

DAV PUBLIC SCHOOL, HUDCO, BHILAI

CLASS XII PHYSICS

Q1. Two identical metal balls with charges $4Q$ and $-Q$ are separated by some distance, and exert a force F on each other. The balls are mutually touched and now placed at a distance one fourth of the initial distance. The new force between the balls is

- (A) $9F$ (B) F (C) $F/3$ (D) $F/4$

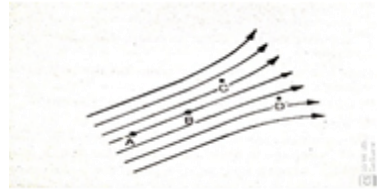
Q2. The ratio of the forces between two small spheres with constant charges in air to in a medium of dielectric constant K is respectively.

- (A) $1:K$ (B) $K^2:1$ (C) $1:K^2$ (D) $K:1$

Q3. Electric charges $q, q, -2q$ are placed at the corners of an equilateral triangle ABC of side L . The magnitude of the electric dipole moment of the system is

- (A) qL (B) $2qL$ (C) $\sqrt{3}qL$ (D) $4qL$

Q4. The diagrammatic representation of electric field has been done in terms of field lines. E_A, E_B, E_C and E_D are magnitude of electric field at A, B, C and D respectively. The distance $AB=BC=CD=r$, then



- (A) $E_A=E_B=E_C=E_D$ (B) $E_A=E_B \neq 0$ and $E_C=E_D=0$ (C) $E_A > E_B > E_C > E_D$ (D) $E_A=E_B > E_C > E_D$

Q5. A +ve charge moves on an equatorial surface of an electric dipole from a point A to point B . Then

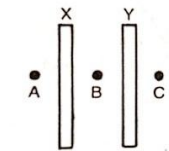
- (A) $V_A=V_B=0$ (B) $V_A-V_B=+ve$ (C) $V_A, V_B=-ve$ (D) charge can not move

Q6. E and V represents electric field and electric potential at any point

- (A) if $E=0$ then V must be zero (B) if $V=0$ then E must be zero (C) if $E=0$ then V will be either zero or constant (D) none of the above statement is zero

Q7. Two large parallel conducting plates X and Y are placed close to each other. The area of each face is A . X is given a charge q while Y is uncharged. The point A, B and C are shown in fig.

- (A) The fields at A, B and C are of the same magnitude (B) The fields at A and C are of the same magnitude but opposite in direction (C) The field at B is $q/2\epsilon_0 A$ (D) The field at B is $q/\epsilon_0 A$



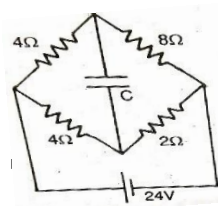
Q8. With usual notations, the electric field inside the current carrying conductor is

- (A) $E=0$ (B) $E=\rho J$ (C) $E=6J$ (D) $E=dv/dr$

Q9. A wire is stretched 50%. The percentage change in its resistance is

- (A) 50% (B) 100% (C) 125% (D) 150%

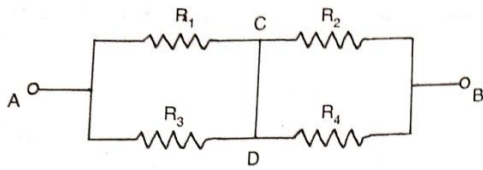
Q10. In the steady state condition the potential difference across the capacitance is



- (C) 16 volt (D) 24 volt

age $V=25v$ is maintained between points A and B of the circuit shown. If

$R_3=3ohm$ and $R_4=4ohm$. The magnitude and direction of current through CD is



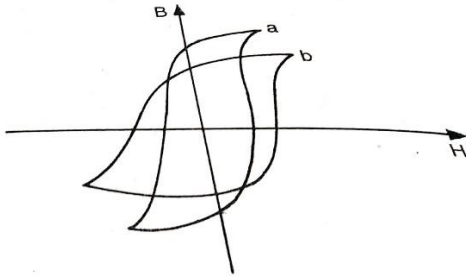
- (A) 1A from C to D (B) 2A from C to D (C) 1A from D to C (D) 2A from D to C

Q12. Two identical heater wires of equal length are 1st connected in series and then in parallel. The ratio of heat produced in the two cases is

- (A) 2:1 (B) 1:2 (C) 4:1 (D) 1:4

Q13. A wire of length L meter carrying a current IA is bent in the form of a circle. The magnitude of its magnetic moment is

- (A) M=0 (B) M=∞ (C) M=iL/4π (D) M=iL²/4π



Q14. The B-H curve (a) and (b) in figure associated with

- (A) a diamagnetic and paramagnetic substance respectively (B) a paramagnetic and a ferromagnetic substance respectively (C) soft iron and steel respectively (D) steel and soft iron respectively

Q15. A coil has an inductance of 0.7H and is joined in series with a resistance of 220ohm. When an alternating emf of 220V at 50c.p.s is applied to it, then the wattless component of the current in the circuit is

- (A) 5amp (B) 0.5amp (C) 0.7amp (D) zero

Q16. In a loss less transformer, an alternating current of 2A is flowing in the primary coil. The number of turns in the primary and secondary coils are 100 and 20 respectively. The value of current in the secondary coil is

- (A) 0.08A (B) 0.4A (C) 5A (D) 10A

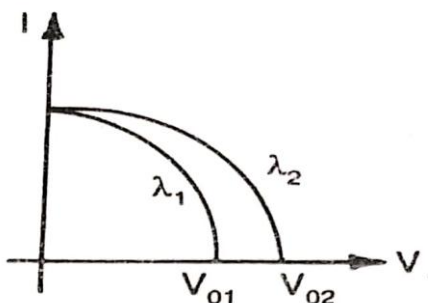
Q17. From Brewster's law for polarisation, it follows that the angle of polarisation depends upon

- (A) the wave length of light (B) plane of polarisation's orientation (C) plane of vibration's orientation (D) none of the above

Q18. A concave and convex lens have the same focal length of 20cm and are put in contact to form a lens combination. The combination is used to view an object of 5cm length kept at 20cm from the lens combination. As compared to the object the image will be

- (A) magnified and inverted (B) reduced and erect (C) of the same size as the object and would be erect (D) of the same size as the object and would be inverted

Q19. For two different wavelengths of incident radiation on a metal, the graph between photoelectric current and stopping potential are shown. Then



(A) $\lambda_1 > \lambda_2$ (B) $\lambda_1 = \lambda_2$ (C) $\lambda_1 < \lambda_2$ (D)None of the above

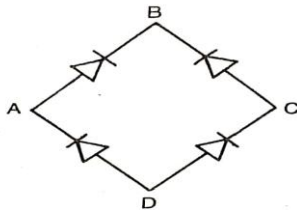
Q20. The maximum frequency of light that will cause the emission of photoelectrons from the surface of a metal (for which work function is 1.65 eV) will be

(A) 4×10^{10} Hz (B) 4×10^{11} Hz (C) 4×10^{14} Hz (D) 4×10^{10} Hz

Q21. The counting rate observed from a radioactive source at $t=0$ second was 1600 counts per second and at $t=8$ seconds it was 100 counts per second. The counting rate observed, as counts per second at $t=6$ seconds, will be

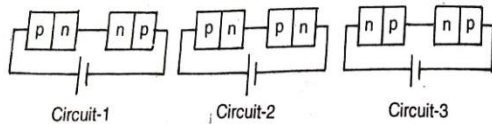
(A)150 (B)200 (C)300 (D)400

Q21. In the circuit, the input is across the terminals A and C, output is across B and D. The output is



(A)Zero (B)half wave rectifier (C)full wave rectifier (D)same as the input

Q22. Two identical p-n junction may be connected in series with a battery in three ways. Potential drop across the two p-n junctions are equal in



(A)circuit 1 and 2 (B) circuit 2 and 3 (C)circuit 1 and 3 (D)circuit 1 only

Q23. Ohms law expressed as $E=IR$

(A)May never be applied to AC circuit (B)applicable to AC in the same manner (C)always applied to AC as to DC circuits when z is substituted for R (D)tells us that $E(\text{effective})=0.707E(\text{max})$

Q24. Four lenses with focal lengths ± 15 cm and ± 150 cm are being considered for use as a telescopic objective. The focal length of the lens which produces the largest magnification with a given eyepiece is

(A)-15 cm (B)+150 cm (C)-150 cm (D)+15 cm

Q25. An equiconvex lens of refractive index 1.5 has a focal length of 10 cm in air. The focal length of this lens in a liquid of refractive index 1.25 will be

(A)20 cm (B)25 cm (C)30 cm (D)50 cm

Q26. Biasing of the p-n junction offers high resistance to current flow across the junction. This biasing is obtained by connecting the p side to the terminal of the battery.

Q27 The half of a radioactive isotope is 3 days. The fraction of the specimen left over after a period of 27 days will be percent of the original

Q28. In the Bohr model of the hydrogen atom, the ratio of kinetic energy to the total energy of the electron in a quantum state n is

Q29. The ratio of the wavelengths of the longest wavelength lines in the Lyman and Balmer series of hydrogen spectrum is

Q30. The magnifying power of a telescope is increased by using an objective of a focal length and eyepiece of a focal length.

Q31. The plates of a parallel plate capacitor have a charge of 8.85×10^{-5} C and area 10 m^2 . They will attract each other with a force

Q32. If an ammeter is connected in parallel, or a voltmeter is connected in series, Is (are) likely to be damaged.

Q33. The range of voltmeter is 5 V and its resistance is 5000 ohm (4900 ohm connected in series with a coil of 100 ohm resistance). To double its range, addition resistance of Ohm should be connected in series with it.

Q34. An electric bulb rated for 500 W at 100 V is used in a circuit having a 200 V supply. The resistance R that one must put in series with the bulb so that the bulb delivers 500 W is ohm.

Q35. Laminating cores are used in the transformers to

- Q36. A circular coil consisting of an single turn of wire carrying an electric current produces an magnetic field B at the centre of the coil. The coil is unwound and then rewound into a circular coil with two turns. The same current flows through the coil as before. The magnetic field at the centre of the coil is.....times B.
- Q37. A beam of light travels in glass and then in air. The wavelength of light in.....is greater than that in ...
- Q38. Two light sources are coherent if they emit light of the same and zero or constant.....
- Q39. A light wave of frequency 5×10^4 Hz enters a medium of refractive index 1.5 .in this medium the speed of the light wave iscm/sec and its wave length is A° .
- Q40. As the radius of the orbit in Bohrs atom increases, The potential energy of the electron.....

DAV PS Gevera
CLASS 12th PHYSICS
QUESTION BANK

1. An electron and a proton are released in the uniform electric field, will they experience same force and have same acceleration?
2. X and Y are two conducting spheres of same diameter ,X being solid and Y being hollow. Both are charge to the same potential. What will be the relation between the charges on the two sphere?
3. Why should electrostatic field be zero inside a conductor ?
4. The instantaneous current from an alternating current source $i = 10 \sin 314 t$. what is the root mean square value of the current ?
5. An electron moving with a velocity of 10^7 m/s enter a uniform magnetic field of 2 T along a direction parallel to the field. what would be its trajectory in this field?
6. A 60u capacitor is connected to a 110V ,60Hz ac supply. Determine the RMS value of the current in the circuit?
7. What happens to the width of depletion layer of a p-n junction when it is (i) forward biased, (ii) reverse biased ?
8. State law of Malus.
9. Write the relationship between angle of incidence I, angle of prism A and angle of minimum deviation for a triangular prism.
10. Drift velocity V_d varies with the intensity of electric field as per the relation:

(a) V_d directly proportional to E	(b) V_d inversely proportional to E
(c) $V_d = \text{constant}$	(d) v directly proportional to E^2
11. Which of the following rays are not electromagnetic waves ?

(a) B rays	(b) Heat rays
(c) X-rays	(d) Y-rays
12. The frequency of the light wave in a material is 2×10^{14} Hz and wave length is 5,000A. The refractive index of material will be
 - (a) 1.40
 - (b) 1.50
 - (c) 3.00
 - (d) 1.33
13. The velocity of all radio waves in free space is 3×10^8 M/S. The frequency of a radio wave of wave length 150m is
 - (a) 120kHz
 - (b) 2kHz
 - (c) 2MHz

(d) 1MHz

14. Infrared spectrum lies between

(a) radio wave and microwave region

(b) micro wave and visible region

(c) visible and ultra-violet region

(d) Ultra-violet and X-rays

15. Heat radiations propagate with the speed of

(a) alpha rays

(b) microwaves

(c) light waves

(d) sound waves

16. Which rays are not the portion of electro-magnetic spectrum ?

(a) X rays

(b) microwaves

(c) alpha rays

(d) radiowaves

17. Two wires of same dimension but resistivities P_1 and P_2 are connected in series. The equivalent resistivity of the combination is

(a) $P_1 + P_2$ (b) $1/2(P_1 + P_2)$

(c) $\sqrt{P_1 P_2}$ (d) $2(P_1 + P_2)$

18. The emission of an alpha particle by a radio active nucleus reduces the mass number by _____.

19. For light of intensity I_0 of unpolarised light incident on a polariser; the intensity of the transmitted unpolarised light is _____.

20. For an EM wave propagating in a medium, the electric energy density _____ magnetic energy density.

21. The electric field intensity at every point is _____ to an equipotential surface.

22. The electrostatic potential energy of a charge q placed at a point in an electric field with potential $V(r)$ is _____.

23. Two nuclei have their mass no. in the ratio 8:27. What is the ratio of the densities of the nuclei?

24. Draw the pattern of electric field lines, when a point charge $-Q$ is kept near an uncharged conducting plate?

25. How does the mobility of electrons in a conductor change, if the potential difference applied across the conductor is doubled, keeping the length and temperature of the conductor constant?

26. Define the term "threshold frequency", in the context of photoelectric emission.

27. Define the term "intensity" in photon picture of electro, magnetic radiation.

28. What is the speed of light in a denser medium of polarising angle 60° ?

29. Define the term magnetic dipole moment. Give its SI unit.

30. Name the elements or parameters of earth's magnetic field.

31. Define magnetic permeability. State its SI unit.

32. Define magnetic susceptibility.

33. What is a diamagnetic substance?

34. What is a paramagnetic substance?

35. What is a ferromagnetic substance?

36. What is the basic use of a hysteresis curve?

37. Name two magnetic materials commonly used for making permanent magnets?

38. State Faraday's law of electromagnetic induction?

39. State the law that gives the polarity of the induced EMF.

40. Define the unit of self-inductance.

41. What is meant by mutual induction?

42. When current in a coil changes with time, how is the back EMF induced in the coil related to it?

43. Name any two useful application of eddy currents .
44. The whole apparatus of young`s double slit experiment is immersed in liquid of refractive index 1.5 what will be the changed fringe width if that in air is 0.3 mm.
45. the junction of a solar cell is made extra thin .why?

D.A. V. PUBLIC SCHOOL ACC JAMUL
MCQs/ VSA QUESTIONS

CLASS XII

PHYSICS

1. A circular coil expands radially in a region of magnetic field and no electromotive force is produced in the coil. This can be because
- (a) the magnetic field is constant.
 - (b) the magnetic field is in the same plane as the circular coil and it may or may not vary
 - (c) the magnetic field has a perpendicular (to the plane of the coil) component whose magnitude is decreasing suitably
 - (d) there is a constant magnetic field in the perpendicular to the Plane
2. Dimensions of rate of change of flux are equivalent to those of
- A. voltage
 - B. current
 - C. 1/charge
 - D. charge of the coil direction.
3. In a coil of self-induction 5 H, the rate of change of current is 2 A/s. Then emf induced in the coil is
- (a) 10 V
 - (b) -10 V
 - (c) 5 V
 - (d) -5 V
- 4.. Lenz's law is a consequence of the law of conservation of
- (a) charge
 - (b) energy
 - (c) induced emf
 - (d) induced current
5. The material suitable for making electromagnets should have
- (a) high retentivity and high.
 - (b) low retentivity and low coercivity.
 - (c) high retentivity and low coercivity.
 - (d) low retentivity and high coercivity.
6. The magnetic susceptibility of an ideal diamagnetic substance is
- (a) +1
 - (b) 0

- (c) -1
- (d) ∞

7. An object is placed at a distance of 0.5 m in front of a plane mirror. The distance between object and image will be

- (a) 0.25 m
- (b) 0.5 m
- (c) 1.0 m
- (d) 2.0 m

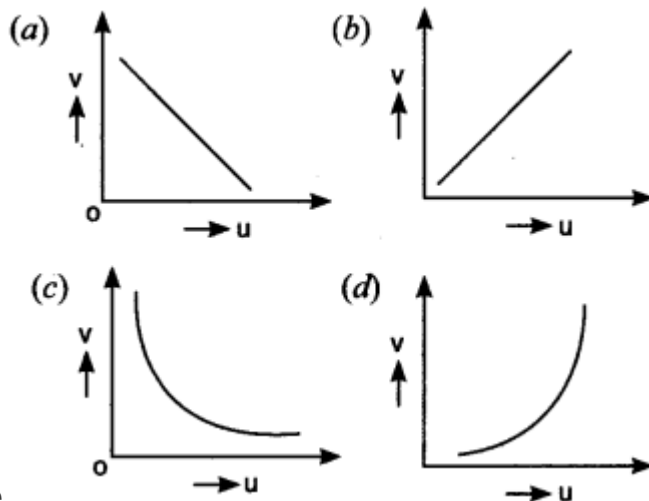
8. In an a.c. generator, a coil with N turns, all of the same area A and total resistance R , rotates with frequency ω in a magnetic field B the maximum value of emf generated in the coil is

- (a) $NABR$
- (b) $NAB\omega$
- (c) $NABR\omega$
- (d) NAB

9. We combine two lenses, one is convex and other is concave having focal lengths f_1 , and f_2 and their combined focal length is F . Combination of the lenses will behave like concave lens, if

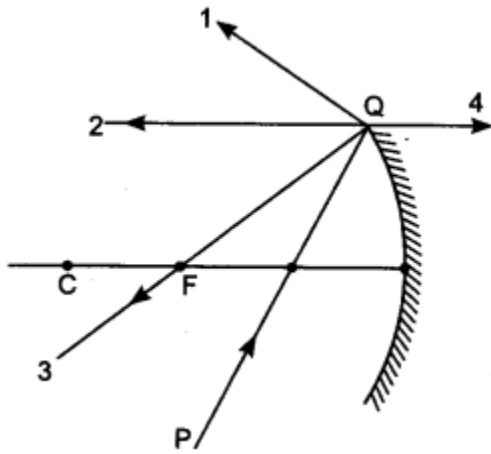
- (a) $f_1 > f_2$
- (b) $f_1 = f_2$
- (c) $f_1 < f_2$.
- (d) $f_1 \leq f_2$

10. In an experiment to find focal length of a concave mirror, a graph is draw between the magnitude of u and v . The graph looks



like

11. The direction of ray of light incident on a concave mirror is shown by PQ while directions in which the ray would travel after reflection is shown by four rays marked 1, 2, 3 and 4. Which of the four rays correctly shows the direction of reflected ray?



- (a) 1
- (b) 2
- (c) 3
- (d) 4

12. Light of frequency 1.9 times the threshold frequency is incident on a photosensitive material. If the frequency is halved and intensity is doubled, the photocurrent becomes--

- (a) quadrupled
- (b) doubled
- (c) halved
- (d) zero

13. Which of the following are not electromagnetic waves?

- (a) Cosmic rays
- (b) γ -rays
- (c) β -rays
- (d) X-rays

14. Electromagnetic waves possess both _____ and _____

15. Name the part of electromagnetic spectrum whose wavelength lies in the range of 10^{-10} m.

16. Angular momentum and energy of an electron in an atom is _____

17. The quantity which is not conserved in a nuclear reaction is

- (a) momentum.
- (b) charge.

(c) mass.

(d) none of these.

18. Two nuclei have mass numbers in the ratio 2:5. What is the ratio of their nuclear densities?

19.. The best material for the core of a transformer is

(a) stainless steel

(b) mild steel

(c) hard steel

(d) soft iron

20. What is path difference for destructive interference?

(a) $n\lambda$

(b) $n(\lambda + 1)$

(c) $(2n + 1)\lambda/2$

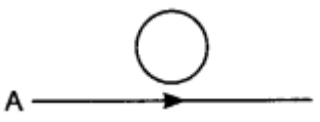
(d) $(n + 1)\lambda/2$

21. What type of wavefront will emerge from a

(i) point source, and

(ii) distant light source?

22. The current flows from A to B is as shown in the figure. The direction of the

induced current  in the loop is

a) clockwise.

(b) anticlockwise.

(c) straight line.

(d) no induced e.m.f. produced.

23. The magnetic flux linked with a coil of N turns of area of cross section A held with its plane parallel to the field B is

(a) $\frac{NAB}{2}$ (b) NAB (c) $\frac{NAB}{4}$ (d) zero

24. A solenoid is connected to a battery so that a steady current flows through it. If an iron core is inserted into the solenoid, the current will

(a) increase

(b) decrease

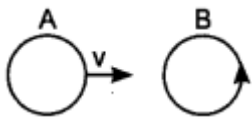
(c) remain same

(d) first increase then decrease

25. Which of the following statements is not correct?

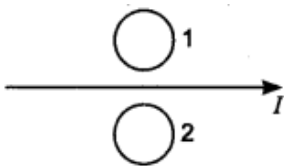
- (a) Whenever the amount of magnetic flux linked with a circuit changes, an emf is induced in circuit.
- (b) The induced emf lasts so long as the change in magnetic flux continues.
- (c) The direction of induced emf is given by Lenz's law.
- (d) Lenz's law is a consequence of the law of conservation of momentum.

26. There are two coils A and B as shown in Figure. A current starts flowing in B as shown, when A is moved towards B and stops when A stops moving. The current in A is counterclockwise. B is kept stationary when A moves. We can infer that

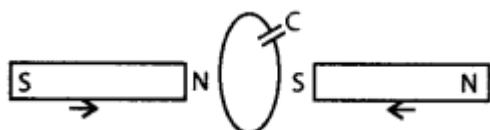


- (a) there is a constant current in the clockwise direction in A.
- (b) there is a varying current in A.
- (c) there is no current in A.
- (d) there is a constant current in the counterclockwise direction in A.

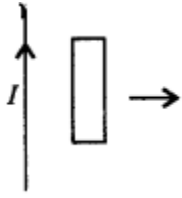
27. What is the direction of induced currents in metal rings 1 and 2 when current I in the wire is increasing steadily?



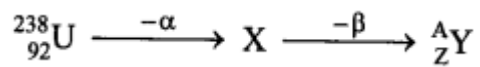
28. Two bar magnets are quickly moved towards a metallic loop connected across a capacitor C as shown in the figure. Predict the polarity of the capacitor.



29. A rectangular loop of wire is placed right, away from the long straight wire through which a steady current I flows upwards. What is the direction of induced current in the loop?



30. In the disintegration series



the values of Z and A respectively will be

- (a) 92, 236
- (b) 88, 230
- (c) 90, 234
- (d) 91, 234

31. In the nuclear reaction-- ${}_{6}^{11}\text{C} \longrightarrow {}_{5}^{11}\text{B} + \beta^{+} + \text{X}$ What does X stand for?

- (a) Electron
- (b) Proton
- (c) Neutron
- (d) Neutrino

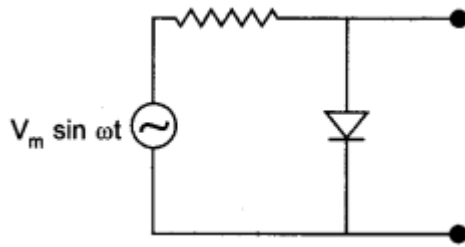
32. Average binding energy is maximum for

- (a) C^{12}
- (b) Fe^{56}
- (c) U^{235}
- (d) Po^{210}

33. Two nuclei have mass numbers in the ratio 27 : 125. What is the ratio of their nuclear radii?

34. What is the effect of temperature on radioactivity?

35. The output of the given circuit in figure is given below.



- (a) would be zero at all times.
- (b) would be like a half-wave rectifier with positive cycles in output.
- (c) would be like a half-wave rectifier with negative cycles in output.
- (d) would be like that of a full-wave rectifier.

36. In an insulator, the forbidden energy gap between the valence band and the conduction band is of the order of _____ .

37. If a small amount of antimony is added to germanium crystal
- (a) its resistance is increased
 - (b) it becomes a p-type semiconductor
 - (c) there will be more free electrons than holes in the semiconductor,
 - (d) none of these.

38. Silicon is a semiconductor. If a small amount of As is added to it, then its electrical conductivity _____ .

39. Which of the following has maximum penetrating power?

- (a) Ultraviolet radiation
- (b) Microwaves
- (c) γ -rays
- (d) Radio waves

40. In electromagnetic waves the phase difference between electric and magnetic field vectors are

- (a) zero
- (b) $\pi/4$
- (c) $\pi/2$
- (d) π

41. Which of the following are not electromagnetic waves?

- (a) Cosmic rays
- (b) γ -rays
- (c) β -rays
- (d) X-rays

42. Which radiations are used in treatment of muscle ache?

- (a) Infrared
- (b) Ultraviolet
- (c) Microwave
- (d) X-rays

43. Electromagnetic waves with wavelength λ are used by a FM radio station for broadcasting. Here λ belongs to

- (a) radio waves
- (b) VHF radio waves
- (c) UHF radio waves
- (d) microwaves

44. Which of the following statement is false for the properties of electromagnetic waves?

- (a) Both electric and magnetic field vectors attain the maxima and minima at the same place and same time.
- (b) The energy in electromagnetic waves is divided equally between electric and magnetic field vectors.
- (c) Both electric and magnetic field vectors are parallel to each other and perpendicular to the direction of propagation of wave.
- (d) These waves do not require any material medium for propagation.

45. Electromagnetic waves used in RADAR are _____ .

46. Name the part of electromagnetic spectrum whose wavelength lies in the range of 10^{-10} m. Give its one use.

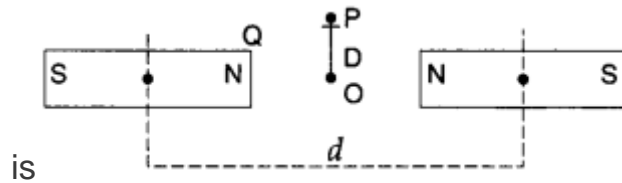
47. Name em radiations used for detecting fake currency notes.

48. Do electromagnetic waves carry energy and momentum?

49. A magnet of dipole moment M is aligned in equilibrium position in a magnetic field of intensity B . The work done to rotate it through an angle θ with the magnetic field is

- (a) $MB \sin \theta$
- (b) $MB \cos \theta$
- (c) $MB (1 - \cos \theta)$
- (d) $MB(1 - \sin \theta)$

50. Two identical bar magnets are fixed with their centres at a distance d apart. A stationary charge Q is placed at P in between the gap of the two magnets at a distance D from the centre O as shown in the figure. The force on the charge Q



is

- (a) zero
- (b) directed along OP
- (c) directed along PO
- (d) directed perpendicular to the plane of paper

21. A magnetic needle suspended parallel to a magnetic field requires $\frac{1}{3}$ J of work to turn it through 60° . The torque needed to maintain the needle in this position will be

23. The best material for the core of a transformer is

- (a) stainless steel
- (b) mild steel
- (c) hard steel
- (d) soft iron

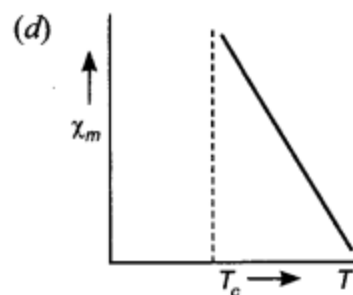
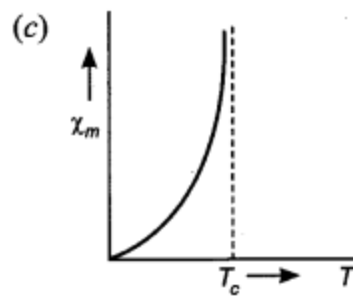
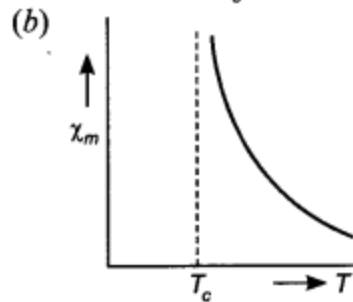
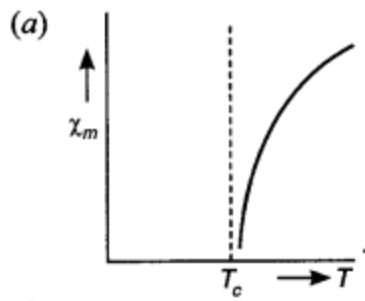
Answer/Explanation

24. Domain formation is the necessary feature of

- (a) diamagnetism.
- (b) Paramagnetism.
- (c) ferromagnetism.
- (d) all of these.

Answer/Explanation

25. The variation of magnetic susceptibility with the temperature of a ferromagnetic material can be plotted as



Answer/Explanation

26. In which type of material the magnetic susceptibility does not depend on temperature?

- (a) Diamagnetic
- (b) Paramagnetic
- (c) Ferromagnetic
- (d) Ferrite

Answer

27. A diamagnetic material in a magnetic field moves

- (a) perpendicular to the field.
- (b) from weaker to stronger parts.
- (c) from stronger to weaker parts.
- (d) in random direction.

Answer/Explanation

28. At a certain place on earth, $B_H = \frac{1}{3}\sqrt{3}B_V$ angle of dip at this place is

- (a) 60°
- (b) 30°
- (c) 45°
- (d) 90°

Answer/Explanation

29. The universal property among all substances is

- (a) diamagnetism.
- (b) paramagnetism.
- (c) ferromagnetism.
- (d) all of these.

Answer/Explanation

30. At a point on the right bisector of a magnetic dipole, the magnetic

- (a) potential varies as $1/r^2$
- (b) potential is zero at all points on the right bisector.
- (c) field varies as r^3 .
- (d) field is perpendicular to the axis of dipole.

Answer/Explanation

31. A magnet of dipole moment M is aligned in equilibrium position in a magnetic field of intensity B . The work done to rotate it through an angle θ with the magnetic field is

- (a) $MB \sin \theta$
- (b) $MB \cos \theta$
- (c) $MB (1 - \cos \theta)$
- (d) $MB(1 - \sin \theta)$

Answer/Explanation

32. A magnet can be completely demagnetised by

- (a) breaking the magnet into small pieces.
- (b) heating it slightly.
- (c) dropping it into ice cold water.
- (d) a reverse field of appropriate strength.

Answer

33. The primary origin of magnetism lies in

- (a) atomic current and intrinsic spin of electrons.
- (b) polar and non polar nature of molecules.
- (c) pauli exclusion principle.
- (d) electronegative nature of materials.

Answer

34. Magnetic moment for solenoid and corresponding bar magnet is

- (a) equal for both
- (b) more for solenoid
- (c) more for bar magnet
- (d) none of these

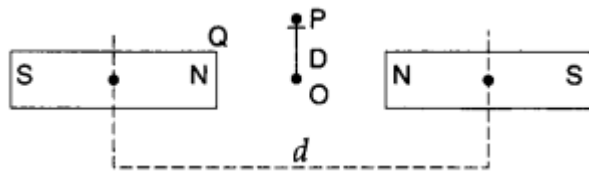
Answer

35. Which of the following is correct about magnetic monopole?

- (a) Magnetic monopole exist.
- (b) Magnetic monopole does not exist.
- (c) Magnetic monopole have constant value of monopole momentum.
- (d) The monopole momentum increase due to increase at its distance from the field.

Answer

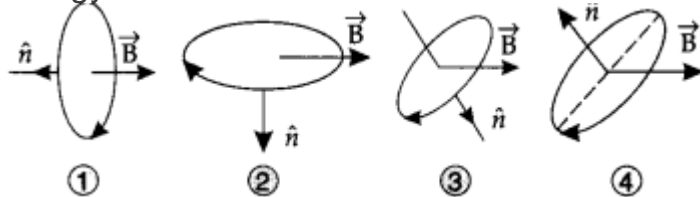
36. Two identical bar magnets are fixed with their centres at a distance d apart. A stationary charge Q is placed at P in between the gap of the two magnets at a distance D from the centre O as shown in the figure. The force on the charge Q is



- (a) zero
- (b) directed along OP
- (c) directed along PO
- (d) directed perpendicular to the plane of paper

Answer

37. A current carrying loop is placed in a uniform magnetic field in four different orientations as shown in figure. Arrange them in the decreasing order of potential energy.



- (a) 4, 2, 3, 1
- (b) 1, 4, 2, 3
- (c) 4, 3, 2, 1
- (d) 1, 2, 3, 4

Answer

38. Which of the following is not showing the essential difference between electrostatic shielding by a conducting shell and magnetostatic shielding?

- (a) Electrostatic field lines can end on charges and conductors have free charges.
- (b) Magnetic field lines can end but conductors cannot end them.
- (c) Lines of magnetic field cannot end on any material and perfect shielding is not possible.
- (d) Shells of high permeability materials can be used to divert lines of magnetic field from the interior region.

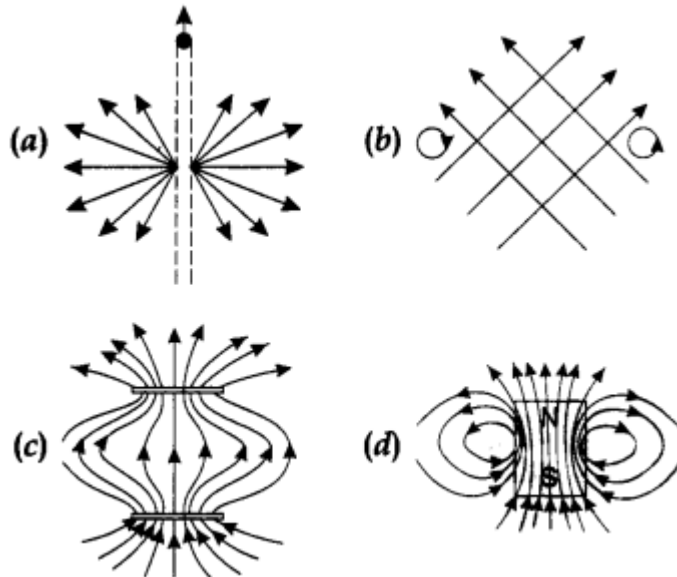
Answer

39. The net magnetic flux through any closed surface, kept in a magnetic field is

- (a) zero
- (b) $\mu_0 4\pi$
- (c) $4\pi\mu_0$
- (d) $4\mu_0\pi$

Answer

40. Point out the correct direction of magnetic field in the given figures.



Answer

41. The earth behaves as a magnet with magnetic field pointing approximately from the geographic

- (a) North to South
- (b) South to North
- (c) East to West
- (d) West to East

Answer

42. The strength of the earth's magnetic field is

- (a) constant everywhere.
- (b) zero everywhere.
- (c) having very high value.
- (d) vary from place to place on the earth's surface.

Answer

43. Which of the following is responsible for the earth's magnetic field?

- (a) Convective currents in earth's core
- (b) Divergent current in earth's core.
- (c) Rotational motion of earth.
- (d) Translational motion of earth.

Answer

44. Which of the following independent quantities is not used to specify the earth's magnetic field?

- (a) Magnetic declination (θ).
- (b) Magnetic dip (δ).
- (c) Horizontal component of earth's field (B_H).
- (d) Vertical component of earth's field (B_V).

Answer

45. Let the magnetic field on earth be modelled by that of a point magnetic dipole at the centre of earth. The angle of dip at a point on the geographical equator is

- (a) always zero
- (b) positive, negative or zero
- (c) unbounded
- (d) always negative

Answer

46. The angle of dip at a certain place where the horizontal and vertical components of the earth's magnetic field are equal is

- (a) 30°
- (b) 75°
- (c) 60°
- (d) 45°

Answer

47. The vertical component of earth's magnetic field . at a place is $\sqrt{3}$ times the horizontal component

the value of angle of dip at this place is

- (a) 30°
- (b) 45°
- (c) 60°
- (d) 90°

Answer

48. At a given place on earth's surface the horizontal component of earth's magnetic field is 2×10^{-5} T and resultant magnetic field is 4×10^{-5} T. The angle of dip at this place is

- (a) 30°
- (b) 60°
- (c) 90°
- (d) 45°

Answer

49. Which of the following property shows the property of ferromagnetic substances?

- (a) The ferromagnetic property depends on temperature. ‘
- (b) The ferromagnetic property does not depend on temperature.
- (c) At high enough temperature ferromagnet becomes a diamagnet.
- (d) At low temperature ferromagnet becomes a paramagnet.

Answer

50. Gauss's law in magnetism indicates that magnetic _____ do not exist.

Answer/Explanation

51. Magnetic dipole moment associated with an electron due to its orbital motion in first orbit of H-atom is known as _____ .

Answer/Explanation

52. Magnetic lines of force form closed loop. They converge at _____ pole and diverge at _____ pole.

Answer/Explanation

53. Angle between the geographical meridian and magnetic meridian at the given place is known as _____ .

Answer/Explanation

54. Angle made by the earth's total magnetic field with the horizontal direction is known as _____ .

Answer/Explanation

55. S.I. unit of magnetic dipole moment is _____ .

Answer/Explanation

56. Magnetic moment developed per unit volume of a material when placed in a magnetising field is known as _____ .

Answer/Explanation

57. Which orientation of a magnetic dipole in a uniform magnetic field will correspond to its stable equilibrium? [HOTS]

Answer/Explanation

58. Magnetic field arises due to charges in motion. Can a system have magnetic moments even though its net charge is zero?

Answer/Explanation

59. If magnetic monopoles existed, how would the Gauss's law of magnetism be modified? [Delhi 2019]

Answer/Explanation

60. Must every magnetic configuration have a north pole and a south pole? What about the field due to a toroid?

Answer/Explanation

61. Does a bar magnet exert a torque on itself due to its own field? Does an element of a current-carrying wire exert a force on another element of the same wire?

Answer/Explanation

62. A magnetised needle in a uniform magnetic field experiences a torque but no net force. An iron nail near a bar magnet, however, experiences a force of attraction in addition to a torque. Why?

Answer/Explanation

63. How does the (i) pole strength, and (ii) magnetic moment of each part of a bar magnet change if it is cut into two equal pieces transverse to its length? [HOTS]

Answer/Explanation

64. What happens if a bar magnet is cut into two pieces: (i) transverse to its length, (ii) along its length?

Answer/Explanation

65. How does the (i) pole strength and (ii) magnetic moment of each part of a bar magnet change if it is cut into two equal pieces along its length? [HOTS]

Answer/Explanation

66. Magnetic field lines show the direction (at every point) along which a small magnetised needle aligns (at the point). Do the magnetic field lines also represent the lines of force on a moving charged particle at every point?

Answer/Explanation

67. Magnetic field lines can be entirely confined 'within the core of a toroid, but not within a straight solenoid. Why?

Answer/Explanation

68. What is the angle of dip at a place where the horizontal and vertical components of the earth's magnetic field are equal? [Foreign 2012]

Answer/Explanation

69. Two identical looking iron bars A and B are given, one of which is definitely known to be magnetised. (We do not know which one.) How would one ascertain which one? [Use nothing else but the bars A and B.]

Answer/Explanation

70. A magnetic needle, free to rotate in a vertical plane, orients itself vertically at a certain place on the Earth. What are the values of (i) horizontal component of earth's magnetic field, and (ii) angle of dip at this place? [Foreign 2012]

Answer/Explanation

71. At a place, the horizontal component of earth's magnetic field is B and angle of dip is 60° . What is the value of horizontal component of the earth's magnetic field at equator? [Delhi 2017]

Answer/Explanation
[CBSE Chemistry MCQs for Class 12 with Answers Chapter 16 Chemistry in Everyday Life](#)
[Physics MCQs for Class 12 with Answers Chapter 6 Electromagnetic Induction](#)

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DAV PS Chhal **Physics (042)**

1. In general metallic ropes are suspended on the carriers taking inflammable materials. The reason is
 - (a) To control the speed of the carrier
 - (b) To keep the centre of the gravity of the carrier nearer to the earth
 - (c) To keep the body of the carrier in contact with the earth
 - (d) None of these.
2. Does the charge given to a metallic sphere depend on whether it is hollow or solid?
3. Equipotentials at a great distance from a collection of charges whose total sum is not zero are approximately
 - (a) Spheres
 - (b) planes
 - (c) paraboloids
 - (d) ellipsoids
4. Where does the energy of a capacitor reside?
5. When electrons drift in a metal from lower to higher potential, does it mean that all the free electrons of the metal are moving in the same direction.
6. The E.M.F. of a cell is always greater than its terminal voltage. Why?
7. When there is an electric current through a conducting wire along its length, then an electric field must exist
 - (a) Outside the wire, but normal to it
 - (b) Outside the wire but parallel to it
 - (c) Inside the wire but parallel to it
 - (d) Inside the wire but normal to it.
8. Relation between S.I. unit and C.G.S. unit of magnetic field is _____.
9. Force on a current carrying conductor in a magnetic field I _____.
10. The material suitable for making electro magnets should have
 - (a) High retentivity and high coercivity

- (b) Lower intensity and low coercivity
 (c) High retentivity and low coercivity
 (d) Low retentivity and high coercivity.
11. Write S.I. unit of magnetic dipole moment.
12. Average or mean value of AC current over a half cycle is _____.
13. A transformer works on the principle of
 (a) Converter (b) inverter (c) mutual inductance (d) self inductance
14. Two spherical bobs, one metallic and other of glass, of the same size are allowed to fall freely from the same height above the ground. Which of the two would reach earlier and why?
15. Lenz's law of electromagnetic induction is as per law of conservation of
 (a) Energy (b) Momentum Angular (c) charge (d) electro motive force
16. Which quantity is increased in a step down transformer?
17. An object is immersed in a fluid in order that the object becomes invisible, it should
 (a) Behave as a perfect reflector
 (b) Absorb all light falling on it
 (c) have refractive index one
 (d) Have refractive index exactly matching with that of the surrounding fluid.
18. Virtual image formed by convex mirror has magnification _____.
19. Name the principle on which an optical fibre works.
20. For which material the value of refractive index is
 1. Minimum and 2. Maximum
21. Name the phenomena due to which one cannot see through the fog.
22. Dispersal of light is caused due to
 (a) Wave length (b) intensity of light
 (c) Density of medium (d) none of these
23. Wave associated with the material particle is known as _____.
24. _____ is the minimum energy required to cause photo electric emission.
25. Can non metals show photo electric effect?
26. In photo electric effect, the number of photo electrons emitted is proportional to
 (a) Intensity of incident beam
 (b) Frequency of incident beam
 (c) Velocity of incident beam
 (e) Work function of photo cathode.
27. Non radiating electron orbits in an atom are called _____ orbits.
28. What will happen if an electron instead of revolving becomes stationary in hydrogen atom?
29. What is the ratio of radii of the orbits corresponding to first excited state and ground state in a hydrogen atom?
30. Write the expression for Bohr's radius in hydrogen atom?
31. What is the relation between the binding energy per Nucleon and stability of a nucleus/
32. Packing fraction of a nucleus is it's _____ per nucleon.
33. How is the mean life of a radioactive sample related to its half life?
34. What happens during regulation action of a zenre diode?
 (a) The current in and voltage across the zenre remains fixed
 (b) The current through the series resistance does not change
 (c)The Zenre resistance is constant
 (e) The resistance offered by the Zenre changes.
35. Name two factors on which electrical conductivity of a pure semi conductor at a given temperature depends.
36. What do you understand by a dynamic resistance of p-n junction diode?

37. In an insulator, the forbidden energy gap between the valance band and the conduction band is of the order of _____.
38. Resolving power of an optical instrument is _____ to limit resolution.
39. What is figure of merit of a galvanometer?
40. It is necessary to use satellite for long distance TV transmission. Why?

Monnet Raigarh

QUESTION BANK **PHYSICS** **CLASS-XII**

Q. Answer the following in one word/Fill up the blanks/chose the correct option.

Note: - Each question carries one mark.

1. What are the majority charge carriers in p-type semiconductors?
2. Which of the following is called diverging mirror?
Convex or concave?
3. What happen to the lens when it is immersed in a
Liquid of refractive index more than the refractive
Index of lens?
4. When a cell is in charging process the terminal potential
Difference is----- than in discharging.
5. A conductor carrying 5A current and length 6.5m is
Held in magnetic field of intensity 10 T normally, the
Magnitude of force on conductor is-----.
6. A p n junction diode is said to be in forward biased
When its n side is joined to----- of the battery.
7. The phenomenon total internal reflection occurs when
The critical angle is-----.
8. Define the term 'fermi level'.
9. The susceptibility of ferromagnetic materials varies_____.
10. What is the value of angle of dip where the horizontal and vertical component
Of the earth magnetic field are equal?
11. What is the effect of temperature on the resistivity of semiconductors?
12. Which of the following is used as a voltage regulator?
(a) Photodiode (b) Transistor (c) Zener diode (d) Transformer
13. Define the term 'Potential gradient'.
14. What should be the resistance of an ideal voltmeter?
15. What is the frequency of the A.C. in India?
16. Write the formula for speed of the Electromagnetic wave in vacuum.
17. Lyman series consists spectral lines in ----- region.
18. When 5 cells each of emf E are joined in parallel combination the net emf of
The combination will be
(a) 5E (b) E (c) 2E (d) 10E
19. Define magnifying power of the Astronomical telescope and write the formula for it when
the image is formed at infinity.
- 20 Plot a graph between inductive reactance and self inductance.
21. For the nucleus ${}_{7}\text{N}^{14}$ the binding energy is 839 eV. What is binding energy per nucleon?
22. Express the linear magnification of mirror in terms of its focal length.
23. The radius of the orbit varies-----as square of the -----.
24. How does the radius of the nucleus is related to its mass number?
25. The temperature coefficient of resistance of the semiconductors are-----.
26. Write the condition of resonance in LCR circuit.

27. Write the full form of LED.
28. The electromagnetic waves are-----in nature.
29. Name the device used as filter circuit in rectifier.
30. Define half life period in radioactive disintegration.
31. How does the thickness of the depletion layer changes when it is in forward biased?
And in reverse biased?
32. Define the term 'Threshold frequency'.
33. Write any two uses of Polaroids.
34. The ratio of intensities of two light sources is 9:25.what is the ratio of their maximum and minimum intensities?
35. What is meant by the plane polarized light?
36. Name the device used to up or down the AC voltage. On What principle does it work?
37. De Broglie wave length for the same K.E. will maximum either for electron or alpha particle..
38. Define the term 'Retentivity'.
39. If an electron is moving in an orbit of radius r then its magnetic moment will be
(a) $evr/2$ (b) erT (c) mvr^2 (d) mv^2r^3
40. The fringe width for a source of light of wavelength 4000 \AA is 0.5 mm. What should be the wavelength of another source to get the width 1.5mm?

-----X-----

ANSWERS

1. Holes
2. Convex
3. Nature of the lens changes
4. more
5. 325 N
6. Negative terminal
7. less than the angle of incidence
- 8.
9. inversely with temperature
10. 45°
11. decreases with rise in temperature
12. Zener diode
13. -----
14. infinity
15. 50 Hz
- 16.
- 17.
18. E
19. $M = f_o / f_e$
- 20.
21. 59.93 eV
- 22.
23. directly square of the n
24. $R = R_o A^{1/3}$
25. Negative
26. Inductive reactance is equal to the capacitive reactance
27. Light Emitting Diode
28. Transverse
29. Capacitor

30.
 31. In Forward biased decreases and in Reverse biased increases.
 32.
 33.
 34. 16: 1
 35.
 36. Transformer, based on electromagnetic induction
 37. Electron
 38.
 39. (a) evr / 2
 40. 12000 A⁰

DAV PS, Rajahara

CLASS – XII

1 – MARKS QUESTION BANK

1. 1) If $\begin{vmatrix} 3x & 7 \\ -2 & 4 \end{vmatrix} = \begin{vmatrix} 8 & 7 \\ 6 & 4 \end{vmatrix}$, then the value of x is
 a) 3 b) -4 c) -2 d) 0
2. $\int \frac{\sin^2 x - \cos^2 x}{\sin x \cos x} dx$ is
 a) $\log(\operatorname{cosec} 2x) + c$ b) $\log(\sin 2x) + c$ c) $-\cos 2x$ d) $\sec 2x + c$
3. If the Cartesian equations of a line are $\frac{3-x}{5} = \frac{y+4}{7} = \frac{2z-6}{4}$, then the vector equation of the line is
4. If $y = \tan^{-1}(\sin \sqrt{x})$ then $\frac{dy}{dx}$ is
 a) $\frac{\cos \sqrt{x}}{2\sqrt{x}(1+\sin^2 \sqrt{x})}$ b) $\frac{\sin \sqrt{x}}{2\sqrt{x}(1+\sin^2 \sqrt{x})}$ c) $\frac{-\cos \sqrt{x}}{2\sqrt{x}(1+\sin^2 \sqrt{x})}$ d) $\frac{-\sin \sqrt{x}}{\sqrt{x}(1+\sin^2 \sqrt{x})}$
- 5) If A_{ij} is the cofactor of the element a_{ij} of the determinant $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$, then the value of $a_{32} \cdot A_{32}$ is
 a) 112 b) 110 c) -112 d) -110
- 6) If $\tan^{-1} x + \tan^{-1} y = \frac{\pi}{4}$, $xy < 1$, then the value of $x + y + xy$ is
 a) 1 b) -1 c) 0 d) -3
- 7) Find the value of 'p' for which the vectors $3\hat{i} + 2\hat{j} + 9\hat{k}$ and $\hat{i} - 2p\hat{j} + 3\hat{k}$ are parallel.
 a) $P = \frac{-1}{3}$ b) $P = \frac{1}{3}$ c) $P = \frac{-2}{3}$ d) $P = \frac{-4}{3}$

- 8) If $\int_0^a \frac{1}{4+x^2} dx = \frac{\pi}{8}$, then the value of a is
 a) -2 b) 0 c) 4 d) 2
- 9) If $P(A)=0.8$, $P(B)=0.5$ and $P(B/A)=0.4$ then the value of $P(A \cap B)$ is
 a) 0.34 b) 0.32 c) 0.42 d) 0.38
- 10) vector of magnitude 12 units in the direction of vector $\hat{i} - 2\hat{j} + 2\hat{k}$ is
 a) $4\hat{i} - 8\hat{j} + 8\hat{k}$ b) $8\hat{i} - 4\hat{j} + 8\hat{k}$ c) $4\hat{i} - 8\hat{j} - 8\hat{k}$ d) $4\hat{i} + 8\hat{j} + 8\hat{k}$
- 11) If A is a square matrix of order 2 and $|A| = 7$ then the value of $|A \cdot \text{Adj}A|$ is
 a) 49 b) 343 c) 64 d) 36
- 12) the value of integration $\int e^{-\log \sec x} dx$ is
 a) $\sin x + c$ b) $-\sin x + c$ c) $\cos x + c$ d) $\sec x + c$
- 13) Find the value of $A+A'$ if matrix $A = \begin{bmatrix} 4 & -1 \\ 6 & 2 \end{bmatrix}$
- 14) The value of $\tan^{-1} 1 - \sec^{-1}(-\frac{2}{\sqrt{3}})$ is
 a) $\frac{5\pi}{8}$ b) $\frac{-5\pi}{12}$ c) $\frac{7\pi}{12}$ d) $\frac{-7\pi}{12}$
- 15) Write the direction cosine of a vector parallel to the line $\frac{4-x}{2} = \frac{y+3}{3} = \frac{z+2}{6}$
- 16) Find the distance between the planes $2x+3y+4z = 4$ and $4x+6y+8z = 12$
- 17) The distance of the point (2,1,-1) from the plane $x - 2y + 4z = 9$ is
- 18) Evaluate $P(A \cup B)$, if $2P(A) = P(B) = \frac{5}{13}$ and $P(A/B) = \frac{2}{5}$.
- 19) The order and degree of the differential equation $(y'')^2 + \cos y' = 0$ is
 (a) order- 2 degree -1 b) order- 2 degree -2 c) order- 2 degree -Not defined
 d) order- 1 degree -2
- 20) write the order of the differential equation representing the family of ellipses having centre at origin and foci on X- axis.
- 21) If $\vec{a} = \hat{i} + 3\hat{j} + 7\hat{k}$ and $\vec{b} = 7\hat{i} - \hat{j} + 8\hat{k}$, then the projection of \vec{a} on \vec{b} is
 a) $\frac{60}{\sqrt{114}}$ b) $\frac{60}{\sqrt{112}}$ c) $\frac{58}{\sqrt{114}}$ d) $\frac{54}{\sqrt{110}}$
- 22) The slope of the normal to the curve $x = a \cos^3 \theta$, $y = a \sin^3 \theta$ at $\theta = \frac{\pi}{4}$ is
 a) -2 b) 1 c) -1 d) 4
- 23) If x is real, find the minimum value of $x^2 - 8x + 17$.
- 24) If the function $f(x) = 2x^2 - kx + 5$ is increasing on [1, 2], then k lies in the interval
 a) $(-\infty, 4)$ b) $(4, \infty)$ c) $(-\infty, 8)$ d) $(8, \infty)$
- 25) The minimum value of $x \log_e x$ is equal to
 a) e b) 1/e c) -1/e d) 2/e
- 26) If R is a relation on the set $A = \{1, 2, 3\}$ given by $R = \{(1, 1), (2, 2), (3, 3)\}$, then R is
 a) reflexive b) symmetric c) transitive d) all the three option
- 27) If $f: R \rightarrow R$ is given by $f(x) = x^3 + 3$, then $f^{-1}(x)$ is equal to
 a) $x^{1/3} - 3$ b) $x^{1/3} + 3$ c) $(x - 3)^{1/3}$ d) $x + 3^{1/3}$
- 28) The function $f: [0, \infty) \rightarrow R$ given by $f(x) = \frac{x}{x+1}$ is
 a) one-one and onto b) one-one but not onto
 c) onto but not one-one d) neither one-one nor onto

- 29) If $x = t^2$, $y = t^3$, then $\frac{d^2y}{dx^2} =$
 a) $\frac{3}{2}$ b) $\frac{3}{4t}$ c) $\frac{3}{2t}$ d) $\frac{3t}{2}$
- 30) If $y = \sqrt{\sin x + y}$, then $\frac{dy}{dx} =$
 a) $\frac{\sin x}{2y-1}$ b) $\frac{\sin x}{1-2y}$ c) $\frac{\cos x}{1-2y}$ d) $\frac{\cos x}{2y-1}$
- 31) The solution of $x^2 + y^2 \frac{dy}{dx} = 4$ is
 a) $x^2 + y^2 = 12x + c$ b) $x^3 + y^3 = 3x + c$ c) $x^2 + y^2 = 3x + c$ d) $x^3 + y^3 = 12x + c$
- 32) Out of 30 consecutive integers, 2 are chosen at random. The probability that their sum is odd, is
 a) $\frac{14}{29}$ b) $\frac{16}{29}$ c) $\frac{15}{29}$ d) $\frac{10}{29}$
- 33) If $A = \begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and $A = A^T$, then
 a) $x = 0, y = 5$ b) $x + y = 5$ c) $x = y$ d) none of these
- 34) If A is a square matrix such that $A^2 = I$, then A^{-1} is equal to
 a) $A + I$ b) A c) 0 d) $2A$
- 35) The area between x-axis and curve $y = \cos x$ when $0 \leq x \leq 2\pi$ is
 a) 0 b) 2 c) 3 d) 4
- 36) The area bounded by the parabola $y^2 = 4ax$ and $x^2 = 4ay$ is
 a) $\frac{8a^3}{3}$ b) $\frac{16a^2}{3}$ c) $\frac{32a^2}{3}$ d) $\frac{64a^2}{3}$
- 37) Objective function of a LPP is
 a) a constant b) a function to be optimized c) a relation between the variables d) none of these
- 38) The point which does not lie in the half plane $2x + 3y - 12 \leq 0$ is
 a) $(1, 2)$ b) $(2, 1)$ c) $(2, 3)$ d) $(-3, 2)$
- 39) Find $\int \frac{3+3\cos x}{x+\sin x} dx$
- 40) If $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 4 \end{bmatrix}$, then value of y is
- ANSWER -** 1(c) 2(a) 3) $\vec{r} = 3\hat{i} - 4\hat{j} + 3\hat{k} + \mu(-5\hat{i} + 7\hat{j} + 2\hat{k})$
- 4(a) 5(b) 6(a) 7(a) 8(d) 9(b) 10(a) 11(a) 12(a) 13) $\begin{bmatrix} 8 & 5 \\ 5 & 4 \end{bmatrix}$ 14(d) 15) $\frac{-2}{7}, \frac{3}{7}, \frac{6}{7}$
- 16) $\frac{2}{\sqrt{29}}$ 17) $\frac{13}{\sqrt{21}}$ 18) $\frac{11}{26}$
- 19) (c) 20) 2 21(a) 22(b) 23) 1 24(a) 25(c) 26(d) 27(c) 28(b) 29(b) 30(d)
- 31(d) 32(c) 33(c) 34(b) 35(d) 36(b) 37(b) 38(c) 39) $\log(x + \sin x)^3 + c$ 40) $y = 2$

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- Q1. When a body becomes negatively charged, its mass
 (a) Decreases (b) Increases (c) Remains the same (d) none.
- Q2. The cause of charging a body is
 (a) Transfer of neutrons (b) transfer of protons (c) transfer of electrons (d) transfer of both protons and neutrons.

- Q3. What is the work done in moving a charge of 10nC between two points on an equipotential surface
 (a) 0V (b) 10V (c) 20V (d) 5V
- Q4. A charge Q coulomb is placed at the centre of a cube. The flux coming out from any surface will be
 (a) $Q/6\epsilon_0$ (b) Q/ϵ_0 (c) $Q/8\epsilon_0$ (d) 0
- Q5. The instrument for the accurate measurement of the EMF of a cell is
 (a) A voltmeter (b) an ammeter (c) a potentiometer (d) a slide wire bridge.
- Q6. Which one of the following is best material for making connecting wires
 (a) Manganin (b) Constantan (c) Copper (d) Nichrome
- Q7. When a resistor of finite length is reduced to half of its original diameter, what is the new resistance?
 (a) 2times (b) 4times (c) 8times (d) 16times
- Q8. If the length of the potentiometer wire is increased then the accuracy in the determination of null point
 (a) Will increase (b) will decrease (c) will remain same (d) none
- Q9. The angle between magnetic axis and geographic axis is
 (a) 9° (b) 10° (c) 11.3° (d) 11°
- Q10. The ratio of orbital magnetic moment of current loop and the angular momentum of electron is a
 (a) e/m (b) $2e/m$ (c) $m/2e$ (d) $e/2m$
- Q11. A cyclotron is used to accelerate a electron
 (a) electron (b) neutron (c) positive ions (d) none
- Q12. Two long parallel conductors carrying current in the same direction
 (a) attract each other (b) repel each other (c) neither attract nor repel (d) none
- Q13. Dip angle vary as one moves magnetic equator to pole
 (a) 90° to 0° (b) 0° to 90° (c) 90° (d) 0° to 180°
- Q14. The radius of the circular path of an electron moving in magnetic field perpendicular to its path is equal to
 (a) Be/mv (b) me/B (c) mE/B (d) mv/Be .
- Q15. If a current is passed in a spring, it
 (a) Get compressed (b) get expanded (c) oscillates (d) remain uncharged.
- Q16. The resistance of an ideal voltmeter is
 (a) 0 (b) very low (c) very large (d) infinite.
- Q17. A current loop placed in magnetic field behaves like a
 (a) magnetic dipole (b) magnetic substance (c) magnetic pole (d) all true.
- Q18. The magnetic moment has dimension of
 (a) $[\text{LA}]$ (b) $[\text{L}^2\text{A}]$ (c) $[\text{LT}^{-1}\text{A}]$ (d) $[\text{L}^2\text{T}^{-1}\text{A}]$.
- Q19. Maximum matter show the following magnetic property
 (a) Diamagnetism (b) ferromagnetism (c) paramagnetism (d) none.
- Q20. The magnetic field is produced by
 (a) moving charge (b) charging electric field (c) both (d) none.
21. A straight line conductor of length 0.4 m is moved with a speed of 7 m/s perpendicular to a magnetic field of 0.9 Wb/m^2 . The induced e.m.f. across the conductor is
 (a) 5.04 V (b) 1.26 V (c) 2.52 V (d) 15.2 V
22. Which of the following has dimensions different from the rest
 (a) L/R (b) CR (c) \sqrt{LC} (d) $1/CR$
23. An A.C. having a peak value of 1.41 A is used to heat a wire. A D.C. producing the same heating rate will be
 (a) 1.41 A (b) 2.0 A (c) 0.705 A (d) 1.0 A

24. As the speed of a motor increases, the back e.m.f.
 (a) Increases (b) decreases (c) remains unchanged (d) ultimately vanishes
25. Infrared spectrum lies between
 (a) Radio wave and micro wave region (c) micro wave and visible region
 (b) visible and ultraviolet region (d) ultraviolet and X-ray
26. Which of the following is the unit of displacement current?
 (a) C/s (b) V/s (c) V/m (d) C/m
27. Which of the following spectrum form the part of the electromagnetic spectrum?
 (a) Alpha rays (b) Beta rays (c) Cathode rays (d) Gamma rays
28. In Young's experiment the intensity of the central fringe in the interference pattern is I . On closing one slit, the intensity at this place becomes I_0 . Which one of the following relations is true?
 (a) $I=I_0$ (b) $I=2I_0$ (c) $I=4I_0$ (d) there is no relation between I and I_0
29. The unit of illuminance is
 (a) Lumen (b) lux (c) candela (d) watt
30. A diminished virtual image can be produced only with
 (a) A plane mirror (b) a concave mirror (c) a convex mirror (d) all of them
31. The minimum value of absolute refractive index is
 (a) Zero (b) between zero and one (c) one (d) more than one
32. Monochromatic light of wavelength λ gets refracted from vacuum to a medium of refractive index n . The ratio of wavelengths of the incident and refracted wave is
 (a) $1 : n$ (b) $1 : 1$ (c) $n : 1$ (d) $n^2 : 1$
33. Large aperture of telescope is used for
 (a) Greater magnification (b) greater resolution (c) reducing lens aberration (d) cost of manufacture
34. Rutherford experiments on scattering of alpha-particles proved that
 (a) Atom is mostly empty
 (b) Positive charge is uniformly distributed in the atom
 (c) Number of +ve charges is equal to the number of -ve charges
 (d) Atom contains electrons
35. A hydrogen atom (ionization potential 13.6 Volt) makes a transition from third excited state to first excited state. The energy of the photon emitted in the process is
 (a) 1.89 eV (b) 2.55 eV (c) 12.09 eV (d) 12.75 eV
36. Which of the following can pass through 20 cm thickness of steel?
 (a) Alpha-particle (b) Beta-particle (c) Gamma-rays (d) ultra-violet rays
37. The half life of radioactive radon is 3.8 days. The time at the end of which $(1/20)$ th of the radon sample will remain undecayed is

(a) 3.8 days (b) 16.5 days (c) 33 days (d) 76 days

38. The velocity of the ejected photoelectrons depends upon the

- (a) Frequency of incident light
- (b) Intensity of incident light
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

39. The momentum of a photon of de Broglie wavelength λ is given by

- (a) $h\nu$
- (b) p/h
- (c) h/p
- (d) h/\sqrt{p}

40. In a simple cubic lattice the coordination number is

- (a) 4
- (b) 6
- (c) 5
- (d) 8