



VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE

[Central Technological Institute, Maharashtra state]
Matunga, Mumbai-400019

SEMESTER EXAMINATION

NOVEMBER 2011

DATE OF EXAM:

18/11/11

SEMESTER & COURSE

SYBTech.(ELECTRONICS)

TIME ALLOWED

3 HRS

MAX MARKS : 100

SUBJECT(Code): ELECTRICAL TECHNOLOGY (EC 0203)

Instructions:

1. Answer to two sections must be written in separate answer books.
2. All questions are compulsory.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Illustrate your answers with neat sketches wherever necessary.

Q.1	Answer the following	(20)
(a)	Give the classification of magnetic materials.	(5)
(b)	What are the advantages and disadvantages of alloying steel with silicon for use as magnetic material in transformers and electrical machines?	(5)
(c)	What information does the hysteresis loop of magnetic material give? Explain in detail.	(5)
(d)	Why cold rolled grain oriented steel is used as lamination material for building cores for energy transformers? Why cannot this material be used for electrical rotating machines?	(5)
Q.2		(20)
(a)	Explain the working principle of a three phase induction motor and show that a rotating magnetic field can be developed by a three phase current.	(6)
(b)	Sketch and discuss the torque-slip curve of a three phase induction motor and indicate how will these changes when the rotor resistance is doubled keeping the stator voltage and frequency unchanged.	(5)
(c)	A three phase 50 Hz four pole induction motor has rated output of 10KW at 1425 rpm and maximum torque is developed at 1200 rpm. Calculate the starting torque. Neglect stator resistance and rotational losses. OR A 6 pole, 50 Hz, 3-phase induction motor has rotor resistance and reactance per phase of 0.02Ω and 0.1Ω respectively. At what speed is the torque maximum? What must be the value of external rotor resistance per phase to produce two-third of the maximum torque at starting?	(5)
(d)	State the advantages and disadvantages of decreasing the air gap length of a three phase induction motor:	(4)
Q.3		(20)

	(a)	1) A stepper motor has a step angle of 1.8 degree and is driven at 4000 pps. Determine i) resolution ii) motor speed iii) number of pulses required to rotate the shaft through 54 degrees	(5)
	(b)	Explain the applications of a stepper motor.	(5)
	(c)	Explain the working principle of a stepper motor. What are the types of a stepper? Explain any one of them in detail.	(10)
Q.4			(20)
	(a)	Why PMMC instruments are not used in ac measurement?	(3)
	(b)	Why secondaries of current transformer not kept open?	(3)
	(c)	Compare attraction type and repulsion type wattmeter.	(3)
	(d)	Explain ammeter voltmeter method of measuring resistance.	(3)
	(e)	Discuss errors in PMMC and moving iron instruments.	(3)
	(f)	Explain and draw circuit diagram of an ohmmeter .	(5)
Q.5			(20)
	(a)	Derive circuit diagram of Anderson's bridge. Derive condition for balance and also draw phasor diagram. Or Explain Kelvin double bridge to measure low resistance with proper diagram.	(8)
	(b)	Compare different damping methods and state why damping is needed in indicating instruments?	(5)
	(c)	Discuss application and limitation of Wheatstone bridge.	(5)