



# Alpha Waves Coaching Centre

## MICROTEST 2 (12.11.2024) SOLUTION

**Botany:** Biological Classification

**Zoology:** Structural organization in animals

**Chemistry:** Structure of Atom

**Physics:** Motion in a Straight Line

### Solution

1. Answer: (3)

2. Answer: (4)

3. Answer: (4)

4. Answer: (4)

5. Answer: (1)

6. Answer: (2)

7. Answer: (2)

8. Answer: (4)

9. Answer: (3)

10. Answer: (2)

11. Answer: (3)

No. of angular nodes =  $l$  &  $l$  value for  $s$  and  $p = 0$  & 1 respectively.

$\therefore$  Angular nodes for  $4s$  and  $2p$  are 0 and 1 respectively.

12. Answer: (3)

Orbital angular momentum

$$= \sqrt{l(l+1)} \frac{h}{2\pi}$$

$$\sqrt{2(2+1)} \frac{h}{2\pi} = \sqrt{6} \frac{h}{2\pi}$$

or  $\sqrt{\frac{3}{2}} \frac{h}{\pi}$

13. Answer: (1)

For Lyman series  $n_1 = 1$  &  $n_2 = 3$

$$\therefore \text{Number of spectral lines} = \frac{(n_2 - n_1)(n_2 - n_1 + 1)}{2}$$

$$= \frac{(3-1)(3-1+1)}{2} = \frac{(3 \times 2)}{2} = 3$$

14. Answer: (3)

Since  $KE = hv - hv_0$  therefore kinetic energy of photoelectrons increases linearly with increase in frequency.

15. Answer: (2)

$$\bar{\nu} = R_H Z^2 \left( \frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$$

For Paschen Series shortest wavelength:

$$n_1 = 3, n_2 = \infty$$

$$\therefore \bar{\nu} = R_H \times (1)^2 \times \left( \frac{1}{3^2} - 0 \right) = \frac{R_H}{9}$$

16. Answer: (3)

Ball will stop momentarily at  $t = 3.5$  s.

Distance travelled in 4<sup>th</sup> second will be

$$S = 2 \times \frac{1}{2} a (0.5)^2$$

$$\Rightarrow S = 2 \times \frac{1}{2} \times 10 (0.5)^2 = 2.5 \text{ m}$$

17. Answer: (1)

$$v = 6t + 3t^2$$

$$\frac{dx}{dt} = (6t + 3t^2)$$

$$\int_0^x dx = \int_0^3 (6t + 3t^2) dt,$$

$$\int_0^3 (6t + 3t^2) dt$$

$$v_{av} = \frac{0}{(3-0)} = 18 \text{ m/s}$$

18. Answer: (2)

$$T = 5 \text{ second (Time of flight)}$$

$$t_1 + t_2 = T$$

$$t_2 = T - T_1$$

$$= 5 - 2 = 3 \text{ second}$$

19. Answer: (3)

$$v_{av} = \frac{30 \times \frac{t}{3} + 15 \times \frac{2t}{3}}{t} = 20 \text{ km/h}$$

20. Answer: (2)

$$\frac{S(5)}{S_{5^{\text{th}}}} = \frac{\frac{1}{2} a (5)^2}{\frac{1}{2} a [2 \times 5 - 1]} = \frac{25}{9}$$