Physics -Set 5

1. An erect image 3 times the size of the object is obtained with a concave mirror of radius of curvature 36 cm. calculate the position of the object.

   a)3cm
   b)-12cm
   c) 36 cm
   d)-12 cm

2. Name the physical quantities whose dimensional formula is $M^1 L^{-1} T^{-2}$?
   a) pressure
   b) strain
   c) energy
   d) Force.

3. The near point of a hypermetropic eye is at 75 cm from the eye. What is the power of the lens required to enable him to read clearly a book held at 25 cm from the eye?
   a)P= 2.66D
   b) 2 D
   c)1.5 D
   d)1 D

4.10^5Fermi is equal to

   a) 1 meter
   b) 100 micron
   c) **1angstrom unit**
   d) 1 mm

5.20gm of water at 20^0C is mixed with 10gm of water at 10^0C. The temperature of the mixture is
   a) 10^0C,
   b) 15^0C,
   c) 16.66^0C,
   d) 20^0C.

6. A soap bubble of radius r is formed in air. The excess pressure inside the bubble is
   a) 4T/r,
   b) 2T/r,
   c) P_o + 2T/r,
   d) P_o - 4T/r.

7. The conductance of a conductor of length l, cross sectional area A and specific resistance s is given by
   a) A/sl,
   b) sl/A,
   c) l/sA,
   d) sA/l

8. An electric motor
   a) creates mechanical energy.
   b) creates electrical energy
   c) converts electrical energy into mechanical energy
   d) converts mechanical energy into electrical energy.

9. Total internal reflection of light is possible when light enters from
    a) air to glass
    b) vacuum to air
    c) air to water
    d) water to air

10. To get 5 images of a single object, one should have two plane mirrors inclined at an angle of
    a) 72^0
    b) 60^0
    c) 36^0
    d) 90^0

11. The saturation current in a diode valve is governed by
    a) Child's Law
    b) Lenz's Law
    c) Richardson's Law
    d) Ampere's Law

12) One solid sphere A and another hollow sphere B are of same mass and same outer radii. Their moment of inertia about their diameters are respectively I_A and I_B such that

    (a) $I_A = I_B$

    (b) $I_A > I_B$

    © $I_A < I_B$

    (d) $I_A/I_B = d_A/d_B$
where d_A and d_B are their densities.

13) A particle is projected at $60°$ to the horizontal with a kinetic energy K. The kinetic energy at the highest point is
    a) $K/2$
    b) K
    c) zero
    d) $K/4$

14) An observer moves towards a stationary source of sound, with a velocity one-fifth of the velocity of sound. What is the percentage increase in the apparent frequency ?
    (a) Zero
    (b) 0.5%
    (c) 5%
    (d) 20%

15) Two concentric coils each of radius equal to $2n$ cm are placed at right angles to each other. 3 ampere and 4 ampere are the currents flowing in each coil respectively. The magnetic induction in weber/m^2 at the centre of the coils will be ($\mu_0 = 4\pi \times 10^{-7}$ Wb /A.m)
    (a) 12×10^{-5}
    (b) 10^{-5}
    (c) 5×10^{-5}
    (d) 7×10^{-5}

16) The length of a given cylindrical wire is increased by 100%. Due to the consequent decrease in diameter the change in the resistance of the wire will be :

        (a) 200%
        (b) 100%
        (c) 50%
        (d) 300%

17) A 220 volt, 1000 watt bulb is connected across a 110 volt mains supply. The power consumed will be
        (a) 750 watt
        (b) 500 watt
        (c) 250 watt
        (d) 1000 watt

18) If the binding energy of the electron in a hydrogen atom is 13.6 eV, the energy required to remove the electron from the first excited state of Li^{2+} is
        (a) 30.6 eV
        (b) 13.6 eV
        (c) 3.4 eV
        (d) 122.4 eV

19) A spring of spring constant $5 \times 10_3$ N/m is stretched initially by 5 cm from the un stretched position. Then the work required to stretch it further by another 5 cm is
        (a) 12.50 N-m
        (b) 18.75 N-m
        (c) 25.00 N-m
        (d) 6.25 N-m

20) A Carnot engine takes 3×10^6 cal of heat from a reservoir at 627°C and gives it to a sink at 27°C. The work done by the engine is
        (a) 4.2×10^6 J
        (b) 8.4×10^6 J
        (c) 16.8×10^6 J
        (d) zero