

Single Phase Induction Motor MCQ

1. Single phase ac motors are used in largest number. This is due to

(a) their great variety of useful services in the home, office, the factory, in business establishment and on the farm.

(b) their wide applications in automatic control devices of various types.

(c) lower cost.

(d) both (a) and (b).

Answer: (d) both (a) and (b).

2. A dual voltage single phase ac motor can be operated on either

(a) 230 or 400 V.

(b) 30 or 400 V

(c) 115 or 230 V.

(d) 160 or 320 V.

Answer: (c) 115 or 230 V.

3. Single phase ac motors are classified on the basis of

- (a) construction.
- (b) starting methods.
- (c) size.
- (d) rpm.
- (e) both construction and starting methods.

Answer: (e) both construction and starting methods.

4. In a single phase ac induction motor

- (a) stator is supplied with single phase ac.
- (b) rotor is supplied with single phase ac.
- (c) rotor is a cage rotor.
- (d) rotor is a wound rotor.
- (e) both (a) and (c).

Answer: (e) both (a) and (c).

5. The rotor slots in an induction motor are, usually not kept parallel to the shaft as it

- (a) helps the rotor teeth to remain under the stator teeth.
- (b) helps in reducing the tendency of the rotor teeth to remain under the stator teeth.
- (c) improves pf.

(d) improves efficiency.

Answer: (b) helps in reducing the tendency of the rotor teeth to remain under the stator teeth.

6. A single phase induction motor is

(a) self starting.

(b) not self starting.

(c) self starting with the help of an auxiliary winding.

(d) none of the above.

Answer: (c) self starting with the help of an auxiliary winding.

7. Double revolving field theory is based on the idea that pulsating field produced in single phase motors can be resolved into two components of its amplitude and rotating in direction with synchronous speed.

(a) half, same

(b) half, opposite

(c) $1/\sqrt{2}$ times of, same

(d) $\sqrt{2}$ times, opposite

Answer: (b) half, opposite

8. When a single phase induction motor is excited with single phase ac voltage, the magnetic field set up is equivalent to

- (a) two fields, rotating in opposite directions with different speeds.
- (b) two fields, rotating at synchronous speed in opposite directions.
- (c) two fields, rotating at synchronous speed.
- (d) two fields, rotating in the same direction but at different speeds.

[U.P.S.C. LES. E.E.- II, 2004]

Answer: (b) two fields, rotating at synchronous speed in opposite directions.

9. A single phase induction motor with only the main winding excited would exhibit the following response at synchronous speed

- (a) Rotor current is zero.
- (b) Rotor current is non-zero and is at slip frequency.
- (c) Forward and backward rotating fields are equal.
- (d) Forward rotating field is more than backward rotating field. [GATE E.E. 2003]

Answer: (d) Forward rotating field is more than backward rotating field.

10. A single phase induction motor is running at N rpm. Its synchronous speed is N_s . If its slip with respect to forward field is s , what is the slip with respect to the backward field?

- (a) s
- (b) $-s$
- (c) $(1 - s)$
- (d) $(2 - s)$ [U.P.S.C. IES. E.E-II, 2006]

Answer: (d) $(2 - s)$

11. In case of a split-phase motor, the phase shift between currents in the two windings is around

- (a) 30°
- (b) 70°
- (c) 90°
- (d) 120° [GATE E.E. 1996]

Answer: (a) 30°

12. An 8-pole, 50 Hz single phase induction motor is running at 690 rpm. Its slip w.r.t. forward field is (in pu)

- (a) $+ 0.08$
- (b) $+ 1.92$
- (c) $- 0.08$

(d) 1.00 [A.M.I.E. Sec B. Elec. Machines Summer 1999]

Answer: (a) + 0.08

13. An 8-pole single phase induction motor is running at 690 rpm. What is its slip with respect to forward and backward fields, respectively?

(a) 0.08, 2.0

(b) 0.08, 1.92

(c) 1.92, 0.08

(d) 2.0, 0.08 [U.P.S.C. I.E.S. E.E.-II, 2007]

Answer: (b) 0.08, 1.92

14. In a comparative study of the torque-slip characteristic of a balanced polyphase induction motor and that of a single phase induction motor, it is found that for zero slip

(a) the torque for the former is zero and has a non-zero negative value for the latter.

(b) the torque has a non-zero positive value on the former and has a non-zero negative value on the latter.

(a) the torque is zero for both of the characteristics.

(d) the torque has a non-zero positive value for both of the characteristics.

Answer: (a) the torque for the former is zero and has a non-zero negative value for the latter.

15. In a repulsion motor

(a) stator usually carries a distributed winding similar to the main winding of an ordinary single phase induction motor.

(b) the rotor or armature is similar to a dc motor armature with a drum type winding connected to the commutator.

(c) the brushes fixed directly opposite to each other are connected to each other or short-circuited.

(d) the speed is function of load.

(e) all of the above.

Answer: (e) all of the above.

16. The commutation of repulsion motor is at its best

(a) during starting.

(b) when runs near synchronous speed.

(c) when runs at 50% of synchronous speed.

(d) when runs at 150% of synchronous speed. [A.M.I.E. Sec B. Winter 2001]

Answer: (b) when runs near synchronous speed.

17. Which of the following statements associated with repulsion motor is wrong ?

- (a) Its direction of rotation depends upon the position of brushes.
- (b) Its characteristics are similar to those of series motor.
- (c) Its power factor is high.
- (d) It is used where sturdy motor with large starting torque and adjustable but constant speed is required.

Answer: (c) Its power factor is high.

18. In a repulsion motor, commutator provides a means of connecting the

- (a) stator windings.
- (b) armature windings.
- (c) starting winding.
- (d) none of these.

Answer: (b) armature windings.

19. In a repulsion motor the brushes are connected

- (a) to the external supply.
- (b) to each other or short-circuited.
- (c) to the stator winding.
- (d) none of the above.

Answer: (b) to each other or short-circuited.

20. Cross-connecting of commutator bars in repulsion motors reduces circulating currents caused due to

- (a) unequal air gaps between the stator and rotor.
- (b) shorted stator winding.
- (c) shorted brushes.
- (d) all of these.

Answer: (a) unequal air gaps between the stator and rotor.

21. In repulsion motors, brush angle with respect to magnetic axis is kept

- (a) 0° to 15°
- (b) 15° to 45°
- (c) 90°
- (d) 180°

Answer: (b) 15° to 45°

22. The torque-speed characteristic of a repulsion motor resembles which of the following dc motor characteristic ?

- (a) Separately excited.
- (b) Shunt.

(c) Series.

(d) Compound. [GATE E.E. 1996].

Answer: (c) Series.

23. In a single-phase repulsion motor power factor is

(a) always leading.

(b) high at low speed.

(c) high at high speed.

(d) always unity. [A.M.I.E. Sec B. Elec. Machines Summer 1996]

Answer: (c) high at high speed.

24. In a repulsion motor by shifting the brush position

(a) speed and direction of rotation can be controlled.

(b) only speed can be controlled.

(c) speed, torque and direction of rotation can be controlled.

(d) only torque can be controlled by varying the speed at constant output power. [A.M.I.E. Sec B. Elec. Machines Winter 1996]

Answer: (c) speed, torque and direction of rotation can be controlled.

25. In a repulsion motor, if the angle of brush shift α from low impedance position is increased from 0 to 45° with constant current supply, then

- (a) speed and power factor decrease but torque increases.
- (b) speed and torque increase but pf decreases.
- (c) speed, pf and torque increase.
- (d) speed and pf increase but torque decreases. [A.M.I.E. Sec B. Summer 2002]

Answer: (a) speed and power factor decrease but torque increases.

26. In a repulsion motor, torque developed will be zero when brush axis is at electrical degrees to the field axis.

- (a) 0
- (b) 90
- (c) 45
- (d) both(a) and (b)

Answer: (d) both(a) and (b)

27. In a repulsion motor speed control is affected by varying the

- (a) impressed voltage.
- (b) position of brushes.
- (c) supply frequency.

(d) either (a) or (b).

Answer: (d) either (a) or (b).

28. Direction of rotation of a repulsion motor is reversed by.

(a) interchanging the supply leads.

(b) shifting the brushes round the commutator.

(c) either (a) or (b).

(d) none of these.

Answer: (b) shifting the brushes round the commutator.

29. In a compensated repulsion motor, an additional stator winding is provided in order to

(a) improve power factor.

(b) provide better speed regulation.

(c) increase the output.

(d) improve mechanical balance.

(e) both (a) and (b).

Answer: (e) both (a) and (b).

30. A repulsion start induction motor operates as an induction motor when

(a) commutator segments are short circuited.

(b) brushes are short-circuited.

(c) stator is short-circuited.

(d) short-circuiting device is disconnected.

Answer: (a) commutator segments are short circuited.

31. The short-circuiting device in a repulsion start induction motor operates by

(a) magnetic attraction.

(b) centrifugal force.

(c) circulating currents.

(d) none of the above.

Answer: (b) centrifugal force.

32. The repulsion start induction motor has the advantage(s) of

(a) high starting torque (2.5 to 4.5 times of full-load torque).

(b) low starting current (about 3.5 times of full-load current).

(c) low cost, high efficiency and good power factor.

(d) both (a) and (b).

Answer: (d) both (a) and (b).

33. Which of the following statements regarding repulsion start induction motor is/are correct ?

(a) It runs below synchronous speeds on all loads.

- (b) It needs more maintenance of commutator and other mechanical devices.
- (c) It makes quite a bit noise on starting.
- (d) It starts as a repulsion motor with its brushes set to give maximum torque.
- (e) all of the above.

Answer: (e) all of the above.

34. Repulsion induction motor has

- (a) single phase winding on its stator.
- (b) two separate windings on its rotor in common slots.
- (c) squirrel cage rotor and two separate windings on stator in common slots.
- (d) both (a) and (b).

Answer: (d) both (a) and (b).

35. In a repulsion induction motor, the rotor has a

- (a) squirrel cage winding with rotor bars permanently short-circuited and placed at the bottom of the slots.
- (b) repulsion winding similar to dc armature winding placed over the squirrel cage winding.

(c) repulsion winding placed at the bottom of slots and squirrel cage winding placed above the repulsion winding.

(d) both (a) and (b).

Answer: (d) both (a) and (b).

36. Which of the following statements regarding repulsion induction motor is wrong ?

(a) At start squirrel cage winding does not produce any torque.

(b) At start and at low speeds, major part of the torque is developed by repulsion winding.

(c) At rated load it almost runs at synchronous speed.

(d) It employs centrifugally operated mechanism for short-circuiting the commutator.

Answer: (d) It employs centrifugally operated mechanism for short-circuiting the commutator.

37. The repulsion induction motor has

(a) fairly good speed regulation.

(b) starting torque 2.25 to 3 times the full-load torque.

(c) starting current 3 to 4 times the full-load current.

(d) all of the above.

Answer: (d) all of the above.

38. The repulsion induction motor does not have the drawback of

- (a) higher cost.
- (b) careful maintenance.
- (c) poor starting torque.
- (d) tendency of sparking.

Answer: (c) poor starting torque.

39. Single phase synchronous motors

- (a) are self starting motors.
- (b) do not need dc excitation.
- (c) operate at constant speed.
- (d) are built for a wider range of output.
- (e) all of the above.

Answer: (e) all of the above.

40. Single phase induction motor built with a variable air gap and without dc excitation is called the motor.

- (a) reluctance
- (b) hysteresis
- (c) repulsion

(d) split phase

Answer: (a) reluctance

41. A single phase reluctance motor

(a) has salient pole rotor structure and runs at sub-synchronous speed.

(b) has salient pole rotor structure and runs at super-synchronous speed.

(c) has salient pole rotor structure and runs at synchronous speed.

(d) has non-salient pole rotor structure and runs at synchronous speed.

[A.M.I.E. Sec B. Elec. Machines Winter 1994]

Answer: (c) has salient pole rotor structure and runs at synchronous speed.

42. Reluctance torque is the

(a) torque developed in a given synchronous motor as a function of field excitation and the sine of the torque angle.

(b) torque developed by salient pole synchronous or synchronous induction motors due to variations in air gap produced by armature reaction.

(c) torque developed by non-salient pole asynchronous motor.

(d) torque developed by none of the above. [A.M.I.E. Sec B. Elec. Machines Winter 1993; Summer 1997]

Answer: (b) torque developed by salient pole synchronous or synchronous induction motors due to variations in air gap produced by armature reaction.

43. Reluctance motor

- (a) is a self starting motor.
- (b) runs at constant speed.
- (c) needs no dc excitation for its rotor.
- (d) starts as an induction motor and runs as a synchronous motor.
- (e) all of the above.

Answer: (e) all of the above.

44. In a reluctance motor, when the load increases to an extent that it cannot maintain synchronous speed, it will

- (a) fall out of synchronism and come to rest.
- (b) run as an induction motor.
- (c) draw excessive armature current and burn out.
- (d) become unstable.

Answer: (b) run as an induction motor.

45. The torque of a reluctance motor can be effectively increased by

- (a) increasing reluctance of the magnetic circuit along the direct axis.
- (b) decreasing reluctance of the magnetic circuit along the quadrature axis.
- (c) increasing the ratio of quadrature axis reluctance to direct-axis reluctance.
- (d) decreasing the ratio of quadrature axis reluctance to direct-axis reluctance. [U.P.S.C. I.E.S. E.E.-II, 2001]

Answer: (c) increasing the ratio of quadrature axis reluctance to direct-axis reluctance.

46. Hysteresis motor is a

- (a) synchronous induction motor.
- (b) single phase induction motor.
- (c) single phase synchronous motor without any salient pole and without dc excitation.
- (d) single phase synchronous motor with salient poles and without dc excitation.

Answer: (c) single phase synchronous motor without any salient pole and without dc excitation.

47. Hysteresis motor operates on the principle of

- (a) hysteresis loss.

- (b) eddy current loss.
- (c) electromagnetic induction.
- (d) magnetization of rotor.

Answer: (a) hysteresis loss.

48. The rotor of a hysteresis motor is made of magnetic material having area of hysteresis loop

- (a) large.
- (b) very small.
- (c) medium.
- (d) any of the above. [A.M.I.E. Sec B. Winter 2001]

Answer: (a) large.

49. The rotor of a hysteresis motor is built up of

- (a) cast iron sheet.
- (b) a group of specially hardened steel rings.
- (c) thin silicon steel laminations.
- (d) thin μ -metal laminations.

Answer: (b) a group of specially hardened steel rings.

50. In an hysteresis motor, the rotor core must have

- (a) retentivity.
- (b) susceptibility.
- (c) resistivity.
- (d) none of these.

Answer: (a) retentivity.

51. A hysteresis motor

- (a) is a self starting motor.
- (b) is a constant speed motor.
- (c) does not need dc excitation.
- (d) all of the above.

Answer: (d) all of the above.

52. In a single phase hysteresis motor

- (a) starting torque is caused by both eddy current and hysteresis while the running torque is caused by hysteresis.
- (b) starting as well as running torques are caused by both eddy current and hysteresis.
- (c) starting torque is caused by only eddy current while running torque is caused by only hysteresis.

(d) starting as well as running torques both are caused by only hysteresis.

Answer: (a) starting torque is caused by both eddy current and hysteresis while the running torque is caused by hysteresis.

53. A hysteresis motor

(a) has high starting torque due to its high rotor hysteresis loss.

(b) is extremely quiet in operation due to absence of teeth and winding on rotor. (c) accelerates from rest to full speed almost instantaneously.

(d) all of the above.

Answer: (d) all of the above.

54. Hysteresis motors are used for Hi-Q record players because of their

(a) constant (synchronous) speed.

(b) extremely steady torque.

(c) insensitivity to supply voltage fluctuations.

(d) non-dependence on centrifugal switch requirement. [U.P.S.C. S. E.E.-II, 1998]

Answer: (b) extremely steady torque.

55. The main reason for using a hysteresis motor for high quality tape recorders and record players is that

- (a) its speed is constant (synchronous).
- (b) it develops extremely steady torque.
- (c) it requires no centrifugal switch.
- (d) its operation is not affected by mechanical vibrations. [U.P.S.C. LES. E.E.-II, 1995]

Answer: (b) it develops extremely steady torque.

56. A fluctuating voltage supply is detrimental to a refrigerator motor but not to a ceiling fan, although both are single phase induction motors because, the refrigerator motor

- (a) is made more robust than the fan motor.
- (b) is subjected to short duty cycle but the fan motor is subjected to continuous duty.
- (c) is enclosed in a sealed unit while the fan motor is open to the environment.
- (d) load is constant, but the fan motor load is voltage dependent. [U.P.S.C. I.E.S. E.E.-11, 1993]

Answer: (d) load is constant, but the fan motor load is voltage dependent.

57. A ceiling fan uses

- (a) capacitor motor.
- (b) capacitor-start capacitor run motor.
- (c) capacitor start motor.
- (d) universal motor. [A.M.I.E. Sec B. Summer 2003]

Answer: (a) capacitor motor.

58. Ceiling fan is

- (a) three phase IM.
- (b) single phase IM.
- (c) single phase synchronous motor.
- (d) none of these.

Answer: (b) single phase IM.

59. The electric motor generally used in household food mixers is

- (a) universal motor.
- (b) shaded pole motor.
- (c) capacitor start motor.
- (d) none of the above. [A.M.I.E. Sec B. Winter 2001]

Answer: (a) universal motor.

60. For toys, the preferred motor is

- (a) shaded-pole motor.
- (b) capacitor motor.
- (c) reluctance motor.
- (d) universal motor. [A.M.I.E. Sec B. Elec. Machines Winter 2003]

Answer: (a) shaded-pole motor.

61. Which of the following motors is suitable for timing and control purposes?

- (a) Reluctance motor.
- (b) Series motor.
- (c) Repulsion motor.
- (d) Hysteresis motor. [A.M.I.E. Sec B. Summer 2003]

Answer: (a) Reluctance motor.

62. In which single phase motor, the motor has no teeth or winding?

- (a) Split-phase motor.
- (b) Reluctance motor.
- (c) Hysteresis motor.
- (d) Universal motor.

Answer: (c) Hysteresis motor.

63. If a single phase motor fails to start but gives humming noise, this may be due to

- (a) low voltage.
- (b) high voltage.
- (c) shorted stator winding.
- (d) blown fuses.

Answer: (c) shorted stator winding.

64. When a ceiling fan using a capacitor run motor is switched on, it hums but does not run. When it is driven by some external means it runs in the direction in which it was made to run. The probable cause is

- (a) open-circuited capacitor.
- (b) blown fuses.
- (c) short-circuited capacitor.
- (d) any of the above.

Answer: (a) open-circuited capacitor.

65. If a single phase induction motor runs at a speed lower than the rated one, the most likely defect is

- (a) improper size fuses.

(b) wornout bearings or low voltage or overload.

(c) open-circuit in the winding.

(d) short-circuit in the winding.

Answer: (b) wornout bearings or low voltage or overload.

66. An electric motor gets overheated. This may be due to

(a) overloading.

(b) shorted stator winding.

(c) worn-out or dry bearings.

(d) low or high voltage.

(e) any of the above.

Answer: (e) any of the above.

67. If the centrifugal switch fails to open when the motor attains 70 to 80 per cent of synchronous speed, it would result in

(a) overloading of main winding.

(b) damage to centrifugal switch.

(c) overheating of auxiliary winding due to continuous flow of current and may get damaged.

(d) none of the above.

Answer: (c) overheating of auxiliary winding due to continuous flow of current and may get damaged.

68. The running winding of a single phase motor is found earthed on testing. The most probable location of ground fault is at the

- (a) end connection.
- (b) end terminals.
- (c) slot edge where coil enters or comes out of the slot.
- (d) anywhere on the winding inside a slot.

Answer: (c) slot edge where coil enters or comes out of the slot.

69. Burning out of windings is due to,

- (a) open-circuited capacitor.
- (b) short-circuited capacitor.
- (c) capacitor of improper rating.
- (d) none of the above.

Answer: (b) short-circuited capacitor.

70. An open in the centrifugal switch circuit gives an indication of

- (a) open winding.

- (b) shorted winding.
- (c) grounded winding.
- (d) none of these.

Answer: (a) open winding.

71. Starting or auxiliary winding of a single phase motor used in a refrigerator is disconnected from the circuit by

- (a) centrifugal switch.
- (b) magnetic relay.
- (c) thermal relay.
- (d) any of the above.

Answer: (b) magnetic relay.

72. Which of the following motors are used in largest number ?

- (a) Fractional horse power motors.
- (b) 3-phase induction motors.
- (c) DC shunt motors.
- (d) Synchronous motors.

Answer: (a) Fractional horse power motors.

73. Which of the following is not the induction motor ?

- (a) Squirrel cage.
- (b) Slip-ring.
- (c) Reluctance.
- (d) Double cage.

Answer: (c) Reluctance.

74. Which of the following types of motors are not the induction motors ?

- (a) Repulsion motors.
- (b) [Split phase motors](#).
- (c) [Shaded pole motors](#).
- (d) Repulsion start induction motors.

Answer: (a) Repulsion motors.

75. Which of the following types of motors are not the commutator motors ?

- (a) AC series motors.
- (b) Reluctance motors.
- (c) [Universal motors](#).
- (d) Repulsion motors.
- (e) Repulsion -induction motors.

Answer: (b) Reluctance motors.

76. Which of the following types of ac motors are synchronous type ?

(a) Reluctance motors.

(b) [Hysteresis motors](#).

(c) Universal motors.

(d) both (a) and (b).

Answer: (d) both (a) and (b).

77. Which of the following motors does not use a centrifugal switch ?

(a) Shaded pole motor.

(b) Split phase motor.

(c) [Capacitor-start capacitor run motor](#).

(d) Repulsion start induction motor.

Answer: (a) Shaded pole motor.

78. Which single phase induction motor has the lowest speed ?

(a) Shaded pole.

(b) Universal.

(c) Hysteresis.

(d) Repulsion.

Answer: (a) Shaded pole.

79. For speeds higher than say 3000 rpm, the machine used is

(a) induction motor.

(b) synchronous motor.

(c) universal motor.

(d) none of the above. [A.M.I.E. Sec B. Elec. Machines Summer 1995]

Answer: (c) universal motor.

80. The stator and rotor pole number may be different in a

(a) pole changing induction motor.

(b) reluctance motor.

(c) repulsion motor.

(d) synchronous motor. [U.P.S.C. I.E.S. E.E.-II, 1993]

Answer: (b) reluctance motor.

81. Which of the following motors is relatively free from mechanical and magnetic vibrations and give least noise ?

(a) Shaded pole motor.

(b) Universal motor.

(c) Hysteresis motor.

(d) Reluctance motor.

Answer: (c) Hysteresis motor.

82. AC servomotor is basically a

(a) universal motor.

(b) capacitor motor.

(c) 2-phase induction motor.

(d) 3-phase induction motor.

Answer: (c) 2-phase induction motor.

83. Two stator windings of ac servomotors are oriented electrical degrees apart.

(a) 90

(b) 60

(c) 120

(d) 180

Answer: (a) 90

84. Consider the following statements regarding ac servomotor:

1. The torque-speed curve has negative slope.

2. It is sensitive to noise.
3. The rotor has high resistance and low inertia.
4. It has slow acceleration.

Which of the following are the characteristics of ac servomotor as control component?

- (a) 1 and 2.
- (b) 2 and 3.
- (c) 1 and 3.
- (d) 2 and 4.

Answer: (c) 1 and 3.

85. An ac servomotor (2-phase induction motor) has a rotor with

- (a) high resistance winding.
- (b) very small diameter to reduce inertia.
- (c) very small axial length to reduce inertia.
- (d) both (a) and (b).
- (e) both (a) and (c).

Answer: (d) both (a) and (b).

86. The drag cup rotor is employed in a two phase induction motor to give

- (a) low inertia.
- (b) high inertia.
- (c) low torque.
- (d) high torque.

Answer: (a) low inertia.

87. AC servomotor has the drawback of

- (a) commutation problem.
- (b) low starting torque.
- (c) poor reliability.
- (d) all of these.

Answer: (b) low starting torque.

88. Which one of the following statements is not true for an ac servo-motor ?

- (a) Has low inertia rotor.
- (b) Is a single phase motor.
- (c) Has slip torque characteristic as straight line with negative slope.
- (d) Reference voltage frequency is high compared to signal frequency.

Answer: (b) Is a single phase motor.

89. For stability of an ac servomotor

- (a) a negative slope on the torque speed curve is necessary.
- (b) linearized torque-speed curve is essential.
- (c) the ratio of the rotor reactance to rotor resistance should be high.

Answer: (a) a negative slope on the torque speed curve is necessary.

90. If a conventional motor is used for servo-applications, the system becomes unstable due to

- (a) large diameter of rotor.
- (b) small axial length of rotor.
- (c) low resistance of rotor.
- (d) high resistance of rotor.

Answer: (c) low resistance of rotor.

91. While a 2-phase ac servomotor is in operation, if the voltage across the control field winding becomes zero, then the motor has a tendency to run as a single phase induction motor. To prevent this

- (a) rotor having high mass moment of inertia is used for such a motor.
- (b) drag cup type of light rotor and high resistance is preferred.
- (c) a low resistance is used.

(d) the number of turns in the control field winding used is less than the main reference winding. [U.P.S.C. I.E.S. E.E.-II, 1993]

Answer: (b) drag cup type of light rotor and high resistance is preferred.

92. A linear servomotor must have

(a) high rotor resistance.

(b) high rotor reactance.

(c) a large air gap.

(d) both high rotor resistance and reactance. [I.E.S. E.E.-II, 2005]

Answer: (a) high rotor resistance.

93. A two-phase servomotor develops maximum torque at

(a) forward speed of one-half of the synchronous speed.

(b) backward speed of one-half of the synchronous speed.

(c) synchronous speed.

(d) a speed of twice the synchronous speed. [U.P.S.C. I.E.S. 1999]

Answer: (a) forward speed of one-half of the synchronous speed.

94. Ratio of the rotor reactance X to the rotor resistance R for a 2-phase servomotor

- (a) is equal to that of a normal induction motor.
- (b) is less than that of a normal induction motor.
- (c) is greater than that of a normal induction motor.
- (d) may be less or greater than that of a normal induction motor. [GATE E.E 2000]

Answer: (b) is less than that of a normal induction motor.

95. A stepper motor is a device.

- (a) hydraulic
- (b) pneumatic
- (c) electromechanical

Answer: (c) electromechanical

94. The input to a stepper motor is in the form of

- (a) frictional force.
- (b) electric pulses.
- (c) mechanical inertia.
- (d) viscous damping force.

Answer: (b) electric pulses.

97. The rotor of a stepper motor has

- (a) no windings.
- (b) no commutator.
- (c) no brushes.
- (d) all of the above. [A.M.I.E. Sec B. Summer 2004]

Answer: (d) all of the above.

98. In a stepper motor, the detent torque means

- (a) minimum of the static torque with the phase winding excited.
 - (b) maximum of the static torque with the phase winding excited.
 - (c) minimum of the static torque with the phase winding unexcited.
 - (d) maximum of the static torque with the phase winding unexcited.
- [GATE E.E. 2008]

Answer: (c) minimum of the static torque with the phase winding unexcited.

99. For a given stepper motor, the following torque has the highest numerical value

- (a) Detent torque.
- (b) Pull-in torque.
- (c) Pull-out torque.
- (d) Holding torque. [GATE E.E. 2004]

Answer: (c) Pull-out torque.

100. Which one among the following has the highest numerical value in a stepper motor?

- (a) detent torque.
- (b) Holding torque.
- (c) Dynamic torque.
- (d) Ripple torque.

Answer: (b) Holding torque.

101. Switched reluctance motor means

- (a) salient pole synchronous motor without excitation winding.
- (b) a stepper motor with salient poles.
- (c) synchronous motor with salient poles on stator and rotor.
- (d) a stepper motor with closed loop control and with rotor position sensor. [I.E.S. E.E.-II, 2001]

Answer: (d) a stepper motor with closed loop control and with rotor position sensor.

102. The following motor definitely has a permanent magnet rotor:

- (a) DC commutator motor.

- (b) Brushless dc motor.
- (c) Stepper motor.
- (d) Reluctance motor. [GATE E.E. 2004]

Answer: (c) Stepper motor.

103. The motor which can produce uniform torque from standstill to synchronous speeds is

- (a) universal motor.
- (b) stepper motor.
- (c) reluctance motor.
- (d) hysteresis motor. [A.M.I.E. Sec B. Summer 2004]

Answer: (d) hysteresis motor.

104. Stepper motors are mostly used for

- (a) high power requirements.
- (b) control system applications.
- (c) very high speed of operation.
- (d) very low speed of operation. [A.M.I.E. Sec B. Summer 2000]
[U.P.S.C. I.E.S. E.E.-II, 2002]

Answer: (b) control system applications.

105. Stepper motors are widely used because of

- (a) wide speed range.
- (b) large rating.
- (c) no need for field control.
- (d) compatibility with digital systems. [U.P.S.C. I.E.S. E.E.-11, 2002]

Answer: (d) compatibility with digital systems.

106. Which one of the following types of motors is most suitable for a computer printer drive?

- (a) Reluctance motor.
- (b) Hysteresis motor.
- (c) Shaded pole motor.
- (d) Stepper motor. [I.E.S. 2004; GATE 1996]

Answer: (d) Stepper motor.

107. The output of a stepper motor is in the form of

- (a) linear movements.
- (b) angular movements.
- (c) either (a) or (b).
- (d) none of the above.

Answer: (c) either (a) or (b).

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