Code No: R05220401 **R05** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL TECHNOLOGY
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Derive an expression for the torque of a DC motor.
   (b) A 240V, 50A, 800rpm DC shunt motor has armature resistance of 0.2Ω. If the load torque is reduced to 60% of its full load value and a resistance of 2Ω is inserted in series with armature circuit, find the motor speed. Armature reaction weakens the field flux by 4% at full load and by 2% at 60% of full load. [6+10]

2. How do you classify the transformers and also discuss the different parts of transformer in detail. [16]

3. (a) Why brushes and commutator are necessary for operation of a D.C. Machine.
   (b) How D.C. Generators are classified?
   (c) A 4-pole, lap wound DC shunt generator has a useful flux/pole 0.06Wb. The armature winding consists of 200 turns, each turn having a resistance of 0.003Ω. Calculate the terminal voltage when running at 1000rpm if armature current is 45A. [4+6+6]

4. (a) Define voltage regulation of a transformer. Deduce the expression for the voltage regulation.
   (b) The number of turns on the primary and secondary windings of a single phase transformer are 350 and 35 respectively. If the primary is connected to a 2.2 KV 50 HZ supply determine the secondary voltage. [8+8]

5. Discuss how controlling torque and damping torque is provided in the indicating instruments. [16]

6. (a) Derive the expression for Torque-Slip characteristics of a 3-phase Induction Motor. Explain how the torque of Induction Motor varies with speed with the help of a diagram.
   (b) Deduce the condition for maximum torque of a 3-phase Induction Motor.
   (c) A 12-pole, 3-phase Induction Motor is fed from 50Hz supply. If the frequency of rotor e.m.f at Half full-load is 2 Hz, find the Half Full-load speed and %Slip. [8+4+4]

7. Using double field revolving theory for single phase induction motors. Give its torque speed characteristic. Why this motor does not have starting torque. [16]

8. (a) Derive EMF equation of an alternator. Also derive expressions for pitch and breadth factor.

   (b) The stator of 3-phase, 8-pole synchronous generator driven at 750 rpm has 72 slots. The winding has been made with 36 coils having 10 turns per coil. Claculate the rms value of induced emf per phase if the flux per pole is 0.15 mwb, sinusoidally distributed. Assume that full-pitch coils have been used. [10+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05220401 **R05** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL TECHNOLOGY
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Define voltage regulation of a transformer. Deduce the expression for the voltage regulation.
   (b) The number of turns on the primary and secondary windings of a single phase transformer are 350 and 35 respectively. If the primary is connected to a 2.2 KV 50 HZ supply determine the secondary voltage. [8+8]

2. (a) Derive the expression for Torque-Slip characteristics of a 3-phase Induction Motor. Explain how the torque of Induction Motor varies with speed with the help of a diagram.
   (b) Deduce the condition for maximum torque of a 3-phase Induction Motor.
   (c) A 12-pole, 3-phase Induction Motor is fed from 50Hz supply. If the frequency of rotor e.m.f at Half full-load is 2 Hz, find the Half Full-load speed and %Slip. [8+4+4]

3. (a) Derive an expression for the torque of a DC motor.
   (b) A 240V, 50A, 800rpm DC shunt motor has armature resistance of 0.2Ω. If the load torque is reduced to 60% of its full load value and a resistance of 2Ω is inserted in series with armature circuit, find the motor speed. Armature reaction weakens the field flux by 4% at full load and by 2% at 60% of full load. [6+10]

4. How do you classify the transformers and also discuss the different parts of transformer in detail. [16]

5. Discuss how controlling torque and damping torque is provided in the indicating instruments. [16]

6. (a) Derive EMF equation of an alternator. Also derive expressions for pitch and breadth factor.
   (b) The stator of 3-phase, 8-pole synchronous generator driven at 750 rpm has 72 slots. The winding has been made with 36 coils having 10 turns per coil. Claculate the rms value of induced emf per phase if the flux per pole is 0.15 mwb, sinusoidally distributed. Assume that full-pitch coils have been used. [10+6]

7. Using double field revolving theory for single phase induction motors. Give its torque speed characteristic. Why this motor does not have starting torque. [16]

8. (a) Why brushes and commutator are necessary for operation of a D.C. Machine.
   (b) How D.C. Generators are classified?
   (c) A 4-pole, lap wound DC shunt generator has a useful flux/pole 0.06Wb. The armature winding consists of 200 turns, each turn having a resistance of 0.003Ω. Calculate the terminal voltage when running at 1000rpm if armature current is 45A. [4+6+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05220401 **R05** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL TECHNOLOGY
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Using double field revolving theory for single phase induction motors. Give its torque speed characteristic. Why this motor does not have starting torque. [16]

2. (a) Derive an expression for the torque of a DC motor.
   (b) A 240V, 50A, 800rpm DC shunt motor has armature resistance of 0.2Ω. If the load torque is reduced to 60% of its full load value and a resistance of 2Ω is inserted in series with armature circuit, find the motor speed. Armature reaction weakens the field flux by 4% at full load and by 2% at 60% of full load. [6+10]

3. (a) Derive the expression for Torque-Slip characteristics of a 3-phase Induction Motor. Explain how the torque of Induction Motor varies with speed with the help of a diagram.
   (b) Deduce the condition for maximum torque of a 3-phase Induction Motor.
   (c) A 12-pole, 3-phase Induction Motor is fed from 50Hz supply. If the frequency of rotor e.m.f at Half full-load is 2 Hz, find the Half Full-load speed and %Slip. [8+4+4]

4. Discuss how controlling torque and damping torque is provided in the indicating instruments. [16]

5. How do you classify the transformers and also discuss the different parts of transformer in detail. [16]

6. (a) Derive EMF equation of an alternator. Also derive expressions for pitch and breadth factor.
   (b) The stator of 3-phase, 8-pole synchronous generator driven at 750 rpm has 72 slots. The winding has been made with 36 coils having 10 turns per coil. Claculate the rms value of induced emf per phase if the flux per pole is 0.15 mwb, sinusoidally distributed. Assume that full-pitch coils have been used. [10+6]

7. (a) Define voltage regulation of a transformer. Deduce the expression for the voltage regulation.
   (b) The number of turns on the primary and secondary windings of a single phase transformer are 350 and 35 respectively. If the primary is connected to a 2.2 KV 50 HZ supply determine the secondary voltage. [8+8]

8. (a) Why brushes and commutator are necessary for operation of a D.C. Machine.
   (b) How D.C. Generators are classified?
   (c) A 4-pole, lap wound DC shunt generator has a useful flux/pole 0.06Wb. The armature winding consists of 200 turns, each turn having a resistance of 0.003Ω. Calculate the terminal voltage when running at 1000rpm if armature current is 45A. [4+6+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05220401 **R05** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL TECHNOLOGY
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Discuss how controlling torque and damping torque is provided in the indicating instruments. [16]

2. How do you classify the transformers and also discuss the different parts of transformer in detail. [16]

3. (a) Derive an expression for the torque of a DC motor.
   (b) A 240V, 50A, 800rpm DC shunt motor has armature resistance of 0.2Ω. If the load torque is reduced to 60% of its full load value and a resistance of 2Ω is inserted in series with armature circuit, find the motor speed. Armature reaction weakens the field flux by 4% at full load and by 2% at 60% of full load. [6+10]

4. (a) Define voltage regulation of a transformer. Deduce the expression for the voltage regulation.
   (b) The number of turns on the primary and secondary windings of a single phase transformer are 350 and 35 respectively. If the primary is connected to a 2.2 KV 50 HZ supply determine the secondary voltage. [8+8]

5. Using double field revolving theory for single phase induction motors. Give its torque speed characteristic. Why this motor does not have starting torque. [16]

6. (a) Derive the expression for Torque-Slip characteristics of a 3-phase Induction Motor. Explain how the torque of Induction Motor varies with speed with the help of a diagram.
   (b) Deduce the condition for maximum torque of a 3-phase Induction Motor.
   (c) A 12-pole, 3-phase Induction Motor is fed from 50Hz supply. If the frequency of rotor e.m.f at Half full-load is 2 Hz, find the Half Full-load speed and %Slip. [8+4+4]

7. (a) Derive EMF equation of an alternator. Also derive expressions for pitch and breadth factor.
   (b) The stator of 3-phase, 8-pole synchronous generator driven at 750 rpm has 72 slots. The winding has been made with 36 coils having 10 turns per coil. Claculate the rms value of induced emf per phase if the flux per pole is 0.15 mwb, sinusoidally distributed. Assume that full-pitch coils have been used. [10+6]

8. (a) Why brushes and commutator are necessary for operation of a D.C. Machine.
   (b) How D.C. Generators are classified?
   (c) A 4-pole, lap wound DC shunt generator has a useful flux/pole 0.06Wb. The armature winding consists of 200 turns, each turn having a resistance of 0.003Ω. Calculate the terminal voltage when running at 1000rpm if armature current is 45A. [4+6+6]

⋆ ⋆ ⋆ ⋆ ⋆