

Code No: R05311801

R05**Set No. 2****III B.Tech I Semester Examinations, November 2010****ELECTRICAL ENGINEERING****Metallurgy And Material Technology****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

1. (a) Derive the torque equation of an induction motor.
 (b) A 6 pole, 50Hz squirrel cage induction motor runs on load at a shaft speed of 970rpm Calculate
 - i. % slip
 - ii. The frequency of induced current in the rotor. [6+10]
2. (a) A short shunt compound generator supplies a load current of 100A at 250V. The generator has the following winding resistances: shunt field 130Ω , armature 0.1Ω and the series field 0.1Ω . Find the emf generated, if the brush drop is 2V per brush.
 (b) A 4-pole lap connected shunt generator has 300 armature conductors and flux per pole of 0.1wb. It runs at 1000rpm. The armature and field resistance are 0.2Ω and 1.5Ω respectively. Calculate the terminal voltage when it is supplying 9A to load. [8+8]
3. (a) Derive the relationship between line and phase quantities in a balanced star connected system.
 (b) An RLC Series circuit consists of a resistance of 10Ω , an inductance of 0.03H and a capacitance of $10\mu F$. Calculate
 - i. the resonant frequency
 - ii. the maximum current
 - iii. the Q factor of the circuit and
 - iv. Band width. [8+8]
4. (a) Explain the performance curves of D.C. shunt motor
 (b) A 220V shunt motor with an armature resistance of 0.5Ω is excited to give constant main field. At full-load motor runs at 500 rpm and takes an armature current of 30A. Find the speed if a resistance of 1Ω is placed in the armature circuit. Find the speed at
 - i. Full-Load torque
 - ii. Double Full-Load torque. [6+10]
5. (a) Explain how the equivalent circuit parameters can be obtained from o.c and s.c tests.

Code No: R05311801

R05**Set No. 2**

- (b) A 100 KVA, 1000V/10000V, 50Hz, 1- Φ transformer has an iron loss of 1200W. Find the maximum efficiency at 0.8 p.f lagging if the copper loss is 500W with 6A in H.V side. Also calculate the corresponding regulation if the equivalent leakage reactance referred to HV side is 10Ω . [8+8]
6. (a) What are passive and active circuit elements? Explain the voltage-current relationships of passive elements with examples.
- (b) Two coupled coils have $K = 0.8$, $N_1 = 500$ turns, $N_2 = 1000$ turns and mutual flux being 0.9Wb, find the primary coil flux. If the primary current be 10A, find the primary coil inductance. Also obtain the secondary inductance. [8+8]
7. (a) Explain the airfriction damping in indicating instruments with neat sketch
- (b) Write short notes on the following:
- i. spring control
 - ii. Gravity control. [6+10]
8. (a) Explain the principle of operation of an Alternator.
- (b) Why the Alternator is also named as Synchronous Generator
- (c) The effective resistance of a 2200 V, 50 Hz, 440kVA, 1-phase alternator is 0.5Ω , on short circuit. A field current of 40 A gives the full load current of 200A. The emf on open-circuit with the same excitation is 1,160 V. Calculate the synchronous impedance and reactance. [5+5+6]

Code No: R05311801

R05**Set No. 4****III B.Tech I Semester Examinations, November 2010****ELECTRICAL ENGINEERING****Metallurgy And Material Technology****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

1. (a) Derive the relationship between line and phase quantities in a balanced star connected system.
(b) An RLC Series circuit consists of a resistance of 10Ω , an inductance of $0.03H$ and a capacitance of $10\mu F$. Calculate
 - i. the resonant frequency
 - ii. the maximum current
 - iii. the Q factor of the circuit and
 - iv. Band width. [8+8]
2. (a) Explain the performance curves of D.C. shunt motor
(b) A 220V shunt motor with an armature resistance of 0.5Ω is excited to give constant main field. At full-load motor runs at 500 rpm and takes an armature current of 30A. Find the speed if a resistance of 1Ω is placed in the armature circuit. Find the speed at
 - i. Full-Load torque
 - ii. Double Full-Load torque. [6+10]
3. (a) Derive the torque equation of an induction motor.
(b) A 6 pole, 50Hz squirrel cage induction motor runs on load at a shaft speed of 970rpm Calculate
 - i. % slip
 - ii. The frequency of induced current in the rotor. [6+10]
4. (a) Explain the principle of operation of an Alternator.
(b) Why the Alternator is also named as Synchronous Generator
(c) The effective resistance of a 2200 V, 50 Hz, 440kVA, 1-phase alternator is 0.5Ω , on short circuit. A field current of 40 A gives the full load current of 200A. The emf on open-circuit with the same excitation is 1,160 V. Calculate the synchronous impedance and reactance. [5+5+6]
5. (a) Explain how the equivalent circuit parameters can be obtained from o.c and s.c tests.
(b) A 100 KVA, 1000v/10000v, 50Hz, 1- Φ transformer has an iron loss of 1200W. Find the maximum efficiency at 0.8 p.f lagging if the copper loss is 500W with 6A in H.V side. Also calculate the corresponding regulation if the equivalent leakage reactance referred to HV side is 10Ω . [8+8]

Code No: R05311801

R05**Set No. 4**

6. (a) A short shunt compound generator supplies a load current of 100A at 250V. The generator has the following winding resistances: shunt field 130Ω , armature 0.1Ω and the series field 0.1Ω . Find the emf generated, if the brush drop is 2 V per brush.
- (b) A 4-pole lap connected shunt generator has 300 armature conductors and flux per pole of 0.1wb. It runs at 1000rpm. The armature and field resistance are 0.2Ω and 1.5Ω respectively. Calculate the terminal voltage when it is supplying 9A to load. [8+8]
7. (a) Explain the air friction damping in indicating instruments with neat sketch
- (b) Write short notes on the following:
- i. spring control
 - ii. Gravity control. [6+10]
8. (a) What are passive and active circuit elements? Explain the voltage-current relationships of passive elements with examples.
- (b) Two coupled coils have $K = 0.8$, $N_1 = 500$ turns, $N_2 = 1000$ turns and mutual flux being 0.9Wb, find the primary coil flux. If the primary current be 10A, find the primary coil inductance. Also obtain the secondary inductance. [8+8]

Code No: R05311801

R05**Set No. 1****III B.Tech I Semester Examinations, November 2010****ELECTRICAL ENGINEERING****Metallurgy And Material Technology****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

1. (a) Explain the air friction damping in indicating instruments with neat sketch
(b) Write short notes on the following:
 - i. spring control
 - ii. Gravity control. [6+10]
2. (a) Derive the relationship between line and phase quantities in a balanced star connected system.
(b) An RLC Series circuit consists of a resistance of 10Ω , an inductance of $0.03H$ and a capacitance of $10\mu F$. Calculate
 - i. the resonant frequency
 - ii. the maximum current
 - iii. the Q factor of the circuit and
 - iv. Band width. [8+8]
3. (a) Derive the torque equation of an induction motor.
(b) A 6 pole, 50Hz squirrel cage induction motor runs on load at a shaft speed of 970rpm Calculate
 - i. % slip
 - ii. The frequency of induced current in the rotor. [6+10]
4. (a) A short shunt compound generator supplies a load current of 100A at 250V. The generator has the following winding resistances: shunt field 130Ω , armature 0.1Ω and the series field 0.1Ω . Find the emf generated, if the brush drop is 2V per brush.
(b) A 4-pole lap connected shunt generator has 300 armature conductors and flux per pole of 0.1wb. It runs at 1000rpm. The armature and field resistance are 0.2Ω and 1.5Ω respectively. Calculate the terminal voltage when it is supplying 9A to load. [8+8]
5. (a) Explain how the equivalent circuit parameters can be obtained from o.c and s.c tests.
(b) A 100 KVA, 1000V/10000V, 50Hz, 1- Φ transformer has an iron loss of 1200W. Find the maximum efficiency at 0.8 p.f lagging if the copper loss is 500W with 6A in H.V side. Also calculate the corresponding regulation if the equivalent leakage reactance referred to HV side is 10Ω . [8+8]

Code No: R05311801

R05**Set No. 1**

6. (a) Explain the principle of operation of an Alternator.
(b) Why the Alternator is also named as Synchronous Generator
(c) The effective resistance of a 2200 V, 50 Hz, 440kVA, 1-phase alternator is 0.5Ω , on short circuit. A field current of 40 A gives the full load current of 200A. The emf on open-circuit with the same excitation is 1,160 V. Calculate the synchronous impedance and reactance. [5+5+6]
7. (a) What are passive and active circuit elements? Explain the voltage-current relationships of passive elements with examples.
(b) Two coupled coils have $K = 0.8$, $N_1 = 500$ turns, $N_2 = 1000$ turns and mutual flux being 0.9Wb, find the primary coil flux. If the primary current be 10A, find the primary coil inductance. Also obtain the secondary inductance. [8+8]
8. (a) Explain the performance curves of D.C. shunt motor
(b) A 220V shunt motor with an armature resistance of 0.5Ω is excited to give constant main field. At full-load motor runs at 500 rpm and takes an armature current of 30A. Find the speed if a resistance of 1Ω is placed in the armature circuit. Find the speed at
i. Full-Load torque
ii. Double Full-Load torque. [6+10]

Code No: R05311801

R05**Set No. 3****III B.Tech I Semester Examinations, November 2010****ELECTRICAL ENGINEERING****Metallurgy And Material Technology****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

1. (a) Derive the relationship between line and phase quantities in a balanced star connected system.
- (b) An RLC Series circuit consists of a resistance of 10Ω , an inductance of $0.03H$ and a capacitance of $10\mu F$. Calculate
 - i. the resonant frequency
 - ii. the maximum current
 - iii. the Q factor of the circuit and
 - iv. Band width. [8+8]
2. (a) Explain the performance curves of D.C. shunt motor
- (b) A 220V shunt motor with an armature resistance of 0.5Ω is excited to give constant main field. At full-load motor runs at 500 rpm and takes an armature current of 30A. Find the speed if a resistance of 1Ω is placed in the armature circuit. Find the speed at
 - i. Full-Load torque
 - ii. Double Full-Load torque. [6+10]
3. (a) Explain how the equivalent circuit parameters can be obtained from o.c and s.c tests.
- (b) A 100 KVA, 1000v/10000v, 50Hz, 1- Φ transformer has an iron loss of 1200W. Find the maximum efficiency at 0.8 p.f lagging if the copper loss is 500W with 6A in H.V side. Also calculate the corresponding regulation if the equivalent leakage reactance referred to HV side is 10Ω . [8+8]
4. (a) Explain the airfriction damping in indicating instruments with neat sketch
- (b) Write short notes on the following:
 - i. spring control
 - ii. Gravity control. [6+10]
5. (a) Explain the principle of operation of an Alternator.
- (b) Why the Alternator is also named as Synchronous Generator
- (c) The effective resistance of a 2200 V, 50 Hz, 440kVA, 1-phase alternator is 0.5Ω , on short circuit. A field current of 40 A gives the full load current of 200A. The emf on open-circuit with the same excitation is 1,160 V. Calculate the synchronous impedance and reactance. [5+5+6]

Code No: R05311801

R05**Set No. 3**

6. (a) Derive the torque equation of an induction motor.
- (b) A 6 pole, 50Hz squirrel cage induction motor runs on load at a shaft speed of 970rpm Calculate
- % slip
 - The frequency of induced current in the rotor. [6+10]
7. (a) A short shunt compound generator supplies a load current of 100A at 250V. The generator has the following winding resistances: shunt field 130Ω , armature 0.1Ω and the series field 0.1Ω . Find the emf generated, if the brush drop is 2 V per brush.
- (b) A 4-pole lap connected shunt generator has 300 armature conductors and flux per pole of 0.1wb. It runs at 1000rpm. The armature and field resistance are 0.2Ω and 1.5Ω respectively. Calculate the terminal voltage when it is supplying 9A to load. [8+8]
8. (a) What are passive and active circuit elements? Explain the voltage-current relationships of passive elements with examples.
- (b) Two coupled coils have $K = 0.8$, $N_1 = 500$ turns, $N_2 = 1000$ turns and mutual flux being 0.9Wb, find the primary coil flux. If the primary current be 10A, find the primary coil inductance. Also obtain the secondary inductance. [8+8]
