Exam No:-_____

GANPAT UNIVERSITY
B.TECH SEM. – III CBCS (NEW) (MECHANICAL)
REGULAR EXAMINATION NOV-DEC 2015
2EE306:- ELECTRICAL TECHNOLOGY

Time: 3 Hours   Total Marks:-60

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate full marks.
(3) Be precise and to the point in answering the descriptive questions.
(4) Make suitable assumptions wherever necessary.

SECTION-I

Que-1 (A) Derive e.m.f. equation of single phase transformer and show that e.m.f./turn in   [05]
primary is equal to e.m.f./turn in secondary.

(B) Discuss transformer on load with necessary vector diagram.   [05]

OR

Que-1 (A) Derive the condition for maximum efficiency of transformer and give your   [05]
suggestions to reduce the losses.

(B) Obtain the equivalent circuit of a 200/400 V ,50 Hz, single phase transformer from   [05]
the following test data
O.C. Test : 200 V, 0.8 A, 80 W - on L.V. side
S.C. Test : 18 V, 10 A, 90 W - on H.V. side

Que- 2 (A) Draw and explain Torque/Slip characteristic of induction motor and also discuss the   [05]
effect of rotor resistance on it.

(B) Explain permanent magnet stepper motor.   [05]

OR

Que- 2 (A) For an induction motor, derive the condition for maximum torque under running   [05]
condition.

(B) The power input to the rotor of 440 V, 50 Hz, 6 pole, 3 phase induction motor is   [05]
75 kW. The rotor electromotive force is observed to make 100 complete alterations
per minute. Calculate (i) slip (ii) rotor speed (iii) rotor copper losses per phase. (iv)
mechanical power developed.

Que-3   Attempt following questions.   [10]
(A) Compare overhead versus underground supply system.
(B) State and explain the factors affecting the selection of electrical drives in brief.

SECTION-II

Que-4 (A) Explain the Different types of D.C Generator with necessary figure and equation. **[05]**

(B) A long shunt compound generator delivers a load current of 50 A at 500 V and has **[05]** armature, series field and shunt field resistances of 0.05 Ω, 0.03 Ω and 250 Ω respectively. Calculate the generated voltage and the armature current. Allow 2 V brush contact drop.

OR

Que-4 (A) Why Starters are used in D.C. shunt motors? Explain 3-point Starter with neat **[05]** diagram.

(B) Draw and explain following characteristics of separately excited D.C generator **[05]**
(i) No-load saturation characteristic
(ii) Load Characteristic
(iii) Internal and External characteristic

Que- 5 (A) What is Voltage Regulation of an alternator? Explain synchronous impendence **[05]** method for find out the voltage regulation of alternator.

(B) Explain the effect of increased load with constant excitation of synchronous motor **[05]** with necessary vector diagram.

OR

Que- 5 (A) What is armature reaction? Explain the effect of armature reaction on the terminal **[05]** voltage of an alternator.

(B) Explain the various methods of speed control of D.C. Shunt motors. **[05]**

Que-6 **Attempt following questions.**
(A) Discuss the advantages of electric heating. **[04]**
(B) Explain resistance welding. **[04]**
(C) Compare the synchronous motor with induction motor. **[02]**

END OF PAPER