CBSE Sample Paper 9

General Instruction:

1. Answer all questions
2. Internal choices are provided for some questions
3. Question numbers 1 to 8 are very short answer questions and carry 1 mark each.
4. Question numbers 8 to 18 are short answer questions and carry 2 marks each.

5. Question numbers 19 to 27 are also short answer questions and carry 3 marks each.
6. Question numbers 28 to 30 are long answer questions and carry 5 marks each.

7. Use log tables if necessary.

8. There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions of five marks each. You have to attempt only one of the choices in such questions.

9. You may use the following values of physical constants wherever necessary:

$c = 3 \times 10^{8}\ ms^{-1}$
$h = 6.626 \times 10^{-34}\ Js$
$e = 1.602 \times 10^{-19}\ C$
$\mu_0 = 4\pi \times 10^{-7}\ TmA^{-1}$
Mass of electron $m_e = 9.1 \times 10^{-31}\ kg$
Mass of neutron $m_n = 1.675 \times 10^{-27}\ kg$
Boltzmann's constant $k = 1.381 \times 10^{-23}\ JK^{-1}$
Avogadro's number $NA = 6.022 \times 10^{23}\ mol^{-1}$
Radius of earth = 6400 km

Very Short Answer type questions

Question 1

What is the SI unit for Magnetic Dipole moment?

Question 2

Three capacitors have capacitances of 0.5 μF, 0.3 μF and 0.2 μF respectively. They are first connected to have maximum capacitance and then connected to have minimum capacitance. Find the ratio of maximum capacitance to minimum capacitance

Question 3

An 8 ohm resistance wire is bent into middle by 180^0 and both the halves are twisted into each other. Finds it new resistance

Question 4

What is the dimension of quantity CR where C is capacitance and R is Resistance?

Question 5

A hollow metal sphere has large charge on its surface. What is the electric field inside the sphere?

Question 6

What do you mean by depletion layer and Potential barrier?

Question 7

Explain the meaning of excited atom?

Question 8

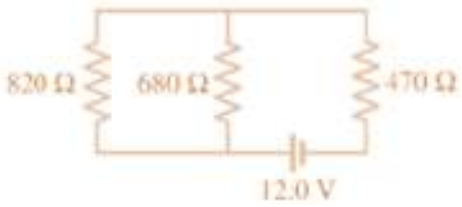
Define emissivity e of the surface?

Short Answer type questions

Question 9

Three identical charges of +q are placed at three corners of a square with sides of length L. The magnitude of the electric field at the center of the square is?

Question 10



Find the equivalent resistance, Current & voltage in each resistor

Question 11

True or False statement

a) Radioactive substance does not emits protons
b) Deflection of alpha particles and beta particles are opposite in electric field
c) Gamma rays are not deflected by electric and magnetic fields
d) Gamma rays have highest penetrating power among the particle emitted by the radioactive substance
e) Radioactive substance can simultaneously emit both alpha and beta particles

Question 12

What is Lenz's Law? With the help of Lenz's Law, Find the direction of current in circular in below situation

Question 13

Find out the wavelength of the second line of Lyman series of Hydrogen spectrum?

Question 14

Explain phasors diagram. Draw the phasors diagram for the circuit containing Inductance and Resistance

Question 15

Give reason for any three of these
a) Electric field inside a charged conductor is zero?
b) Electrical conductivity of earth atmosphere increases with altitude?
c) Electrons in metal drift due to force exerted on them by the electric field but they do not acquire net average acceleration?
d) When the bulb is operated at low frequency electricity, the light flicker noticeably,

Question 16

A parallel plate capacitor is charged to a certain potential difference. When a 3 mm thick slab is slipped between the capacitor plates then to maintain the same Potential difference between the plates, the plate separation has to be increased by 2.4 mm. Find the dielectric constant of the slab

Question 17

The work function of a metal is 1.5 eV. Find the maximum kinetic energy of the photo electrons when the metal is illuminated with light of wavelength 6600 Å?

Question 18

A coil in the shape of an equilateral triangle of side .02 m is suspended from a vertex such that it is hanging in a vertical plane. A horizontal magnetic field $5X10^{-2}$ T exists in the region. Find the torque acting on the coil when a current of .2 A is passed through it

Question 19

Two charged particle, q_1= +5.00 C and q_2 = −3.00 C, are separated by .35 m.

(a) What is the potential energy of the pair? Explain the significance of the algebraic sign in your answer.
(b) What is the electric potential at a point midway between the charged particles?

Question 20

A plastic hemisphere has a radius of curvature of 8 cm and an index of refraction of 1.6. On the axis halfway between the plane surface and spherical one (4 cm from each) is a small object. How far from surface does the object appear to be when viewed along the axis of the spherical surface?

Question 21

A nuclear fission process of .001 kg of Uranium produces a mass lost of .92 milligram. The Process is used in a Power house of 400 MW power. How much Uranium will be required for the functioning of the plant if the efficiency of the plant is 20%**?**

Question 22

A capacitor of capacitance 1μF withstands the maximum voltage of 6KV while another capacitor of capacitance of 2 μF withstands the maximum voltage of 4KV. Now these capacitor are connected in series. What maximum voltage the system can withstand?

Question 23

Explain the working LASER with neat diagram?

Question 24

Write down all the fundamental particles and Describe few words about them

Question 25

The voltage equation of an alternating current source is given by

$$E = 120\sin(\omega t + \frac{\pi}{6})$$

The current equation in the circuit is given by

$$I = 5\sin(\omega t - \frac{\pi}{6})$$

Calculate following

1) V_{rms} and I_{rms}

2) Impedance

3) Power loss in the circuit

Question 26

A copper rod of length L is moving with uniform velocity v_0 parallel to a long straight wire carrying a current I. The rod itself is perpendicular to the wire with its ends at distance and b from it. Calculate the EMF induced in the rod

Question 27

i) Derive the expression for the radius of the nth orbit of hydrogen atom using Bohr postulates

ii) what is the radius and angular momentum of the electron in the nth Bohr orbit if the radius of first orbit is r_0

Question 28

Find the current and voltage drop across each resistor

OR

i)The focal lengths of the objective and the eyepiece of an astronomical telescope are 200 cm and 5cm respectively. What is the magnifying power if the final image is formed at infinity?

ii) You are given three convex lens of focal length 20 cm ,2 cm and 3 cm which two lens should be used for the construction of a telescope in order to obtain maximum magnification?

Question 29

What is a transistor? Compare p-n-p and n-p-n Transistors

Question 30

What do you mean by half life time of the radioactive element?. Explain half –life time and decay constant by drawing a curve between indisintegrated atoms of the elements and time

OR

Explain the principle ,working and construction with neat diagram of a AC dynamo.