

POWER SYSTEM

S. Y. B. Tech

2021-22

Tutorial No. 1

- 1) Enlist and explain different sources of electrical energy.
- 2) Enlist and explain different types of turbines and their selection.
- 3) A consumer has following connected load: 10 lamps each of 60 W, 2 heaters each of 100 W, Maximum Demand 1500 W. On the average he uses 8 lamps for 5 hrs per day, each heater 3 hrs per day. Find i) average load, ii) monthly energy consumption, iii) load factor.
- 4) Explain load duration curve and factors used in electricity supply industry.
- 5) Explain Hydroelectric Power Plant in detail.

Tutorial No. 2

1. Explain various types of Excitation Systems.
2. Write a short note on Major Electric Equipment in control room.
3. Find an expression for Overall flux linkages due to a single current carrying conductor.
4. Derive an expression for the loop inductance of a single phase line.
5. Derive an expression for the inductance per phase for a 3-phase overhead transmission line when conductors are unsymmetrically placed but the line is completely transposed.

Tutorial No. 3

1. What do you understand by electric potential? Derive an expression for electric potential (i) at a charged single conductor (ii) at a conductor in a group of charged conductors
2. Derive an expression for the capacitance of a single phase overhead transmission line.
3. Deduce an expression for line to neutral capacitance for a 3-phase overhead transmission line when the conductors are symmetrically placed
4. Deduce an expression for line to neutral capacitance for a 3-phase overhead transmission line when the conductors are unsymmetrically placed but transposed

Tutorial No. 4

- 1) Write a short note on ACSR conductor.
- 2) Discuss Types of supports with suitable diagrams.
- 3) State type of insulators and explain Suspension type insulators.
- 4) Derive an expression for String Efficiency for 3 disc string.
- 5) Discuss the methods of improving string efficiency.
- 6) Explain Ferranti effect in Transmission Line.

Tutorial No. 5

- 1) Explain the concept of sag.
- 2) Derive an expression for sag when supports are at equal levels.
- 3) Derive an expression for sag when supports are at unequal levels.
- 4) Explain the effect of wind and ice coating on sag with appropriate equations.
- 5) Explain the phenomenon of corona formation. Also explain factors affecting corona and methods of reducing corona effect.

Tutorial No. 6

Question nos. 4 and 7 are optional.

- 1) Explain classification of overhead transmission line with figures.
- 2) Deduce an expression for voltage regulation and transmission efficiency of a short transmission line, giving the vector diagram.
- 3) What is the effect of load power factor on regulation and efficiency of a transmission line?
- 4) Explain end condenser method of medium transmission line.
- 5) Explain nominal T method of medium transmission line.
- 6) Explain nominal pi-method of medium transmission line.
- 7) Using rigorous method, derive expressions for sending end voltage and current for a long transmission line.
- 8) Evaluate the generalized circuit constants for
 - (i) short transmission line
 - (ii) medium line — nominal T method
 - (iii) medium line — nominal π method