Kafrelsheikh University
Faculty of Engineering
Subject: **Electrical testing3**
Year: Fourth Electrical power (R. 2007)
Exam Date: 17/1/2019

Final Exam of 1st semester-2018-2019
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

Q1: (15 Marks)

Choose the correct answer with explain your choice.

1. In an induction motor air gap flux density is kept low so as to:
a) Improve efficiency b) improve power factor c) improve maximum torque d) both (a) and (b)
2. The relative speed between stator and rotor fluxes is equal to:
a) Synchronous speed n_s b) Rotor speed n c) Zero d) n_s-n
3. The rotor slots in 3 phase induction motor are kept inclined. This phenomenon is known as:
a) skewing b) crawling c) cogging d) none of the above
4. Air gap of a 3 phase induction motor is kept small to:
a) reduce the crawling b) reduce the noise c) reduce the I_m d) obtain high starting torque
5. When a poly phase induction motor loaded:
a) motor speed decreases b) stator flux cuts the rotor bars more rapidly c) emf induced in the rotor and rotor frequency increases d) all the above
6. In Induction motors, the short circuit test is ___ test
a) no load b) blocked rotor c) stator resistance d) open circuit
7. The no-load current in an induction motor is approximately ___ percentage of the full load current?
a) much lower b) much higher c) slightly less d) slightly more
8. The value of the airgap flux density in an induction motor is in the range of:
a) 0.35 to 0.6T b) 0.8 to 1.0 T c) 0.1 to 0.25T d) 2.5 to 3.5 T
9. The squirrel cage rotor of a 6-pole induction motor can be used for induction motor:
a) only 6 pole b) 6 pole or 12 pole c) any number of even number of poles d) none of the above
10. The speed of an induction motor:
a) decreases too much with the increase of load b) increase with the increase of load
c) decreases slightly with the increase of load d) remains constant with the increase of load

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Q2: (15 Marks)

a) Plot, with all necessary measuring devices, the connection diagram of No-Load test of an IM.

b) 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- A 208-V, 60 Hz, six-pole Y-connected 25-hp design class B induction motor is tested in the laboratory, with the following results:

No load: 208 V, 22.0 A, 1200 W, 60 Hz

Locked rotor: 24.6 V, 64.5 A, 2200 W, 15 Hz

DC test: 13.5 V, 64 A

Find the equivalent circuit parameters of this motor, and plot its exact equivalent circuit.

Q4: (15 Marks)

a- Experimentally, how can the linear part of the torque/speed characteristic curve of an IM be determined?

b- A 460-V, 60 Hz, 3-phase, star-connected induction motor have the following torque speed data:

T N.m.	0	149	148.2	144.1	138.4	132	125.5	123	119.2
n (rpm)	1800	1008	900	720	540	360	180	108	0

Plot the torque-slip characteristic, from characteristic determines: no of poles, starting torque, if this motor is loaded by constant load at 50, 125 Nm what are motor speed and its slip.

With my best wishes

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