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**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2008**

EC/AIPT 2K 306 – ELECTRICAL ENGINEERING

Time : Three Hours

Maximum : 100 Marks

1. (a) Define commutation in DC machine.
(b) State the factors on which the Torque developed in a DC motor depends.
(c) Draw the phasor diagram of a loaded transformer for lagging PF load.
(d) Write down the equation for saving in copper effected by Auto-transformer.
(e) Sketch the torque-slip characteristic of a 3-phase slip ring induction motor for various rotor resistance.
(f) Explain any *one* method of a starting of a synchronous motor.
(g) Why cannot a moving coil instrument be used in AC circuits?
(h) Distinguish between wattmeter and energy meter.

(8 × 5 = 40 marks)

2. (a) (i) Sketch the occ of DC generators and explain the reason for the different shapes.
(ii) A 220V, DC shunt motor with an armature resistance of 0.5Ω is expected to give constant main field. At full load the motor runs at 500 r.p.m. and takes an armature current of 30 A, If a resistance of 1Ω is placed in series with armature, Find the speed at full load. Find also the stalling torque.

(8 + 7 = 15 marks)

Or

- (b) (i) Derive the emf equation of a DC generator.
(ii) With the neat sketch explain the four point starter.

(7 + 8 = 15 marks)

3. (a) (i) Derive the emf equation of a Transformer.
(ii) A 220 V/440 V single - phase transformer has the following test results:
OC test: 220 V, 1 A, 70 W on LV side.
SC test: 20 V; 12 A; 100 W on HV side.
Draw the equavalant circuit of the transformer referred to HV side.

(7 + 8 = 15 marks)

Or

Turn over

- (b) (i) Discuss the operation of an Auto transformer and its advantages over a two winding transformer.
(ii) Draw and explain the phasor diagram of a transformer for LPF load.

(8 + 7 = 15 marks)

4. (a) (i) Discuss with neat sketch constructional features of high speed Alternator.
(ii) Develop the equivalent circuit of an 3-ph Induction Motor.

(7 + 8 = 15 marks)

Or

- (b) (i) Explain the Auto transformer starter for 3-phase Induction motor.
(ii) Explain the starting methods of a 3-phase synchronous motor.

(7 + 8 = 15 marks)

5. (a) (i) Describe the operation of a attraction type moving iron instrument.
(ii) Explain how the 3-phase power is measured with the two wattmeter method.

(8 + 7 = 15 marks)

Or

- (b) With the neat diagram explain the operation of a 3-Phase energy meter. Also distinguish with wattmeter.

(15 marks)

[4 × 15 = 60 marks]