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**Question Paper Code: 97302**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Seventh Semester

Electrical and Electronics Engineering

19UEE702- ELECTRIC VEHICLES

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. Why do we need hybrid vehicles? CO1-U
2. What are the limitations of electric vehicles when compared to petrol and diesel vehicles? CO1 -U
3. What are the propulsion components in EV? CO1 -U
4. What are the main components of an electric propulsion system? CO1 -U
5. What are factors affecting battery cell life cycles ? CO1 -U
6. What is the source of energy storage in electric vehicle? CO1- U
7. Define Battery Management System in Electric Vehicles. CO1- U
8. What are the performance standards of Electric Vehicle? CO1 -U
9. Write short notes on E- mobility Indian Road map perspective . CO1 -U
10. What is the difference between V2G and G2V technologies? CO1 -U

PART – B (5 x 16= 80 Marks)

11. (a) Contrast the social and environmental impacts of conventional and electric vehicle in detail CO1 -U (16)

Or

- (b) Explain in detail about the following parameters with neat diagram CO1- U (16)
  - (i) Aero Dynamic Drag
  - (ii) Rolling Resistance
  - (iii) Uphill Resistance
  - (iv) Grade/Inclination

12. (a) Explain in detail the electric components used in hybrid and electric vehicles. CO1- U (16)
- Or
- (b) Explain in detail about configuration and control of brushless DC motor drives. CO1- U (16)
13. (a) Justify why Lead-acid battery is used in EV? Explain the storage technology with neat sketch. CO1- U (16)
- Or
- (b) Explain the fuel cell energy production technology in electric vehicle with neat sketch. CO1 -U (16)
14. (a) (i) Compare and Explain the different energy management strategies CO1- U (8)
- (ii) Discuss the issues of energy management strategies. CO1- U (8)
- Or
- (b) Explain in detail about CO1- U (16)
- (i) Battery cell monitoring: current and voltage
- (ii) Battery charge/ discharge control, estimation & protection
- (iii) Cell Equalization
- (iv) Power, temperature, and heat management
15. (a) Explain typical CAN in Hybrid electric vehicle. CO1 -U (16)
- Or
- (b) Explain in detail about Electrification challenges of Tesla Electric Vehicle CO1- U (16)