Enthusiast, Leader & Achiever Course

PHASE : ALL PHASE

TARGET : PRE-MEDICAL 2020

Test Type : **MAJOR** Test Pattern : **NEET (UG)**

TEST DATE : 14-07-2020

Q.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.	4	1	3	2	4	2	4	4	4	1	2	4	2	1	4	3	3	3	4	3	4	2	3	3	3	2	2	2	2	1
Q.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
A.	3	4	3	1	2	4	3	4	1	1	3	1	3	3	2	2	3	3	1	1	4	4	1	4	1	3	4	2	1	2
Q.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
A.	4	4	3	4	2	3	4	1	3	1	1	2	3	4	2	4	3	1	1	2	4	3	4	2	4	1	4	3	3	3
Q.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
A.	3	1	1	1	1	2	2	3	2	1	2	3	2	3	2	4	3	3	4	2	2	2	1	4	3	4	2	4	3	2
Q.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
A.	2	3	2	3	2	3	3	4	2	2	4	1	4	4	4	2	4	3	1	4	2	2	2	3	1	3	4	4	4	4
Q.	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
A.	4	1	3	3	3	3	3	4	4	2	4	2	1	2	4	1	2	2	4	4	4	4	2	1	4	2	3	2	3	1

HINT – SHEET

1. Ans (4)

Range of projectile

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

for $\theta = 60°$,

$$R = \frac{20^2 \sin 120}{g} = 20\sqrt{3} = 34.64 \text{ m}$$

for % error $\frac{\Delta R}{R} = \frac{2\Delta u}{u}$

$$\Delta R = \frac{2 \times 5}{100} \times 20\sqrt{3} = 2\sqrt{3} = 3.464 \text{ m}$$

So, range R = 34.64 ± 3.46 m

$R_{min} = 31.1$ m and $R_{max} = 38.1$ m

2. Ans (1)

$$\vec{F}_x = 1\cos 60° \hat{i} - 4 \sin 30° \hat{i} + 2 \sin 30° \hat{i}$$

$$= \frac{1}{2}\hat{i} - 2\hat{i} + \hat{i}$$

So minimum additional force required is

$$\vec{F} = -\vec{F}_x = 0.5\hat{i}$$

3. Ans (3)

$$\cos\theta = \frac{\vec{A} \cdot \vec{B}}{AB} = \frac{2 + 2 - 3}{\sqrt{6}\sqrt{9}} = \frac{1}{\sqrt{54}}$$

$$\sin\theta = \sqrt{\frac{53}{54}}$$

$$\tan\theta = \sqrt{53}$$

$$\theta = \tan^{-1}\sqrt{53}$$

4. Ans (2)

$$\text{Area} = \frac{1}{2}\left(\vec{A} \times \vec{B}\right) \qquad \vec{A} \times \vec{B} = 2\hat{k}$$

$$= \frac{1}{2}(2)$$

$$= 1 \text{ unit}$$

5. Ans (4)

$$1 \text{ Volt} = \frac{1 \text{ Watt}}{1 \text{ C}}$$

6. Ans (2)

Energy $\propto$ work

work = Force × displacement

$[\text{Energy}]_1 = [\text{Force}] \times [\text{displacement}]$

$[\text{Energy}]_2 = [4\ \text{Force}] \times [4\ \text{displacement}]$

$= 16\ [\text{Force}] \times [\text{displacement}]$

$[\text{Energy}]_2 = 16\ [\text{Energy}]_1$

7. Ans (4)

$$\frac{mr^2}{6\pi\eta} = \frac{ML^2}{ML^{-1}T^{-1}} = L^3T$$

$$\sqrt{\frac{6\pi mr\eta}{g^2}} = \left[\frac{M\,L\,M\,L^{-1}\,T^{-1}}{L^2T^{-4}}\right]^{1/2}$$

$$= ML^{-1}T^{3/2}$$

$$\frac{m}{6\pi\eta r^2} = \frac{M}{ML^{-1}T^{-1}.\ L.\ LT^{-1}} = L^{-1}T$$

8. Ans (4)

by R – 4 & R-5

9. Ans (4)

Least count (LC) = $\left(\frac{b-a}{b}\right)$MSD;

here a = 9, b = 10;

1MSD = 1mm

LC = $\left(\frac{10-9}{10}\right)$ 1mm = 0.1mm

There is zero error in measurement.

As the zero of the vernier lies to the left of the main scale, it has negative zero error.

For negative zero error, the coinciding division is to be read from right and it has 2nd division coinciding from right. Thus zero error

= ZE = –2 VSD = –2 × 0.1mm

= –0.2mm

Reading at measurement: 11MSD + 6VSD (coinciding)

Corrected reading = MSR + VSR × LC – zero error = 11mm + [6 × 0.1mm] – (–0.2mm) = 11.8mm

Hence the value of x = 118

10. Ans (1)

LC = 1MSD – 1 VSD

= 1MSD – $\frac{7}{8}$ MSD

length = MS Reading + VS Reading

= 4mm + 5 × $\frac{1}{8}$ mm = $\frac{37}{8}$ mm = 4.625 mm

11. Ans (2)

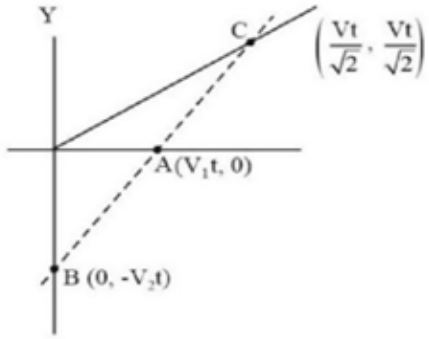
During 10 sec $\vec{v}$ will rotate by 60°

$$|\Delta\vec{v}| = \sqrt{v^2 + v^2 - 2v^2\cos 60^\circ} = v$$

$$v = \left(\frac{2\pi}{60}\right)(20)\frac{cm}{2} = \frac{2\pi}{3}cm/s$$

12. Ans (4)

Slope of line AC = slope of line BA



$$\frac{\left(\frac{vt}{\sqrt{2}} - 0\right)}{\left(\frac{vt}{\sqrt{2}} - v_1t\right)} = \frac{0-(-v_2t)}{(v_1t-0)}$$

$$v = \frac{\sqrt{2}v_1v_2}{v_2 - v_1}$$

13. Ans (2)

$$\vec{r} = (a\cos\omega t)\hat{i} + (a\sin\omega t)\hat{j}$$

$$\vec{v} = \frac{d\vec{r}}{dt} = (-a\omega\ \sin\omega t)\hat{i} + (a\omega\ \cos\omega t)\hat{j}$$

$$\vec{v}\cdot\vec{r} = -a^2\omega\sin\omega t\cos\omega t + a^2\omega\sin\omega t\cos\omega t = 0$$

i.e., $\vec{v} \perp \vec{r}$

14. Ans (1)

For first 5 sec.

$$10 = 5u + \frac{1}{2}(1)(5)^2$$

For first 8 sec.

$$20 = 8u + \frac{1}{2}(1)(8)^2$$

$$u = \frac{35}{3}\ \text{m/s} \qquad a = \frac{1}{3}\ \text{m/s}$$

For first 10 sec

$$s = 10u + \frac{1}{2}a(10)^2 = 28.3\ \text{m}$$

in last 2 sec distance travelled

$$= 28.3 - 20 = 8.3\ \text{m}$$

15. Ans (4)

$$V = \frac{ds}{dt} = 12 - 4t$$

$\therefore$ u = 12 m/s and a = –4 m/s^2

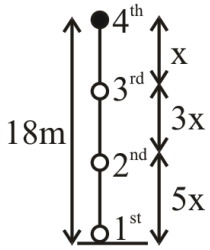
$$t_0 = \left|\frac{u}{a}\right| = 3s$$

Here t_0 is the time when velocity becomes zero. Since the given time t = 5s is greater then t_0. The distance is greater than displacement which is

$$d = \left|\frac{u^2}{2a}\right| + \left|\frac{1}{2}a(t - t_0)^2\right|$$

$$= \frac{144}{2 \times 4} + \frac{1}{2} \times (4)\ (5-3)^2 = 26\text{m}$$

16. Ans (3)



Time interval between each drop is same

So 9x = 18 m

x = 2 m

From roof 3rd drop will beat 2m and 2nd drop will be at 8m.

17. Ans (3)

$$h = \frac{1}{2}gt^2 \quad ...(i)$$

and v = gt ..(ii)

$$h' = v\frac{t}{2} - \frac{1}{2}g\left(\frac{t}{2}\right)^2 = gt\frac{t}{2} - \frac{1}{4} \times \frac{1}{2}\ gt^2$$

$$= h - \frac{1}{4}h = \frac{3}{4}h$$

18. Ans (3)

Displacement = Area under (v–t) graph

19. Ans (4)

$$v_1 = \frac{v_A}{2},\ v_2 = \frac{v_A + v_B}{2}$$

$$v_3 = \frac{v_B}{2} = \frac{2\,[v_2 - v_1]}{2}$$

20. Ans (3)

Without information of initial velocity we can't compare range of particles

21. Ans (4)

Angle made by projectile with horizontal is 30° which is less than 45°. Hence the two velocities are not perpendicular at any instant

22. Ans (2)

$$\tan 60° = \frac{v_y}{v_x} \Rightarrow v_y = v_x\sqrt{3} = 20\ \text{m/s}$$

$$v_y = 0 + gt,\ t = \frac{20}{g} = 2\text{sec.}$$

23. Ans (3)

$$\vec{v}_{Bus} = 40\hat{j}\ ;\ \vec{v}_{mB} = -10\hat{j} = \vec{v}_m - \vec{v}_B$$

$$\vec{v}_m = -10\hat{j} + \vec{v}_B = 30\hat{j}$$

24. Ans (3)

$$\vec{v}_m = 2\hat{i} + 3\hat{j}\ \text{m/s}$$

$$\vec{v}_{rm} = -4\hat{j}\ \text{m/s}$$

$$\vec{v}_{rm} = \vec{v}_r - \vec{v}_m$$

$$-4\hat{j} = \vec{v}_r - \left(2\hat{i} + 3\hat{j}\right)$$

$$\vec{v}_r = 2i - \hat{j}$$

Now for downward motion

$$\vec{v}_{rm} = \vec{v}_r - \vec{v}_m = 2\hat{i} - \hat{j} + \left(2\hat{i} + 3\hat{j}\right)$$

$$= 2\hat{i} - \hat{j} + 2\hat{i} + 3\hat{j}$$

$$\vec{v}_{rm} = 4\hat{i} + 2\hat{j} \qquad \Rightarrow$$

$$|\vec{v}_{rm}| = \sqrt{20} = 2\sqrt{5}\ \text{m/s}$$

25. Ans (3)

$\vec{r}_1 = 3t\,\hat{i} + 4t^2\,\hat{j}$

$\vec{V}_1 = \dfrac{d\vec{r}_1}{dt}$

$= 3\hat{i} + 8t\,\hat{j}$

$\vec{V}_{1\ (t=1)} = 3\hat{i} + 8\hat{j}$

$\vec{r}_2 = 4t^2\,\hat{i} + 3t\,\hat{j}$

$\vec{V}_2 = \dfrac{\overrightarrow{dr_2}}{dt}$

$= 8t\,\hat{i} + 3\hat{j}$

$\vec{V}_{2\ (t=1)} = 8\hat{i} + 3\hat{j}$

$\vec{V}_{1/2} = \vec{V}_1 - \vec{V}_2$

$= 3\hat{i} + 8\hat{j} - 8\hat{i} - 3\hat{j}$

$= -5\hat{i} + 5\hat{j}$

$|\vec{V}_{1/2}| = \sqrt{5^2 + 5^2}$

$= 5\sqrt{2}$ m/s

26. Ans (2)

t = 0 t = 2sec

t = 4sec

X = –16m X = 0 X = 4m

$X = 3t^2 - t^3$ at $t = 0 \Rightarrow X = 0$

$V = 6t - 3t^2 = t(6 - 3t)$

V = 0 at t = 2sec

X = 12 – 8 = 4m

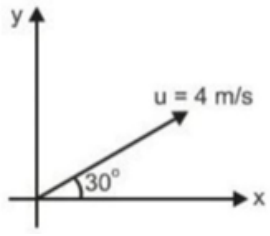
at t = 4 sec.

X = 48 – 64 = – 16 m

Distance = 4 + 4 + 16 = 24 m

27. Ans (2)

Components of velocity of ball relative to lift are :



$u_x = 4\cos 30^\circ =$

$2\sqrt{3}$ m/s

and $u_y = 4 \sin 30^\circ = 2$ m/s

And acceleration of ball relative to lift is 12 m/s^2 in negative y – direction or vertically downwards. Hence time of flight

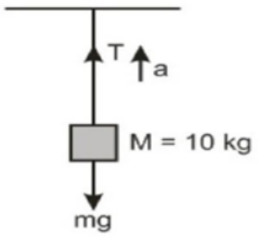
$T = \dfrac{2u_y}{12} = \dfrac{u_y}{6} = \dfrac{2}{6} = \dfrac{1}{3}$s

28. Ans (2)

Maximum tension in the string T = mg

= 30 x 10

= 300 N



T – mg = ma

From the figure

300 – 10 x 10 = 10a, so, $a = 20$ m/s^2

Thus, the maximum acceleration with which the stone can be raised is 20 m/s^2

Given,

S = 10 m

And u = 0

So,

$10 = \dfrac{1}{2}(20)\,t^2$

t = 1 s

29. Ans (2)

Horizontal velocity of apple will remain same but due to retardation of train, velocity of train and hence velocity of boy w.r.t. ground decreases, so apple falls away from the hand of boy in the direction of motion of the train.

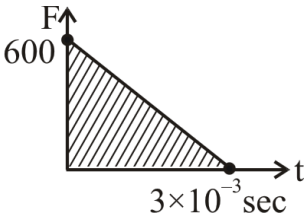
30. Ans (1)

The system (truck + rain drops) is free from external horizontal force and so the momentum along the horizontal direction is conserved.

$\therefore 9000v' = 8000 \times 1.8 \Rightarrow v' = \dfrac{8 \times 1.8}{9}$

or $v' = 1.6 \text{ m s}^{-1}$

31. Ans (3)



F = 0 at

$t = \dfrac{600}{2 \times 10^5}$

$t = 3 \times 10^{-3}$ sec

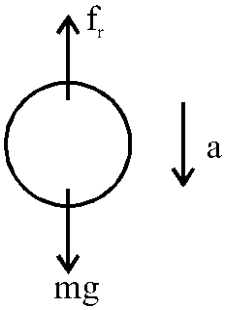
Impulse $= \dfrac{1}{2} \times 600 \times 3 \times 10^{-3} = 0.9\text{Ns}$

32. Ans (4)

The dimension of A is not equal to the dimension of C

Hence it is not possible to subtract AC from A^2

33. Ans (3)



$mg - f_r = ma$

$f_r = m(g - a)$

$= mg\left(1 - \dfrac{a}{g}\right)$

$f_r = w\left(1 - \dfrac{a}{g}\right)$

34. Ans (1)

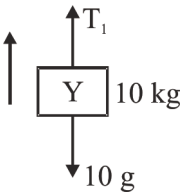
As v = constant a = 0

So net force on each block = 0

35. Ans (2)

$T_1 - 10g = 10(1)$

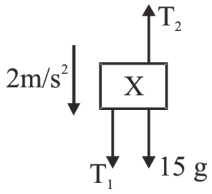
$T_1 = 110$



$T_1 + 15g - T_2 = 15(2)$

$110 + 150 - T_2 = 30$

$T_2 = 230$ N

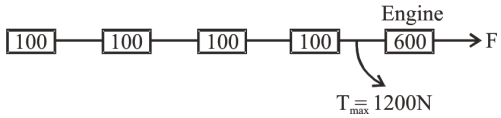


36. Ans (4)

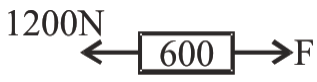
$F_1 = \dfrac{4m_1m_2g}{m_1 + m_2} = \dfrac{(4)(6m)(2m)g}{8m} = 6mg$

$F_2 = \dfrac{(4)(6m)(4m)g}{10m} = \dfrac{96}{10}mg$

37. Ans (3)



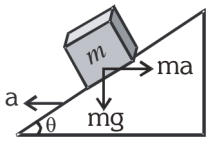
$a_{max} = \dfrac{T_{max}}{\text{mass}} = \dfrac{1200}{400} = 3\text{m/s}^2$



$F - 1200 = 3 \times 600$

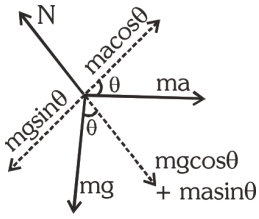
$F = 3000$ N

38. Ans (4)



According to question $\sin\theta = 1/x$ (1 in x)

So $\tan\theta = \dfrac{1}{\sqrt{x^2-1}}$



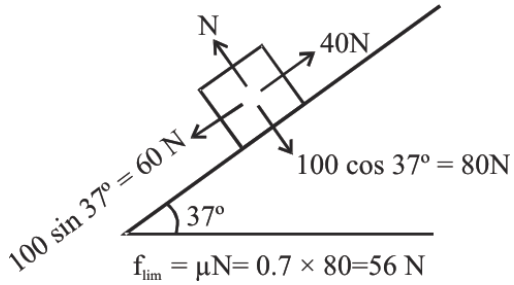
To keep the block stationary relative to the inclined plane

$mg\sin\theta = ma\cos\theta$

$a = g\tan\theta$

$\Rightarrow a = \dfrac{g}{\sqrt{x^2-1}}$

39. Ans (1)



Net driving force = 60 – 40 = 20 N (down the plane) As resisting force is greater than net driving force, the friction will be static of nature and friction force is 20 N (up the plane)

40. Ans (1)

acceleration of system $a = \dfrac{20-2}{2+4} = 3\text{m/s}^2$

For upper block : - f ← a → 2N

$f - 2 = ma$, $f = ma + 2 = 2 \times 3 + 2$

$f = 8$ N

Here $f_{max} = 0.5 \times 2 \times 10 = 10$ N

$\because\ f < f_{max}$

So, friction between the blocks is 8 N.

41. Ans (3)

Let after t time two bodies are 40 m apart. Then according to the problem

$$\frac{1}{2}gt^2 - \frac{1}{2}g(t-2)^2 = 40$$

or $\dfrac{1}{2} \times 10\,(2t-2)\,(2) = 40$

or $2t - 2 = 4$ or $t = 3$ s

42. Ans (1)

$ma = \mu mg$ ma ← m → f

$a = \mu g$

43. Ans (3)

Consider $y = x^3$ at $x = 2$

$y + \Delta y = (2.0001)^3 = (2 + 0.0001)^3$

$= (x + \Delta x)^3$

And $\Delta y = 3x^2\Delta x$

$\Delta y = 3(2)^2 \times (0.0001) = 0.0012$

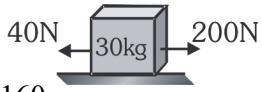
$\therefore\ y = 2^3 + \Delta y = 8.0012$

44. Ans (3)

Force of upthrust will be there on mass m shown in figure, so A weighs less than 2 kg. Balance will show sum of load of beaker and reaction of upthrust so it reads more than 5 kg.

45. Ans (2)

$F = 20 \times 2 = 40$N



$a = \dfrac{160}{30} = 5.3\ \text{m/s}^2$

46. Ans (2)

$CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$

sto. 100 g 73 g 1 mol

Given 20 g 20 g ?

= 0.2 mol

= 0.2 × 44 g

= 8.8 g

50. Ans (1)

$$\% \text{ oxygen} = \frac{16}{40} \times 100$$
$$= 40\%$$

55. Ans (1)

N^{3-}

7p & 10e

57. Ans (4)

$$\frac{\lambda_P}{\lambda_{Be^{+3}}} = \frac{h}{\sqrt{2eV\, m_p h}} \times \sqrt{2 \times 3eV\, m_{Be^{+3}}}$$
$$= \sqrt{\frac{2 \times 3 \times eV \times 9m_p}{2eV \times m_P}} = 3\sqrt{3}$$
$$\frac{\lambda_P}{\lambda_{Be^{+3}}} = 3\sqrt{3} \Rightarrow \frac{\lambda_{Be^{+3}}}{\lambda_P} = \frac{1}{3\sqrt{3}}$$

66. Ans (3)

$HSO_3^- \rightarrow H^+ + SO_3^{2-}$

67. Ans (4)

Potassium ferricyanide does not give the test of ferric ion as it is available as $[Fe(CN_6)]^{-3}$ complex ion.

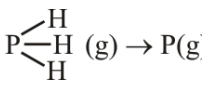
71. Ans (1)

$$\alpha = \frac{K_a}{\text{Concentration of common ion}}$$

75. Ans (2)

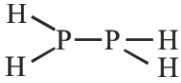
Melting is acompanied by increase in entropy.

78. Ans (1)


$(g) \rightarrow P(g) + 3H(g)$ ΔH_{atom}=954 kJ/mol

$$\therefore BE_{(P-H)} = \frac{\Delta H_{atom}}{3} = \frac{954}{3}$$

BE_{P-H} = 318 kJ/mol


or $P_2H_4(g) \rightarrow 2P(g) + 4H(g)$

ΔH_{atom} = 1485 kJ/mol

$BE_{(P-P)} + 4BE_{P-H} = 1485$

$BE_{(P-P)}$ = 213 kJ/mol

79. Ans (1)

$HCl + NaOH \rightarrow NaCl + H_2O$ $\Delta H = -x$

v.f = 1

$H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ $\Delta H = -y$

v.f = 2 $2x=y$

81. Ans (4)

Intramolecular redox change involve oxidation of one atom and reduction of one atom within a molecule.

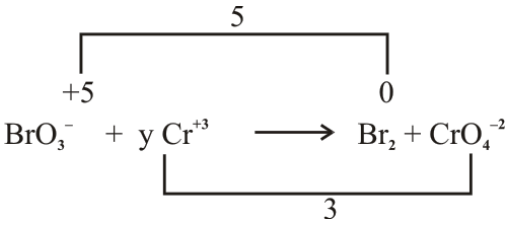
82. Ans (3)

$6FeC_2O_4 + 3Cr_2O_7^{-2} \rightarrow 6Fe^{3+} + 12\ CO_2 + 6Cr^{3+}$

6 mol 3 mol

1 mol $\frac{3}{6}$ mol = 0.5 mol

85. Ans (4)



$6BrO_3^- + 10\ Cr^{+3} \rightarrow 3Br_2 + 10\ CrO_4^{-2} + 44H^+ + 22H_2O$

86. Ans (1)

$$\frac{r_{O_2}}{r_{H_2}} = \sqrt{\frac{2}{32}} = \frac{1}{4}$$

90. Ans (3)

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123. Ans (2)

Statement (B) is wrong and Statement (A), (C) and (D) are correct