

1. A slow speed alternator is generally known as a

- (a) turbo-generator
- (b) water-wheel generator
- (c) non-salient pole alternator
- (d) none of these

ans-b

2. The most common type of prime-mover used for slow-speed alternator is

- (a) diesel engine
- (b) steam turbine
- (c) hydraulic turbine
- (d) petrol engine

Ans-c

3. In modern alternators, the rotating part is

- (a) field system
- (b) armature
- (c) armature as well as field system
- (d) none of these

ans-a

4. The distribution factor of the stator winding with 3 slots per pole per phase is 0.96. Its magnitude with 9 slots per pole per phase will be,

- (a) slightly more than 0.96
- (b) slightly less than 0.96
- (c) appreciably less than 0.96
- (d) appreciably more than 0.96

ans-b

5. The stator winding of a 3-phase alternator usually utilize,

- (a) full pitch coil
- (b) short-pitched coil
- (c) full pitch/short pitch
- (d) all of the above

ans-b

6. The distribution factor of the stator winding of a 3-phase alternator is,

- (a) unity
- (b) much less than unity
- (c) more than unity
- (d) slightly less than unity

Ans-d

7. The starting torque in the case of a 3-phase synchronous motor is

- (a) high
- (b) low
- (c) very low
- (d) zero

Ans-d

8. A 3-phase synchronous motor can operate over a wide range of power factors that is from lagging to leading power factors. This is achieved by

- (a) changing the field excitation
- (b) varying the speed
- (c) varying the applied voltage
- (d) changing the load

ans-a

9. The speed at which the rotating magnetic field produced by stator currents rotates is

- (a) synchronous speed
- (b) rotor speed

(c) greater the synchronous speed

(d) lower the synchronous speed

ans-a

10. A 3-phase, 50 Hz induction motor runs at a speed of 940 rpm the speed of the rotating magnetic field will be

(a) 940 rpm (b) 1000 rpm

(c) 1050 rpm (d) 1100 rpm

Ans-b

11. The thickness of stator lamination is of the order of

(a) 0.5 mm

(b) 1 mm

(c) 0.05 mm

(d) none of these

Ans-a

12. The stator of a 3-phase induction motor is laminated in order to

(a) reduce eddy current losses

(b) reduce hysteresis loss

(c) reduce copper losses in the stator winding

(d) reduce the weight of the stator

ans-a

13. The stator slots used in a 3-phase induction motor are

(a) open slots

(b) partially closed slots

(c) completely closed slots

(d) any of the above

ans-b

14. In a 3-phase induction motor, iron losses occur in

(a) rotor core and teeth

(b) stator core and teeth

(c) stator and rotor

(d) stator winding

ans-b

15. The thickness of rotor lamination as compared to stator lamination is,

(a) larger

(b) lesser

(c) same

(d) none of the above

ans-a

16. Skewing of rotor slots by a certain angle with the shaft results in,

(a) reduced magnetic noise

(b) more uniform torque

(c) avoiding magnetic locking of rotor with the stator

(d) none of these

ans-c

17. The stator of an alternator is laminated to reduce,

(a) Hysteresis loss

(b) Copper losses

(c) Mechanical loss

(d) Eddy current loss

Ans-d

18. For a 4-pole, 3-phase alternator having 24-slots on the stator, the slot pitch angle is,

- (a) 20° (b) 40°
(c) 30° (d) 60°

Ans-c

19. Distribution factor, k_d of the alternator is equal to,

- (a) $\frac{m \sin \alpha}{\sin m \alpha}$
(b) $\frac{\sin m \alpha / 2}{m \sin \alpha / 2}$
(c) $\frac{m \sin \alpha / 2}{\sin m \alpha / 2}$
(d) none of these

Ans-b

20. In a 3-phase induction motor, mechanical power developed by the rotor plus rotor copper losses can be termed as,

- (a) Useful mechanical power
(b) Power input to the rotor
(c) Power output of the motor
(d) Net output power + total losses

Ans-b

21. A 3-phase induction motor operates with a slip, s and the corresponding rotor power input is p_2 , then the mechanical power developed by the rotor of the motor is given by,

- (a) sp_2 (b) $(1+s)p_2$

- (c) $(1-s)p_2$ (d) None of these

Ans-c

22. A 3-phase, 6-pole, 60 Hz induction motor develops 5 kW (including mechanical losses) at 1140 rpm. Power input to the rotor corresponding to this condition is,

- (a) 5 kW (b) 5.238 kW
(c) 5.46 kW (d) 5.82 kW

Ans-b

23. In the low speed region, the nature of torque-slip characteristic of 3-phase induction motor is,

- (a) Straight line
(b) Rectangular hyperbola
(c) Parabola
(d) None of these

Ans-b

24. Torque developed by the motor of a 3-phase induction motor at zero slip is,

- (a) maximum
(b) 30% of full load
(c) 50% of full load
(d) zero

Ans-d

25. In a double cage induction motor, the cage which is effective at starting is,

- (a) inner cage
(b) outer cage
(c) inner cage/outer cage
(d) none of the above

Ans-b

26. A 4-pole, 60 Hz 3-phase induction motor is developing maximum torque at 1650 rpm. Then the ratio of rotor resistance to stand-still reactance is given by,

- (a) 0.083 (b) 0.04
(c) 0.05 (d) none of these

Ans-a

27. In case of 3-phase induction motors, the difference between the power transferred to the rotor and the mechanical power obtained from the rotor is equal to,

- (a) zero
(b) rotor copper losses
(c) friction and windage loss
(d) rotor copper + friction and windage loss

ans-d

28. The mechanical losses and iron losses of a 3-phase induction motor are 400 W and 1000 W, respectively, when it is operating on 75 per cent of full load with its maximum efficiency. Total full load copper losses of this motor are,

- (a) 1400 W (b) 1777.8 W
(c) 711.1 W (d) 2488.9 W

Ans-d

29. The starting torque in a single phase induction motor is,

- (a) high (b) low
(c) zero (d) very low

Ans-a

30. The no load current of a single phase induction motor is of the order of,

- (a) 20% (b) 45%
(c) 10% (d) 30%

Ans-a

31. When a 3-phase synchronous motor is under excited, its power factor will be

- (a) leading (b) lagging
(c) zero (d) unity

Ans-b

32. A 3-phase synchronous motor works at a leading pf, it is,

- (a) under excited
(b) normally excited
(c) over excited
(d) None

Ans-c

33. The efficiency of power transformer can be determined indirectly by

- (a) open-circuit test alone
(b) short-circuit test alone
(c) open-circuit and short-circuit tests
(d) back-to-back test

ans-c

34. A 3-phase, 400 V, 50 Hz, 4-pole induction motor runs at a slip

of 5 per cent. The relative speed between the rotor and stator magnetic fields is

- (a) 1425 rpm (b) zero
(c) 75 rpm (d) 1500 rpm

Ans-b

35. The starting torque can be externally increased in,

- (a) 3-phase squirrel cage induction motors
(b) 3-phase slip ring induction motors
(c) 3-phase squirrel cage deep bar induction motors
(d) 3-phase double cage induction motors

Ans-b

36. A 3-phase, 4-pole, 50 Hz, squirrel cage induction motor is operating on full load and runs at 1460 rpm. The frequency of induced emf in the stator and rotor, respectively are,

- (a) 50 Hz, 2.5 Hz
(b) 50 Hz, 50 Hz
(c) 50 Hz, 1.33 Hz
(d) 1.33 Hz, 50 Hz

Ans-c

37. Deep bar rotor construction in squirrel cage induction motor is adopted for,

- (a) reducing the maximum torque

(b) increasing the starting torque

- (c) reducing the starting current
(d) increasing the load torque

ans-b

38. The magnetising current drawn by a 3-phase induction motor is much higher compared to the transformer of similar rating, mainly because of,

- (a) stator teeth (b) air gap
(c) rotor core (d) stator core

Ans-b

39. Iron losses in the rotor of a 3-phase induction motor are negligible, because

- (a) frequency of rotor emf is too low
(b) flux linking the rotor is of constant magnitude
(c) flux density in the rotor parts is too low
(d) none of these

ans-a

40. For high starting torque, the most suited 3- ϕ induction motor is,

- (a) squirrel cage type
(b) slip ring type
(c) deep bar squirrel cage type
(d) double cage induction motor

ans-b

41. Stator of a 3-phase induction motor is laminated, in order to reduce,

- (a) hysteresis loss
- (b) eddy current loss
- (c) mechanical loss
- (d) weight of core

ans-b

42. The working efficiency of a 3-phase induction motor as compared to transformer is,

- (a) lesser
- (b) higher
- (c) much –much less
- (d) much higher

Ans-a

43. The nature of operating pf of 3-phase induction motor is,

- (a) always lagging
- (b) leading
- (c) may be lagging or leading
- (d) unity

ans-a

44. The effect of armature flux upon the main field flux is called

- (a) magnetizing
- (b) demagnetizing
- (c) cross-magnetizing
- (d) armature reaction

ans-d

45. The pessimistic method of finding the regulation of alternators is,

- (a) ZPF method
- (b) MMF method
- (c) Synchronous impedance method
- (d) Potier triangle method

Ans-c

46. Starting torque of squirrel cage induction motors can be increased by providing.

- (a) external resistance in the rotor circuit
- (b) double cage rotor
- (c) deep-bar rotor
- (d) either double cage rotor or deep bar rotor

ans-d

47. In a double cage induction motor, resistance and reactance of the upper cage winding, respectively are,

- (a) high, low
- (b) high, high
- (c) low, low
- (d) low, high

Ans-a

48. The frequency of the rotor currents in a 3-phase, 4-pole, 50 Hz, induction motor is 2.0 Hz. Then the slip and the speed of rotor, respectively are,

- (a) 0.05, 1500 rpm
- (b) 0.04, 1440 rpm
- (c) 0.05 1440 rpm

(d) 0.04, 1460 rpm

Ans-b

49. When a 3-phase induction motor is operating on no load, the total power drawn by the motor is approximately equal to,

- (a) output/ η
- (b) total losses
- (c) constant losses
- (d) iron losses

Ans-c

50. Power input to the rotor of 3-phase induction motor can be expressed as,

- (a) rotor copper losses per phase /slip
- (b) mechanical power developed \times slip
- (c) stator input power \times slip
- (d) total rotor copper losses /slip

ans-a

51. Iron losses in rotor core and teeth of a 3-phase induction motor are negligible compared to the iron losses in stator core and teeth, because of,

- (a) very low rotor frequency
- (b) extremely less thickness of rotor lamination
- (c) low rotor flux
- (d) none of these

ans-a

52. In a 3-phase alternator, the emf of various phases are displaced in time phase by,

- (a) $\frac{2\pi}{3}$
- (b) $\pi/3$
- (c) π
- (d) $\pi/6$

Ans-a

53. Coil span factor, k_c of an alternator is given by expression,

- (a) $k_c = \sin \frac{\beta}{2}$
- (b) $k_c = \cos \beta$
- (c) $k_c = \cos \frac{\beta}{2}$
- (d) $k_c = \sin \beta$

Ans-c

54. For a transformer to be tested at full load conditions but consuming only losses from the mains, we do

- (a) load test
- (b) open-circuit and short-circuit tests
- (c) back-to-back test
- (d) none of the above

ans-c

55. When a synchronous motor is normally excited then power factor is,

- (a) lagging
- (b) leading
- (c) zero
- (d) unity

Ans-d

56. A 3-phase synchronous motor has been provided with a damper winding. It can be started as

(a) a 3-phase synchronous motor

(b) a 3-phase induction motor

(c) a single-phase motor

(d) a 3-phase alternator

ans-b

57. Average emf generation in each stator conductor of DC generator is given by,

(a) $\frac{P\phi N}{60}$

(b) $\frac{P\phi N}{120}$

(c) $\frac{PN}{120}$

(d) $P\phi N$

Ans-a

58. A 3-phase induction motor, while operating on full load runs at 940 rpm. The number of poles of the motor and the frequency of applied voltage, respectively are,

(a) 6-poles, 50 Hz

(b) 6-poles, 60 Hz

(c) 4-poles, 50 Hz

(d) None of these

Ans-b

59. If the frequency of the generated emf of a three-phase alternator is to be 60 Hz, the highest possible speed at which the alternator should be run is

(a) 3000 rpm

(b) 3600 rpm

(c) 6000 rpm

(d) 7200 rpm

Ans-b

60. The pf at full load of a medium rating 3-phase induction motor is about,

(a) 0.81 lagging

(b) 0.88 leading

(c) 0.88 lagging

(d) 0.82 leading

Ans-c

61. Full load copper losses in a 3-phase, 50 Hz, 4-pole induction motor running at 1455 rpm is 300 W. The rotor input is

(a) 5 kW

(b) 10 kW

(c) 20 kW

(d) 50 kW

Ans-b

62. The no load current of a 3-phase induction motor in terms of its full load current is of the order of

(a) 5%

(b) 10%

(c) 50%

(d) 25%

Ans-d

63. The pf of a 3-phase induction motor at no load is approximately

(a) 0.85

(b) 0.7

(c) unity

(d) 0.2

Ans-d

64. Iron losses occurring in rotor core and teeth of 3-phase induction motor, during its normal operation are,

- (a) zero
- (b) low
- (c) high
- (d) none of these

Ans-d

65. A 3-phase, 400 V, 50 Hz induction motor is operating at full load, its slip is approximately.

- (a) 1%
- (b) 1.5%
- (c) 4%
- (d) 10%

Ans-c

66. In case of 3-phase induction motors, a uniform rotating magnetic field of constant magnitude is produced in the,

- (a) Rotor
- (b) Stator
- (c) Rotor/Stator
- (d) None of these

Ans-b

67. Coil span factor of the full stator winding is,

- (a) 0.95
- (b) 0.97
- (c) 1
- (d) 0.948

Ans-c

68. Starting torque of a 3-phase squirrel cage induction motor is,

- (a) zero
- (b) low
- (c) high
- (d) equal to full load torque

Ans-c

69. A 3-phase induction motor would develop maximum torque at a slip, given by,

- (a) 0.03
- (b) R_2 / X_2
- (c) $\frac{X_2}{R_2}$
- (d) none of these

Ans-b

70. The slip of 3-phase induction motor under block rotor test is,

- (a) zero
- (b) 1.0
- (c) 0.05
- (d) 0.02

Ans-b

71. The transformer efficiency at relatively light loads is quite low. This is due to

- (a) small copper losses
- (b) small secondary output
- (c) high fixed loss in comparison to the output
- (d) poor power factor

ans-c

72. The synchronous reactance, X_s of synchronous machine is equal to,

- (a) the reactance X_{al} , due to leakage
- (b) armature reaction reactance, X_{ar} of flux
- (c) the sum of X_{al} and X_{ar}
- (d) none of these

ans-c

73. Various parts of 3-phase induction motor, in which iron

losses occur during normal operation are,

- (a) stator core, stator teeth, rotor core, rotor teeth
- (b) stator core, rotor core
- (c) stator core, stator teeth
- (d) stator core and teeth, rotor winding

ans-c

74. The material of wires used for making resistance standards is usually:

- a) Manganin
- b) Nichrome
- c) Copper
- d) Phosphor Bronze

Ans-a

75. A Wheatstone bridge cannot be used for precision measurements because errors are introduced into on account of

- a) resistance of connecting leads
- b) thermo-electric emfs
- c) contact resistances
- d) all of the above

ans-d

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