CG PVPT 2021 Question Paper

Q.1 The binding energy per nucleon for a deuteron and α-particle are x1 and x2 respectively. What will be the energy Q released in the reaction $1\ H2 + 1\ H2 \rightarrow 2\ He4 + Q$?

A. 4(x2 – x1)
B. 4(x1 + x2)
C. 2(x1 + x2)
D. 2(x2 – x1)

Q.2 One end of the metal rod is kept in a furnace. In a steady state, the temperature of the rod

A. Increases
B. Decreases
C. Remains constant
D. is non-uniform

Q.3 . The root mean square speed of the molecules of a diatomic gas is v. When the temperature is doubled, the molecules dissociate into two atoms. The new root mean square speed of the atom is

A. V
B. 2v
C. 3v
D. 4v

Q.4 A metallic sphere cools from 50°C to 40°C in 300 seconds. If the room temperature is 20°C, then its temperature in next 5 minutes will be

A. 30°C
B. 33.3°C
C. 36.3°C
D. 38°C

Q.5 The critical wavelength for producing the photoelectric effect in tungsten metal is 2600 Å. What wavelength would be necessary to produce photoelectrons from tungsten having twice the kinetic energy of those produced at 2200 Å?

A. 1800 Å
B. 1907 Å
C. 1926 Å
D. 2015 Å

Q.6 What focal length should reading spectacles have for a person whose near point is 50 cm?

A. 25 cm
B. 30 cm
C. 40 cm
D. 50 cm

Q.7 The Bohr model of atom

A. Assumes that the angular momentum of electron is quantized
B. Uses Einstein's photoelectric effect
C. Predicts continuous emission spectra for atoms
D. Predicts the same emission spectra for all types of atoms

Q.8 Two coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are respectively

A. 5I and I
B. 9I and I
C. 5 and 3
D. 9I and 3I

Q.9 An object is placed between two plane mirrors inclined at 60° to each other. How many images do you expect to see?

A. 5
B. 6
C. 7
D. 9

Q.10 The focal length of a plane convex lens, when radius of curved surface is 15 cm and μ = 1.5

A. 15 cm
B. 20 cm
C. 30 cm
D. 45 cm

Q.11 If the refractive index of a material of equilateral prism is 3 , then the angle of minimum deviation of prism is

A. 75°
B. 60°
C. 45°

D. 30°

Q.12 A parallel plate condenser contains a mica sheet (thickness 10–3 m) and a sheet of a fiber (thickness 0.5 × 10–3 m). The dielectric constant of mica is 8 and that of fibre is 2.5. Assuming that the fiber breaks down when subjected to an electric field of 6.4 × 106 volt/meter. Then the maximum safe voltage that can be applied to the condenser is

A. 5200 volts
B. 2600 volts
C. 6800 volts
D. 6400 volts

Q.13 A solenoid of 0.4 m length with 500 turns carries a current of 3 A. A coil of 10 turns and of radius 0.01 m carries a current of 0.4 A. The torque required to hold the coil with its axis at right angle to that of solenoid in the middle point of it is

A. 6π2 ×10–7 Nm
B. 3π2 ×10–7 Nm
C. 9π2 ×10–7 Nm
D. 12π2 ×10–7 Nm

Q14 Solar energy is mainly caused due to

A. Burning of hydrogen in oxygen
B. Fission of uranium present in the sun
C. Fusion of protons during the synthesis of heavier elements
D. Gravitational contraction

Q. 15 A sample of radioactive element has a mass of 5 g at an instant t = 0. The approximate mass of this element in the sample after two mean half-life periods is

A. 3.15 gm
B. 1.85 gm
C. 1.25 gm
D. 0.67 gm