Corporate Office **:** Aakash Tower, 8, Pusa Road, New Delhi-110005
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Aakash National Talent Hunt Exam 2021

Sample Paper

(Class IX Studying Moving to Class X)

ANSWERS

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

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HINTS & SOLUTIONS

PHYSICS

1. Answer (3)

   Both the bodies attract each other with equal amount of force. Therefore, moon will also attract the earth with 10^{20} N.

2. Answer (2)

   Distance = Speed × time

   $\Rightarrow S = S_1 + S_2 + S_3$

   $= 5 \times 1 + 10 \times 1 + 15 \times 1$

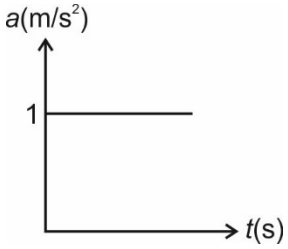
   $= 30$ m

3. Answer (2)

   Slope of velocity-time graph gives acceleration.

   $\therefore \quad a = \frac{10}{10} = 1\,\text{m/s}^2$

   Hence correct graph is

4. Answer (1)

   $$F = \frac{mv - mu}{t} = \frac{0 - 0.2 \times 20}{0.4} = -10\ \text{N}$$

5. Answer (1, 3)

   Let the total distance covered by the object is x.

   Time taken to cover 1st half $(t_1) = \frac{x}{2v_1}$

   Again

   $$\frac{t}{3} \times v_2 + \frac{2t}{3} \times v_3 = \frac{x}{2}$$

   $$\Rightarrow t\left(\frac{v_2}{3} + \frac{2v_3}{3}\right) = \frac{x}{2}$$

   $$\therefore \quad t = \frac{3x}{2(v_2 + 2v_3)}$$

   Now,

   $$\text{Average velocity} = \frac{x}{t_1 + t}$$

   $$= \frac{x}{\frac{x}{2v_1} + \frac{3x}{2(v_2 + 2v_3)}}$$

   $$= \frac{2v_1(v_2 + 2v_3)}{3v_1 + v_2 + 2v_3}$$

   And

   $$\frac{t_1}{t} = \frac{x}{2v_1} \times \frac{2(v_2 + 2v_3)}{3x}$$

   $$= \frac{v_2 + 2v_3}{3v_1}$$

6. Answer (1)

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

   Acceleration due to gravity (g) is maximum at the surface of the earth.

   Acceleration due to gravity (g) is zero at the centre of the earth.

   Acceleration due to gravity (g) decreases with altitude and depth from the surface of the earth.

   Weight = mass × acceleration due to gravity

CHEMISTRY

8. Answer (2)

Colloids having solid dispersed phase = Smoke, Milky glass, Automobile exhaust, Mud.

$\therefore$ x = 4

Colloids having solid dispersion medium = Cheese, Milky glass, Butter, Jelly, Rubber, Pumice

$\therefore$ y = 6

So, value of x + y = 4 + 6 = 10

9. Answer (3)

Chemical symbol of potassium is K.

10. Answer (1)

Symbol of ammonium ion is NH_4^+.

Formula unit mass of quicklime (CaO)

= Atomic mass of Ca + Atomic mass of O

= 40 + 16 = 56 u

Number of atoms present in a molecule of ethyne (C_2H_2) is 4.

11. Answer (4)

Water can be separated from acetone-water mixture by distillation.

12. Answer (3, 4)

Homogeneous mixture	Heterogeneous mixture
Mixture of water in alcohol	Mixture of sand and salt
Mixture of sulphur in carbon disulphide	Mixture of water and oil

13. Answer (4)

Properties of a compound are different from its constituent elements

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

(A) MgS – 24 : 32 = 3 : 4

(B) CaO – 40 : 16 = 5 : 2

(C) CO_2 – 12 : 32 = 3 : 8

(D) NH_3 – 14 : 3

BIOLOGY

15. Answer (4)

Penicillium is the multicellular organism. It belongs to the group Fungi.

16. Answer (2)

AIDS is transmitted by sexual contact whereas rabies spreads through the bite of infected dogs.

17. Answer (3)

The above depicted tissues are components of xylem tissue.

18. Answer (3)

Purkinje coined the term "protoplasm" for the fluid substances of the cell.

19. Answer (2, 3)

Sieve tubes are tubular cells with perforated walls. It is the living component of phloem tissue and helps in transportation of food.

20. Answer (2)

Both (A) and (R) are true but (R) is not the correct explanation of (A).

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

Bone is strong and non-flexible tissue. Cartilage smoothens the bone surfaces at joints. Ligament connects bone to bone. Tendon connects bone to muscle.

MATHEMATICS

22. Answer (3)

$p(3) = 2(3)^2 - K(3) - 3 = 0$

$\Rightarrow$ $K = 5$

$\therefore$ $p(x) = 2x^2 - 5x - 3$

$= (2x + 1)(x - 3)$

For zeroes of polynomial, $p(x) = 0$

i.e., $(2x + 1)(x - 3) = 0$

So, the other zero is $-\frac{1}{2}$.

23. Answer (3)

$$8x\left(6x-\frac{1}{y}\right)+\frac{1}{12y^2}\left(4-3y+36xy^2\right)$$

$$=48x^2-\frac{8x}{y}+\frac{1}{3y^2}-\frac{1}{4y}+3x$$

$$=\frac{16}{3}\left(9x^2-\frac{2(3x)}{4y}+\frac{1}{16y^2}\right)+\left(3x-\frac{1}{4y}\right)$$

$$=\frac{16}{3}\left(3x-\frac{1}{4y}\right)^2+\left(3x-\frac{1}{4y}\right)$$

$$= 3096 \qquad \left[\because\ 3x-\frac{1}{4y}=24\right]$$

24. Answer (4)

We have, $4x + 5y = k$

So, $4(8) + 5(-7) = -3 \neq k$. [$\because k \in W$]

Hence, (8, –7) is not the solution of the given equation.

25. Answer (1)

$$y = \frac{4}{\sqrt{8}+\sqrt{16}-\sqrt{50}+\sqrt{72}} = \frac{4}{2\sqrt{2}+4-5\sqrt{2}+6\sqrt{2}}$$

$$= \frac{4}{4+3\sqrt{2}}$$

$$= \frac{4}{4+3\sqrt{2}} \times \frac{\left(4-3\sqrt{2}\right)}{\left(4-3\sqrt{2}\right)}$$

$$= \frac{4\left(4-3\sqrt{2}\right)}{-2}$$

$$y = \left(-8+6\sqrt{2}\right)$$

$$\therefore \quad y^2 = 136 - 96\sqrt{2}$$

Now, $y^2 + 15y = \left(136 - 96\sqrt{2}\right) + 15\left(-8+6\sqrt{2}\right)$

$$= 16 - 6\sqrt{2}$$

26. Answer (1, 2, 4)

X and R divides PZ into three equal parts.

i.e., $PX = XR = RZ$ or $PR = XZ$ …(i)

ΔPQR is an isosceles triangle and $PQ = QR$ [Given]

Let $PQ = QR = x$ …(ii)

$\therefore$ Perimeter of $\Delta PQR = 2x + PR$

Perimeter of ΔYXZ = Perimeter of ΔPQR [Given]

$XY + YZ + XZ = 2x + PR$

$XY + YZ = 2x$ [from equation (i)]

Or $XY = YZ = x = PQ = QR$

[$\angle YXZ = \angle XZY$] [Given]

$\therefore \quad \Delta PQR \cong \Delta ZYX$

$\angle QPR = \angle XZY$ [CPCT]

i.e., $PQ \parallel YZ$.

27. Answer (2)

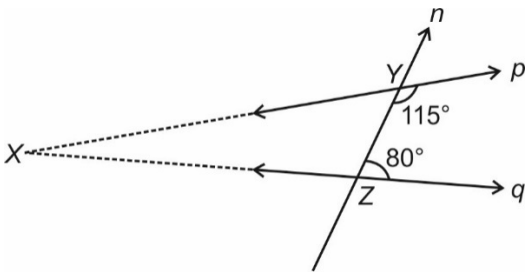
(a, b) lies on y-axis *i.e.*, $a = 0$.

$$\therefore \quad \frac{a}{b}k + 1 = \frac{0}{b} \times k + 1$$

$= 1$ ($k \in N$)

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

(A)



$\angle XYZ = 180° - 115°$

$= 65°$ …(i)

$\angle XYZ + \angle YXZ = 80°$

$\angle YXZ + 65° = 80°$

$\angle YXZ = 15°$

(B) $\frac{2}{5}\left(180° - \left(90° - 65°\right)\right) = \frac{2}{5} \times 155°$

$= 62°$

(C) $\angle AEF = \angle BAE + \angle DFE$

$85° = x + 57° + 3x + 8°$

$85° = 4x + 65°$

$x = 5°$

$\therefore \quad \angle BAE = x + 57°$

$= 62°$

(D) $\angle AEC = \angle BAE = 48°$

[Alternate interior angles]

$\angle AEC = \angle DEI = 48°$ …(i)

[Vertically opposite angles]

$\angle CEH + \angle GCD = 39°$ …(ii)

[Alternative interior angles]

$\angle CEH + \angle HEF = 90°$ [$\because EF \perp CD$]

$\angle HEF = 90° - 39°$

$= 51°$

Now, $\angle HEF + \angle DEI = 51° + 48°$

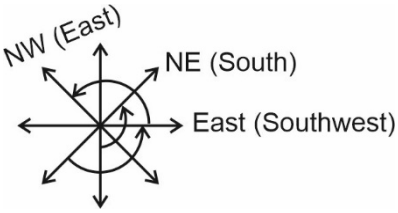
$= 99°$

MENTAL ABILITY

29. Answer (2)

By observation

30. Answer (3)



31. Answer (3)

By observation

32. Answer (2)

$(5 + 2) \times (4 + 1) = 35$

33. Answer (1)

Cubes of numbers are written in reverse order.

34. Answer (2, 4)

$2^5 + 1 : 33$

$6^5 + 1 : 7777$

$5^5 + 1 : 3126$

35. Answer (3, 4)

$a \% b = (a + b)^2 - 1$

❑ ❑ ❑

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