Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 41022

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Fifth/Sixth/Seventh Semester

Electrical and Electronics Engineering

EE 3033 – HYBRID ENERGY TECHNOLOGY

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any two advantages of hybrid energy system.

2. What are the impacts of renewable energy power generation on the environment?

3. How SCIG is differ from PMSG?

4. What do you mean by Doubly - fed induction generator?

5. What are the two main types of solar PV system?

6. List out the power converters for SPV systems.

7. What is PWM inverters?

8. List the limitations of matric converters.

9. What is the range of hybrid systems?

10. Mention the types of hybrid systems.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss present Indian and International energy scenario of conventional and renewable energy sources.

Or

(b) Explain the construction, working principle, and characteristics of Solar photovoltaic and Fuel cells.

12. (a) Discuss the construction, working principle, and characteristics of SCIG.

Or

(b) Explain the construction, working principle, and characteristics of Doubly - fed induction generator.

13. (a) Discuss the line commutated converters in the inversion mode with neat sketch.

Or

(b) Explain grid tied (battery less) system and stand-alone PV system.

14. (a) Explain Stand-alone and Bi-directional converters with neat sketch.

Or

(b) Explain the Grid-Interactive and Matrix converters with neat diagrams.

15. (a) Explain the Diesel-PV and Wind-PV hybrid systems in detail.

Or

(b) Explain the PV-fuel cell and micro-hydel - PV hybrid systems in detail.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss in detail the various renewable energy sources with necessary sketches.

Or

(b) Explain boost converters and buck-boost converters in detail.