ENGT 3050 Homework #10
Fundamentals of Electricity

NAME Alexander J King

1. The stator is made up of all the non-rotating parts which includes the yolk, poles and field windings.
   a. True
   b. False

   A - TRUE

2. When the motor is not spinning, the CEMF is zero and the current pulled by the motor is at maximum.
   a. True
   b. False

   A - TRUE

3. Torque is the amount of mechanical power developed by the armature.
   a. True
   b. False

   A - True

4. A separately excited DC motor stator field is controlled with an external DC supply. A decrease in field current causes a stronger magnetic field
   a. True
   b. False

   B - False

5. Which of the following is not a type of DC motor?
   a. Series
   b. Shunt
   c. Separately Excited
   d. Induction

   D - Induction

6. At start-up back or counter-EMF will be zero and therefore starting current will be
   a. Zero
   b. Minimum
   c. Maximum
   d. Infinite

   C -Maximum

7. As the speed of a motor is increased, torque
   a. Increases
   b. Stays the same
   c. Decreases
   d. Goes to zero

   C - Decreases

8. Which of the following is a true statement? (Hint: there may be more than one answer.)
   a. Series motors are used for constant torque
   b. Series motors are used for constant speed
   c. Shunt motors are used for constant torque
   d. Shunt motors are used for constant speed

   C – Shunt motors are used for constant torque
   D- for constant speed

9. Which of the following is not a component of a DC motor?
   a. End Bells
   b. Brushes
   c. Commutator
   d. Centrifugal Switch
   e. All are components of a DC motor

D- Centrifugal Switch

10. Counter-EMF causes a decrease in the amount of _____ being pulled by the motor.
    a. Current
    b. Voltage
    c. Resistance
    d. Capacitance

A - Current

11. Calculate the voltage induced in the armature winding of a 6-pole, wave-wound, dc machine having 728 active conductors and running at 1600 rpm. Flux per pole is 15mWb.
    a. 874V
    b. 497V
    c. 320V
    d. 580V

A - 874v

12. Find the counter-EMF of a permanent magnet DC motor when it runs at 1000 rpm. The armature generates 50V at a speed of 800 rpm.
    a. 62.5V
    b. 80V
    c. 57.2V
    d. 50V

A – 62.5v

13. Find the armature current when the counter-EMF is 80V, the supply is 120V, and the resistance is 1.8Ω
    a. 25A
    b. 15A
    c. 19.6A
    d. 22.2A

D – 22.2A

14. Given a counter-EMF of 300V with an armature that develops 40kW of power, determine the armature current.
    a. 150A
    b. 133A
    c. 90A
    d. 120A

B - 133A

15. Calculate the torque produced by a motor with a counter-EMF of 300V, a current of 75A and a speed of 1600 rpm.
    a. 134 Nm
    b. 142 Nm
    c. 150 Nm
    d. 112 Nm

B - 142Nm

16. A polyphase system is an ac system composed of a number of single-phase ac systems that have the same _____.
    a. voltage
    b. amplitude
    c. frequency
    d. line current

C - Frequency

17. In a 3-phase circuit, each voltage waveform is separated by
    a. 360°
    b. 270°
    c. 90°
    d. 120°

D- 120deg

18. In a 3-phase ac generator, counter-clockwise rotation of the rotor produces a voltage repetition sequence of _____ and clockwise rotation of the rotor produces a voltage repetition sequence of _____.
    a. ABCABC… ; CBACBA….
    b. CBACBA… ; ABCABC…
    c. BCABCA… ; ABCABC…
    d. 90° ; 270°

A

19. In a 3-phase wye system, which of the following is a true statement? (Hint: there may be more than one answer.)
    a. The phase voltage is the line voltage
    b. There is a phase voltage and a line voltage
    c. The phase voltage is the line voltage divided by √3
    d. Phase current is line current
    e. Line current is phase current times √3
    f. Power in a wye system = V_L^2/R

B,C,D,F

20. In a 3-phase delta system, which of the following is a true statement? (Hint: there may be more than one answer.)
    a. There is no phase voltage, only line voltage
    b. The phase voltage is the line voltage divided by √3
    c. Phase current is line current
    d. Phase current is line current divide by √3
    e. Power in a delta system = $1.73V_LI_L$

D,E

21. The _____ 3-phase configuration has an inherent neutral line whereas the _____ configuration does not.
    a. line; phase
    b. wye ; delta
    c. delta / wye
    d. 120° ; 360°

B- wye; delta

22. In a certain 3-phase wye system, the line current is 200 A. The phase current is
    a. 346 A
    b. 200 A
    c. 141 A
    d. 115 A

B- 200A

23. In a certain 3-phase delta system, the line current is 200 A. The phase current is
    a. 346 A
    b. 200 A
    c. 141 A
    d. 115 A

D - 115A

24. In a certain 3-phase wye system, the line current is 200 A. The phase voltage is 120 V. The power is _____.
    a. 13.9 kVA
    b. 24 kVA
    c. 41.5 kVA
    d. 72.0 kVA

D 72.0 kVA