1. The induced current is produced in a circuit due to

(a) a source of emf
(b) a magnetic flux
(c) a changing magnetic flux
(d) an electric field

2. Rate of change of magnetic flux linking a circuit is directly proportional to

(a) the magnetic field
(b) changing electric field
(b) induced emf
(d) induced current

3. The induced emf produced in a circuit lasts

(a) as long as the magnetic flux keep on changing
(b) indefinitely
(c) even after the magnetic flux stops changing
(d) none of the these

4. The current induced in a coil depends upon

(a) the resistance of the coil
(b) the strength of magnetic field
(c) the area of the coil
(d) all of these

5. Which of the following will produce an induced emf?

(a) By changing the magnetic flux..
(b) By changing the area of the coil in the magnetic field.
(c) By changing the orientation of the coil with respect to the magnetic field.
(d) All of these.

6. When a magnet was pushed towards a solenoid, the sensitive meter connected to the solenoid deflected to the right. When the same magnet was pulled away from the solenoid with the same speed, what was the deflection on the meter?

(a) The same and to the right
(b) Greater and to the right
(c) Zero
(d) The same but to the left

7. A bar magnet with its N-pole facing a circular vertical loop is moved towards the coil. The current induced in the coil flows in

(a) clockwise direction
(b) first anticlockwise and then clockwise direction
(c) anticlockwise direction
(d) first clockwise and then anticlockwise direction

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

(a) no current is produced
(b) current is produced in it
(c) magnet will attract the loop
(d) magnet will repel the loop

9. The current produced due to phenomena of electromagnetic induction is called

(a) positive current (b) negative current
(c) conventional current (d) induced current

10. Identify the phenomena by which an induced emf could be generated:

(a) By moving a conductor across a magnetic field
(b) By rotating a coil in a magnetic field
(c) By moving a magnet across a stationary coil
(d) All of above

11. The induced current can be increased by

(a) increasing the number of turns of coil
(b) by moving the coil faster through the field
(c) by increasing the strength of field
(d) all of the above

12. A rod of unit length is moving at 30° through a 0.5T magnetic field. If velocity of rod is 1 ms^{-1} then the emf induced in the rod will be

(a) 0.25V (b) 0.5V
(c) 1V (d) 0.1V

13. A straight conductor is moved across a magnetic field. The emf induced in the conductor is because of the

(a) rate of change of magnetic flux
(b) rate of cutting of magnetic flux
(c) Lenz's law
(d) motion of the conductor

14. The motional emf developed in a conductor depends upon

(a) its length (b) its velocity
(c) magnetic field (d) all of these

15. An emf of 0.003 V is induced in a wire when it moves at right angle to a uniform magnetic field with a speed of $4ms^{-1}$. If the length of the wire in the field is 15 cm, the magnetic flux density in Wbm^{-2} is

(a) 0.003 (b)0.005
(c) 6 (d) 12

16. A closed circular loop of wire of area 7.8×10^{-3} m^2 is placed so that its plane is at 30° to a uniform magnetic field changing at 0.01 Ts^{-1}.The emf, in V, induced in the loop is

(a)3.9×10^{-5} (b) 6.8×10^{-2}
(c) 7.8×10^{-5} (d) 1.6×10^{-3}

17. Lenz's law

(a) is a consequence of the law of conservation of charge
(b) is a consequence of the law of conservation of energy
(c) relates induced current with induced emf
(d) relates induced emf with the magnetic field

18. The magnitude of the motional emf induced in a conducting bar of length *L* moving through a magnetic field *B* with velocity *v* is

(a) $E = BvL$ (b) $E = BvL \sin\theta$
(c) $E = vBL \cos\theta$ (d) $E = vB/L$

19. The mutual inductance between a primary and secondary is the ratio of

(a) the emf induced in secondary to the emf applied in primary
(b) current induced in secondary to the current applied in primary
(c) emf induced in secondary to the rate of change of current in primary
(d) the magnetic flux in primary to the magnetic flux in secondary

20. Mutual induction between two coils depends upon

(a) their size and shape
(b) the separation between the two coils
(c) the orientation of the two coils
(d) all of these

21. For two coils, with all other conditions remaining the same, the mutual induction will be

(a) maximum when the entire magnetic flux of primary is linked with the secondary
(b) maximum when the two coils are perpendicular to each other
(c) decreased by a factor μ, if the coils are wound over a material of permeability μ
(d) independent of the size of secondary

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

(a) mutual induction (b) mutual inductance
(c) self induction (d) self inductance

23. Henry is the unit of

(a) magnetic flux
(b) induced emf
(c) mutual inductance
(d) both self inductance and mutual inductance

24. The self inductance of a long solenoid with n turns per unit length is

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

(c) $L = \mu_o n^2 A l$ (d) $L = \frac{\mu_o n^2 l}{A}$

25. A choke coil

(a) works on the principle of mutual induction
(b) works on the principle of self induction
(c) increases current in A.C.
(d) increases voltage in A.C.

26. A steady current of 1A in a coil of 1000 turns generates a flux of 10^{-4} Wb to pass through the loop of the coil. The energy stored in the inductor is

(a) 5 J (b) 0.05 J
(c) 0.5 J (d) 50 J

27. The energy density inside a solenoid is

(a) $\mu_m = B/2\mu_o$ (b) $\mu_m = B^2/\mu_o$

(c) $\mu_m = 2B^2 / \mu_o$ (d) $\mu_m = B^2/2\mu_o$

28. The emf produced by a generator operating at constant speed depends mainly on

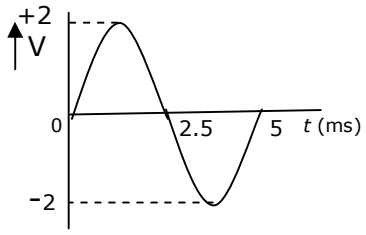
(a) the thickness of the wire of the armature
(b) the thickness of the wire on the field magnet
(c) the strength of the magnetic field
(d) the length of the time the generator operates

29. Which of the followings converts mechanical energy into electrical energy?

(a) Electric motor (b) Transformer
(c) Electric generator (d) None of these

30. The diagram shows how the emf of a simple generator varies with time. What is the frequency and the maximum value of the emf?

	Frequency	Maximum emf
(a)	200 Hz	2.0 V
(b)	200 Hz	4.0 V
(c)	400 Hz	2.0 V
(d)	400 Hz	4.0 V



31. A transformer is a device which

(a) only steps down ac voltage
(b) only steps up ac voltage
(c) steps up or steps down ac voltage
(d) steps up ac power

32. A.C. is preferred to D.C for transmission of electricity because

(a) most domestic appliances work on a.c.
(b) higher voltages can be used with a.c.
(c) wires having a.c. have no magnetic field around them
(d) the use of transformer enables power losses to be reduced

33. The working principle of transformer is

(a) self induction (b) Ampere's law
(c) mutual induction (d) Ohm's law

34. A transformer consists of 500 turns in primary and 200 turns in secondary. When a battery of emf 9V is connected at the primary, the voltage obtained at the secondary is

(a) 3.6 V (b) 22.5 V

(c) 9V (d) zero

35. A step up transformer changes 220 V to 4400 V at 2A current. The primary of the transformer has 100 turns. The current in primary and the number of turns in secondary are respectively

(a) 0.1 A and 5 turns (b) 40 A and 5 turns
(c) 0.1 A and 2000 turns (d) 40 A and 2000 turns

36. What is the purpose of a step down transformer?

(a) It makes the output current lower than the input current
(b) It makes the output voltage lower than the input voltage
(c) It makes the output voltage higher than the input voltage
(d) It makes the output voltage equal to the input voltage

37. Why is electrical energy transmitted at high voltage?

(a) The current in the transmission cable can be made as large as possible
(b) Little energy is wasted in the transmission cables
(c) The transmission cables are safe to handle
(d)The transmission system does not require transformers

38. The percentage efficiency of a transformer is given by

(a) $E = \frac{V_P}{V_S} \times 100\%$ (b) $E = \frac{V_S}{V_P} \times 100\%$

(c) $E = \frac{I_P}{I_S} \times 100\%$ (d). $E = \frac{P_S}{P_P} \times 100\%$

39. The maximum value of EMF of an AC generator is given by

(a) $\varepsilon_o = \frac{B\omega N}{A}$ (b) $\varepsilon_o = \frac{B\omega}{AN}$

(c) $\varepsilon_o = \frac{BN}{\omega A}$ (d) $\varepsilon_o = B\omega NA$

40. Motor action always tends to rotate the coil in

(a) stronger part of the magnetic field
(b) perpendicular to the magnetic field
(c) weaker part of the magnetic field
(d) parallel to the magnetic field

Key to Test Chapter 15

1	**c**	21	**a**
2	**b**	22	**c**
3	**a**	23	**d**
4	**d**	24	**c**
5	**a**	25	**b**
6	**d**	26	**b**
7	**a**	27	**d**
8	**b**	28	**c**
9	**d**	29	**c**
10	**d**	30	**a**
11	**d**	31	**c**
12	**a**	32	**d**
13	**b**	33	**c**
14	**d**	34	**d**
15	**b**	35	**d**
16	**a**	36	**b**
17	**b**	37	**b**
18	**b**	38	**d**
19	**c**	39	**d**
20	**d**	40	**c**