



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:IV
Class:SY BTech Electrical	Program:B.Tech
Branch Code:ELE	Pattern:2022
Name of Course:Power System Engineering	Course Code:ELE222014
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

- 1a) Explain how load curves help in the selection of size and number of generating units. (6) CO1

Or

Why the load on generating stations is not constant? What are the impacts of variable load on power station.

Question No. 2 Attempt following Question

- 2a) Write short notes on following (any 2) (6) CO1

1. Two part Tariff (3 Marks)
2. Three part Tariff (3 Marks)
3. Power factor Tariff (3 Marks)

Question No. 3 Attempt following Question

- 3a) Explain Potential distribution over suspension insulators string of 3 insulators. (8) CO3

OR

- 3b) Explain the construction of cable. How cables are classified. List out the properties of insulating material used in cable. (8) CO3

- 3c) Find the maximum and minimum stress in the insulation for a 33kV single core cable having conductor diameter of 1.2cm and a sheath of inside diameter of 4.1cm. (8) CO3

OR

- 3d) Transmission line with equi-level supports has a span of 200m. It uses conductor having cross section area of 3.35cm^2 . Calculate the safety factor if vertical sag is 2.4m, breaking stress is 2420kg/cm^2 , wind pressure 1.3kg/m run and conductor weight is 1.22 kg/m run (8) CO3

Question No. 4 Attempt following Question

- 4a) Explain in Brief (1) Skin effect (2) Proximity effect (8) CO3

OR

- 4b) Write a note on Flux linkages due to parallel current carrying conductor (8) CO3

- 4c) In a 3 phase 3 wire system $D_{31}=4.2\text{m}$, $D_{12}=D_{23}=2.2\text{m}$ when the conductors are arranged in a horizontal plane. The conductors are transposed and having a diameter of 2.6cm. Calculate the inductance of each conductor. (8) CO3

OR

- 4d) In a single-phase line, conductors a & a' in parallel from one circuit while conductors b&b' in parallel from the return path. Calculate the total inductance of the line /km assuming that current is equally shared by two parallel conductors. Conductor diameter is 2cm, spacing between $aa'=bb'=20\text{cm}$ & $a'b=100\text{cm}$ (8) CO3

Question No. 5 Attempt following Question

- 5a) Derive the equation of receiving end power using generalized ABCD constants (8) CO4

OR

- 5b) Briefly explain the effect of load power factor on regulation and efficiency of transmission line. (8) CO4

- 5c) Find sending end voltage, sending end current, sending end power and efficiency of a transmission line of a single circuit supplying a load of 50MVA at 110kV at 0.8 p.f. lagging. (8) CO4

Given: $A=D=0.98 \angle 30^\circ$ $B=110 \angle 750^\circ \Omega$ $C=0.0005 \angle 800^\circ \text{ seimen}$.

OR

- 5d) Determine sending end voltage, voltage regulation and efficiency of a 18km long transmission line which supplies power of 1500kW at 11kV, 50Hz, 0.8 p.f. lagging. Resistance & inductance per phase /km of line is 0.025Ω & 0.55mH (8) CO4

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