LIONS SCHOOL MIRZAPUR
PRE-BOARD EXAMINATIONS 2021-22
TERM - 1

CLASS XII   M.M 35
SUBJECT .- PHYSICS   TIME .
90 min
General Instructions

a) This question paper   contains three sections
b) Section A has 25 questions .Attempt any 20 questions.
c) Sections B has 24 questions . Attempt any 20 questions.
d) Sections C has 6 questions . Attempt any 5 questions .
e) All questions carry equal   marks .
f) There is no negative marking.

Section A

This section consists of 25 multiple choice questions with overall choice to attempt any 20 questions.In case more then desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

Q1. The surface considered for Gauss's law is called
(a) Closed surface
(b) Spherical surface
(c) Gaussian surface
(d) Plane surface

Q2. . The total flux through the faces of the cube with side of length a if a charge q is placed at corner A of the cube is
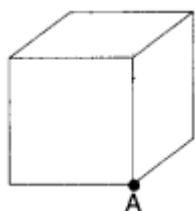
(a) $\dfrac{q}{8\varepsilon_0}$ (b) $\dfrac{q}{4\varepsilon_0}$

(c) $\dfrac{q}{2\varepsilon_0}$ (d) $\dfrac{q}{\varepsilon_0}$

Q3. . Consider a uniform electric field in the z-direction. The potential is a constant
(a) for any x for a given z
(b) for any y for a given z
(c) on the x-y plane for a given z
(d) all of these

Q4. 1 volt is equivalent to
(a) $\dfrac{newton}{second}$ (b) $\dfrac{newton}{coulomb}$

(c) $\dfrac{joule}{coulomb}$ (d) $\dfrac{joule}{second}$

Q5. . A test charge is moved from lower potential point to a higher potential point. The potential energy of test charge will

a) remain the same
   (b) increase
   (c) decrease
   (d) become zero
   Q6. Dielectric constant for a metal is
   (a) zero
   (b) infinite
   (c) 1
   (d) 10
   Q7. Two small spheres each carrying a charge q are placed r metre apart. If one of the spheres is taken around the other one in a circular path of radius r, the work done will be equal to
   (a) force between them × r
   (b) force between them × 2πr
   (c) force between them/2πr
   (d) zero
   Q8. A capacitor is charged by a battery. The battery is removed and another identical uncharged capacitor is connected in parallel. The total electrostatic energy of resulting system
   (a) increases by a factor of 4.
   (b) decreases by a factor of 2.
   (c) remains the same.
   (d) increases by a factor of 2.
   Q9. In the series combination of two or more than two resistances
   (a) the current through each resistance is same.
   (b) the voltage through each resistance is same.
   (c) neither current nor voltage through each resistance is same.
   (d) both current and voltage through each resistance are same.
   Q10. A cell having an emf E and internal resistance r is connected across a variable external resistance R. As the resistance R is increased, the plot of potential difference V across R is given by
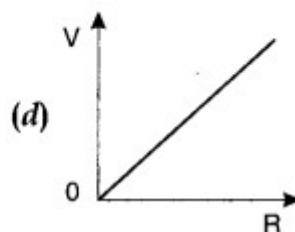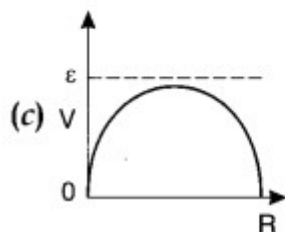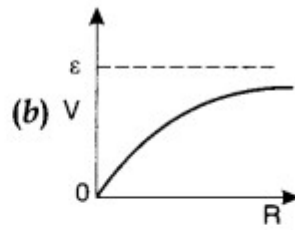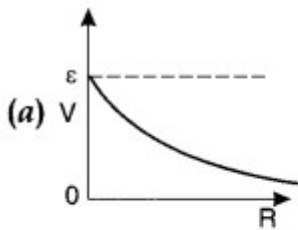
   Q11. If n cells each of emf e and internal resistance r are connected in parallel, then the total emf and internal resistance will be

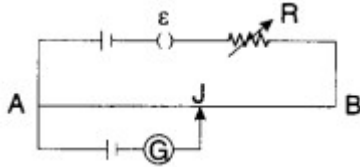   (a) $\varepsilon, \dfrac{r}{n}$ (b) ε, nr

   (d) $n\varepsilon, \dfrac{r}{n}$ (d) $n\varepsilon, nr$

Q12. In a Wheatstone bridge if the battery and galvanometer are interchanged then the deflection in galvanometer will
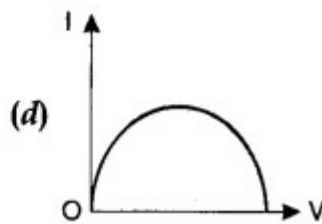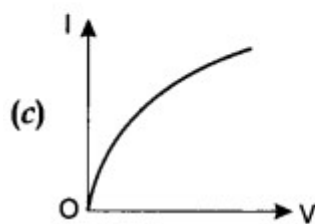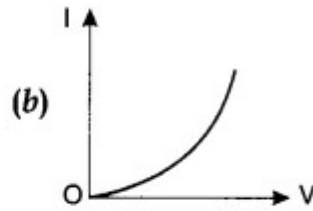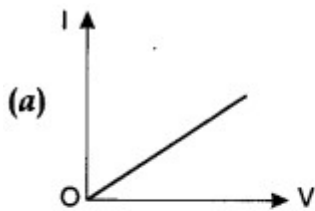(a) change in previous direction
(b) not change
(c) change in opposite direction
(d) none of these.

Q13 AB is a wire of potentiometer with the increase in the value of resistance R, the shift in the balance point J will be

(a) towards B
    (b) towards A
    (c) remains constant
    (d) first towards B then back towards A.

Q14' Which of the following I-V graph represents ohmic conductors?

Q15. The resistivity of alloy manganin is
(a) Nearly independent of temperature
(b) Increases rapidly with increase in temperature
(c) Decreases with increase in temperature
(d) Increases rapidly with decrease in temperature

Q16. When a metal conductor connected to left gap of a meter bridge is heated, the balancing point
(a) shifts towards right
(b) shifts towards left
(c) remains unchanged
(d) remains at zero

Q17 A charged particle is moving in a cyclotron, what effect on the radius of path of this charged particle will occur when the frequency of the ratio frequency field is doubled?
(a) It will also be doubled.
(b) It will be halved.

(c) It will be increased by four times.
(d) It will remain unchanged.

Q18. . Ampere's circuital law is given by

(a) $\oint \vec{H}.\vec{dl} = \mu_0 I_{enc}$ (b) $\oint \vec{B}.\vec{dl} = \mu_0 I_{enc}$

(c) $\oint \vec{B}.\vec{dl} = \mu_0 J$ (d) $\oint \vec{H}.\vec{dl} = \mu_0 J$

Q19. The nature of parallel and anti-parallel currents are
(a) parallel currents repel and antiparallel cur¬rents attract.
(b) parallel currents attract and antiparallel cur-rents repel.
(c) both currents attract. '
(d) both currents repel.

Q20. . The magnetic moment of a current I carrying circular coil of radius r and number of turns N varies as

(a) $1/r^2$
(b) $1/r$
(c) r
(d) r^2

Q21. . A current carrying loop is placed in a uniform magnetic field. The torqe acting on it does not depend upon
(a) area of loop
(b) value of current
(c) magnetic field
(d) None of these

Q22. In the expression e = $-d\emptyset/dt$, the -ve sign signifies:
(a) The induced emf is produced only when magnetic flux decreases
(b) The induced emf opposes the change in the magnetic flux
(c) The induced emf is opposite to the direction of the flux
(d) None of these

Q23. A transformer is used to light 100 W and 110 V lamp from a 220 V mains. If the main current is 0.5 A. Then the efficiency of the transformer is:
(a) 11%
(b) 50%
(c) 80%
(d) 90%

Q24. If the magnetic flux linked with a coil through which a current off ampere is set up is $\emptyset$, then the coefficient of self-inductance of the coil is:
(a) $l/\emptyset$
(b) $\emptyset l$
(c) $\emptyset/l$
(d) None of these

Q25. The role of inductance is equivalent to:
(a) inertia
(b) force

(c) energy
(d) momentum

Section B

This section consists of 24 multiple choice questions with overall choice to attempt any 20 questions.In case more then desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

Q26. An electric dipole of moment $\vec{p}$ is placed in a uniform electric field $\vec{E}$. Then
(i) the torque on the dipole is $\vec{p} \times \vec{E}$
(ii) the potential energy of the system is $\vec{p} . \vec{E}$
(iii) the resultant force on the dipole is zero. Choose the correct option.
(a) (i), (ii) and (iii) are correct
(b) (i) and (iii) are correct and (ii) is wrong
(c) only (i) is correct
(d) (i) and (ii) are correct and (iii) is wrong

Q27.

 Which of the following statements is false for a perfect conductor?
(a) The surface of the conductor is an equipotential surface.
(b) The electric field just outside the surface of a conductor is perpendicular to the surface.
(c) The charge carried by a conductor is always uniformly distributed over the surface of the conductor.
(d) None of these.

Q28. **A circular coil of radius 4 cm and of 20 turns carries a current of 3 amperes. It is placed in a magnetic field of intensity of 0.5 weber/m². The magnetic dipole moment of the coil is**
(a) 0.15 ampere-m²
(b) 0.3 ampere-m²
(c) 0.45 ampere-m²
(d) 0.6 ampere-m²

Q29. **An electron is projected with uniform velocity along the axis of a current carrying long solenoid. Which of the following is true?**
(a) The electron will be accelerated along the axis.
(b) The electron path will be circular about the axis.
(c) The electron will experience a force at 45° to the axis and hence execute a helical path.
(d) The electron will continue to move with uniform velocity along the axis of the solenoid.

Q30. **The strength of magnetic field at the centre of circular coil is**
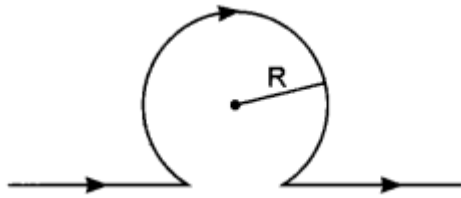
(a) $\dfrac{\mu_0 I}{R}\left(1-\dfrac{1}{\pi}\right)$ (b) $\dfrac{\mu_0 I}{\pi R}$

(c) $\dfrac{\mu_0 I}{2R}\left(1-\dfrac{1}{\pi}\right)$ (d) $\dfrac{\mu_0 I}{2R}\left(1+\dfrac{1}{\pi}\right)$

Q31. Drift velocity of electrons is due to
(a) motion of conduction electrons due to random collisions.
(b) motion of conduction electrons due to electric field E
(c) repulsion to the conduction electrons due to inner electrons of ions.
(d) collision of conduction electrons with each other.

Q32.

 The relaxation time in conductors
(a) increases with the increases of temperature
(b) decreases with the increases of temperature
(c) it does not depends on temperature
(d) all of sudden changes at 400 K

Q33. The effective resistance between C & D in given circuit is
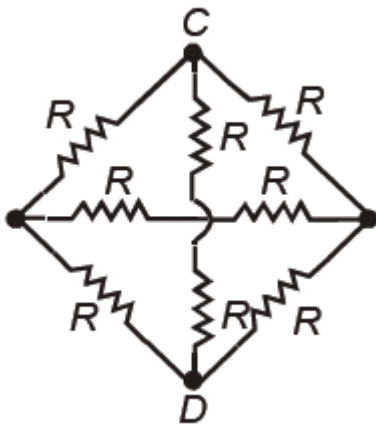
(a) R
    (b) 3R
    (c) 2R/3
    (d) R/3
    Q34

Q34.. What is the suitable material for electric fuse?
(a) Cu
(b) Constantan
(c) Tin-lead alloy
(d) Nichrome

Q35. Kirchhoff's first law, i.e., $\sum i = 0$ at a junction, deals with the conservation of
(a) charge (b) energy
(c) momentum (d) angular momentum

Q36. 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.

Q37. 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) $\dfrac{NAB}{2}$ (b) NAB (c) $\dfrac{NAB}{4}$ (d) zero

Q38. If number of turns in primary and secondary coils is increased to two times each, the mutual inductance
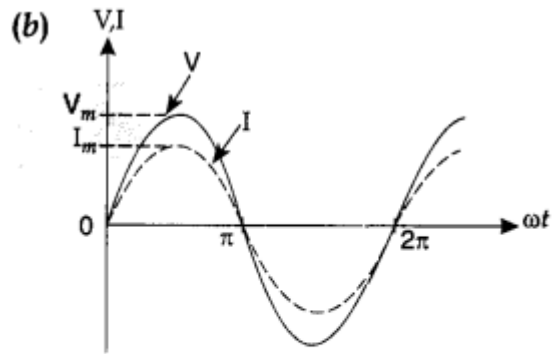(a) becomes 4 times
(b) becomes 2 times
(c) becomes A times
(d) remains unchanged 4

Q39. The rms value of potential difference V shown in the figure is
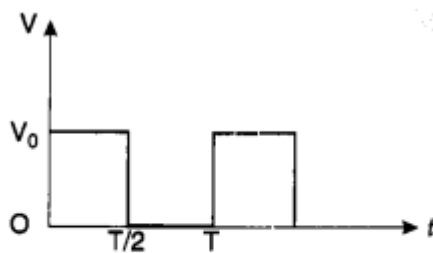
(a) $\dfrac{V_0}{\sqrt{3}}$ (b) V_0 (c) $\dfrac{V_0}{\sqrt{2}}$ (d) $\dfrac{V_0}{2}$

Q40. The phase relationship between current and voltage in a pure resistive circuit is best represented by

(a)

(b)

(c)

(d)
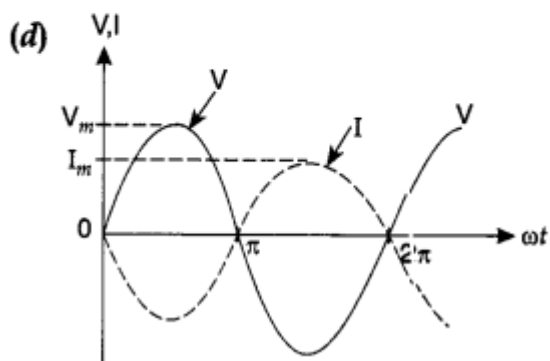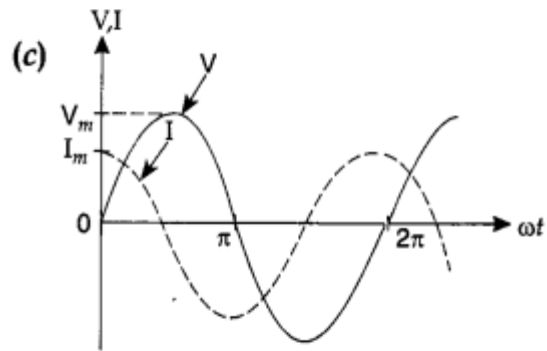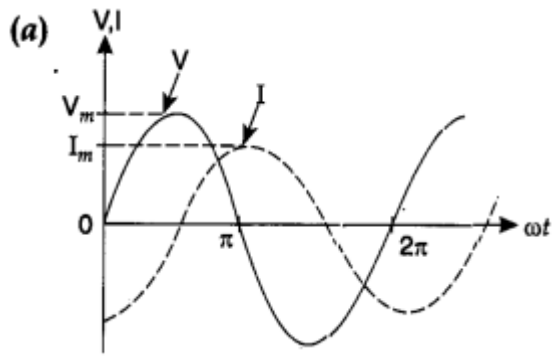
Q40. Which of the following graphs represents the correct variation of inductive reactance X_L with frequency u?

(a) X_L

(b) X_L

(c) X_L

(d) X_L

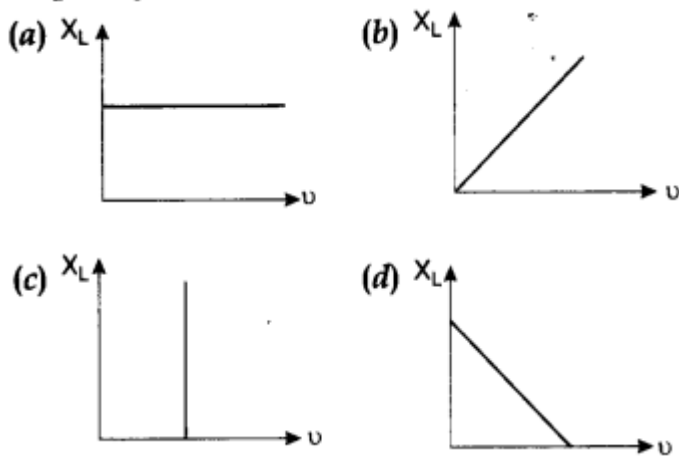Q41. In a series LCR circuit the voltage across an inductor, capacitor and resistor are 20 V, 20 V and 40 V respectively. The phase difference between the applied voltage and the current in the circuit is
(a) 30°
(b) 45°
(c) 60°
(d) 0°

Q42. In an LCR-series ac circuit, the voltage across each of the component L, C and R is 50 V. The voltage across the LC-combination will be
(a) 50 V
(b) 50√2 V
(c) 100 V
(d) zero

Q43. What is the value of inductance L for which the current is maximum in a series LCR- circuit with C = 10 μF and ω = 1000 s⁻¹?
(a) 100 mH
(b) 1 mH
(c) 10 mH
(d) cannot be calculated unless R is known

Q44. The temperature coefficient of resistance of a wire is 0.00125° C⁻¹. At 27°C, its resistance is 1Ω. The temperature of the wire at which its resistance becomes 2Ω is:
(a) 1400 K
(b) 854°C
(c) 1127 K
(d) 1154 K.

Q45.Given below are two statements lebelled as Assertion(A) and Reason (R)

Assertion: Electron move away from a region of lower potential to a region of higher potential.
Reason: An electron has a negative charge.

(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

Q46.

Assertion : Electric lines of force never cross each other.
Reason : Electric field at a point superimpose to give one resultant electric field.

a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

Q47.

Assertion : Voltmeter is connected in parallel with the circuit.
Reason : Resistance of a voltmeter is very large.

(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

Q48.

Assertion : Cyclotron is a device which is used to accelerate the positive ion.
Reason : Cyclotron frequency depends upon the velocity.

(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect
Q49.   **Assertion :** The magnetic field produced by a current carrying solenoid is independent of its length and cross-sectional area.
**Reason :** The magnetic field inside the solenoid is uniform.

(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect
Section – C

This section consists of 6 multiple choice questions with an overall choice to attempt any 5 questions .In case more then desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

Q50.

A sphere 'P' of mass 6.4×10^{-15} kg is hanging between the two charged parallel plates as shown in figure. How many electrons can be added or removed from the sphere so that it still remains hanging?
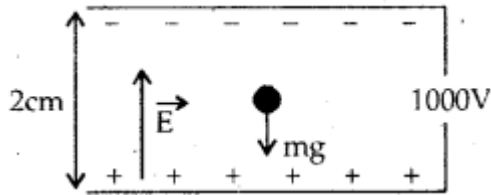
(a) 8 electrons can be added

(b) 8 electrons can be removed

(c) No. electron can be added or removed

(d) 8 electrons can be either removed or added.

Q51 In an experiment with potentiometer, null point with a cell is found at 240 cm. When the cell is shunted with a resistance 2 Ω, the null point becomes 120 cm internal resistance of cell is :

(a) 4 Ω

(b) 2 Ω

(c) 1 Ω

(d) 1/2 Ω

Case study ;

Read the following paragraph and answers the questions;

A transformer is essentially an a.c. device. It cannot work on d.c. It changes alternating voltages or currents. It does not affect the frequency of a.c. It is based on the phenomenon of mutual induction. A transformer essentially consists of two coils of insulated copper wire having different number of turns and wound on the same soft iron core.

The number of turns in the primary and secondary coils of an ideal transformer are 2000 and 50 respectively. The primary coil is connected to a main supply of 120 V and secondary coil is connected to a bulb of resistance 0.6 ohm.

Q52. The value of voltage across the secondary coil is

(a) 5V   (b) 2V   (c) 3 V   (d) 10 V

Q53. The value of current in the bulb is

(a) 7 A   (b) 15 A   (c) 3 A   (d) 5 A

Q54. The value of current in primary coil is

(a) 0.125 A   (b) 2.52 A   (c) 1.51 A   (d) 3.52 A

Q55. Power in primary coil is

(a) 20W   (b) 5W   (c) 10 W   (d) 15W