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

II B.Tech II Semester Examinations,April/May 2012
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

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1. Explain with neat sketch the principle of operation of permanent magnet type moving coil instrument. [16]

2. (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]

3. Describe the methods of speed control of D.C. motors with their advantages and disadvantages. [16]

4. (a) The armature of a 6-pole D.C. generator has a wave winding containing 650 conductors. Calculate the generated e.m.f. when the flux/pole is 0.055Wb and the speed is 300rpm.Calculate the speed at which the armature must be driven to generate an e.m.f. of 550V if the flux/pole is reduced to 0.05Wb.
   (b) A DC series generator, having an external characteristic which is a straight line through zero to 50V at 200A is connected as a booster between a station bus-bar and a feeder of 0.3Ω resistance. Calculate the voltage difference between the station bus-bar and the far end of the feeder at a current of
      i. 200A and
      ii. 50A [4+2+10]

5. Explain with neat diagrams the principle of operation of
   (a) AC servo motor
   (b) Stepper motor. [8+8]

6. With a neat diagram explain the constructional details of a transformer. [16]

7. (a) Explain the constructional features of alternator.
   (b) How e.m.f is induced in an 3-phase alternator? Derive the expression for e.m.f induced in an alternator in terms of pitch and distribution factors. [8+8]

8. (a) Explain why a 3-phase Induction Motor cannot develop torque when running at synchronous speed. Define the slip and deduce how the frequency of rotor currents and magnitude of rotor e.m.f are related to slip.

(b) A 3-phase star connected Induction motor has 55V across its slip rings on open circuit when normal stator voltage is applied. The rotor is star connected and has impedance (0.7+j5)Ω per phase. Find the rotor current when the machine is

i. at stand still with the slip rings connected to a star connected starter with a phase impedance of (4+j3)Ω and

ii. running normally with 5% slip. [10+6]

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

II B.Tech II Semester Examinations,April/May 2012
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

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1. With a neat diagram explain the constructional details of a transformer. [16]

2. (a) Explain the constructional features of alternator.
   (b) How e.m.f is induced in an 3-phase alternator? Derive the expression for e.m.f induced in an alternator in terms of pitch and distribution factors. [8+8]

3. Explain with neat sketch the principle of operation of permanent magnet type moving coil instrument. [16]

4. (a) The armature of a 6-pole D.C. generator has a wave winding containing 650 conductors. Calculate the generated e.m.f. when the flux/pole is 0.055Wb and the speed is 300rpm.Calculate the speed at which the armature must be driven to generate an e.m.f. of 550V if the flux/pole is reduced to 0.05Wb.
   (b) A DC series generator, having an external characteristic which is a straight line through zero to 50V at 200A is connected as a booster between a station bus-bar and a feeder of 0.3Ω resistance. Calculate the voltage difference between the station bus-bar and the far end of the feeder at a current of
      i. 200A and
      ii. 50A [4+2+10]

5. (a) Explain why a 3-phase Induction Motor cannot develop torque when running at synchronous speed. Define the slip and deduce how the frequency of rotor currents and magnitude of rotor e.m.f are related to slip.
   (b) A 3-phase star connected Induction motor has 55V across its slip rings on open circuit when normal stator voltage is applied. The rotor is star connected and has impedance (0.7+j5)Ω per phase. Find the rotor current when the machine is
      i. at stand still with the slip rings connected to a star connected starter with a phase impedance of (4+j3)Ω and
      ii. running normally with 5% slip. [10+6]

6. Explain with neat diagrams the principle of operation of
   (a) AC servo motor
   (b) Stepper motor. [8+8]

7. Describe the methods of speed control of D.C. motors with their advantages and disadvantages. [16]

8. (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]

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

II B.Tech II Semester Examinations,April/May 2012
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

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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. With a neat diagram explain the constructional details of a transformer. [16]
3. Describe the methods of speed control of D.C. motors with their advantages and disadvantages. [16]
4. (a) Explain why a 3-phase Induction Motor cannot develop torque when running at synchronous speed. Define the slip and deduce how the frequency of rotor currents and magnitude of rotor e.m.f are related to slip.
   (b) A 3-phase star connected Induction motor has 55V across its slip rings on open circuit when normal stator voltage is applied. The rotor is star connected and has impedance (0.7+j5)Ω per phase. Find the rotor current when the machine is
      i. at stand still with the slip rings connected to a star connected starter with a phase impedance of (4+j3)Ω and
      ii. running normally with 5% slip. [10+6]
5. Explain with neat diagrams the principle of operation of
   (a) AC servo motor
   (b) Stepper motor. [8+8]
6. Explain with neat sketch the principle of operation of permanent magnet type moving coil instrument. [16]
7. (a) Explain the constructional features of alternator.
   (b) How e.m.f is induced in an 3-phase alternator? Derive the expression for e.m.f induced in an alternator in terms of pitch and distribution factors. [8+8]
8. (a) The armature of a 6-pole D.C. generator has a wave winding containing 650 conductors. Calculate the generated e.m.f. when the flux/pole is 0.055Wb and the speed is 300rpm.Calculate the speed at which the armature must be driven to generate an e.m.f. of 550V if the flux/pole is reduced to 0.05Wb.

(b) A DC series generator, having an external characteristic which is a straight line through zero to 50V at 200A is connected as a booster between a station bus-bar and a feeder of 0.3Ω resistance. Calculate the voltage difference between the station bus-bar and the far end of the feeder at a current of

i. 200A and

ii. 50A [4+2+10]

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

II B.Tech II Semester Examinations,April/May 2012
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

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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) Explain the constructional features of alternator.
   (b) How e.m.f is induced in an 3-phase alternator? Derive the expression for e.m.f induced in an alternator in terms of pitch and distribution factors. [8+8]

3. (a) The armature of a 6-pole D.C. generator has a wave winding containing 650 conductors. Calculate the generated e.m.f. when the flux/pole is 0.055Wb and the speed is 300rpm.Calculate the speed at which the armature must be driven to generate an e.m.f. of 550V if the flux/pole is reduced to 0.05Wb.
   (b) A DC series generator, having an external characteristic which is a straight line through zero to 50V at 200A is connected as a booster between a station bus-bar and a feeder of 0.3Ω resistance. Calculate the voltage difference between the station bus-bar and the far end of the feeder at a current of
      i. 200A and
      ii. 50A [4+2+10]

4. Explain with neat diagrams the principle of operation of
   (a) AC servo motor
   (b) Stepper motor. [8+8]

5. (a) Explain why a 3-phase Induction Motor cannot develop torque when running at synchronous speed. Define the slip and deduce how the frequency of rotor currents and magnitude of rotor e.m.f are related to slip.
   (b) A 3-phase star connected Induction motor has 55V across its slip rings on open circuit when normal stator voltage is applied. The rotor is star connected and has impedance (0.7+j5)Ω per phase. Find the rotor current when the machine is
      i. at stand still with the slip rings connected to a star connected starter with a phase impedance of (4+j3)Ω and
      ii. running normally with 5% slip. [10+6]

6. With a neat diagram explain the constructional details of a transformer. [16]
7. Explain with neat sketch the principle of operation of permanent magnet type moving coil instrument. [16]
8. Describe the methods of speed control of D.C. motors with their advantages and disadvantages. [16]

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