1. A device that transforms chemical energy into electrical energy
    A. secondary battery
    B. cell
    C. battery
    D. primary battery

    ANSWER: B

2. A device that is capable of converting chemical energy into electrical energy
    A. generator
    B. battery
    C. converter
    D. cell

    ANSWER: D

3. A secondary cell whose active positive plate consists of nickel hydroxide, and active negative-plate material is powdered iron oxide mixed with cadmium. Its typical output when fully charged is V_O = 1.2V
    A. Leclanche cell
    B. dry cell
    C. Edison cell
    D. lead-acid cell

    ANSWER: C

4. If a cell can be charged after it is depleted, it is considered as
    A. a secondary cell
    B. a storage cell
    C. an accumulator
    D. all of the above

    ANSWER: D

5. What type of cell that cannot be recharged which cannot restore chemical reaction?
    A. nickel-cadmium cell
    B. secondary cell
    C. primary cell
    D. lead-acid wet cell

    ANSWER: C

6. A cell whose chemical reaction is not reversible
    A. primary cell
    B. secondary cell
    C. rechargeable cell
    D. solar cell

    ANSWER: A

7. A voltage source in a single container made from one or more cells combines in series, parallel, or series-parallel.
    A. photoelectric
    B. thermocouple
    C. battery
    D. piezo-electric

    ANSWER: C

8. A battery means
    A. cells connected in series
    B. cells connected in parallel
    C. cells connected in series-parallel
    D. all of the above
    ANSWER: D

9. A battery is used to
    A. supply a steady dc voltage
    B. supply an unstable dc voltage
    C. supply an ac voltage
    D. supply an ac/dc voltage
    ANSWER: A

10. In a dry cell, what will happen to the internal resistance as it aged?
    A. decreases
    B. increases
    C. remains constant
    D. decreases or increases, depends on the chemical composition
    ANSWER: B

11. The maximum current a cell can deliver through a 0.01 ohm load during testing
    A. flash current
    B. surge current
    C. ideal current
    D. full-load current
    ANSWER: A

12. In batteries, the material used to insulate the positive plates from negative plates are technically called
    A. insulator
    B. break-point
    C. coupler
    D. separator
    ANSWER: D

13. How long will a battery need to operate a 240 Watts equipment, whose capacity is 100Ah and 24 volts rating?
    A. 5 hrs
    B. 10 hrs
    C. 1 hr
    D. 0.10 hr
    ANSWER: B

14. A battery is rated 20 A-hr and is delivering a current of 2A. How long does it last?
    A. 1 hr
    B. 5 hrs
    C. 8 hrs
    D. 10 hrs
    ANSWER: D

15. A primary cell with carbon and zinc as its positive and negative electrodes respectively, and an electrolyte of either a gel or paste. This is commonly known as dry cell.
    A. Leclanche cell
    B. Edison cell
    C. storage cell
    D. solar cell
    ANSWER: A

16. Find the output of a four (4) lead acid cells.
    A. 3.2 V
    B. 8.4 V
    C. 5.8 V
    D. 12 V
    ANSWER: B

17. Silver-cadmium cell has a nominal open-circuit voltage of
    A. 1.05 V
    B. 1.5 V
    C. 2.1 V
    D. 2.2 V
    ANSWER: A

18. Output of six carbon-zinc cells connected in series
    A. 3 V
    B. 6 V
    C. 6.6 V
    D. 9 V
    ANSWER: D

19. The flat 9-V battery, has how many cells in series?
    A. 3
    B. 4
    C. 6
    D. 9
    ANSWER: C

20. Output of automotive battery with six lead-acid cells in series
    A. 6V
    B. 12V
    C. 24V
    D. 48V
    ANSWER: B

21. Substance, which generates a voltage when exposed to light.
    A. generating substance
    B. photovoltaic material
    C. thermoelectric generator
    D. hydroelectric generator
    ANSWER: B

22. A cell whose voltage is generated as a function of light
    A. photovoltaic cell
    B. thermoelectric cell
    C. photodiode
    D. LED
    ANSWER: A

23. Substance used in photovoltaic cells
    A. Silicon
    B. Selenium
    C. Germanium
    D. All of these
    ANSWER: D

24. A junction between two conductors that exhibits electrical characteristics under condition of changing temperature
    A. pn junction
    B. photojunction
    C. thermoelectric junction
    D. hydroelectric junction
    ANSWER: C

25. Electricity that is generated due to heat, as in thermocouple.
    A. thermodynamics
    B. thermojunction
    C. electric heater
    D. thermoelectricity
    ANSWER: D

26. The source of mechanical power to turn the rotors of alternators, large and small, A.C. and D.C.
    A. prime contactor
    B. primer
    C. prime mover
    D. prime user
    ANSWER: C

27. Electrical machines refer to machines that convert _____
    A. mechanical to electrical energy
    B. electrical to mechanical energy
    C. electrical energy of one form to electrical energy of another form
    D. all of the above
    ANSWER: D

28. Electrical machines that convert mechanical energy to electrical energy.
    A. generators
    B. motors
    C. cycloconverters
    D. frequency converters
    ANSWER: A

29. Electrical machine that converts ac voltage to dc voltage, or vice versa.
    A. generator
    B. motor
    C. rotary converter
    D. frequency converter
    ANSWER: C

30. Electrical machine that changes ac voltage at one frequency to another ac voltage at another frequency.
    A. generator
    B. motor
    C. rotary converter
    D. frequency converter
    ANSWER: D

31. It consist of a single coil rotated in a magnetic field and produces an A.C. voltage.
    A. field winding
    B. armature
    C. commutator
    D. elementary generator
    ANSWER: D

32. Generation of voltage in a generator can only happen when?
    A. there is a rotary conductor
    B. there is a magnetic field in a conductor
    C. there is a relative motion between conducting wires and magnetic lines of force
    D. there is a relative motion between a conductor and electric field
    ANSWER: C

33. Two essential parts in rotating generators
    A. electro/permanent magnets and armature winding
    B. electromagnets or permanent magnets and commutator
    C. commutator and armature winding
    D. brushes and commutator
    ANSWER: A

34. In electrical machines, what do you call the set of conductors wound on laminated cores of good magnetic permeability?
    A. armature core
    B. armature winding
    C. rotary winding
    D. rotary core
    ANSWER: B

35. In dc generator, what converts the alternating emf to DC?
    A. armature
    B. commutator
    C. diode
    D. alternator
    ANSWER: B

36. Generally, in dc generators
    A. The armature winding is rotated with respect to a stationary magnetic field produced by electromagnets or permanent magnets.
    B. The electromagnets or permanent magnets (magnetic fields) are rotated with respect to the stationary armature winding.
    C. Current is sent into the armature winding; or the armature winding is usually placed in a stationary laminated iron core and the rotating element may or may not be a set of magnet poles, it depends on the type of motor.
    D. The armature winding is supplied with current; or the armature is placed inside a set of radially supported magnetic poles.

    ANSWER: A

37. In electrical machines, what type of voltage is generated at the armature winding?
    A. dc
    B. pulsating dc
    C. ac
    D. ac or dc depending on the type of machine

    ANSWER: C

38. Generally in ac generators
    A. The armature winding is rotated by a stationary magnetic field produced by electromagnets or permanent magnets.
    B. Current is sent into the armature winding; or the armature winding is usually placed in a stationary laminated iron core and the rotating element may or may not be a set of magnet poles, it depends on the type of motor.
    C. The electromagnets or permanent magnets (magnetic fields) are rotated with respect to the stationary armature winding.
    D. The armature winding is supplied with current; or the armature is placed inside a set of radially supported magnetic poles.

    ANSWER: C

39. A dc generator whose excitation is produced by a winding connected to its own positive and negative terminals.
    A. series generator
    B. separately excited shunt generator
    C. self-excited shunt generator
    D. compound generator

    ANSWER: C

40. What is true about field poles in electric machines?
    A. there are always even number of them (exist by pair)
    B. there are always an odd number of them
    C. there are an even or an odd number of them
    D. none of the above

    ANSWER: A

41. In a compound generator, which field winding usually, has a lower resistance?
    A. series field winding
    B. shunt field winding
    C. armature winding
    D. excitation winding

ANSWER: A

42. Which winding in a dc-compound generator that is relatively made of fine wires?
    A. armature winding
    B. excitation winding
    C. shunt field winding
    D. series field winding
ANSWER: C

43. What important characteristic you should consider in choosing a dc-generator?
    A. voltage capacity
    B. current capacity
    C. voltage vs. load
    D. power rating
ANSWER: C

44. What is the purpose of laminating the field poles and armature of a dc machine?
    A. to reduce eddy current
    B. to avoid contaminants
    C. to provide isolation
    D. to beautify the machine
ANSWER: A

45. An alternator with a lagging power factor of 0.8 will have a _____ voltage regulation at unity power factor.
    A. 0%
    B. less than
    C. greater than
    D. 100%
ANSWER: C

46. With alternators connected in parallel, the frequency of the system can be changed by
    A. increasing the field excitation
    B. decreasing the field excitation
    C. changing the rpm of the prime movers
    D. synchronizing the prime movers
ANSWER: C

47. With alternators connected in parallel, the voltage of the system can be changed by
    A. changing the field excitation
    B. increasing the speed of the prime movers
    C. changing the rpm of the prime movers
    D. synchronizing the prime movers
ANSWER: A

48. If an ac generator is to be driven from prime mover having variable speed, such as aircraft engine, a _____ must be used.
    A. constant speed drive (CSD)
    B. regulator
    C. conditioner
    D. peak limited

ANSWER: A

49. Find the frequency in kilocycles per second in the armature of a 10 pole, 1,200 rpm generator.
    A. 100
    B. 1000
    C. 10
    D. 0.1
    ANSWER: D

50. What should be the speed of a 6-pole ac generator in order to have a frequency of 50Hz?
    A. 100 rpm
    B. 500 rpm
    C. 1000 rpm
    D. 1500 rpm
    ANSWER: C

51. What is the voltage regulation when the full load voltage is the same as no-load voltage assuming a perfect voltage source?
    A. 100%
    B. 1%
    C. 10%
    D. 0%
    ANSWER: D

52. Calculate the voltage regulation of a generator having a no-load voltage of 220 V and a full load voltage of 180 V.
    A. 18%
    B. 22%
    C. 28%
    D. 32%
    ANSWER: B

53. Usually used to drive low-speed alternators
    A. diesel engines
    B. jet propulsion engines
    C. steam turbines
    D. hydraulic turbines
    ANSWER: D

54. Is usually used to drive high-speed alternators
    A. diesel engines
    B. pneumatic engines
    C. steam turbines
    D. hydraulic turbines
    ANSWER: C

55. Which statement is true regarding alternators?
    A. high-speed alternators are smaller than low-speed
    B. low-speed alternators are smaller than high-speed

C. high-power alternators are smaller than low-power
D. high-voltage alternators are smaller than low-voltage

ANSWER: A

56. For what reason, why carbon brushes are widely used dc machines?
A. it is abundant
B. it is cheap
C. it has a high voltage drop
D. it lubricates and polishes the contacts

ANSWER: D

57. Alternators have less chance to hunt if driven by
A. steam turbines
B. hydroturbines
C. diesel turbines
D. nuclear reactor

ANSWER: A

58. In alternators, what is the purpose of damper windings?
A. it prevents over speeding
B. it maintain constant speed
C. it prevents hunting
D. it protects overloading

ANSWER: C

59. What term applies to the use of two or more generators to supply a common load?
A. on-line operation
B. series operation
C. cascaded operation
D. parallel operation

ANSWER: D

60. In paralleling ac generators, _____ is very important.
A. voltage level
B. current level
C. phase angle
D. internal resistance

ANSWER: C

61. Description used for generators trying to self-adjust its parameters before paralleling with on line generators.
A. synchronizing
B. sequencing
C. jogging
D. alighning

ANSWER: C

62. In changing power from one generator to another, what do you call the operational sequence wherein the incoming generator is connected first before removing the existing generator?
A. No Break Power Transfer (NBPT)

B. UPS
C. LIFO
D. Standby Power transfer

ANSWER: A

63. What do you mean by break power transfer?
    A. The incoming generator will be connected first to the bus bar before disconnecting the existing generator.
    B. The present on-line generator will be disconnected first before connecting the incoming generator.
    C. The incoming generator will only be connected to the bus bar when the bus bar breaks.
    D. The present on-line generator will be disconnected first and then reconnected together with the incoming generator.

ANSWER: B

64. How alternators rated?
    A. in Watts
    B. in kW
    C. in kVar
    D. in kVA

ANSWER: C

65. In electrical power distribution, what do you call the first distribution line from the main generating station?
    A. main transmission lines
    B. primary distribution lines
    C. sub transmission lines
    D. secondary distribution lines

ANSWER: A

66. The lines which carry the energy from the transformer to a customer's services are called _____.
    A. main transmission lines
    B. primary distribution lines
    C. sub transmission lines
    D. secondary distribution lines

ANSWER: D

67. In electrical power Generating/distribution Company, which do you think is their highest expenses?
    A. generation of power
    B. distribution of power to the consumers
    C. power transmission
    D. substations

ANSWER: B

68. In electrical power distributions, what insulator is generally used?
    A. rubber
    B. wood
    C. plastic

D. porcelain
ANSWER: D

69. Electrical machines refer to machines that convert _____
A. mechanical to electrical energy
B. electrical to mechanical energy
C. electrical energy of one form to electrical energy of another form
D. all of the above
ANSWER: D

70. Electrical machines that convert electrical energy to mechanical energy.
A. generators
B. motors
C. rotary converters
D. frequency converters
ANSWER: B

71. Synchronous type of ac-motor,
A. uses a dc-generator to supply dc-excitation to the rotating field
B. uses pulsating dc
C. uses alternator
D. has an ac or dc depending on the type of machine
ANSWER: A

72. Generally in dc motors
A. the armature winding is rotated by a stationary magnetic field produced by electromagnets or permanent magnets.
B. current is sent into the armature winding; or the armature winding is usually placed in a stationary laminated iron core and the rotating element may or may not be a set of magnet poles, it depends on the type of motor.
C. the electromagnets or permanent magnets (magnetic fields) are rotated with respect to the stationary armature winding.
D. the armature winding is supplied with current; or the armature is placed inside a set of radially supported magnetic poles.
ANSWER: D

73. In ac motors, generally
A. current is sent into the armature winding; or the armature winding is usually placed in a stationary laminated iron core and the rotating element may or may not be a set of magnet poles, it depends on the type of motor.
B. the armature winding is supplied with current; or the armature is placed inside a set of radially supported magnetic poles.
C. the armature winding is rotated by a stationary magnetic field produced by electromagnets or permanent magnets.
D. the electromagnets or permanent magnets (magnetic fields) are rotated with respect to the stationary armature winding.
ANSWER: A

74. Among the dc motors, which produces the highest torque?
A. series
B. shunt

C. compound
D. differentially compounded
ANSWER: A

75. Dc motor that has the most stable speed.
A. differentially compounded
B. compound
C. shunt
D. series
ANSWER: C

76. In dc motors, when does severe arcing happens?
A. during starting
B. during rated speed
C. during speed fluctuation
D. during shutdown
ANSWER: A

77. What is the primary reason why carbon brushes are preferred over copper brushes in dc motors?
A. they have low loss
B. they are more strong
C. they produce less arcing
D. all of the above
ANSWER: C

78. In dc motors, the emf developed which opposes to the supplied voltage.
A. residual emf
B. induced emf
C. coercive emf
D. counter emf or back emf
ANSWER: D

79. To minimize arcing during starting of dc motors, a resistance should be added to limit the current in the _____
A. series field winding
B. shunt field winding
C. armature winding
D. all of these
ANSWER: C

80. Which dc motors whose speed is greatly affected by a change in load? It will even run-away if the load is removed.
A. series
B. shunt
C. cumulatively compounded
D. differentially compounded
ANSWER: A

81. Motors whose speed can be easily controlled.
A. dc motors

B. ac motors
C. ac & dc motors
D. ac or dc motors

ANSWER: A

82. When a dc motor has no load, what will happen to the back emf?
A. reduces
B. increases
C. becomes maximum
D. becomes zero

ANSWER: C

83. When can we get a maximum mechanical power from a dc motor?
A. Eb = 0
B. Eb = ½V
C. Eb = 1V
D. Eb = 2V

ANSWER: B

84. The torque of a dc motor is
A. directly proportional to the field strength
B. inversely proportional to the field strength
C. directly proportional to the armature current
D. A and C are correct

ANSWER: D

85. One causes why the shaft torque is less than the developed armature torque of a dc motor.
A. eddy current
B. field loss
C. brushes loss
D. friction loss

ANSWER: D

86. For heavy-duty dc motor, how does the effect of armature reaction be corrected?
A. using interpoles & brush shifting
B. using interpoles
C. using compensatory winding
D. B & C are correct

ANSWER: D

87. Considered as a variable speed motor
A. compounded
B. differentially compounded
C. shunt
D. series

ANSWER: D

88. What is the most common method used in varying the speed of a dc motor?
A. by varying the supply voltage
B. by changing the effective number of conductors in series

C. by varying the armature resistance
D. by varying the field strength

ANSWER: D

89. The running speed of a dc series motor is greatly affected by what factor?
A. field excitation
B. load
C. armature resistance
D. supply voltage

ANSWER: B

90. In choosing a motor for a particular application, what characteristic you should consider?
A. speed-torque
B. speed-armature current
C. speed efficiency
D. speed power

ANSWER: A

91. What will happen to the dc shunt motor if the load torque greatly increases?
A. the speed will decrease
B. there will be a great increase in current
C. the speed almost remains constant
D. B and C are correct

ANSWER: D

92. What will happen to a dc series motor when its load is removed?
A. the motor will stop
B. the motor speed remains the same
C. the torque remains the same
D. the motor will overspeed

ANSWER: D

93. A motor whose speed increases as the load is increased.
A. series dc
B. dc shunt
C. cumulatively compounded
D. differentially compounded

ANSWER: D

94. Factor(s) that affect iron losses in a dc motor.
A. flux
B. speed
C. armature resistance and flux
D. A and B are correct

ANSWER: D

95. One advantage of a cumulatively compounded motor is that it does not run widely at light loads, this feature is due to
A. shunt winding
B. brake winding
C. series winding

D. clutch winding
ANSWER: A

96. In applications where an almost constant speed is required, a _____ motor is a good choice.
A. dc shunt
B. dc series
C. cumulatively compounded
D. differentially compounded
ANSWER: A

97. In applications where a high torque is needed during starting a _____ motor is preferred.
A. dc shunt
B. dc series
C. differentially compounded
D. cumulatively compounded
ANSWER: B

98. In applications where sudden heavy loads happen for short duration, a _____ motor is the best choice.
A. dc shunt
B. dc series
C. cumulatively compounded
D. differentially compounded
ANSWER: C

99. In motors of the same rating, which has the least starting torque?
A. dc shunt
B. dc series
C. differentially compounded
D. cumulatively compounded
ANSWER: A

100. Factor(s) that affect friction and winding loses in dc motors.
A. speed
B. armature current
C. interpoles
D. armature resistance
ANSWER: A

101. In dc motors, power loss is contributed greatly by
A. flux loss
B. core loss
C. copper loss
D. mechanical friction
ANSWER: C

102. Dirt on the commutator may produce
A. isolation
B. excessive sparking

C. power loss
D. lower torque

ANSWER: B

103. Motor vibrations are usually caused by
A. loose coupling
B. dirt on the commutator
C. much brush tension
D. worn bearings

ANSWER: D

104. When a motor is overloaded, it will usually
A. slow down
B. speed up
C. vibrate
D. overheat

ANSWER: D

105. Which motor that produces the highest increase in torque considering the same increase in current?
A. dc shunt
B. dc series
C. differentially compounded
D. cumulatively compounded

ANSWER: B

106. When an armature opens in dc motor, it may cause
A. intermittent sparking
B. an increase in speed
C. the motor to slow down
D. the motor to stop rotating

ANSWER: A

107. Why do motors take large current during starting?
A. the armature resistance is still low
B. the field produced is still weak
C. it has to break the momentum
D. there's still a low back emf

ANSWER: D

108. In dc motors, the speed will
A. increase with an increase in field strength
B. decrease with an increase in field strength
C. decrease as the supply voltage is increased
D. B and C are correct

ANSWER: B

109. When armature current is increased in a dc motor, its armature reaction will
A. also increase
B. decrease
C. increase exponentially

D. decrease exponentially
ANSWER: A

110. Why does in dc motor, brushes are positioned such that they will be with the direction of the rotation?
A. to reduce sparking
B. to last long
C. to have less loss
D. all of the above
ANSWER: A

111. Motors are used to convert electrical energy to mechanical energy. What type of motor that is best suited for heavy-load application?
A. dc series motors
B. dc compound motors
C. single phase motors
D. polyphase motors
ANSWER: D

112. DC shunt motor speed can be controlled electronically by using a _____ in series with the armature winding.
A. thyrector
B. potentiometer
C. rheostat
D. thyristor
ANSWER: D

113. Which thyristor is commonly used is motor speed control?
A. triac
B. diac
C. SCR
D. SUS
ANSWER: C

114. In controlling motor speed, the SCRs controls the
A. number of pulses
B. phase angle
C. firing angle
D. any of these
ANSWER: C

115. How do you reverse the rotation of a dc shunt motor?
A. By reversing the direction of the field current, leaving the armature current the same.
B. By reversing the direction of the armature current, leaving the field current the same.
C. By reversing both field and armature current
D. Either A or B
ANSWER: D

116. In motor speed control, what is responsible for SCR firing?

A. trigger circuit
B. threshold circuit
C. reference circuit
D. holding circuit

ANSWER: A

117. A circuit that converts ac-voltage to dc-voltage
A. rectifier
B. inverter
C. dc-converter
D. ac-converter

ANSWER: A

118. Conversion from dc-voltage to another dc-voltage requires a
A. inverter
B. cycloconverter
C. dc-converter
D. ac-converter

ANSWER: C

119. A converter that changes ac-voltage to another ac-voltage level.
A. inverter
B. cycloconverter
C. dc-converter
D. ac-converter

ANSWER: D

120. What converter must be used if one wished to change dc-voltage into ac-voltage?
A. inverter
B. cycloconverter
C. dc-converter
D. ac-converter

ANSWER: A

121. A converter that changes ac-voltage frequency from one to another.
A. inverter
B. cycloconverter
C. dc-converter
D. ac-converter

ANSWER: B

122. In electronic converters, what signal is mostly used to trigger the active device?
A. sine-wave
B. square-wave
C. triangular-wave
D. sawtooth-wave

ANSWER: B

123. A transformer consist of the following:
A. An inductance and resistance
B. A parallel resonant circuit

C. A capacitor and an inductor
D. Two coils wound on a common core
ANSWER: D

124. Transformer is considered by many as an efficient device due to the fact that
A. it uses an inductive coupling
B. it is magnetically coupled
C. it is a static device
D. it is electrically coupled
ANSWER: C

125. With transformer, what is measured when performing open-circuit test?
A. turns ratio
B. copper loss
C. leakage reactance
D. turns impedance
ANSWER: B

126. Open-circuit test with transformers is always done on what winding?
A. low-voltage
B. high-voltage
C. primary
D. secondary
ANSWER: A

127. Short-circuit test with transformers is always done on what winding?
A. low-voltage
B. high-voltage
C. primary
D. secondary
ANSWER: A

128. When the transformer secondary winding is short-circuited, its primary inductance will
A. become zero
B. decrease
C. increase
D. not be affected
ANSWER: C

129. Cooling system for transformers with ratings less than 5kVA
A. forced-air cooling
B. oil-cooling
C. natural air cooling
D. water cooling
ANSWER: C

130. For transformers, zero efficiency happens when it has
A. no-load
B. 1/2 of full-load
C. 2/3 of full-load
D. full-load

ANSWER: A

131. For transformers, maximum efficiency happens when
   A. copper loss is zero
   B. copper loss is equal to constant loss
   C. the primary and secondary windings are equal
   D. the leakage reactances of both windings are equal

ANSWER: B

132. In constructing transformers, the primary and secondary windings should have
   A. good electrical coupling
   B. loose magnetic coupling
   C. tight magnetic coupling
   D. best inductive coupling

ANSWER: C

133. What are the two parameters in transformers that are the same in both primary and secondary?
   A. power and voltage
   B. power and current
   C. power and impedance
   D. voltage per turn and ampere-turns

ANSWER: D

134. In transformers, the amount of copper used in the primary is
   A. less than that of the secondary
   B. greater than that of secondary
   C. exactly twice that of secondary
   D. almost equal as that of secondary

ANSWER: D

135. At very low frequencies, transformers woks poorly because
   A. its magnetizing current will be very high
   B. its core permeability will be greatly increased
   C. its core permeability will be greatly reduced
   D. its impedance will increase

ANSWER: A

136. What will happen if a power transformer is to be operated at a very high frequency?
   A. it will have a very high core loss
   B. its impedance will decrease
   C. its core permeability will be greatly increased
   D. its core permeability will be greatly reduced

ANSWER: A

137. How are the primary and secondary coupled in autotransformers?
   A. electrically
   B. magnetically
   C. electrically and magnetically
   D. capacitively

ANSWER: C

138. In a single-phase transformer, the core flux is
    A. constant
    B. pulsating
    C. alternating
    D. alternating and sometimes stable
ANSWER: C

139. What do you think will happen to a transformer when its primary is connected to a DC supply?
    A. It will become more efficient
    B. It will become less efficient
    C. It will have good regulation
    D. It might burn out
ANSWER: D

140. Generally, in what application you consider the use of core-type transformers?
    A. low voltage and low current
    B. low voltage and high current
    C. high voltage and low current
    D. high voltage and high current
ANSWER: C

141. In _____ transformers, when its primary is energized the secondary should never be open-circuited.
    A. power
    B. voltage
    C. current
    D. matching
ANSWER: C

142. Considered as an ideal transformer
    A. the one with no losses and leakage reactance
    B. the one with 100% regulation
    C. the one with zero efficiency
    D. the one with equal primary and secondary
ANSWER: A

143. What is the effect of air gaps at the transformer core?
    A. Its reluctance is decreased
    B. It increases eddy current
    C. It decreases hysteresis loss
    D. It increases magnetizing current
ANSWER: D

144. _____ currents are wasteful currents which flows in cores of transformers and produces heat.
    A. Residual
    B. Eddy
    C. Sneak
    D. Magnetizing

ANSWER: B

145. What will happen to the eddy current loss in transformers when the load is increased?
A. will also increase
B. will decrease
C. will become infinite
D. nothing will happen
ANSWER: D

146. Leakage flux in transformers will cause
A. copper loss to increase
B. copper loss to decrease
C. eddy current to decrease
D. voltage drop in the windings
ANSWER: D

147. The increase in temperature in a transformer is mainly due to
A. true power
B. reactive power
C. apparent power
D. virtual power
ANSWER: C

148. In transformers, the voltage per turn at the primary is _____ the secondary.
A. less than that of
B. greater than that of
C. a factor of
D. the same as
ANSWER: D

149. In transformer windings, the more number of turns
A. the higher is the voltage
B. the lower is the voltage
C. the lower is the impedance
D. the higher is the current
ANSWER: A

150. What is true about core-type transformers?
A. It has a shorter magnetic path
B. It has a longer magnetic path
C. It has a very long magnetic path
D. It has an infinite magnetic path
ANSWER: A

151. Practically how many percent is copper loss to the total loss in transformers?
A. 15%
B. 50%
C. 85%
D. 100%
ANSWER: C

152. What is the purpose of laminating the core of a transformer?
    A. to decrease eddy current loss
    B. to increase eddy current loss
    C. to decrease copper loss
    D. to decrease hysteresis loss
ANSWER: A

153. Large transformers have approximately an efficiency of
    A. 25%
    B. 45%
    C. 75%
    D. 95%
ANSWER: D

154. The loss in a transformer due to the changing field is called
    A. leakage
    B. hysteresis loss
    C. eddy loss
    D. keeper
ANSWER: B

155. The ratio of the amount of magnetic flux linking a secondary coil compared to the flux generated by the primary coil:
    A. coupling factor
    B. mutual coupling
    C. coefficient of coupling
    D. hysteresis factor
ANSWER: C

156. Mutual inductance between two coils can be decreased by
    A. moving the coils apart
    B. inserting an iron core
    C. moving the coils close
    D. reducing the reluctance
ANSWER: A

157. An advantage of full-wave rectifier over half-wave rectifier.
    A. Each diode can cool-off during half of each input cycle
    B. The ripple frequency is lower
    C. The tube will conduct during both halves of the input cycle
    D. Output voltage is lower with more ripple
ANSWER: C

158. One of the following items below is not one of the main components of an alternating current power supply.
    A. Power transformer
    B. Voltage regulator
    C. Rectifier
    D. Filter
ANSWER: C

159. Most electronic devices/circuits require dc-voltage to operate. A battery is a good power source, however, its operating time is limited. The use of battery also proves to be expensive. A more practical alternative is to use the household main supply, and since this is an ac-voltage, it must be converted to a dc-voltage. The circuit that converts this ac-voltage to a dc-voltage is called
    A. rectifier
    B. clamper
    C. filter
    D. regulator
ANSWER: A

160. A rectifier that uses either the positive or negative portion only of the main ac-supply
    A. half-wave
    B. full-wave
    C. full-wave bridge
    D. all of the above
ANSWER: A

161. For a half-wave rectifier, the average output voltage is _____ of the maximum ac-voltage.
    A. 31.8%
    B. 45%
    C. 63.6%
    D. 90%
ANSWER: A

162. Percent ripple of a half-wave rectifier.
    A. 24%
    B. 48%
    C. 63.6%
    D. 121%
ANSWER: D

163. Calculate the dc-voltage at the output of a half-wave rectifier with a 12Vrms input.
    A. 2.7 V
    B. 3.8 V
    C. 4.5 V
    D. 5.4 V
ANSWER: D

164. To double the capability of the half-wave rectifier, a _____ must be used.
    A. full-wave rectifier
    B. full-wave bridge
    C. dual-supply
    D. A or B is correct
ANSWER: D

165. Fullwave rectifier defers from fullwave bridge in what aspect?
    A. fullwave uses two diodes, while four for fullwave bridge
    B. diode's PIV in fullwave is twice that of fullwave bridge
    C. fullwave generates less heat than fullwave bridge

D. all of the above
ANSWER: D

166. Common to both full-wave and full-wave bridge rectifiers
A. dc-voltage
B. ripple factor
C. ripple frequency and percent ripple
D. all are correct
ANSWER: D

167. Find direct current voltage from a full-wave rectifier with 120 V peak rectified voltage.
A. 60 V
B. 7.639 V
C. 76.39 V
D. 6.0 V
ANSWER: C

168. The dc-voltage of a full-wave bridge rectifier.
A. 0.318 Vmax
B. 0.45 Vmax
C. 0.636 Vmax
D. 0.90 Vmax
ANSWER: C

169. Relate the magnitude of the dc-output voltage to the ac input rms voltage of a full-wave rectifier.
A. V_{DC} = 0.318 Vrms
B. V_{DC} = 0.45 Vrms
C. V_{DC} = 0.636 Vrms
D. V_{DC} = 0.90 Vrms
ANSWER: D

170. Determine the dc-voltage of a full-wave bridge rectifier when the input ac-voltage is 24 Vrms.
A. 7.63 V
B. 10.8 V
C. 15.3 V
D. 21.6 V
ANSWER: D

171. Ripple factor of a full-wave rectifier.
A. 0.318
B. 0.48
C. 0.9
D. 1.21
ANSWER: B

172. To improve the dc output voltage of a power supply, a _____
A. shunt resistor may be installed
B. limiting resistor may be installed
C. feedback element may be installed

D. filter capacitor may be installed
ANSWER: D

173. Factor(s) that can reduce the ripple voltage of a power supply.
A. filter capacitance
B. reduction of load current
C. increase in input frequency
D. all of the above
ANSWER: D

174. Making the filter capacitor large in a power supply results to
A. an increase of the ripple voltage
B. an increase of the dc-voltage
C. a decrease of the ripple frequency
D. A and B above
ANSWER: B

175. Find the ripple factor (kr) of a sinusoidal signal with peak ripple of 4 volts on an average of 30.
A. 0.094
B. 0.013
C. 0.130
D. 0.94
ANSWER: A

176. Calculate the peak-to-peak ripple voltage of a 20 V full-wave power supply with a filter capacitor C = 220 μF when delivering a load current of 50 mA.
A. 2.0 Vpp
B. 3.79 Vpp
C. 5.67 Vpp
D. 7.9 Vpp
ANSWER: A

177. In capacitor-filtered power supply, what will happen to the ripple voltage if the load is disconnected?
A. increases
B. becomes infinite
C. becomes unpredictable
D. drops to zero
ANSWER: D

178. For a power supply with a peak-to-peak ripple voltage of 5 Vpp, determine its rms ripple.
A. 1.44 Vrms
B. 1.77 Vrms
C. 2.88 Vrms
D. 3.54 Vrms
ANSWER: B

179. A 20-Vdc power supply was found to have a ripple voltage of 2 Vrms when supplying 1.5 amps load. Calculate its percent ripple.

A. 7.5 %
B. 10.0 %
C. 12.5 %
D. 15.0 %

ANSWER: B

180. Which power supply filter gives the smallest ripple voltage?
A. capacitor filter
B. RC-filter
C. LC-filter
D. multi-section LC-filter

ANSWER: D

181. Ripple voltage in power supplies causes unwanted effects on the load it is supplying, i.e. a hum in audio amplifiers. To minimize this effect several filtering techniques are used, however, ripple still exists. What is a better alternative to reduce further the ripples?
A. truncation
B. clipping
C. clamping
D. regulation

ANSWER: D

182. A voltage regulator connected in parallel with the load.
A. series regulator
B. parallel regulator
C. shunt regulator
D. switching regulator

ANSWER: C

183. Which regulator is the most efficient?
A. series
B. shunt
C. switching
D. modulating

ANSWER: B

184. Voltage reference element in most voltage regulators
A. diac
B. thyrector
C. zener diode
D. transistor

ANSWER: C

185. In voltage regulators, what do you call the element/device that controls the amount of current/voltage/power?
A. sampling circuit
B. comparator
C. limiter
D. control element

ANSWER: D

186. The element/device used as a comparator in most voltage regulators.
    A. zener diode
    B. BJT
    C. IGBT
    D. op-amp
ANSWER: D

187. Sampling circuit used in most voltage regulators.
    A. voltage divider network
    B. bleeder network
    C. crowbar
    D. bootstrap circuit
ANSWER: A

188. Most voltage regulators used _____ as their control element.
    A. BJT
    B. SBS
    C. UJT
    D. JFET
ANSWER: A

189. The most efficient voltage regulator and is therefore used in high-current high-voltage applications.
    A. series regulators
    B. shunt regulators
    C. hybrid regulators
    D. switching regulators
ANSWER: D

190. A 12 VDC power supply is regulated using 7805 IC and is used in TTL circuits that require a 0.2 amps current. Determine the dropout voltage of the system.
    A. 4 V
    B. 5 V
    C. 6 V
    D. 7 V
ANSWER: D

191. A load draws 1 A current from a 10-V regulated power supply. Calculate the power dissipated by the regulator if it has an input voltage of 16 V.
    A. 6 Watts
    B. 10 Watts
    C. 12 Watts
    D. 16 Watts
ANSWER: A

192. Three-terminal fixed positive voltage regulators commonly used in industry.
    A. 78XX series
    B. 79XX series
    C. 723 IC regulator
    D. 317 regulator

ANSWER: A

193. What is the regulated output voltage of a 7924 regulator?
   A. + 4 V
   B. - 4 V
   C. + 24 V
   D. - 24 V
   ANSWER: D

194. A three-terminal variable positive voltage regulator
   A. 317
   B. 337
   C. 723
   D. 741
   ANSWER: A

195. What three-terminal IC regulator that has a variable negative voltage output?
   A. 317
   B. 337
   C. 723
   D. 741
   ANSWER: B

196. In a three-terminal adjustable positive voltage regulator (317), what is the band-gap voltage between the output terminal and adjustment terminal?
   A. 1.25 V
   B. 2.5 V
   C. 3.25 V
   D. 4.125 V
   ANSWER: A

197. Typical ripple rejection of most three-terminal voltage regulators
   A. 0.1 %
   B. 0.8 %
   C. 1.2 %
   D. 2.0 %
   ANSWER: A

198. The three-terminal voltage regulators, such as the 78XX series has a typical current rating of 1.5 amperes. If a high current is required, say 30 amperes, how will you make modifications from this regulator in order to provide the required current?
   A. by cascading them
   B. by the use of a crowbar circuit
   C. by connecting them in parallel
   D. by the use of external pass transistor
   ANSWER: D

199. What is the simplest way of protecting power supplies from reverse-polarity/reverse-current flow?
   A. by a forward-biased diode
   B. by a reverse-biased diode

C. by a crowbar circuit
D. by a snubber circuit

ANSWER: B

200. A crowbar circuit is used
A. to monitor the output current of a power supply and automatically shuts down the system when an overload occur.
B. to monitor the temperature of a power supply and switches the cooling fan when a threshold temperature is reached.
C. as voltage reference in regulated power supplies.
D. as an over-voltage protection in power supplies.

ANSWER: D

201. Technique(s) in using low-power, low-voltage transistors in high voltage regulators.
A. ground return regulation
B. by lifting the regulator above ground
C. connecting them in series
D. all of the above

ANSWER: D

202. Which of the regulators dissipates less power and therefore generates less heat?
A. series
B. shunt
C. switching
D. UPS

ANSWER: C

203. In switching regulators, what are the semiconductor devices that can be used as controllable power switches?
A. BJTs and MDs
B. MOSFETs and IGBT
C. GTOs and thyristors
D. all of the above

ANSWER: D

204. In voltage regulators, the control element plays a major part in providing proper and efficient regulation. What are the desirable characteristics of the control element to be used if excellent regulator is desired?
A. very small off-state leakage current and high on-state current ratings
B. large forward and reverse blocking voltage and very small on-sate voltage
C. short turn-on and turn-off times so that it can be used in high-speed switching regulators
D. all of the above

ANSWER: D

205. Active devices used in switching regulators may experience large over-currents during conduction (turn-on-state) and large over-voltages during turn-off. These excessive currents and voltages may cause distraction or damage of the active devices. How do we protect them?
A. by the use of a crowbar circuit
B. by providing a buck-boost circuit

C. by shunting a thyrector
D. by installing a snubber circuit

ANSWER: D

206. One of the major concerns in power electronics is to clean-up or shape-up the utility-supply voltage (the wall-outlet 220 V/60 Hz) from disturbances such as, overvolt, undervolt, voltage spikes, and harmonic distortions. What circuit is used for this?
A. power conditioners
B. UPS
C. power inverters
D. line scanning

ANSWER: A

207. A power supply that continuously provides protection against undervoltage, overvoltage and even power outages.
A. standby power supply
B. uninterruptible power supply
C. power conditioners
D. regulated power supply

ANSWER: B