

06/06/2025 SE ELECTRICAL SEM-III C-SCHEME FEMM QP CODE: 10081957

Duration – 3 Hours

Total marks- 80

- Note: - (1) Question No.1 is compulsory.  
(2) Attempt any three questions out of the remaining five questions.  
(3) Assume suitable data if necessary and justify the same.

- Q 1 Answer the following questions. 20M**
- a) What is back emf? Explain the significance of back emf in case of DC Motor **5M**
- b) Differentiate between active and passive transducers. Give examples of each. **5M**
- c) Explain i) Magnetic Flux Density ii) Reluctance iii) Magnetic saturation. **5M**
- d) Which three torques are required for satisfactory operation of analog indicating instrument? State the function of each torque. **5M**
- Q 2 (a) Explain in brief the principle of electro-mechanical energy conversion and develop a model of electro-mechanical energy conversion device. 10M**
- Q 2 (b) A 200 V dc series motor runs at 1000 rpm and takes 20A. Combined resistance of armature and field is 0.4 ohm. Calculate the resistance to be inserted in series so as to reduce the speed to 800 rpm, assuming torque to vary as square of the speed and linear magnetization curve. 10M**
- Q 3 (a) Explain the concept of the energy stored in the magnetic field. Also derive the expression for the energy stored in the magnetic field. 10M**
- Q 3 (b) Explain the measurement of unknown resistance using Kelvin's double bridge. 10M**
- Q 4 (a) Describe construction, working principle and theory of dynamometer type wattmeter. 10M**
- Q 4 (b) Explain with diagram the construction and working principle of LVDT. What are the applications of LVDT? 10M**
- Q 5 (a) Explain the construction and working principle of digital Tachometer. 10M**
- Q 5 (b) Explain with phasor diagram how Schering bridge can be used to measure unknown capacitor. 10M**
- Q 6 (a) Explain the Hopkinson's test with neat diagram. 10M**
- Q 6 (b) Draw and explain working of successive approximation type digital voltmeter 10M**