

PERIODIC ASSESSMENT TEST (PAT)

STUDENT SUPPORT BOOKLET (SSB)

Answer Key (AK) | Standard Hints (SH) | Text Solutions (TS) | Weightage Sheet (WS)

CLASS	XI	COURSE NAME	SAKSHAM	COURSE CODE	MA
PHASE CODE(S)	02MA	TOTAL PAGES	1	BATCH CODE(S)	02MA

Target Examination & Year:

NEET 2025

TEST PATTERN	TEST TYPE	TEST CODE & SEQUENCE
NEET	CUMULATIVE TEST (CT)	CT-5



DATE & DAY:

28th January 2024 | Sunday



Duration & Time:

200 Minutes | 11:30 AM to 02:50 PM

Contents:

- ▶ Weightage Sheet (WS)
- ▶ Answer Key (AK)
- ▶ Standard Hints (SH)
- ▶ Text Solutions (TS)
- ▶ Resonance Student's Critical Analysis of Learning for Excellence (ResoSCALE)
- ▶ Student Self Assessment Sheet (SAS)
- ▶ Video Solutions (VS)

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ANSWER KEY (AK)

PAPER											
PART-A : PHYSICS	Q.No.	1	2	3	4	5	6	7	8	9	10
	Ans.	4	4	4	1	1	2	1	2	1	1
	Q.No.	11	12	13	14	15	16	17	18	19	20
	Ans.	2	2	1	1	4	1	1	3	3	4
	Q.No.	21	22	23	24	25	26	27	28	29	30
	Ans.	4	2	4	4	2	3	1	4	3	1
	Q.No.	31	32	33	34	35	36	37	38	39	40
	Ans.	2	1	1	2	3	2	4	2	4	4
	Q.No.	41	42	43	44	45	46	47	48	49	50
Ans.	4	1	1	3	4	4	3	3	3	2	
PART-B : CHEMISTRY	Q.No.	51	52	53	54	55	56	57	58	59	60
	Ans.	2	1	4	4	2	3	4	2	4	3
	Q.No.	61	62	63	64	65	66	67	68	69	70
	Ans.	1	1	3	4	4	2	3	2	1	4
	Q.No.	71	72	73	74	75	76	77	78	79	80
	Ans.	2	4	1	2	1	1	3	1	4	1
	Q.No.	81	82	83	84	85	86	87	88	89	90
	Ans.	4	3	4	1	3	1	2	3	2	3
	Q.No.	91	92	93	94	95	96	97	98	99	100
Ans.	1	1	1	3	3	4	2	2	1	2	
PART-C : BIOLOGY	Q.No.	101	102	103	104	105	106	107	108	109	110
	Ans.	1	4	2	1	2	1	3	4	3	4
	Q.No.	111	112	113	114	115	116	117	118	119	120
	Ans.	1	1	4	2	4	4	4	4	4	2
	Q.No.	121	122	123	124	125	126	127	128	129	130
	Ans.	4	1	3	2	4	2	2	2	2	2
	Q.No.	131	132	133	134	135	136	137	138	139	140
	Ans.	3	1	2	3	1	4	3	1	1	3
	Q.No.	141	142	143	144	145	146	147	148	149	150
	Ans.	2	3	3	1	1	2	1	3	3	3
	Q.No.	151	152	153	154	155	156	157	158	159	160
	Ans.	1	1	3	4	4	1	4	2	4	1
	Q.No.	161	162	163	164	165	166	167	168	169	170
	Ans.	2	2	3	2	4	2	1	3	4	1
	Q.No.	171	172	173	174	175	176	177	178	179	180
	Ans.	3	1	2	2	1	2	1	4	1	3
	Q.No.	181	182	183	184	185	186	187	188	189	190
	Ans.	3	2	4	1	3	4	3	2	3	2
Q.No.	191	192	193	194	195	196	197	198	199	200	
Ans.	4	1	2	1	3	3	3	3	3	2	

STUDENT'S SPACE

TEXT SOLUTIONS (TS)

PAPER

PART-A: PHYSICS

1. $W = \vec{F} \cdot \vec{s} = (6\hat{i} + 2\hat{j} - 3\hat{k}) \cdot (2\hat{i} - 3\hat{j} + x\hat{k}) = 0$
 $12 - 6 - 3x = 0 \Rightarrow x = 2$

2. If two vectors \vec{A} and \vec{B} are given then the resultant
 $R_{\max} = A + B = 7\text{N}$ and $R_{\min} = 4 - 3 = 1\text{N}$
 i.e. net force on the particle is between 1 N and 7 N.
 यदि दो सदिश \vec{A} तथा \vec{B} दिये गये हैं तो उनका परिणामी
 $R_{\max} = A + B = 7\text{N}$ तथा $R_{\min} = 4 - 3 = 1\text{N}$
 अर्थात् कण पर कुल बल 1 N तथा 7 N के मध्य होगा

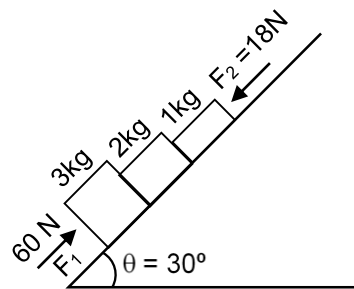
3. $R_{\max} = A + B = 17$ when जब $\theta = 0^\circ$
 $R_{\min} = A - B = 7$ when जब $\theta = 180^\circ$
 by solving we get $A = 12$ and $B = 5$
 हल करने पर $A = 12$ तथा $B = 5$
 Now when $\theta = 90^\circ$ then $R = \sqrt{A^2 + B^2}$
 अब यदि $\theta = 90^\circ$ है, तो $R = \sqrt{A^2 + B^2}$
 $\Rightarrow R = \sqrt{(12)^2 + (5)^2} = \sqrt{169} = 13$

4. Net force on the particle is zero so the \vec{v} remains unchanged.
 कण पर परिणामी बल शून्य है अतः \vec{v} का मान अपरिवर्तित रहेगा।

5. Work done = area under curve and displacement axis
 किया गया कार्य = वक्र तथा विस्थापन अक्ष से घिरा क्षेत्रफल
 $= 1 \times 10 - 1 \times 10 + 1 \times 10 = 10 \text{ J}$

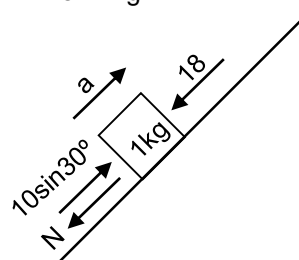
6. Tension at pt. P $\left[m + \frac{2L/3}{L} (3m) \right] g_{\text{eff}}$
 $= 3m_{\text{geff.}} = 3m \left(g + \frac{g}{3} \right) = 4mg$

7.



$$a = \frac{\text{Net force}}{\text{Total mass}} = \frac{60 - (18 + 60\sin 30^\circ)}{6} = 2 \text{ ms}^{-2}$$

FBD of 1 kg



$$N - 18 - 5 = 1(2)$$

$$N = 25 \text{ N}$$

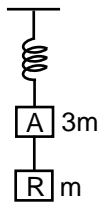
8. Only direction of displacement and velocity gets changed, acceleration is always directed vertically downward.
 सिर्फ विस्थापन तथा वेग की दिशा में परिवर्तन होगा, त्वरण की दिशा सदैव ऊर्ध्वाधरतः नीचे की ओर रहेगी।

9. $\therefore a = \frac{dv}{dt} = 2(t-1) \Rightarrow dv = 2(t-1) dt$
 $\Rightarrow v = \int_0^5 2(t-1) dt = 2 \left[\frac{t^2}{2} - t \right]_0^5$
 $= 2 \left[\frac{25}{2} - 5 \right] = 15 \text{ m/s}$

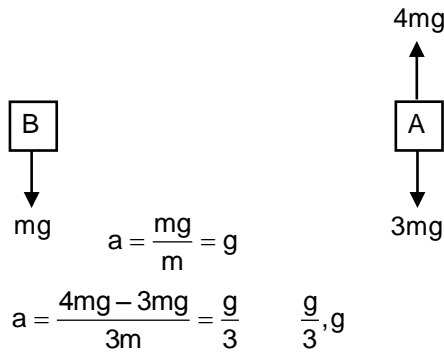
10. $\frac{1}{2} at^2 = vt \Rightarrow t = \frac{2v}{a}$

11. $\therefore V = \frac{4}{3} \pi r^3$
 $\therefore \% \text{ error is volume} = 3 \times \% \text{ error in radius}$
 $= 3 \times 1 = 3\%$
 $V = \frac{4}{3} \pi r^3$
 \therefore आयतन में प्रतिशत त्रुटि
 $= 3 \times$ त्रिज्या में प्रतिशत त्रुटि

12.



Tension in spring initially = $4mg$ tension in string initially = mg after cutting string



13. The work done, $W = \vec{F} \cdot \vec{s} = F \cos \theta$, when a person walk on a horizontal road with load on his head then $\theta = 90^\circ$.

Hence $W = F \cos 90^\circ = 0$

Thus no work is done by the person.

किया गया कार्य $W = \vec{F} \cdot \vec{s} = F \cos \theta$, जब कोई व्यक्ति अपने सिर पर भार रखकर क्षैतिज सड़क पर चलता है,

तब $\theta = 90^\circ$ अतः $W = F \cos 90^\circ = 0$

अतः व्यक्ति द्वारा कोई कार्य नहीं किया जाता।

14. $W = F \times s = F \times v \times t = 5 \times 2 \times 60 = 600J$

15. As the body moves in the direction of force therefore work done by gravitational force will be positive.

$W = Fs = mgh = 10 \times 9.8 \times 10 = 980J$

16. $x = 36t \therefore v_x = \frac{dx}{dt} = 36m/s$

$y = 48t - 4.9t^2 \therefore v_y = 48 - 9.8t$

at $t=0$ $v_x = 36$ and $v_y = 48m/s$

So, angle of projection

$$\theta = \tan^{-1} \left(\frac{v_y}{v_x} \right) = \tan^{-1} \left(\frac{4}{3} \right)$$

Or $\theta = \sin^{-1}(4/5)$

$x = 36t \therefore v_x = \frac{dx}{dt} = 36m/s$

$y = 48t - 4.9t^2 \therefore v_y = 48 - 9.8t$

$t=0$ पर $v_x = 36$ तथा $v_y = 48m/s$

इसलिये प्रक्षेपण कोण

$$\theta = \tan^{-1} \left(\frac{v_y}{v_x} \right) = \tan^{-1} \left(\frac{4}{3} \right)$$

अथवा $\theta = \sin^{-1}(4/5)$

17. For both cases $t = \sqrt{\frac{2h}{g}} = \text{constant}$.

दोनों स्थितियों के लिये $t = \sqrt{\frac{2h}{g}} = \text{नियत}$

18. At the topmost point

उच्चतम बिन्दु पर

19. Instantaneous velocity of rising mass after t

sec will be $v_t = \sqrt{v_x^2 + v_y^2}$

where $v_x = v \cos \theta = \text{Horizontal component of velocity}$

$v_y = v \sin \theta - gt = \text{Vertical component of velocity}$

$$v_t = \sqrt{(v \cos \theta)^2 + (v \sin \theta - gt)^2}$$

$$v_t = \sqrt{v^2 + g^2 t^2 - 2v \sin \theta gt}$$

t सेकण्ड पश्चात् द्रव्यमान का तात्क्षणिक वेग होगा

$$v_t = \sqrt{v_x^2 + v_y^2}$$

जहाँ $v_x = v \cos \theta = \text{वेग का क्षैतिज घटक}$

$v_y = v \sin \theta - gt = \text{वेग का ऊर्ध्वाधर घटक}$

$$v_t = \sqrt{(v \cos \theta)^2 + (v \sin \theta - gt)^2}$$

$$v_t = \sqrt{v^2 + g^2 t^2 - 2v \sin \theta gt}$$

20. $R = 4H \cot \theta$, if $R=3H$ then $\cot \theta = \frac{3}{4}$

$\Rightarrow \theta = 53^\circ 8'$

$R = 4H \cot \theta$, यदि $R=3H$ तब

$$\cot \theta = \frac{3}{4} \Rightarrow \theta = 53^\circ 8'$$

21. The relative velocity of policeman w.r.t. thief = $10 - 9 = 1m/s$.

∴ Time taken by police to catch the thief
 $= \frac{100}{1} = 100 \text{ sec}$
 पुलिस का चोर के सापेक्ष, आपेक्षिक वेग
 $= 10 - 9 = 1 \text{ m/s}$
 ∴ चोर को पकड़ने में पुलिस द्वारा लिया गया समय
 $= \frac{100}{1} = 100 \text{ sec}$

22. $\text{Time} = \frac{\text{Total length}}{\text{Relative velocity}} = \frac{50+50}{10+15} = \frac{100}{25} = 4 \text{ sec}$
 समय = $\frac{\text{कुल लंबाई}}{\text{आपेक्षिक वेग}} = \frac{50+50}{10+15} = \frac{100}{25} = 4 \text{ sec}$

23. Relative velocity आपेक्षिक वेग
 $= 10 + 5 = 15 \text{ m/sec}$
 ∴ $t = \frac{150}{15} = 10 \text{ sec}$

24. Let the velocity of the scooterist = v
 Relative velocity of scooterist with respect to bus = (v - 10)
 $\Rightarrow S = (v - 10) \times 100$
 $\Rightarrow 1000 = (v - 10) \times 100$
 ∴ $v = 10 + 10 = 20 \text{ m/s}$
 माना कि स्कूटर चालक का वेग = v
 बस के सापेक्ष स्कूटर चालक का आपेक्षिक वेग = (v - 10)
 $\Rightarrow S = (v - 10) \times 100$
 $\Rightarrow 1000 = (v - 10) \times 100$
 ∴ $v = 10 + 10 = 20 \text{ m/s}$

25. When the man is at rest w.r.t. the ground, the rain comes to him at an angle 30° with the vertical. This is the direction of the velocity of raindrops with respect to the ground.
 Here \vec{v}_{rg} = velocity of rain with respect to the ground
 \vec{v}_{mg} = velocity of the man with respect to the ground.
 and \vec{v}_{rm} = velocity of the rain with respect to the man,
 We have $\vec{v}_{rg} = \vec{v}_{rm} + \vec{v}_{mg}$ (i)

Taking horizontal components equation (i) gives

$$v_{rg} \sin 30^\circ = v_{mg} = 10 \text{ km/hr}$$

$$\text{or } v_{rg} = \frac{10}{\sin 30^\circ} = 20 \text{ km/hr}$$

जब मनुष्य विराम अवस्था में है तब पानी की बूँदें उसके ऊपर ऊर्ध्वाधर से 30° के कोण पर गिरती हैं। यही पानी की बूँदों के वेग की जमीन के सापेक्ष दिशा होगी।

अब \vec{v}_{rg} = पानी की बूँदों का जमीन के सापेक्ष वेग

\vec{v}_{mg} = मनुष्य का जमीन के सापेक्ष वेग

तथा \vec{v}_{rm} = पानी की बूँदों का मनुष्य के सापेक्ष वेग

$$\vec{v}_{rg} = \vec{v}_{rm} + \vec{v}_{mg} \quad \dots\dots(i)$$

क्षैतिज घटक लेने पर समीकरण (i) से

$$v_{rg} \sin 30^\circ = v_{mg} = 10 \text{ km/hr}$$

$$\text{अथवा } v_{rg} = \frac{10}{\sin 30^\circ} = 20 \text{ km/hr}$$

26. $R = m(g + a) = m(g + 4g) = 5mg$

27. Both **Assertion** and **Reason** are true and the **Reason** is the correct explanation of the **Assertion**.

28. $R = m(g - a) = m(10 - 10) = \text{zero}$

29. $a = \frac{m_2 - m_1}{m_1 + m_2} g = \frac{10 - 5}{10 + 5} g = \frac{g}{3}$

30. By lowering his hand player increases the time of catch, by doing so he experience less force on his hand because $F \propto 1/dt$.

अपने हाथों को नीचे ले जाकर खिलाड़ी गेंद पकड़ने के समय को बढ़ाता है। ऐसा करने से वह हाथों पर कम बल महसूस करता है, क्योंकि $F \propto 1/dt$

31. Dynamic friction गतिक घर्षण

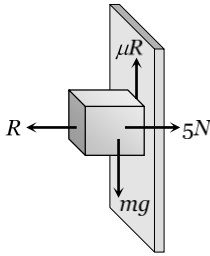
32. $W = \mu mgS = 0.2 \times 50 \times 9.8 \times 1 = 98 \text{ J}$

33. On a rainy day, the roads are wet. Wetting of roads lowers the coefficient of friction between the tyres and the road. Therefore, grip of car on the road reduces and thus chances of skidding increases.

वर्षा होने पर सड़कें गीली हो जाती हैं। सड़क के गीला होने से टायर तथा सड़क के बीच घर्षण गुणांक का मान कम हो जाता है। अतः सड़क पर कार की पकड़ कम हो जाती है। अतः कार के फिसलने की सम्भावना बढ़ जाती है।

34. Limiting friction $F_l = \mu_s R = 0.5 \times (5) = 2.5 \text{ N}$

Since downward force is less than limiting friction therefore block is at rest so the static force of friction will work on it.

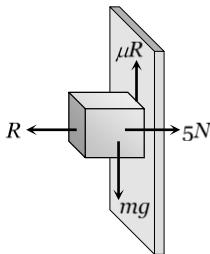


$F_s = \text{downward force} = \text{Weight}$

$= 0.1 \times 9.8 = 0.98 \text{ N}$

सीमांत घर्षण $F_l = \mu_s R = 0.5 \times (5) = 2.5 \text{ N}$

चूँकि नीचे की ओर लगने वाला बल सीमांत घर्षण से कम है, अतः गुटका विराम स्थिति में ही रहता है तथा इस पर स्थैतिक घर्षण कार्य करता है।



$F_s = \text{नीचे की ओर लगने वाला बल}$

$= \text{भार} = 0.1 \times 9.8 = 0.98 \text{ N}$

35. Coefficient of friction = Tangent of angle of repose

$\therefore \mu = \tan \theta$

घर्षण गुणांक = विराम कोण की स्पर्शज्या

$\therefore \mu = \tan \theta$

36. Kinetic energy acquired by body

$= (\text{Total work done on the body}) - (\text{work against friction})$

$= F \times S - \mu mgS = 25 \times 10 - 0.2 \times 5 \times 10 \times 10$

$= 250 - 100 = 150 \text{ Joule}$

वस्तु द्वारा प्राप्त गतिज ऊर्जा

$= (\text{वस्तु पर किया गया कुल कार्य}) - (\text{घर्षण के विरुद्ध किया गया कार्य})$

$= F \times S - \mu mgS = 25 \times 10 - 0.2 \times 5 \times 10 \times 10$

$= 250 - 100 = 150 \text{ J}$

37. $E = \frac{P^2}{2m} \therefore E \propto P^2$

i.e. if P is increased n times then E will increase n^2 times.

38. Potential energy of water = kinetic energy at turbine

$mgh = \frac{1}{2}mv^2 \Rightarrow$

$v = \sqrt{2gh} = \sqrt{2 \times 9.8 \times 19.6} = 19.6 \text{ m/s}$

39. Here $k = \frac{F}{x} = \frac{10}{1 \times 10^{-3}} = 10^4 \text{ N/m}$

$W = \frac{1}{2}kx^2 = \frac{1}{2} \times 10^4 \times (40 \times 10^{-3})^2 = 8 \text{ J}$

40. $U = \frac{1}{2}kx^2$ if x becomes 5 times then energy will become 25 times i.e. $4 \times 25 = 100 \text{ J}$

41. Kinetic energy for first condition
प्रथम स्थिति में गतिज ऊर्जा

$= \frac{1}{2}m(v_2^2 - v_1^2) = \frac{1}{2}m(20^2 - 10^2) = 150 \text{ mJ}$

K.E. for second condition द्वितीय स्थिति में

गतिज ऊर्जा $= \frac{1}{2}m(10^2 - 0^2) = 50 \text{ mJ}$

$\therefore \frac{(\text{K.E.})\text{I}}{(\text{K.E.})\text{II}} = \frac{150 \text{ m}}{50 \text{ m}} = 3$

$\frac{(\text{गतिज ऊर्जा})\text{I}}{(\text{गतिज ऊर्जा})\text{II}} = \frac{150 \text{ m}}{50 \text{ m}} = 3$

42. The work done on the spring against the restoring force is stored as potential energy in both conditions when it is compressed or stretched.

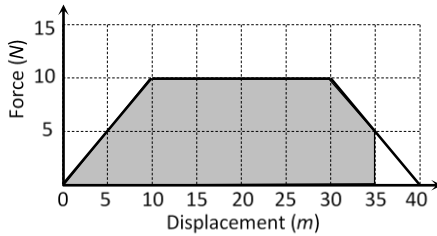
प्रत्यानन बल के विरुद्ध स्प्रिंग पर किया गया कार्य दोनों स्थितियों में स्थितिज ऊर्जा के रूप में संचित हो जाता है, जब इसे खींचा अथवा संपीडित किया जाता है।

43. Kinetic energy $E = \frac{1}{2}mv^2 \Rightarrow E \propto v^2$
graph will be parabola symmetric to E-axis.

$$\text{गतिज ऊर्जा } E = \frac{1}{2}mv^2 \Rightarrow E \propto v^2$$

ग्राफ E-अक्ष के सममित परवलय होगा।

- 44.



Work done = (Shaded area under the graph between

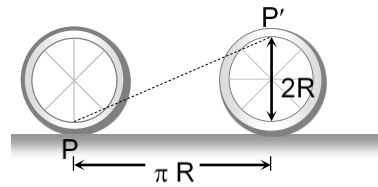
किया गया कार्य = ग्राफ का छायांकित भाग ($x=0$ से $x=35$ m तक)

$$x = 0 \text{ to } x = 35 \text{ m}) = 287.5 \text{ J}$$

45. $U \propto x^2$

$$\Rightarrow \frac{U_2}{U_1} = \left(\frac{x_2}{x_1}\right)^2 = \left(\frac{0.1}{0.02}\right)^2 = 25 \therefore U_2 = 25U_1$$

- 46.



आधे चक्कर के पश्चात् बिन्दु P का विस्थापन

$$PP' = \sqrt{(\pi R)^2 + (2R)^2} = R\sqrt{\pi^2 + 4} = 5\sqrt{\pi^2 + 4}$$

47. $\omega^2 = \omega_0^2 - 2\alpha\theta \Rightarrow 0 = 4\pi^2 n^2 - 2\alpha\theta$

$$\theta = \frac{4\pi^2 \left(\frac{1200}{60}\right)^2}{2 \times 4} = 200\pi^2 \text{ rad}$$

$$\therefore 2\pi n = 200\pi^2 \Rightarrow n = 100\pi = 314 \text{ चक्कर}$$

48. $v = r\omega \Rightarrow \omega = \frac{v}{r} = \text{constant}$

[As v and r are constant]

यदि एक वस्तु r त्रिज्या के वृत्त में अचर वेग v से

गति कर रही है, तो इसका कोणीय वेग होगा

$$v = r\omega \Rightarrow \omega = \frac{v}{r} = \text{नियत}$$

[चूँकि v तथा r नियत हैं]

49. $\omega_{\min} = \frac{2\pi \text{ Rad}}{60 \text{ min}}$ and $\omega_{\text{hr}} = \frac{2\pi \text{ Rad}}{12 \times 60 \text{ min}}$

$$\therefore \frac{\omega_{\min}}{\omega_{\text{hr}}} = \frac{2\pi/60}{2\pi/12 \times 60}$$

$$\omega_{\min} = \frac{2\pi \text{ Rad}}{60 \text{ min}} \text{ तथा } \omega_{\text{hr}} = \frac{2\pi \text{ Rad}}{12 \times 60 \text{ min}}$$

$$\therefore \frac{\omega_{\min}}{\omega_{\text{hr}}} = \frac{2\pi/60}{2\pi/12 \times 60}$$

50. $\omega = 2\pi n = \frac{2\pi \times 100}{60} = 10.47 \text{ rad/s}$

PART-B: CHEMISTRY

51. Moles of $\text{NO}_2 = \frac{112}{22400} = 0.005 \quad \therefore$
 mass of NO_2 (ℓ) = $0.005 \times 46 = 0.23 \text{ g}$
 \therefore volume of NO_2 (ℓ) = $\frac{\text{Mass}}{\text{Density}} = \frac{0.23}{1.15} = 0.2 \text{ mL}$
 \therefore molecules of liquid $\text{NO}_2 = \text{moles} \times N_A = 0.005 \times N_A = 3.01 \times 10^{21}$.
 NO_2 के मोल = $\frac{112}{22400} = 0.005 \quad \therefore \text{NO}_2$ (ℓ) का द्रव्यमान = $0.005 \times 46 = 0.23 \text{ g}$
 $\therefore \text{NO}_2$ (ℓ) का आयतन = $\frac{\text{भार}}{\text{घनत्व}} = \frac{0.23}{1.15} = 0.2 \text{ mL}$
 \therefore द्रव NO_2 के अणु = मोल $\times N_A = 0.005 \times N_A = 3.01 \times 10^{21}$.
53. Number of gold atoms (गॉल्ड परमाणुओं की संख्या) = $\frac{19.7 \times 10^3}{197} N_A = 6.02 \times 10^{25}$
54. 180 amu \rightarrow Mol. mass of glucose \rightarrow 1 molecule
 \therefore 360 amu 2 molecules of glucose
 Number of H-atoms = $2 \times 12 = 24$
 Number of C-atoms = $2 \times 6 = 12$
 180 amu \rightarrow ग्लूकोस का आण्विक द्रव्यमान \rightarrow 1 अणु
 \therefore 360 amu ग्लूकोस के 2 अणु
 H-परमाणु की संख्या = $2 \times 12 = 24$
 C-परमाणु की संख्या = $2 \times 6 = 12$
55. Mol. wt. of gas is = $\frac{16 \times 22.4}{5.6} = 64 \text{ g}$
 $32 + 16x = 64$
 $x = 2$
 गैस का अणुभार = $\frac{16 \times 22.4}{5.6} = 64 \text{ g}$
 $32 + 16x = 64$
 $x = 2$

56. 16.8 g
57.

	A	B	C
	W	W	W
mole	$\frac{W}{20}$	$\frac{W}{40}$	$\frac{W}{60}$
Simple ratio	3	1.5	1
Whole no. ratio	6	3	2
Empirical formula	मूलानुपाती सूत्र $\text{A}_6\text{B}_3\text{C}_2$		

Ans.

59. $K_a = \frac{K_w}{K_b} = \frac{10^{-14}}{1.8 \times 10^{-5}} = 5.6 \times 10^{-10} < 1$
 \therefore Weak acid दुर्बल अम्ल
60. 5
62. M/3
63. Hypo phosphorous acid
 हाइपो फॉस्फोरस अम्ल में
64. $[\text{Cl}^-] = \frac{300 \times 3 + 200 \times 4 \times 2}{500} = \frac{2500}{500} = 5 \text{ M}$
65. 11.65 g
66. 14/3
68. $E = \frac{M}{n - \text{factor}}, \text{N}^{-1} \rightarrow \text{N}^{+1} \therefore n\text{-factor} = 2.$
 $E = \frac{M}{n - \text{कारक}}, \text{N}^{-1} \rightarrow \text{N}^{+1} \therefore n\text{-कारक} = 2.$
69. $\text{Cl}_2(\text{g}) \rightleftharpoons 2\text{Cl}(\text{g})$
 $\frac{1}{2}\text{atm} \qquad \qquad \qquad \frac{1}{2}\text{atm}$
 $K_p = \frac{(1/2)^2}{(1/2)}$
 $K_p = \frac{1}{2} = 0.5$
 $K_p = 5 \times 10^{-1}$

70. In KCl, HCl and AgNO₃ solubility decrease due to common ion effect so solubility maximum in deionised water.

71. 4-Methylhept-2-en-5-yne
4-मिथाइल हेप्ट-2-इन-5-यिन

72. BF₄⁻ hybridisation sp³, tetrahedral structure.
NH₄⁺ hybridisation sp³, tetrahedral structure.

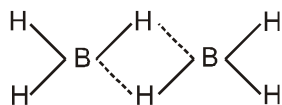
BF₄⁻ संकरण sp³, चतुष्फलकीय संरचना

NH₄⁺ संकरण sp³, चतुष्फलकीय संरचना

73. If the no. of C-atoms in the ring and in the side chain are the same, then the name of ring appears in word root and side chain appears as secondary prefix.

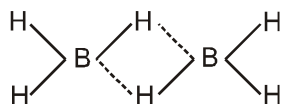
यदि वलय में तथा पार्श्व-श्रृंखला में C-परमाणु की संख्या समान है तब वलय का नाम मूल शब्द में लिखा जाता है तथा पार्श्व श्रृंखला द्वितीयक पूर्वलग्न के रूप में रहती है।

74. (BH₃)₂ or (B₂H₆)



It contains two 3 centre-2 electron bonds.

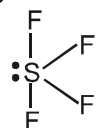
(BH₃)₂ या (B₂H₆)



इसमें दो 3 केन्द्र-2 इलेक्ट्रॉन बंध होते हैं।

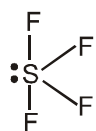
75. 3-Methylpent-2-en-4-yn-1-oic acid

76. SF₄ has sp³d hybridisation and seesaw

shape (4bp + 1lp)  and resultant μ ≠ 0.

0.

SF₄ में sp³d संकरण होता है तथा इसकी आकृति

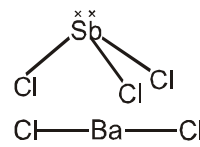
सीसों होती है (4bp + 1lp)  व परिणामी

μ ≠ 0.

77. I, II, III

78. F—Xe⁺—F sp³d & Linear

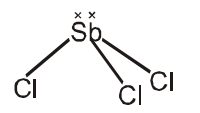
Cl—I⁺—Cl sp³d & Linear

 sp³ pyramidal
sp Linear

 sp³ V-shape

F—Xe⁺—F sp³d तथा रेखीय

Cl—I⁺—Cl sp³d तथा रेखीय

 sp³ पिरैमिडल

Cl—Ba—Cl sp रेखीय

 sp³ V-आकृति

79. C = C — O — C — C ,

C = C — C — O — C — H ,

C — C = C — O — C — H ,

C — O — C — C = C ,

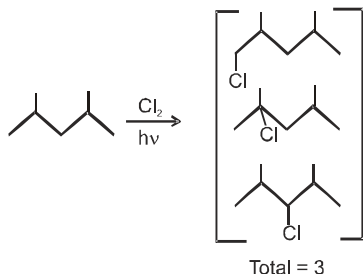
C = C — O — C — H

81. Na⁺

83. Alkali metals

क्षार धातुओं का

84.

85. $O \rightarrow O^{2-}$

86. Law of mass action

द्रव्य अनुपाती क्रिया नियम

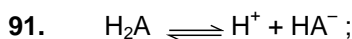
87. $n\text{-factor} = \left(3 - \frac{2}{0.9}\right) \times 0.9 = 0.7$

$$\Rightarrow \text{equivalent weight} = \frac{M}{0.7}$$

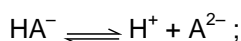
$$n \text{ कारक} = \left(3 - \frac{2}{0.9}\right) \times 0.9 = 0.7$$

$$\Rightarrow \text{तुल्यांकी भार} = \frac{M}{0.7}$$

88. $K_c = \frac{[Z]^2}{[X]^2 [Y]^2}$

90. $[K \Rightarrow \text{Product}]$ 

$$K_1 = \frac{[H^+][HA^-]}{[H_2A]} = 1 \times 10^{-5}$$



$$K_2 = 5 \times 10^{-10} = \frac{[H^+][A^{2-}]}{[HA^-]}$$

$$K = \frac{[H^+]^2 [A^{2-}]}{[H_2A]} = K_1 \times K_2 = 1 \times 10^{-5} \times 5$$

$$\times 10^{-10} = 5 \times 10^{-15}$$

$$K = K_1 \times K_2$$

92. Final milimoles of H_2O_2 solution = (100)

$$(0.1) + (0.5) (400) = 210 \text{ m.mol}$$

Now, mili. eq. (H_2O_2) = mili. eq. ($KMnO_4$)

$$\Rightarrow (210) (2) = (V) (0.1) (5)$$

$$\Rightarrow V = 840 \text{ ml}$$

$$H_2O_2 \text{ विलयन के अन्तिम मिलीमोल} = (100) (0.1)$$

$$+ (0.5) (400) = 210 \text{ m.mol}$$

अब, (H_2O_2) के मिली तुल्यांक = ($KMnO_4$) के

मिली तुल्यांक

$$\Rightarrow (210) (2) = (V) (0.1) (5)$$

$$\Rightarrow V = 840 \text{ ml}$$

93. $pH = -\log[H^+]$; $7.4 = -\log[H^+]$; $[H^+] = 4 \times 10^{-8} \text{ M}$

$$[H^+] = \text{antilog}(-7.4) = \text{antilog}(1 - 0.4) \times 10^{-7}$$

$$= (\text{antilog } 0.6) \times 10^{-8} = 4 \times 10^{-8}$$

94. Rate of chemical reaction has nothing to do with value of equilibrium constant.

96. Hydrogen bonding

हाइड्रोजन बन्ध

98. co-ordinate bond between B and N

B तथा N के मध्य उपसहसंयोजी बंध से

99. In NO_3^- , N is sp^2 hybridised, therefore, NO_3^- ion has trigonal planar geometry. PO_3^- units are linked together through P - O - P bonds to form either linear or cyclic structures. In these polymeric structures, the P-atom is sp^3 hybridised and thus each PO_3^- unit has tetrahedral shape. NO_3^- में N का sp^2 संकरण होता है। इसलिए NO_3^- आयन समतलीय त्रिभुजीय ज्यामिति रखता है। PO_3^-

इकाई P - O - P

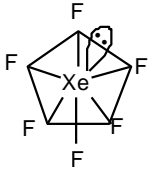
बन्ध के साथ बंधित होकर रेखीय या चक्रीय

संरचना बनाता है। इन बहुलकीय संरचना में P-

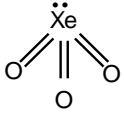
परमाणु sp^3 संकरित होता है तथा इसलिए PO_3^-

इकाई चतुष्फलकीय आकृति दर्शाती है।

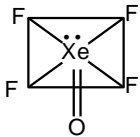
100. $XeF_6 \longrightarrow sp^3d^3 \longrightarrow \text{distorted octahedral}$
विकृत अष्टफलकीय



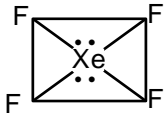
$\text{XeO}_3 \longrightarrow \text{sp}^3 \longrightarrow$ pyramidal पिरामिडीय



$\text{XeF}_4 \longrightarrow \text{sp}^3\text{d}^2 \longrightarrow$ square pyramidal वर्ग पिरामिडीय



$\text{XeF}_4 \longrightarrow \text{sp}^3\text{d}^2 \longrightarrow$ square planar वर्ग समतलीय



---- TEXT SOLUTIONS (TS) END ----

