



C20-A-505

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BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

DAE – FIFTH SEMESTER EXAMINATION

ELECTRIC AND ELECTRIC HYBRID VEHICLES

Time : 3 Hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Describe briefly about electric vehicle history.
2. What is a solar power vehicle? State its merits and demerits.
3. What are the advantages of Lithium based batteries used in electric vehicles?
4. List the types of fuel cells.
5. List the advantages of parallel hybrid drive train.
6. What is meant by plug in hybrid electric vehicle?
7. What is the advantage of brushless permanent magnet DC motor drive?
8. What is the role of motor controllers in electric vehicles?
9. List the advantages of regenerative braking.
10. What is meant by optimal feel series brake?

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **eight** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) What is the current state and future of EV and EHV scenario in India? State its impact on society and environment.

(OR)

(b) Explain the basic components and working of electric hybrid vehicle with block diagram.

12. (a) Explain briefly about Nickel and Lithium based batteries used in EV and EHV.

(OR)

(b) What is ultra-capacitor? State the advantages and limitations of ultra-capacitors for using in electric vehicles.

13. (a) Explain series hybrid and parallel hybrid drive train with neat sketches.

(OR)

(b) Write short note on transmission system used in electric vehicles. State the difference between transmission system of electric vehicle and IC engine vehicle.

14. (a) What are the criterion to be considered with respect to sizing and selection of motors for electric vehicles and electric hybrid vehicles?

(OR)

(b) Explain briefly about Switch Reluctant Motor drive (SRM) used in propulsion of electric vehicle.

15. (a) Explain parallel braking system used in electric vehicles with a suitable block diagram.

(OR)

(b) Write short note on ABS system of EV/EHV and state the merits of it.

PART—C

10×1=10

- Instructions :** (1) Answer the following question.
(2) The question carries **ten** marks.
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Explain the control strategy of parallel hybrid drive train in detail.

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