RAHEIN EDUCATION PVT. LTD.

RAHEIN EDUCATION www.raheineducation.com
PHYSICS

CONTACT: 9205010851

Website: www.raheineducation.com

PHYSICS MOCK TEST



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),





RAHEIN EDUCATION www.raheineducation.com







RAHEIN EDUCATION PHYSICS raheineducation.com Mock Test – 1 CLASS - XII SECTION - A 1) The critical angle for total internal reflection at a diamond - air interface is 25°. Suppose light is incident at an angle of θ with the normal. Total internal reflection will occur if the incident medium is: (a) Air and $\theta = 25^{\circ}$ (b) air and $\theta > 25^{\circ}$ (c) air and $\theta < 25^{\circ}$ (d) diamond and $\theta > 25^{\circ}$ 2) The tip of needle does not give sharp image on screen. This is due to: (a) polarization (b) interference (c) diffraction (d) none of these 3) In photoelectric effect, electrons are rejected from metals, if the incident light has a certain minimum: (a) wavelength (b) frequency (d) angle of incidence (c) amplitude 4) Energy E of hydrogen atom with principal quantum number n is given by $E = -\frac{13.6}{n^2}$ eV. The energy of a photon ejected, when the electron jumps from n = 3 state on n = 2 state of hydrogen is approximately (a) 1.5 eV (b) 0.85 eV (c) 3.4 eV (d) 1.9 eV 5) r_1 and r_2 are the radii of atomic nuclei of mass number 64 and 27 respectively. The ratio $\frac{r_1}{r_2}$ is: (a) $\frac{64}{27}$ (b) $\frac{4}{3}$ $(d)\frac{3}{4}$ $(c)\frac{27}{64}$ 6) Avalanche breakdown in a zener diode take place due to : (a)Thermal energy (b) Light energy (d) Accelerated minority charge carriers (c) Magnetic energy 7) The built-in potential of p-n junction diode is a function of : (a) temperature (b) biased voltage (c) doping density (d) all of these 8) State the essential condition for diffraction of light to occur. 9) Material particles can also show wave property. Give atleast two reasons given by de-Broglie.

Or

Two particles have equal momenta. What is the ratio of their de- Broglie wavelengths?

10) What will be the ratio of the radii of two nuclei of mass numbers A_1 and A_2 ?

RAHEIN EDUCATION PHYSICS www.raheineducation.com

SECTION – B

11) Two monochromatic rays of light are incident normally on the face AB of an isosceles rightangled prism ABC. The refractive indices of the glass prism for the two rays '1' and '2' are respectively 1.35 and 1.45. Trace the path of these rays after entering through the prism.



12) All protons in an atom remain packed in a small nucleus inspite of the electrostatic repulsive force among them why?

How many electrons, protons and neutrons there in 16 g of ${}_{8}O^{16}$?

SECTION – C

13) (a) In the following nuclear reaction

$$n + {}^{235}_{92}U \rightarrow {}^{144}_{z}Ba + {}^{A}_{36}X + 3n$$

assign the values of Z and A.

(b) If both the number of protons and the number of neutrons are conserved in each nuclear reaction, in what way is the mass converted into energy? Explain.

14) The figure given below shows the V-I characteristic for a semiconductor diode.



(i) Identify the semiconductor diode used.

(ii) Draw the circuit diagram to obtain the given characteristic of this device.

(iii) Briefly explain how this diode can be used as a voltage regulator.

Or

Show schematically the generation of hole and the thermal motion of a hole.

RAHEIN EDUCATION PHYSICSwww.raheineducation.com

15) Figure shows a modified Young's double slit experimental set up. Here $SS_2 - SS_1 = \lambda/4$.



(i) State the condition for constructive and destructive interference.

(ii) Obtain an expression for the fringe width.

(iii) Locate the position of the central fringe.

16) A single thin lens of focal length 30 cm is placed in front of the lens of a camera, the camera lens is set at infinity. Where should you place an object to get a clear picture on the film with extra lens?

Or

A concave lens produces a virtual and diminished image independent of the location of the object. Explain why?

SECTION – D

17) Derive the expression for the magnetic field at the site of a point nucleus in a hydrogen atom due to the circular motion of the electron. Assume that the atom is in its ground state and give the answer in terms of fundamental constants.

Or

(a) Using Bohr's postulates; derive the expression for the total energy of the electron in the stationary states of the hydrogen atom.

(b) Using Rydberg formula, calculate the wavelengths of the spectral lines of the first member of the Lyman series and of the Balmer series.

18) Draw a ray diagram to show the working of a compound microscope. Deduce an expression for the total magnification when the final image is formed at the near point. In a compound microscope, an object is placed at a distance of 1.5 cm from the objective of focal length 1.25 cm. If the eye piece has a focal length of 5 cm and the final image is formed at the near point, estimate the magnifying power of the microscope.

Or

Light has several properties like reflection, refraction etc. Light travels from an optically denser medium to a rarer medium.

(a) What happens to the light at the interface?

(b) Give a demonstration for total internal reflection.

(c) What are the technological applications of total internal reflection in nature?

(d) What is the Brewster angle for air to glass transition? (Refractive index of glass is 1.5).

CBSE RESULT 2020

aheineducation.com



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: www.raheineducation.com E-mail: tarunkumar.csengg@gmail.com