RAHEIN EDUCATION PVT. LTD.

RAHEIN EDUCATION PHYSICS

CONTACT: 9205010851

Website: www.raheineducation.com

PHYSICS PRACTICE PAPER



BY Asst. Prof. Tarun Kumar Gautam (B.Tech, M.Tech, PhD (P))

Currently working in Jamia Hamdard, (HSC), Delhi

Working on Nano Technology with Rise University, USA

Author of 8 books regarding Physics and Engineering Subject.

Ex-Faculty of Rajshree Institute of Management & Technology (RMIT), Braeilly, Uttar Prdesh

Ex-Faculty of Assistant professor in Krishna Engineering Collage (KEC), Ghaziabad, Uttar Prdesh Member of Educational Project in University of Petroleum and Energy Studies (UPES),

UK



RAHEIN EDUCATION





PHYSICS



PHYSICS (BASED ON LATEST PATTERN)

RAHEIN EDUCATION PHYSICS

Practice Paper – 1

CLASS - XII

SECTION - A

1) Two spherical conductors B and C having equal radii and carrying equal charges in them repel each other with a force F when kept apart at some distance. A third spherical conductor having same radius as that of B but uncharged is bought in contact with B, then brought in contact with C finally removed away from both. The new force of repulsion between B and C is

$(a) \frac{F}{-}$	$(b)\frac{3F}{}$	$(c) \frac{F}{F}$	$(d) \frac{3F}{2}$
(a) 4	(0) 4	8	(u) 8
2) A 5 cm radius conducting sphere has a surface charge density of 2×10^{-6} C/m ² on its surface. Its			
electric potential, relative to the potential, relative to the potential far away, is:			
(a) $1.1 \times 10^4 \mathrm{V}$	(b) $2.2 \times 10^4 \mathrm{V}$	(c) $2.3 \times 10^5 \text{ V}$	(d) 3.6×10^5 V
3) The resistance of a conductor is 5 Ω at 50° C, and 6 Ω at 100°C. What is its resistance at 0°C?			
(a)1Ω	(b) 2Ω	(c) 3Ω	(d) 4Ω
4) In the formula $\vec{F} = q$	$(\vec{v} \times \vec{B})$:		
(a) \vec{F} must be perpendicular to \vec{v} but not necessarily to \vec{B}			
(b) \vec{F} must be perpendicular to \vec{B} but not necessarily to \vec{v}			
(c) \vec{F} must be perpendicular to \vec{B} but not necessarily to \vec{F}			
(d) \vec{F} must be perpendicular to both \vec{v} and \vec{B}			
5) According to Gauss' law for magnetism, magnetic field lines:			
(a) from closed loops			
(b) Start at south poles and end at north poles			
(c) Start at north poles and end at south poles			
(d) Start at north poles and south poles and end at infinity			
6) 1 Weber is the same as			
(a) 1 V/s	(b) 1 T/s	(c) 1 T/m	(d) 1T.m ²
7) Displacement current is:			
(a) $d\Phi_{\rm E}/dt$	(b) $\epsilon_0 d\Phi_{\rm E}/dt$	(c) $\mu_0 d\Phi_{\rm E}/dt$	(d) $\mu_0 \epsilon_0 \ d\Phi_{\rm E} / \ dt$
8) Which rays are not the portion of electromagnetic spectrum?			
(a) X- rays	(b) Microwaves	(c) α-rays	(d) Radiowaves

9) An object is placed at a distance equal to focal length of convex mirror. If the focal length of the mirror be f, then the distance of the image from the pole of the mirror is:

RAHEIN EDUCATION PHYSICS

(a) Less than f (b) equal to f (c) more than f (d) infinite

www.raheineducation.com

10) A point object O is placed in front of a glass rod having spherical end of radius of curvature 30cm. The image would be formed at



19) Give the ratio of the number of holes and the number of conduction electrons in an intrinsic semiconductor.

20) Write which are isotones among the nuclei $^{24}_{12}$ Mg, $^{14}_{6}$ C, $^{16}_{8}$ O, $^{11}_{5}$ B.

www.raheineducation.com

Or

RAHEIN EDUCATION PHYSICS

Write any three moderators which are used in nuclear reactors.

SECTION-B

21) State two limitations of cyclotron.

Or

Suggest any three ways to choose amperian loop.

22) Find the wavelength of electromagnetic waves of frequencies 4×10^{17} Hz in free space. Give its two applications.

23) Explain the shaking of picture in TV screen is observed, when a low flying airplane passes overhead.

24) Prove that equipotential surfaces are closer in the region of strong electric field and wider in the region of weak electric field.

Or

As shown in below figure a dielectric material of dielectric constant κ is interested in half portion between the plates of a parallel plate capacitor. If its initial capacitance is 2C, find the new capacitance.



25) Two identical cells, whether joined together in series or in parallel give the same current, when connected to an external resistance of 1Ω . Find the internal resistance of each cell.

26) A women travelling in a car during heavy rain and thunderstorm, watches a boy standing under a tree. She stops her car and asks the boy to get inside the car.

(a) It is safer for boy to be remain inside the car. Explain.

(b) What danger did the boy had while standing under the tree during the thunderstorm and heavy rain?

27) How can you say that a capacitor leaks charges?

RAHEIN EDUCATION www.raheineducation.com PHYSICS

SECTION – C

28) Define electric potential and deduce an expression for it due to a point charge at a distance 'r' from it.

29) Draw a schematic arrangements for winding of primary and secondary coils in a transformer with the two coils on separate limbs of the core. State its underlying principle and find therelation between the primary and secondary windings. How are the currents in the primary and secondary coils related to the voltages in the case of an ideal transformer?

Or

Give some of the important characteristics of the series resonant circuits.

30) For the same angle of incidence, the angle of refraction in three different media A, B and C are 15°, 25° and 35° respectively. In which medium will the velocity of light be minimum?

31) A bar magnet of magnetic moment m and moment of inertia I (about centre, perpendicular to length) is cut into two equal pieces, perpendicular to length. Let T be the period of oscillations of the original magnet about an axis through the mid point, perpendicular to length, in a magnetic field B. What would be the similar period 'T' for each piece?

32) (a) The energy levels of a hypothetical hydrogen like atom are shown in the figure. Find out the transition, from the ones shown in the figure, which will result in the emission of a photon of wavelength 275 nm.

(b) Which of these transitions corresponds to the emission of radiation of (i) maximum and (ii) minimum wavelength?



33) The length of potential barrier versus width of depletion region for an unbiased diode is shown in A. In comparison to A, graph B and C are obtained after biasing the diode in different ways. Identity the type of biasing B and C and justify your answer.



34) The sequence of stepwise decay of a radioactive nucleus is

 $D \xrightarrow{\alpha} D_1 \xrightarrow{\beta^-} D_2$

If the mass number and atomic number of D_2 ARE 176 and 71 respectively, what are their corresponding values for D ?

RAHEIN EDUCATION www.raheineducation.com PHYSICS

SECTION – D

35) Explain briefly with the help of a labeled diagram, the basic principle of the working of an a.c. generator.

In an a.c. generator coil of N turns and area A is rotated at *v* revolutions per second in a uniform magnetic field B. Write the expression for the emf produced.

A 100-turn coil of area 0.1m^2 rotates at a half a revolution per second. It is placed in a magnetic field 0.01 T perpendicular to the axis of rotation of the coil. Calculate the maximum voltage generated in the coil.

Or

State Faraday's law of electromagnetic induction.

Figure shows a rectangular conductor PQRS in which the conductor PQ is free to move in a uniform magnetic field B perpendicular to the plane of the paper. The field extends from x = 0 to x = b and is zero for x > b. Assume that only the arm PQ possesses resistance r. When the arm PQ is pulled outward from x = 0 to x = 2b and is then moved backward to x=0 with constant speed v, obtain the expressions for the flux and the induced emf. Sketch the variations of these quantities with distance $0 \le x \le 2b$.



36) Figure shows that variations of the stopping potential V_0 with the frequency (v) of the incident radiations for two different photosensitive materials M_1 and M_2 .

(i) What are the values of work functions for M_1 and M_2 ?

(ii) The values of the stopping potential for M_1 and M_2 for a frequency v_3 (> v_{02}) of the incident radiations are $\frac{V_1 - V_2}{v_{02} - v_{01}}$.



37) Monochromatic light waves when passed through a double slit produces alternate dark and bright fringe as shown in figure:



RAHEIN EDUCATION www.raheineducation.com PHYSICS

(i) Name the experiment.

(ii) What change can you observed in the fringe pattern if the double slit and the screen are moved slightly closed to each other?

(iii) If the double slit is at a separation of 1 mm and is illuminated with light from a sodium vapour lamp ($\lambda = 5890\dot{A}$) the fringe width is measured to be 0.01 cm. What is the distance between the slit and the screen?

(iv) In the above arrangement, when one of the slits is closed, the fringes are found to disappear. But on adjusting the other slit width slightly, fringes are found to appear again.

(a) What is the new phenomenon due to?

(b) Distinguish between the fringes formed in the two cases.

Or

(i) A prism is made of glass of unknown refractive index. A parallel beam of light is incident on a face of the prism. The angle of minimum deviation is measured to be 40°. What is the refractive index of the material of the prism? The refracting angle of minimum deviation of a parallel beam of light.

(ii) What is the dispersion of light? What is its cause?

(iii) A ray of light incident normally on one face of a right isosceles prism is totally reflected as shown in figure. What must be the minimum value of refractive index of glass? Give relevant calculations.



CBSE RESULT 2020



RAHEIN EDUCATION PHYSICS

Special Physics for NEET/JEE

Timing: 8:30a.m. to 10:30a.m. [Monday to Friday] Saturday: Test Fees: Rs. 25,000 and Online Test Series Rs. 1,000 Place: Rahein Education Pvt. Ltd. Contact us: 9205010851, 9711833446 For Free Download Notes: <u>www.raheineducation.com</u> <u>E-mail: tarunkumar.csengg@gmail.com</u>