

Total No. of Questions : 11]

SEAT No. :

P762

[Total No. of Pages : 2

[4659]-389

**B.E. (Automobile Engineering) (Semester - II)**

**C: HYBRID, ELECTRIC AND FUEL CELL VEHICLES**

**(2008 Pattern) (Elective - IV)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates :*

- 1) *Answer any three questions from each section.*
- 2) *Question No. 11 is compulsory. Out of the remaining attempt 3 questions from Section - I and 2 questions from Section - II.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Why hybrid vehicle concept comes in picture? Draw simple layout & explain the simple working. [8]  
b) Explain construction and working of DC series and series motor with the help of neat sketch. [8]

OR

- Q2)** a) Advantages and disadvantages of hybrid vehicle? [8]  
b) Explain construction and working of AC motor used in hybrid vehicle. [8]

- Q3)** Explain in details performance characteristic of hybrid vehicle? [16]

OR

- Q4)** a) Compare hybrid vehicle and road vehicle with help of power & torque. [8]  
b) Write a Short Note on grid connected hybrid. [8]

- Q5)** a) Explain continuously variable transmission (CVT) in detail. [9]  
b) Explain in detail series configuration of locomotive drive? [9]

OR

- Q6)** a) Explain in detail load tracking architecture of hybrid vehicle? [9]  
b) What is mean by tracking and energy recuperation. Explain it in brief? [9]

**P.T.O.**

**SECTION - II**

- Q7)** a) Define the term sizing power electronics? [8]  
b) What is the procedure for matching electric drives and ICE? [8]

OR

- Q8)** Write a brief note on battery with the help of following parameter : [16]  
battery basics, different type of batteries, battery parameter.

- Q9)** a) Discuss fuel cell characteristic? [8]  
b) Explain hydrogen storage system. [8]

OR

- Q10)** Write a short note on : [16]  
a) Proton exchange membrane.  
b) Reformers.  
c) Fuel Cell EV.  
d) Super and ultra capacitor.

- Q11)** Give brief introduction of any three from following : [18]  
a) Accumulators.  
b) CVT.  
c) Hydraulic pump & motor.  
d) Pneumatic hybrid engine.

