

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

Branch – APPLIED ELECTRONICS

HYBRID ELECTRIC VEHICLE

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 The benefits of hybrid car are -----
(i) Less pollution (ii) Energy recovery
(iii) High speed (iv) All of these
- 2 One of the following is contact less charging technique in energy storage management systems.
(i) Fast AC charging (ii) DC charging
(iii) Induction charging (iv) Slow AC charging
- 3 The total energy output from the dynamic power train will be ----- in the whole driving cycle.
(i) Maximum (ii) zero
(iii) Minimum (iv) Infinity
- 4 The battery that is NOT suitable for the hybrid vehicle is ----- .
(i) Li ion battery (ii) NaS batter
(iii) Na Ni Cl battery (iv) Lead acid battery
- 5 Select the cycle used in the hybrid engine.
(i) Otta (ii) Atkinson
(iii) Diesel (iv) Isentropic

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Write a note on the development of electric vehicle towards the beginning of 21st century.
OR
b State the merits of fuel cell based electric vehicle.
- 7 a What are the social implications of hybrid vehicles?
OR
b What are the economic advantage of introduction of electrical vehicles?
- 8 a What are the types of train topology?
OR
b Define the efficiency of driving system.
- 9 a What is a super capacitor?
OR
b How hybridization of energy storage systems is carried out?
- 10 a Define driving cycle.
OR
b Write a short note of solar cell.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a State the motion equation of an electric vehicle.
OR
b What are the various forces that act upon the vehicle in static and dynamic conditions?
- 12 a Briefly give an account on the environmental strategies of hybrid vehicles.
OR
b What are the various types of charging techniques used in electric vehicles?
- 13 a Explain how power flow is controlled in an electric drive system.
OR
b State the configuration and control of switch reluctance motor drives.
- 14 a Explain the working principle of energy storage system based on fuel cell.
OR
b Describe the operation of internal combustion system.
- 15 a Explain the range modeling of electric vehicle.
OR
b Explain the operation of solar power based electric vehicle.

Z-Z-Z

END