Department of Electrical and Electronics Engineering
Mar Athanasius College of Engineering, Kothamangalam
(Government Aided Autonomous Engineering College)

Second Sessional Examination – October 2026

B24EE3T02 Power System I-S5 EA &EB

Time: 1.5 Hrs. Max Marks: 40

Part A [4*3 =12 marks]

1. Define string efficiency of a suspension insulator string. Write its expression. **[CO3]**
2. List any three factors affecting corona. **[CO3]**
3. State any three objectives of power system protection. **[CO4]**
4. Explain the difference between primary protection and back-up protection. **[CO4]**

Part B [2*14 = 28 marks]

5 (a). A 132 kV transmission line has the following data. Weight of conductor = 680 kg/km; Length of span = 260 m. Ultimate strength = 3100 kg; safety = 2. Calculate the height above the ground at which the conductor should be supported. Ground clearance required is 10 m. **[CO3] (7 Marks)**

(b). A 3- phase transmission line is being supported by three disc insulators. The potential across top unit (i.e. near to the tower) a middle unit are 8 kV and 11 kV respectively. Calculate (i) the ratio of capacitance between pin and earth to the self-capacitance of each unit (ii) the line voltage (iii) string efficiency. **[CO3] (7 Marks)**

6. .Given a power-system network with generators, transformers and transmission lines, identify and sketch suitable zones of protection. **[CO4] (14 Marks)**

Students will be able to:

CO3: Analyze the mechanical characteristics of power transmission, including sag – tension, insulators, corona effects, underground cables, and modern technologies – EHVAC, HVDC, FACTS.

CO4: Analyze the principles of power system protection and switchgear, including protective relays and circuit breakers, for reliable fault detection and isolation.

VISION

Endeavour to Ensure Excellence

MISSION

Mould technically competent and morally strong Engineers

Achieve dynamic leadership through quality Education

Cater the needs of industry and community through Emulation

Empower the students to serve the nation with Dedication