

SAMPLE MODEL QUESTION PAPERS

2mark questions

Why is commutator employed in DC machines?

Define coil pitch and coil span.

Define resultant pitch.

What is the basic principle on which a generator operates?

Why the armature of a DC machine is made of laminated silicon steel?

What is armature reaction?

State the effects of armature reaction in DC machines.

Give the relation between electrical and mechanical angle in case of rotating machine.

What is the function of compensating winding in a DC machine?

What is the role of interpoles and compensating winding in DC machine?

Define critical resistance of DC shunt generator.

What is meant by OCC of a DC generator?

What is critical speed in a DC shunt generator?

Under what circumstances does a DC shunt generator fails to build up.

Why do you prefer starter to rheostat in starting DC motors?

Name the methods used for speed control of DC motors.

What are the different losses which occur in a DC machine.

State the advantages of Swinburne's test

What is the main drawback of brake test?

Explain the principle of operation of a DC motor.

Explain the function of commutator in a DC motor.

What is back emf? Give its significance.

On what factors does the torque developed by a DC motor depends?

A DC series motor should not be started without load why?

Write a general expression for the speed of a DC motor in terms of supply voltage and flux per pole.

What is the operating principle of transformer?

What is transformer?

Why is the transformer core laminated?

Can a transformer work on DC? Justify.

Even at no-load, a transformer draws current from the mains. Why?

How does leakage flux occur in a transformer?

What is voltage regulation of a transformer?

What are no-load losses occurring in the transformer?

How can eddy current loss be reduced?

Why short circuit test is performed on high voltage side of transformer?

Why are iron losses or core losses assumed to remain constant in a power transformer from no-load to full-load?

How can iron loss be measured?

What is the necessity of parallel operation of transformer?

Explain that "The main flux in a transformer remains practically invariable under all conditions of load".

What do you mean by voltage regulation of a transformer?

Define an autotransformer. How does the current flow in different parts of its windings?

What is instrument transformer?

What is the use of CT & PT?

5-mark questions

What are disadvantages of armature reaction?

What are the conditions to be fulfilled for a DC shunt generator to build-up emf.

Derive emf equation of a DC generator (or DC machine).

Explain what is meant by armature reaction of a DC machine. Describe different methods for minimising armature reaction.

Explain what do you mean by commutation in a DC machine. Mention the methods of improving it.

Discuss the internal and external characteristics of a shunt generator.

Derive a condition for maximum efficiency of a DC generator.

What is the field of application of DC shunt motor and DC series motor?

Derive an expression for the speed of a DC motor in terms of back emf and flux per pole.

Derive the torque equation of a DC machine.

List applications of DC shunt, DC series and DC compound motors.

Write a short note on DC motor starters.

Describe briefly the methods of speed control used for DC series motors.

What are the various losses occurring in rotating machines? Mention the method to reduce them.

Mention the factors on which the hysteresis loss (W_b) and eddy current loss (W_e) in a DC machine depend. How these losses are reduced?

Draw a power flow diagram of a DC motor and define commercial, mechanical and electrical efficiency of a motor.

Derive condition for maximum efficiency of a DC motor.

What is an ideal transformer?

Define efficiency and all-day efficiency of a transformer.

The iron losses of a transformer are 2500 W when operated on 440 V, 50 Hz; these are reduced to 850 W when operated on 220V, 25 Hz. Calculate the eddy current loss at normal frequency and voltage.

What conditions are required to be fulfilled for parallel operation of transformers?

An 11000/22000-volt transformer is rated at 100 kVA as a two-winding transformer. If the winding is connected in series to form an auto-transformer what, will be the voltage ratio and output?

Explain what is a transformer and its necessity in power system?

Derive an expression for the emf induced in a transformer winding. Show that the emf induced per turn in primary is equal to the emf per turn in secondary.

Draw a neat phasor diagram showing the performance of a transformer on-load.

What are the various losses in a transformer? Where do they occur and how do they vary with load?

What are the applications of autotransformers?

Derive an expression for the saving of copper in an autotransformer as compared to an equivalent two winding transformer.

Write a short note on (i) ratio error (ii) phase angle error (iii) burden

10-mark questions

Name the various parts of a DC machine and give their function.

Explain the principle of action of a DC generator. Describe briefly its important parts.

Write short notes on the following:

(i) Principle of operation of DC generator.

(ii) Construction and function of commutator.

(iii) Lap winding.

(iv) Wave winding-merits and demerits overlap winding.

What are the various energy losses in a DC machine and how do they vary with load?

Mention the various types of DC motors and their uses.

Sketch the speed-torque curve of a DC series motor and discuss its nature. What are the applications for DC series motors?

Describe the speed control methods of DC shunt motors.

To determine no-load losses, Swinburne's test is performed. Explain it and mention its limitations.

A single phase, 50 kVA, 2300/230 V, 50 Hz transformer is connected to 230 V supply on the secondary side, the primary being open. The meter indicates the following readings: Power = 187 watt; Voltage = 230 V; Current = 6.5 A. Find (i) core loss; (ii) loss component of the current; (iii) magnetising current.

An autotransformer supplies a load of 5 kW at 110 V at unity power factor. If the applied primary voltage is 220 V, calculate the power transferred to the load (a) inductively, (b) conductively.

Draw and explain the phasor diagram of a loaded transformer (neglecting voltage drop due to resistance and leakage reactance).

Draw and explain the phasor diagram of single-phase transformer connected to a lagging p.f. load.

Define efficiency of a transformer and find the condition for obtaining maximum efficiency.

How open circuit and short circuit tests are performed on a single-phase transformer. Draw circuit diagram for each test. Also mention uses of these tests.

Give the constructional features of an auto-transformer. State the applications of autotransformers.

Explain the working principle and construction of an auto-transformer.

What is an auto-transformer? State its merits and demerits over the two-winding transformer.