

PHYSICS-2

1. In Bohr's theory the potential of an electron at a position is kr^2 , k is constant, then the quantized energy of the electron in n^{th} orbit : $2 \underline{\hspace{1cm}}$

- (1) $nh \frac{k}{m} \left[\underline{\hspace{1cm}} \right]$ (2) $nh \frac{k}{m} \left[\underline{\hspace{1cm}} \right]^{\frac{1}{2}}$ (3) $nh \frac{m}{k} \left[\underline{\hspace{1cm}} \right]$ (4) $nh \frac{m}{k} \left[\underline{\hspace{1cm}} \right]^{\frac{1}{2}}$

2. To reduce the de-Broglies wave length of an electron from 100 pm to 50 pm, the required increase in energy is :

- (1) 150 eV (2) 300 eV (3) 450 eV (4) 600 eV

3. The angular width of fringes in Young's bislit experiment is 0.20° with the wavelength 5890 Å. If the whole apparatus is dipped in water, the angular width will be :

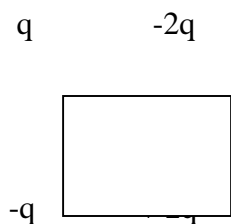
- (1) 0.30° (2) 0.22° (3) 0.15° (4) 0.11°

4. Resistance of a 10 m. long wire of potentiometer is $1 \Omega/m$. A cell of 2.2 volt emf. and HRB is connected in series with the wire. How much resistance must be applied to get 2.2 mv gradient :

$mt \underline{\hspace{1cm}}$

- (1) 1000 Ω (2) 990 Ω (3) 810 Ω (4) 790 Ω

5. Four charges are placed on corners of a square, having side of 5 cm. , if q is one coulomb then electric field intensity at the centre will be :



- (1) 1.02×10^7 N/c upwards
 (2) 2.04×10^7 N/c upwards
 (3) 2.04×10^7 N/c down
 (4) 1.02×10^7 N/c down

6. Capacitance of a capacitor made by a thin metal foil is $2 \mu\text{F}$. If the foil is filled with paper of thickness 0.15 mm. and dielectric constant of paper is 2.5, width of paper is 40 mm. then length of foil will be :

- (1) 33.9 mm. (2) 13.4 mm. (3) 1.33 mm (4) 0.34 mm.

7. An electron and an α particle are accelerated with v volt voltage. If the masses are m_e and m_{α} then the ratio of momentum is :

- (1) $\sqrt{\frac{2m_e}{m_{\alpha}}}$ (2) $\sqrt{\frac{m_e}{2m_{\alpha}}}$ (3) $\sqrt{\frac{m_e}{m_{\alpha}}}$ (4) $\sqrt{\frac{m_e}{m_{\alpha}}}$

8. Ultra sonic sound can be observed by :

- (1) Telephone (2) Hebb method (3) Quincke tube (4) Kundit tube

9. Which two of the given transverse waves will give stationary wave when get super imposed :

$z_1 = a \cos(kx - \omega t)$ A

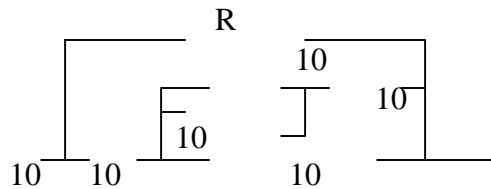
$z_2 = a \cos(kx - \omega t)$ B

$z_3 = a \cos(ky - \omega t)$ C

- (1) A and B (2) A and C (3) B and C (4) any two

10. For what value of R the net resistance of the circuit will be 18 ohms :

- (1) 24 Ω
 (2) 16 Ω
 (3) 10 Ω
 (4) 8 Ω



11. For a medium refractive indices for violet, red and yellow are 1.62, 1.52 and 1.55 resp. then dispersive power of medium will be :

- (1) 0.02 (2) 0.18 (3) 0.22 (4) 0.65

12. The temperature at which the rms speed of hydrogen molecule is equal to escape velocity on earth surface will be :

- (1) 10059 K (2) 8270 K (3) 5030 K (4) 1060 K

13. The temperature of a liquid drops from 365 K to 361 K in 2 minutes. Find the time during which temperature of the liquid drops from 344 K to 342 K. Room temp. is 294 K.

- (1) 60 sec. (2) 66 sec. (3) 72 sec. (4) 84 sec.

14. Venturimeter is used to measure :

- (1) surface tension of liquid
 (2) rate of flow of liquid
 (3) density of liquid
 (4) pressure of liquid

15. A rod is fixed between two points at 20°C , coefficient of linear expansion of material of rod is $1.1 \times 10^{-5} /^{\circ}\text{C}$ and Young's modulus is $1.2 \times 10^{11} \text{ N/m}$. Find the force developed in the rod if temp. of rod becomes 10°C :
- (1) $1.1 \times 10^6 \text{ N/m}^2$
 - (2) $1.1 \times 10^{15} \text{ N/m}^2$
 - (3) $1.2 \times 10^7 \text{ N/m}^2$
 - (4) $1.32 \times 10^8 \text{ N/m}^2$
16. If an air bubble of radius 1 mm. moves up with uniform velocity of 0.109 cm/s. in a liquid column of density $14.7 \times 10^3 \text{ kg./m}^3$. If $g = 10 \text{ m/sec.}^2$ then coefficient of viscosity will be :
- (1) 10.0 m-sec.^2
 - (2) 9.78 m-sec.^{-2}
 - (3) 9.62 m-sec.^{-2}
 - (4) 9.86 m-sec.^{-2}
17. A rocket launched with 10 km/sec. velocity radius of earth is R, then the maximum height attained by it will be :
- (1) 5 R
 - (2) 4 R
 - (3) 3 R
 - (4) 2 R
18. A block of 2 kg. mass and body of 1 kg. mass are connected with the two ends of a string. The string is passing through a pulley. The block is put on a horizontal table and the body is hanging. The table is friction less then acceleration and force of tension are:
- (1) 4.38 ms^{-2} , 9.86 N
 - (2) 4.38 ms^{-2} , 6.54 N
 - (3) 3.27 ms^{-2} , 6.54 N
 - (4) 3.27 ms^{-2} , 9.86 N
19. A mass m performs oscillations of period T, when hanged by spring of force constant k, If spring is cut in two parts and arranged in parallel, If same mass is oscillated by them, new time period will be :
- (1) $\frac{T}{2}$
 - (2) 2 T
 - (3) $\frac{T}{\sqrt{2}}$
 - (4) T
20. In a triode amplifier $\mu_{\text{tr}} = 70$, $g_m = 1600 \mu\text{mho}$ and $R_L = 0.1 \text{ M}\Omega$. If input of 1v (rms) is given then power gained in load will be:
- (1) 4.87 mW
 - (2) 23.7 mW
 - (3) 2.37 mW
 - (4) 48.7 mW
21. Moment of inertia a rectangular thin plate having mass m, length a width b, about an axis passing through its centre and perpendicular to the plane is :
- (1) $\frac{Ma^2}{12}$
 - (2) $\frac{Mb^2}{12}$
 - (3) $\frac{M(a^2+b^2)}{3}$
 - (4) $\frac{M(a^2+b^2)}{12}$
22. In a triode circuit for a given plate voltage, plate current will be maximum when:

- (1) V_g Positive and V_p negative
- (2) V_g and V_p both positive
- (3) $V_g = 0$ and V_p positive
- (4) V_g negative and V_p positive

23. In p-n junction avalanche current flows in circuit when maximum when :

- (1) excess (2) zero (3) reverse (4) forward

24. Half life of a radioactive element is 10 days. The time during which quantity remains 1/10 of initial mass will be :

- (1) 16 days (2) 33 days (3) 50 days (4) 100 days

25. Resistance of semiconductor at 0K is :

- (1) small (2) large (3) infinity (4) zero

26. α particle of 400 KeV energy are bombarded on nucleus of ^{82}Pb . In scattering of α particles, its minimum distance from nucleus will be :

- (1) 0.59 pm (2) 5.9 pm (3) 0.59 nm (4) 0.59 Å

27. If the uncertainty in the position of an electron is 2Å then the uncertainty in the energy is (about) :

- (1) 94 eV (2) 9.0 eV (3) 1.0 eV (4) 0.1 eV

28. Wrong statement is :

- (1) Nuclear force is produced by the exchange of pions
- (2) Nuclear force increases with increase in no. of nucleons
- (3) Range of nuclear forces is very small
- (4) Nuclear forces are strongest

29. The inductance required to connect bulb in series of 1 :

- (1) 1.62 mH (2) 16.2 mH (3) 2.42 mH (4) 1.27 mH

30. A block follows the path as shown in the figure from height h . If radius of circular path is r , then relation holds good to complete full circle is

