

Question Bank of Asynchronous Machines

1. At zero slip in an induction motor

- a) Motor runs as a generator
- b) Motor does not run
- c) The motor runs at synchronous speed
- d) Slip produced is zero

Ans: (b)

2. In an induction motor, rotor slots are usually not quite parallel to the shaft but are given a slight skew

- a) To reduce the magnetic hum
- b) To reduce the locking tendency of the rotor
- c) Both (a) and (b) above
- d) To increase the speed of the motor

Ans: (c)

3. The field of an induction motor rotor rotates relative to the stator at

- a) Rotor speed
- b) Synchronous speed
- c) Slip speed
- d) Very low speed

Ans: (b)

4. In an induction motor, rotor runs at a speed

- a) Equal to the speed of stator field
- b) Lower than the speed of stator field
- c) Higher than the speed of stator field
- d) Having no relation with the speed of stator field

Ans: (b)

5. Starters are used in induction motor because

- a) Its starting torque is high
- b) It is run against heavy load
- c) It can not run in reverse direction
- d) Its starting current is five times or more than its rated current

Ans: (d)

6. When an induction motor runs at rated load and speed, the iron losses are

- a) Negligible
- b) Very heavy
- c) Independent of supply frequency
- d) Independent of supply voltage

Ans: (a)

7. By synchronous wattage of an induction motor is meant

- a) Stator input in watts
- b) Rotor output in watts
- c) Rotor input in watts
- d) Shaft output in watts

Ans: (c)

8. The emf induced in the rotor of an induction motor is proportional to

- a) Voltage applied to stator
- b) Relative velocity between flux and rotor conductors
- c) Both (a) and (b) above
- d) Slip

Ans: (c)

9. The synchronous speed of an induction motor is defined as

- a) Natural speed at which a magnetic field rotates
- b) The speed of a synchronous motor
- c) The speed of an induction motor at no load
- d) None of these

Ans: (a)

10. The starting torque of an induction motor is maximum when

- a) Rotor resistance equals rotor reactance
- b) Rotor resistance is twice the rotor reactance
- c) Rotor resistance is half the rotor reactance
- d) Rotor resistance is R_2 times the rotor reactance

Ans: (a)

11. Three-phase induction motor is mainly suitable for which of the following application

- a) For running different machine tools where several speeds are required
- b) For running paper machine requiring exact speed control
- c) For running electric vehicles
- d) For running rolling mills needing exact speed control

Ans: (a)

12. Wattmeter reading in no-load test of induction motor gives

- a) Copper losses in the stator
- b) Friction and winding losses
- c) Sum of (a) and (b) above
- d) Total losses in the rotor on no load

Ans: (d)

13. The slip frequency of an induction motor is

- a) The frequency of rotor currents
- b) The frequency of stator currents
- c) Difference of the frequencies of the stator and rotor currents
- d) Sum of the frequencies of the stator and rotor currents

Ans: (a)

14. The field winding of a three phase synchronous machine is excited by

- a) Single-phase ac supply
- b) Three- phase ac supply
- c) Dc supply
- d) Supply obtained from an inverter

Ans: (c)

15. With increase of load, the speed of induction motor operating in the stable region

- a) Increases
- b) Decreases
- c) Remains constant
- d) Increases and then becomes constant

Ans: (b)

16. When a polyphase induction motor is loaded

- a) Increases and its frequency decreases
- b) Increases and its frequency increases
- c) Decreases and its frequency increases
- d) Decreases and its frequency decreases

Ans: (a)

17. In the following motor, external resistance can be added to start the motor

- a) Slip ring induction motor
- b) Squirrel cage induction motor
- c) Salient pole synchronous motor
- d) Wound rotor synchronous motor

Ans: (a)

18. If in a 3-phase induction motor, two phases open accidentally, the motor will

- a) Run at dangerously high speed
- b) Stop
- c) Continue to run depending on load
- d) None of these

Ans: (c)

19. An induction motor is running at its rated torque and rated applied voltage of 440 volts. The effect of reducing the applied voltage to say 350 volts is

- a) That the motor stops
- b) Current decreases slightly
- c) Speed reduces slightly
- d) Motor heats up with passage of time

Ans: (d)

20. A three-phase synchronous machine is a

- a) Single excited machine
- b) Double excited machine
- c) Machine in which three-phase supply is fed to both stator and rotor winding
- d) None of these

Ans: (c)

21. The disadvantage of starting an induction motor with a star-delta starter is that

- a) The starting torque is one-third of the torque in case of delta connection
- b) During starting high losses result
- c) The starting torque increases and the motor runs with jerks
- d) None of these

Ans: (a)

22. Squirrel cage induction motor has

- a) Zero starting torque
- b) Very small starting torque
- c) Medium starting torque
- d) Very high starting torque

Ans: (b)

23. Improvement of the power factor in an induction motor results in

- a) Decreased torque
- b) Increased torque
- c) Increased torque current
- d) Increased torque and decreased current due to increased impedance

Ans: (d)

24. The purpose of blades in a squirrel cage induction motor is

- a) To reduce the magnetic resistance of the rotor
- b) To cool the rotor
- c) To reduce the electrical resistance of rotor cage
- d) None of these

Ans: (b)

25. Which of the following function is served by the resistance placed in parallel with one phase of three-phase induction motor?

- a) Smooth starting
- b) Higher starting torque
- c) Higher maximum torque
- d) Higher reduced starting torque

Ans: (a)

26. Which of the following is the advantage of double squirrel cage rotor as compared to the round bar cage rotor?

- a) Large slip
- b) Lower starting torque
- c) Higher power factor
- d) Higher efficiency

Ans: (b)

27. The rotor output of an induction motor is 15 kW and the slip is 4%. Then the rotor copper loss is

- a) 600 watts
- b) 300 watts
- c) 700 watts
- d) 1200 watts

Ans: (a)

28. On open circuiting the rotor of a squirrel cage induction motor, the rotor

- a) Makes noise
- b) Does not run
- c) Does not run
- d) Runs at dangerously high speed

Ans: (c)

29. Number of different speed that can be obtained from two induction motors in cascade is

- a) 6
- b) 4
- c) 3
- d) 2

Ans: (b)

30. The drawback of speed control of a slip ring induction motor with the help of resistance in the circuit is that

- a) It is applicable only to motors having power of more than 100 kW
- b) It results in high losses
- c) With reduction in speed, the torque decreases significantly
- d) The speed can be controlled only very broadly

Ans: (b)

31. Advantage of slip ring induction motor over squirrel cage induction motor is

- a) Suitability of high speeds
- b) Higher efficiency
- c) Higher power factor
- d) That it can be started using factor resistance

Ans: (d)

32. In an induction motor, the rotor input is 600 W and slip is 4%. The rotor copper loss is

- a) 700 W
- b) 625 W
- c) 600 W
- d) 650 W

Ans: (b)

33. The starting torque of a cage rotor induction motor can be increased by using rotor having

- a) Low inductance and low resistance
- b) Low inductance and high resistance

- c) High inductance and high resistance
- d) High inductance and low resistance

Ans: (c)

34. For smooth starting of three-phase squirrel cage induction motor, the starting method preferred is

- a) Rotor resistance
- b) Star-delta
- c) Auto-transformer
- d) Stator resistance

Ans: (c)

35. Large air gap in an induction motor results in

- a) Reduced noise
- b) Reduced pulsation losses
- c) Better cooling
- d) Increased overload capacity

Ans: (b)

36. The power factor of star connected induction motor is 0.5. On being connected in delta, the power factor will?

- a) Increase
- b) Reduce
- c) Remain the same
- d) Become zero

Ans: (b)

37. Simplest method of eliminating the harmonic induction torque is

- a) Integral slot winding
- b) Chording
- c) Skewing
- d) None of these

Ans: (b)

38. Any odd harmonic in the current of an induction motor will result in magnetic field which

- a) Is stationary relative to the field of the fundamental
- b) Rotates in forward direction at the harmonic speed
- c) Rotates in backward direction
- d) Oscillates at harmonic frequency

Ans: (c)

39. The drive generally used for lathe machines are

- a) Dc shunt motors
- b) Slip ring induction motors
- c) Synchronous motors
- d) Squirrel cage induction motors

Ans: (d)

40. Cogging of motor implies that motor

- a) Refuses to start at load
- b) Refuses to start at no load
- c) Runs at low speed and then stops
- d) Runs at very low speed

Ans: (b)

41. Motor commonly used for traction purpose is

- a) Induction motor
- b) Dc series motor
- c) Dc shunt motor
- d) Synchronous motor

Ans: (b)

42. In a double cage induction motor, the inner cage has

- a) Low R and low X
- b) Low R and high X
- c) High R and high X
- d) High R and low X

Ans: (b)

43. Maximum power developed in a synchronous motor occurs at a coupling angle of

- a) 0°
- b) 60°
- c) 90°
- d) 120°

Ans: (c)

44. The back emf set up in the stator of synchro-nous motor depends on

- a) Speed of the rotor
- b) Input to prime mover
- c) Rotor excitation
- d) Coupling angle

Ans: (c)

45. The speed of a three-phase cage-rotor induction motor depends on

- a) Number of pole alone
- b) Frequency of the supply alone
- c) Input voltage
- d) Number of poles and frequency of supply

Ans: (d)

46. Synchronous induction motors are mostly used for driving

- a) Rotary compressors
- b) Cranes
- c) Lathe machines
- d) None of these

Ans: (a)

47. Dispersion coefficient σ is the ratio of

- a) Magnetizing current to ideal short circuit current
- b) Magnetizing current to supply voltage
- c) Open circuit voltage to short circuit current for the same excitation
- d) None of these

Ans: (a)

48. The noise and tooth pulsation losses may be reduced by using

- a) Large number of open slots in stator
- b) Large number of narrow slots in stator
- c) small number of open slots in stator
- d) Small number of narrow slots in stator

Ans: (b)

49. The fraction slip of an induction motor is to ratio

- a) Rotor Cu loss/rotor input
- b) Rotor Cu loss/rotor output
- c) stator Cu loss/stator input
- d) Rotor Cu loss/stator Cu loss

Ans: (a)

50. When a 3-phase synchronous motor is switched on, there exists a rotating magnetic field. The magnitude of this field flux

- a) Varies with power factor
- b) Varies with load
- c) Is constant at all loads
- d) None of these

Ans: (c)

51. The complete circuit diagram of a 3-phase induction motor can be drawn with the help of

- a) Block rotor test alone.
- b) Running-light and blocked-rotor and stator-resistance tests
- c) Both running-light and blocked-rotor tests
- d) Running-light test alone

Ans: (b)

52. Which of the following motors is most suitable for best speed control?

- a) Dc shunt motor
- b) Dc series motor
- c) Induction motor
- d) Synchronous motor

Ans: (a)

53. A SCIM runs at constant speed only so long as

- a) Stator flux remains constant
- b) Its torque exactly equals the mechanical load
- c) Its supply voltage remains constant
- d) Torque developed by it remains constant

Ans: (b)

54. If the frequency of input power to an induction motor increases, the rotor copper loss

- a) Decreases
- b) Increases
- c) Remains the same
- d) None of these

Ans: (b)

55. The synchronous speed of a linear induction motor does NOT depend on

- a) Width of pole pitch
- b) Number of poles
- c) Supply frequency
- d) Any of the above

Ans: (a)

56. The stator frame in an induction motor is used

- a) To provide ventilation to the armature
- b) To protect the whole machine
- c) To hold the armature stampings/stator
- d) As a return path for the flux

Ans: (d)

57. If the stator voltage and frequency of an induction motor are reduced proportionately, its

- a) Locked rotor current is reduced
- b) Torque developed is increased
- c) Magnetizing current is decreased
- d) Both (a) and (b)

Ans: (d)

58. Motor A has deeper and narrow slots, whereas motor B. It has shallow and wide slots. Induction motor A, as compared to motor B, has

- a) More operating slip
- b) Less starting torque
- c) More pull-out torque
- d) More starting torque

Ans: (b)

59. If a single phase motor runs hot. The probable cause may be

- a) Overload
- b) Low voltage
- c) High voltage
- d) Any of the above

Ans: (d)

60. Which of the following single phase motors is relatively free from mechanical and magnetic vibration?

- a) Reluctance motor
- b) Hysteresis motor
- c) Universal motor

d) Shaded pole motor

Ans: (b)

61. Single phase induction motor can be made self-starting by

- a) Adding series combination of capacitor and auxiliary winding in parallel with the main winding
- b) Adding an auxiliary winding in parallel with the main winding
- c) Adding an auxiliary winding in series with a capacitor and the main winding
- d) None of these

Ans: (a)

62. Which of the following single phase motors does not have constant speed characteristic?

- a) Reluctance motor
- b) Hysteresis motor
- c) Universal motor
- d) All of the above

Ans: (c)

63. For the same rating which of the following motors has the highest starting torque?

- a) Universal motor
- b) Split phase motor
- c) Synchronous motor
- d) All have identical starting torque

Ans: (a)

64. All single phase motors have

- a) Large starting torque
- b) Zero starting torque
- c) Medium starting torque
- d) Very small starting torque

Ans: (b)

65. If a single phase motor fails to start, the probable cause may be

- a) Open circuit in auxiliary winding
- b) Open circuit in main winding
- c) Blown fuses
- d) Any of the above

Ans: (d)

66. Single phase motors generally get overheated due to

- a) Overloading
- b) Short winding
- c) Bearing troubles
- d) Any of above

Ans: (d)

67. The speed of the split phase induction motor can be reversed by reversing the leads of

- a) Auxiliary winding
- b) Main winding
- c) Either (a) or (b)
- d) Speed can not be reversed

Ans: (c)

68. If a single phase motor runs slow, it may be due to

- a) Overload
- b) Low frequency
- c) Low voltage
- d) Any of these

Ans: (d)

69. A capacitor start single phase induction motor will usually have power factor of

- a) Unity
- b) 0.6 leading
- c) 0.8 leading
- d) 0.6 lagging

Ans: (d)

70. Which of the following single phase motors is cheapest?

- a) Capacitor run motor
- b) Capacitor start motor
- c) Reluctance motor
- d) All have almost the same cost

Ans: (b)