

SE Sem-III Choice Based Electrical

Electrical Machine-1
(3 Hours)

Q. P. Code : 21836

(Total Marks : 80)

1/1

6-2018

Please check whether you have the right question paper.

- N.B.: 1) Questions No.1 is compulsory.
2) Attempt any three from the remaining Questions No.2 to No.6.
3) Illustrate answer with diagrams wherever necessary.

1. Attempt any four :

- a) Explain eddy current loss & various factors affecting it. (20)
 - b) Explain significance of commutator and brushes in DC machine?
 - c) Explain necessity of starter in DC Motor
 - d) Write a difference between electric circuit and magnetic circuit.
2. a) Explain the principle of energy conversion & develop the model of an electromechanical energy conversion device. (10)
- b) An iron ring of mean length 60 cm has air gap of 1 mm and a winding of 200 turns. If a relative permeability of iron is 300, find the flux density when a current of 1 Amp flows through the coil. (10)
3. a) Write a short note on Doubly excited magnetic field. (10)
- b) Explain different electrical braking methods for separately excited DC Motor. (10)
4. a) Explain the effect of armature reaction on working of DC machines and methods to minimize it? (10)
- b) 120V dc shunt motor having armature & field winding resistances as $0.2\ \Omega$ and $60\ \Omega$ draws a line current of 40A at full load. The brush voltage drop is 3V and rated full load speed is 1800 rpm. Calculate speed at half the full load. (10)
5. a) Draw and explain speed-torque, torque-armature current and speed -armature current characteristics of DC series motor. Also write applications. (10)
- b) A DC machine is tested for Swinburne's test. The machine is rated for 230V, 50 Amp. (10)
The observations during test were as follows :
No load current = 5Amp, Armature resistance = $1\ \Omega$, Shunt field resistance = $200\ \Omega$
Find full load efficiency if the machine was tested as DC Motor.
6. a) Explain Hopkinson's Test with neat diagram. (10)
- b) What are the different types of Stepper Motor? Explain anyone type with neat diagram. (10)