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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022
B. Tech Degree Examinations, December – 2020
(Seventh Semester)

BEEOE 7051 / BELOE 7051 – HYBRID ELECTRIC VEHICLES
(EE & EEE)

Time: 2 hrs

Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

- Q.1. Answer *ALL* questions** [CO#] [PO#]
- a. An hybrid vehicle is a vehicle that has [Co 1] [Po 1]
 (i) 2 motors (ii) 2 different type of engines
 (iii) 2 engines that can be the same (iv) 2 engines
- b. The hybrid vehicle was first created for [Co 1] [Po 2]
 (i) going faster (ii) pollution less
 (iii) save fuel cost (iv) save maintenance cost
- c. Two environmental impact elements were accounted before HEV [Co 2] [Po 2]
 (i) air pollution (AP) (ii) greenhouse gas (GHG)
 (iii) water pollution (iv) AP & GHG
- d. An Electric Vehicle contains 3 main parts [Co 2] [Po 2]
 (i) Source, Power modulator, Motor (ii) Source, Power converter, Engine
 (iii) Source, Power converter, Motor (iv) Source, converter, engine
- e. To save energy during braking-----braking is used? [Co 3] [Po1]
 (i) dynamic (ii) regenerative
 (iii) plugging (iv) all the above
- f. The first hybrid vehicles reported were shown at the Paris Salon of [Co 3] [Po1]
 (i) 1999 (ii) 2009
 (iii) 1899 (iv) 1799
- g. Which of the following pair is used for frequency converter? [Co 4] [Po7]
 (i) SCIM & SRIM (ii) SRIM & Synchronous motor
 (iii) SCIM & Synchronous motor (iv) Any of the above
- h. **Which of the following is true?** [Co 4] [Po7]
 (i) high torque is required at the start of the vehicle (ii) low torque is required at high speeds
 (iii) gearbox helps in smooth running of vehicle (iv) all of the above
- i. An energy management strategy (EMS) is important for hybrid electric vehicles (HEVs) because [Co 5] [Po1]
 (i) it decides future of vehicle (ii)) it decides market value of vehicle
 (iii) it decides performance of vehicle (iv)) it decides next gen/- of vehicle
- j. The energy strategies of companies have the principle of [Co 5] [Po 7]
 (i) restoring and preserving the (ii) reducing wastes and pollutants

environment

(iii) educating the people about (iv) all of these energy conservation

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

Q.2. Answer ALL questions

	[CO#]	[PO#]
a. What is mean by Hybrid electric vehicle (HEV)	Co 1	Po2
b. Define hybrid drive-train topologies?	Co 2	Po2
c. What are all the major Components of Cells and Batteries	Co 3	Po 7
d. What is mean by hybridization of different energy storage devices in EV	Co 4	Po 2
e. Write short notes on CAN network in EV	Co 5	Po 7

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

Answer ANY FIVE questions

	Marks	[CO#]	[PO#]
3. Explain Different types of drive train structure	(6)	Co 1	Po 2
4. Explain in detail about the history of hybrid and electric vehicles	(6)	Co 1	Po 2
5. Explain with block diagram representing power flow strategies used for HEV	(6)	Co 2	Po 1
6. Explain about any one of the basic components of Hybrid Electric Vehicle (HEV)	(6)	Co 2	Po 1
7. Explain in detail about motor and engine rating	(6)	Co 3	Po 1
8. Explain in detail about hybrid drivetrain and possible energy flow for HEV	(6)	Co 3	Po 1
9. Explain in detail about Energy Management Strategy for a Hybrid Electric Vehicle	(6)	Co 5	Po 2
10. List the types of battery technologies used in details	(6)	Co 4	Po 7

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