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ELECTRICAL MACHINES ° II - nptel.ac.in

generating mode of operation Primary focus will be on the operation of 3-phase induction machine, single phase induction motor, and synchronous machines A fair knowledge of distributed windings is essential in order to understand the working of rotating machines more effectively - few lectures will be devoted on this topic Concept

NPTEL

NPTEL Syllabus Electrical Machines -I - Video course COURSE OUTLINE Synchronous machines: types, windings, emf equation, generator and motor operations, phasor diagrams; testing, power angle characteristic, v-curves,

II. Synchronous Generators

The generator delivers a load at a unity power factor Figure1 (a) The per-phase equivalent circuit of a synchronous generator without armature reaction while depicting the revolving field produced by the rotor The phasor diagrams for a (b) lagging pf, (c) unity pf, and (d) leading pf

CHAPTER 31 SYNCHRONOUS GENERATORS

Most synchronous generators that have brushless exciters also use slip rings and brushes as an auxiliary source of field DC current in emergencies Figure 316 illustrates a cutaway of a complete large synchronous generator with a salient-pole rotor with eight poles and a brushless exciter THE SPEED OF ROTATION OF A SYNCHRONOUS GENERATOR

THEORY, CONSTRUCTION, AND OPERATION

THEORY, CONSTRUCTION, AND OPERATION 1 CHAPTER 1 PRINCIPLES OF OPERATION OF SYNCHRONOUS MACHINES The synchronous electrical generator (also called alternator) belongs to the family of electric rotating machines Other members of the family are the direct-current (dc) motor or generator, the induction motor or generator, and a number of derivatives of all these three What is ...

III. Synchronous Motors

Synchronous Motors Dr Suad Ibrahim Shahl 6 Figure 3 shows the effect of change in field excitation on the operation of the synchronous motor As the field current is changed, the tip of armature current

Chapter 4-Parallel Operation of Generators

Parallel Operation of Generators 1 Chapter 4: Parallel Operation of Generators In modern power systems isolated generators are very rare Power systems are highly interconnected and many generators share the load The first problem of an engineer is connecting a synchronous generator on an existing bus Generator 1 Generator 2 System Load 3

Lecture 6: Synchronous machines

The equivalent circuit of a 3-phase synchronous generator is shown The adjustable resistor R_{adj} controls the field current and, therefore, the rotor magnetic field Equivalent circuit of a synchronous generator A synchronous generator can be Y- or Δ -connected: The terminal voltage will be V_t for Y V_t for Δ 3 Equivalent circuit of a synchronous generator Since Δ - for balanced loads - the

EE 340 Spring 2011 - University of Nevada, Las Vegas

EE 340 Spring 2011 Synchronous Generators I Construction of synchronous machines In a synchronous generator, a DC current is applied to the rotor winding producing a rotor magnetic field The rotor is then turned by external means producing a rotating magnetic field, which induces a 3-phase voltage within the stator winding • Field windings are the windings producing the main magnetic

Excitation System Models of Synchronous Generator

synchronous generator operation in stationary state, ie in one operating point In practice, it is important to maintain system stability in transition state of synchronous generator or electric power system, eg synchronous generator synchronization, short circuit in electric ...

CHAPTER 3 STATIC SYNCHRONOUS SERIES COMPENSATOR

32 SERIES COMPENSATOR Series compensation, if properly controlled, provides voltage stability and transient stability improvements significantly for post-fault systems It is also very effective in damping out power oscillations and mitigation of sub-synchronous resonance (Hingorani 2000)

ELECTRICAL MACHINE-II

synchronous reactances, power angle characteristics, Slip Test Parallel operation: Synchronising method, effect of wrong synchronising, load sharing between alternators in parallel Sudden Short Circuit of a Synchronous Generator, Transient and Subtransient reactance- s Synchronous Motor: General Physical consideration, torque and power

Explain how a three phase induction motor can work as a ...

2 Explain why a three-phase induction motor can not run at synchronous speed 3 What is meant by slip an induction motor? What in the value of slip at starting will be and at synchronous speed? 4 Is it possible to change the direction of rotation of three phase induction motors? How? 5 Explain the purpose of making two types of rotor

Electrical & Electronics Engineering Department BRCM ...

Generator using 3 phase induction motor as prime mover 10 To perform OC test on synchronous generator And determine the full load regulation of a three phase synchronous generator by synchronous impedance method NOTE: At least 10 experiments are to be performed, with at least 7 from above list, remaining three may

Chapter 6. Synchronous Machines - Educypedia

Synchronous Machines Topics to cover: 1) Introduction 2) Synchronous machine structures 3) Rotating magnetic field 4) Equivalent circuit model 5) Performance as a generator 6) Performance as a motor Introduction A synchronous machine is an ac rotating machine whose speed under steady state

Numerical Problems Synchronous Machines - VTU-NPTEL-NMEICT

Numerical Problems Synchronous Machines 1 A three phase, 10 pole, 600rpm, star connected alternator has 12 slots per pole with 8 conductors per slot and the windings are short chorded by 2 slots The air gap flux per pole contains a fundamental component of 0.09 webers, third harmonic component

POWER SYSTEM STABILITY

3 Machines swinging in unison or coherently 4 Examples Swing Equation:- GENERATOR P_e T_m ω_s T_e P_m (Fig-1 Flow of power in a synchronous generator) Consider a synchronous generator developing an electromagnetic torque T_e (and a corresponding electromagnetic power P_e) while operating at the synchronous speed ω_s