MAR ATHANASIUS COLLEGE OF ENGINEERING, KOTHAMANGALAM

(Government Aided Autonomous Institution)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Second Sessional Examination October 2026

B24EE3P13: HIGH VOLTAGE ENGINEERING

S5 EEE

Max. Marks :40 Time: 1 hr 30 min

Answer all questions

PART A (3 x 4=12 Marks)

1. Differentiate between uniform and non-uniform electric fields. (3 Marks) [CO3]
2. A high-voltage apparatus employs solid, liquid, and gaseous insulating materials. Compare the suitability of these three dielectric media for high-voltage applications, citing one appropriate example for each. (3 Marks) [CO3]
3. Outline the operating principle of Unified Power Flow Controller with a neat sketch. (3 Marks) [CO4]
4. Distinguish how a series and shunt compensation influence the operating conditions of the transmission system. (3 Marks) [CO4]

PART B (2 x 14=28 Marks)

5. Analyze the development of corona discharge in a high-voltage system with a non-uniform electric field. With a neat sketch, explain the mechanism of corona formation and examine its advantages and disadvantages in practical high-voltage systems. (14 Marks) [CO3]
6. Describe the operation of an HVDC transmission system with a neat block diagram, highlighting the function of its major components. (14 Marks) [CO4]

Students will be able to:
CO3: Understand dielectric behavior and breakdown mechanisms in solid, liquid and gaseous media and explain insulation systems used for high-voltage applications.
CO4: Identify the main components and functions of HVDC transmission and FACTS controllers in power systems.

VISION

Endeavour to Ensure Excellence

MISSION

Mould technically competent and morally strong Engineers
Achieve dynamic leadership through quality Education
Cater to the needs of industry and community through Emulation
Empower the students to serve the nation with Dedication