

Total No. of Questions : 10]

SEAT No. :

P3543

[Total No. of Pages : 2

[4959] - 1228

**B.E. Automobile (Elective-II)**  
**Automotive Material**  
**(2012 Pattern) (Semester-I)**

*Time : 2.30 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume Suitable data if necessary.*

**Q1) a)** Explain the strength density char with neat sketch? **[5]**

b) Explain the P & N type semiconductor material? **[5]**

OR

**Q2) a)** What are the application of composite material and polymer in industry? **[5]**

b) Difference between bending and twisting? **[5]**

**Q3) a)** Give five areas of application of ceramics in industries. Gives specific name of ceramic being used and appropriate property which makes its suitable? **[5]**

b) What do you mean by term polymer? Explain with type, properties and application? **[5]**

OR

**Q4) a)** Difference between soft and hard magnetic material? **[5]**

b) Explain the material limit and shape factor? **[5]**

**P.T.O.**

- Q5) a) Explain the ceramic and organic coating? [8]**  
b) Explain the vapor deposition and diffusion coating? [8]

OR

- Q6) a) Write down the name of different methods of mechanical surface treatment and explain any one in details? [8]**  
b) Explain the case hardening and hard facing? [8]

- Q7) a) Explain in details shape memory alloy with properties and application? [9]**  
b) Write a short note on nano-crystalline material? [9]

OR

- Q8) a) Write a short note on trip steel and merging steel? [9]**  
b) Explain the smart material and write down the application of smart material in automobile? [9]

- Q9) a) What is the criteria of selecting material for automotive component?[8]**  
b) Which steel would you select for following automotive component and justify them [8]  
i) Gear  
ii) Crank-shaft  
iii) Ball bearing  
iv) clutch plate

OR

- Q10) a) What is selection criteria chassis material and brake-lining material?[8]**  
b) What are the application of ceramic material for automotive purpose?[8]

