3E1209

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3E1209

B.Tech. III-Sem. (Main/Back) Examination, January- 2025

Automobile Engineering

3AE4-06 Materials Science and Engineering

AE, ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. Explain crystal imperfections.
2. Define elastic and Plastic modes of deformation.
3. Define Crystal growth.
4. Define eutectoid and peritectoid
5. Explain flame and induction hardening.
6. Explain equilibrium system in Material science.
7. Define strain hardening
8. Define critical cooling rate.

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9. Explain polymer.

10. Explain surface and volume defects.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. Define Bauschinger's effect and its process.

2. Explain formation of Austenite from pearlite.

3. Define critical cooling rate.

4. Explain Jominey end quench test.

5. Explain properties and applications of PE, PP, PS, PVC, PMMA , PET.

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any Three questions. **(3×10=30)**

1. Explain Frank Reed Source of dislocation.

2. Define Iron carbon equilibrium diagram.

3. Define HSLA steel.

4. Define Hume-Rothery rule.

5. Explain isothermal transformation diagram.

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