BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.EE-2022/Dip.EE-2023
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) Identify the cause for electricity transmitted over long distances

a) To save costs
b) To promote environmental conservation
c) To ensure safety
d) To minimize energy loss

(ii) Identify the advantages and disadvantages of using aluminum and copper conductors in power transmission

a) Copper is cheaper but less conductive
b) Aluminum is more conductive but expensive
c) Copper is more conductive but expensive
d) Aluminum is cheaper but less conductive

(iii) Indicate the role of steel in ACSR conductors.

a) Enhances flexibility
b) Increases conductivity
c) Provides strength and support
d) Improves insulation properties

(iv) Identify the role of a string of suspension insulators in maintaining a uniform distribution of potential.

a) By increasing potential at specific points
b) By storing excess potential
c) By preventing potential variations
d) By converting potential into kinetic energy

(v) Identify the maximum voltage of the disc type insulators is at

a) Same at all points
b) Near the tower or starting of the insulator
c) Near to the conductors
d) None of these.

(vi) 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

(vii) Predict the necessary to step up voltage in a substation before transmission.

a) To reduce losses
b) To increase current
c) To improve power factor
d) To enhance safety

(viii) In a substation, if the voltage needs to be stepped down from 220 kV to 110 kV, predict type of transformer would be used.

a) Step-up transformer
b) Distribution transformer
c) Power transformer
d) Instrument transformer

(ix) If a fault occurs in a substation, predict device is used to disconnect the faulty equipment from the rest of the system

a) Circuit breaker
b) Fuse
c) Isolator
d) Relay

(x) Indicate the threshold voltage below which a single bus-bar arrangement is typically employed in substations.

a) 11 KV
b) 33 KV
c) 132 KV
d) 220 KV

(xi) Select 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

(xii) Identify the reason for insulation of underground cables.

a) To reduce power losses
b) To prevent short circuits
c) To improve conductivity
d) To enhance durability

(xiii) Select the usual spans with R.C.C. poles are

a) 40—50 metres
b) 60—100 metres
c) 200 – 300 meters
d) 80 – 150 meters

(xiv) Select the following is a disadvantage of underground cables compared to overhead lines.

a) Lower installation cost
b) Ease of maintenance
c) Limited heat dissipation
d) Higher susceptibility to lightning strikes

(xv) Choose power despatch through a line can be increased by

a) installing series capacitors
b) installing shunt capacitors
c) installing series reactors
d) installing shunt reactor

Group-B

(Short Answer Type Questions) 3 x 5=15

2. String efficiency of dc system is 100%. Explain briefly. (3)
3. Explain the significance of circuit breakers in a substation. (3)
4. Define the effect of inductance on the performance of a transmission line. (3)
5. Discuss the purpose a busbar contribute to the functioning of a substation. (3)
6. Between skin and proximity effects, explain the effect has a more significant impact on high-voltage AC transmission lines. (3)

OR

Explain the difference overhead and underground distribution lines in terms of cost, reliability, and environmental impact. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Indicate the limitations of nominal -T and -pi methods in the line problems. (5)
8. Explain a scenario where a substation might experience overloading and explain the potential consequences. (5)
9. Explain the construction of underground cable. (5)
10. Define the important components of an overhead transmission line. (5)

11. 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, Evaluate (i) the distribution of voltage over 3 insulators and (ii) string efficiency. (5)

12. Explain the different types of transmission lines and how they differ in function. (5)

OR

Explain the role of substation inefficient electricity transmission and distribution. (5)

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