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Total No. of Pages : 02

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B.Tech.(EE / Electrical & Electronics Engg.) (2012 Onwards)
B.Tech (Electronics & Electrical Engg.) (2012 to 2017)
(Sem.–4)

POWER SYSTEM-I

Subject Code : BTEE-405
M.Code : 57107

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

a) What do you understand by voltage regulation?

b) What are the various methods of reactive power compensation?

c) How is radial network different from mesh distribution network?

d) What is a sag template?

e) What is the significance of ABCD parameters?

f) List the causes of failures of underground cables.

g) What is the reason behind transposition of power lines?

h) What is the purpose of bedding provided on the cable?

i) Explain the concept of GMD.

j) What are the reasons behind increasing transmission line voltage?

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SECTION-B

2. What is a composite conductor? Derive the expression of inductance of 1-phase transmission line with composite conductors.

3. What do you understand by the term 'String Efficiency'? What are the various methods of improving string efficiency of insulators? Discuss these methods.

4. State Kelvin's law. What are the limitations of this law?

5. Compare : Overhead lines and Underground cables.

6. A transmission line conductor at a river crossing is supported from two towers at height of 50 and 75 metres above water level. The horizontal distance between the towers is 280m. If the tension in the conductor is 2000kg, find the clearance between the conductor and water at a point midway between the towers. Weight of conductor per metre = 0.844kg. Assume that the conductor takes the shape of parabolic curve.

SECTION-C

7. Derive the expression of capacitance of 3-phase double circuit line with conductors placed at the corners of a regular hexagon of side D. Assume conductor. Radius as r. What is the effect of earth on the capacitance? Justify.

8. Compare the following :

   a) Overhead and Underground distribution systems.

   b) Synchronous phase modifier and Capacitor.

9. a) What are the various methods of laying the cables? Discuss these methods, in detail.

   b) A 220km long 3 phase overhead line has a resistance of 42 Ohms/phase, inductive reactance of 80 Ohms/phase and capacitance (line to neutral) 8.2nF/km. It supplies a load of 12MW at a voltage of 66kV and power factor 0.95 lagging. Using Nominal-T circuit, find : (a) the sending end voltage, (b) current, (c) regulation, (d) efficiency and (e) power angle.

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NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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