

**Model Question Paper-1/2 with effect from 2022-23 (CBCS Scheme)**

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**Fourth Semester B.E. Degree Examination**  
**Electric and Hybrid Vehicles**

**TIME: 03 Hours****Max. Marks:****100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

| Module -1       |   |  | Bloom's Taxonomy Level | COs | Marks |
|-----------------|---|--|------------------------|-----|-------|
| Q.01            | a | Explain Components of road load                                    | L2                     | CO1 | 7     |
|                 | b | Illustrate Grid connected HEV20 and HEV60                          | L2                     | CO1 | 7     |
|                 | c | Explain Efficiency paths for hybrid powertrain                     | L3                     | CO1 | 6     |
| OR              |   |  |                        |     |       |
| Q.02            | a | Write short note on Friction and wheel slip                        | L2                     | CO1 | 7     |
|                 | b | Explain series and shunt wound DC motor                            | L2                     | CO1 | 7     |
|                 | c | Demonstrate connected car, V2G                                     | L3                     | CO1 | 6     |
| <b>Module-2</b> |   |  |                        |     |       |
| Q. 03           | a | Explain Series hybrid propulsion system architecture               | L2                     | CO2 | 7     |
|                 | b | Discuss Switched reluctance motor.                                 | L2                     | CO2 | 7     |
|                 | c | Outline Switchable series-parallel hybrid architecture             | L2                     | CO2 | 6     |
| OR              |   |  |                        |     |       |
| Q.04            | a | Explain Electric locomotive propulsion system                      | L2                     | CO2 | 7     |
|                 | b | Illustrate Micro hybrid technologies.                              | L2                     | CO2 | 7     |
|                 | c | Explain brushless DC motor   | L2                     | CO2 | 6     |
| <b>Module-3</b> |   |  |                        |     |       |
| Q. 05           | a | Illustrate Parallel regenerative brake system                      | L2                     | CO3 | 7     |
|                 | b | Explain Schematic of epicyclic gear set                            | L2                     | CO3 | 7     |
|                 | c | Discuss Wilson type stepped automatic transmission                 | L2                     | CO3 | 6     |
| OR              |   |  |                        |     |       |
| Q. 06           | a | Explain Series braking system                                      | L2                     | CO3 | 7     |
|                 | b | Explain Simpson type stepped automatic transmission system         | L2                     | CO3 | 7     |
|                 | c | Interpret Lepelletier transmission system                          | L2                     | CO3 | 6     |
| <b>Module-4</b> |   |  |                        |     |       |
| Q. 07           | a | Explain different types batteries                                  | L2                     | CO4 | 7     |
|                 | b | Explain lithium ion battery  | L2                     | CO4 | 7     |
|                 | c | Explain Schematic of epicyclic gear set                            | L2                     | CO4 | 6     |
| OR              |   |  |                        |     |       |
| Q. 08           | a | Explain high discharge capacitor                                   | L2                     | CO4 | 7     |
|                 | b | Describe Ultra-capacitor constant current discharge testing system | L2                     | CO4 | 7     |
|                 | c | Explain Wilson type stepped automatic transmission                 | L2                     | CO4 | 6     |
| <b>Module-5</b> |   |  |                        |     |       |
| Q. 09           | a | Explain alkaline fuel cell technology .                            | L2                     | CO5 | 7     |
|                 | b | Describe molten carbonate fuel cell                                | L2                     | CO5 | 7     |
|                 | c | Explain hydrogen storage systems.                                  | L2                     | CO5 | 6     |
| OR              |   |  |                        |     |       |

|       |   |                                    |    |     |   |
|-------|---|------------------------------------|----|-----|---|
| Q. 10 | a | Explain Fuel cell characteristics, | L2 | CO5 | 7 |
|       | b | Explain fuel cell EV.              | L2 | CO5 | 7 |
|       | c | Explain phosphoric acid fuel cell  | L2 | CO5 | 6 |