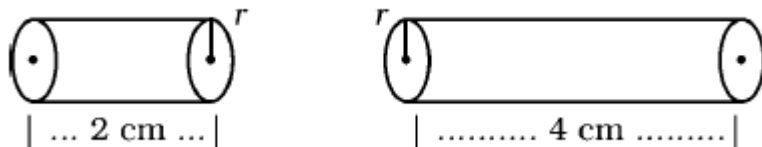


Rajasthan Board Class 12 Physics Important Questions

- 1) Write resistance of an ideal voltmeter and an ideal ammeter.
- 2) Write 2 properties of Magnetic Lines of Force.
- 3) Write the working principle of an optical fibre.
- 4) Define Super Conductivity.
- 5) Draw hysteresis curve (B-H curve) for a ferromagnetic substance.
- 6) Find the de-Broglie wavelength related to an electron accelerated by 10^4 volt.
- 7) Define Curie temperature in magnetism.
- 8) A charged particle oscillates about its equilibrium position with a frequency of 100MHz. What is the frequency of electromagnetic waves produced by the oscillator?
- 9) A light bulb is rated at 100W for a 220 V supply. Find the peak voltage of the source.
- 10) In the figure, resistivity of two conductors of the same material are $\rho_1 \Omega\text{-m}$ and $\rho_2 \Omega\text{-m}$ respectively. Write the value of the ratio of ρ_1 and ρ_2 .



- 11) Define binding energy per nucleon and draw a graph of it with mass number.
- 12) a) Write the definition of Curie temperature for ferromagnetic substances.
b) Obtain an expression for the magnetic moment of an orbital electron.
- 13) Draw a labelled diagram of an alternating current generator. Determine the induced electromotive force by the rotation of the coil in it.
- 14) The length of the side of a square loop is 4m. This loop is placed in a uniform magnetic field of 2.5T. Outside the loop, the magnetic field is zero and it is coming outside from magnetic field perpendicularly with velocity 2m/s. Find the value of induced emf in the loop after one second.
- 15) Write the name of any four waves (radiations) produced in the electromagnetic spectrum.

16) What is logic gates? Write two names of universal logic gates.

17) What is the displacement current? Obtain an expression of displacement current for a charged capacitor. Write Ampere- Maxwell's law.

18) Write the method to determine the value of an unknown resistance by meter bridge and derive the necessary formula. Draw the circuit diagram.

19) (a) Define potential gradient.

(b) Write Kirchhoff's junction rule.

In the given diagram write the value of current I.



20) A ray of light is incident at Brewster's angle on the surface of a transparent medium. Deduce Brewster's law by using Snell's law.

21) Draw the circuit diagram of a practical arrangement to study the characteristics PNP transistor in common emitter configuration. Sketch typical output characteristics curves and explain the calculation of current gain from these curves.

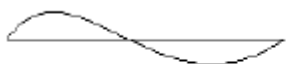
22) State Bio-Savart Law. Using this law, find an expression for the magnetic field at a point on the axis of a current-carrying circular coil.

23) (a) What does mean by the magnifying power of a Microscope?

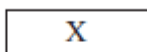
(b) An object is placed at 20cm from a convex lens. If 3 times magnified real image is formed by the lens then find the focal length of the lens.

24) What does mean by mass defect? Establish a relationship between mass defect and nuclear binding energy. And hence write the expression for binding energy per nucleon.

25) Write the name of device "X" in the following given diagram. Explain its working making its circuit diagram.



Input signal



Output signal

26) Determine the force acting between two parallel current-carrying conductor wires. Write a theoretical definition of ampere on this basis.

27) Write Gauss's Law. Determine the electric field at the points which are situated outside and inside of a uniformly charged thin spherical shell. Draw necessary diagrams of Gaussian surfaces.

28) Match the frequency:

	Column I		Column II
i)	Resonant frequency	a)	$VI \cos \phi$
ii)	Quality factor	b)	$\frac{1}{2} LI^2$
iii)	Average power	c)	$\frac{1}{\sqrt{LC}}$
iv)	Impedance	d)	$\sqrt{R^2 + (X_L - X_C)^2}$
v)	Magnetic potential energy	e)	$\frac{-E}{\left(\frac{dI}{dt}\right)}$
vi)	Coefficient of self-induction	f)	$\frac{\omega_0 L}{R}$

29) Define the following:

- (a) Total internal reflection
- (b) Diffraction of light
- (c) Refraction of light.

30) Define common emitter output characteristic for a transistor.

Draw a circuit diagram for studying the characteristics of an n-p-n transistor in common emitter configuration. Among emitter, base and collector regions of a transistor which one is (a) largest in size and (b) most heavily doped?

31) Write the principle of a capacitor. Derive an expression for the capacitance of a parallel plate capacitor, partially filled with dielectric. Draw the necessary diagram.

32) What is meant by diffraction? Differentiate between diffraction of light and sound waves. Draw the intensity distribution curve in frounhofer diffraction due to a single slit. Explain to maximum intensity in this diffraction.

33) Write one merit and one de-merit of alternating current in comparison of direct current. Obtain an expression for followings in a pure inductive alternating current circuit-

(i) Instantaneous value of current

(ii) Reactance of circuit

(iii) Peak value of current

Draw curve for power in a pure inductive circuit.

34) Write definitions of the plane of vibration and plane of polarisation. Explain the working process to obtain plane polarised light by Nicol prism. Draw the necessary diagram.

35) Describe the construction and the working of Van de graff generator making the labelled diagram.

36) What is a Polaroid? Write any two uses of it. How will you identify the polarised light, the partially polarised light and the unpolarised light?

37) Describe the construction of a compound microscope. Derive an expression for its total magnification. Draw a ray diagram for the formation of an image by a compound microscope.

38) What is rectification? Draw the circuit diagram of the half-wave rectifier and explain its working. Show the input ac voltage and output voltage waveforms from the rectifier circuit.

39) Write the working of the cyclotron in brief. Draw a schematic sketch of the cyclotron showing path of accelerated charged particles (ions) in both Dees.

Derive the following parameters of cyclotron:

(a) Cyclotron frequency and

(b) The kinetic energy of ions in a cyclotron.

40) Define interference of light waves.

Draw a diagram of Young's double slit experiment to produce an interference fringe pattern. Derive an expression of fringe width for bright fringes.