Roll No. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚ **Total No. of Pages : 2**

Total No. of Questions : 09

B.Tech.(AE) (Sem.–3)
AUTOMOTIVE MATERIALS AND METALLURGY
Subject Code : AE-207
Paper ID : [A0705]

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

l. Write briefly :

   (a) Define atomic number.

   (b) What is crystal imperfections?

   (c) What is cementite?

   (d) Define binary solutions.

   (e) Define annealing.

   (f) What is hot dipping?

   (g) Define fatigue.

   (h) Name the material for gudgeon pin.

   (i) Give the composition of stainless steel.

   (j) What is thermal coating?

SECTION-B

2. Differentiate between slip and twin.

3. What is recrystallisation? How it is different from recovery?

4. State the applications of composite materials in automobiles.

5. What is induction hardening? How it is different from flame hardening?

6. State the criterion to be taken care of while selecting the material for piston and piston ring.

SECTION-C

7. (a) What is allotropy? State which materials exhibit allotropy and why?

   (b) What is the difference between annealing and normalizing? Explain annealing process in detail.

8. What is Gibbs phase rule? Explain the phase transformations in a system whose components have complete mutual solubility in the liquid state and limited solubility in the solid state.

9. Write short note on following :

   (a) Anodizing

   (b) Alloys of Mg