

Dear Parents/Students,

- ✓ Thank you for participating in the **STAR (Student Talent academic Reward) Exam**.
- ✓ All attempts have been made in making sure that you experience an **error-free** exam. However, in case if you find any discrepancy in any question/option, feel free to inform us through message on our Whatsapp No. **7976711979**. Our Expert panel will surely review your suggestions.

Regards,

Shubham Galav

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The Radiant Academy Udaipur

CLASS : XI

PHYSICS, CHEMISTRY & BIOLOGY

SAMPLE PAPER

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	A	D	D	D	D	C	A	B	D	C	A	C	B	A	B
Ques.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	B	D	B	A	B	D	C	C	B	C	B	B	D	D	B
Ques.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	A	B	A	B	D	C	C	C	C	C	C	D	C	A	D
Ques.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	D	D	C	C	A	B	A	A	B	D	B	B	A	C	A

SOLUTIONS

4. $R = \frac{u^2 \sin 2\theta}{g}$

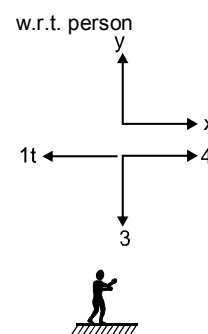
$R \propto u^2$

8. $y = x^3 - 2x + 1$
 $\frac{dy}{dx} = 3x^2 - 2$

slope at $x = 1$ is $\left. \frac{dy}{dx} \right|_{x=1} = 3(1^2) - 2 = 1$

9. $30 - 20 = 2a$
 $a = 5 \text{ m/s}^2$
 $F - 70 = 7 \times 5$
 $F_{\text{max}} = 105 \text{ N.}$

11.



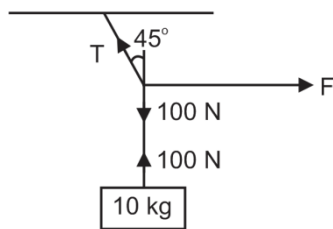
$\pm \tan 45^\circ = \frac{4 - 1t}{3}$

$\frac{4 - 1t}{3} = \pm 1$

$t = 1, 7$

$\Delta t = 7 - 1 = 6.$

12.



$$\frac{T}{\sqrt{2}} = 100$$

$$\frac{T}{\sqrt{2}} = F$$

$$F = 100 \text{ N}$$

13.

$$\vec{V} = \vec{\omega} \times \vec{r}$$

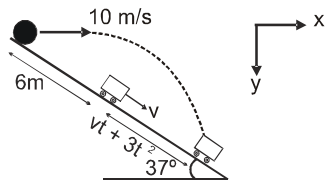
$$= 3\hat{i} + 8\hat{j} + 10\hat{k}$$

$$\Rightarrow k = \left(\frac{\mu g}{v_0} \right)^2 (m + M)$$

14.

Because the collision is perfectly inelastic,
 $2mV = mv$ or $V = v/2$ by conservation of energy
 $2mgh = 1/2 2m (V/2)^2$ or $h = v^2/8g$

15.



$$\text{time taken for collision (T)} = \frac{2 \times 10 \times \sin 37^\circ}{g \cos 37^\circ}$$

$$\text{along the inclined} \Rightarrow u_{\text{rel.}} = 8 - v$$

$$\Rightarrow a_{\text{rel.}} = 0$$

$$\Rightarrow s_{\text{rel.}} = 6$$

$$s_{\text{rel.}} = u_{\text{rel.}} \times T$$

$$6 = (8 - v) \times 1.5$$

$$v = 4 \text{ m/s}$$

16.

according to the question

$$\alpha = v \frac{dv}{dx} = v \left(\frac{d}{dx} \beta x^{-2n} \right)$$

$$= (-2n\beta x^{-2n-1}) \beta x^{-2n}$$

$$= -2n\beta^2 x^{-4n-1}$$

17.

Using $v = u + at$ or $v - u = at$, we find that if

If t is the time for accelerations, then $t/2$ is

$$\text{Now, } t + t/2 = 3$$

$$\text{or } 3t/2 = 3$$

$$t = 2 \text{ s}$$

$$S = 1/2 \times 2 \times 2 \times 2 + 1/2 \times 4 \times 1 \times 1 = (4 + 2)$$

20.

Case (i)

$$a = \frac{F}{m_1 + m_2}$$

$$\longrightarrow a$$



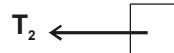
$$T_1 = \frac{m_1 F}{m_1 + m_2} \quad \text{--- (1)}$$

Now

Case (ii)

$$a = \frac{F}{m_1 + m_2}$$

$$\longleftarrow a$$



$$T_2 = \frac{m_2 F}{m_1 + m_2} \quad \text{--- (2)}$$

$$\frac{T_1}{T_2} = \frac{m_1}{m_2}$$

So,

$$T_1 < T_2$$

21.

(A) $0.2 \times 22.4 \text{ L}$

(B) $0.1 \times 22.4 \text{ L}$

(C) $0.5 \times 22.4 \text{ L}$

(D) $1 \times 22.4 \text{ L}$

22.

Mass No. = no. of protons + no. of neutrons

At. No. = no. of protons

23.

$$\text{No. of moles of Na} = \frac{115}{23} = 5 \text{ mol}$$

hence the two blocks stick together. By conservation of linear momentum

$$\text{No. of atoms of Na} = 5 N_A$$

27.

Compound is homocyclic aromatic containing 10

31.

Due to inert pair effect Tl is stable in +1 state

32.

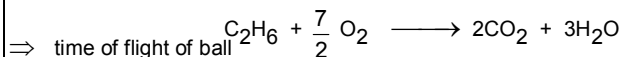
General formula of alkane = $C_n H_{2n+2}$

If 1 molecule contains 6 H-atoms, then $2n + 2 = 6$

$$\therefore n = 2$$

$$\therefore \text{Alkane} = C_2 H_6$$

Combustion reaction is :



$$\text{mole } \frac{5.6}{22.4} \left(\frac{20}{100} \times 80 \right) \frac{1}{32}$$

$$= 0.25 = 0.5$$

$$\frac{\text{mole}}{\text{st. coeff.}} = \frac{0.25}{1} = \frac{0.5}{7/2} = \frac{1}{7}$$

(LR)

$$\therefore \text{Moles of } CO_2 \text{ produced} = \frac{0.5 \times 2}{7/2} = \frac{2}{7}$$

$$\therefore \text{Mass of } CO_2 \text{ produced} = \frac{2}{7} \times 44 = 12.57 \text{ g.}$$

33.

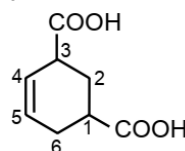
$$\% \text{ As} = \frac{75 \times 1}{\text{Min molar mass}} \times 100$$

$|\vec{a}|$ is doubled, M will be halved.

$$35. \text{ R.D.} = \frac{M_{\text{Su}_3}}{M_{\text{CH}_4}} = \frac{16}{16} = 5.$$

36.

$$m = 6 \text{ m}$$



Cyclohex-4-ene-1,3-dicarboxylic acid.

40.

