1	Hall Ticket Number:													
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Code No.: 16110 N(D)

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (CBCS) VI-Semester Main Examinations, May-2019

Hybrid Vehicles (Open Elective-VII)

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Q.No.	Stem of the question	M	L	СО	PO
	$Part-A (10 \times 2 = 20 Marks)$				
1.	What are the limitations of electric vehicle?	2	1	1	1,2,4
2.	List out the types of hybrid electric vehicles.	2	1	1	1,2,4
3.	Draw the basic diagram of a fuel cell.	2	1	2	1,2,4
4.	List out any two types of secondary batteries.	2	1	2	1,2,4
5.	How would a motor run as a generator?	2	2	3	1,2,4
6.	What is the step angle of 8/6 switched reluctance motor?	2	3	3	1,2,4
7.	Compare the I-V characteristics of IGBT & MOSFET.	.2	2	4	1,2,4
8.	Draw the symbols of IGBT & MOSFET.	2	1	4	1,2,4
9.	Define specific power.	2	1	2	1,2,4
10.	List out different charging methods of hybrid electric vehicle.	2	1	4	1,2,
	$Part-B (5 \times 10 = 50 Marks)$				
11.a)	With neat sketch analyze the parallel hybrid electric vehicle.	6	4	1	1,2,
b)	Explain the historical developments of electric vehicles.	4	1	1	1,2,
12.a)	Describe the working principle of fuel cell with neat sketch.	6	2	2	1,2,
b)	How are solar and wind energies used for hybrid electric vehicle?	4	4	2	1,2,
13.a)	Illustrate the working principle of three phase induction motor with neat sketch.	6	2	3	1,2,
b)	Explain the concept of regenerative braking.	4	2	3	1,2,
14.a)	Discuss the wireless charging technique of electric vehicle with a diagram.	5	2	4	1,2,
b)	Explain the operation of a chopper with neat sketch.	-5	2	4	1,2,
15.a)	How would you design a series parallel hybrid vehicle with neat sketch?	7	6	1	1,2,
b)	Define the terms i) Potential density ii) Energy density iii) Specific energy.	3	1	2	1,2
16.a)	Demonstrate the working principle of brushless dc motor with neat sketch.	5	2	3	1,2
b)	Explain the operation of a basic inverter with a diagram.	5	2	4	1,2
17.	Answer any two of the following:				-,
a)	Describe the electric vehicle transmission configurations.	5	2	1	1,2
b)	What are the types of permanent magnet synchronous motor? And explain their advantages and disadvantages with diagrams.	5	4	3	1,2
c)	Which vehicle is better in the present scenario among the conventional, electric, hybrid electric & fuel cell vehicles? Inspect with valid reasons.	5	4	1	1,2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	70.5
2	Knowledge on application and analysis (Level-3 & 4)	23.16
3	*Critical thinking and ability to design (Level-5 & 6)	6.32
	(*wherever applicable)	