

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EE 216
Course Name: ELECTRICAL ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any TWO full questions

1. (a) Discuss the principle of working of a transformer. (5)
(b) A single phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60 cm^2 . If the primary winding be connected to a 50 Hz supply, at 500 V, calculate (i) the peak value of flux density in the core and (ii) the voltage induced in the secondary winding. (5)
(c) Draw the approximate equivalent circuit of a transformer and indicate how it differs from exact equivalent circuit. (5)
2. (a) Derive the EMF equation of a multi pole DC generator. (5)
(b) A six pole lap connected machine has an armature with 90 slots and 8 conductors per slot and runs at 1000 rpm; the flux per pole is 0.05 weber. Determine the induced emf. (5)
(c) What are functions of interpoles? (5)
3. (a) An auto transformer having 120 turns is connected across a 250 V ac supply. What secondary voltage will be obtained if a tap is taken at 800th turn? (5)
(b) What do you understand by armature reaction? (5)
(c) List out the conditions to be satisfied for running two or more DC shunt generators in parallel. (5)

PART B

Answer any TWO full questions

4. (a) What are important characteristics of a DC Motor and sketch all these characteristics of DC series motor? (5)
(b) A 120 V DC shunt motor has an armature resistance of 0.2Ω and a field resistance of 60Ω . The full load line current is 60 A and full load speed is 1800 rpm. Find the speed of the motor at half load. (5)
(c) Draw the power flow diagram of a DC motor. (5)
5. (a) Write advantages of stationary armature and rotating field in an alternator. (5)
(b) Derive the expression for distribution factor in an alternator. (5)
(c) Draw and explain the equivalent circuit of a three phase induction motor (5)
6. (a) Explain the working principle of a three point starter of a DC shunt motor. (8)
(b) Explain the different starting methods of a synchronous motor. (7)

PART C*Answer any TWO full questions*

- 7 (a) Explain why a single phase induction motor does not self start. Discuss its operation based on double field revolving theory. (10)
- (b) The power input to a 500 V, 50 Hz, 6 pole, three phase squirrel cage induction motor running at 975 rpm is 40 kW. The stator losses are 1 kW and the friction and windage losses are 2 kW. Calculate (i) slip, (ii) rotor copper loss (iii) BHP (iv) efficiency. (10)
- 8 (a) Describe the construction and working of PMMC instrument. (10)
- (b) Describe the constructional details of an electro dynamometer type wattmeter. (10)
- 9 (a) Give four reasons why ac servomotors are generally preferred to dc servomotor. (4)
- (b) Enumerate various components of power loss in an induction motor and name the parts wherein these occur. (4)
- (c) Describe the measurement of power using two wattmeter method with necessary diagrams. (8)
- (d) Describe the basic principle of operation of a DC potentiometer. (4)
