

CBCS Scheme

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17/16EPS22

Second Semester M.Tech. Degree Examination, June/July 2018 Insulators for Power System

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Describe the guiding principles in the design of insulator profiles. (04 Marks)
b. Draw a neat sketch of cap and pin disc insulator and describe various parts. (04 Marks)
c. List and discuss the requirement and properties of the three main materials of insulators. (08 Marks)

OR

- 2 a. Define the terms flashover, form factor and leakage distance with reference to an insulator. (06 Marks)
b. What polymeric materials are used for insulators? Mention their superiority and drawbacks over glass and porcelain. (04 Marks)
c. Discuss the mechanical stresses on insulators in temperate, freezing and dynamic load conditions. (06 Marks)

Module-2

- 3 a. List different porcelain insulators manufactured by wet process. Discuss briefly the material compositions used in their manufacturing. (06 Marks)
b. With a neat block diagram, explain the steps in the manufacturing of green clay required for making porcelain insulators. (10 Marks)

OR

- 4 a. Name standards internationally used for testing of non-ceramic insulators. Describe briefly the various classes of tests prescribed in these standards. (06 Marks)
b. Why and how are non-ceramic insulators tested for tensile load with standability? (05 Marks)
c. Explain the need for multi-stress test on non-ceramic insulators. Describe the testing method as in the relevant IEC standard. (05 Marks)

Module-3

- 5 a. Compare the attributes of different insulator materials. (04 Marks)
b. Name and describe important aspects that are to be considered in specifying insulation of power lines. What is the role of national electricity safety code in the design of power line insulation? (04 Marks)
c. Distinguish between contamination and pollution. With examples discuss electrically significant pollution deposits. List principal forces causing deposits on insulators. How is the process of pollution deposit on DC insulators different? (08 Marks)

OR

- 6 a. Discuss the insulator pollution flashover paradox and common pre-cursors of pollution flashover. (08 Marks)
b. Show how experimentally the behavior of layers of artificial pollution under electrical stress can be investigated using strip geometry. (08 Marks)

Module-4

- 7 a. How does ice morphology influence the flashover path? (03 Marks)
b. With neat sketches, explain the crystal structure of ice. (07 Marks)
c. Describe the process of formation Glaze ice and the influence of water droplet size on formation of type of ice. (06 Marks)

OR

- 8 a. Describe in detail the high frequency behavior of ice. (08 Marks)
b. With an example, discuss the process and factors influencing insulator flashover during light icing. (08 Marks)

Module-5

- 9 a. Discuss the need for testing insulators. (04 Marks)
b. Describe the background and stages of development of natural pollution testing of insulators. (06 Marks)
c. Describe the following pollution test methods:
(i) Pre-applied Kieselguhr test.
(ii) Japanese equivalent fog test. (06 Marks)

OR

- 10 a. Discuss the basic philosophy underlying the salt fog and pre-applied layer insulator pollution test methods. (10 Marks)
b. How source impedance affects the artificial pollution test results? How it can be overcome? (06 Marks)

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