Assignment 10

Due on 2019-10-08, 23:59 IST.

The student is required to submit this assignment on or before 23:59 IST on 2019-10-08.

Please read this assignment carefully.

For questions 1 to 3:
A 30 kW, 10-pole, 50 Hz, star connected induction motor has a full load slip of 4 percent.

1. What is the synchronous speed of this motor?
   - 1.56 rpm
   - 1.65 rpm
   - 1.61 rpm
   - None of the above.
   
   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - None of the above.
   
   Feedback Form:
   - Correct Answer: Option 1
   - Feedback Not Provided.

2. What is the rotor speed of this motor at rated load?
   - 0 rpm
   - 1.56 rpm
   - 1.65 rpm
   - None of the above.
   
   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - None of the above.
   
   Feedback Form:
   - Correct Answer: Option 3
   - Feedback Not Provided.

3. What is the shaft torque of this motor at rated load?
   - 0.13 Nm
   - 0.15 Nm
   - 0.12 Nm
   - None of the above.
   
   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - None of the above.
   
   Feedback Form:
   - Correct Answer: Option 1
   - Feedback Not Provided.

For questions 4 to 6:
A 30 kW, 6 pole, 50 Hz, three-phase induction motor has friction and windage loss of 2% of the output. The machine is working at full load with a full load slip of 4 percent.

4. What is the rotor frequency of this motor at rated load?
   - 3 Hz
   - 2 Hz
   - 4 Hz
   - None of the above.
   
   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - None of the above.
   
   Feedback Form:
   - Correct Answer: Option 3
   - Feedback Not Provided.

5. What is the shaft torque of this motor at rated load?
   - 0.13 Nm
   - 0.15 Nm
   - 0.12 Nm
   - None of the above.
   
   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - None of the above.
   
   Feedback Form:
   - Correct Answer: Option 1
   - Feedback Not Provided.

6. The output torque of the machine will be,
   - 0.19 Nm
   - 0.18 Nm
   - 0.19 Nm
   - 0.18 Nm

   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - Option 4
   
   Feedback Form:
   - Correct Answer: Option 4
   - Feedback Not Provided.

For questions 8 to 10:
A 48 VDC, 4000 rpm, 24 V, 5 pole wound-rotor induction motor has a slip of 0.03 when operated at rated voltage and frequency. It has full load time constant of 0.05 and efficiency of 88.6%.

8. Find the power factor at which the motor operates.
   - 0.65 lag
   - 0.65 lag
   - 0.78 lag
   - 0.78 lag

   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - Option 4
   
   Feedback Form:
   - Correct Answer: Option 2
   - Feedback Not Provided.

9. Find the shaft torque delivered to the load.
   - 0.1 Nm
   - 0.05 Nm
   - 0.05 Nm
   - None of the above.

   Multi-choice:
   - Option 1
   - Option 2
   - Option 3
   - None of the above.
   
   Feedback Form:
   - Correct Answer: Option 1
   - Feedback Not Provided.