



Botany: Plant Kingdom, **Zoology:** Biomolecules

Chemistry: Classification of Elements & Periodicity in Properties, **Physics:** Motion in a Plane

Solution

1. Answer: (3)

2. Answer: (4)

3. Answer: (1)

4. Answer: (3)

5. Answer: (2)

6. Answer: (2)

7. Answer: (3)

8. Answer: (3)

9. Answer: (1)

10. Answer: (2)

11. Answer: (4)

Moving down the group, the negative value of electron gain enthalpy decreases

Li = - 60 kJ mol⁻¹

Na = - 53 kJ mol⁻¹

K = - 48 kJ mol⁻¹

Cs = - 46 kJ mol⁻¹

12. Answer: (2)

Alkali metal - ns^1

Alkaline earth metal - ns^2

Transition metal - $(n-1)d^{1-10}ns^{1-2}$

Pnictogens - ns^2np^3

13. Answer: (1)

Electronic configuration of Cu = [Ar]3d¹⁰ 4s¹

Electronic configuration of Cr = [Ar]3d⁵ 4s¹

14. Answer: (1)

After losing first electron, Li acquires He configuration, So, removal of 2nd electron from Li⁺ is most energetic as compared to the 2nd ionisation enthalpy of other elements given in options.

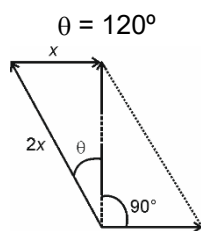
15. Answer: (2)

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16. Answer: (3)



$$2x \sin \theta = x$$

$$\Rightarrow \theta = 30^\circ, \text{ thus angle between two vectors is } 120^\circ$$

17. Answer: (4)

When particle is at same height in a projectile, vertical component of velocity is equal and opposite.

$$v_{av} = u \cos \theta$$

18. Answer: (1)

$$\text{Since } u \cos \theta = \frac{1}{2}u$$

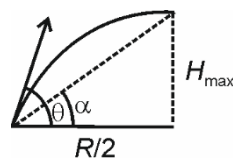
$$\Rightarrow \theta = 60^\circ$$

$$\therefore R = \frac{u^2 \sin 2\theta}{g} = \frac{\sqrt{3}u^2}{2g}$$

19. Answer: (4)

$$|\vec{v}_{\text{rain}}| = \sqrt{1^2 + 2^2} = \sqrt{5} \text{ km/h}$$

20. Answer: (2)



$$y = ax - bx^2$$

$$\Rightarrow \tan \theta = a$$

$$\tan \alpha = \frac{H_{\text{max}}}{R/2}$$

$$\Rightarrow \tan \alpha = \frac{\tan \theta}{2}$$

$$\alpha = \tan^{-1} \left(\frac{a}{2} \right)$$