EXAMINATION MAY/JUNE 2018

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SUBJECT CODE NO:- H-209
FACULTY OF ENGINEERING 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) What are the desirable properties of an insulator?
b) What is block rate tariff and flat rate tariff?
c) What are the advantages and disadvantages of HVDC transmission?
d) What are the constants of an overhead line?
e) Classify transmission line on the basis of voltages.
f) Define transmission efficiency.
g) Define Ferranti effect.
h) Draw a single line diagram showing a typical distributing system.

Q.2 a) A short 3ϕ overhead transmission line has impedance per phase of 5+j20.2, when sending end and receiving end voltages are 46.85 KV and 33KV respectively. At 0.8 P.F., lagging, calculate: 05
a) Current
b) Voltage
c) Regulation and
d) Transmission efficiency
b) What are surge arresters? Where and why do we use this equipment? 05
c) Explain any two types of A.C. distribution solution. 05

Q.3 a) Derive an expression for loop inductance of a single phase line. 05
b) Explain why bundled conductors are used for transmission voltage above 220 KV. 05
c) Write a note on GMR and GMD. 05

Q.4 a) Explain the effects of high voltage on volume of copper and on efficiency. 05
b) Derive the expression for nominal T method. 05
c) The towers of height 30m and 90m respectively support a transmission line conductor at a water crossing. The horizontal distance between the towers is 500meters. If the tension in the conductors is 1600kg, find the minimum clearance of the conductor at water and clearance midway between supports. The weight of conductor is 1.5 kg/m. The basis of the towers can be considered to be at water level. 05

Q.5 Write short notes: 15
a) Different types of loads in power station
b) Methods of improving string efficiency
c) Storage batteries in substation

Section B

Q.6 Attempt any five: 10

a) What is serving?
b) What is meant by short, medium and long transmission line?
c) What is sag? Illustrate the same by a figure.
d) State the effect of low P.F. on
    a) Efficiency of transmission line
    b) Regulation of transmission line
e) What is effect of capacitance on a transmission line?
f) What is spacing between conductors?
g) Define insulation resistance.
h) Compare the merits and demerits of underground system versus overhead system.

Q.7
a) A three phase, 50hz, 132kv overhead line has conductors placed in a horizontal plane 4 meters apart. The conductor diameter is 2cm. if the length of the line is 110 KMS, calculate the charging current per phase assuming complete transposition. 05
b) Derive the expression for capacitance of 3 phase line with unsymmetrical spacing. 05
c) Discuss the various types of line supports with the aid of neat sketches. 05

Q.8
a) Derive the expression for capacitance of single phase with earth and without earth effect. 05
b) Using rigorous method, derive the expression for the sending end voltage & current for a long transmission line. 05
c) A three phase, 50 Hz transmission line 100kms long delivers 200MW power at 0.9 power factor lagging at 110KV. The resistance and reactance of line per phase per kilometre are 0.2Ω and 0.4Ω respectively, while the capacitance admittance is 2.5×10^{-6} Siemens, per km per phase. Calculate the current and voltage at sending end transmission efficiency. Use nominal T method. 05

Q.9
a) Explain with neat sketches, the methods of laying underground cables in special locations 05
b) Draw a neat sketch of an underground cable. Explain its construction. 05
c) Explain the methods of locating cable fault. 05

Q.10 Write short notes(any three) 15

a) ABCD parameters
b) Grading of cables
c) Circuit breakers and insulators
d) XLPE cables