Chapter 15

ELECTROMAGNETIC INDUCTION

Each question has four possible answers, tick (✓) the correct answer:

1. The induced emf in a circuit depends upon:

(a) Maximum magnetic flux **(b)** Change in magnetic flux

(c) Initial magnetic flux **(d)** Rate of charge of magnetic flux

2. The induced current in a circuit depends upon:

(a) Direction of the loop **(b)** Shape of the loop

(c) Resistance of the loop **(d)** Speed of the loop

3. Which one of the following produced first:

(a) Induced emf **(b)** Induced current

(c) Motional emf **(d)** None of the above

4. The induced current can be increased by:

(a) Replacing the loop by a coil **(b)** Moving the loop faster

(c) Using the strong magnetic field **(d)** All of the above

5. The magnitude of motional emf is given by:

(a) $\varepsilon = -VBL$ **(b)** $\varepsilon = VBL$

(c) $\varepsilon = \frac{V}{BL}$ **(d)** $\varepsilon = -\frac{L}{VB}$

6. If a closed metallic loop is moved across a magnetic field then:

(a) Induced current is produced in it **(b)** No induced current is produced

(c) Magnet will attract the loop **(d)** None of above

7. The Phenomenon by which an induced emf is produced in the conductor due to change of magnetic flux in it is called:

(a) Electro magnetism **(b)** Electromagnetic induction

(c) Electric polarization **(d)** All of above

8. The current produced by moving a loop (wire) across the magnetic field is called:

(a) Alternating current **(b)** Direct current

(c) Induced current **(d)** None of these

9. An emf is set up in a conductor when it:

(a) Moves across the magnetic field **(b)** Is kept in the magnetic field

(c) Is kept in an electric field **(d)** None of these

10. The phenomenon of production of induced emf is called:

(a) Magnetic induction **(b)** Electromagnetic induction

(c) Both (a) and (b) **(d)** None of these

11. In magnet-coil experiment, emf can be produced by:

(a) Motion of loop and magnet

(b) Keeping the magnet stationary and moving the coil

(c) Keeping the coil stationary and moving magnet

(d) All of above

12. Michael Faraday and Joseph Henry belongs to:

(a) England and USA **(b)** France and USA

(c) China and USA **(d)** None of these

13. A coil of constant area is placed in a constant magnetic field, an induced current is produced in the coil when:

(a) The coil is rotated **(b)** The coil is stationary

(c) Both (a) and (b) **(d)** None of these

14. The unit of induced emf is:

(a) Ampere **(b)** Volt

(c) Joule/coulomb **(d)** Both (b) and (c)

15. When the conductor is moved with its length parallel to the lines of magnetic field:

(a) emf passes through the conductor **(b)** emf is induced across its ends

(c) Both (a) and (b) **(d)** None of these

16. The law of electromagnetic induction is related to:

(a) Lenz **(b)** Faraday

(c) Coulomb **(d)** Ampere

17. Faraday's law of electromagnetic induction has been used in the construction of:

(a) Electric generator **(b)** Ammeter

(c) Galvanometer **(d)** All of above

18. The Lenz's law refers to:

(a) Induced current **(b)** Induced emf

(c) Both (a) & (b) **(d)** None of these

19. When we say that Lenz law refers to induced currents, it means that we can apply it directly to:

(a) Open circuits **(b)** Closed conducting loop

(c) Every circuits **(d)** None of these

20. The current produced due to electromagnetic induction is called:

(a) Electric current **(b)** Conventional current

(c) Induced current **(d)** All of above

21. The emf produced by the motion of a coil across the magnetic field is called:

(a) Motional emf **(b)** emf

(c) Induced emf **(d)** None of the above

22. The rate of change of magnetic flux is directly proportional to the induced emf is called:

(a) Lenz law **(b)** Faraday's law

(c) Oersted law **(d)** None of them

23. Mathematically Faraday's law can be expressed as:

(a) $\varepsilon = N\frac{\Delta\phi}{\Delta t}$ **(b)** $\varepsilon = -N\frac{\Delta\phi}{\Delta t}$

(c) $\varepsilon = -N\frac{\Delta I}{\Delta t}$ **(d)** $\varepsilon = N\frac{\Delta t}{\Delta \phi}$

24. The direction of induced current is always so as to oppose the change which causes the current, this is the statement of:

(a) Lenz's law **(b)** Faraday's law

(c) Ampere's law **(d)** Coulomb's law

25. Lenz's law is also statement of:

(a) Law of conservation of charge **(b)** Law of conservation of energy

(c) Law of conservation of mass **(d)** Law of conservation of momentum

26. Faraday's law was deduced in:

(a) 1830 **(b)** 1841

(c) 1831 **(d)** 1931

27. Lenz's law presented in:

(a) 1834 **(b)** 1934

(c) 1826 **(d)** 1836

28. Lenz was a ———— physicist.

(a) Japan **(b)** China

(c) Russian **(d)** None of above

29. When we study the phenomenon mutual induction between two coils, the primary coil consists of:

(a) A rheostat and battery **(b)** A rheostat and galvanometer

(c) Galvanometer only **(d)** None of these

30. When we study mutual induction between two coils, the secondary coil circuit consists of:

(a) A rheostat and battery **(b)** A battery only

(c) A galvanometer only **(d)** A rheostat only

31. The emf induced in the secondary coil is directly proportional to:

(a) Rate of change of magnetic flux **(b)** Rate change of electric flux

(c) Change of magnetic flux **(d)** All of above

32. The negative sign in the equation $\varepsilon_s = -M\frac{\Delta I}{\Delta t}$ shows that the induced emf in such a direction that it:

(a) Favours the current in the primary coil

(b) Opposes the current in the primary coil

(c) Opposes the change of current in the primary coil

(d) None of these

33. The negative sign in the equation $\varepsilon_L = -L\frac{\Delta I}{\Delta t}$ can be explained by:

(a) Lenz's law **(b)** Faraday's law

(c) Ampere's law **(d)** None of these

34. If the current in the coil itself is increased by rheostat, the emf induced will be:

(a) Opposite to that of battery **(b)** In the same direction at that of battery

(c) Both (a) and (b) **(d)** None of these

35. Inductors behaves like the:

(a) Resistors in D.C circuit **(b)** Resistors in A.C circuit

(c) Both (a) and (b) **(d)** None of these

36. A coil of wire is also called:

(a) Insulator **(b)** Semi-conductor

(c) Inductor **(d)** All of above

37. The energy can be stored in the:

(a) Magnetic field of an inductor **(b)** Electric field of the capacitor

(c) Magnetic field of the capacitor **(d)** Both (a) and (b)

38. The symbol U_m represents:

(a) Energy density inside the coil **(b)** Energy stored in a conductor

(c) Energy stored in an inductor **(d)** All of above

39. Self inductance of an iron-cored coil can be calculated by:

(a) $L = \mu_o NnA$ **(b)** $L = \mu_o n^2 Al$

(c) $L = \frac{N\phi}{I}$ **(d)** All of above

40. Energy stored per unit volume inside a long solenoid is known as:

(a) Energy density **(b)** Power density

(c) Energy **(d)** Surface charge density

41. The phenomenon in which a change of current in one coil induces an emf in the other coil is called:

(a) Self induction **(b)** Mutual induction

(c) Electric induction **(d)** None of above

42. Mathematically the mutual inductance may be defined as:

(a) $\frac{-\varepsilon_s}{\left(\frac{\Delta I}{\Delta t}\right)p}$ **(b)** $\frac{\varepsilon}{\left(\frac{\Delta t}{\Delta I}\right)p}$

(c) $\frac{\varepsilon}{\left(\frac{\Delta V}{\Delta t}\right)p}$ **(d)** None of these

43. The SI unit of mutual inductance is:

(a) Farad **(b)** Coulomb

(c) Henry **(d)** Ampere

44. Which of the following is scalar:

(a) Flux density **(b)** emf

(c) Magnetic flux **(d)** Both (a) and (b)

45. The practical Illustration of the phenomenon of mutual induction in:

(a) Transformer **(b)** D.C. dynamo

(c) A.C. generator **(d)** None of these

46. One henry is equal to:

(a) 1 ohm × 1 sec **(b)** 1 ohm × 1 hertz

(c) 1 ohm × 1 metre **(d)** All of above

47. A magnetic compass will be deflected if it is kept near a:

(a) Charge at rest **(b)** Charge in motion

(c) Positive charge at rest **(d)** None of them

48. The phenomenon of producing emf in a coil due to the change of current in itself is called:

(a) Self induction **(b)** Mutual induction

(c) Inductance **(d)** Both (a) and (b)

49. The SI unit of self inductance is:

(a) Ampere **(b)** Coulomb

(c) Farad **(d)** Henry

50. Self induction is expressed as:

(a) $\varepsilon_L = -\frac{\Delta I}{\Delta t}$ **(b)** $\varepsilon_L = -L\frac{\Delta I}{\Delta t}$

(c) $\varepsilon_L = \frac{\Delta \phi}{\Delta t}$ **(d)** $\varepsilon_L = -L\frac{\Delta t}{\Delta I}$

51. The mutual induction between the two coils depends upon:

(a) Area of the coil **(b)** Number of turns

(c) Distance between the coil **(d)** All of the above

52. The self induction does not depend upon:

(a) Core material **(b)** Weight of coil

(c) Number of turns of the coil **(d)** Area of coil

53. The energy stored in a magnetic field is given by:

(a) $E = \frac{1}{2} LI^2$ **(b)** $E = \frac{1}{2}\frac{Q^2}{C}$

(c) $E = \frac{1}{2} L^2 I$ **(d)** LI^2

54. Self inductance of a long solenoid is given by:

(a) $L = \frac{\mu_o n^2}{l}$ **(b)** $L = \mu_o N I^2 A$

(c) $L = \mu_o n^2 A l$ **(d)** None of the above

55. The ratio of the self-induced emf to the rate of change of current in the coil is known as:

(a) Mutual induction **(b)** Self induction

(c) Self inductance **(d)** Mutual inductance

56. The ratio of the emf in the secondary coil to the rate of change of current in the primary coil is known as:

(a) Mutual induction **(b)** Self induction

(c) Mutual inductance **(d)** Both (a) and (c)

57. If one coil is wound on an iron core, the flux through it will:

(a) Remains constant **(b)** Decrease

(c) Increase **(d)** Becomes zero

58. A 50 mH coil carries a current of 2A. The energy stored in its magnetic field is:

(a) E = 005 J **(b)** E = 10J

(c) E = 0.1 J **(d)** E = 50 J

59. The motional emf produced in a conductor depends upon:

(a) Magnetic field **(b)** Length

(c) Material of the conductor **(d)** All of the above

60. A.C. generator is a device which converts:

(a) Electrical energy into mechanical energy **(b)** Mechanical energy into electrical energy

(c) Chemical energy into mechanical energy **(d)** Heat energy into electrical energy

61. The magnitude of the emf induced in the coil of A.C generator is given by:

(a) $\varepsilon = N\omega AB \sin\theta$ **(b)** $\varepsilon = \dfrac{\omega ABN}{\sin\theta}$

(c) $\varepsilon = \dfrac{B \sin\omega t}{N\omega A}$ **(d)** all of above

62. A device that converts mechanical energy into electrical energy is called:

(a) A.C generator **(b)** Motor

(c) Converter **(d)** Vibrator

63. Energy stored per unit volume inside a solenoid is:

(a) $\dfrac{1}{2}\dfrac{E^2}{\mu_o}$ **(b)** $\dfrac{1}{2}\dfrac{B^2}{\mu_o}$

(c) $\dfrac{B^2}{\mu_o}$ **(d)** $\dfrac{EB}{2\mu_o}$

64. A.C is converted into D.C by:

(a) Dynamo **(b)** Rectifier

(c) Motor **(d)** Transformer

65. An electric motor converts:

(a) Mechanical energy into electrical energy **(b)** Electrical energy into mechanical energy

(c) Magnetic energy into mechanical energy **(d)** None of the above

66. Emf produced by A.C generator depends upon:

(a) Magnetic field strength **(b)** Number of turns in the coil

(c) Frequency of rotation **(d)** All the above

67. Slip rings are used in:

(a) Electric motor **(b)** D.C Dynamo

(c) A.C generator **(d)** None of above

68. The product of induced current and resistance is always:

(a) Lesser **(b)** Greater

(c) Constant **(d)** None of above

69. Energy can be stored in a magnetic field of:

(a) Inductor **(b)** Resistance

(c) Solenoid **(d)** Capacitor

70. The principle of electric generator is based on:

(a) Faradays law **(b)** Lenz law

(c) Ampere's law **(d)** None of above

71. The Lenz's law refers to induced ————.

(a) Current **(b)** emf

(c) Both (a) and (b) **(d)** None of them

72. Alternating emf is produced by rotating a coil of wire in:

(a) Electric field **(b)** Magnetic field

(c) Conservative field **(d)** Gravitational field

73. An alternating current is that which:

(a) Flows intermediately

(b) Varies in magnitude

(c) Reverses its direction several times per second

(d) None of the above

74. An alternating current is converted into direct current by:

(a) Dynamo **(b)** Transformer

(c) Rectifier **(d)** Motor

75. The only difference between construction of D.C. generator and an A.C generator is that of:

(a) Commutator **(b)** Coil

(c) Carbon brushes **(d)** Magnetic field

76. A transformer is a device which:

(a) Steps up D.C voltage **(b)** Steps down D.C voltage

(c) Steps up or steps down A.C. voltage **(d)** None of above

77. A transformer consists of an iron core with:

(a) A secondary coil **(b)** A primary coil

(c) Neither primary nor secondary **(d)** Primary coil and secondary coil

78. A device consisting of two coils wound on iron core is called a:

(a) Electric motor **(b)** A.C generator

(c) Transformer **(d)** D.C. generator

79. The practical application of the phenomenon of mutual induction is:

(a) A.C generator **(b)** D.C generator

(c) Electric motor **(d)** Transformer

80. Who invented commutator:

(a) William Black **(b)** William Smith

(c) William Sturgeon **(d)** Mosley

81. Commutator was invented in:

(a) 1834 **(b)** 1820

(c) 1840 **(d)** 1835

82. Work can be stored in an inductor as:

(a) Elastic P.E **(b)** Electrical P.E

(c) Gravitational P.E **(d)** Kinetic energy

83. Energy stored per unit volume inside the solenoid is called:

(a) Mass density **(b)** Energy density

(c) Charge density **(d)** Volume density

84. A current which reverses its direction in each second is called:

(a) Alternating current **(b)** Direct current

(c) Induced current **(d)** None of these

85. Alternating current generator use:

(a) Split rings **(b)** Slip rings

(c) Loop rings **(d)** Coiled rings

86. The direction of the induced emf during electromagnetic induction can be determined by the use of:

(a) Amperes law **(b)** Coulomb's law

(c) Lenz's law **(d)** Faraday's law

87. A generator running in reverse direction may be called as:

(a) D.C generator **(b)** Commutator

(c) Motor **(d)** A.C generator

88. For the use of an electric lamp of low voltage on A.C main of high voltage, we use the device called ————.

(a) Resistor **(b)** Rheostat

(c) Transformer **(d)** Solenoid

89. Lenz's law provides a relation between:

(a) Current and magnetic field

(b) Force on a current carrying conductor and magnetic field

(c) Induced emf and the rate of change of magnetic flux

(d) None of these

90. Lenz's law does not violated the principle of:

(a) Conservation of mass **(b)** Conservation of energy

(c) Conservation of charge **(d)** Conservation of momentum

91. A straight line conductor of length 0.4 m is moved with speed of 7m/s perpendicular to the magnetic field 0.9 Wb/m^2. The induced emf across the conductor is:

(a) 1.26 volt **(b)** 25.2 volt

(c) 2.52 volt **(d)** 5.04 volt

92. The direction of the induced emf during electromagnetic induction is determined by:

(a) Lenz's law **(b)** Faraday's law

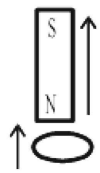
(c) Ampere's law **(d)** None of these

93. The knowledge of electromagnetic induction has been used in construction of:

(a) Galvanometer **(b)** Voltmeter

(c) Electric motor **(d)** A.C generator

94. If the north pole of a magnet moves away from a metallic ring. Then the current flows:



(a) Clockwise **(b)** Anticlockwise

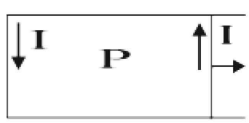
(c) First clockwise and then anticlockwise **(d)** None of above

95. If the number of turn in a coil is increased metallic ring to 3 times than its initial number, then the magnetic flux linked with is:

(a) Becomes one third of its initial value **(b)** Remains unchanged

(c) Becomes nine times of its initial value **(d)** Increased by 3 times

96. The movable wire is moved to the right causing an anticlockwise induced current. The direction of magnetic induction in the region P.



(a) Points to the right **(b)** Points to the left

(c) Points up the paper **(d)** Points down into the paper

97. When the rate of change of current in a coil is unity then the induced emf is equal to:

(a) Number of turns of the coil **(b)** Total flux linked with the coil

(c) Coefficient of self inductance **(d)** None of the above

98. When a current carrying conductor placed in an external magnetic field, experience a force. The device whose working based on this principle is:

(a) Electric bell **(b)** Electric motor

(c) Dynamo **(d)** None of these

99. If the load in the external circuit is greater, the current supplied by the generator is:

(a) Very small **(b)** Very large

(c) No change **(d)** None of these

100. A wire carrying the current placed in a magnetic field experience a force, this is the basic principle of:

(a) Transformer **(b)** D.C generator

(c) A.C generator **(d)** Electric motor

101. An electric motor consists of:

(a) An armature **(b)** A commutator

(c) Magnetic field **(d)** All of above

102. The windings of an electromagnet used in motors are called:

(a) Armature coil **(b)** Primary coil

(c) Secondary coil **(d)** Field coils

103. When a motor rotates, emf is induced. This induced emf is in such a direction that:

(a) Helps the emf running the motor **(b)** Opposes the emf running the motor

(c) Both (a) and (b) **(d)** None of these

104. In case of a motor, if V is the applied emf and ε is the back emf then net emf in the circuit is:

(a) $V - \varepsilon$ **(b)** $V + \varepsilon$

(c) $V \times \varepsilon$ **(d)** $\frac{\varepsilon}{V}$

105. If R is the resistance of the motor coil and I is the current drawn by the motor, then ohm's law gives:

(a) $V = IR - \varepsilon$ **(b)** $V = \varepsilon + IR$

(c) $V = \varepsilon - IR$ **(d)** $V = \frac{IR}{\varepsilon}$

106. When the motor is just started, the back emf is:

(a) Maximum and no current pass through the coil

(b) Minimum and a large current pass through the coil

(c) Zero and large current passes through the coil

(d) All of above

107. The output of a dynamo using a split ring commutator is:

(a) Half wave rectified voltage **(b)** A.C

(c) D.C **(d)** Fluctuating D.C

108. An electric motor:

(a) Generates mechanical energy

(b) Generates electric energy

(c) Converts mechanical energy into electric energy

(d) Converts electrical energy into mechanical energy

109. A dynamo is sometimes said to generate electricity it actually acts as a source of:

(a) Charge **(b)** emf

(c) Energy **(d)** Magnetism

110. A d.c electric motor is based on the interaction of current and magnetic field and the principle employed is the same as in a:

(a) Converter **(b)** Thermo couple

(c) d.c dynamo **(d)** d.c galvanometer

111. A transformer:

(a) Transform voltage **(b)** Transforms energy

(c) Transforms frequency **(d)** Generates emf

112. To step up voltage, the number of turns in the secondary should be:

(a) Less than the number of turns in the primary

(b) Greater than the number of turns in the primary

(c) Equal the number of turns in the primary

(d) Infinite

113. In a step up transformer, voltage in the secondary increases and current.

(a) Decreases **(b)** Increases

(c) Remain unchanged **(d)** None of the above

114. A transformer has no:

(a) Hystresis loss **(b)** Copper loss

(c) Both (a) and (b) **(d)** Mechanical loss

115. A transformer has:

(a) Two coil

(b) Only one coil

(c) Works on the principle of mutual induction

(d) None of these

116. The coil from which the power is delivered to the circuit is called:

(a) Primary coil **(b)** Secondary coil

(c) Field coil **(d)** None of these

117. The coils of a transformer are:

(a) Magnetically linked **(b)** Electrically linked

(c) Both (a) and (b) **(d)** None of these

118. The transformer equation is:

(a) $\frac{v_s}{v_p} = \frac{I_p}{I_s}$ **(b)** $\frac{v_s}{v_p} = \frac{N_s}{N_p}$

(c) $\frac{N_s}{N_p} = \frac{I_p}{I_s}$ **(d)** All of above

119. In an ideal case, the rate of change of flux in the secondary coil of transformer is:

(a) Equal to that of primary **(b)** Equal to that of secondary

(c) Greater than that of primary **(d)** Smaller than that of primary

120. When current I passes through a resistance R, the power loss due to heating effect is:

(a) Calculated by I^2R **(b)** Zero

(c) Maximum **(d)** All of above

121. In order to minimize the power loss during transmission:

(a) Resistance is reduced **(b)** Current is increased

(c) Potential difference is increased **(d)** Current is reduced

122. In a practical transformer, the output is always:

(a) Equal to input **(b)** Less than input

(c) Greater than input **(d)** None of these

123. The main cause of power loss in transformer is:

(a) Hysteresis **(b)** Eddy current

(c) Both (a) and (b) **(d)** None of these

124. Eddy currents are the induced currents which are setup:

(a) In a direction perpendicular to the flux **(b)** Along the flux lines

(c) Out of flux area **(d)** None of these

125. To improve the efficiency of a transformer:

(a) Insulation should be perfect **(b)** Resistance of both should be least

(c) Core should be laminated **(d)** All of above

126. It is possible to transmit A.C power over long distances without much power loss by:

(a) Commutators **(b)** Transformer

(c) D.C motor **(d)** Thermistors

127. The efficiency of a transformer can be calculated by:

(a) $\eta = \frac{P_{out}}{P_{in}} \times 100$ **(b)** $\eta = \frac{P_{in}}{P_{out}} \times 100$

(c) $\eta = \frac{P_{out} \times P_{in}}{100}$ **(d)** $\eta = \frac{100}{P_{out} \times P_i}$

128. The turn ratio of setup transformer is the voltage ratio and current ratio respectively will be:

(a) 25, 50 **(b)** 50, 0.02

(c) 0.02, 50 **(d)** 50 volt, 0.02 A

129. The power loss in transformer takes place due to:

(a) Eddy current **(b)** Hysteresis

(c) Magnetic field **(d)** Both (a) and (b)

130. For an ideal transformer:

(a) Power input = Power output **(b)** Power input is less than power output

(c) Power input is greater than power output **(d)** Power output is greater than power input

131. In step down transformer, the number of turns in:

(a) Primary are more **(b)** Primary are less

(c) Primary and secondary are equal **(d)** None of these

132. A transformer works on:

(a) A.C only **(b)** D.C only

(c) High voltage only **(d)** Both A.C and D.C

133. Which one of the following materials is more suitable for making cores of transformer?

(a) Soft iron **(b)** Copper

(c) Nickel **(d)** Aluminum

134. A coil has an inductance of 0.02 Henry. When a current in the coil is changing at the rate of 150 A/S then the induced emf will be:

(a) 3 volt **(b)** 0.3 volt

(c) 1.5 volt **(d)** 0.2 volt

135. In a step down transformer, the input voltage is 200 V and the output voltage is 5 volts the turn ratio of the transformer is:

(a) 1:20 **(b)** 1:40

(c) 20:1 **(d)** 40:1

136. A 25 watt and 100 watt bulbs are joined in series and connected to the mains. Which bulb will glow brighter?

(a) 100 watt **(b)** 25 watt

(c) First 25 and then 100watt **(d)** None of these

137. A coil of 10 cm × 20 cm having 40 turns in making 18.00 rev/min in a magnetic field 0.5 wb/m^2. The peak value of the induced emf is:

(a) 113 volt **(b)** 226 volt

(c) 339 volt **(d)** 452 volt

138. When the back emf in a current is zero, it draws.

(a) Zero current **(b)** Maximum current

(c) Minimum current **(d)** Steady average current

139. A loop of wire is suspended between poles of a magnet with its plane parallel to pole faces. What happens if A.C. is used?

(a) Coil oscillate **(b)** Coil rotate

(c) Coil remain at rest **(d)** Both (a), (b)

140. Motional e.m.f. in the stationary rod is:

(a) VBL sin θ **(b)** −VBL sin θ

(c) Both (a), (b) **(d)** Zero

141. 1 Henry =

(a) VSA^{-1} **(b)** $VS^{-1}A^{-1}$

(c) $V^{-1}SA$ **(d)** VSA^{-2}

142. When motor just started, back e.m.f. is almost:

(a) Maximum **(b)** Minimum

(c) Zero **(d)** None of these

143. For ideal transformer, V_s is ———— proportional to I_s.

(a) Directly **(b)** Inversely

(c) Both (a), (b) **(d)** None of these

144. Lenz's law is in accordance with law of conservation of:

(a) Mass **(b)** Momentum

(c) Charge **(d)** Energy

145. The phenomenon in which changing current in one coil induces an e.m.f. in another coil is called:

(a) Mutual inductance **(b)** Self induction

(c) Mutual induction **(d)** All of these

146. A dynamo converts:

(a) Electrical energy into mechanical energy **(b)** Mechanical energy into electrical energy

(c) Magnetic energy into electrical energy **(d)** None of these

147. Unit of energy density is:

(a) $\frac{T^2}{wbm^{-1}A^{-1}}$ **(b)** $\frac{J}{m^3}$

(c) Both (a), (b) **(d)** $\frac{kg}{m^3}$

148. In a D.C. motor ———— rings are used.

(a) Slip **(b)** Split

(c) Both (a), (b) **(d)** None of these

149. $\frac{V_s}{V_p} = \frac{N_s}{N_p}$. This relation is true only when ———— of transformer.

(a) Input is open **(b)** Output is open

(c) Both input and output are closed **(d)** Both input and output are open

150. If $\frac{N_s}{N_p} = 50$, $I_p = 20$ A, $V_p = 220$ V, $V_s = ?$

(a) 1100 V **(b)** 11000 V

(c) 500 V **(d)** 1000 V

ANSWERS

1.	(d)	**2.**	(d)	**3.**	(a)	**4.**	(d)	**5.**	(a)
6.	(a)	**7.**	(b)	**8.**	(c)	**9.**	(a)	**10.**	(b)
11.	(d)	**12.**	(a)	**13.**	(a)	**14.**	(d)	**15.**	(d)
16.	(b)	**17.**	(a)	**18.**	(a)	**19.**	(b)	**20.**	(c)
21.	(a)	**22.**	(b)	**23.**	(b)	**24.**	(a)	**25.**	(b)
26.	(c)	**27.**	(a)	**28.**	(c)	**29.**	(a)	**30.**	(c)
31.	(a)	**32.**	(c)	**33.**	(a)	**34.**	(a)	**35.**	(b)
36.	(c)	**37.**	(a)	**38.**	(c)	**39.**	(d)	**40.**	(a)
41.	(b)	**42.**	(a)	**43.**	(c)	**44.**	(d)	**45.**	(a)
46.	(a)	**47.**	(b)	**48.**	(a)	**49.**	(d)	**50.**	(b)
51.	(d)	**52.**	(b)	**53.**	(a)	**54.**	(c)	**55.**	(c)
56.	(c)	**57.**	(c)	**58.**	(c)	**59.**	(d)	**60.**	(b)
61.	(a)	**62.**	(a)	**63.**	(b)	**64.**	(b)	**65.**	(b)
66.	(d)	**67.**	(c)	**68.**	(c)	**69.**	(a)	**70.**	(a)
71.	(a)	**72.**	(b)	**73.**	(c)	**74.**	(c)	**75.**	(a)
76.	(c)	**77.**	(d)	**78.**	(c)	**79.**	(d)	**80.**	(c)
81.	(a)	**82.**	(b)	**83.**	(b)	**84.**	(a)	**85.**	(b)
86.	(c)	**87.**	(c)	**88.**	(c)	**89.**	(a)	**90.**	(b)
91.	(c)	**92.**	(a)	**93.**	(d)	**94.**	(a)	**95.**	(d)
96.	(d)	**97.**	(c)	**98.**	(b)	**99.**	(a)	**100.**	(d)
101.	(d)	**102.**	(d)	**103.**	(b)	**104.**	(a)	**105.**	(b)
106.	(c)	**107.**	(d)	**108.**	(d)	**109.**	(b)	**110.**	(d)
111.	(a)	**112.**	(b)	**113.**	(a)	**114.**	(d)	**115.**	(c)
116.	(b)	**117.**	(a)	**118.**	(d)	**119.**	(b)	**120.**	(a)
121.	(d)	**122.**	(b)	**123.**	(c)	**124.**	(a)	**125.**	(d)
126.	(b)	**127.**	(a)	**128.**	(b)	**129.**	(d)	**130.**	(a)
131.	(a)	**132.**	(a)	**133.**	(c)	**134.**	(a)	**135.**	(d)
136.	(b)	**137.**	(a)	**138.**	(d)	**139.**	(c)	**140.**	(d)
141.	(a)	**142.**	(c)	**143.**	(b)	**144.**	(d)	**145.**	(c)
146.	(b)	**147.**	(c)	**148.**	(b)	**149.**	(b)	**150.**	(b)