

Previous Questions and Answers

Physics (312)

1. The total energy of electron in the first orbit of hydrogen atom is -13.6 eV. It's energy in the third orbit of electron will be :

a) -13.6 eV b) -3.4 eV

c) -1.51 eV d) + 3.4 eV **(April 2024)**

Ans. -1.51 eV

2. A 10 A ammeter has a resistance of 0.09Ω . What resistance of the shunt will enable it to read up to 100 A?

a) 0.01Ω b) 0.001Ω

c) 0.1Ω d) 0.9Ω **(April 2023)**

Ans. 0.01Ω

3. A metal wire of length 'l' and area of cross-section 'a' has electrical resistance 'r'. Wire of length '2l' and area of cross-section '2a' of the same metal will have a resistance :

(April 2024)

a) 4r b) 2r c) r d) r/4

Ans. 2r

4. The fundamental frequency of an open pipe is 120 Hz, then the frequency of the third harmonic will be : **(Oct 2022)**

a) 120 Hz b) 360 Hz

c) 240 Hz d) 450 Hz

Ans. 360 Hz

5. The potential due to point charge Q charge, at a distance r from it is **(April 2022)**

a) Inversely proportional to r

b) Inversely proportional to r^2

c) Directly proportional to r

d) Directly proportional to r^2

Ans. Inversely proportional to r

6. The source of the immense power of radiations emitted by the sun is **(April 2024)**

- a) Physical reaction b) chemical reaction
c) nuclear fission reaction d) nuclear fusion reaction

Ans. Nuclear fusion reaction

7. All electromagnetic waves travel with the same velocity in ----- **(April 2024)**

Ans. Vacuum

8. Blue colour of the sky is due to the phenomena of **(Oct 2022))**

- a) Scattering b) Diffraction
c) Interference d) Dispersion

Ans. Scattering

9. A ----- converts ac to dc **(April 2024)**

Ans. Rectifier

10. A water heater is ----- system **(April 2024)**

Ans. Open system

11. What is meant by capillarity? What is the cause of capillary action? **(April 2024)**

{ Hint : phenomena of rise or depression of liquids in capillary tubes is known as capillarity (1 mark)
The capillary action is caused by the combination of adhesion and cohesion (1 mark)}

12. Write two postulate of Rutherford atomic model. (April 2022)

{Hint: • the entire charge and most of the mass of the atom is confined in a very small central region called nucleus

• the negatively charged electrons revolve at a distance around the atom as a whole is electrically neutral and stable

(2 mark) }

13. Why do most of the ordinary gases not show dispersion with white light? **(April 2022)**

{Hint : all light travels at the same speed in a vacuum. (1 mark) This means that all wavelengths of light in a beam follow the same optical path, so dispersion doesn't occur. (1mark) }

14. A metallic wire has a resistance of 50Ω at 20°C and 50.5Ω at 120°C . Calculate the temperature coefficient of resistivity of wire. **(April 2022,2023)**

{Hint : temperature coefficient of resistivity

$$= \frac{R_2 - R_1}{R_1 t_2 - R_2 t_1} \quad (1 \text{ mark})$$

$$= \frac{50.5 - 50}{50 \times 120 - 50.5 \times 20}$$

$$= 0.5/4990 = 0.00010 = 1 \times 10^{-4} \quad (1 \text{ mark})$$

15. Define Work. Give its SI unit. Write the conditions under which work done is i) zero ii) positive iii) negative. Give examples for each cases. **(April 2023)**

{Hint : work done is defined as the product of the magnitude of force component in the direction of displacement and the displacement of the object. S I unit of work is Joule. (1 mark)

- i) If force and displacement become perpendicular to one another, the work is zero. (1 mark)
- ii) If car moves in x direction and the force is also applied in the same direction, the work is positive (1 mark)
- iii) If car moves in x direction but the force is applied in the opposite direction to stop the car, the work is negative (1 mark)

Examples – • A block is travelling on a flat horizontal surface work is zero.

- If we kick a football, then the football will travel along the direction of force applied, work is positive
- The work done is negative if the buoyant force does when a coin sinks. (1 mark) }