Exam.Code:1018
Sub. Code: 7477

2023

M.E. Electrical Engineering (Power System)

Second Semester

EE-8202: EHV AC Transmission

Time allowed: 3 Hours | Max. Marks: 50

***NOTE**: Attempt any <u>five</u> questions.*

x-x-x

I. a) Differentiate between Standard Nominal and Maximum Operative Voltages in India with examples.

b) Discuss the factors which are influencing the power handling capacity of transmission lines and suggest the measures to improve it. (5,5)

II. a) Derive the formula for Inductance per phase per km of a bundled conductor line.

b) Enlist the various advantages of bundling of EHV AC transmission lines. (8,2)

III. Discuss the charge-potential relation for multi-conductor lines. Give examples of surface voltage gradients on EHV lines as per the available literature. (10)

IV. a) State the different factors that affect the Corona Loss in EHV AC Line.

b) Derive the relation between single phase and three phase audible noise level. (5,5)

V. The dimensions of the 3-phase, 400 kV horizontal line shown in the Figure 1 are H= 15 m, S = 11 m phase separation. Conductor is 2x3.18 cm diameter. Bundle spacing B= 45.72 cm. Calculate the matrix of inductance per km for transposed and untransposed lines.

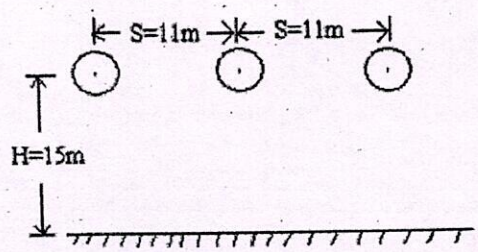

Figure 1

(10)

P.T.O.

VI. Explain clearly how overvoltages are generated when interrupting (a) low inductive currents and (b) low capacitive currents. Draw a figure showing ferro-resonance condition in a network when two poles of a circuit breaker are open and one pole is closed. (10)

VII. A 420 kV line is 750 km long. Its inductance and capacitance per km are L = 1.5 mH/km and C = 10.5 nF/km. The voltages at the two ends are to be held 420 kV at no load. Neglect resistance. Calculate the MVAR of shunt reactors to be provided at the two ends and at intermediate station midway with all four reactors having equal resistance. (10)

VIII. List the dangers resulting from series capacitor compensation on long lines, and the remedies taken to counteract them. (10)

x-x-x