Aakash National Talent Hunt Exam 2021

(*for Class X Studying Moving to Class XI*)

Sample Paper

ANSWERS

1. (2)
2. (4)
3. (2)
4. (4)
5. (2)
6. (1, 3)
7. (2, 3)
8. (1)
9. A(P, Q, S); B(Q); C(R); D(P)
10. (2)
11. (3)
12. (4)
13. (1)
14. (2)
15. (2, 4)
16. (1, 4)
17. (3)
18. A(R); B(R); C(Q, S); D(P)
19. (3)
20. (2)
21. (2)
22. (2)
23. (3)
24. (1)
25. (2, 3)
26. (1, 3)
27. (2)
28. A(Q); B(S); C(P); D(R)
29. (2)
30. (3)
31. (4)
32. (1)
33. (3)
34. (1)
35. (2, 4)

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ANSWERS & SOLUTIONS

1. Answer (2)

$$P = \frac{1}{f}$$

2. Answer (4)

The angle between two lateral faces of a prism is called the angle of the prism or the prism angle. When the light ray is allowed to pass through the prism, it makes the emergent ray bend at an angle to the direction of the incident ray. This angle is called the angle of deviation for the prism.
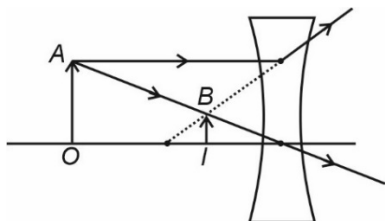
3. Answer (2)

$\because \quad V = IR$

$$R = \frac{V}{I} = \frac{0.5 - 0.25}{0.2 - 0.1} = \frac{0.25}{0.1} = 2.5\ \Omega$$

$$I = \frac{V}{R} = \frac{0.85}{2.5} = 0.34\ A$$

4. Answer (4)

The resistivity of a conductor depends on the nature of material of conductor, not on its shape and size.

5. Answer (2)

A concave lens always form a virtual and erect image.

6. Answer (1, 3)

$$R_{AB} = 5 + 3 + \frac{(2 + 4 + 6) \times 4}{2 + 4 + 6 + 4}$$

$$R_{AB} = 8 + \frac{48}{16} = 11\ \Omega$$

$$R_{CD} = 5 + 3 + \frac{48}{16} = 11\ \Omega$$

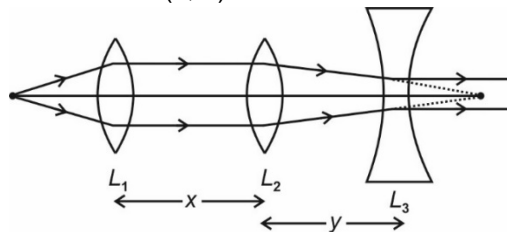$$R_{AC} = 5 + 3 + \frac{2 \times 14}{16} = \frac{39}{4}\ \Omega$$

$$R_{BD} = 5 + 3 + \frac{6 \times 10}{16} = \frac{47}{4}\ \Omega$$

$$R_{BC} = 3 + 3 + \frac{6 \times 10}{16} = \frac{39}{4}\ \Omega$$

$$R_{AD} = 5 + 5 + \frac{6 \times 10}{16} = \frac{55}{4}\ \Omega$$

Hence $R_{AB} = R_{CD}$; $R_{AC} = R_{BC}$

7. Answer (2, 3)

The image formed by lens L_2 should be focused on second focus of lens L_3.

So for second lens L_2

$$u = -\infty$$

$$v = y + 10$$

$\therefore \quad \dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u}$

$\Rightarrow \quad \dfrac{1}{40} = \dfrac{1}{(y+10)} - \dfrac{1}{-\infty}$

$\Rightarrow \quad y + 10 = 40$

$\Rightarrow \quad y = 30$ cm

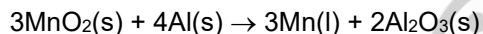So, for any value of x and $y = 30$ cm, final rays comes out parallel to the principal axis.

8. Answer (1)

9. Answer A(P, Q, S); B(Q); C(R); D(P)

10. Answer (2)

It is a redox reaction in which hydrogen sulphide is oxidised.
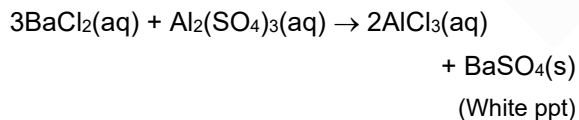
11. Answer (3)

$3MnO_2(s) + 4Al(s) \rightarrow 3Mn(l) + 2Al_2O_3(s)$

12. Answer (4)

13. Answer (1)

Gypsum is calcium sulphate dihydrate ($CaSO_4 \cdot 2H_2O$)

14. Answer (2)

$3BaCl_2(aq) + Al_2(SO_4)_3(aq) \rightarrow 2AlCl_3(aq)$
$+ BaSO_4(s)$
(White ppt)

15. Answer (2, 4)

Milk of magnesia and sodium hydroxide are bases. So their aqueous solution becomes pink on addition of few drops of phenolphthalein.

16. Answer (1, 4)

Magnesium does not react with cold water. It reacts with hot water to evolve H_2 gas. Silver neither reacts with oxygen nor with water.

17. Answer (3)

Alkali metals like sodium and potassium have low densities and low melting points.

18. Answer A(R); B(R); C(Q, S); D(P)

	Column I		Column II
(A)	Sodium chloride	(R)	Neutral salt
(B)	Potassium nitrate	(R)	Neutral salt
(C)	Sodium acetate	(Q)	Basic salt
		(S)	pH value more than 7
(D)	Aluminium chloride	(P)	Acidic salt

19. Answer (3)

When ATP is broken through hydrolysis, the energy equivalent to 30.5 kJ/mol is released.

Hence, for 1403 kJ of energy, 46 ATPs should be broken.

20. Answer (2)

Bread moulds and yeast have saprophytic mode of nutrition.

21. Answer (2)

In aerobic respiration, CO_2, water and energy are released.

22. Answer (2)

Bile juice helps in the digestion of fat.

23. Answer (3)

In humans, the percent probability of giving birth to a male child is 50%.

24. Answer (1)

The genotype of the parents would be Vv X Vv.

25. Answer (2, 3)

The common changes in males and females are appearance of thin hair on legs and arms and skin frequently becomes oily.

26. Answer (1, 3)

Here, 'X' is stamen.

27. Answer (2)

Both (A) and (R) are correct but (R) does not explain (A)

28. Answer A(Q); B(S); C(P); D(R)

Uterus   – Embryo is implanted here

Placenta – It provides nutrition to embryo

Oviduct   – Fertilization occurs here

Ovary   – It contains thousands of eggs

29. Answer (2)

$2^2|3^2$, $3^2|5^2$, $5^2|7^2$, $7^2|11^2$, $11^2|13^2$ and so on.

30. Answer (3)

Total 11 triangles.

31. Answer (4)

Total cost = Rs 10,00,000

Painting = 36° = 10% of 360°
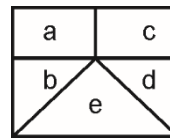
$\Rightarrow$ cost of painting = 10% of total cost

$\Rightarrow$ cost of painting = Rs 1,00,000

32. Answer (1)

TOM $\rightarrow$ (20 × 2 + 1) (15 × 2 + 1) (13 × 2 + 1)

TOM $\rightarrow$ 413127

33. Answer (3)

$\Rightarrow e = (a - b) \times (c - d)$

34. Answer (1)

49 is not a prime number

35. Answer (2, 4)

abc : (a × b) + (b × c)

or

abc : b × (a + c)

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