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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AE) (2011 Onwards) (Sem.-3)

AUTOMOTIVE MATERIALS

Subject Code : BTAE-305

Paper ID : [A1155]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS 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 have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Write briefly :**

- a) Give composition of any two tool steels.
- b) List any two alloys with composition of Nickel.
- c) List down the uses of ceramics in Automotives.
- d) Give structure of most commonly used elastomers in automotive industry.
- e) Why do we need composite materials?
- f) What is the significance of re-crystallization temperature?
- g) What are oxide ceramics? Give one example.
- h) State advantages of carbon matrix in composites.
- i) List common heat treatment processes for automotive components.
- j) State objective of surface hardening process.

SECTION-B

2. Discuss the effect of various alloying elements on properties of steel.
3. Discuss various types of thin film coatings used and its applications.
4. Explain cold and hot isostatic pressing with applications.
5. Classify glass and list its properties.
6. Discuss various types of polymer matrix composites used in automobiles.

SECTION-C

7. Discuss the need of composite materials and classify them by listing their applications.
8. Discuss following heat treatment processes :

Annealing and normalizing in detail.
9. Discuss criteria for selecting materials for automotive components: cylinder block, cylinder head, piston and crank shaft.