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BVOC
(SEM I) THEORY EXAMINATION 2021-22
MODERN ELECTRIC & HYBRID VEHICLES

Time: 3 Hours**Total Marks: 30****Notes:**

- Attempt all Sections and Assume any missing data.
- Appropriate marks are allotted to each question, answer accordingly.

SECTION-A	Attempt All of the following Questions in brief	Marks (6X1=6)
Q1(a)	What is the function of traction motor?	
Q1(b)	What is brushless DC motor?	
Q1(c)	Write the function of traction motor.	
Q1(d)	Which types of power converters are required for modern electric vehicle?	
Q1(e)	What do you mean by hybrid vehicle?	
Q1(f)	What are the electric drive components used in hybrid vehicle?	

SECTION-B	Attempt ANY THREE of the following Questions	Marks (3X3=9)
Q2(a)	Explain power flow control in electric and hybrid electric vehicles.	
Q2(b)	Explain with diagram the construction and working of shock absorber.	
Q2(c)	(i) What are the Comparisons of Hybrid Electric Vehicles and Conventional Vehicles (ii) Explain the Impact of modern Drive Trains on Energy Supplies	
Q2(d)	Explain the Series - Parallel Configurations of Hybrid Drive Train with neat diagram.	
Q2(e)	What are the social and environmental importance of hybrid and electric hybrid vehicles? Explain.	

SECTION-C	Attempt ANY ONE following Question	Marks (1X3=3)
Q3(a)	Draw a general lay out of a EV and discuss the transmission characteristics.	
Q3(b)	What is meant by Constant Power Speed Ratio as applied to an electric motor?	

SECTION-C	Attempt ANY ONE following Question	Marks (1X3=3)
Q4(a)	With a neat sketch, explain the configuration of Series hybrid electric drive train	
Q4(b)	Draw the typical torque Vs speed envelope curves of drive train motors and show the continuous, intermittent and peak overload ratings	

SECTION-C	Attempt ANY ONE following Question	Marks (1X3=3)
Q5(a)	Classify and explain the different energy management strategies in hybrid electric vehicle	
Q5(b)	Explain the different power flow control modes of a typical parallel hybrid system with the help of block diagrams.	

SECTION-C	Attempt ANY ONE following Question	Marks (1X3=3)
Q6(a)	Explain the two-quadrant operation of chopper DC motor drive with suitable waveforms for electric vehicle.	
Q6(b)	What are factors affecting the performance of batteries used in EVs?	

SECTION-C	Attempt ANY ONE following Question	Marks (1X3=3)
Q7(a)	With the help of neat diagram, explain the construction and working of shock absorber.	
Q7(b)	Why regenerative braking system is required in modern hybrid electric vehicle? Explain.	