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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Eighth Semester, B.E. – Automobile Engineering

Semester End Examination; June-2016

Hybrid Vehicles

Time: 3 hrs *Max. Marks: 100*

Note**: Answer any **FIVE** full questions, selecting at least **TWO** full questions from each **part.

PART - A

1 a. Explain the performance characteristics of road vehicles in detail. 6

b. Write a note on predicting fuel economy of hybrid electric vehicles. 6

c. Explain in brief grid connected and mention their advantages and disadvantages. 8

2 a. Explain with the help of neat sketch series wound DC motor and Shunt wound DC motor. Mention their applications. 10

b. Sketch and explain induction type AC motor. List advantages and disadvantages also mention their applications. 10

3 a. Explain with a neat sketch the working of a brushless DC motor. Mention its merits and demerits. 10

b. With neat sketch explain working of an AC synchronous motor. List their advantages and disadvantages. 10

4 a. Explain locomotive drive with the help of block diagram. Mention its important factors. 7

b. Discuss in detail series – parallel switching. 5

c. Explain continuously Variable Transmission (CVT) and Power split with shift. 8

PART - B

5 a. What is drive cycle? Explain its implications. 5

b. Write a short note on: (i) Range and Performance
(ii) Engine downsizing
(iii) Usage requirements of hybrid power plant 10

c. Explain in brief braking and energy recuperation. 5

6 a. What is meant by matching of electric drive and ICE? Explain its importance. 6

b. Explain the significance of sizing of power electronics. 6

c. Explain with a neat sketch Simpson type stepped automatic transmission. 8

7 a. Enumerate types of batteries. With a neat sketch explain construction and working of lead-acid battery. 12

b. Write a note on : (i) Nickel - Cadmium Battery
(ii) Lithium - Ion Battery 8

Contd…2

8	a.	List the various types of fuel cell. With neat sketch, explain construction and working of proton exchange membrane fuel cell (PEM). Mention its merits.	10
	b.	Write a note on Ultra- capacitor.	5
	c.	What is flywheel? Explain the flywheel which is used in hybrid vehicles.	5

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