15108

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – B.Tech.(EE)-2023
Course Name – Power System-I
Course Code - PCC-EE502
(Semester V)

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) Predict the value of charging current in short transmission lines

a) Less than medium transmission lines b) Equal to medium transmission lines
c) More than medium transmission lines d) More than long transmission lines

(ii) Choose the material usually used for armoring purpose in a cable

a) Steel tape steel wire b) Galvanized
c) Anyone of these d) None of theses

(iii) Choose among the following which is not a type of steel pole

a) Rail poles b) Tubular poles.
c) Rolled steel joints. d) None of these

(iv) Select the year in which first power system was built

a) 1892 b) 1872
c) 1881 d) 1886

(v) Identify the isotope of uranium used for fission reaction

a) U-235 b) U-233
c) U-234 d) U-236

(vi) Identify from the following the effect of presence of ozone owing to corona

a) improves the power factor b) reduces the power factor
c) corrodes the material d) improves regulation

(vii) Choose from the following the correct dependence of dielectric strength of air

a) proportional to barometric pressure b) proportional to absolute temperature
c) inversely proportional to barometric pressure d) none of these

(viii) Predict in case of DC voltage, smoother uniform glow near the positive conductor

a) Yellow b) Bluish white
c) Reddish white d) Greenish yellow

(ix) Identify the correct relation regarding ABCD parameters of transmission lines

a) AD - BC =1
b) BC-AD = 1
c) AC-BD=1
d) AC-BD=-1

(x) Choose the operating voltage of Extra high tension cable

a) 11 kV
b) 33 kV
c) 66 kV
d) Above 66 kV

(xi) Indicate the correct statement about the ABCD constants of a transmission line

a) They are always equal
b) A = D
c) B = C
d) A = B

(xii) Identify the value of line constant 'B' for a short transmission line

a) 0
b) 1
c) equal to impedance of the line
d) none of these

(xiii) Identify the reason behind flowing of current in the transmission line under no-load condition

a) capacitance effect
b) corona effect
c) proximity effect
d) back flow from earth

(xiv) Name the part of the steam power plant which derives heat from the flue gases

a) Economiser
b) Coal handling plant
c) Ash storage plant
d) Ash handling plant

(xv) Identify the factors affecting corona

a) Conductor size
b) Spacing between the conductors
c) Line voltage
d) All of these

Group-B

(Short Answer Type Questions) 3 x 5=15

2. A single phase line has two parallel conductors 2 m apart. the diameter of each conductor is 1.2 cm. Calculate the loop inductance per km of the line. (3)
3. Write the factors on which the string efficiency of an insulator depends. (3)
4. State the name of the main stages of a steam power station. (3)
5. Explain the methods of reducing the effect of corona. (3)
6. Explain any three advantages of suspension type insulators over pin type insulators. (3)

OR

Explain how the electrical breakdown can occur in an insulator. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the effect of load power factor on regulation of a short transmission line. (5)
8. Calculate the inductance per km of a 3 phase transmission line using 20 mm diameter conductors when conductors are situated at the corners of a triangle with spacing 4, 5, and 6 metres. (5)
9. State the function of air preheater in a steam power plant. (5)
10. Calculate the most economical size of a single core cable working on a 132 kV three phase system, if a dielectric stress of 60 kV/cm can be allowed. (5)
11. The maximum demand of a consumer is 20 A at 220 V and his total energy consumption is 8760 kWh. If the energy is charged at the rate of 20 paise per unit for 500 hours use of the maximum demand per annum plus 10 paise per unit for additional units. Evaluate the annual bill and the equivalent flat rate. (5)
12. Explain the power frequency dry flashover test conducted on an insulator. (5)

OR

Explain mechanical strength test and electromechanical test regarding insulators. (5)