Code No: RR222104 **RR** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL AND ELECTRONICS ENGINEERING
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Derive from first principles, emf equation of a transformer.
   (b) The rated primary and secondary voltages of a 100kVA transformer are 11000 V and 400 volts. The Iron losses and full load copper loss determined by open circuit and short circuit test are 250 watts and 750 watts respectively. The short circuit test is performed by applying 500 volts to primary winding with secondary winding short circuits. Find full load voltage regulation of 0.8 p.f. lagging, leading and unity p.f. [6+10]

2. (a) Draw a neat diagram for various types of generators.
   (b) An 8-pole d.c. shunt generator with 778 wave-connected armature conductors and running at 500 rpm supplies a load of 12.5Ω resistance at terminal voltage of 250V. The armature resistance is 0.24 ohms and the field resistance is 250Ω . Find the armature current, the induced emf and the flux per pole. [6+10]

3. (a) Explain the crystal structure of N - type Semi Conductor with neat diagram
   (b) Derive an expression for conductivity of Intrinsic Semi Conductor. [8+8]

4. (a) Define magnetic force. Discuss electron movement in uniform electric field when it enters into the field with 90^0.
   (b) Explain Different Screen materials used in CRT. [8+8]

5. (a) Sketch and explain the input characteristics of a transistor operating in CB configuration and explain the effect of base width modulation on these characteristics.
   (b) Draw the symbols of PNP and NPN transistors and explain the significance of arrow direction on emitter lead. [10+6]

6. (a) Explain the Half-power frequencies in a resonance circuit.
   (b) An R-L-C series circuit consists of a resistance of 1000 ohm, an inductance of 100mH and a capacitance of 10 micro Farad. If a voltage of 100V is applied across the combination, find
      i. the resonance frequency
      ii. Q-factor of the circuit and
      iii. the half power points. [6+10]

7. (a) How FET can be used as an amplifier? Explain.
   (b) Give the applications of UJT. [8+8]

8. (a) A 3-phase, 200kVA, 400V, 50 Hz alternator has per phase armature resistance and synchronous reactance of 0.1 and 1.2 ohm respectively. Determine induced emf when the machine is delivering rated current at a load power factor of unity. Draw the phasor diagram also.

   (b) A 440, three phase, 50Hz, six pole induction motor running at 970 rpm takes 50kW at a certain load. The friction and windage loss is 1.6kW, stator losses = 1kW, Calculate

   i. percentage slip
   ii. rotor copper loss
   iii. output from the rotor
   iv. efficiency. [8+8]

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Code No: RR222104 **RR** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL AND ELECTRONICS ENGINEERING
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw a neat diagram for various types of generators.
   (b) An 8-pole d.c. shunt generator with 778 wave-connected armature conductors and running at 500 rpm supplies a load of 12.5Ω resistance at terminal voltage of 250V. The armature resistance is 0.24 ohms and the field resistance is 250Ω . Find the armature current, the induced emf and the flux per pole. [6+10]

2. (a) How FET can be used as an amplifier? Explain.
   (b) Give the applications of UJT. [8+8]

3. (a) A 3-phase, 200kVA, 400V, 50 Hz alternator has per phase armature resistance and synchronous reactance of 0.1 and 1.2 ohm respectively. Determine induced emf when the machine is delivering rated current at a load power factor of unity. Draw the phasor diagram also.
   (b) A 440, three phase, 50Hz, six pole induction motor running at 970 rpm takes 50kW at a certain load. The friction and windage loss is 1.6kW, stator losses = 1kW, Calculate
      i. percentage slip
      ii. rotor copper loss
      iii. output from the rotor
      iv. efficiency. [8+8]

4. (a) Define magnetic force. Discuss electron movement in uniform electric field when it enters into the field with 90^0.
   (b) Explain Different Screen materials used in CRT. [8+8]

5. (a) Explain the Half-power frequencies in a resonance circuit.
   (b) An R-L-C series circuit consists of a resistance of 1000 ohm, an inductance of 100mH and a capacitance of 10 micro Farad. If a voltage of 100V is applied across the combination, find
      i. the resonance frequency
      ii. Q-factor of the circuit and
      iii. the half power points. [6+10]

6. (a) Explain the crystal structure of N - type Semi Conductor with neat diagram
   (b) Derive an expression for conductivity of Intrinsic Semi Conductor. [8+8]

7. (a) Sketch and explain the input characteristics of a transistor operating in CB configuration and explain the effect of base width modulation on these characteristics.

   (b) Draw the symbols of PNP and NPN transistors and explain the significance of arrow direction on emitter lead. [10+6]

8. (a) Derive from first principles, emf equation of a transformer.

   (b) The rated primary and secondary voltages of a 100kVA transformer are 11000 V and 400 volts. The Iron losses and full load copper loss determined by open circuit and short circuit test are 250 watts and 750 watts respectively. The short circuit test is performed by applying 500 volts to primary winding with secondary winding short circuits. Find full load voltage regulation of 0.8 p.f. lagging, leading and unity p.f. [6+10]

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Code No: RR222104 **RR** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL AND ELECTRONICS ENGINEERING
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) A 3-phase, 200kVA, 400V, 50 Hz alternator has per phase armature resistance and synchronous reactance of 0.1 and 1.2 ohm respectively. Determine induced emf when the machine is delivering rated current at a load power factor of unity. Draw the phasor diagram also.
   (b) A 440, three phase, 50Hz, six pole induction motor running at 970 rpm takes 50kW at a certain load. The friction and windage loss is 1.6kW, stator losses = 1kW, Calculate
      i. percentage slip
      ii. rotor copper loss
      iii. output from the rotor
      iv. efficiency. [8+8]
2. (a) Draw a neat diagram for various types of generators.
   (b) An 8-pole d.c. shunt generator with 778 wave-connected armature conductors and running at 500 rpm supplies a load of 12.5Ω resistance at terminal voltage of 250V. The armature resistance is 0.24 ohms and the field resistance is 250Ω . Find the armature current, the induced emf and the flux per pole. [6+10]
3. (a) Sketch and explain the input characteristics of a transistor operating in CB configuration and explain the effect of base width modulation on these characteristics.
   (b) Draw the symbols of PNP and NPN transistors and explain the significance of arrow direction on emitter lead. [10+6]
4. (a) Explain the Half-power frequencies in a resonance circuit.
   (b) An R-L-C series circuit consists of a resistance of 1000 ohm, an inductance of 100mH and a capacitance of 10 micro Farad. If a voltage of 100V is applied across the combination, find
      i. the resonance frequency
      ii. Q-factor of the circuit and
      iii. the half power points. [6+10]
5. (a) Define magnetic force. Discuss electron movement in uniform electric field when it enters into the field with 90^0.
   (b) Explain Different Screen materials used in CRT. [8+8]

6. (a) Derive from first principles, emf equation of a transformer.
   (b) The rated primary and secondary voltages of a 100kVA transformer are 11000 V and 400 volts. The Iron losses and full load copper loss determined by open circuit and short circuit test are 250 watts and 750 watts respectively. The short circuit test is performed by applying 500 volts to primary winding with secondary winding short circuits. Find full load voltage regulation of 0.8 p.f. lagging, leading and unity p.f. [6+10]

7. (a) How FET can be used as an amplifier? Explain.
   (b) Give the applications of UJT. [8+8]

8. (a) Explain the crystal structure of N - type Semi Conductor with neat diagram
   (b) Derive an expression for conductivity of Intrinsic Semi Conductor. [8+8]

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Code No: RR222104 **RR** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
ELECTRICAL AND ELECTRONICS ENGINEERING
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Sketch and explain the input characteristics of a transistor operating in CB configuration and explain the effect of base width modulation on these characteristics.
   (b) Draw the symbols of PNP and NPN transistors and explain the significance of arrow direction on emitter lead. [10+6]
2. (a) Draw a neat diagram for various types of generators.
   (b) An 8-pole d.c. shunt generator with 778 wave-connected armature conductors and running at 500 rpm supplies a load of 12.5Ω resistance at terminal voltage of 250V. The armature resistance is 0.24 ohms and the field resistance is 250Ω . Find the armature current, the induced emf and the flux per pole. [6+10]
3. (a) Explain the Half-power frequencies in a resonance circuit.
   (b) An R-L-C series circuit consists of a resistance of 1000 ohm, an inductance of 100mH and a capacitance of 10 micro Farad. If a voltage of 100V is applied across the combination, find
      i. the resonance frequency
      ii. Q-factor of the circuit and
      iii. the half power points. [6+10]
4. (a) Define magnetic force. Discuss electron movement in uniform electric field when it enters into the field with 90^0.
   (b) Explain Different Screen materials used in CRT. [8+8]
5. (a) Explain the crystal structure of N - type Semi Conductor with neat diagram
   (b) Derive an expression for conductivity of Intrinsic Semi Conductor. [8+8]
6. (a) Derive from first principles, emf equation of a transformer.
   (b) The rated primary and secondary voltages of a 100kVA transformer are 11000 V and 400 volts. The Iron losses and full load copper loss determined by open circuit and short circuit test are 250 watts and 750 watts respectively. The short circuit test is performed by applying 500 volts to primary winding with secondary winding short circuits. Find full load voltage regulation of 0.8 p.f. lagging, leading and unity p.f. [6+10]

7. (a) A 3-phase, 200kVA, 400V, 50 Hz alternator has per phase armature resistance and synchronous reactance of 0.1 and 1.2 ohm respectively. Determine induced emf when the machine is delivering rated current at a load power factor of unity. Draw the phasor diagram also.

   (b) A 440, three phase, 50Hz, six pole induction motor running at 970 rpm takes 50kW at a certain load. The friction and windage loss is 1.6kW, stator losses = 1kW, Calculate

   i. percentage slip
   ii. rotor copper loss
   iii. output from the rotor
   iv. efficiency. [8+8]

8. (a) How FET can be used as an amplifier? Explain.

   (b) Give the applications of UJT. [8+8]

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