

الامتحان 5



Kafrelsheikh University
Faculty of Engineering
Electrical department
Date: 1 / 6 / 2016

Full mark =100
number of pages: 2

Final Exam of 2nd
Subject: Electric machines 2
Year:3
Time Allowed: 3 hours

Answer all questions:

Q1

a) If you opened the secondary winding of the transformer and put an ammeter in the primary winding, observe the ammeter reading, is there a reading? if yes or no explain why, if yes what does this reading represent.

b) A 50KVA single phase transformer has a full load primary current 250A and total resistance referred to primary is 0.006Ω , If iron loss is 200 W, find the efficiency on full load and on half load in case of 0.8 pf.

Q2

a) Mention the advantages of auto transformer.

b) The parameters of 12 kVA , 120/480V, 60HZ , two winding ,step up transformer are $R_H=0.7 \Omega$, $X_H=1.3 \Omega$, $R_L=0.1 \Omega$, $X_L=0.3 \Omega$, $R_{CH}=3.3 K\Omega$, $X_{mH}=1.2 K\Omega$, the transformer is connected as a 480/600 V step up -autotransformer, it delivers its rated load at power factor of 0.866 leading .Find its efficiency and voltage regulation.

Q3

a) What is the importance of the transformer testing ,in open and short circuit test, explain the requirements that you must avoid during testing.

b)The following data were obtained from testing a 50-KVA, 5000/250V step down transformer.

	Voltage (V)	Current(A)	Power(w)
Open ct test	250	2	120
Short ct test	160	10	600

Determine the equivalent circuit of the transformer as viewed from the high voltage side .

Q4

Three identical single phase transformers each rated is 50 kVA,50Hz each transformer has the following parameter values, $R_L=0.45\Omega$, $X_L=2.2 \Omega$, $R_H=4.5m\Omega$, $X_H= 22m \Omega$, $R_{CH}=10K\Omega$, $X_{mH}=8 K\Omega$,, are connected to form three phase Y/ Δ connection step down transformer to deliver the rated load at 0.8 pf lagging .

- Sketch the connection diagram.
- Find the nominal voltage and power rating of the three phase transformer.
- The primary voltage.
- The primary and secondary line currents.
- The efficiency.
- The voltage regulation.