

**Duration: 3hrs**

**[Max Marks:80]**

- N.B. : (1) Question No 1 is **Compulsory**.  
(2) **Attempt any Three questions out of the remaining Five**.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.

	Marks
<b>Q1. Solve any Four</b>	<b>20</b>
a. Give the classification of cables based on operating voltages?	
b. Compare the chief sources of energy used for the generation of electrical energy.	
c. Discuss the terms voltage regulation and transmission efficiency as applied to transmission line.	
d. What is per unit system? State its advantages?	
e. Discuss the various conductor materials used for overhead lines. What are their relative advantages and disadvantages?	
<b>Q2.</b>	<b>20</b>
a. What is neutral grounding? Explain any two methods of neutral grounding?	10
b. Explain the functions of the following with respect to hydroelectric power plant: (i) Dam (ii) spillways (iii) surge tank (iv) headworks (v) draft tube.	10
<b>Q3.</b>	<b>20</b>
a. Draw nominal T method model for medium transmission line and derive the expression for sending end voltage, sending end current, % voltage regulation and % efficiency.	10
b. State the importance of earthing. Explain what tower footing resistance is.	10
<b>Q4.</b>	
a. Explain the following methods of cable grading: (i) Capacitance grading (ii) Intersheath grading	10
b. Derive expression for inductance of a three-phase line with symmetrical spacing.	10
<b>Q5.</b>	
a. Explain various methods of improving string efficiency.	10
b. Explain with a neat diagram effect of Earth on the Capacitance of Single-phase transmission line.	10
<b>Q6.</b>	<b>20</b>
a. Derive expression of impedance in per unit for change of base.	10
b. Explain step and touch potential.	10

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