

QUESTION BANK

Course: Electrical Machines - II

Course Code: BTEE-402-18

Semester: 4th

2 Marks

1. Why a 3-phase synchronous motor will always run at synchronous speed?
2. What are the two classification synchronous machines?
3. What are the essential features of synchronous machine?
4. Mention the methods of starting of 3-phase synchronous motor.
5. What are the principal advantages of rotating field system type of construction of synchronous machines?
6. Write down the equation for frequency of emf induced in an alternator.
7. What are the advantages of salient pole type of construction used for synchronous machines?
8. Why do cylindrical rotor alternators operate with steam turbines?
9. Which type of synchronous generators are used in Hydroelectric plants and why?
10. What is the relation between electrical degree and mechanical degree?
11. What is the meaning of electrical degree?
12. Why short-pitch winding is preferred over full pitch winding?
13. Write down the formula for distribution factor.
14. Define winding factor.
- 15 Why are alternators rated in kVA and not in kW?
16. What are the causes of changes in voltage of alternators when loaded?
17. What is meant by armature reaction in alternators?
18. What do you mean by synchronous reactance?
19. What is synchronous impedance?

20. What is meant by load angle of an alternator?
21. Define the term voltage regulation of alternator.
22. What does hunting of synchronous motor mean?
23. What could be the reasons if a 3-phase synchronous motor fails to start?
24. What is synchronous condenser?
25. Write the applications of synchronous motor.
26. What is an inverted 'V' curve?
27. A synchronous motor starts as usual but fails to develop its full torque. What could it be due to?
28. What are the two types of 3-phase induction motor?
29. Write the two extra features of slip ring induction motors.
30. Can we add extra resistance in series with squirrel cage rotor? State the reason?
31. Why an induction motor is called rotating transformer?
32. Why an induction motor will never run at its synchronous speed?
33. Define SCR?
34. Why is open circuit characteristics called magnetic characteristics?
35. What are the losses determined from SCC?
36. What is synchronizing?
37. What is a synchroscope?
38. What is direct axis?
39. What is quadrature axis?
40. When does a synchronous motor get over excited?
41. What are types of 3-phase induction motor?
42. Why the rotor slots of a 3-phase induction motor are skewed?
43. What are slip rings?

44. State the difference between slip ring rotor and cage rotor of an induction motor?
45. Write an expression for the slip of an induction motor.
46. What is cogging of an induction motor?
47. Explain why the no load current of an induction motor is much higher than that of an equivalent transformer.
48. State the effect of rotor resistance on starting torque?
49. What are the advantages of cage motor?
50. Give the conditions for maximum torque for 3-phase induction motor?
51. What is reason for inserting additional resistance in rotor circuit of a slipring induction motor?
52. List out the methods of speed control of cage type 3-phase induction motor?
53. Mention different types of speed control of slip ring induction motor?
54. What are the advantages of 3-phase induction motor?
55. What does crawling of induction motor mean?
56. State the application of an induction generator?
57. Name the two windings of a single-phase induction motor.
58. What are the various methods available for making a single-phase motor self-starting?
59. Give the names of three different types of single-phase motor.
60. What is the use of shading ring in a pole motor?
61. State any four use of single-phase induction motor.
62. What are the types of starters?
63. What are the types of starters?
64. List out the methods of speed control of cage type 3-phase induction motor?
65. Mention different types of speed control of slip ring induction motor?
66. State the advantages of capacitor start run motor over capacitor start motor.

67. What is Universal motor?
68. State some application of universal motor.
69. Explain why single-phase induction motor is not self-starting one.
70. What type of motor is used for ceiling fan?
71. What is the type of induction motor used in wet grinders?
72. What kind of motor is used in mixie?
73. What is the application of shaded pole induction motor?
74. In which direction does a shaded pole motor run?
75. Why single-phase induction motor has low power factor?
76. Differentiate between “capacitor start “and “capacitor start capacitor run “induction motor?
77. State the application of an induction generator?
78. State the effect of rotor resistance on starting torque?
79. How can varying supply frequency control speed?
80. How is speed control achieved by changing the number of stator poles?
81. What are the main disadvantages of rotor rheostatic control?
82. Define-Slip frequency.
83. What is the main use of squirrel cage winding in synchronous motor starting?
84. What is breakdown torque?
85. Name the two winding of single phase induction motor?
86. What are methods available for making single phase induction motor a self-starting?
87. What is the function of capacitor in single phase induction motor?
88. State any 4 use of single phase induction motor?
89. Why single phase induction motor is not a self-starting one?
90. What kind of motors used in ceiling fan and wet grinders?

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91. What is the application of shaded pole induction motor?
 92. In which direction a shaded pole motor runs?
 93. Why single phase induction motor have low PF?
 94. Differentiate between “capacitor start” & “Capacitor start capacitor run” single phase induction motor?
 95. Why an induction motor is called as rotating transformer?
 96. What is the use of shading coil in the shaded pole motor?
 97. Why is hysteresis motor free from mechanical and magnetic vibrations?
 98. What types of motor is used in computer drives and wet grinders?
 99. Give two advantages and two applications of stepper motor.
 100. Discuss characteristics of single phase series motor

5 Marks/ 10 Marks

1. Describe the constructional details of cage and wound rotor induction machines.
2. Explain how rotating magnetic field of constant amplitude is produced.
3. Derive the following (i) Torque equation of an induction motor (ii) Condition for Maximum Torque under running condition?
4. Explain the Torque-Slip and Torque Speed characteristics of a 3-phase Induction motor.
5. (a) From fundamentals, deduce a relationship between Rotor power input, rotor copper loss and mechanical power developed in case of Induction motor. (b) Explain various losses in an induction motor and draw power flow diagram?
6. Develop the Equivalent circuit of a poly phase induction motor.
7. Explain how to predetermine the performance of induction motor from no-load and blocked rotor tests.
8. With the help of circuit diagram explain Auto Transformer starting of Induction motor.
9. Explain cascade connection method of speed control of 3-phase IM with neat diagram.

10. Briefly explain the working of star delta starter with a neat diagram.
11. Explain the constructional features of synchronous alternator with neat sketches. Also derive EMF equation of an alternator.
12. Explain the procedural steps to find voltage regulation of synchronous alternator by Synchronous Impedance Method.
13. Draw the phasor diagram of Salient Pole Synchronous Machine and explain the concept of direct axis reactance and quadrature axis reactance
14. Draw and explain the phasor diagram of synchronous motor and derive the back EMF.
15. Write short notes on (a) Synchronous condenser (b) Hunting and elimination of hunting.
16. Derive the expression for power developed by the synchronous motor.
17. Explain the working principle of reluctance motor and Draw torque –speed characteristics.
18. Describe with neat sketches the constructional details of a salient pole type alternator.
19. Draw a neat sketch showing the various parts of a synchronous machine. State the type of synchronous generator used in nuclear power stations.
20. Discuss briefly the load characteristics of alternator for different power factor.
21. Explain any one method of predetermining the regulation of an alternator.
22. Explain why the potier reactance is slightly higher than leakage reactance.
23. Explain dark lamp method of synchronizing an alternator with the bus bar.
24. For a salient pole synchronous machine, derive an expression for power developed as a function of load angle.
25. What is meant by hunting in a synchronous motor? Why is it undesirable? What is done to minimize it?
26. Explain V-curves and inverted V-curves.
27. Draw the power angle diagram of a synchronous machine.
28. Explain briefly the principle of operation of three-phase synchronous motor.
29. Develop the equivalent circuit for 3-phase induction motor?

30. Explain the different speed control methods of squirrel cage induction motor.
31. Describe the principle of operation of synchronous induction motor.
32. Explain any one method of speed control of three- phase induction motor.
33. Draw the slip-torque characteristics for a three-phase induction motor and explain.
34. Explain how a rotating magnetic field is produced in a three-phase induction motor.
35. Draw and explain the equivalent circuit of a three-phase induction motor.
36. Describe with a neat diagram, the principle of operation of induction generator.
37. Draw and explain the torque/slip curves of a three-phase induction motor for different values of rotor resistance.
38. Starting from the first principles, develop the equivalent circuit of a 3- phase induction motor.
39. Explain the different speed control methods of phase wound induction motor.
40. Discuss the theory of star – delta starter.