UNIT I DC MACHINES

R8, MAY 2013 :

Mention the applications of DC series motors (2)

What is the significance of back emf (2)

Discuss in detail the most important characteristics of dc shunt, series and compound generators. (8)

What is the need of starters? Explain any one of the DC starters (8)

Discuss in detail the methods of speed control of DC shunt motor and DC series motor (10)

A 240V, dc shunt motor has armature resistance of 0.25 ohm, on load it takes an armature current of 50A and runs at 750 rpm. If the flux per pole is reduced by 10% without changing the load torque, find the new speed of motor (6)

R8, Dec 2013:

An 8 pole, wave connected armature has 600 conductors and is driven at 625 rev/min. If the flux per pole is 20mWb, determine the generated emf. (2)

A DC motor operates from a 240V supply. The armature resistance is 0.2 ohm. Determine the back emf when the armature current is 50A. (2)

What is fixed coil in DC machine (2)

A series motor has an armature resistance of 0.2 ohm and a series field resistance of 0.3 ohm. It is connected to a 240V supply and at a particular load runs at 24 rev/s when drawing 15A from the supply. Determine the generated emf at this load ii) Calculate the speed of the motor when the load is changed such that the current is increased to 30A. Assume that this causes a doubling of the flux (16)

A 250 V series motor draws a current of 40A. The armature resistance is 0.15 ohm and the field resistance is 0.05 ohm. Determine the maximum efficiency of the motor shown below (16)

R8 Dec 2012

What are the different methods of excitation of Generator (2?)

Define back emf of DC motor (2)

Explain the constructional details of DC generator discuss its working principle and derive its emf equation (16)

Discuss the methods of speed control of DC shunt motors (8)

How will you predetermine the efficiently of a DC machine as motor and generator (8)

R8 Dec 2010

What is a dc compound generator (2?)

What is the need for DC starter in DC motor (2)

Briefly explain the construction of a DC machine with neat diagram (10)

A dc shunt generator has a terminal voltage of 160V and a no load induced emf of 168V. The resistance of armature and field are 0.03 and 20 ohm. Find the armature current , field current and load current. Neglect armature reaction (6)

Explain the characteristics of series, shunt and compound motors (9)

Explain he ward Leonard method of speed control of dc shunt motor (7)

R8 May 2010

What are the conditions to be fulfilled for the self excitation of a dc shunt generator (2)

What are the functions of interpole and how are the interpoles windings connected (2)

Describe with a neat sketch the construction of a dc machine (8)

A separately excited dc generator running at 1000 rpm supplied 110A at 220V to a resistive load. If the load resistance remains constant, what will the load current if the speed is reduced to 800 rpm. Armature resistance is 0.2 ohm. Field current is unaltered. Assume a voltage drop of 1V per brush. Ignore the effect of armature reaction. (8)

Derive from the first principle , an expression for the torque developed in dc motor. (8)

In a brake test on a dc shunt motor, the load on the side of the brake was 35 kg and on the other side 5 kg. TH motor was running at 1500 rpm its input being 34A at 400 V. The diameter of the pulley is 50cm. Determine the torque and efficiency of the motor (8)

R8 DEc 2009

What are the functions of yoke in a dc machine (2)

List the methods of speed control of a DC shunt motor (2)

With a neat sketch explain he constructional details of a DC machine (12)

Draw and explain the internal and external characteristics of a DC shunt generator (4)

Derive the torque equation of a DC motor (6)

With a neat sketch explain the operation of a 3 point starter for a DC motor (10)

UNIT II TRANSFOREMERS

R8, may 2013:

What do you mean by step down transformer (2)

Draw the equivalent circuit of transformer (2)

Describe briefly about open circuit and short circuit test on transformer. (10)

What is meant by regulation in transformer (6)

Discuss in detail the construction details , principle of operation and emf equation in transformer (16)

R8, Dec 2013:

A single phase auto transformer has a voltage ratio 320V:250V and supplies a load of 20 KVA at 250V.Assuming an ideal transformer, determine the current in each section of the winding and the current in the common part of the winding. (2)

Determine the optimum value of load resistance for maximum power transfer if the load is connected to an amplifier of output resistance 150 ohm through a transformer with a turns ratio of 5:1 (2)

A 400 KVA transformer has a primary winding resistance of 0.5 ohm and a secondary winding resistance of 0.001 ohm. The iron loss is 2.5 KW and the primary and secondary voltages are 5KV and 320V respectively. IF the power factor of the load is 0.85, determine the efficiency of the transfer on full load and on half load (16)

Derive the emf equation of transformer (16)

R8 Dec 2012

Write down the emf equation of a transformer (2)

Define voltage transformation ratio of transformer (2)

With necessary vector diagrams, discuss about transformer on no load and loaded conditions (16)

Draw the equivalent circuit of a transformer with all its notations (8)

Write a note on open circuit test on transformer (8)

R8 Dec 2010

Why is the core of transformer laminated (2)

Define voltage regulation of a transformer (2)

Derive the emf equation of a transformer (10)

A single phase transformer is rated at 240/120 V, 50 HZ. Find voltage and frequency of secondary at no load) if primary voltage is 120V,25 Hz and ii) if primary voltage is 240V dc (6)

Deduce the equivalent circuit of 1 phase transformer (6)

A 1 phase transformer is rated at 10 KVA, 50 HZ. The secondary rated voltage is 240V and tuns ratio is 10. The resistance and leakage reactance as referred to primary are 8.4 and 13.7 respectively. Find voltage regulation at full load and power factors of 0.8 lagging, 0.8 leading and unity (10)

R8 May 2010

The emf per turn of a single phase 6.6 Kv/440 V, 50 hz transformer is approximately 12V. Calculate the number of turns in the HV and LV winding ii) the net cross sectional area of the core for a maximum flux density of 1.5 T (16)

Define voltage regulation of a transformer (2)

From the first principles, derive the emf equation of a transformer. Also show that the voltage induced per turn is the same, whether it is primary or secondary (8)

A single phase transformer with a rating of 6.6 KV /415V takes a no load current of 0.75 A at 0.22 pf. IF the secondary supplies a current of 120 A 0.? Pf. Calculate the total current taken by the primary. (8)

Develop an equivalent circuit for a single phase two winding transformer (8)

Calculate the full load efficiently at 0.8 pf and the voltage at the secondary terminals when supplying full load secondary current at unity power factor for a 4 KVA , 200/400 V, 50 Hz single phase transformer of which the following are the rest results

OC test (on py) V= 200 V; I =0.8A; W = 50 W

SC test (on sy) V=17.5; I=9A ; W=50W;

R8 Dec 2009

Write down the emf equations of 1 phase transformer (2)

Give the expression for percentage voltage regulation of a single phase transformer (2)

Explain the principle of operation of a single phase transformer and its behavior on loaded condition with phasor diagram (16)

Develop the equivalent circuit of a transformer (8)

Explain the OC and SC test done on a single phase transformer (8)

UNIT III INDUCTION & SYNCHRONOUS MACHINES

R8, May 2013:

Define slip of induction motor.(2)

Why synchronous motor are called so (2)

Mention some applications of synchronous motor (2)

Comment on starting torque of cage type and slip ring motor. Arrive at the condition of maximum starting torque. (10)

A 12 pole ,3 phase alternator driven at a speed of 500 rpm supplies power to 8 pole , 3 phase induction motor . If the slip of the motor at full load is 3% . Calculate the full speed of the motor (6)

Discuss in detail the various methods by which speed control of induction motor is achieved. (16)

Compare between synchronous motor and induction motor (8)

Discuss the procedure for starting a synchronous motor (8)

A 60 KVA , 220 V , 50Hz, 1 phase alternator has an effective armature resistance of 0.016 ohm and an armature leakage reactance of 0.07 ohm. Compute the voltage induced in the armature when the alternator is delivering rated current at a load power factor of unity and o,7 pf. (8)

Discuss the principle of operation of hysteresis motor (8)

R8, Dec 2013:

A 3 phase 2 pole motor is to have a synchronous speed of 6000 rev/min. Calculate the frequency of the supply voltage. (2)

A stator winding supplied from a 3 phase 60 Hz system is required to produce a magnetic flux rotating at 900 rev/min. Determine the number of poles (2)

Differentiate between VR stepper motor and SR stepper motor (2)

The power supplied to a 3 phase induction motor is 32 KW and the stator losses are 1200 W. If the slip is 5%, determine i) rotor copper loss, ii) total mechanical power developed by the rotor iii) the output power of the motor if friction and windage losses are 750W iv) the efficiency of the motor , neglecting rotor iron loss. (16)

A 415 V, 3 phase , 50?Hz 4 pole star connected induction motor runs at 24 rev/s on full load. The rotor resistance and reactance per phase are 0.35 ohm and 3.5 ohm respectively and the effective rotor stator turns ratio is 0.85:1 . Calculate i) the synchronous speed, ii) slip , iii) full load torque iv) power output if mechanical losses amount to 770w v) the maximum torque vi) the speed at which maximum torque occurs and vii) the starting torque (16)

Derive the mechanical power flow within the synchronous motor(16)

Explain the different toques of a synchronous motor (16)

R8 Dec 2012

Define the slip of an induction motor (2)

Define torque / speed curve of an induction motor (2)

Write down the relation between speed and frequency (2)

Define voltage regulation of an alternator(2)

Explain eh construction and working principle of 3 phase induction motors. What are its advantages and disadvantages (16)

Write a short note on i) Torque developed by induction motro and Making single phase induction motor self starting (8)

Discuss the EMF method of finding regulation of an alternator (8)

Discuss the Reluctance motor construction and principle of operation ()

Write short notes on MMF method of determining regulation of an alternator (8)

Write short notes on Hysteresis motor working principle (8)

R8 Dec 2010

What are the types of 3 phase induction motors (2)

Name the starting methods for cage motors (2)

Why should an alternator run always at synchronous speed (2)

Write down the emf equation of alternator (2)

Explain eh principle of operation of 3 phase induction motor (5)

A 3 phase 6 pole 50 HZ cage motor is running with a slip of 4% . Find speed of the rotating field relative to the stator winding , motor speed and frequency of emf induced in the rotor (6)

Briefly explain the starting of squirrel cage motor using star delta starter (5)

Discuss the operation of capacitor start capacitor run motor (8) Discuss the operation of shaded pole motor (8)

Salient pole and cylindrical rotors (8)

Briefly discuss the construction of stator of synchronous machine (8)

Reluctance motor construction and operation (8)

Hysteris motor construction and operation (8)

R8 May 2010

Why can not an induction motor run at synchronous speed (2)

What are single-phase induction motors not self starting (2)

What are the causes of faulty starting of a synchronous motor (2)

What are the applications of stepper motors (2)

Explain with neat sketches, the principle do operation of a 3 phase induction motor (8)

A 6 pole 3 phase 50 Hz induction motor develops a maximum torque o 50 Nm at 96 rpm. Determine the torque exerted by the motor at 5% slip. The rotor resistance per phase is 0.6 ohm (16)

Discuss briefly the various methods of speed control of 3 phase induction motor (16)

Derive the emf equation of an alternator. Discuss the effect of winding factor on the induced emf (8)

Explain the speed torque characteristics of a reluctance motor (8)

A 500 KVA 3.3 KV, 3 phase star connected alternator is found to give a short circuit current of 290A at normal field current. Its effective winding resistance per phase is 0.1 ohm. Estimate the full load of voltage regulation by EMF method for 0.8 pf lagging (8)

Explain the speed torque characteristics of a hysteresis motor (8)

R8 Dec 2009

Define the slip of a 3 phase induction motor (2)

List the types of starters used to start 3 phase induction motors (2)

What are the two types of synchronous machines (2)

Give the applications of stepper motors (2)

Explain eh principle of operation of a shaded pole 1 phase induction motor (8)

Derive the expression for the induced emf of asynchronous generator (8)

Explain the construction and operation of a reluctance motor (8)

Explain he method of obtaining the voltage regulation of a synchronous generator using EMF method (10)

Explain eh construction and operation of hysteris motor (6)

UN IT IV

UNIT V