

Electrical Vehicle

UNIT-01

- Q1. Define Electric vehicle and explain necessity of Electric vehicle.
Q2. States the advantages of EV over conventional IC Engine vehicles.
Q3. What are the different types of Electric vehicle? Explain any two.
Q4. Explain the function of any two components of EV.
(a) Motor
(b) Motor Controller
(c) Battery and Battery Management System
(d) Charging System

UNIT-2

- Q1. Explain the general characteristics of motors use in Electric vehicle.
Q2. What are the different types of motors used in EV ? Explain any one.
Q3. Explain the working principle of brushless DC motor.
Q4. Explain the motor selection criteria for Electric Vehicle.
Q5. Describe the Mechanical and Electrical connections of Motors.

UNIT-3

- Q1. What are the different types of battery used in EV ? Explain any one.
Q2. Write various battery parameters used for Electric vehicle.
Q3. Explain the fuel cell storage system used in EV.
Q4. Explain the features of Lithium Ion battery. Also Explain charging and Discharging process of Lithium Ion battery.
Q5. Explain battery management system used in Electric vehicle with block diagram.
Q6. Describe the procedure of battery disposal and Recycling.

UNIT-4

- Q1. Write the power electronics components used in EV. Explain any one .
Q2. Explain the working principle of Rectifier.
Q3. Explain the working principle of DC to AC Converter with suitable block diagram.
Q4. Describe the types of charging system used for Electric vehicle.
Q5. Explain different components of charging system and Also the working of charging system using single line diagram.

UNIT-5

- Q1. Write Rules and Regulations set by the government for manufacturer of Electric vehicle.
Q2. Explain policies for Electric vehicle in India.
Q3. Describe the importance of EV in reduction of greenhouse gases in the environment.

Important Objectives Questions

- Q. On average, how much does it cost to operate an electric vehicle compared to a traditional car?
a) The same cost
b) Half the cost
c) $\frac{3}{4}$ the cost
d) $\frac{1}{4}$ the cost

Q. From where tractive effort is generated in EV.

- A) Battery
- B) Converter
- C) Driving Shaft
- D) Motor**

Q. Which Battery are preferred for EV.

- A) Lead-acid (Pb-acid)
- **B) Lithium-ion (Li-ion)**
- C) Sodium-sulphur (NaS)
- D) Nickel-cadmium (NiCd)

Q. Which motor is suitable for high starting torque .

- **A) DC Series motor**
- B) DC shunt Motor
- C) DC separately Excited Motor
- D) Synchronous Motor

Q. Diode issemiconductor.

- **A) Unidirectional**
- B) Bidirectional
- C) Both of above
- D) None of these

Q. Which components are used in rectifier?

- A) Transistor
- **B) Diode**
- C) MOSFET
- D) FET

Q. For the purpose of fast switching in charging system, is used.

- A) BJT
- **B) MOSFET**
- C) JFET
- D) DIAC

Q. The function of rectifier is to converts from

- **A) AC to DC**
- B) DC to AC
- C) DC to DC
- D) Any of above

Q. DC to DC converter is used to convert from

- A) Variable dc to fixed dc
- **B) Fixed dc to variable dc**
- C) DC to sinusoidal
- D) none

Q. The function of inverter is to convert from

- **A) DC to AC**
- B) AC to DC
- C) DC to DC
- D) None

Q. Fuel Cell use combination of

- A) Zinc Sulphur
- B) Sulphur oxygen
- **C) Hydrogen Oxygen**
- D) Sodium Sulphur

Q. Which of the following is not a type of electrical car

- A) BEV
- B) PHEV
- C) Hybrid
- **D) Ultra PHVE**

Q. Flywheel stores energy in... ..

- A) Chemical form
- B) Electrical form
- **C) Mechanical form**
- D) Static form

Q. During breaking of electric vehicle the motor becomes

- **A) Alternator**
- B) Converter
- C) Inverter
- d) None of above

Q. High specific energy, high specific power, long cycle life, high-energy efficiency, quick recharge, maintenance free characteristics, cost effectiveness, and environmental friendliness are the features of _____

- A) ultracapacitor
- **B) battery**
- C) fuel cell
- D) flywheel

Q. Battery that cannot be charged again is called

- **A) Primary Battery**
- B) Secondary Battery
- C) Nor Primary Neither secondary
- D) Both primary and Secondary

Q. Which is the brain of electrical vehicle

- A) Gear system
- B) Governing system
- **C) Controller**
- D) Inverter

Q. A battery labeled 200 Ah at C5 rate has a 200 amp-hour capacity at 5 hours discharge rate the discharging current will be _____.

- A) 25 Amps
- B) 22.5 Amps
- C) 27.5 Amps
- **D) 40 Amps**

Q. Which of the following is not a power source combination for Hybrid electric Vehicles

- A) ICE and Battery
- B) Battery and Ultra capacitor
- **C) Diesel and ICE**
- D) Battery and Fuel Cell

Q. What is the unit of charge capacity in a battery .

- **A) Ahr**
- B) W hr
- C) W/hr
- D) W/Ahr

Q. _____ vehicles are powered by battery only .

- A) Conventional
- **B) EV**
- C) HEV
- D) PHEV

Q. In electrical vehicle control system controls the speed by

- A) Changing the voltage
- B) Changing the inductance
- **C) Changing the frequency**
- D) Changing the capacitance

Q. The _____ monitors and measures temperature and assures cooling is adequate for battery.

- A) Hybrid ECU
- B) Transmission ECU
- C) ICE EMU
- **D) Battery management system**

Q. In a hybrid electric vehicle one energy source is _____ & the other is a conversion of a _____ .

- A) combustion, energy to fuel
- B) storage, energy to fuel
- C) storage, energy to energy
- **D) storage, Fuel to energy**

Q. Over the years application of which motor to EV and HEV is limited .

- A) Induction Motor
- B) BLDC
- C) PMSM
- **D) SRM**

Q. The Fuel Cell provides _____ energy but _____ power .

- **A) High, Low**
- B) modest, modest
- C) modest, low
- D) low, low

Q. In electrical vehicle power is converted from

- A) AC to DC
- **B) DC to AC**
- C) Half wave to full wave
- D) Full wave to half wave

Q. Which of the following vehicle produces zero emissions.

- A) gasoline vehicle
- **B) Electrical vehicle**
- C) hybrid vehicle
- D) Diesel vehicle

Q. Which vehicle has the smallest number of principle components?

- **A) gasoline vehicle**
- B) electrical vehicle
- C) hybrid vehicle
- D) Diesel vehicle

Q. The slowest method of charging is known as

- A) AC charging
- **B) DC charging**

- **C) Trickle charging**

- D) None of above

Q. An electric vehicle only needs one of the following maintenance jobs done. Which is it?

- A) Oil change

- B) Belt replacement

- C) New spark plugs

- **D) Brake pad inspections**

Q. Which of the following is not a type of charging in electrical vehicle?

- A) AC charging

- B) DC charging

- C) Triakal charging

- **D) Tab charging**

Q. What other types of transportation have been electrified?

- A) Scooter

- B) Bike

- C) Bus

- **D) All of the above**

Q. What is the difference between a plug-in hybrid and a battery electric vehicle?

- A) There is no difference

- B) A plug-in hybrid only accepts AC power, while a battery electric vehicle accepts AC and DC power

- **C) A plug-in hybrid can be powered by either the battery or the gasoline engine. A fully electric vehicle is powered only by the battery.**

- D) NOT

Q. What country has the most electric vehicles per capita?

- A) China

- **B) Norway**

- C) Iceland

- D) United Arab Emirates

Q. When was the first electric car invented?

a) 1830

b) 1985

c) 1832

d) 1945

Q. Which of the following is not a type of charging in electrical car

- A) AC charging

- B) DC charging

- C) Trickle charging

- **D) Tab charging**

Q. Full form of EV is _____

a) Energy voltage

b) Electric vehicles

c) Electric voltage

d) Energy vehicles

Q. Full form of ICV is _____

a) Internal combustion vehicles

b) Internet combustion vehicles

c) Internally combined vehicles

d) Internet combined vehicles

Q. The main function of controller used in electric vehicle is to

- A) change the voltage
- B) Change the current
- **C) change the frequency**
- D) Change the resistance

Q. Which one of the following is most popular drive used in electric vehicle

- **A) Permanent magnet synchronous motor drive**
- B) Brushed motor drive
- C) Both of above
- D) None of these

Q. When the battery is half (50%) charged, the specific gravity of acid in a battery is usually

- A) 0.74
- B) 1.00
- C) 1.12
- **D) 1.19**

Q. Battery life of electrical vehicle is generallyyears

- A) 5
- B) 4
- **C) 8**
- D) 10

Q. The breaking system used in electric vehicle is

- A) Hydraulic break
- B) Regenerative Bank
- **C) Combination of both of above**
- D) none of these

Q. Which of the following motor is mostly preferred by electric car manufacturer?

- **A) Brushless DC motor**
- B) Induction motor
- C) Both of above
- D) None of these

Q. Which of the following is not a type of safety of electric vehicle ?

- A) Battery safety
- B) Protection against electrical shop
- C) Chemical hazard
- **D) None of these**

Q. Minimum range of charging time of battery of car is

- A) 1 to 2 hour
- B) 2 to 4 hour
- **C) 4 to 20 hour**
- D) 20 to 30 hour

Q. The driving range of electrical car is normally on full charge is

- **A) 60 to 100 miles**
- B) 20 to 50 miles
- C) 100 to 150 miles

- D) 10 to 40 miles

Q. Electrical car require..... Maintenance than gas or diesel car.

- A) More
- **B) Less**
- C) Same
- D) not

Q. Which is the best advantage of electrical car over conventional car.

- A) Better for drive
- **B) Better for environment**
- C) Better for initial cost
- D) None of the above

Q. The voltage range available for battery of electrical car

- A) 21 V to 50 V
- B) 12 V to 18 V
- C) 1000 V to 2000 V
- **D) 100 V to 400 V**