Code.No: R05010501 | R05 | SET-1

I B.TECH – EXAMINATIONS, JUNE - 2011
BASIC ELECTRICAL ENGINEERING
(COMMON TO CSE, IT)

Time: 3hours   Max.Marks:80

Answer any FIVE questions
All questions carry equal marks
- - -

1.a)   Derive the formula for magnetic force of a long straight conductor.
 b)   A current of 15A is passing along a straight wire. Calculate the force on a unit
       magnetic pole placed 0.15 m from the wire.   [8+8]

2.a)   What is meant by Energy storing elements? Name them?
 b)   Derive an expression for the capacitance of a parallel circuit.
 c)   A potential difference of 400V is maintained across a capacitor of
       value $25 \times 10^{-6} F$. Calculate:
       i) The charge   ii) Electric field strength,
       if the distance between the plates of capacitor is 0.5 mm, and area of the plates is
       I m^2 and permittivity is 8.85×10^{-12} F/m.   [4+4+8]

3.   Two coils of 1500 and 2000 turns are wound on a common magnetic circuit of
       reluctance 250,000 AT/wb. Find the mutual inductance when leakage flux is
       neglected. If the self inductance of the two coils is 2H each, calculate the net
       inductance if the fluxes in the two coils:
       a)   Oppose each other   b)   Aid each other
       c)   Coupled with a co efficient of derive the equation used.   [16]

4.a)   What is meant by Active power, reactive power and apparent power.
 b)   A coil of $R = 4\Omega$, $X_L = 3\Omega$ connected in series with a condenser of R = 8 Ω,
       $X_c = 8\Omega$, this combination is connected to 4 Ω resistor. Across this series circuit a
       voltage $100\angle 0$ is applied. Calculate:
       (i)   Current   (ii) Voltage drops across coil, condenser and resistor and
       (iii)   Power absorbed by the circuit. Take voltage vector along the reference
                axis.   [16]

5.a)   Discuss the constructional features of transformers. Draw neat diagrams.
 b)   Calculate the flux in the core of a single-phase transformer having a primary
       voltage of 230 V, at 50 Hz and 50 turns. If the flux density in the core is 1 Tesla,
       calculate the net cross-sectional area of the core.   [8+8]

6.a)   Explain the principle of operation of a dc motor with neat diagram.
 b)   The armature of a dc machine has a resistance of 0.1 Ω and is connected to a
       230V supply. Calculate the back emf when it is running as a motor taking 80A.
 c)   Mention merits and demerits of lab and wave windings.   [8+3+5]

7.a)   Explain the working principle of three phase induction motor.
 b)   A 6 pole induction motor is fed by three phase 50 HZ supply and running with a
       full load slip of 3%. Find the full load speed of induction motor and
       also the frequency of rotor emf.   [8+8]

8.   Explain the following with reference to the indicating instruments:
       a)   Deflecting torque   b)   Controlling torque
       c)   Damping torque   d)   Scale and pointer   [16]

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Code.No: R05010501   R05   SET-2

I B.TECH – EXAMINATIONS, JUNE - 2011
BASIC ELECTRICAL ENGINEERING
(COMMON TO CSE, IT)

Time: 3hours   Max.Marks:80

Answer any FIVE questions
All questions carry equal marks
- - -

1.   Two coils of 1500 and 2000 turns are wound on a common magnetic circuit of reluctance 250,000 AT/wb. Find the mutual inductance when leakage flux is neglected. If the self inductance of the two coils is 2H each, calculate the net inductance if the fluxes in the two coils:
       a)   Oppose each other   b)   Aid each other
       c)   Coupled with a co efficient of derive the equation used.   [16]

2.a)   What is meant by Active power, reactive power and apparent power.
   b)   A coil of $R = 4\Omega$, $X_L= 3\Omega$ connected in series with a condenser of R = 8Ω, $X_c= 8\Omega$, this combination is connected to 4Ω resistor. Across this series circuit a voltage $100\angle0$ is applied. Calculate:
       (i)   Current   (ii) Voltage drops across coil, condenser and resistor and
       (iii)   Power absorbed by the circuit. Take voltage vector along the reference axis.   [16]

3.a)   Discuss the constructional features of transformers. Draw neat diagrams.
   b)   Calculate the flux in the core of a single-phase transformer having a primary voltage of 230 V, at 50 Hz and 50 turns. If the flux density in the core is 1 Tesla, calculate the net cross-sectional area of the core.   [8+8]

4.a)   Explain the principle of operation of a dc motor with neat diagram.
   b)   The armature of a dc machine has a resistance of 0.1Ω and is connected to a 230V supply. Calculate the back emf when it is running as a motor taking 80A.
   c)   Mention merits and demerits of lab and wave windings.   [8+3+5]

5.a)   Explain the working principle of three phase induction motor.
   b)   A 6 pole induction motor is fed by three phase 50 HZ supply and running with a full load slip of 3%. Find the full load speed of induction motor and also the frequency of rotor emf.   [8+8]

6.   Explain the following with reference to the indicating instruments:
       a)   Deflecting torque   b)   Controlling torque
       c)   Damping torque   d)   Scale and pointer   [16]

7.a)   Derive the formula for magnetic force of a long straight conductor.
   b)   A current of 15A is passing along a straight wire. Calculate the force on a unit magnetic pole placed 0.15 m from the wire.   [8+8]

8.a)   What is meant by Energy storing elements? Name them?
   b)   Derive an expression for the capacitance of a parallel circuit.
   c)   A potential difference of 400V is maintained across a capacitor of value $25\times10^{-6}F$. Calculate:
       i) The charge   ii) Electric field strength,
       if the distance between the plates of capacitor is 0.5 mm, and area of the plates is I m² and permittivity is 8.85×10^{-12} F/m.   [4+4+8]

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BASIC ELECTRICAL ENGINEERING
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Time: 3hours   Max.Marks:80

Answer any FIVE questions
All questions carry equal marks
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1.a) Discuss the constructional features of transformers. Draw neat diagrams.
 b) Calculate the flux in the core of a single-phase transformer having a primary voltage of 230 V, at 50 Hz and 50 turns. If the flux density in the core is 1 Tesla, calculate the net cross-sectional area of the core. [8+8]

2.a) Explain the principle of operation of a dc motor with neat diagram.
 b) The armature of a dc machine has a resistance of 0.1Ω and is connected to a 230V supply. Calculate the back emf when it is running as a motor taking 80A.
 c) Mention merits and demerits of lab and wave windings. [8+3+5]

3.a) Explain the working principle of three phase induction motor.
 b) A 6 pole induction motor is fed by three phase 50 HZ supply and running with a full load slip of 3%. Find the full load speed of induction motor and also the frequency of rotor emf. [8+8]

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    a) Deflecting torque   b) Controlling torque
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7. Two coils of 1500 and 2000 turns are wound on a common magnetic circuit of reluctance 250,000 AT/wb. Find the mutual inductance when leakage flux is neglected. If the self inductance of the two coils is 2H each, calculate the net inductance if the fluxes in the two coils:
    a) Oppose each other   b) Aid each other
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8.a) What is meant by Active power, reactive power and apparent power.
 b) A coil of $R=4\Omega$, $X_L=3\Omega$ connected in series with a condenser of R = 8Ω, $X_c=8\Omega$, this combination is connected to 4Ω resistor. Across this series circuit a voltage $100\angle0$ is applied. Calculate:
    (i) Current   (ii) Voltage drops across coil, condenser and resistor and
    (iii) Power absorbed by the circuit. Take voltage vector along the reference axis. [16]

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Code.No: R05010501   R05   SET-4

I B.TECH – EXAMINATIONS, JUNE - 2011
BASIC ELECTRICAL ENGINEERING
(COMMON TO CSE, IT)

Time: 3hours   Max.Marks:80

Answer any FIVE questions
All questions carry equal marks

- - -

1.a) Explain the working principle of three phase induction motor.
  b) A 6 pole induction motor is fed by three phase 50 HZ supply and running with a full load slip of 3%. Find the full load speed of induction motor and also the frequency of rotor emf.   [8+8]

2. Explain the following with reference to the indicating instruments:
    a) Deflecting torque   b) Controlling torque
    c) Damping torque   d) Scale and pointer   [16]

3.a) Derive the formula for magnetic force of a long straight conductor.
  b) A current of 15A is passing along a straight wire. Calculate the force on a unit magnetic pole placed 0.15 m from the wire.   [8+8]

4.a) What is meant by Energy storing elements? Name them?
  b) Derive an expression for the capacitance of a parallel circuit.
  c) A potential difference of 400V is maintained across a capacitor of value $25 \times 10^{-6} F$. Calculate:
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5. Two coils of 1500 and 2000 turns are wound on a common magnetic circuit of reluctance 250,000 AT/wb. Find the mutual inductance when leakage flux is neglected. If the self inductance of the two coils is 2H each, calculate the net inductance if the fluxes in the two coils:
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    c) Coupled with a co efficient of derive the equation used.   [16]

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