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BEY-004

**BACHELOR OF SCIENCE (APPLIED
SCIENCE-ENERGY) (BSCAEY)**

Term-End Examination

June, 2026

BEY-004 : ZERO EMISSION VEHICLES

Time : 3 Hours

Maximum Marks : 70

Note : (i) Attempt any **seven** questions.

(ii) All questions carry equal marks.

1. (a) What are the key technological challenges faced by zero emission vehicles ? 5
- (b) How could ride sharing and fleet electrification contribute to zero emission vehicle market growth ? 5
2. (a) Explain the working principle of solar charging systems. 5

- (b) Discuss advantages, limitations and applications of solar charging system. 5
- 3. Discuss the utilization of hydrogen in CI engines. 10
- 4. (a) Compare the power flow in series and parallel drive trains. 5
- (b) Describe the impact of temperature and road conditions on the energy consumption of an electric vehicle. 5
- 5. Explain the concept of battery management systems. How does it optimize battery performance and ensure safety in electric vehicles ? 10
- 6. Differentiate between mild, hybrid vehicle, full hybrid vehicle and plug in hybrid vehicle. 10
- 7. (a) How does fuel cell performance degrade overtime ? 5
- (b) Discuss any *two* strategies to increase the life span of a fuel cell. 5

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8. (a) What is the importance of real time algorithms in electric vehicles ? 5
- (b) How does different charging methods contribute to sustainability and use convenience ? 5
9. Write short notes on any *two* of the following : 5+5
- (a) Stoichiometric combustion
- (b) Steam reforming of methane
- (c) Life cycle analysis of zero emission vehicle
- (d) EV charging stations

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