301 MCQ Questions on Synchronous Machine

1. A 3ϕ synchronous motors has been provided with damper winding. It can be started as a

(a) Single phase synchronous motor.

(b) 3ϕ squirrel cage induction motor.

(c) 1ϕ induction motor.

(d) 3ϕ alternator. [UPSSSC 2015]

Answer: (b) 3ϕ squirrel cage induction motor.

2. Consider the following statements about a three-phase synchronous generator synchronized to an infinite bus when its mechanical input is increased gradually with field current held constant

1. The power factor of the current supplied becomes more lagging.

2. The power factor of the current supplied improves.

3. The power factor remains unity.

4. The load angle is increased.

Of these statements are correct:

(a) 1 only

(c) 2 and 4

(b) 2 only

(d) 3 and 4

Answer: (c) 2 and 4

3. Which of the following will change in a three-phase synchronous motor, as a consequence of excitation variations?

1. Pull-out torque

2. Torque angle

3. Magnitude and power factor of stator current

4. Output power

Select the correct answer using the codes given below:

(a) 1 and 3

(b) 2 and 4

(c) 2, 3 and 4

(d) 1, 2 and 3

Answer: (c) 2, 3 and 4

4. A 3-phase alternator delivers power to a balanced 3-phase load of power factor 0.707 lagging. It is observed that the open-circuit emf phasor leads the corresponding terminal voltage phasor by 15. Neglecting the effect of harmonics, the angle between the axis of the main field mmf and the axis of the armature mmf will be

(a) 30° electrical

(b) 60° electrical

(c) 90° electrical

(d) 150° electrical

Answer: (b) 60° electrical

5. In an AC machine, the effect of distributing the turns in different slots, results in a further reduction of generated EMF by the factor k_d. This factor is called

(a) Distribution spread factor

(b) Coil pitch factor

(c) Winding factor

(d) Generation factor [RRB SSE - 2015]

Answer: (a) Distribution spread factor

6. A single-phase alternator has a synchronous Reactance of 2 ohms and negligible resistance. If it supplies 10 A to a purely capacitive load at 200V, then the generated emf will be

(a) 240 volts

(b) 220 volts

(c) 200 volts

(d) 180 volts

Answer: (d) 180 volts

7. Suppose a synchronous generator connected to an infinite bus is supplying electrical power at unity PF to the bus. If its field current is now increased

(a) Both the active and reactive power output of the generator will remain unchanged.

(b) The active power supplied will remain unchanged but the machine will also supply lagging reactive power.

(c) The active power supplied will increase and the machine will draw leading reactive power.

(d) The active power supplied will decrease and the machine will supply leading reactive power.

Answer: (b) The active power supplied will remain unchanged but the machine will also supply lagging reactive power.

8. If the load of a synchronous motor is increased while keeping the field excitation constant, then

(a) Power factor will increase and power angle will decrease.

(b) Power factor will decrease and power angle will increase.

(c) Both power factor and power angle will increase.

(d) Both power factor and power angle will decrease.

Answer: (b) Power factor will decrease and power angle will increase.

9. A synchronous motor operates as a synchronous condenser when it is

(a) Operated at unity power factor

(b) Under-excited

(c) Over-excited

(d) Connected in parallel with condensers

Answer: (c) Over-excited

10. The field winding of a 3-phase synchronous motor is short-circuited directly. If a 3-phase balanced voltage is impressed across the stator terminals, then the rotor will

(a) Rotate at synchronous speed

(b) Rotate at a speed slightly less than synchronous speed

(c) Rotate at a speed very near to half of the synchronous machine

(d) Not rotate at all

Answer: (b) Rotate at a speed slightly less than synchronous speed

11. In a synchronous machine, the electric circuits are armature circuit, field circuit and damper circuit and X_d is d-axis synchronous reactance; X'_d, is d-axis transient synchronous reactance and X''_d is d-axis sub-transient synchronous reactance. If there is no damper winding, then

(a) $X'_d = X''_d$

(b) $X''_d = X_d$

(c) $X'_d = X_d$

(d) $X_d = X'_d = X''_d$

Answer: (a) X'd = X"d

12. A synchronous motor is operating with normal excitation. With the increase in load, the armature current drawn from the supply mains increase due to:

(a) Increase in resultant voltage across the armature.

(b) Increase in power factor.

(c) Increase in back emf.

(d) Fall in motor speed.

Answer: (a) Increase in resultant voltage across the armature.

13. In a 3-phase ac machine, the phase emf and output power for a phase spread of 60° are respectively E_1 and P_1 the phase emf and output power for a phase spread of 120° are respectively E_2 and P_2. In this context which one of the following sets of relations is correct?

(a) $E_1 = E_2$ and $P_1 = P_2$

(b) $E_1 = 1.15E_2$ and $P_1 = 1.15P_2$

(c) $E_1 = 1.15E_2$ and $P_1 = P_2$

(d) $E_1 = E_2$ and $P_1 = 1.15P_2$

Answer: **(b) $E_1 = 1.15E_2$ and $P_1 = 1.15P_2$**

14. A synchronous generator with a synchronous reactance of 1.3 pu is connected to an infinite bus whose voltage is 1 pu, through an equivalent reactance of 0.2 pu. For maximum output of 1.2 pu, the alternator emf must be

(a) 1.5 pu

(b) 1.56 pu

(c) 1.8 pu

(d) 2.5 pu

Answer: (c) 1.8 pu

15. A 3-phase synchronous motor with negligible losses is connected to the supply at rated frequency and constant terminal voltage V. The induced emf of the motor is designated as E. If the motor is now gradually loaded to its rated power, adjusting its excitation to obtain, say 0.8 leading power factor operation, then E-phasor would

(a) Be less than V-phasor and also lead V-phasor.

(b) Be greater than V-phasor and also lead V-phasor.

(c) Be less than V-phasor and also lag V-phasor.

(d) Be greater than V-phasor and also lag V-phasor.

Answer: (d) Be greater than V-phasor and also lag V-phasor.

16. Consider the following statements regarding an electrical machine having cylindrical stator and salient-pole rotor:

1. Reluctance torque is produced when rotor winding is excited.

2. Reluctance torque is produced when stator winding is excited.

3. When both stator and rotor windings are excited, electromagnetic torque is produced.

4. When both stator and rotor windings are excited, electromagnetic as well as reluctance torques are produced.

Which of these statements are correct?

(a) 2 and 4

(b) 1 and 4

(c) 1 and 3

(d) 2 and 3

Answer: (a) 2 and 4

17. To calculate the full-load voltage regulation of a synchronous generator at any power factor using potier triangle method, it is required to have

(a) Open-circuit and short-circuit characteristics.

(b) Open-circuit and zero power factor characteristics.

(c) Open-circuit characteristics, field current at rated short-circuit current and armature resistance.

(d) Short-circuit characteristics, zero power factor characteristics and armature resistance.

Answer: (b) Open-circuit and zero power factor characteristics.

18. An under-excited synchronous motor is operating at no load on an infinite bus of voltage 0.75 p.u and drawing a current of 0.8 p.u. at 0.8 pf lag. Its synchronous reactance is 0.5 p.u. What is the p.u. value of its excitation emf?

(a) 1.4

(b) 1.0

(c) 0.6

(d) 0.4

Answer: (c) 0.6

19. The field current of a synchronous motor is increased while its load is constant How will its power angle and power factor change?

(a) Power angle decreases and power factor improves.

(b) Power angle remains same throughout but power factor improves.

(c) Power angle increases while its power factor gradually decreases.

(d) Power angle and power factor both increase.

Answer: (a) Power angle decreases and power factor improves.

20. Two 3-phase alternators are synchronized so that their no-load voltages E_{n1} and E_{n2} are equal. If the excitation of machine 1 is now increased, then

1. A local circulating current I_c is set up.

2. I_c magnetizing in nature for machine 2.

3. I_c tends to reduce E_{n1}

4. The terminal voltage does not change.

Which of the statements given above are correct?

(a) 2 and 3

(c) 1, 3 and 4

(b) 1, 2 and 4

(d) 1, 2 and 3

Answer: (d) 1, 2 and 3

21. A 3-phase cylindrical rotor alternator is delivering rated power to a grid at its rated power factor. On account of some fault, steam supply to the turbine of the alternator is cut-off. The alternator would

(a) Stop.

(b) Continue running as an alternator at synchronous speed N, and deliver active power to the grid.

(c) Continue running as a synchronous motor at N, and deliver reactive power to the grid.

(d) Continue running as a synchronous motor at N, and draw reactive power from the grid.

Answer: (c) Continue running as a synchronous motor at N, and deliver reactive power to the grid.

22. Which of the following information is obtained, by Potier's method using open circuit characteristic and zero power factor characteristics?

(a) Field current equivalent of armature reaction.

(b) Synchronous reactance.

(c) Leakage reactance.

(d) Leakage reactance and field current equivalent of armature reaction.

Answer: (d) Leakage reactance and field current equivalent of armature reaction.

23. Alternator is operating on infinite bus. It will develop maximum synchronizing power when it is operating at

(a) No load.

(b) Full Load.

(c) Its steady state stability limit.

(d) Any load.

Answer: (c) Its steady state stability limit.

24. Short circuit ratio of a synchronous machine is the ratio of

(a) Field current required to produce rated voltage on open circuit and rated armature current.

(b) Field current required to produce rated armature current on short circuit to that required to produce rated voltage on open circuit.

(c) Field current required to produce rated voltage on open circuit to that required to produce rated armature current on short circuit.

(d) Open circuit voltage to short circuit armature current for the same field current.

Answer: (c) Field current required to produce rated voltage on open circuit to that required to produce rated armature current on short circuit.

25. A salient pole synchronous motor is running with normal excitation. If the excitation is reduced to zero

(a) It becomes an induction motor.

(b) It becomes a reluctance motor.

(c) It remains a synchronous motor.

(d) The motor would stop.

Answer: (b) It becomes a reluctance motor.

26. In a synchronous generator operating at zero pf lagging, the effect of armature reaction is

(a) Magnetizing.

(b) Demagnetizing.

(c) Cross-magnetizing.

(d) Both magnetizing and cross-magnetizing.

Answer: (b) Demagnetizing.

27. Consider the following reasons excited for providing damper bars on the pole faces of a synchronous motor:

1. Starting the motor as a squirrel cage induction motor.

2. To reduce the tendency of oscillation of the rotor with load changes.

3. To provide additional induction motor torque besides the main synchronous motor torque

4. To reduce the effects of slot harmonics causing noise and vibrations

Of these reasons:

(a) 1 alone is valid.

(b) 1 and 2 are valid.

(c) 1, 2 and 3 are valid.

(d) 2, 3 and 4 are valid.

Answer: (c) 1, 2 and 3 are valid.

28. Open-circuit (OC) and short circuit (SC) tests on an AC generator are conducted under which of the following conditions?

1. OC test at nominal flux and SC test at nominal current

2. OC test at reduced flux and SC test at reduced current

3. OC test at zero armature current and SC test at reduced flux

4. OC test zero current and SC test at nominal flux

Select the correct answer using the codes given below:

(a) 1 and 3

(b) 2 and 3

(c) 1 and 4

(d) 2 and 4

Answer: (a) 1 and 3

29. During the slip-test for determining the direct and the quadrature axis synchronous reactances of an alternator, the voltage across the open field circuit terminals

(a) DC voltage

(b) AC voltage of supply frequency

(c) AC voltage of slip frequency

(d) A modulated voltage with an envelope of slip frequency

Answer: (c) AC voltage of slip frequency

30. The fifth harmonic component of the induced voltage in a 3-phase ac generator coil, be entirely eliminated by using a winding pitch of

(a) 2/3

(b) 4/5

(c) 5/6

(d) 6/7

Answer: (b) 4/5

31. For proper synchronisation of a large synchronous machine to a bus, the frequency of the incoming machine

(a) Should be exactly the same as that of the bus.

(b) Should be slightly higher than that of the bus.

(c) Should be slightly lower than that of the bus.

(d) Can be of any value.

Answer: (a) Should be exactly the same as that of the bus.

32. An alternator coupled to which prime mover will usually have the highest rotating speed?

(a) Steam engine

(b) Reciprocating diesel engine

(c) Francis turbine

(d) Steam turbine

Answer: (d) Steam turbine

33. In an alternator the voltage generated per phase in proportional to

(a) Number of turns in coil

(b) Flux per pole

(c) Frequency of waveform

(d) All of the above

Answer: (d) All of the above

34. Turbo-alternators are generally used to run at

(a) 1500 r.p.m.

(c) 5000 r.p.m.

(b) 3000 r.p.m.

(d) 15000 r.p.m.

Answer: (b) 3000 r.p.m.

35. The dark and bright lamp method is used for

(a) Transfer of load

(b) Synchronizing

(c) Balancing of load

(d) Phase sequence

Answer: (b) Synchronizing

36. Which harmonic will be totally eliminated in an alternator by using a fractional pitch of 4/5?

(a) Third

(c) seventh

(b) Fifth

(d) Ninth

Answer: (b) Fifth

37. Damper winding on alternator results in all of the following except

(a) Increases instability of machine

(b) Elimination of harmonic effects

(c) Absorption of energy of oscillations when operating in parallel with other alternators

(d) Suppression of spontaneous hunting when supplying power to transmission line with high resistance to reactance ratio

Answer: (a) Increases instability of machine

38. In an alternator the armature reaction is mainly influenced by

(a) The power factor of the load

(b) Short-circuit ratio

(c) Speed of the alternator

(d) Total current drawn

Answer: (a) The power factor of the load

39. In an alternator terminal voltage rise will be more

(a) When leading load is thrown off.

(b) When lagging load is thrown off.

(c) When unity power factor load is thrown off.

(d) None of the above.

Answer: (b) When lagging load is thrown off.

40. The power drawn by the prime-mover of an alternator, under no-load conditions, goes to

(a) Meet copper losses both in armature and rotor windings

(b) Produce power in armature

(c) Meet no-load losses

(d) Produce e.m.f in armature winding

Answer: (c) Meet no-load losses

41. The advantage of salient poles in an alternator is

(a) Reduced windage loss

(b) Reduced bearing loads and noise

(c) Reduced noise

(d) Adaptability of low and medium speed operation

Answer: (d) Adaptability of low and medium speed operation

42. When two alternators are running in exact synchronism, the synchronizing power will be

(a) Unity

(b) Zero

(c) Sum of the output of two

(d) None of the above

Answer: (b) Zero

43. A synchronous motor can be started by

(a) Pony motor

(b) D.C. compound motor

(c) Providing damper winding

(d) Any of the above

Answer: (d) Any of the above

44. When the excitation of an unloaded salient pole synchronous motor suddenly gets disconnected

(a) The motor stops

(b) It runs as a reluctance motor at the same speed

(c) It runs as a reluctance motor at a lower speed

(d) None of the above

Answer: (b) It runs as a reluctance motor at the same speed

45. For V-curves for a synchronous motor the graph is drawn between

(a) Field current and armature current

(b) Terminal voltage and load factor

(c) Power factor and field current

(d) Armature current and power factor

Answer: (a) Field current and armature current

46. The back e.m.f. of a synchronous motor depends on

(a) Speed

(c) Load angle

(b) Load

(d) All of the above

Answer: (c) Load angle

47. Synchronizing power of a synchronous machine is

(a) Directly proportional to the synchronous reactance

(b) Inversely proportional to the synchronous reactance

(c) Equal to the synchronous reactance

(d) None of the above

Answer: (b) Inversely proportional to the synchronous reactance

48. An over-excited synchronous motor is used for

(a) Fluctuating loads

(b) Variable speed loads

(c) Low torque loads

(d) Power factor corrections

Answer: (d) Power factor corrections

49. Stability of a synchronous machine

(a) Decreases with increase in its excitation

(b) Increases with increase in its excitation

(c) Remains unaffected with increase in excitation

(d) Any of the above

Answer: (b) Increases with increase in its excitation

50. If one-phase of a 3-phase synchronous motor is short-circuited, motor

(a) Will refuse to start

(b) Will overheat in spots

(c) Will not come upto speed

(d) Will fail to pull into step

Answer: (a) Will refuse to start

51. Hunting in a synchronous motor can't be due to

(a) Windage friction

(b) Variable load

(c) Variable frequency

(d) Variable supply voltage

Answer: (a) Windage friction

52. The duration of sudden short-circuit test on a synchronous motor is usually about

(a) One hour

(b) One minute

(c) One second

(d) None of the above

Answer: (c) One second

53. Drop in alternator frequency is corrected by

(a) Damper winding

(b) Increased prime mover output

(c) Automatic voltage regulator

(d) None of these [DMRC JE-2016]

Answer: (b) Increased prime mover output

54. If the excitation of an alternator operating in parallel with other alternators decreased, its

(a) Power factor becomes more leading

(b) Output kW will change

(c) Power factor becomes more lagging

(d) Power factor becomes unity

Answer: (a) Power factor becomes more leading

55. A field excitation of 20 A in a certain alternator results in an armature current of 400 A in short circuit and a terminal voltage of 2000 V in open circuit. The magnitude of internal voltage drop within the machine at a load current of 200 A is

(a) 1500 V

(b) 2000 V

(c) 1000 V

(d) 100 V

Answer: (c) 1000 V

56. A synchronous motor is connected to an infinite bus at 1.0 pu voltage and draws 1.0 pu current at unity power factor. The synchronous reactance is 1.0 pu and resistance is negligible. What is the load angle?

(a) 90°

(b) 45°

(c) 0°

(d) 60°

Answer: (b) 45°

57. ZPF (Zero power factor) method finds …… of an alternator.

(a) Voltage regulation

(b) Efficiency

(c) Armature resistance

(d) Synchronous impedance

Answer: (a) Voltage regulation

58. By reversing …….. the direction of rotation of a synchronous motor can be reversed. [UPPCL JE - 2014]

(a) Supply phase sequence

(b) Current to the field winding

(c) Polarity of rotor poles

(d) Either "polarity of rotor poles" or "supply phase sequence".

Answer: (a) Supply phase sequence

59. An alternator's operating principle is quite similar to that of

(a) A.C. Generator.

(b) D.C. Generator.

(c) A.C. Inverter.

(d) A.C. Stablizer. [UPPCL JE - 2014]

Answer: (b) D.C. Generator.

60. What is the value of load angle at a point where power output of a salient pole synchronous generator is maximum? [UPPCL JE 2014]

(a) 0°

(b) 45°

(c) 120°

(d) It is less than 90° but not fixed.

Answer: (d) It is less than 90° but not fixed.

61. Match the characteristics with its relevant relation. [UPPCL JE - 2014]

List-I (Characteristics)

A. Open circuit characteristics

B. Internal characteristics

C. External characteristics

D. Load saturation curve

List-II (Relation)

1. V vs I_f

2. E_o vs I_f

3. E vs I_a

4. V vs I

Where, E_o = no load induced e.m.f. ; I_f = field current; I_a = armature current; E = generated e.m.f. on load; V = terminal voltage; I = load current.

(a) A-4, B-3, C-2, D-1

(b) A-2, B-1, C-4, D-3

(c) A-4, B-1, C-2, D-3

(d) A-2, B-3, C-4, D-1

Answer: (d) A-2, B-3, C-4, D-1

62. When a synchronous motor is ……., it operates with leading power factor current. [UPPCL JE - 2014]

(a) Under-excited

(b) Critically excited

(c) Over-excited

(d) Heavily loaded

Answer: (c) Over-excited

63. What will be the effect on a salient pole synchronous motor if its field current is switched off (provided the motor runs at no load)?

(a) It will stop.

(b) It continues to run at synchronous speed.

(c) It continues to run at a speed slightly more than the synchronous speed.

(d) It continues to run at a speed slightly less than the synchronous speed. [UPPCL JE 2014]

Answer: (b) It continues to run at synchronous speed.

64. The following system is used in connections of various lamps and appliances in parallel. Identify the system. [UPPCL JE - 2014]

(a) Gain-in-system

(b) Loop-in-system

(c) Voltage-in-system

(d) Parallel-in-system

Answer: (b) Loop-in-system

65. On which of the following parameters does the power factor of an alternator depend? [UPPCL JE - 2014]

(a) Load

(b) Speed of rotor

(c) Core losses

(d) Armature losses

Answer: (a) Load

66. What is the purpose of dampers in a large generator? [UPPCL JE - 2014]

(a) They increase stability.

(b) They reduce voltage fluctuations.

(c) They reduce frequency fluctuations.

(d) They decrease stability.

Answer: (a) They increase stability.

67. On which of the following does the back emf set up in the stator of a synchronous motor depend? [UPPCL JE 2014]

I. Rotor speed

II. Rotor excitation

III. Coupling angle

Choose the correct answer from the options given below.

(a) Only II

(b) Only II and III

(c) I, II and III

(d) Only I and III

Answer: (a) Only II

68. For the following specifications of a synchronous motor, determine the ratio of no load speed to full load speed. [UPPCL JE - 2014]

(a) 2:3

(b) 1:1

(c) 3:5

(d) 2:7

Answer: (b) 1:1

69. Embedding the damper winding in the pole face serves which of the following purposes? [UPPCL JE - 2014]

(a) Eliminate hunting and provide adequate starting torque.

(b) Reduce windage losses.

(c) Eliminate losses on account of air friction.

(d) Reduce bearing friction.

Answer: (a) Eliminate hunting and provide adequate starting torque.

70. Let us assume that two alternators running exactly in synchronism. Find the synchronizing power of the system. [UPPCL JE 2014]

(a) 0

(b) 1

(c) 0.8

(d) 0.5

Answer: (a) 0

71. A synchronous motor having 5 poles is running with a supply frequency of 40 Hz. What is the control operating speed of the motor?

(a) 100 rpm

(b) 1200 rpm

(c) 600 rpm

(d) 960 rpm

Answer: (d) 960 rpm

72. In a synchronous alternator which of the following coils will have emf closer to sine wave from? [LMRC 2015]

(a) Concentrated winding in full pitch coils.

(b) Distributed winding in full pitch coils.

(c) Distributed winding in short pitch coils.

(d) Concentrated winding in short pitch coil.

Answer: (c) Distributed winding in short pitch coils.

73. Damping winding in a synchronous motor

(a) Improves power factor of the motor.

(b) Increases hunting of the motor.

(c) Reduces windage losses.

(d) Increases starting torque. [NMRC JE-2017]

Answer: (d) Increases starting torque.

74. Synchronous Generator is a source of

(a) Real Power

(b) Reactive power

(c) Apparent power

(d) Both real and reactive power

Answer: (d) Both real and reactive power

75. The ratio of starting torque to running torque in a synchronous motor is

(a) Zero

(c) Two

(b) One

(d) Infinity

Answer: (a) Zero

76. For very low speed and high power applications, the best suited ac motor is

(a) Slip-ring induction motor.

(b) Squirrel cage induction motor.

(c) AC commutator motor.

(d) Synchronous motor.

Answer: (d) Synchronous motor.

77. The generator develops an electric power by

(a) Conversion of heat.

(b) Conversion of light.

(c) Electro-magnetic induction.

(d) Conversion of chemical energy.

Answer: (c) Electro-magnetic induction.

78. When a synchronous motor is started, the field winding is initially

(a) Excited by a d.c. sources.

(b) Short circuited.

(c) Open circuited.

(d) None of these.

Answer: (c) Open circuited.

79. A 10 pole, 25 Hz alternator is directly coupled to and is driven by a 60 Hz synchronous motor. The number of poles of a synchronous motor

(a) 48 poles

(b) 12 poles

(c) 24 poles

(d) all of the above

Answer: (c) 24 poles

80. To eliminate the 5th harmonic of a short pitched coil should have a short pitching angle of

(a) 36°

(b) 18°

(c) 15°

(d) 12°

Answer: (a) 36°

81. The direction of induced e.m.f. can be found with the help of

(a) Fleming's right hand rule

(b) Kirchhoff's voltage law

(c) Lenz's law

(d) Laplace's law [UPPCL JE 2007]

Answer: (a) Fleming's right hand rule

82. A 50 Hz alternator will run at the highest speed if it is wound for

(a) 8 poles

(b) 6 poles

(c) 4 poles

(d) 2 poles [UPPCL JE 2007]

Answer: (d) 2 poles

83. Which one of the following methods gives voltage regulation higher than the actual value in an alternator ? [UPPCL JE - 2007]

(a) ZPF method

(b) mmf method

(c) emf method

(d) ASA method

Answer: (c) emf method

84. The most common type of prime mover used for low speed alternators is

(a) Steam turbine

(b) Petrol engine

(c) Hydraulic turbine

(d) Diesel engine [UPPCL JE 2007]

Answer: (c) Hydraulic turbine

85. When speed of an alternator is changed from 3600 rpm to 1800 rpm, the generated emf will be

(a) One-half

(b) Twice

(c) One-fourth

(d) Four times [UPPCL JE - 2007]

Answer: (a) One-half

86. The power factor of an alternator is determined by its

(a) Prime mover

(b) Speed

(c) Excitation

(d) Load [UPPCL JE 2007]

Answer: (d) Load

87. Change in excitation of synchronous motor result

(a) Change in motor speed.

(b) Change in power factor.

(c) Both (a) and (b).

(d) None of the above.

Answer: (b) Change in power factor.

88. From no-load to full-load, synchronous motors give

(a) Constant speed.

(b) Variable speed.

(c) Gradually increasing speed.

(d) Gradually decreasing speed. [UPPCL JE 2016]

Answer: (a) Constant speed.

89. Alternators are rated at

(a) kW

(b) kVA

(c) kVA or kW

(d) kWh [UPPCL JE 2016]

Answer: (b) kVA

90. To reduce the peripheral speed of an alternator, diameter of the rotor is

(a) Increased

(b) Decreased

(c) Increased or decreased

(d) Kept same [UPPCL JE 2016]

Answer: (b) Decreased

91. The maximum power developed by a synchronous motor depends on……. and…….

(a) Supply voltage, Maximum value of load angle

(b) Supply voltage, Excitation current

(c) Excitation current, Maximum value of load angle

(d) Output voltage, Supply frequency [UPPCL AE - 2016]

Answer: (b) Supply voltage, Excitation current

92. Which of the following statement is false? [UPPCL AE - 2016]

(a) Silica gel is used in transformers

(b) Transformer is a constant flux machine

(c) Induction motor can be self starting

(d) Synchronous motor is self starting

Answer: (d) Synchronous motor is self starting

93. The size of a synchronous motor decreases with the increase in

(a) Speed

(c) Flux density

(b) Horse power rating

(d) All of these

Answer: (c) Flux density

94. Synchronous capacitor is

(a) An ordinary static capacitor bank.

(b) An over excited synchronous motor driving mechanical load.

(c) An over excited motor running without mechanical load.

(d) None of the above. [Uttrakhand - 2013]

Answer: (c) An over excited motor running without mechanical load.

95. What will be the rotation speed of a 3-phase, 4-pole, 50 Hz synchronous motor, if the frequency, number of poles and load torque is halved? [UPPCL JE - 2018]

(a) 3000 RPM

(b) 750 RPM

(c) 6000 RPM

(d) 1500 RPM

Answer: (d) 1500 RPM

96. Quadrature axis synchronous reactance is the ratio of

(a) V_{min} to I_{max}

(b) V_{min} to I_{min}

(c) V_{max} to I_{max}

(d) V_{max} to I_{min} [UPPCL JE 2018]

Answer: **(a) V_{min} to I_{max}**

97. Stator and rotor fields rotate simultaneously in which of the following motors?

(a) Universal motor

(b) Synchronous motor

(c) D.C. motor

(d) Reluctance motor [UPPCL JE 2018]

Answer: (b) Synchronous motor

98. In which of the following conditions will a 3-phase synchronous machine works as a capacitor? [UPPCL JE - 2018]

(a) Over Excited

(b) Critically Excited

(c) Under Excited

(d) None of these

Answer: (a) Over Excited

99. What is the role of alternator in a steam power station? [UPPCL JE - 2018]

(a) It converts electrical energy into mechanical energy.

(b) It converts heat energy to mechanical energy.

(c) It converts heat energy to electrical energy.

(d) It converts mechanical energy into electrical energy.

Answer: (d) It converts mechanical energy into electrical energy.

100. What is the Synchronising power of a synchronous machine? [UPPCL JE - 2018]

(a) Directly proportional to the synchronous reactance.

(b) Equal to the synchronous reactance.

(c) Inversely proportional to the synchronous reactance.

(d) None of these.

Answer: (c) Inversely proportional to the synchronous reactance.

101. What the damper bars develops, when the rotor speed, in a synchronous machine, becomes more than the synchronous speed during hunting? [UPPCL JE 2018]

(a) Inductor motor torque

(b) Induction generator torque

(c) D.C. motor torque

(d) Synchronous motor torque

Answer: (b) Induction generator torque

102. A synchronous motor can operate at

(a) Lagging power factor only.

(b) Lagging, leading and unity power factors.

(c) Leading power factor only.

(d) None of these. [UPPCL JE - 2018]

Answer: (b) Lagging, leading and unity power factors.

103. According to Fleming's right hand rule, what does the thumb indicate?

(a) Direction of the motion of the conductor relative to the magnetic field.

(b) Direction of the induced or generated current within the conductor.

(c) Direction of the magnetic field.

(d) None of these. [UPPCL JE - 2018]

Answer: (a) Direction of the motion of the conductor relative to the magnetic field.

104. The constant speed of a synchronous motor can be changed to new fixed value by which of the following methods? [UPPCL JE - 2018]

(a) By changing the applied voltage.

(b) By interchanging any two phases.

(c) By changing the supply frequency.

(d) All of these.

Answer: (c) By changing the supply frequency.

105. Which of the following generator is used in the thermal power plant? [UPPCL JE 2018]

(a) Turbo generator.

(b) Synchronous motor.

(c) Non-salient pole synchronous generator.

(d) Salient pole synchronous generator.

Answer: (c) Non-salient pole synchronous generator.

106. Calculate the frequency in Hz of a 10-pole AC generator which rotates at 1800 rpm. [UPPCL JE 2018]

(a) 120

(b) 100

(c) 150

(d) 180

Answer: (c) 150

107. In a synchronous motor, the breakdown torque is

(a) Inversely proportional to the square of the applied voltage.

(b) Inversely proportional to applied voltage.

(c) Directly proportional to applied voltage.

(d) Directly proportional to the square of the applied voltage. [UPPCL JE - 2018]

Answer: (c) Directly proportional to applied voltage.

108. If field current of a three phase alternator is reversed, what happens to its phase sequence? [UPPCL JE 2018]

(a) Remains same.

(b) Reverses.

(c) Two phases are exchanged.

(d) It becomes ac motor.

Answer: (a) Remains same.

109. A 10 pole, 25 Hz alternator is directly coupled to and is driven by 60 Hz synchronous motor. Then the number of poles in a synchronous motor are

(a) 12 poles

(b) 48 poles

(c) 24 poles

(d) 6 poles

Answer: (c) 24 poles

110. Which of the following phenomenon shows the regulation of an alternator? [UPPCL JE 2018]

(a) The increase in terminal voltage when load is thrown off.

(b) The variation of terminal voltage under the conditions of over and under excitation.

(c) Terminal voltage at zero power factor.

(d) The reduction in terminal voltage when alternator is on full load.

Answer: (a) The increase in terminal voltage when load is thrown off.

111. The synchronous motor has

(a) Constant speed

(b) Variable speed

(c) Constant poles

(d) Constant size

Answer: (a) Constant speed

112. Which of the following motors one will choose to drive the rotary compressor?

(a) D.C. shunt motor

(b) D.C. series motor

(c) Universal motor

(d) Synchronous motor

Answer: (d) Synchronous motor

113. Negative voltage regulation is indicative that the load is

(a) Capacitive only

(b) Inductive only

(c) Inductive or resistive

(d) None of the above

Answer: (a) Capacitive only

114. As load p.f. of an alternator becomes more leading, the value of generated voltage required to give rated terminal voltage

(a) Increases

(b) Remains unchanged

(c) Decreases

(d) Varies with rotor speed

Answer: (c) Decreases

115. Synchronous condenser means

(a) A synchronous motor with capacitor connected a cross stator terminals to improve PF.

(b) A synchronous motor operating at full load with leading PF.

(c) An over excited synchronous motor partially supplying mechanical load and also improving PF of the system to which it is connected.

(d) An over excited synchronous motor operating at no load with leading PF to improve the PF of the system.

Answer: (d) An over excited synchronous motor operating at no load with leading PF to improve the PF of the system.

116. In alternators during armature reaction the effect of armature flux on main flux with unity power factor is:

(a) Cross magnetizing.

(b) Wholly demagnetizing.

(c) Partially magnetizing.

(d) Wholly magnetizing. [Jharkhand JE 2017]

Answer: (a) Cross magnetizing.

117. An integral number of slots per pole is often used in an alternator in order to

(a) Eliminate harmonics in the waveform.

(b) Provide insulation.

(c) Permit easy installation of stator coils.

(d) Provide easy removal in case of repair. [UPPCL JE - 2016]

Answer: (a) Eliminate harmonics in the waveform.

118. Damper in a large generator is used to ……

(a) Increase stability.

(b) Reduce voltage fluctuation.

(c) Reduce frequency fluctuation

(d) All above. [Uttrakhand AE 2013]

Answer: (a) Increase stability.

119. Harmonics present in alternators affect

(a) Pitch factor.

(b) Chording factor.

(c) Neither Chording factor nor pitch factor.

(d) Chording factor and pitch factor. [UPRVUNL JE - 2016]

Answer: (d) Chording factor and pitch factor. [UPRVUNL JE - 2016]

120. Synchronous generator can…….. reactive power. [UPRVUNL JE 2016]

(a) Neither generates nor absorbs.

(b) Absorb.

(c) Generate and absorb.

(d) Generate.

Answer: (c) Generate and absorb.

121. Select the correct choice of alternators for power generation using hydro and steam.

(a) Kaplan and Francis are both steam turbines.

(b) Kaplan and Francis are hydro turbines.

(c) Only Francis turbine is the hydro turbine.

(d) Kaplan for steam and Francis for hydro. [UPRVUNL JE 2016]

Answer: (b) Kaplan and Francis are hydro turbines.

122. ……. excitation will …… the terminal voltage of the machine when connected …….

(a) Variable - not change - to infinite bus.

(b) Fixed - change - independently.

(c) Variable - change - to Infinite bus.

(d) Variable - not change - independently.

Answer: (a) Variable - not change - to infinite bus.

123. The pitch factor or chording factor of a short pitch winding in an alternator is defined as…….

(a) (Vector sum of induced emf per coil) × (Arithmetic sum of induced emf per coil)

(b) (Vector sum of induced emf per coil) / (Arithmetic sum of induced emf per coil)

(c) (Vector sum of induced emf per coil) + (Arithmetic sum of induced emf per coil)

(d) (Vector sum of induced emf per coil) - (Arithmetic sum of induced emf per coil) [UPRVUNL JE 2016]

Answer: (b) (Vector sum of induced emf per coil) / (Arithmetic sum of induced emf per coil)

124. An alternator has ……..

(a) Rotating armature and stationary field .

(b) Stationary armature and stationary field.

(c) Rotating armature and rotating field.

(d) Stationary armature and rotating field. [UPRVUNL JE 2016]

Answer: (d) Stationary armature and rotating field. [UPRVUNL JE 2016]

125. To determine voltage regulation of an alternator the following experimental results are required:

(a) Short circuit characteristic and open circuit characteristic.

(b) Open circuit characteristic and armature impedance.

(c) Armature impedance.

(d) Short circuit characteristic and open circuit characteristic and Armature impedance. [UPRVUNL JE - 2016]

Answer: (d)

126. To reduce the peripheral speed of an alternator, diameter of the rotor is ……

(a) Increased.

(b) Decreased.

(c) Increased or decreased.

(d) Kept same. [UPPCL-JE 2016]

Answer: (b) Decreased.

127. What is the frequency of voltage generated by an alternator having 6-poles and rotating at 900 rpm? [MPPKVVCL-2007]

(a) 50 rad/s

(b) 50 Hz

(c) 45 Hz

(d) 45 rad/s

Answer: (c) 45 Hz

128. The speed of two pole alternator at 60 Hz is ……..

(a) 3600 rpm

(b) 750 rpm

(c) 300 rpm

(d) 1500 rpm [JUVNL-JE 2017]

Answer: (a) 3600 rpm

129. The distribution or winding factor is defined in an alternator in terms of

(a) Power factor

(b) Electromotive force

(c) Power

(d) Current [JUVNL-JE 2017]

Answer: (b) Electromotive force

130. In case of leading load power factor, the terminal voltage of an alternator will

(a) Fall on removing the full load.

(b) Rise on removing the full load.

(c) Rise on adding the full load.

(d) Fall on adding the full load. [DMRC JE- 2017]

Answer: (a) Fall on removing the full load.

131. A magnetic flux on 300 m Wb in a coil of 100 turns is reverted in 0.2 seconds. The average emf induced is

(a) 600 V

(b) -300 V

(c) -600 V

(d) 300 V [DMRC JE- 2017]

Answer: (d)

132. Distributed winding and short chording employed in AC machines will result in……..

(a) Reduction in both emf and harmonics emf.

(b) Reduction in emf and increase in harmonics emf.

(c) Increase in both emf and harmonics emf.

(d) Increase in emf and reduction in harmonics emf. [Coal India - 2017]

Answer: (a) Reduction in both emf and harmonics emf.

133. An alternator has a phase sequence of RYB for its phase voltages. In case the field current is reversed the phase sequence will become ……

(a) RBY

(b) RYB

(c) YRB

(d) None of the above [UJVNL-2016]

Answer: (b) RYB

134. What is the pitch factor of a 4 pole alternator having 36 slots and a coil span of 1 to 8? [J&K JE 2016]

(a) 140°

(b) 80°

(c) 20°

(d) 40°

Answer: (d) 40°

135. A 3 Phase, 60 Hz generator connected in Y connection, generated a line to line voltage of 23900 V. Calculate the peak line voltage. [J&K JE - 2016]

(a) 13800 V

(b) 33800 V

(c) 42300 V

(d) 23900 V

Answer: (b) 33800 V

136. Damper winding and pony break are the methods of starting of

(a) Slip ring motors.

(b) Synchronous motors.

(c) Schrage motors.

(d) Squirrel cage motors. [UPPCL - 2016]

Answer: (b) Synchronous motors.

137. A reactor having an inductive reactance of 4 ohm is connected to the terminals of a 120 V AC generator. Calculate the power associated with the reactor. [J&K JE 2016]

(a) 3.6 kVAR

(b) 30 kVAR

(c) 7.2 kVAR

(d) 4.16 kVAR

Answer: (a) 3.6 kVAR

138. If the type of excitation of synchronous motors is critical excitation then what will be the nature of power factors? [MPJE - 2016]

(a) Lagging.

(b) Unity power factor.

(c) Lagging power factor.

(d) Leading power factor.

Answer: (b) Unity power factor.

139. An alternator is feeding an infinite bus bar. Its prime mover is suddenly shutdown. The alternator will……..

(a) Continue to work as alternator but the direction of rotation will reverse.

(b) Come to stand still.

(c) Continue to work as synchronous motor and direction of rotation will also be same.

(d) Will work as an induction motor. [J&K JE - 2016]

Answer: (c) Continue to work as synchronous motor and direction of rotation will also be same.

140. An alternator is connected to an infinite bus. If its field current is decreased then its armature current will be……..

(a) Increase with zero pf lagging.

(b) Decreases with zero pf leading.

(c) Increases with zero pf leading.

(d) None of the other options.

Answer: (c) Increases with zero pf leading.

141. A 500 MW, 3 phase star connected synchronous generator has a rated voltage of 21.5 kV at 0.85 pf. What will be the line current when operating at full load rated conditions? [LMRC AE- 2016]

(a) 13.43 KA

(b) 15.79 KA

(c) 23.25 kA

(d) 27.36 kA

Answer: (b) 15.79 KA

142. A synchronous generator has higher power handling capacity when operating

(a) At lagging power factor.

(b) At leading power factor.

(c) At unity power factor.

(d) Independent of power factor.

Answer: (c) At unity power factor.

143. The statement "Generators are Coherent", implies that ……

(a) All of them oscillate at same frequency.

(b) Each of them oscillates at different frequencies.

(c) They rotate at same frequency.

(d) Each generator rotates at different frequency.

Answer: (a) All of them oscillate at same frequency.

144. Harmonics in power system are not generated by ……..

(a) Unbalanced source and balanced load.

(b) Balanced source and unbalanced load.

(c) Balanced loading with a balanced source.

(d) Non linear switches.

Answer: (c) Balanced loading with a balanced source.

145. A 6 pole, 3-phase alternator running at 1000 rpm supplies to an 8-pole, 3-phase induction motor which has a rotor current of frequency 2 Hz. The speed at which the motor operates is ……

(a) 100 rpm

(b) 970 rpm

(c) 750 rpm

(d) 720 rpm [Uttrakhand AE - 2013]

Answer: (b) 970 rpm

146. A 10 pole AC generator rotates at 1200 rpm. The frequency of AC voltage in cycle per second will be ……..

(a) 120

(b) 110

(c) 100

(d) 50

Answer: (c) 100

147. Maximum speed of a synchronous machine for 50 Hz is ……..

(a) 1500 rpm

(b) 3000 rpm

(c) 20000 rpm

(d) 30000 rpm

Answer: (b) 3000 rpm

148. We have assigned a frequency of 50 Hz to power system because it

(a) Can be easily obtained.

(b) Gives best result when used for operating both lights and machinery.

(c) Easy calculations.

(d) None

Answer: (b) Gives best result when used for operating both lights and machinery.

149. Direction of the alternating e.m.f. produced in the stator conductors of an alternator is given by

(a) Lenz's law

(b) Flemings left hand rule

(c) Fleming's right hand rule

(d) Kirchoff's Law

Answer: (c) Fleming's right hand rule

150. An alternator running at 3000 rpm generates voltage at 50 Hz. The number of poles of alternator will be

(a) 8

(b) 6

(c) 4

(d) 2

Answer: (d) 2

151. Find the stator winding voltage of a three phase star connected 5500 V synchronous motor having synchronous reactance per phase of 20 Ω.

(a) 3175.4 V

(b) 5500 V

(c) 9526 V

(d) 3180 V [MPJE - 2016]

Answer: (a) 3175.4 V

152. What is the value of load angle at a point where power output of a salient pole synchronous generator is maximum? [UPRVUNL - 2014]

(a) 0°

(b) 45°

(c) 120°

(d) Less than 90° but not fixed

Answer: (d)

153. On which of the following parameters does the power factor of an alternator depend? [UPRVUNL 2014]

(a) Load

(b) Speed of rotor

(c) Core losses

(d) Armature losses

Answer: (a) Load

154. The rotor of an alternator has

(a) Four slip rings

(b) Three slip rings

(c) Two slip rings

(d) No slip rings [DMRC - 2015]

Answer: (c) Two slip rings

155. If the speed of rotation of a dynamo is doubled, then the induced emf will ……..

(a) Become half.

(b) Become double.

(c) Become four times.

(d) Remain unchanged. [LMRC - 2015]

Answer: (b) Become double.

156. An exciter for a turbo generator is a ……

(a) Separately excited generator

(b) Shunt generator

(c) Series generator

(d) Compound generator [LMRC - 2015]

Answer: (b) Shunt generator

157. The seventh space harmonic in the M.M.F. developed by balance fundamental-frequency armature currents rotates at X-times the synchronous speed with respect to poles, while

(a) X = 5/7

(b) X = 1/7

(c) X=1

(d) X = 8/7

Answer: (b) X = 1/7

158. The capacity of large turbo-generators varies from

(a) 20 to 100 MW

(b) 50 to 30 MW

(c) 70 to 400 MW

(d) 100 to 650 MW

Answer: (d) 100 to 650 MW

159. The integration of a three phase Alternator with the infinite grid requires which quantities to be same?

(a) Voltage

(b) Frequency

(c) Phase sequence

(d) All of the above [UPSSSC - 2015]

Answer: (d) All of the above

160. The phase angle introduced between the induced emf phasor, E and terminal voltage phasor, V during the load condition of an alternator is called ……..

(a) Electric angle

(b) Mechanical angle

(c) Load angle

(d) None of the above [MP JE - 2016]

Answer: (c) Load angle

161. The most common type of prime mover used for low speed alternators is …….

(a) Steam turbine

(b) Petrol engine

(c) Hydraulic turbine

(d) Diesel engine

Answer: (c) Hydraulic turbine

162. The power factor of an alternator is determined by its

(a) Prime mover

(c) Excitation

(b) Speed

(d) Load

Answer: (d) Load

163. If the excitation of an alternator operating in parallel with other alternators decreased, its:

(a) Power factor becomes more leading.

(b) Output kW will change.

(c) Power factor becomes more lagging.

(d) Power factor becomes unity. [DMRC 2016]

Answer: (a) Power factor becomes more leading.

164. Drop in alternator frequency is corrected by:

(a) Damper winding.

(b) Increased prime mover output.

(c) Automatic voltage regulator.

(d) None of these. [DMRC 2016]

Answer: (b) Increased prime mover output.

165. Two identical alternators are running in parallel and carry equal loads. If the excitation of one alternator is increases without changing the steam supply then

(a) KVAR supplied by it would decrease

(b) power factor will increase

(c) it will keep supplying the same load

(d) kVA supplied by it will decrease [LMRC - 2015]

Answer: (c) it will keep supplying the same load

166. Armature reaction in alternator primarily affects:

(a) Terminal voltage per phase.

(b) Frequency of armature current.

(c) Generated voltage per phase.

(d) Rotor speed. [LMRC - 2015]

Answer: (c) Generated voltage per phase.

167. For successful parallel operation of two alternators it is desirable that both have:

(a) Low reactance in comparison to resistance.

(b) Same resistance.

(c) Same reactance.

(d) High reactance in comparison to resistance.

Answer: (d) High reactance in comparison to resistance.

168. Because of which one of the following reasons the phasor addition of stator and rotor mmf is possible in a cylindrical rotor synchronous machine?

(a) Two mmfs are rotating in opposite direction .

(b) Two mmfs are rotating in same direction at different speed.

(c) Two mmfs are stationary with respect to each other.

(d) One mmf is stationary and the other mmf is rotating.

Answer: (c) Two mmfs are stationary with respect to each other.

169. An alternator A is connected to bus bar and another alternator B supplies its own constant impedance load. If field excitation is changed, then

(a) pf of both A and B changes.

(b) pf of A changes but pf of B remains unchanged.

(c) Armature current of both A and B changes.

(d) terminal voltage of both A and B changes.

Answer: (b) pf of A changes but pf of B remains unchanged.

170. If both the generator active and reactive power are doubled, kVA loading on the generator …….

(a) Quadruples

(b) Doubles

(c) Increases by a factor of √2

(d) Remains the same

Answer: (b) Doubles

171. Average value of flux density wave over one pole pitch is…. times the maximum flux density.

(a) 2

(b) 2/π

(c) π /2

(d) 2π

Answer: (b) 2/π

172. Which one of the following is NOT a necessary condition to be satisfied for synchronizing an incoming alternator to an already operating alternator?

(a) Same voltage.

(b) Same frequency.

(c) Same prime mover speed.

(d) Same phase sequence.

Answer: (c) Same prime mover speed.

173. If a P-pole alternator rotates N completes rotations, it produces ……. cycles of generated voltage. (As N in the number of rotations made per second) [UPPCL (JE) 2016]

(a) NP/2

(b) P/2N

(c) 2N/P

(d) 2NP

Answer: (a) NP/2

174. Magnetic field poles are the …… part of an alternator. [UPPCL (JE) - 2016]

(a) Static

(b) Rotary

(c) Reciprocating

(d) Circuital

Answer: (b) Rotary

175. At lagging loads, the effect of armature reaction in an alternator is …….

(a) Neutralizing

(b) Cross magnetizing

(c) Magnetizing

(d) Demagnetizing [UPPCL (JE) 2016]

Answer: (d) Demagnetizing [UPPCL (JE) 2016]

176. By matching which of the following individual machines, the load frequency control is achieved? [UPPCL (JE) 2016]

(a) Reactive power

(b) Turbine inputs

(c) Generated voltage

(d) Turbine and generator ratings

Answer: (b) Turbine inputs

177. Speed of synchronous motor on increasing load

(a) Becomes infinity.

(b) Remains constant.

(c) Increases.

(d) Decreases. [UPPCL (JE) - 2016]

Answer: (b) Remains constant.

178. A 3-phase synchronous motor connected to AC mains, is running at full load and unity power factor. If its shaft load is reduced to half, with field current held constant, its new power factor will be …….

(a) Lagging

(b) Leading

(c) Unity

(d) Dependent on machine parameters [Coal India 2017]

Answer: (b) Leading

179. Which of the following motor is not self starting? [UJVNL-2016]

(a) Squirrel cage Induction motor

(b) Wound rotor Induction motor

(c) Synchronous motor

(d) D.C. series motor

Answer: (c) Synchronous motor

180. A synchronous compensator is a synchronous motor running:

(a) Without a mechanical load and variable excitation.

(b) Without a mechanical load and fixed excitation.

(c) With a mechanical load and fixed excitation.

(d) With a mechanical load and variable excitation. [UPRVUNL 2016]

Answer: (a) Without a mechanical load and variable excitation.

181. In a synchronous motor the load angle and internal angle are denoted by and θ respectively. The maximum torque or pull out torque of a synchronous motor occurs when:

(a) $\alpha + \theta = 0°$

(b) $\alpha - \theta = 0°$

(c) $\alpha + \theta = 90°$ [UPRVUNL JE 2016]

Answer: (c)

182. The magnitude of armature current in synchronous motor operation:

(a) Has small value and leads for low excitation .

(b) has large value and lags for low excitation.

(c) Has large value and leads for low excitation.

(d) Has small value and lags for low excitation. [UPRVUNL JE - 2016]

Answer: (b) has large value and lags for low excitation.

183. The unexcited single phase synchronous motors are of:

(a) Neither reluctance nor hysteresis type.

(b) Reluctance type.

(c) Both reluctance and hysteresis type.

(d) Hysteresis type.

Answer: (c) Both reluctance and hysteresis type.

184. Hunting of a synchronous motor may be caused due to:

(a) Pulsating supply frequency & Varying load conditions.

(b) Neither pulsating supply frequency nor varying load conditions.

(c) Pulsating supply frequency.

(d) Varying load conditions.

Answer: (a) Pulsating supply frequency & Varying load conditions.

185. The synchronous motor is:

(a) Not a self starting machine and does not run at synchronous speed.

(b) A self starting machine and does not run at synchronous speed.

(c) Not a self starting machine and runs at synchronous speed.

(d) A self starting machine and runs at synchronous speed.

Answer: (c) Not a self starting machine and runs at synchronous speed.

186. A synchronous machine has P number of poles, find the relation between electrical angular momentum (ω_e) and mechanical angular momentum (ω_m).

(a) $\omega_e = \omega_m$

(b) $\omega_e = P \times \omega_m$

(c) $\omega_e = P/2 \times \omega_m$

(d) $\omega_e = 2/P \times \omega_m$

Answer: **(c) $\omega_e = P/2 \times \omega_m$**

187. Which motor is generally used in rolling mills, paper and cement industries?

(a) D.C. shunt motor.

(b) Double squirrel cage motor.

(c) Slip-ring induction motor.

(d) Three-phase synchronous motor.

Answer: (d) Three-phase synchronous motor.

188. Damping winding in a synchronous motor:

(a) Improves power factor of the motor.

(b) Increase hunting of the motor.

(c) Reduces windage losses.

(d) Increases starting torque. [NMRC - 2017]

Answer: (d)

189. When over excited, synchronous motor has:

(a) Leading power factor.

(b) Zero power factor.

(c) Unity power factor.

(d) Lagging power factor. [DMRC JE- 2017]

Answer: (a) Leading power factor.

190. The machine used for power factor correction is:

(a) Induction generator

(b) Universal motor

(c) Stepper motor

(d) Synchronous motor [DMRC JE- 2017]

Answer: (d)

191. Overexcited synchronous motors are used for

(a) Improving power factor of power systems with more inductive load.

(b) Reducing the copper losses of inductive load.

(c) Reducing power factor of power systems with more inductive load.

(d) Maintaining the power factor to zero. [LMRC JE - 2016]

Answer: (a) Improving power factor of power systems with more inductive load.

192. In case the field of a synchronous motor is under excited, the power factor will be:

(a) Leading

(b) Lagging

(c) Zero

(d) Unity [UJVNL-2016]

Answer: (b) Lagging

193. An unexcited single phase synchronous motor is:

(a) Reluctance motor.

(b) Repulsion motor.

(c) Universal motor.

(d) A.C. series motor. [UJVNL-2016]

Answer: (a) Reluctance motor.

194. A synchronous motor is said to be 'floating' when it operates:

(a) On no load and without loss.

(b) On constantly varying load.

(c) On pulsating load.

(d) On high load & variable supply voltage. [UJVNL-2016]

Answer: (a) On no load and without loss.

195. Maximum power developed in a synchronous motor occurs at a coupling angle of? [J&K JE - 2016]

(a) 120°

(b) 60°

(c) 90°

(d) 0°

Answer: (c) 90°

196. What type of excitation is given to the rotor winding of a synchronous motor? [J&K JE 2016]

(a) DC supply at 100 - 250V

(b) AC supply at 400V

(c) Revolving field

(d) Induction from stator current

Answer: (a) DC supply at 100 - 250V

197. A three phase synchronous generator is connected to an infinite bus. If the excitation of the generator fails then it acts as a

(a) Synchronous motor.

(b) Induction motor.

(c) Induction generator.

(d) None of these.

Answer: (c) Induction generator.

198. A cylindrical rotor synchronous motor is switched on to the supply with its field winding shorted on itself. It will:

(a) No start.

(b) Start but not run at synchronous speed.

(c) Start as an induction motor and then run as a synchronous motor.

(d) Start and run as a synchronous motor.

Answer: (b) Start but not run at synchronous speed.

199. For 100% excitation in synchronous motor, the relationship between back emf E and applied voltage V is

(a) E > V

(b) E < V

(c) E = V

(d) E≥ V [Uttrakhand AE -2013]

Answer: (b) E < V

200. The power factor of the input power to a synchronous motor is adjusted by adjusting

(a) Magnitude of excitation.

(b) Magnitude of armature reaction.

(c) Number of poles.

(d) None of these.

Answer: (a) Magnitude of excitation.

201. A synchronous motor is operate on no load at unity power factor, if the field current is increased, the power factor will become

(a) Leading and the stator current will decrease.

(b) Lagging and the stator current will increase.

(c) Lagging and the stator current will decrease.

(d) Leading and the stator current will increase.

Answer: (d) Leading and the stator current will increase.

202. In a synchronous motor with field under-excited the power factor will be

(a) lagging

(b) leading

(c) unity

(d) none of these

Answer: (a) lagging

203. In a synchronous motor the magnitude of back emf E_b depends on

(a) speed of the motor.

(b) load on the motor.

(c) both speed and stator flux.

(d) d.c. exciation only.

Answer: (d) d.c. exciation only.

204. The regulation of a synchronous motor is

(a) 0.01

(b) 1

(c) 0.5

(d) 0

Answer: (d) 0

205. In a synchronous machine, in case the axis of field flux is in line with the armature flux then

(a) The machine is working as synchronous motor.

(b) The machine is working as synchronous generator.

(c) The machine is said to floating.

(d) The machine will vibrate violently.

Answer: (c) The machine is said to floating.

206. A rotary converter generally:

(a) Combines the function of an induction motor and a dc generator.

(b) Has a set of slip rings at both ends.

(c) Has one armature and 2 fields.

(d) Is a synchronous motor and a dc generator combined.

Answer: (d) Is a synchronous motor and a dc generator combined.

207. A synchronous motor is supplying its rated load. If excitation is increased

(a) The power factor becomes more leading.

(b) The power factor becomes more lagging

(c) The power factor remains constant

(d) None of these.

Answer: (a) The power factor becomes more leading.

208. Which of the following motors is preferred as a drive, when quick speed reversal is the main consideration?

(a) Wound rotor induction motor

(b) Synchronous motor

(c) Squirrel case induction motor

(d) DC Motor

Answer: (d) DC Motor

209. A synchronous motor is found more economical over a load of:

(a) 2 kW

(b) 20 kW

(c) 50 kW

(d) 100 kW [UPRVUNL - 2015]

Answer: (d)

210. By reversing ……. the direction of rotation of a synchronous motor can be reversed.

(a) supply phase sequence

(b) current to the field winding

(c) polarity of rotor poles

(d) either "polarity of rotor poles" or "supply phase sequence

Answer: (a) supply phase sequence

211. When a synchronous motor is …… it operates with leading power factor current.

(a) under-excited

(b) critically excited

(c) over-excited

(d) heavily loaded

Answer: (c) over-excited

212. It will be the effect on a salient pole synchronous motor if its field current is switched off (provided the motor runs at no load)?

(a) It will stop.

(b) It continues to run at synchronous speed.

(c) It continues to run at a speed slightly more than the synchronous speed.

(d) It continues to run at a speed slightly less than the synchronous speed.

Answer: (b) It continues to run at synchronous speed.

213. Which of the following leads to reduction in the size of a synchronous motor?

(a) Increase in horse power rating

(b) Decrease in load angle

(c) Increase in flux density

(d) Decrease in flux density

Answer: (c) Increase in flux density

214. On which of the following does the back emf set up in the stator of a synchronous motor depend?

I. Rotor speed

II. Rotor excitation

III. Coupling angle

Chose the correct answer from the options given below.

(a) Only II

(b) Only II and III

(c) I, II and III

(d) Only I and III [UPRVUNL - 2014]

Answer: (a) Only II

215. A salient pole synchronous motor is running at no load. Its excitation is reduced to zero, then

(a) It will stop.

(b) It will remain running at synchronous speed.

(c) It will lose synchronism.

(d) It is uncertain. [DMRC - 2015]

Answer: (b) It will remain running at synchronous speed.

216. A three phase synchronous motor will have:

(a) No slip rings.

(b) One slip ring.

(c) Two slip rings.

(d) Three slip rings. [LMRC - 2015]

Answer: (c) Two slip rings.

217. Hunting in a synchronous motor takes place when:

(a) Supply voltage fluctuated.

(b) Load varies.

(c) Power factor is unity.

(d) Motor is under loaded. [LMRC - 2015]

Answer: (b) Load varies.

218. The angle between rotating stator flux and rotor poles is called:

(a) Torque angle.

(b) Obtuse angle.

(c) Synchronizing angle.

(d) Power factor angle. [LMRC - 2015]

Answer: (a) Torque angle.

219. The ratio of starting torque to running torque in a synchronous motor is:

(a) 0

(b) 1

(c) 2

(d) 4 [LMRC 2015]

Answer: (a) 0

220. A synchronous machine is called a doubly excited machine because:

(a) It can be overexcited.

(b) It has two sets of rotor poles.

(c) Both its rotor and stator are excited.

(d) It needs twice the normal exciting current.

Answer: (c) Both its rotor and stator are excited.

221. Synchronous motors are to be used in situations where

(a) The load is constant.

(b) The load is required to be driven at very high speeds.

(c) The load is to be driven at constant speed.

(d) The starting torque requirement of the load is very high.

Answer: (c) The load is to be driven at constant speed.

222. When excitation of synchronous motor is increased upto normal excitation from under excitation, armature current

(a) Increases.

(b) Decreases.

(c) Remains constant.

(d) None of the above. [Uttrakhand - 2013]

Answer: (b) Decreases.

223. In synchronous motor inverted V curve represents the relation between:

(a) Field current and power factor.

(b) Field current and armature current.

(c) Armature current and power factor.

(d) None of these. [MPJE - 2015]

Answer: (a) Field current and power factor.

224. ……. motor is a constant speed motor. [UPSSSC - 2015]

(a) Synchronous motor

(b) Scharge motor

(c) Induction motor

(d) Universal motor

Answer: (a) Synchronous motor

225. A synchronous motor is

(a) Self starting.

(b) Non self-starting.

(c) Sometimes self-starting.

(d) None of them. [UPSSSC - 2015]

Answer: (b) Non self-starting.

226. In a synchronous motor, the minimum armature current occurs at

(a) Zero power factor.

(b) Unity power factor.

(c) Lagging power factor.

(d) Leading power factor. [MPJE - 2016]

Answer: (b) Unity power factor.

227. When 3-phase supply is given to the stator of the motor, a

(a) Rotating field is set up.

(b) Pulsating field is set up.

(c) Revolving field at synchronous speed is set up.

(d) Rotating field at the rotor speed is set up. [MPJE - 2016]

Answer: (c) Revolving field at synchronous speed is set up.

228. A synchronous motor operated at no load with over excitation condition to draw large leading reactive current and power is called a

(a) Synchronous motor.

(b) Capacitor start motor.

(c) Synchronous condenser.

(d) None of the above. [MPJE - 2016]

Answer: (c) Synchronous condenser.

229. In a synchronous machine, if the field flux is ahead of the armature field axis, in the direction of rotation, the machine works as

(a) Asynchronous motor.

(b) Asynchronous generator.

(c) Synchronous motor.

(d) Synchronous generator. [MPJE - 2016]

Answer: (d) Synchronous generator.

230. Which type of torque in synchronous motor is also called as break away torques?

(a) Starting torque.

(b) Running torque.

(c) Pull torque.

(d) Pull-out torque. [MPJE - 2016]

Answer: (a) Starting torque.