BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – Dip.EE-2022
Course Name – Transmission and Distribution of Power
Course Code - DEEPC403
(Semester IV)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Indicate the maximum voltage level upto which the pin type insulators can be used

a) 22 kV b) 33 kV
c) 66 kV d) 132 kV

(ii) Identify the main purpose of electrical transmission

a) To generate electricity b) To store electricity
c) To transport electricity over long distances d) To convert electricity into other forms of energy

(iii) Explain the impact of ACSR conductor selection on the overall efficiency of a power transmission system.

a) Analyze energy losses b) Assess environmental sustainability
c) Evaluate long-term costs d) Consider safety and reliability factors

(iv) Identify the basic requirements for line supports in electrical transmission

a) Aesthetic appeal b) Mechanical strength
c) Color variation d) Noise reduction

(v) predict the scenarios that insulators be most crucial in preventing electrical failures

a) High-voltage transmission lines b) Low-voltage household wiring
c) Battery-powered devices d) Static electricity generation

(vi) Predict the conductor sag which should be kept

a) Minimum b) Maximum
c) Zero. d) None of these.

(vii) Determine supply frequency and diameter of the conductor due to which the skin effect is negligible

a) < 50 Hz and < 1 cm. b) < 50 Hz and > 1 cm
c) > 50 Hz and < 1 cm. d) .> 50 Hz and > 1 cm.

(viii) Name the line constants in a transmission line

a) Resistance and series conductance only. b) .Series and shunt conductance.

c) Resistance, inductance and capacitance
d) Resistance, inductance, capacitance and shunt conductance

(ix) Name gas is formed near to the conductors by producing a hissing noise

a) Oxygen
b) Ozone
c) .Hydrogen
d) Nitrogen.

(x) Identify the primary purpose of a substation in an electrical power system

a) To generate electricity
b) To transmit electricity over long distances
c) To distribute electricity to end-users
d) To transform and regulate voltage levels

(xi) If a substation has a transformer with a turns ratio of 10:1 and the primary voltage is 110 kV, Predict the secondary voltage.

a) 10 kV
b) 11 kV
c) 100 kV
d) 1.1 kV

(xii) Identify the string efficiency of a high voltage line is around

a) 0.8
b) 1
c) 0.4
d) 0.1

(xiii) Identify the main purpose for guy wire in distribution.

a) Provides emergency earth route.
b) Protects against the surges
c) Supports the pole
d) All of these.

(xiv) Explain the method of voltage control is applied for long line AC transmissions.

a) Switching by shunt capacitors
b) Tap changing transformers
c) Switching by shunt reactors
d) Static Var sources

(xv) Explain why For high-voltage transmission lines, conductors are suspended from towers to

a) Increase clearance from ground
b) Reduce clearance from ground
c) Take care of increase in length
d) Reduce wind and snow effects

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Indicate the components of a power system (3)
3. string efficiency of dc system is 100%. Explain (3)
4. Explain the difference between a distribution substation and a transmission substation. (3)
5. Explain the Ferranti effect. (3)
6. Explain the economic feasibility of upgrading an existing transmission system to Extra High Voltage (EHV) standards versus constructing a new system. (3)

OR

Plan a modification to improve the efficiency of an existing Extra High Voltage (EHV) transmission system. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the generalized circuit constants of a transmission line. (5)
8. Explain the ABCD parameter in a short Transmission line (5)
9. In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, calculate (i) the distribution of voltage over 3 insulators and (ii) string efficiency (5)

10. Compare and contrast the requirements of overhead distribution systems with those of underground distribution systems. (5)
11. Evaluate the impact of changing the ABCD parameters of a transmission line on power flow and system stability. Provide examples of situations where changes in the parameters (5)

might be beneficial or detrimental.

12. limitations of nominal T and pi methods in the line problems. (5)

OR

Assess the impact of different distribution system configurations (e.g., radial, ring main) on voltage regulation and power quality. (5)

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