Kafrelsheikh University
Faculty of Engineering
Subject: **Electrical testing3**
Year: Fourth Electrical power (R. 2007)
Exam Date: 9/1/2020

Final Exam of 1st semester-2019-2020
Department of Electrical Engineering
course code: EPM4014 Full Mark: 60 Marks
number of pages: 2 Time allowed: 3 hours

This exam measures the following ILOs (**a19, b19, c5, c13,c14, c15,c16, d1**)

Attempt to solve all questions

Q2: (15 Marks)

a) A dc test is performed on a 460-V Δ-connected 100-hp induction motor. If V_{DC} = 21 V and I_{DC} = 72 A, what is the stator resistance R_1 ? Why is this so?
b) **Plot**, with all necessary measuring devices, the connection diagram of toque-speed characteristic test of an IM.
c) **Plot**, with all necessary measuring devices, a connection diagram of induction generator experiment.

Q3: (15 Marks)

a- **Describe** and mention the required preliminary precautions at the locked-rotor test of the IM.
b- **Discuss** the possible methods used for speed control in IM, in both armature and rotor sides, then steps that follow for the most effective of them in your lab.
c- A 230-V, 50 Hz, 4-pole 5-hp squirrel cage induction motor gave the following test data:
No load: 230 V, 6.3 A, 275 W
Locked rotor: 40 V, 15 A, 735 W

Determine the full load efficiency of the motor from the above test data. Neglect the small amount of core loss under locked rotor condition.

Q3: (15 Marks)

a- State the various abnormal conditions possible in induction motors and corresponding choice of protection circuit
b- Draw and explain rotor resistance starter used for three phase induction motors.
c- What is a cogging and crawling effect in a three-phase induction motor?

Q4: (15 Marks)

Choose the correct answer with explain your choice.

1. In an induction motor, no-load the slip is generally:

a) Less than 1% b) 5% c) 4% d) 2 %

Kafrelsheikh University
Faculty of Engineering
Subject: **Electrical testing3**
Year: Fourth Electrical power (R. 2007)
Exam Date: 9/1/2020

Final Exam of 1st semester-2019-2020
Department of Electrical Engineering
course code: EPM4014 Full Mark: 60 Marks
number of pages: 2 Time allowed: 3 hours

2. A 3-phase 440 V, 50 Hz induction motor has a 4% slip. The frequency of the rotor current will be:

a) 5 Hz b) 50 Hz c) 25 Hz d) 2 Hz

3. The efficiency of an induction motor is about:

a) less than 50 % b) 100 % c) 50-60 % d) 80-90%

4. A double squirrel-cage induction motor has:

a) Two parallel winding in Rotor b) Two parallel windings in the stator c) Two series winding in the stator d) Two rotors moving in the opposite direction

5. A 50 Hz, 3-phase induction motor has a full load speed of 1440 r.p.m. The number of poles in the motor is:

a) 8 pole b) 2 pole c) 6 pole d) 4 pole

6. The crawling in the induction motor is caused by

a) Harmonic developed in the motor b) Low Voltage supply c) High Loads d) Improper design of machine

7. In which of the following reason induction motor operation is stable??

a) High slip region b) Low Slip region c) Any of the two d) None of the above

8. In an induction generator operation, the slip is always:

a) Infinite b) Positive c) Negative d) Zero

9. In an induction motor if the air gap is increased than which of the following statement is correct:

a) Power factor will increase b) Speed will increase c) Power factor will decrease d) Speed will decrease

10. The value of the power factor of an induction motor operating at no load is:

a) Unity b) 0.2 lead c) 0.2 lag d) 0.9 lagging

With my best wishes

Dr. Eng./Mohamed I. AbdelWanis