Total No. of Printed Pages:03

SUBJECT CODE NO:- H-209
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE)
Electrical Power Trans. and Distri.
(REVISED)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Solve any 2 questions from section A.
2) Solve any 2 questions from section B.
3) Q.1 and Q.6 are compulsory.

Section A

Q.1 Attempt any five questions. 10
a) Define string efficiency.
b) Classify transmission line on the basis of voltages.
c) Define load factor and demand factor.
d) Draw a single line diagram showing a typical distribution system.
e) Define Skin effect.
f) What is transposition of conductors? Define.
g) State any eight components of a transmission line.
h) Define tariff. List the different types of tariffs.

Q.2
a) Explain the requirement of an ideal distributing system. 05
b) Derive the expression for the flux linkages due to single current carrying conductor. 05
c) Explain any one method of improving string efficiency. 05

Q.3
a) A generating station has a maximum demand of 25 MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72%. Find: 05
   a) Reserve capacity of the plant
   b) The daily energy produced
   c) Maximum energy that could be produced daily if the plants while running as per schedule were fully loaded.
b) What are the different types of insulators? Write a note on pin type of insulator with a neat sketch. 05
c) Show that in a string of suspension insulators, the disc nearest to the conductor has the highest voltage across it. 05

Q.4
a) Compare EHVAC and HVDC transmission system. 05
b) Derive the expression for nominal T method. 05
c) In a 33 KV OHL, there are 03 units in a string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find: 05
   a) The distribution of voltage over the three insulators
   b) String efficiency

Q.5 Write short notes. Attempt any three. 15

a) GMR and GMD
b) Ferranti effect
c) Ring main and radial distribution system
d) Storage batteries in substation

Section B

Q.6 Attempt any five: 10

a) What is a cable? State its necessity.
b) State any two facts in underground cables.
c) Why is the concept of self MD not applicable for capacitance?
d) Compare the merits and demerits of underground system versus overhead system.
e) State the effect of low P.F. on
    a. Efficiency of transmission line
    b. Regulation of transmission line
f) What is the function of armouring and lead sheath in a cable?
g) Write any four differences between nominal T and nominal π method.
h) What is dielectric stress?

Q.7
a) Derive the expression for capacitance of 3 phase line with equilateral spacing 05
b) State the values of generalized circuit constant ABCD in case of 05
    i. T- equivalent circuit
    ii. π- Equivalent circuit of a medium transmission line.
c) A single three phase line operated at 50Hz is arranged unequally as D_{12}=1.5m, D_{23}=3m, D_{31}=2.6m. The conductor diameter is 8mm and the line is regularly transposed. Determine the inductance & capacitance per KM. 05

Q.8
a) Using rigorous method, derive the expression for sending end voltage and current for a long transmission line. 05
b) A single core cable for use on 11KV, 50Hz system has a conductor area of 0.645 Cm^2 and internal diameter of the sheath is 2.18 cm. the permittivity of the dielectric used in the cable is 3.5. find: 05
    a) Maximum electrostatic stress in the cable
    b) Minimum electrostatic stress in the cable
    c) Capacitance of cable per km length
    d) Charging current
c) Write a note on classification of cables. 05

Q.9
a) Draw a neat sketch of underground cable explain its construction. 05
b) Discuss the various types of line supports. 05
c) Explain with neat sketches the methods of laying underground cables in special locations. 05

Q.10 Write short notes: 15

a) XLPE cable
b) Methods of locating cable fault
c) Calculation of sag at equal and unequal levels.