

Roll No.

EX-505(N)**B. E. (Fifth Semester) EXAMINATION, June, 2010**
(New Scheme)

(Electrical and Electronics Engg. Branch)

POWER SYSTEM-I**[EX-505(N)]***Time : Three Hours**Maximum Marks : 100**Minimum Pass Marks : 35***Note :** Attempt any five questions. All questions carry equal marks.

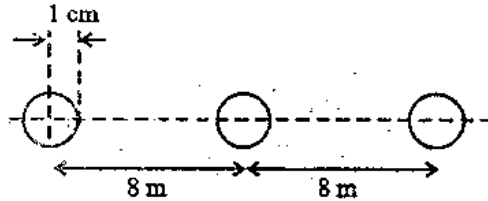
1. (a) Write a short note on non-conventional source of electricity generation.
(b) Compare the performance of hydal and thermal power plants.
2. (a) Write the statement of Kelvin law of economy and derive an expression for most economic size of conductor.
(b) Write short notes on the following :
 - (i) Load curves
 - (ii) Base loads
 - (iii) Load factor
 - (iv) Diversity factor
 - (v) Demand factor

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3. (a) Derive an expression for inductance of a three-phase transmission line with unsymmetrical spacing with solid round conductor.
- (b) Calculate the inductance of a three phase transmission line with horizontal spacing between adjacent phase as 8 meters and radius of conductor as 1 cm. Assume solid round conductor.



4. (a) Draw the cross section of a 3 core belted cable and discuss the function of each part.
- (b) Determine insulation resistance and capacitance of single core cable.
5. (a) Derive ABCD constants, of medium length transmission line using nominal- π model. Draw the phasor diagram also.
- (b) A three-phase, 50 Hz, 150 km line has a resistance inductive reactance and shunt admittance of 1 ohm and 3×10^{-6} mho per km per phase respectively. If the line delivers 50 MW at 110 kV and 8 pf lagging determine the sending end voltage and current. Assume a nominal π model.
6. A 3-phase overhead line has a series impedance of $10 + j30$ ohm per phase. If the receiving end voltage is 132 kV and sending end voltage is 140 kV, draw the receiving end circle diagram and determine :
- (a) The maximum real power which the line can supply and the load power factor for drawing this maximum power.

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- (b) The capacity of shunt compensation equipment needed for supplying a load of 150 MVA at 8 pf lagging and power angle for this load condition
- (c) The capacity of shunt compensation needed to maintain the above voltage under no-load condition.
- (d) The unity pf load which the line can supply with voltages at above values
7. (a) Describe the construction of suspension type insulator. How will you determine its string efficiency for n number of discs ?
- (b) An insulator string for 33 kV line has 4 discs. The shunt capacitance between each joint and metal work is 10% of the capacitance of each disc. Find the voltage across the different discs and string efficiency.
8. Write short notes on any two of the following :
- (a) Comparison of cable and overhead line
- (b) Methods of improving string efficiency
- (c) Kelvin law and its limitation
- (d) Influence of voltage on cost and efficiency of transmission
- (e) Bundle conductor
- (f) Series and shunt compensation
- (g) Type of towers

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