Code No: RR210303 | RR | Set No. 2

II B.Tech I Semester Examinations,November 2010
ELECTRICAL ENGINEERING
Common to ME, CHEM, MECT, MEP, MMT

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) With a neat sketch, explain the operation of three point starter.

   (b) If the load is removed from a dc series motor in operation, what will happen?
   [12+4]

2. uA moving coil instrument which given full scale deflection with 15mA, has a copper
   coil having a resistance of 1.5Ω at 15^0C, and a temperature coefficient of 1/234.5 at
   0^0C in series with a resistor of 3.5Ω having a negligible temp coefficient. Determine

   (a) the resistance of shunt required for a full scale deflection of 20A and

   (b) the resistance required for a full scale deflection of 250v. If the instrument
   reads correctly at 15^0C, determine the percentage error in each case when the
   temperature is 25^0C. [16]

3. (a) What are the assumptions made while calculating the regulation using syn-
   chronous impedance method.

   (b) A 3- phase 50Hz star connected 2000KVA , 2300V, alternator gives a short
   circuit current of 600Amps for a certain field excitation.With the same excita-
   tion the OC Voltage was 900V .The resistance between the pair of terminals
   was 0.12 Ohms . Find the % regulation at Half full load at

        i. UPF
       ii. 0.8PF leading
      iii. 0.9 PF lagging [6+10]

4. (a) A shunt generator has a full load current of 196 A at 220V. The stray losses
   are 720W and the shunt field coil resistance is 55ohms. If it has a full load
   efficiency of 88%, find the armature resistance. Also find the load current
   corresponding to maximum efficiency.

   (b) Long shunt compound wound generator gives 240V at full load output of 100A.
   Resistances of various windings of the machine are armature(including brush
   contact) 0.1ohm, series field 0.02ohm, interpole field 0.025ohm, shunt field
   100ohms. The iron loss at full load is 1000W. Windage and friction losses are
   500W. Calculate the full load efficiency of the machine. [8+8]

5. (a) Define cycle, frequency, phase.

   (b) An alternating current at frequency 60Hz has a maximum value of 120A.
   Write down the equation for its instantaneous value. Reckoning time from the
   instant the current zero and is becoming positive find

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      i. the instantaneous value after 1/360 second and

     ii. the time taken to reach 96A for the first time.   [6+10]

6. (a) Explain about "Dot convention" in the case of mutually coupled circuits.

  (b) Explain briefly "How you can use mutual inductance principle to the transformer".   [8+8]

7. (a) Define regulation of a Transformer. How does it vary with the load current?

  (b) Full load efficiency of a 4,000/400V, 40 KVA, Single Phase Transformer is 94% maximum efficiency occurs at 90% of the full-load: Find Iron loss and full-load copper loss of the Transformer. The load power factor being 0.8 lagging.   [6+10]

8. (a) Draw the torque slip characteristic and mark the operating region of the motor in regard to its safety.

  (b) A 3- phase , 6 pole , 50Hz induction motor has a slip of 1% at no load and 3% at full load. Find

    i. Synchronous speed

   ii. No load speed

  iii. Full load speed

   iv. Frequency of rotor current at standstill

   v. Frequency of rotor current at full load.   [6+10]

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Code No: RR210303 $\boxed{\textbf{RR}}$ $\boxed{\textbf{Set No. 4}}$

II B.Tech I Semester Examinations,November 2010
ELECTRICAL ENGINEERING
Common to ME, CHEM, MECT, MEP, MMT

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) With a neat sketch, explain the operation of three point starter.

   (b) If the load is removed from a dc series motor in operation, what will happen?
   [12+4]

2. (a) Define cycle, frequency, phase.

   (b) An alternating current at frequency 60Hz has a maximum value of 120A.
   Write down the equation for its instantaneous value. Reckoning time from the
   instant the current zero and is becoming positive find
      i. the instantaneous value after 1/360 second and
      ii. the time taken to reach 96A for the first time. [6+10]

3. (a) A shunt generator has a full load current of 196 A at 220V. The stray losses
   are 720W and the shunt field coil resistance is 55ohms. If it has a full load
   efficiency of 88%, find the armature resistance. Also find the load current
   corresponding to maximum efficiency.

   (b) Long shunt compound wound generator gives 240V at full load output of 100A.
   Resistances of various windings of the machine are armature(including brush
   contact) 0.1ohm, series field 0.02ohm, interpole field 0.025ohm, shunt field
   100ohms. The iron loss at full load is 1000W. Windage and friction losses are
   500W. Calculate the full load efficiency of the machine. [8+8]

4. (a) Draw the torque slip characteristic and mark the operating region of the motor
   in regard to its safety.

   (b) A 3- phase , 6 pole , 50Hz induction motor has a slip of 1% at no load and
   3% at full load. Find
      i. Synchronous speed
      ii. No load speed
      iii. Full load speed
      iv. Frequency of rotor current at standstill
      v. Frequency of rotor current at full load. [6+10]

5. (a) What are the assumptions made while calculating the regulation using syn-
   chronous impedance method.

   (b) A 3- phase 50Hz star connected 2000KVA , 2300V, alternator gives a short
   circuit current of 600Amps for a certain field excitation.With the same excita-
   tion the OC Voltage was 900V .The resistance between the pair of terminals
   was 0.12 Ohms . Find the % regulation at Half full load at

3

     i. UPF

     ii. 0.8PF leading

     iii. 0.9 PF lagging   [6+10]

6. (a) Define regulation of a Transformer. How does it vary with the load current?

  (b) Full load efficiency of a 4,000/400V, 40 KVA, Single Phase Transformer is 94%
maximum efficiency occurs at 90% of the full-load: Find Iron loss and full-load
copper loss of the Transformer. The load power factor being 0.8 lagging.

                                             [6+10]

7. uA moving coil instrument which given full scale deflection with 15mA, has a copper
coil having a resistance of 1.5Ω at 15^0C, and a temperature coefficient of 1/234.5 at
0^0C in series with a resistor of 3.5Ω having a negligible temp coefficient. Determine

  (a) the resistance of shunt required for a full scale deflection of 20A and

  (b) the resistance required for a full scale deflection of 250v. If the instrument
reads correctly at 15^0C, determine the percentage error in each case when the
temperature is 25^0C.   [16]

8. (a) Explain about "Dot convention" in the case of mutually coupled circuits.

  (b) Explain briefly "How you can use mutual inductance principle to the trans-
former".   [8+8]

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Code No: RR210303 | **RR** | **Set No. 1**

II B.Tech I Semester Examinations,November 2010
ELECTRICAL ENGINEERING
Common to ME, CHEM, MECT, MEP, MMT

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) With a neat sketch, explain the operation of three point starter.

   (b) If the load is removed from a dc series motor in operation, what will happen?
   [12+4]

2. (a) What are the assumptions made while calculating the regulation using synchronous impedance method.

   (b) A 3- phase 50Hz star connected 2000KVA , 2300V alternator gives a short circuit current of 600Amps for a certain field excitation.With the same excitation the OC Voltage was 900V .The resistance between the pair of terminals was 0.12 Ohms . Find the % regulation at Half full load at

      i. UPF

      ii. 0.8PF leading

      iii. 0.9 PF lagging   [6+10]

3. (a) Define cycle, frequency, phase.

   (b) An alternating current at frequency 60Hz has a maximum value of 120A. Write down the equation for its instantaneous value. Reckoning time from the instant the current zero and is becoming positive find

      i. the instantaneous value after 1/360 second and

      ii. the time taken to reach 96A for the first time.   [6+10]

4. (a) Draw the torque slip characteristic and mark the operating region of the motor in regard to its safety.

   (b) A 3- phase , 6 pole , 50Hz induction motor has a slip of 1% at no load and 3% at full load. Find

      i. Synchronous speed

      ii. No load speed

      iii. Full load speed

      iv. Frequency of rotor current at standstill

      v. Frequency of rotor current at full load.   [6+10]

5. uA moving coil instrument which given full scale deflection with 15mA, has a copper coil having a resistance of 1.5Ω at 15^0C, and a temperature coefficient of 1/234.5 at 0^0C in series with a resistor of 3.5Ω having a negligible temp coefficient. Determine

   (a) the resistance of shunt required for a full scale deflection of 20A and

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(b) the resistance required for a full scale deflection of 250v. If the instrument reads correctly at 15^0C, determine the percentage error in each case when the temperature is 25^0C. [16]

6. (a) Define regulation of a Transformer. How does it vary with the load current?

(b) Full load efficiency of a 4,000/400V, 40 KVA, Single Phase Transformer is 94% maximum efficiency occurs at 90% of the full-load: Find Iron loss and full-load copper loss of the Transformer. The load power factor being 0.8 lagging.

[6+10]

7. (a) A shunt generator has a full load current of 196 A at 220V. The stray losses are 720W and the shunt field coil resistance is 55ohms. If it has a full load efficiency of 88%, find the armature resistance. Also find the load current corresponding to maximum efficiency.

(b) Long shunt compound wound generator gives 240V at full load output of 100A. Resistances of various windings of the machine are armature(including brush contact) 0.1ohm, series field 0.02ohm, interpole field 0.025ohm, shunt field 100ohms. The iron loss at full load is 1000W. Windage and friction losses are 500W. Calculate the full load efficiency of the machine. [8+8]

8. (a) Explain about "Dot convention" in the case of mutually coupled circuits.

(b) Explain briefly "How you can use mutual inductance principle to the transformer". [8+8]

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Code No: RR210303 | **RR** | **Set No. 3**

II B.Tech I Semester Examinations,November 2010
ELECTRICAL ENGINEERING
Common to ME, CHEM, MECT, MEP, MMT

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. uA moving coil instrument which given full scale deflection with 15mA, has a copper coil having a resistance of 1.5Ω at 15^0C, and a temperature coefficient of $1/234.5$ at 0^0C in series with a resistor of 3.5Ω having a negligible temp coefficient. Determine

   (a) the resistance of shunt required for a full scale deflection of 20A and

   (b) the resistance required for a full scale deflection of 250v. If the instrument reads correctly at 15^0C, determine the percentage error in each case when the temperature is 25^0C.   [16]

2. (a) A shunt generator has a full load current of 196 A at 220V. The stray losses are 720W and the shunt field coil resistance is 55ohms. If it has a full load efficiency of 88%, find the armature resistance. Also find the load current corresponding to maximum efficiency.

   (b) Long shunt compound wound generator gives 240V at full load output of 100A. Resistances of various windings of the machine are armature(including brush contact) 0.1ohm, series field 0.02ohm, interpole field 0.025ohm, shunt field 100ohms. The iron loss at full load is 1000W. Windage and friction losses are 500W. Calculate the full load efficiency of the machine.   [8+8]

3. (a) What are the assumptions made while calculating the regulation using synchronous impedance method.

   (b) A 3- phase 50Hz star connected 2000KVA , 2300V, alternator gives a short circuit current of 600Amps for a certain field excitation.With the same excitation the OC Voltage was 900V .The resistance between the pair of terminals was 0.12 Ohms . Find the % regulation at Half full load at

      i. UPF
      ii. 0.8PF leading
      iii. 0.9 PF lagging   [6+10]

4. (a) Draw the torque slip characteristic and mark the operating region of the motor in regard to its safety.

   (b) A 3- phase , 6 pole , 50Hz induction motor has a slip of 1% at no load and 3% at full load. Find

      i. Synchronous speed
      ii. No load speed
      iii. Full load speed

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        iv. Frequency of rotor current at standstill

        v. Frequency of rotor current at full load.   [6+10]

5. (a) With a neat sketch, explain the operation of three point starter.

   (b) If the load is removed from a dc series motor in operation, what will happen?   [12+4]

6. (a) Define regulation of a Transformer. How does it vary with the load current?

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7. (a) Define cycle, frequency, phase.

   (b) An alternating current at frequency 60Hz has a maximum value of 120A. Write down the equation for its instantaneous value. Reckoning time from the instant the current zero and is becoming positive find

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8. (a) Explain about "Dot convention" in the case of mutually coupled circuits.

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