1. Thermal effect is used for producing deflecting torque is
   a) wattmeter b) energy meter
   c) ammeter d) all of the above
2. Moving coil instruments are
   a) permanent magnet type
   b) dynamometer type
   c) induction type
   d) permanent magnet and dynamometer type
3. Moving iron instruments can be used on
   a) a.c. and d.c. both
   b) a.c. only
   c) d.c. only
   d) half wave rectified a.c.
4. Moving coil permanent magnet instruments can be used on
   a) a.c. and d.c.
   b) a.c. only
   c) d.c. only
   d) half wave rectified a.c.
5. The meter used for measuring electrical energy is called
   a) kWh meter b) wattmeter
   c) multimeter d) voltmeter
6. Most commonly used wattmeter is
   a) induction type
   b) electrostatic type
   c) dynamometer type
   d) moving iron type
7. The most commonly used type of single phase energy meter
   a) dynamometer type
   b) electrostatic type
   c) induction type
   d) moving coil type
8. The meter constant of energy meter is given by
   a) rev./kW b) rev./kWh
   c) rev./watt d) rev./kh
9. The series magnet of a single phase Energy meter consists of coil of
   a) thin wire of few turns
   b) thick wire of few turns
   c) thick wire of more turns
   d) thin wire of more turns
10. The pressure coil consists of
   a) more number of turns of fine wire
   b) less number of turns of fine wire
   c) less number of turns of thick wire
   d) more number of turns of thick wire
11. The current in the pressure coil is proportional to
   a) load current
   b) line current
   c) supply voltage
   d) supply voltage and line current both
12. The current in the pressure coil will lag behind the voltage by 90° because of high
   a) inductance
   b) resistance
   c) capacitance
   d) resistance and low inductance
13. The speed of energy meter can be controlled by
   a) series magnet b) braking magnet
   c) shunt magnet d) shading magnet
14. The creeping error in single phase Energy meter can be minimised by
   a) adjusting braking magnet
   b) used of short circuited loops on the outer limbs of the shunt magnet
   c) drilling two holes in the disc on the opposite side of the spindle
   d) adjusting the shaded band
15. Megger is used for measuring
   a) low resistance
   b) high resistance
   c) medium resistance
   d) very low resistance
16. Megger can be used for testing
   a) open circuit only
   b) short circuit only
   c) open and short circuit both
   d) high resistance circuit only
17. Megger is a combination of
   a) motor and generator
   b) generator and voltmeter
   c) generator and ammeter
   d) generator and ohm meter
18. Electrostatic instruments work on the principle of
   a) repulsion of unlike poles

b) attraction of like poles
c) attraction between positive and negative charge
d) repulsion between negative charges

19. Wattmeter measures
a) apparent power
b) true power
c) volt ampere
d) volt ampere reactive

20. Sensitivity of voltmeter is expressed as
a) Volt/Ohms b) Ohms/Volt
c) Ohms Volt d) 1/Ohms/Volt

21. A 100mA meter has accuracy of 2 percent. Its accuracy while reading 50mA will be
a) $\pm 1\%$ b) $\pm 2\%$
c) $\pm 4\%$ d) $\pm 20\%$

22.Which of the following meters has the best accuracy?
a) Moving-iron meter
b) Moving-coil meter
c) Rectifier-type meter
d) Thermocouple meter

23. In a moving-coil instrument, the deflecting torque is proportional to
a) current
b) square of the current
c) square-root of the current
d) sine of the measured

24. No eddy current and hysteresis loss occur in
a) Electro-static instruments
b) PMMC type instruments
c) Moving iron instruments
d) None of these

25. Hot-wire instruments give
a) the average value
b) the rms value calculated from the average value
c) the rms value from the peak value and the crest factor
d) the true rms value based on heat produced

26. The errors in C.T. are mainly due to
a) leakage flux
b) excitation emf required
c) core losses
d) copper losses

27. Schering bridge is used to measure
a) dielectric loss b) the inductance
c) low resistance d) mutual inductance

28. Which bridge is used to determine frequency?
a) Aderson bridge b) De Sauty's bridge
c) Wien bridge d) None of these

29. Siemens is a unit for meaning
a) conductance b) resistance
c) flux density d) electric field

30. A CRO can display
a) a.c. signals
b) d.c. signals
c) both a.c. and d.c. signals
d) time-invariant signals

31. Low resistance is measured by
a) De sauty's bridge
b) Maxwell bridge
c) Kelvin's double bridge
d) Wien bridge

32. In three phase power measurement by Two Wattmeter method the power factor of load will be
a) $\sqrt{3}\frac{(W_1 - W_2)}{W_1 + W_2}$ b) $W_1 + W_2$
c) $\frac{W_1 - W_2}{W_1 + W_2}$ d) $\frac{W_1 W_2}{\sqrt{W_1 + W_2}}$

33. A moving iron type instrument has
a) a linear scale (uniform scale)
b) a nonlinear scale
c) its deflection directly proportional to the current
d) its deflection directly proportional to the voltage

34. Clamp-on ammeter is used for
a) low ac current
b) high ac current
c) low dc current
d) high dc current

35. Creeping in energy-meters implies that
a) fast rotation of the rotor with current-coil excited

b) slow rotation of the rotor with current coil excited
c) slow rotation of the rotor with only voltage coil excited
d) none of these

36. Lissajous patterns are used to measure
a) voltage and frequency
b) frequency and phase shift
c) frequency and amplitude distortion
d) amplitude and flux

37. Which instrument has identical calibration for a.c. well as d.c. values?
a) Hot-wire type
b) Moving-wire type
c) Induction type
d) Moving-iron type

38. Two wattmeter's connected to measure the power in a 3ϕ, balanced delta connected load read W_1 = 12 kW W_2 = 15 kW respectively. If the same load be connected is star the wattmeter's would read
a) W_1 = 8.66 kW W_2 = 6.93 kW
b) W_1 = 6.93 kW W_2 = 8.66 kW
c) W_1 = 5kW W_2 = 4 kW
d) W_1 = 4 kW W_2 = 5 kW

39. Piezometer is used to measure
a) pressure in pipes and channels
b) very high pressure
c) very low pressure
d) difference of pressure between two points

40. The following voltage is fed to an electro-dynamometer meter:
$e \quad 100\sin\omega t + 50\sin(\omega t + 45^\circ)$
The meter will show a reading of nearly
a) 110V b) 91V
c) 79 V d) 55 V

41. Holes are drilled on the opposite sides of the spindle of an energy meter to
a) avoid creep on load
b) balance the disc
c) dissipate heat generated due to eddy currents
d) increase the deflection torque

42. Thermistors have
a) high and negative temperature coefficient
b) low and negative temperature coefficient
c) high and positive temperature coefficient
d) low and positive temperature coefficient

43. Rota-meter is used to measure
a) rotation b) flow
c) viscosity d) specific gravity

44. The pH value of pure water is
a) zero b) 1
c) 7 d) infinite

45. LVDT is a
a) displacement transducer
b) velocity transducer
c) acceleration transducer
d) pressure transducer

46. Temperature inside a boiler furnace can be measured by
a) mercury thermometer
b) bimetallic thermometer
c) optical pyrometer
d) thermistor

47. Which of the following can be measured by a VTVM?
a) Voltage and resistance
b) Voltage and current
c) Voltage and power
d) Current and resistance

48. An air condenser with capacitance 0.001 μF is connected to a d.c. voltage of 200 volts. The energy stored in the condenser will be
a) 10 μ joules
b) 20 μ joules
c) 20 joules
d) 20 μ μ joules

49. Dielectric strength of air is nearly
a) 30 kV/cm (max)
b) 30 k V/mm
c) 300 kV/mm
d) 3000 kV/mm

50. Which of the following capacitors has relatively shorter shelf life?
a) Mica capacitor

b) Electrolytic capacitor
c) Ceramic capacitor
d) Paper capacitor

51. If Q be the charge and C be the capacity of condenser, then the energy stored in the capacitor is given by
a) $1/2QC$ b) $1/3QC$
c) $1/4QC$ d) $\frac{1}{2}\frac{Q^2}{C}$

52. The electrostatic force between two charges of one coulomb each and placed at a distance of 0.5 m will be
a) $36\times10\,fa$ b) $36\times10^{-7}\,N$
c) $36\times10^{-8}\,N$ d) $36\times10^{9}\,N$

53. The direction of electric field due to a positive charge is
a) away from the charge
b) towards the charge
c) between the charge
d) none of these

54. The strength of electromagnet can be increased by
a) reducing number of turns
b) increasing the magnitude of current
c) decreasing the magnitude of current
d) increasing length of the conductor

55. The direction of magnetic field can be determined by
a) end rule
b) right hand rule
c) left hand rule
d) thumb rule

56. The polarity of the pole can be found out by
a) End rule
b) Fleming's right hand rule
c) Fleming's left hand rule
d) Cork screw

57. During discharge of a battery
a) The voltage of cell decreases
b) The voltage of cell increases
c) Voltage does not change
d) None of these

58. The watt-hour efficiency is always
a) more than ampere-hour-efficiency
b) equal to ampere-hour efficiency
c) less than ampere-hour efficiency
d) none of these

59. Temporary magnets are used in
a) loud speakers
b) generators
c) motors
d) all of the above

60. Strength of an electromagnet can be increased by
a) increasing the cross-sectional area
b) increasing the number of turns
c) increasing current supply
d) all above methods

61. Permanent magnets are normally made of
a) alnico alloy
b) aluminium
c) cast iron
d) wrought iron

62. The unit of retentivity is
a) weber
b) weber/sq.m
c) ampere turn/meter
d) ampere turn

63. The unit of reluctance is
a) metre/henry
b) henry/metre
c) henry
d) 1/henry

64. Laminated cores, in electrical machines, are used to reduce
a) copper loss
b) eddy current loss
c) hysteresis loss
d) all of the above

65. Crawling in an induction motor is due to
a) time harmonics is supply
b) slip ring motor
c) space harmonics produced by winding currents
d) insufficient starting torque

66. Slip test is performed to determine
a) slip
b) direct axis reactance and quadrature axis
c) positive sequence reactance and negative sequence reactance

d) sub-transient reactance

67. As compared to DOL starting, a cage induction motor with star-delta starting shall have
   a) more starting torque
   b) more starting time
   c) reduced starting current
   d) smoother acceleration

68. The speed of a 3-phase induction motor operating in its stable region
   a) decreases with increase in load torque
   b) increases with increase in load torque
   c) decreases with decrease in load torque
   d) remains constant

69. In a three-phase induction motor, the resultant flux is constant and is
   a) equal to ϕ_m
   b) 1.5 times the maximum value of flux due to any phase
   c) $\frac{\sqrt{3}}{2}$ times the maximum value of flux due to any phase
   d) none of these

Here, ϕ_m is maximum value of flux due to any phase

70. In a 3-phase squirrel cage induction motor, skewing of rotor slots reduces
   a) parasitic torque and noise but increases pullout torque
   b) parasitic torque and noise but increases starting torque
   c) noise but increases pullout torque and parasitic torque
   d) parasitic torque, noise, pullout torque and starting torque

71. An induction motor and synchronous motor are connected to a common feeder line. To operate the feeder line unity pf, the synchronous motor should be
   a) under-excited
   b) over-excited
   c) normally excited
   d) disconnected from the common terminals

72. In an induction motor if the air gap is increased
   a) speed will reduce
   b) efficiency will improve
   c) power factor will be lowered
   d) breakdown torque will reduce

73. A synchronous motor, connected to an infinite bus, is working at a leading p.f. Its excitation voltage is
   a) less than the supply voltage V_t
   b) equal to V_t
   c) more than V_t
   d) none of these

74. The starting torque of a 3-phase induction motor can be increased by increasing the
   a) rotor resistance
   b) rotor reactance
   c) stator resistance
   d) stator reactance

75. The motor which is mostly used for driving a refrigerator is
   a) universal motor
   b) capacitor start induction motor
   c) d.c. shunt motor
   d) plain squirrel cage induction motor

76. For driving a tape recorder or a record player, the motor used is generally
   a) a synchronous motor
   b) a hysteresis motor
   c) an induction motor
   d) a d.c. series motor

77. If NS is the synchronous speed of the rotating field, N, the actual speed of the rotor of a 3-phase induction motor, then the percent slip, S is given by
   a) $\frac{N_S - N}{N_S} \times 100$
   b) $\frac{N - N_S}{N} \times 100$
   c) $\frac{N - N_S}{N_S} \times 100$
   d) None of these

78. Maximum starting torque of a 3-phase induction motor is obtained when the rotor resistance is
   a) equal to the rotor reactance
   b) very small and rotor reactance is large
   c) double that of the rotor reactance
   d) 1.5 times rotor reactance

79. In a 3-phase induction motor, torque and the supply voltage are related as

a) $T\alpha V^{1/2}$ b) $T\alpha V$

c) $T\alpha V^{2}$ d) $T\alpha \frac{1}{V}$

80. For a P-pole machine, the relation between electrical and mechanical degrees is given by

a) $\theta_{elec.} \quad \frac{P}{2}\theta_{mech.}$ b) $\theta_{elec.} \quad \frac{4}{P}\theta_{mech.}$

c) $\theta_{mech.} \quad \theta_{elec.}$ d) none of these

81. A coil consists of

a) two conductors
b) two coil-sides
c) two turns
d) four turns

82. Main advantage of distributing the winding in slots is to reduce the

a) mechanical strength from the winding
b) amount of copper required
c) harmonics in the generated *e.m.f.*
d) size of the machine

83. The distribution factor is the ratio of

a) arithmetic sum of coil *e.m.fs* to phasor sum of coil *e.m.fs*
b) phasor sum of *e.m.f* per coil to the arithmetic sum of *e.m.f* per coil
c) phasor sum of coil *e.m.fs* to the arithmetic sum of coil *e.m.fs*
d) phasor sum of coil *e.m.fs* to the per phase voltage

84. The mmf produced by the current of a 3-phase induction motor

a) rotates at the speed of rotor in the air gap
b) is standstill with respect to stator mmf
c) rotates at slip speed with respect to stator mmf
d) rotates at synchronous speed with respect to rotor

85. Hysteresis and eddy current losses in electric machines depends on

a) flux density
b) speed
c) speed and flux density
d) none of these

86. The phenomenon of crawling in a 3-phase cage induction motor may be due to

a) unbalanced supply voltage
b) 7th space harmonic of air-gap field
c) 7th time harmonic of voltage wave
d) 5th space harmonic

87. The rotor power output of a 3-phase induction motor is 15 kW and the corresponding slip in 4%. The rotor copper loss will be

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

88. A 3 ϕ induction machine operating at pu slip S would ne motoring, generating or braking in the following ranges of slip.

	Motoring	Generating	Braking
a)	$0 < S < 1$	$0 < S < 2$	$-1 < S < 0$
b)	$0 < S < 1$	$-1 < S < 0$	$1 < S < 0$
c)	$1 < S < 2$	$-1 < S < 0$	$0 < S < 1$
d)	$-1 < S < 0$	$0 < S < 1$	$1 < S < 2$

89. Transformers are rated in kVA and not in kW because

a) it is easy to calculate the load
b) it gives an idea of the efficiency
c) the power factor of load is unknown
d) it is conventional

90. In a transformer,

a) all turns are equally insulated
b) the end turns are more strongly insulated and widely separated
c) the end turns are closely wound
d) all of these

91. Full-load voltage regulation of a power transformer is zero when power factor of the load is near

a) unity and leading
b) zero and leading
c) zero and lagging
d) unity and lagging

92. If all other requirements for parallel operation of transformer are fulfilled, the pair of three-phase transformers, with the given VECTOR GROUPS, which can be operated in parallel is

a) Yd 1 and Y_y 0
b) Yd 1 and D_y 1
c) Dd 6 and D_y 1

d) Dd and D_y 11

93. The transformer used only for electrical isolation between two circuits has turns-ratio
a) more than unity
b) less than unity
c) equal to unity
d) more than 0.5

94.Tertiary windings in 3ϕ transformers are used to
a) connect capacitor for power factor improvement
b) connect instruments for measuring purpose
c) suppress the third harmonic component
d) all of these

95. The flux involved in the emf equation of a transformer is
a) r.m.s. value
b) average value
c) total value
d) maximum value

96. The no-load current in a transformer lags the applied volta°ge by
a) about 90
b) about 70°
c) about 45°
d) about 115°

97. Two transformers operating in parallel will share the load according to their
a) leakage reactance
b) pu impedance
c) efficiency
d) rating

98. Among the parallel combinations of 3-phase to 3 phase transformer connection, the connection that is not possible is
a) Y-Y to Δ-Δ
b) Y-Y to Y-Y
c) Y-Δ to Δ-Y
d) Δ-Y to -Δ

99. Oil in transformer is used to
a) transfer electrical energy
b) insulate the windings
c) heat the windings
d) all of these

100. The zero power factor characteristic for the Potier's diagram can be obtained by loading the alternator using
a) lamp load
b) synchronous motor
c) water load
d) dc motor

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ELECTRICAL TEST ANSEWRS KEY [8-4-2017]	
1. c)	51. d)
2. d)	52. d)
3. a)	53. a)
4. c)	54. b)
5. a)	55. b)
6. c)	56. a)
7. c)	57. a)
8. b)	58. c)
9. b)	59. d)
10. a)	60. c)
11. c)	61. a)
12. a)	62. b)
13. b)	63. d)
14. c)	64. b)
15. b)	65. c)
16. c)	66. b)
17. d)	67. c)
18. c)	68. a)
19. b)	69. b)
20. b)	70. d)
21. c)	71. b)
22. b)	72. c)
23. a)	73. c)
24. a)	74. a)
25. d)	75. a)
26. c)	76. b)
27. a)	77. a)
28. c)	78. a)
29. a)	79. c)
30. c)	80. a)
31. c)	81. b)
32. a)	82. c)
33. b)	83. c)
34. b)	84. b)
35. c)	85. c)
36. b)	86. b)
37. a)	87. b)
38. d)	88. b)
39. c)	89. c)
40. c)	90. b)
41. a)	91. a)
42. a)	92. b)
43. b)	93. c)
44. c)	94. c)
45. a)	95. d)
46. c)	96. b)
47. a)	97. d)
48. b)	98. d)
49. a)	99. b)
50. b)	100. b)