Multiple Choice Questions & Answers

1. Which type of transformer connection results in a secondary voltage equal to the primary voltage?

a) Step-up

b) Step-down

c) Auto-transformer

d) Isolation

Answer: C. Auto-transformer

2. What is the effect of placing an iron core inside a coil in an electrical circuit?

a) Increases inductance

b) Decreases inductance

c) No effect

d) Increases resistance

Answer: A. Increases inductance

3. What is the unit of measurement for magnetic flux density?

a) Tesla

b) Ampere-turn/meter

c) Henry

d) Weber

Answer: A. Tesla

4. What phenomenon causes energy losses in a transformer due to changes in magnetic flux?

a) Hysteresis

b) Eddy currents

c) Induction

d) Capacitance

Answer: A. Hysteresis

5. Which transformer connection is used for connecting equipment with different voltage requirements?

a) Auto-transformer

b) Step-up

c) Step-down

d) Isolation

Answer: A. Auto-transformer

6. What is the primary function of the transformer's cooling system?

a) To dissipate heat

b) To regulate the voltage

c) To provide mechanical support

d) To reduce losses

Answer: A. To dissipate heat

7. Which type of transformer connection is suitable for voltage step-up applications?

a) Step-up

b) Step-down

c) Auto-transformer

d) Isolation

Answer: A. Step-up

8. What is the purpose of the insulation in a transformer?

a) To prevent short circuits

b) To cool the transformer

c) To provide mechanical support

d) To reduce losses

Answer: A. To prevent short circuits

9. Which type of transformer connection provides a secondary voltage lower than the primary voltage?

a) Step-up

b) Step-down

c) Auto-transformer

d) Isolation

Answer: B. Step-down

10. What type of winding is used in the primary of a transformer?

a) High-voltage winding

b) Low-voltage winding

c) Both high and low voltage windings

d) None of the above

Answer: A. High-voltage winding

11. What is the term for the maximum magnetic flux density that a transformer core can handle without saturation?

a) Saturation flux density

b) Remanence

c) Coercivity

d) Permeability

Answer: A. Saturation flux density

12. What phenomenon causes energy losses in a transformer due to the resistance of the winding?

a) Copper losses

b) Hysteresis losses

c) Eddy current losses

d) Inductive losses

Answer: A. Copper losses

13. What is the primary purpose of the transformer's conservator tank?

a) To compensate for oil expansion

b) To cool the transformer

c) To provide mechanical support

d) To prevent oil leakage

Answer: A. To compensate for oil expansion

14. Which type of winding is used in the secondary of a transformer?

a) Low-voltage winding

b) High-voltage winding

c) Both high and low voltage windings

d) None of the above

Answer: A. Low-voltage winding

15. What type of core material reduces eddy current losses in a transformer?

a) Laminated silicon steel

b) Cast iron

c) Aluminum

d) Copper

Answer: A. Laminated silicon steel

16. What is the primary purpose of the transformer's tap changer?

a) To regulate voltage

b) To regulate current

c) To change frequency

d) To dissipate heat

Answer: A. To regulate voltage

17. Which type of transformer connection provides electrical isolation between primary and secondary windings?

a) Isolation

b) Step-up

c) Step-down

d) Auto-transformer

Answer: A. Isolation

18. What is the purpose of the LV bushing in a transformer?

a) To connect the load

b) To connect the primary winding

c) To connect the secondary winding

d) To dissipate heat

Answer: C. To connect the secondary winding

19. Which type of winding has fewer turns in a step-up transformer?

a) Secondary winding

b) Primary winding

c) Both have the same turns

d) None of the above

Answer: A. Secondary winding

20. What type of core material reduces hysteresis losses in a transformer?

a) Silicon steel

b) Cast iron

c) Aluminum

d) Copper

Answer: A. Silicon steel

21. What is the primary reason for using a conservator tank in a transformer?

a) Oil expansion compensation

b) Heat dissipation

c) Mechanical support

d) Voltage regulation

Answer: A. Oil expansion compensation

22. Which type of winding has more turns in a step-down transformer?

a) Secondary winding

b) Primary winding

c) Both have the same turns

d) None of the above

Answer: A. Secondary winding

23. What is the unit of measurement for magnetic flux?

a) Weber

b) Tesla

c) Ampere-turn

d) Henry

Answer: A. Weber

24. Which type of transformer connection provides electrical isolation between primary and secondary windings?

a) Isolation

b) Step-up

c) Step-down

d) Auto-transformer

Answer: A. Isolation

25. What is the purpose of the HV bushing in a transformer?

a) To connect the load

b) To connect the primary winding

c) To connect the secondary winding

d) To dissipate heat

Answer: B. To connect the primary winding

26. What is the primary function of a DC machine?

a) Producing Direct Current

b) Producing Alternating Current

c) Converting AC to DC

d) Generating Magnetic Field

Answer: A. Producing Direct Current

27. In a DC machine, which part converts electrical energy into mechanical energy?

a) Armature

b) Commutator

c) Field Winding

d) Brushes

Answer: A. Armature

28. What type of motor is a DC shunt motor?

a) Constant Speed

b) Variable Speed

c) High Torque

d) Low Torque

Answer: A. Constant Speed

29. In a DC shunt motor, what is the function of the shunt field winding?

a) Provides Constant Field Flux

b) Provides Variable Field Flux

c) Controls Armature Current

d) Controls Voltage Drop

Answer: A. Provides Constant Field Flux

30. What is the significance of torque-slip characteristics in induction motors?

a) Illustrates Torque Behavior

b) Indicates Voltage Variation

c) Demonstrates Speed Regulation

d) Depicts Power Loss

Answer: A. Illustrates Torque Behavior

31. What phenomenon is utilized in a three-phase induction motor to produce a rotating magnetic field?

a) Phase Shifting

b) Armature Reaction

c) Electromagnetic Induction

d) Magnetic Saturation

Answer: C. Electromagnetic Induction

32. In a three-phase induction motor, what is the purpose of the rotor?

a) Rotates

b) Produces Magnetic Field

c) Controls Voltage

d) Regulates Speed

Answer: A. Rotates

33. What distinguishes a single-phase induction motor from a three-phase one?

a) Number of Phases

b) Speed Regulation Capability

c) Efficiency

d) Size

Answer: A. Number of Phases

34. Which type of induction motor requires an additional starting mechanism?

a) Single-phase

b) Three-phase

c) Synchronous

d) DC

Answer: A. Single-phase

35. What is the primary function of a synchronous generator?

a) Produce AC Power

b) Produce DC Power

c) Generate Magnetic Field

d) Control Voltage

Answer: A. Produce AC Power

36. In a synchronous generator, what component maintains synchronization with the grid frequency?

a) Stator

b) Rotor

c) Exciter

d) Prime Mover

Answer: B. Rotor

37. Which principle is employed in the construction of a synchronous generator?

a) Faraday's Law

b) Lenz's Law

c) Fleming's Right Hand Rule

d) Rotating Magnetic Field

Answer: D. Rotating Magnetic Field

38. What is the function of the exciter in a synchronous generator?

a) Provide Field Current

b) Generate Mechanical Energy

c) Regulate Voltage

d) Control Frequency

Answer: A. Provide Field Current

39. Which type of motor has a rotor that moves due to induction but does not rotate at synchronous speed?

a) Single-phase

b) Three-phase

c) Synchronous

d) DC

Answer: A. Single-phase

40. What characteristic does a DC shunt machine exhibit regarding speed with varying loads?

a) Constant Speed

b) Increasing Speed

c) Decreasing Speed

d) Fluctuating Speed

Answer: A. Constant Speed

41. In a three-phase induction motor, what is the speed of the rotor relative to the rotating magnetic field?

a) Slightly Slower

b) Slightly Faster

c) Equal

d) Dependent on Voltage

Answer: A. Slightly Slower

42. What type of rotor is commonly used in a three-phase induction motor?

a) Squirrel Cage

b) Wound

c) Permanent Magnet

d) Commutator

Answer: A. Squirrel Cage

43. What is the primary advantage of a single-phase induction motor?

a) Simplicity

b) High Efficiency

c) Variable Speed

d) Easy Maintenance

Answer: A. Simplicity

44. Which type of motor does not require any external DC supply for its operation?

a) Three-phase

b) Single-phase

c) Synchronous

d) DC

Answer: A. Three-phase

45. How does a synchronous generator differ from an induction generator?

a) Generates Fixed Frequency

b) Generates Variable Frequency

c) Requires External Power Source

d) Operates Without Prime Mover

Answer: A. Generates Fixed Frequency

46. What is the primary function of the commutator in a DC machine?

a) Converts AC to DC

b) Maintains Armature Rotation

c) Regulates Voltage Drop

d) Controls Field Flux

Answer: B. Maintains Armature Rotation

47. Which type of DC motor exhibits a speed-torque characteristic curve showing a hyperbolic relationship?

a) Series

b) Shunt

c) Compound

d) Permanent Magnet

Answer: A. Series

48. In a DC shunt motor, what happens to speed as the load increases?

a) Slight Decrease

b) Slight Increase

c) Remains Constant

d) Varies Erratically

Answer: C. Remains Constant

49. What role does the armature play in a DC machine?

a) Produces Mechanical Energy

b) Produces Magnetic Field

c) Maintains Constant Voltage

d) Provides Field Excitation

Answer: A. Produces Mechanical Energy

50. Which type of DC motor is typically used in applications requiring high starting torque?

a) Series

b) Shunt

c) Compound

d) Permanent Magnet

Answer: A. Series

51. What is the primary advantage of using a three-phase induction motor over a single-phase one?

a) Higher Efficiency

b) Variable Speed Control

c) Lower Maintenance

d) Better Power Factor

Answer: A. Higher Efficiency

52. Which component of a DC machine is responsible for reversing the current in the armature?

a) Commutator

b) Brushes

c) Field Winding

d) Stator Windings

Answer: A. Commutator

53. What is the primary function of the field winding in a DC machine?

a) Produce Magnetic Field

b) Convert Electrical Energy to Heat

c) Control Armature Speed

d) Regulate Voltage

Answer: A. Produce Magnetic Field

54. What characteristic curve represents the relationship between torque and armature current in a DC motor?

a) Torque-Speed

b) Torque-Armature Current

c) Torque-Voltage

d) Speed-Armature Current

Answer: B. Torque-Armature Current

55. Which type of DC motor exhibits high starting torque but poor speed regulation?

a) Series

b) Shunt

c) Compound

d) Permanent Magnet

Answer: A. Series

56. What is the primary function of brushes in a DC machine?

a) Provide Electrical Contact

b) Produce Magnetic Field

c) Control Armature Speed

d) Regulate Voltage

Answer: A. Provide Electrical Contact

57. Which type of DC motor is preferred for applications requiring constant speed under varying loads?

a) Shunt

b) Series

c) Compound

d) Permanent Magnet

Answer: A. Shunt

58. What is the primary disadvantage of a single-phase induction motor compared to a three-phase one?

a) Lower Starting Torque

b) Higher Efficiency

c) Limited Power Output

d) Poor Speed Regulation

Answer: A. Lower Starting Torque

59. Which type of DC motor provides a combination of series and shunt characteristics?

a) Compound

b) Series-Parallel

c) Shunt-Parallel

d) Permanent Magnet

Answer: A. Compound

60. What type of motor is commonly used in applications where precise speed control is required?

a) DC Servo

b) Induction

c) Synchronous

d) Stepper

Answer: A. DC Servo

61. In a three-phase induction motor, what determines the direction of rotation of the rotor?

a) Magnetic Field

b) Supply Voltage

c) Frequency of the Supply

d) Slip

Answer: A. Magnetic Field

62. What is the primary advantage of a synchronous generator over an induction generator?

a) Precise Frequency Control

b) Lower Cost

c) Self-Excitation

d) Variable Power Output

Answer: A. Precise Frequency Control

63. Which type of DC motor has its field winding connected in parallel with the armature winding?

a) Shunt-Parallel

b) Series-Parallel

c) Compound-Parallel

d) Permanent Magnet

Answer: A. Shunt-Parallel

64. What is the primary disadvantage of a synchronous generator compared to an induction generator?

a) Higher Cost

b) Lower Efficiency

c) Limited Starting Torque

d) Requires External Excitation

Answer: C. Limited Starting Torque

65. Which characteristic curve represents the relationship between speed and armature current in a DC motor?

a) Speed-Torque

b) Speed-Armature Current

c) Speed-Voltage

d) Torque-Armature Current

Answer: B. Speed-Armature Current

66. Which type of DC motor exhibits a speed-torque characteristic curve showing a linear relationship?

a) Shunt

b) Series

c) Compound

d) Permanent Magnet

Answer: B. Series

67. What type of motor is commonly used in applications requiring high starting torque and variable speed control?

a) DC Series

b) DC Shunt

c) Induction

d) Synchronous

Answer: A. DC Series

68. Which type of DC motor has its armature winding connected in series with the field winding?

a) Series

b) Shunt

c) Compound

d) Permanent Magnet

Answer: A. Series

69. What is the primary disadvantage of a compound DC motor compared to a shunt DC motor?

a) Poor Speed Regulation

b) Lower Starting Torque

c) Higher Maintenance

d) Limited Efficiency

Answer: A. Poor Speed Regulation

70. Which type of motor relies on the principle of electromagnetic induction for its operation?

a) Induction

b) Synchronous

c) DC

d) Stepper

Answer: A. Induction

71. What type of motor is commonly used in applications where precise position control is required?

a) Stepper

b) Induction

c) Synchronous

d) DC Servo

Answer: A. Stepper

72. What is the primary function of the stator in a three-phase induction motor?

a) Generate Rotating Magnetic Field

b) Produce Mechanical Energy

c) Control Voltage

d) Regulate Speed

Answer: A. Generate Rotating Magnetic Field

73. Which type of DC motor has both series and shunt field winding connected simultaneously?

a) Compound

b) Series-Parallel

c) Shunt-Parallel

d) Permanent Magnet

Answer: A. Compound

74. What characteristic curve represents the relationship between torque and speed in a DC motor?

a) Torque-Speed

b) Torque-Armature Current

c) Speed-Armature Current

d) Speed-Voltage

Answer: A. Torque-Speed

75. In a synchronous generator, what component is responsible for providing initial excitation to the rotor winding?

a) Exciter

b) Stator

c) Rotor

d) Prime Mover

Answer: A. Exciter

76. What is the purpose of a Switch Fuse Unit (SFU)?

a) To regulate current flow

b) To protect against short circuits

c) To store electrical energy

d) To convert AC to DC

Answer: B. To protect against short circuits

77. What is the function of an MCB in electrical installations?

a) Voltage regulation

b) Overload protection

c) Energy storage

d) Temperature control

Answer: B. Overload protection

78. What does ELCB stand for?

a) Electrical Load Circuit Breaker

b) Electronic Logic Control Box

c) Earth Leakage Circuit Breaker

d) Electric Light Control Board

Answer: C. Earth Leakage Circuit Breaker

79. What is the primary purpose of MCCB?

a) To regulate voltage

b) To protect against overcurrent

c) To amplify electrical signals

d) To measure resistance

Answer: B. To protect against overcurrent

80. Which of the following is not a type of wire or cable used in electrical installations?

a) Coaxial cable

b) Twisted pair cable

c) Optical fiber cable

d) Copper rod

Answer: D. Copper rod

81. What is the main function of earthing in electrical systems?

a) To provide additional power

b) To reduce electrical noise

c) To protect against electric shock

d) To increase voltage

Answer: C. To protect against electric shock

82. Which characteristic is important for batteries used in electrical installations?

a) Color

b) Weight

c) Voltage

d) Capacity

Answer: D. Capacity

83. What type of calculations are involved in determining energy consumption?

a) Arithmetic calculations

b) Trigonometric calculations

c) Elementary calculations

d) Advanced calculus

Answer: C. Elementary calculations

84. What is power factor improvement aimed at achieving?

a) Increasing energy consumption

b) Reducing voltage

c) Minimizing power loss

d) Maximizing power consumption

Answer: C. Minimizing power loss

85. What is the purpose of battery backup in electrical installations?

a) To supply primary power

b) To enhance electrical safety

c) To provide power during outages

d) To regulate voltage

Answer: C. To provide power during outages

86. How does an SFU differ from an MCCB?

a) SFU is for short circuit protection, MCCB is for overload protection

b) SFU regulates voltage, MCCB measures resistance

c) SFU converts AC to DC, MCCB amplifies electrical signals

d) SFU stores energy, MCCB protects against electric shock

Answer: A. SFU is for short circuit protection, MCCB is for overload protection

87. What type of current does an ELCB detect?

a) Overcurrent

b) Undercurrent

c) Leakage current

d) Alternating current

Answer: C. Leakage current

88. Which of the following is an advantage of using optical fiber cable?

a) High resistance to electromagnetic interference

b) Low capacity for data transmission

c) Low cost

d) Heavy weight

Answer: A. High resistance to electromagnetic interference

89. How does twisted pair cable differ from coaxial cable?

a) Twisted pair has higher bandwidth

b) Coaxial cable is more susceptible to interference

c) Twisted pair is used for long-distance transmission

d) Coaxial cable is lighter

Answer: B. Coaxial cable is more susceptible to interference

90. What does the voltage rating of a wire or cable indicate?

a) Maximum current it can carry

b) Resistance to fire

c) Tolerance to heat

d) Maximum voltage it can withstand

Answer: D. Maximum voltage it can withstand

91. In which scenario would a higher capacity battery be preferred?

a) Low power consumption applications

b) High power consumption applications

c) No preference, capacity is irrelevant

d) No battery is needed

Answer: B. High power consumption applications

92. What is the primary purpose of a switch fuse unit (SFU)?

a) To regulate voltage

b) To protect against overcurrent

c) To convert DC to AC

d) To measure power

Answer: B. To protect against overcurrent

93. Which type of cable is commonly used for data transmission in computer networks?

a) Twisted pair cable

b) Coaxial cable

c) Optical fiber cable

d) Copper rod

Answer: A. Twisted pair cable

94. Why is it important to calculate power factor?

a) To increase energy consumption

b) To reduce power loss

c) To maximize voltage

d) To regulate current

Answer: B. To reduce power loss

95. Which of the following is a characteristic of a good battery for backup purposes?

a) Low capacity

b) High capacity

c) Low voltage

d) Low resistance

Answer: B. High capacity

96. What is the function of an MCB in an electrical circuit?

a) To regulate voltage

b) To protect against overcurrent

c) To convert AC to DC

d) To amplify signals

Answer: B. To protect against overcurrent

97. Which type of cable is commonly used for television signal transmission?

a) Twisted pair cable

b) Coaxial cable

c) Optical fiber cable

d) Copper rod

Answer: B. Coaxial cable

98. What is the purpose of earthing in electrical installations?

a) To increase electrical noise

b) To reduce power consumption

c) To protect against electric shock

d) To amplify voltage

Answer: C. To protect against electric shock

99. Which of the following is an important characteristic for batteries used in electrical installations?

a) Color

b) Weight

c) Voltage

d) Capacity

Answer: D. Capacity

100. What is the primary function of an SFU?

a) To regulate voltage

b) To protect against overcurrent

c) To convert AC to DC

d) To amplify signals

Answer: B. To protect against overcurrent

101. Which type of cable is commonly used for long-distance data transmission?

a) Twisted pair cable

b) Coaxial cable

c) Optical fiber cable

d) Copper rod

Answer: C. Optical fiber cable

102. Why are batteries used in electrical installations?

a) To regulate voltage

b) To store energy

c) To increase resistance

d) To measure current

Answer: B. To store energy

103. What is the primary purpose of an ELCB?

a) To regulate voltage

b) To protect against overcurrent

c) To detect and prevent leakage current

d) To amplify signals

Answer: C. To detect and prevent leakage current

104. Which type of cable is commonly used for voice communication?

a) Twisted pair cable

b) Coaxial cable

c) Optical fiber cable

d) Copper rod

Answer: A. Twisted pair cable

105. What does the capacity of a battery indicate?

a) Its weight

b) Its resistance

c) Its voltage

d) The amount of charge it can hold

Answer: D. The amount of charge it can hold

106. What is the purpose of a switch fuse unit (SFU) in electrical installations?

a) To regulate current

b) To protect against overcurrent

c) To convert AC to DC

d) To amplify signals

Answer: B. To protect against overcurrent

107. Which type of cable is commonly used for high-speed internet connections?

a) Twisted pair cable

b) Coaxial cable

c) Optical fiber cable

d) Copper rod

Answer: C. Optical fiber cable

108. Why is earthing important in electrical systems?

a) To increase power consumption

b) To reduce electrical noise

c) To protect against electric shock

d) To amplify voltage

Answer: C. To protect against electric shock

109. What is an important characteristic to consider when selecting batteries for backup purposes?

a) Color

b) Weight

c) Voltage

d) Capacity

Answer: D. Capacity

110. Which type of cable is commonly used for cable television?

a) Twisted pair cable

b) Coaxial cable

c) Optical fiber cable

d) Copper rod

Answer: B. Coaxial cable

111. What does the voltage rating of a cable indicate?

a) Its maximum current carrying capacity

b) Its resistance to fire

c) Its tolerance to heat

d) Its maximum voltage it can withstand

Answer: D. Its maximum voltage it can withstand

112. In what scenarios would a high-capacity battery be preferred?

a) Low power consumption applications

b) High power consumption applications

c) Capacity is irrelevant

d) No battery needed

Answer: B. High power consumption applications

113. What is the primary function of an SFU in electrical installations?

a) To regulate voltage

b) To protect against overcurrent

c) To convert DC to AC

d) To amplify signals

Answer: B. To protect against overcurrent

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a) Overcurrent

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c) Leakage current

d) Alternating current

Answer: C. Leakage current

115. Which characteristic is important for batteries used in electrical installations?

a) Color

b) Weight

c) Voltage

d) Capacity

Answer: D. Capacity

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d) Maximizing power consumption

Answer: C. Minimizing power loss

118. What is the purpose of battery backup in electrical installations?

a) To supply primary power

b) To enhance electrical safety

c) To provide power during outages

d) To regulate voltage

Answer: C. To provide power during outages

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122. What is the main function of earthing in electrical systems?

a) To provide additional power

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c) To protect against electric shock

d) To increase voltage

Answer: C. To protect against electric shock

123. Which characteristic is important for batteries used in electrical installations?

a) Color

b) Weight

c) Voltage

d) Capacity

Answer: D. Capacity

124. What types of calculations are involved in determining energy consumption?

a) Arithmetic calculations

b) Trigonometric calculations

c) Elementary calculations

d) Advanced calculus

Answer: C. Elementary calculations

125. What is power factor improvement aimed at achieving?

a) Increasing energy consumption

b) Reducing voltage

c) Minimizing power loss

d) Maximizing power consumption

Answer: C. Minimizing power loss