

SEAT NO :

GANPAT UNIVERSITY

B.TECH. SEM III (MECHANICAL ENGINEERING)

REGULAR EXAMINATION – NOV./DEC. 2011

2ME303 - ELECTRICAL TECHNOLOGY

MAX. TIME : 3 HRS.

TOTAL MARKS : 70

Section - 1

Q-1

- (A) Starting from fundamental, derive an expression to calculate emf generated in D.C. Generator 06  
(B) Discuss O.C.C. of Separately excited D.C. Generator and explain how to find Critical Resistance. 06

OR

Q-1

- (A) Starting from fundamental, explain Torque – Speed characteristics of D.C. Series Motor 06  
(B) Explain Factors Controlling Speed of D.C. Motor. Discuss Speed Control Methods in D.C. Shunt Motors. 06

Q-2

- (A) Explain the Losses in Transformer and enumerate methods to find out the same 06  
(B) Draw and Explain Behavior of Transformer on Load with non- resistive load 05

OR

Q-2

- (A) Draw and Explain Equivalent Circuit of Transformer when connected to load 06  
(B) Explain Voltage Regulation in Transformer. 05

Q-3

Efficiency of A 25 KVA, 3300/230 V, single Phase Transformer having iron and full load Copper Losses are 450W and 550 W respectively, is to be determined under following conditions:

- a) At half load with 0.8 p.f.  
b) At full load with unity p.f.  
c) At 75 % load with unity p.f.  
d) At 75 % load with 0.8 p.f.

Conclude the effect of p.f. on the efficiency of Transformer .

Section – 2

- Q-4
- (A) Derive Torque Equation of an Induction motor on load 06
- (B) Draw and Explain Equivalent Circuit of single Phase Induction Motor 06
- OR
- Q-4
- (A) Draw and Explain Torque – Slip Characteristics of an Induction Motor 06
- (B) Justify why single phase Induction Motor is not self starting ALSO Explain Double Field Revolving Theory. 06
- OR
- Q-5
- (A) Explain Vector Diagrams of Loaded Alternator 06
- (B) Explain Synchronous Impedance method for Voltage Regulation of an Alternator 05
- OR
- Q-5
- (A) Which is the best welding method for joining thin steel plates ? justify your selection 05
- (B) Explain Single Line Diagram of Power system with typical data. 06
- Q-6
- (A) Explain any one method of Speed Control of Three Phase Induction Motor 06
- (B) A 440 V, 4 pole , 50 Hz, star connected induction Motor has full load speed 1450 rpm. 06
- Rotor impedance is  $(0.4 + j 5)$  ohm and rotor/stator turn ration of 0.8 given.
- Calculate
- a) Full load torque
- b) Rotor current and full load  $Cu$  loss
- c) Power output if friction and windage losses is 600w