Q.22 Write down the basic introduction of Micro, Mild and fully hybrid electric vehicle.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Draw a general layout of an EV and discuss the transmission characteristics.

Q.24 Describe the benefits and disadvantages of hybrid and electric vehicles for society and environment.

Q.25 With a neat sketch, explain the configuration of parallel hybrid electric drive train.

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4th Sem / Instrumentation and Control Engineering

Subject : Electric Vehicles

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 What is the primary source of propulsion in an electric vehicle?

a) Gasoline b) Diesel

c) Electric motor d) Hydrogen fuel cell

Q.2 Which type of battery is commonly used in modern electric vehicles due to its high energy density and efficiency?

a) Nickel-Cadmium (NiCd)

b) Lead-Acid

c) Lithium-Ion (Li-ion)

d) Alkaline

Q.3 Where can electric vehicles be charged?

a) Gas stations b) Charging stations

c) Car wash d) Traffic signals

Q.4 What is the driving range of an electric vehicle?

a) The top speed it can reach

b) The time it takes to charge the battery

c) The distance it can travel on a single charge

d) The weight of the vehicle

Q.5 Which component in an electric vehicle allows the driver to control the speed and direction of the vehicle?

a) Battery pack b) Electric motor

c) Charging port d) Drive-by-wire system

Q.6 Mild hybrid vehicle used battery with

a) 12 V b) 24 V

c) 48 V d) 60 V

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Define energy consumption in a vehicle.

Q.8 What is electric traction motor?

Q.9 Write one application of induction motor.

Q.10 What is thermal runaway?

Q.11 Define specific energy of a battery.

Q.12 What do you mean by DC-DC converter?

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 What is meant by constant power speed ratio as applied to an electric motor.

Q.14 Write the causes of battery explosion in electric vehicles.

Q.15 What are the energy storage devices, explain any two of them?

Q.16 How temperature can be controlled during operation of a battery?

Q.17 A cell is different from a battery. How?

Q.18 Why charging is necessary for Evs and discuss the classification of charging configurations?

Q.19 Discuss the comparison between an electric vehicle and hybrid electric vehicle.

Q.20 Write a detailed working process of a traction inverter.

Q.21 What is battery cell equalization problem and how it is solved?