Ahmed Coaching Center

Final Term 2023

Physics

Class: XII Time: 3 Hours
Date: 8-MAY-2023 Total Marks: 85

Section "A" (Multiple Choice Questions)

Note : Attempt all question from this section

1. A transformer is used to change.
   * Capacitance * frequency * voltage * power
2. A compton shift depend only on the Photon's
   * Wavelength * Energy * Frequency * Scattering angel
3. Atomic number of daughter element increases by the emission of:
   * α Particle * β Particle * λ Particle * Position
4. Motional emf induced in a conducter depends upon:
   * Length * Orientation * Magentic Field *All of these
5. The potential at a point situated at a distance of 50cm from a charge of 5 μc is;
   * 9×10^{-4} volt * 9×10^{-2} volt * 9×10^{4} volt * none
6. The electric field intensity between two uniformly oppositely charged parallel plates is:
   * α /ε * α /2ε * 2α /ε * Zero
7. The product of molecular mass and specific heat of substance is called
   * Heat capacity *latent Heat *molar Specific heat *Specific heat
8. Soft Iron care used in Galvanometer make magnetic field.
   * Both strong and radial * radial
   * both strong and radial * Neither strong nor radial
9. The process of generating audio signal in electromagnetic waves is called;
   * Modulation * Amplification * Blasing * Rectification
10. When an object whose length of rest is 1m moves with the velocity of light then its length will be;
    * zero * 3.5m * 2 m * infinity

11. The scientist who studied the spectrum of hydrogen is visible light wavelength was;
    * lyman * balmer * paschen * rudbay
12. The process of β-particle emission from a nucleus involves the change in _____
    * mass number * charge number
    * mass and charge number * no change occurs
13. The track formed in Wilson cloud chamber due to β-particle is;
    * ions * nuclear radiation * droplets of fog * glass window
14. Gama rays from cobalt-60 are used to;
    * kill the cancer tissues * detect the bone fracture
    * produce radiograph of leaf * internal therapy of human body.
15. **xv-** When current is passed through the coil of galvanometer experiences:
    a. *force due to field * Couple *Electric field * None
16. **xvi**- Volume of a given gas at a constant pressure becomes zero at:
    a. *273K *273˚C *-273K *-273$^{\circ}C$
17. xvii- The force between two similar unit charges placed one meter a part in air in Newton is:
    a. *zero *1 *9×10^{9} * Name of these

SECTION "B" (SHORTQUESTIONS)

NOTE: Attempt any FIVE part questions from this section. All question carry equal marks.The use of scientific calculator is allowed. All notations are used in their usual meanings. Draw diagram where necessary.

Q1. What will be the relativistic velocity and momentum of a particle whose rest mass is $m_{\circ}$ and K.E is equal to twice of its rest mass Energy?

OR

Explain the working of PNP transistor Or What is PN-junction diode and explain the

Q2. Find the binding energy and packing fraction of 52 Te^{126}.

Given m_p = 1.0078U, m_p = 1.00864 , mTe = 125.2033 and 1U = 931.5 Mev

OR

Using two isotherms prove that $C_p - C_v = R$

Q3. A maximum of 50 mA Current can be allowed to flow through a 19.8 Ω coil of Galvanometer. The Galvanometer is used to measure 5 amp maximum current. Calculate the length of copper wire to be used as shunt. The diameter of wire is 4 mm. For Copper $\ell = 1.6 \times 10^{-8}$ ohm-m.

OR

What is difference between P.D and EMF. Prove a relation between P.D and EMF when battery is to be charged.

Q4. The resistance of tungsten which used in the filament of 60 watt bulb is 240 ohms when the bulb is hot at a temperature 2020 °C. What would you estimate the resistance at 20 °C Given $\alpha = 0.0046/C^0$

OR

Assuming your radiate as does a black body at your body temperature about 37 ^{0}C, at what wave length do you emit the most energy

Q5. A galvanometer has a resistance of 100 ohms. A difference of potential of 50 m volt gives full scale deflection. Calculate shunt resistance from (0 – 5A) and what is the value of series resistance if galvanometer is converted to voltmeter to read upto 250 volt.

Q6.The inner and outer diameter of toroid are 22cm and 26cm. If a current of 5 Ampare is passed which produces 0.25 tesla flux density inside the core. Find the approximate length of wound on toraid. (Given $\mu_o = 4\pi \times 10^{-7}$ web/Amp.m)

Q7.Prove that for KMT $\frac{1}{2}mv^{-2} = \frac{3}{2}KT$.

OR

A blood corpuscle has a diameter about 9 x 10^{-6}m. In which excited orbit should a hydrogen atom be so that it is just as big as the blood corpuscle.

Q8. X-rays of wavelength 3.64 x 10^{-10}m are used in campton reathering process. Find the fractional change in wavelength for Scallering angle of 120°.

SECTION "C" (DETAILED QUESTIONS)

NOTE: Attempt any TWO part questions from this section. All question carry equal marks.The use of scientific calculator is allowed. All notations are used in their usual meanings. Draw diagram where necessary.

Q8 a. State and explain carnot cycle for carnot engine and draw PV – diagram to explain it also define Efficiency and write its equation in the form of temperature

b. Give the basic postulates of bohr theory and derive expressions for Radius

and energy of nth orbit

Q9 a. A high frequency light falls on a metal plate to eject electron. Explain the phenomenon, Give its results through graph and Einstein's equation.

b: Electrons are produced by heating a filament which offer collision with screen and produce a flash. Discuss method of determination of ratio by Joseph John.

Q10 a. What is Capacitance of parallel plate capacitor if air is b/w the plates? Define compound Capacitor if dielectric slab of thickness t (t <d) is slipped b/w the plates of b/w the plates of capacitor then find series capacitance.

b. Explain JJ. Thompson's experiment to determine the charge to mass (c/m) ratio of electron. Also derive relative expressions?

OR

How's is Geiger Muller Counter used for the counting of Nuclear particles