

S.E. Etm
TV

Electrical machine & Instruments

6/6/06

A March 2 14

Con.1879-06.

(REVISED COURSE)

(3 Hours)

TV-8115

[Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.
(2) Answer any **four** out of remaining six questions
(3) Assume **suitable** data wherever required and state **clearly**.
(4) Answers to the questions should be **grouped** and written **together** .
1. (a) Explain the necessity of Controlling torque in an indicating instrument. 5
(b) What is back emf? Explain the significance of back emf. 5
(c) What is the necessity of a starter in a d.c. motor ? 5
(d) What happens if the secondary of current transformer is open circuited while the primary carries valid current. 5
 2. (a) Explain different methods for the speed control of d.c. motor ? 10
(b) A dc shunt motor drives a centrifugal pump whose torque varies as the square of the speed. The motor is fed from a 200 V supply and takes 50A when running at 1000 rpm. What resistance must be inserted in the armature circuit in order to reduce the speed to 800 rpm ? The armature and the field resistance of the motor are 0.1Ω and 100Ω respectively. 10
 3. (a) Draw and explain the torque - slip characteristics of a 3-phase Induction Motor ? 10
(b) A 50 Hz, 8 pole Induction motor has Full load slip of 4%. The rotor resistance/phase is 0.01Ω and stand still reactance/phase is 0.1Ω . Find the ratio of maximum full load torque and the speed at which maximum torque occurs. 10
 4. (a) With a neat sketch explain the construction and working of a single phase induction type energymeter and show that the total number of revolutions made by the disc during a particular time is proportional to the energy consumed. 10
(b) What are the essential requirements of indicating type instruments ? Explain each of them. 10
 5. (a) Explain the working and principal of a D.C. potentiometer with a neat sketch and state the meaning of standardization ? 10
(b) Explain with the help of neat diagram the working of Anderson Bridge. Draw the phasor diagram at the balance condition of the bridge ? 10
 6. (a) Describe the working principle of an Induction type Wattmeter and with a neat sketch explain the construction of this instrument ? 10
(b) Explain the construction and principle of any one type of Stepper Motor ? 10
 7. Write short notes on (any three) 20
 - (a) PMMC instruments
 - (b) Paramagnetism and Ferromagnetism
 - (c) Extension of range for Voltmeters and Ammeters
 - (d) CT and P.T.