CBSE Sample Paper – 2015
Class - XII
Sub :- Physics

Time : 3:15 Hr. M.M. 70

(Marks :- 1to 5 = 1Each, 6 to 10 = 2 Each, 11 to 22 = 3 Each, 23 = 4, 24 to 26 = 5 Each)

Q.1 Frequency of A.C is 50 Hz. It is applied on a rectifier. What is frequency of current out put.

Q.2 A ray of light is moving from rare to dense medium its speed decreases. It its energy decreases. Explain.

Q.3 Why is it necessary that the field lines from a point charge placed in the vicinity of a conductor must be normal to the surface of the conductor at every point?

Q.4 a steady current flows in a metallic conductor of non-uniform cross-section. Which of these quantities is constant along the conductor : Current, Current density, Drift speed, Electric field?

Q.5 Name the electromagnetic radiations which are produced when high energy electrons are bombarded on a metal target.

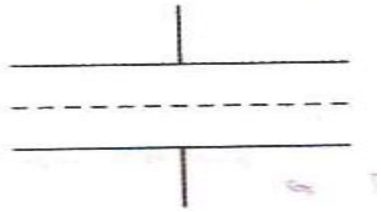
Q.6 In the Rutherford scattering experiment the distance of closest approach for an A-particle is d_0. If a-particle is replaced by a proton, how much kinetic energy in comparison to a-particle will it require to have the same distance of closest approach d_0?

Q.7 State the Faraday's law of electromagnetic induction.

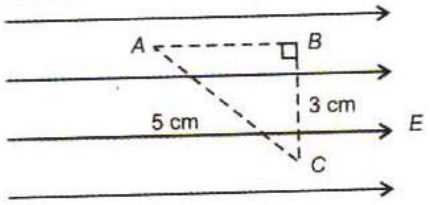
Q.8 Figure shows a sheet of aluminum foil of negligible thickness placed between the plates of a capacitor. How will its capacitance be affected if

(i) the foil is electrically insulated?

(ii) the foil is connected to the upper plate with a conducting wire?



Q.9 Three points A,B and C lie in a uniform electric field (E) of 5×10^{3} NC^{-1} as shown in the figure. Find the potential difference between A and C.



OR

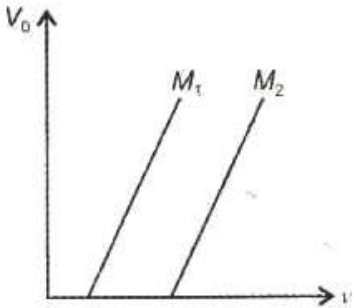
The sun of two point charges in 7μC. They repel each other with a force of 1 N when kept 30 cm apart in free space. Calculate the value of each charge.

Q.10 Name the electromagnetic radiations having the wavelength range from 1 mm to 700 mm. Give its two important applications.

Q.11 A wire of length L is bent round in the form of a coil having N turns of same radius. If a steady current I flows through it in a clockwise direction, find the magnitude and direction of the magnetic field produced at its centre.

Q.12 Derive an expression for the de-Broglie wavelength associated with an electron accelerated through a potential V. Draw a schematic diagram of a localized-wave describing the wave nature of the moving electron.

Q.13 Figure shows variation of stopping potential (V_0) with the frequency (v) for two photosensitive materials M_1 and M_2.



(i) Why is the slope same for both lines ?

(ii) For which material will the emitted electrons have grater kinetic energy for the incident radiations of the same frequency? Justify your answer.

Q.14 The energy of the electron in the ground state of hydrogen atom is -13.6 eV.

(i) What does the negative sign signify?

(ii) How much energy is required to take an electron in this atom from the ground state to the first excited state?

Q.15 Draw the logic symbol of the gate whose truth table is given below :

Input		Output
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

If the logic gate is connected to NOT gate, what will be the output when (i) A=0, B=0 and (ii) A=1, B=1? Draw the logic symbol of the combination.

Q.16 (i) What is line of sight communication?

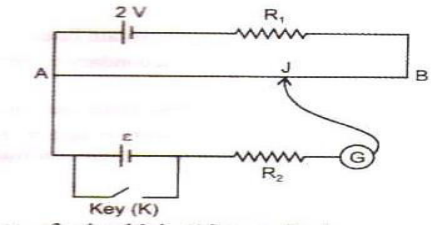
(ii) Why is it not possible to use sky wave propagation for transmission of TV signals?

Q.17 (i) How are eddy currents reduced in a metallic core?

(ii) Give two uses of eddy currents.

Q.18 Define the term 'electric dipole moment'. Is it a scalar or vector? Deduce an expression for the electric field at a point on the equatorial plane of an electric dipole of length 2a.

Q.19 State Kirchhoff's rules. Use Kirchhoff's rules to show that no current flows in the given circuit.



Q.20 (a) State the principle of working of a potentiometer.

(b) Figure shows the circuit diagram of a potentiometer for determining the emf 'ε' of a cell of negligible internal resistance.

(i) What is the purpose of using high resistance R2 ?

(ii) How does the position of balance point (J) change when the resistance R1 is decreased ?

(iii) Why cannot the balance point be obtained

(1) When the emf'E is grater than 2V, and

(2) When the key (K) is closed?

Q.21 Deduce the expression for the torque experienced by a rectangular loop carrying a steady current 'I' and placed in a uniform magnetic field B. Indicate the direction of the torque acting on the loop.

OR

Deduce the expression for magnetic dipole moment of an electron revolving around the nucleus in a circular orbit of radius 'r'. Indicate the direction of the magnetic dipole moment.

Q.22 Depict the field-line pattern due to a current carrying solenoid of finite length.

(i) In what way do these lines differ from those due to an electric dipole?

(ii) Why can't two magnetic field lines intersect each other ?

Q.23 Mr. Sharma conducted a interview to select a physics teacher. x and y attended the interview Mr. Sharma asked three questions –

(a) Why potentiometer is better than voltmeter.

(b) Why balancing point is used to take at mid of Meter bridge wire

(c) How the sensitivity of potentiometer can increased.

Mr. X replied the answer of all questions. But Mr. y only one. Principal of school ordered to select y. but Mr. Sharma refused to do so. He selected x.

(i) Write the answers of three questions.

(ii) What value displayed by Mr. Sharma

Q.24 Derive an expression for the instantaneous value of the emf induced in coil. Why is the emf maximum when the plane of the armature is parallel to the magnetic field?

Q.25 (a) Draw a ray diagram for formation of image of a point object by a thin double convex lens having radii of curvatures R1 and R2 and hence derive lens maker's formula.

(b) Define power of a lens and give its S.I. units.

If a convex lens of length 50 cm is placed in contact coaxially with a concave lens of focal length 20 cm, what is the power of the combination?

OR

Draw a labeled ray diagram to show the image formation by an astronomical telescope.

Derive the expression for its magnifying power in normal adjustment.

Write two basic features which can distinguish between a telescope and a compound microscope.

Q.26 (a) Explain the formation of 'depletion layer' and 'barrier potential' in a *p-n* junction.

(b) With the help of labeled circuit diagram explain the use of a *p-n* junction diode as a full wave rectifier. Draw the input and output waveforms.

OR

Draw a circuit diagram of an *n-p-n* transistor with its emitter base junction forward biased and base collector junction reverse biased. Describe briefly its working.

Explain how a transistor in active state exhibits a low resistance at its emitter base junction and high resistance at its base collector junction.

Draw a circuit diagram and explain the operation of a transistor as a switch.

By :-
Ajay Sharma
(Faculty of Physics)
Prince Academy, Sikar (Raj.)
Mob :- 9414368091
Email – sharmaajay846@gmail.com