Code No: 138BR **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, December - 2020
ELECTRIC AND HYBRID VEHICLES
(Electrical and Electronics Engineering)

Time: 2 Hours **Max.Marks:75**

Answer any Five Questions
All Questions Carry Equal Marks
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1. Explain the various mathematical models that are considered for assessing the vehicle performance. [15]

2.a) List and explain the constituents of a conventional vehicle.
b) Explain the significance of transmission characteristics. [8+7]

3.a) What are the limitations of Electric vehicles?
b) Explain in detail about the following resistive forces:
i) Rolling Resistance ii)Aerodynamic drag iii)Uphill resistance. [7+8]

4.a) Explain in detail about the Parallel HEV with a neat architecture diagram.
b) List and explain the advantages offered by the Hybrid Electric Vehicles. [8+7]

5. Explain the following converter topologies used in HEV applications:
a) Buck Converter b)Boost converter c)Buck – Boost Converter. [5+5+5]

6. Explain in detail about the steady state performance of Induction motor with constant volts/Frequency control. [15]

7. List and explain the following parameters with respect to Battery:
a) Cell and Battery voltages b) Charge (Ahr) capacity c) Energy stored
d) Specific power e) Self discharge rates. [3+3+3+3+3]

8. Give the classification of Energy management strategies and explain them in brief. [15]

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