Q1. A circular loop of radius r, carrying a current I lies in y-z plane with its centre at the origin. The net magnetic flux through the loop is: **1 Mark**

A Directly proportional to r.
B Zero.
C Inversely proportional to r.
D Directly proportional to I.

Q2. A photocell connected in an electrical circuit is placed at a distance 'd' from a source of light. As a result, current I flows in the circuit. What will be the current in the circuit, when the distance is reduced to $\frac{d}{3}$? **1 Mark**

A I
B 6I
C 9I
D $\frac{I}{3}I$

Q3. The magnetic dipole moment of a current carrying coil does not depend upon: **1 Mark**

A Number of turns of the coil.
B Cross-sectional area of the coil.
C Current flowing in the coil.
D Material of the turns of the coil.

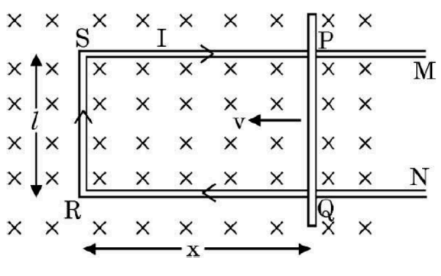
Q4. For a concave mirror of focal length 'f', the minimum distance between the object and its real image is: **1 Mark**

A zero **B** f **C** 2f **D** 4f

Q5. An electron and a proton are moving along the same direction with the same kinetic energy. They enter a uniform magnetic field acting perpendicular to their velocities. The dependence of radius of their paths on their masses is: **1 Mark**

A $r \propto m$
B $r \propto \sqrt{m}$
C $r \propto \frac{1}{m}$
D $r \propto \frac{1}{\sqrt{m}}$

Q6. Figure shows a rectangular conductor PSRQ in which movable arm PQ has a resistance 'r' and resistance of PSRQ is negligible. The magnitude of emf induced when PQ is moved with a velocity $\overrightarrow{v}$ does not depend on: **1 Mark**



A magnetic field $(\overrightarrow{B})$
B velocity $(\overrightarrow{v})$
C resistance (r)
D length of PQ

Q7. Above Curie temperature, a: **1 Mark**

A Ferromagnetic material becomes diamagnetic.
B Ferromagnetic material becomes paramagnetic.
C Paramagneticmaterial becomes ferromagnetic.
D Paramagnetic material becomes diamagnetic.

Q8. A current of 10A is flowing from east to west in a long straight wire kept on a horizontal table. The magnetic field developed at a distance 10cm verticaly above the wire is: **1 Mark**

A 1.2×10^{-5}T, acting towards south.
B 2×10^{-5}T, acting towards north.
C 3×10^{-5}T, acting downwards.
D 2×10^{-5}T, acting upwards.

Q9. There are uniform electric and magnetic fields in a region pointing along X-axis. An $\alpha-$ particle is projected along Y-axis with a velocity v. The shape of the trajectory will be: **1 Mark**

A Circular in XZ plane.
B Circular in YZ plane.
C Helical with its axis parallel to X-axis.
D Helical with its axis parallel to Y-axis.

Q10. A straight current carrying conductor is placed inside a uniform magnetic field. The force per unit length acting on the conductor is: **1 Mark**

A Maximum when the conductor is perpendicular to the direction of magnetic field.
B Maximum when the conductor is along the direction of magnetic field.
C Minimum when the conductor is perpendicular to the direction of magnetic field.
D Minimum when the conductor makes an angle of 45° with the direction of magnetic field.

Q11. A charged particle is placed between the two plates of a charged parallel plate capacitor. It experiences a force F. If one plate is removed, then the force on the particle will be: **1 Mark**

A 2F **B** F **C** $\frac{F}{2}$ **D** Zero

Q12. A diamagnetic substance is brought near the north or south pole of a bar magnet. It will be: **1 Mark**

A repelled by both the poles.
B attracted by both the poles.
C repelled by the north pole and attracted by the south pole.
D attracted by the north pole and repelled by the south pole.

Q13. A loop carrying a current I clockwise is placed in x y plane, in a uniform magnetic field directed along z-axis. The tendency of the loop will be to: **1 Mark**

A move along x-axis **B** move along y-axis **C** shrink **D** expand

Q14. A current of 5A is flowing from east to west in a long straight wire kept on a horizontal table. The magnetic field developed at a distance of 10cm due south on the table is: **1 Mark**

A 1×10^{-5}T acting downwards.
B 1×10^{-5}T acting upwards.
C 2×10^{-5}T acting downwards.
D 2×10^{-5}T acting upwards.

Q15. A current of 10A is flowing from east to west in a long straight wire kept on a horizontal table. The magnetic field developed at a distance of 10cm due north on the table is: **1 Mark**

A 2×10^{-5}T, acting downwards.
B 2×10^{-5}T, acting upwards.
C 4×10^{-5}T, acting downwards.
D 4×10^{-5}T, acting upwards.

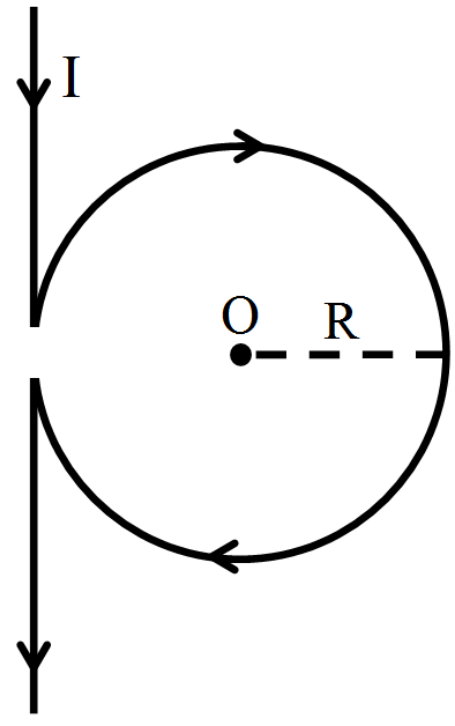
Q16. When two nuclei $(A \leq 10)$ fuse together to form a heavier nucleus, the: **1 Mark**

A Binding energy per nucleon increases.
B Binding energy per nucleon decreases.
C Binding energy per nucleon does not change.
D Total binding energy decreases.

Q17. A biconvex lens of glass having refractive index 1.47 is immersed in a liquid. It becomes invisible and behaves as a plane glass plate. The refractive index of the liquid is: **1 Mark**

A 1.47 **B** 1.62 **C** 1.33 **D** 1.51

Q18. A current I flows through a long straight conductor which is bent into a circular loop of radius R in the middle as shown in the figure: **1 Mark**



The magnitude of the net magnetic field at point O will be:

A Zero
B $\frac{\mu_0 I}{2R}(1+\pi)$
C $\frac{\mu_0 I}{4\pi R}$
D $\frac{\mu_0 I}{2R}\left(1-\frac{1}{\pi}\right)$

Q19. Which of the following statements is not correct according to Rutherford model **1 Mark**

A Most of the space inside an atom is empty.

B The electrons revolve around the nucleus under the influence of coulomb force acting on them.

C Most part of the mass of the atom and its positive charge are concentrated at its centre.

D The stability of atom was established by the model.

Q20. The minimum distance between an object and its real image formed by a convex lens of focal length f is: **1 Mark**

A f **B** 2f **C** $\frac{f}{2}$ **D** 4f

Q21. Which of the following pairs of media has the least value of critical angle? **1 Mark**

A Glass to air **B** Glass to water **C** Diamond to water **D** Diamond to air

Q22. Larger aperture of objective lens in an astronomical telescope: **1 Mark**

A Increases the resolving power of telescope.

B Decreases the brightness of the image.

C Increases the size of the image.

D Decreases the length of the telescope.

Q23. A biconvex lens of focal length f is cut into two identical plano convex lenses. The focal length of each part will be: **1 Mark**

A f **B** $\frac{f}{2}$ **C** $2f$ **D** $4f$

Q24. Ten capacitors, each of capacitance 1 μF, are connected in parallel to a source of 100 V. The total energy stored in the system is equal to: **1 Mark**

A 10^{-2} J **B** 10^{-3} J **C** $0{\cdot}5 \times 10^{-3}$ J **D** $0{\cdot}5 \times 10^{-2}$ J

Q25. A biconcave lens of power P vertically splits into two identical plano concave parts. The power of each part will be: **1 Mark**

A $2P$

B $\frac{P}{2}$

C P

D $\frac{P}{\sqrt{2}}$

Q26. An electron is released from rest in a region of uniform electric and magnetic fields acting parallel to each other. The electron will: **1 Mark**

A Move in a straight line.

B Move in a circle.

C Remain stationary.

D Move in a helical path.

Q27. Two identical circular coaxial coils A and B, arranged in vertical planes parallel to each other, carry currents in the same direction. **1 Mark**
If the distance between the coils is decreased at a constant rate, the current:

A Increases in A and decreases in B.

B Decreases in both A and B.

C Increases in both A and B.

D Remains same in both A and B.

Q28. A bar magnet is dropped in a hollow metallic cylinder along its vertical axis. The acceleration of the falling magnet will be: **1 Mark**

A Zero **B** Equal to g **C** Less than g **D** Greater than g

Q29. Two nuclei have their mass numbers in the ratio of 8 : 1. The ratio of their nuclear densities is: **1 Mark**

A 8 : 1 **B** 4 : 1 **C** 2 : 1 **D** 1 : 1

Q30. A charge particle after being accelerated through a potential difference 'V' enters in a uniform magnetic field and moves in a circle of radius r. If V is doubled, the radius of the circle will become: **1 Mark**

A $2r$

B $\sqrt{2}r$

C $4r$

D $\frac{r}{\sqrt{2}}$

Q31. For Questions two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**
Assertion (A): The mutual inductance between two coils is maximum when the coils are wound on each other.
Reason (R): The flux linkage between two coils is maximum when they are wound on each other.

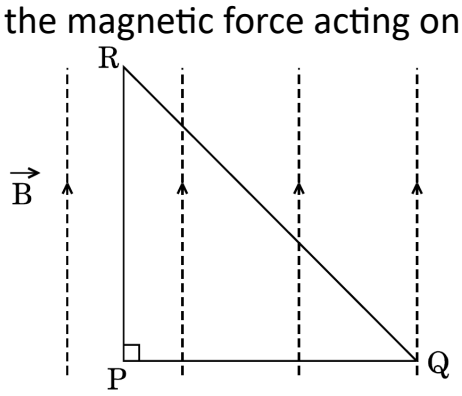
A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false and Reason (R) is also false.

Q32. An isosceles right angled current carrying loop PQR is placed in a uniform magnetic field $\vec{B}$ pointing along PR. If the magnetic force acting on the arm PQ is F, then the magnetic force which acts on the arm QR will be: **1 Mark**



A F

B $\frac{\mathrm{F}}{\sqrt{2}}$

C $\sqrt{2}\mathrm{F}$

D $-\mathrm{F}$

Q33. For a glass prism, the angle of minimum deviation will be smallest for the light of: **1 Mark**

A Red colour. **B** Blue colour. **C** Yellow colour. **D** Green colour.

Q34. The resolving power of a telescope can be increased by increasing: **1 Mark**

A Wavelength of light.

B Diameter of objective.

C Length of the tube.

D Focal length of eyepiece.

Q35. The mass density of a nucleus of mass number A is: **1 Mark**

A proportional to $\mathrm{A}^{\frac{1}{3}}$

B proportional to $\mathrm{A}^{\frac{2}{3}}$

C proportional to A^3

D independent of A

Q36. The material which is not suitable for making a permanent magnet is: **1 Mark**

A Steel. **B** Ticonal. **C** Lead. **D** Alnico.

Q37. The focal length of the objective of a compound microscope is: **1 Mark**

A Greater than the focal length of eyepiece.

B Lesser than the focal length of eyepiece.

C Equal to the focal length of eyepiece.

D Equal to the length of its tube.

Q38. An airplane with wingspan 50m is flying horizontally with a speed of 360kmhr^{-1} over a place where the vertical component of the earth's magnetic field is 2×10^{-2}. The potential difference between the tips of the wings would be **1 Mark**

A 100V **B** 1.0V **C** 0.2V **D** 0.01V

Q39. The image formed behind a mirror and a virtual image: **1 Mark**

A Are of same nature

B Are of different nature

C Are of same nature only in space

D Are of different nature only in space

Q40. A thin diamagnetic rod is placed vertically between the poles of an electromagnet. When the current in the electromagnet is switched on, then the diamagnetic rod is pushed up, out of the horizontal magnetic field. Hence, the rod gains gravitational potential energy. The work required to do this comes from: **1 Mark**

A The current source.

B The magnetic field.

C The induced electric field due to the changing magnetic field.

D The lattice structure of the material of the rod.

Q41. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: In high latitudes one sees colourful curtains of light hanging down from high altitudes

Reason: The high energy charged particles from the sun are deflected to polar regions by the magnetic field of the earth.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true but R is not the correct explanation of A.
C A is true but R is false.
D A is false and R is also false.

Q42. The rays of different colors fail to converge at a point after going through a converging lens. This defect is called _____. **1 Mark**

A Spherical aberration **B** Distortion **C** Coma **D** Chromatic aberration

Q43. Which of the following is not correct about relative magnetic permeability $(\mu,)$? **1 Mark**

A It is a dimensionsless pure ratio.
B For vacuum medium its value is one.
C For ferromagnetic materials $\mu, >> 1$
D For paramagnetic materials $\mu, > 1$

Q44. A circular loop carrying a current is replaced by an equivalent magnetic dipole. A point on the axis of the loop is in: **1 Mark**

A End-on position. **B** Broadside-on position. **C** Both. **D** None of these.

Q45. _____ exists in the region surrounding a magnet, in which force of the magnet can be detected. **1 Mark**

A Electric field. **B** Magnetic field. **C** Both. **D** None.

Q46. The mass number of a nucleus is equal to: **1 Mark**

A The number of neutrons in the nucleus.
B The number of protons in the nucleus.
C The number of nucleons in the nucleus.
D None of them.

Q47. In case of a Van de Graaff generator, the breakdown field of air is: **1 Mark**

A $2 \times 108V\ m^{-1}$ **B** $3 \times 106V\ m^{-1}$ **C** $2 \times 108V\ m^{-1}$ **D** $3 \times 104V\ m^{-1}$

Q48. The sensitivity of a tangent galvanometer can be increased by increasing: **1 Mark**

A The radius of the coil
B The external magnetic field
C The number of turns of the coil
D All the above

Q49. Which one of the following, when suspended freely, slowly sets itself parallel to the direction of the magnetic field? **1 Mark**

A Ferromagnetic materials.
B Diamagnetic materials.
C Paramagnetic materials.
D Ferrimagnetic materials.

Q50. Why are red coloured lights are used in traffic signals to stop the vehicles? **1 Mark**

A Minimum wavelength and less scatter.
B Maximum wavelength and more scatter.
C Maximum wavelength and less scatter.
D Less wavelength and less scatter.

Q51. Which of the following is used as standard for determination of atomic mass unit? **1 Mark**

A O^{16} **B** C^{12} **C** H^{1} **D** O^{17}

Q52. Which of the following is another term for magnetization? **1 Mark**

A Magnetic neutrality. **B** Magnetic polarization. **C** Magnetic power. **D** Magnetic moment.

Q53. How is galvanometer converted into a voltmeter? **1 Mark**

A By connecting a high resistance multiplier in parallel to the galvanometer.
B By connecting a low resistance multiplier in parallel to the galvanometer.
C By connecting a low resistance multiplier in series with the galvanometer.
D By connecting a high resistance multiplier in series with the galvanometer.

Q54. Which of the following is a natural magnet? **1 Mark**

A Magnetic needle **B** Bar magnet **C** Magnetite **D** Horseshoe magnet

Q55. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: Surface of a symmetrical conductor can be treated as equipotential surface

Reason: Charge can easily flow in a conductor.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true but R is not the correct explanation of A.
C A is true but R is false.
D A is false and R is also false.

Q56. The explosion of hydrogen bomb is based on the principle of: **1 Mark**

A Uncontrolled fission reaction
B Nuclear fusion reaction
C Controlled fission reaction
D Photoelectric effect

Q57. The short range attractive nuclear forces that are responsible for the binding of nucleons in a nucleus are supposed to be caused by the role played by the particles called: **1 Mark**

A Positron **B** m-Meson **C** K-Meson **D** π- Meson

Q58. Which of the following isotopes is used for treatment of cancer? **1 Mark**

1 Co^{60} **2** K^{40} **3** Sr^{90} **4** I^{131}

Q59. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: If the rays are diverging after emerging from a lens; the lens must be concave.
Reason: The convex lens can give diverging rays.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true but R is not the correct explanation of A.
C A is true but R is false.
D A is false and R is also false.

Q60. Total internal reflection can take place only if: **1 Mark**

1. Light goes from optically rarer medium (smaller refractive index) to optically denser medium.
2. Light goes from optically denser medium to rarer medium.
3. The refractive indices of the two media are close to each other.
4. The refractive indices of the two media are widely different.

Q61. The magnetic susceptibility is negative for: **1 Mark**

A Diamagnetic material only.
B Paramagnetic material only.
C Ferromagnetic material only.
D Paramagnetic and ferromagnetic materials.

Q62. The magnetic field of the earth can be modelled by that of a point dipole placed at the centre of the earth. The dipole axis makes an angle of 11.3° with the axis of the earth. At Mumbai, declination is nearly zero. Then, **1 Mark**

A The declination varies between 11.3° W to 11.3° E.
B The least declination is 0°.
C The plane defined by dipole axis and the earth axis passes through Greenwich.
D Declination averaged over the earth must be always negative.

Q63. What is the atomic mass (u) of calcium? **1 Mark**

A 10 **B** 20 **C** 30 **D** 40

Q64. A metal rod moves at a constant velocity in a direction perpendicular to its length. A constant uniform magnetic field exists in space in a direction perpendicular to the rod as well its velocity. Select correct statements (s) from the following. **1 Mark**

A the entire rod is at the same potential
B there is an electric field in the rod
C the electric potential is highest at the centre
D the electric potential is lowest at its centre and increases towards its ends

Q65. A temporary magnet is made of: **1 Mark**

A Cast iron. **B** Steel. **C** Soft iron. **D** Stainless steel.

Q66. The area of the coil must be._____ **1 Mark**

A $1.8m^2$ **B** $18m^2$ **C** $8m^2$ **D** none of these

Q67. Lorentz force is: **1 Mark**

A Electrostatic force acting on a charged particle.
B Magnetic force acting on a moving charged particle.
C The vector sum of electrostatic and magnetic force acting on a moving charged particle.
D The vector sum of gravitational and magnetic force acting on a moving charged particle

Q68. Which of the following is a wrong description of binding energy of a nucleus? **1 Mark**

A It is the energy required to break a nucleus into its constituent nucleons.
B It is the energy made available when free nucleons combine to form a nucleus.
C It is the sum of the rest mass energies of its nucleons minus the rest mass energy of the nucleus.
D It is the sum of the kinetic energy of all the nucleons in the nucleus.

Q69. M, M_n and M_p denotes the masses of a nucleus of ${}_ZX^A$, a neutron, and a proton respectively. If the nucleus is separated into its individual protons and neutrons then, **1 Mark**

A $M = (A-Z)M_n + ZM_p$
B $M = ZM_n + (A-Z)M_p$
C $M>(A-Z)M_n+ZM_p$
D $M<(A-Z)M_n+ZM_p$

Q70. A steady electric current is flowing through a cylindrical conductor. **1 Mark**

A The electric field at the axis of the conductor is zero.
B The magnetic field at the axis of the conductor is zero.
C The electric field in the vicinity of the conductor is zero.
D The magnetic field in the vicinity of the conductor is zero.

Q71. Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**
Assertion: By increasing the diameter of the objective of telescope, we can increase its range.
Reason: The range of a telescope tells us how far away a star of some standard brightness can be spotted by telescope.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true but R is not the correct explanation of A.
C A is true but R is false.
D A is false and R is also false.

Q72. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**
Assertion: The focal length of the convex mirror will increase, if the mirror is placed in water.
Reason: The focal length of a convex mirror of radius R is equal to , f = R/2.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true but R is not the correct explanation of A.
C A is true but R is false.
D A is false and R is also false.

Q73. A charged particle moves along a circle under the action of possible constant electric and magnetic fields. Which of the following are possible? **1 Mark**

A $\mathrm{E} = 0,\ \mathrm{B} = 0$
B $\mathrm{E} = 0,\ \mathrm{B} \neq 0$
C $\mathrm{E} \neq 0,\ \mathrm{B} = 0$
D $\mathrm{E} \neq 0,\ \mathrm{B} \neq 0$

Q74. Which of the following best describes the field due to a magnet ? **1 Mark**

A The region where its effects are felt.
B The two regions close to its poles.
C The region between its poles.
D The region where it aligns itself along the north-south direction.

Q75. Fusion reaction is also known as .....: **1 Mark**

A Chemical reaction **B** Elastic reaction **C** Thermonuclear reaction **D** Photonuclear reaction

Q76. Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**
Assertion (A): An aircraft flies along the meridian, the potential develops at the ends of its wings.
Reason (R): Whenever there is change in the magnetic flux e.m.f. induces.

A Both A and R are true and R is the correct explanation of A.
B Both A and Rare true but R is NOT the correct explanation of A.
C A is true but R is false.
D A is false and R is also false.

Q77. The current sensitibility of a moving coil galanometer increases with decrease in: **1 Mark**

1 Magnetic field **2** Area of a coil **3** Number of turns **4** None of these

Q78. For question, statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a) (b) (c) and (d) as given below. **1 Mark**
Assertion (A): Rydberg's constant varies with the mass number of a given element.
Reason (R): The reduced mass of the electron depends on the mass of the nucleus only.

A Both A and R are true, and R is the correct explanation of A.
B Both A and R are true, but R is NOT the correct explanation of A.
C A is true, but R is false.
D A is false and R is also false.

Q79. Lenz's law is a direct consequence of: **1 Mark**

A The law of conservation of momentum.
B The law of conservation of charge.
C The law of conservation of energy.
D The law of conservation of emf.

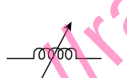
Q80. A charged particle moves through a magnetic field in a direction perpendicular to it. Then the: **1 Mark**

A Velocity remains unchanged.
B Speed of the particle remains unchanged.
C Direction of the particle remains unchanged.
D Acceleration remains unchanged.

Q81. Sun maintains its shining because of: **1 Mark**

A The fission of helium
B Chemical reactoin
C Fusion of hydrogen nuclei
D Burning of carbon

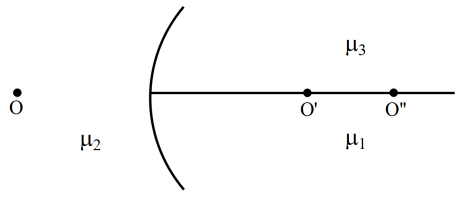
Q82. Given below are the symbols of a few electronic components. Which of these components denote a variable inductor? **1 Mark**

A 
B 
C 
D 

Q83. A charged particle enters a magnetic field H with its initial velocity making an angle of 45° with H. Then the path of the particle will be: **1 Mark**

A Circle
B Helical
C A straight line
D A circle

Q84. Three transparent media of refractive indices μ_1, μ_2 and μ_3. A point object O is placed in the medium μ_2. If the entire medium on the right of the spherical surface has refractive index μ_1, the image forms at O'. If this entire medium has refractive index μ_3, the image forms at O". In the situation shown: **1 Mark**



A The image forms between O' and O"
B The image forms to the left of O'
C The image forms to the right of O"
D Two images form, one at O' and the other at O".

Q85. A point source of light is placed in front of a plane mirror: **1 Mark**

1. All the reflected rays meet at a point when produced backward.
2. Only the reflected rays close to the normal meet at a point when produced backward.
3. Only the reflected rays making a small angle with the mirror, meet at a point when produced backward.
4. Light of different colours make different images.

Q86. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**
Assertion: A magnet remains stable, If it aligns itself with the field
Reason: The P.E. of a bar magnet is minimum, if it is parallel to magnetic field.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true and R is not correct explanation of A.

C A is true, But R is false.

D A is false, But R is true.

Q87. Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: Endoscopy involves use of optical fibres to study intemal organs.

Reason: Optical fibres are based on phenomena of total internal reflection.

A Both A and R are true and R is the correct explanation of A.

B Both A and R are true but R is not the correct explanation of A.

C A is true but R is false.

D A is false and R is also false.

Q88. Two streams of protons move parallel to each other in the same direction. They will: **1 Mark**

A Attract each other

B Repel each other

C Neither attract nor repel

D Rotate

Q89. The value of mutual inductance can be increased by. **1 Mark**

A decreasing N

B increasing N

C winding the coil on wooden frame

D winding the coil on china clay

Q90. Core of elctromagnets are made of ferromagnetic materials which have: **1 Mark**

A Low permeability and low retentivity.

B High permeability and high retentivity.

C High permeability and high retentivity.

D Low permeability and high retentivity.

Q91. Complete the reaction: **1 Mark**

$_{86}Rn^{220} \rightarrow {}_{84}Po^{216} +$ _____:

A β **B** γ **C** α **D** H_1^1

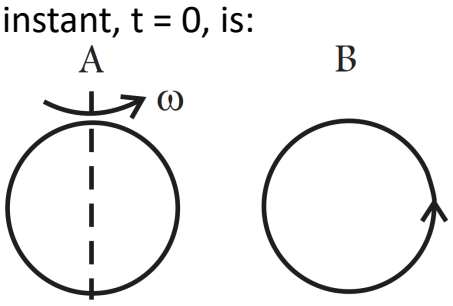
Q92. The hysteresis cycle for the material of permanent magnet is: **1 Mark**

A Short and wide. **B** Tall and narrow. **C** Tall and wide. **D** Short and narrow.

Q93. The self inductance of a straight conductor is. **1 Mark**

A Zero **B** Infinity **C** Very large **D** Very small

Q94. Same as problem 4 except the coil A is made to rotate about a vertical axis (Fig). No current flows in B if A is at rest. The current in coil A, when the current in B (at t = 0) is counterclockwise and the coil A is as shown at this instant, t = 0, is: **1 Mark**



A Constant current clockwise.

B Varying current clockwise.

C Varying current counterclockwise.

D Constant current counterclockwise.

Q95. If a star can convert all the He nuclei completely into oxygen nuclei. The energy released per oxygen nuclei is [Mass of He nucleus is 4.0026 amu and mass of Oxygen nucleus is 15.9994 amu]: **1 Mark**

A 7.6 MeV. **B** 56.12 MeV. **C** 10.24 MeV. **D** 23.9 MeV.

Q96. Among the following _____ has the highest retentivity. **1 Mark**

A Aluminium **B** Steel **C** Nickel **D** Soft iron

Q97. In ...X... water is circulated though the reactor vessel and transfers energy to steam generator in the ...Y... Here, X and Y refer to: **1 Mark**

A Primary loop, secondary loop.

B Reactor core, turbine.

C Secondary loop, primary loop.

D Turbine, reactor core.

Q98. Consider the following statements and select the incorrect statement(s). **1 Mark**

1. The presence of a large magnetic flux through a coil maintains a current in the coil if the circuit is continuous.

2. A coil of a metal wire kept stationary in a non– uniform magnetic field has an e.m.f induced in it.
3. A charged particle enters a region of uniform magnetic field at an angle of 85° to the magnetic lines of force, the path of the particle is a circle.
4. There is no change in the energy of a charged particle moving in a magnetic field, although a magnetic force is acting on it.

A I and II. **B** II and III. **C** II only. **D** IV only.

Q99. Chadwick was awarded the 1935 nobel prize in physics for his discovery of the: **1 Mark**

A Electron. **B** Proton. **C** Neutron. **D** Positron.

Q100. The mutual inductance M_{12} of coil 1 with respect to coil 2:I **1 Mark**

A ncreases when they are brought nearer.
B Depends on the current passing through the coils.
C Increases when one of them is rotated about an axis.
D Is the same as M_{21} of coil 2 with respect to coil 1.