

**Subject Code: XXXXX**

**Roll No:**

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**BTECH  
(SEM-7) HYBRID VEHICLE PROPULSION 2021-22**

**TIME:3 HOUR**

**Total Marks: 100**

**Instruction:** Attempt the questions as per the given instructions. Assume missing data suitably.

**SECTION - A**

Attempt *All Parts* in Brief

**2\*10 = 20**

<b>Q1</b>	<b>Questions</b>	<b>Marks</b>
(a)	What do you mean by hybrid vehicle ?	2
(b)	Write four advantages of electric vehicle over conventional vehicle.	2
(c)	What is meant by propulsion ?	2
(d)	What do you mean by plug-in hybrid electric vehicle ?	2
(e)	What is non-electric traction system?	2
(f)	Briefly describe hybridization of different energy storage devices.	2
(g)	What is induction motor drive ?	2
(h)	What do you mean by energy storage ?	2
(i)	What is battery-based energy storage ?	2
(j)	Enumerate environmental advantages of hybrid electric vehicle.	2

**SECTION - B**

Attempt Any Three of the following

3\*10 = 30

Q2	Questions	Marks
(a)	Enlist the different transmission characteristics of conventional vehicle.	10
(b)	Enumerate vehicle performance parameters. Explain any one in brief.	10
(c)	Compare different HEV control strategies.	10
(d)	What are different energy storage techniques used in hybrid electric vehicles ?	10
(e)	Explain the working of parallel hybrid electric vehicle drive with block diagram of different component.	10

### SECTION - C

Attempt Any One of the following

5\*10 = 50

Q3	Questions	Marks
(a)	Explain in detail the history of hybrid and electric vehicles.	10
(b)	Explain social and environmental importance of hybrid and electric vehicles.	10
Q4	Questions	Marks
(a)	Explain and compare various hybrid drive train topologies in detail.	10
(b)	Explain electric traction systems and their advantages in detail.	10
Q5	Questions	Marks
(a)	Explain the working of the different electric components used in hybrid electric vehicles.	10
(b)	What do you mean by hybridization of different energy storage devices ?	10
Q6	Questions	Marks
(a)	Explain the process of fuel cell-based energy storage.	10
(b)	Analyse flywheel based energy storage system.	10
Q7	Questions	Marks
(a)	What are the different energy management strategies used in hybrid and electric vehicles ?	10
(b)	Compare different energy management strategies and write implementation issues of energy management strategies.	10

