

G 1414

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 602—INDUCTION MACHINES (EE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]



Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Draw equivalent circuit of *three* phase induction motor with usual notations. State the meaning of each notation.
2. Explain why three phase induction motor draws high current during starting Condition. State any *two* methods of starting three phase induction motor.
3. Draw a neat sketch of Brushless DC motor and label all the parts.
4. Why are rotor iron losses in case of *three* phase induction motor negligibly small ?
5. State any *three* applications of universal motor.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Draw power stage diagram or power flow diagram of *three* phase induction motor and explain it in brief.
7. Explain how rotating magnetic field is produced in case of *three* phase induction motor.
8. Explain how and why the following parameters change when load on three phase induction motor is increased: (i) Slip ; (ii) Rotor induced e.m.f. ; (iii) Rotor current ; (iv) Rotor frequency ; and (v) Copper losses.
9. What is single phasing in case of *three* phase induction motor ? State the remedy for it.
10. Explain the working principle of commutator motor.

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.
Each question carries 12 marks.

11. With suitable diagram explain working of induction generator. State its applications.

Or

12. With suitable diagram explain construction and working of synchronous induction motor. State the advantages of this motor.
13. With a neat circuit diagram explain —No load and Blocked rotor test on three phase induction motor. What information can be obtained from these tests ?

Or

14. No load and blocked rotor test on three phase induction motor rated 500 volt, 50 Hz gave following observations :

| | | | |
|--------------------|----------|--------|----------|
| No load test | 500 volt | 4 Amp | 750 Watt |
| Blocked rotor test | 100 volt | 16 Amp | 800 Watt |

From above observations, draw circle diagram and find (i) Efficiency ; (ii) Power factor when motor supplies 25 HP. Assume suitable data if necessary.

15. With suitable diagram explain the working of linear induction motor and state its applications.

Or

16. Explain conductively compensated and inductively compensated single phase a.c. series motor. Draw phasor diagram of single phase a.c. series motor.
17. Why single phase a.c. motor are not self starting ? Explain double field revolving theory.

Or

18. The capacitor start induction motor has the following results :—

Rating-230 volt, 50 Hz, 250 watt.

Main winding impedance $Z_m = 4.5 + j 3.7 \text{ Ohm}$.

Auxiliary (starting) winding impedance $Z_s = 9.5 + j 3.5 \text{ Ohm}$.

Find the value of capacitance of a capacitor which will give maximum starting torque.

19. What are the advantages of a deep bar double cage induction motor ? Draw its equivalent circuit and state applications of this motor.

Or

20. With suitable diagrams, explain construction and working of (i) Reluctance motor (ii) Hysteresis motor. State two applications of each motor.

(5 × 12 = 60 marks)

