempt any three) (Each five mark) (15)
A) Describe the Characteristics of engineering polymers.
B) Discuss the microstructure, material properties and application of dual phase steel.
C) Explain shape memory alloys. How do they “remember” their parent shape?
D) Why are the substitutional solid solutions more common than the interstitial solid solutions?
- Q.3** A) Compare the material selection process for new product design and existing product design. (07)
B) Give the brief classification applications of adhesives. (08)
- OR**
- B) Explain any one method of manufacturing a composite material. (08)
- Q.4** A) Explain the development of precipitates by taking an example of Al based Cu alloy system. (07)
- OR**
- A) Explain in detail the following stages of annealing heat treatment:
a. Recovery b. Recrystallization. (07)
If the material is heated further, what changes will occur in its microstructure?
B) Describe plastic deformation process by the mechanism of slip. Also compare this mechanism with the analogy of caterpillar motion. (08)