Enthusiast, Leader & Achiever Course

PHASE : (All Phase)

TARGET : PRE-MEDICAL 2020

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

TEST DATE : 16-05-2020

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.	2	4	4	1	2	4	4	1	4	2	1	4	2	1	4	1	2	1	3	1	1	1	1	4	2	3	2	2	3	4
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.	1	4	3	1	3	2	3	3	2	4	3	1	3	2	1	4	3	2	1	4	1	4	4	3	3	3	2	3	1	4
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.	1	4	3	1	2	2	2	2	1	2	3	3	1	3	4	4	1	2	3	4	2	1	2	2	2	1	1	3	4	4
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.	2	1	2	4	4	2	1	4	2	4	2	3	4	1	4	2	2	3	2	1	1	3	2	3	1	1	3	1	1	1
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.	4	2	3	3	4	1	3	3	3	2	2	4	3	3	3	3	3	3	3	3	2	3	3	1	2	3	4	3	1	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.	2	2	3	4	4	4	4	1	2	1	2	2	4	2	1	1	4	3	3	1	4	3	4	2	2	1	2	3	3	3

HINT – SHEET

1. Ans (2)

$$LC = \frac{Pitch}{100}, \quad Pitch = \frac{5mm}{5\ Rotations} = 1mm$$

2. Ans (4)

At highest point v = 0, acceleration = g

3. Ans (4)

$R = 4\sqrt{3}$ H

$$\frac{2u^2 \sin\theta\cos\theta}{g} = 4\sqrt{3}\ \frac{u^2\sin^2\theta}{2g}$$

$$\Rightarrow \tan\theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30°$$

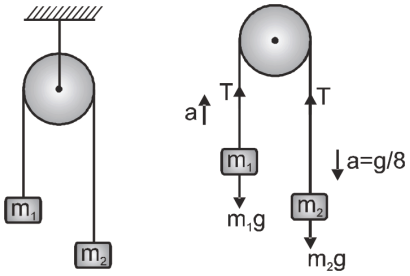
4. Ans (1)

Acceleration of body = $g \sin\theta - \mu g \cos\theta$

$$= 9.8\,[\sin 45° - 0.5 \cos 45°] = \frac{4.9}{\sqrt{2}} m/sec^2$$

5. Ans (2)

FBD of system



Considring $m_2 > m_1$

$m_2g - T = m_2a$ .....(i)

$T - m_1g = m_1a$ .....(ii)

$$a = \frac{(m_2 - m_1)}{m_1 + m_2} g$$

Given , $a = g/8 \Rightarrow \frac{g}{8} = \left(\frac{m_2 - m_1}{m_1 + m_2}\right) g$

$m_1 + m_2 = 8(m_2 - m_1)$

$7m_2 = 9m_1$

$$\frac{m_2}{m_1} = \frac{9}{7}$$

6. Ans (4)

$w = \mu N_{wall}$

$w = 0.2 \times 10 = 2$ N

7. Ans (4)

Unit vector $= \dfrac{\hat{i}+\hat{j}}{\sqrt{1^2+1^2}} = \dfrac{\hat{i}+\hat{j}}{\sqrt{2}}$

8. Ans (1)

Angle between vectors = 180° – 60° = 120°

Resultant =

$\sqrt{20^2+20^2+2\times 20\times 20\cos 120^\circ}$

= 20 N

9. Ans (4)

Vector $\vec{P}$ and $\vec{Q}$ are sides of a rhombus then $\vec{P}+\vec{Q}$ and $\vec{P}-\vec{Q}$ are diagonals of rhombus they are perpendicular to each other.

Aliter $(\vec{P}+\vec{Q}).(\vec{P}-\vec{Q}) = P^2 - Q^2 = 0$

10. Ans (2)

$\vec{F} = |F|\hat{F} = \dfrac{100\left(3i+4\hat{j}\right)}{5} = 60\hat{i}+80\hat{j}$

11. Ans (1)

$\vec{F}.\vec{S} = 0$

$\Rightarrow 12-6+3x = 0 \Rightarrow 3x = -6 \Rightarrow x = -2$

12. Ans (4)

$$\vec{\tau} = \vec{r}\times\vec{f} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 8 & 2 & 3 \\ -3 & 2 & 1 \end{vmatrix}$$

$= \hat{i}(2-6) - \hat{j}(8+9) + \hat{k}(16+6)$

$= -4\hat{i} - 17\hat{j} + 22\hat{k}$

13. Ans (2)

$\vec{A}.\vec{B} = AB\cos\theta$ ...(1)

$|\vec{A}\times\vec{B}| = AB\sin\theta$ ...(2)

(2) ÷ (1) → $\tan\theta = \dfrac{8\sqrt{3}}{8}$

$\theta = 60^\circ$

14. Ans (1)

Parallactic second is the unit of distance

15. Ans (4)

Option 1, 2 and 3 have dimensions of energy in both side of equation.

option (4) LHS = E = Energy

RHS. $= \left(\dfrac{P^2}{2m}\right)\dfrac{u}{v^2}$

$= (E)\dfrac{(E)}{v^2} = E\left(\dfrac{1}{2}\dfrac{mv^2}{v^2}\right)$

= mE

= mass × Energy

16. Ans (1)

$\dfrac{\Delta P}{P} = \pm\left(3\dfrac{\Delta A}{A}+\dfrac{5}{2}\dfrac{\Delta B}{B}\right)$

17. Ans (2)

$v = \dfrac{s}{t}$

$\dfrac{\Delta v}{v} = \pm\left(\dfrac{\Delta s}{s}+\dfrac{\Delta t}{t}\right)$

In % $\dfrac{\Delta v}{v}\times 100 = \pm\left(\dfrac{\Delta s}{s}+\dfrac{\Delta t}{t}\right)\times 100$

$= \pm\left(\dfrac{5}{200}+\dfrac{0.2}{20}\right)\times 100$

$= \pm(2.5+1) = \pm 3.5\%$

18. Ans (1)

(n + 1) divisions of verneir scale = n divisions of main scale

1 VSD $= \left(\dfrac{n}{n+1}\right)$ MSD

Leastcount = 1 MSD – 1 VSD

= 1 MSD $- \dfrac{n}{n+1}$ MSD

$= \dfrac{1}{n+1}$ MSD $= \dfrac{a}{n+1}$

19. Ans (3)

$PA^{1/2}T^{-1} = F\Delta t \times A^{1/2}T^{-1}$

$=[MLT^{-2}][T]\times[L^2]^{1/2}\times[T^{-1}]$

$=[ML^2T^{-2}]$

20. Ans (1)

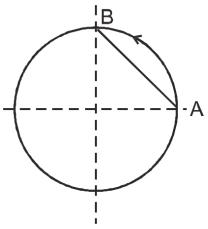
Given $\left(\frac{\Delta V}{V} \times 100\right)\% = 2.5\ \%$

$P = \frac{V^2}{R}$ error in R = 0

$\left(\frac{\Delta P}{P} \times 100\right)\% = 2\left(\frac{\Delta V}{V} \times 100\right)\%$

$= 2 \times 2.5\ \% = 5\%$

21. Ans (1)



Displacement $d_1 = \sqrt{2}\,r$

Distance from A to B $d_2 = \left(\frac{\pi r}{2}\right)$

$\frac{d_2}{d_1} = \frac{\frac{\pi r}{2}}{\sqrt{2}\,r} = \left(\frac{\pi}{2\sqrt{2}}\right)$

22. Ans (1)

$\sqrt{x} = t + 1$

$x = (t + 1)^2 = t^2 + 2t + 1$

$v = \frac{dx}{dt} = 2t + 2$

$\boxed{v \propto t}$

23. Ans (1)

$s \propto t^2$

$s = kt^2$ (k = constant)

$v = \frac{ds}{dt} = 2kt$ (Increasing velocity)

acc $a = \frac{dv}{dt} = 2k$

Uniform acceleration

24. Ans (4)

Use $S = \frac{1}{2}at^2$

$S_1 = \frac{1}{2}at_1^2$

$S_2 = \frac{1}{2}at_2^2$

$S_3 = \frac{1}{2}at_3^2$

If AB = BC = CD

$S_1 = S_2 - S_1 = S_3 - S_2$

$S_2 = 2S_1$, $S_3 = 3S_1$

$t_1 = \sqrt{\frac{2S_1}{a}}$, $t_2 = \sqrt{\frac{2(2S_1)}{a}}$, $t_3 = \sqrt{\frac{2(3S_1)}{a}}$

time $t_{AB} = t_1$, $t_{BC} = t_2 - t_1$

$t_{CD} = t_3 - t_2$

So $t_{AB} : t_{BC} : t_{CD} :: 1 : (\sqrt{2}-1) : (\sqrt{3} - \sqrt{2})$

25. Ans (2)

Average velocity $= \frac{\text{displacement}}{\text{time interval}}$

$= \frac{-5 - 5}{5} = -2$

26. Ans (3)

Here, $h = \frac{u^2\sin^2\theta}{2g}$ $\sqrt{\frac{2h}{g}} = \frac{u \sin\theta}{g}$

Time of flight, $T = \frac{2u \sin\theta}{g} = 2\sqrt{\frac{2h}{g}}$

27. Ans (2)

$\frac{v_y}{v_x} = \tan 60°$, $v_y = v_x \tan 60°$

$v_y = \frac{20}{\sqrt{3}} \times \sqrt{3} = 20 = gt$

$t = \frac{20}{g} = 2$ sec

28. Ans (2)

$$V_G = \frac{\ell}{t_1}$$

$$V_E = \frac{\ell}{t_2}$$

$$t = \frac{\ell}{V_E + V_G} = \frac{\ell}{\frac{\ell}{t_1} + \frac{\ell}{t_2}} \Rightarrow \quad t = \frac{t_1 t_2}{t_1 + t_2}$$

29. Ans (3)

$$v_{rel} = \sqrt{10^2 + 3^2} = \sqrt{109} \text{ km/hr}$$

$\vec{v}_{rain}$ and $\vec{v}_{man}$ are perpendicular to each other

30. Ans (4)

One dimensional motion on straight track.

31. Ans (1)

$$t = \alpha x^2 + \beta x$$

$$\frac{dt}{dx} = 2\alpha x + \beta \Rightarrow \frac{dx}{dt} = \frac{1}{2\alpha x + \beta}$$

$$\text{velocity } v = \frac{dx}{dt} = \frac{1}{2\alpha x + \beta}$$

$$\text{Acceleration } a = v\frac{dv}{dx}$$

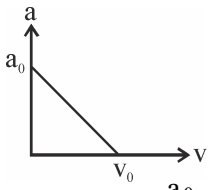
$$\frac{dv}{dx} = -\frac{1}{(2\alpha x + \beta)^2}(2\alpha) = -2\alpha v^2$$

$$\text{Acc } a = -2\alpha v^3$$

$$\text{Retardation} = 2\alpha v^3$$

32. Ans (4)

By graph



$$\text{Acc } a = a_0 - \frac{a_0}{v_0} v$$

$$\text{acceleration } \frac{dv}{dt} = a_0 - \frac{a_0}{v_0} v$$

$$\text{or } \frac{dv}{a_0 - \frac{a_0}{v_0} v} = dt$$

$$\text{By integration } \int_0^v \frac{dv}{a_0 - \frac{a_0 v}{v_0}} = \int_0^t dt$$

$$\frac{1}{\left(-\frac{a_0}{v_0}\right)} \ln\left(\frac{a_0 - \frac{a_0}{v_0} v}{a_0}\right) = t$$

$$\ln\left(\frac{v_0 - v}{v_0}\right) = -\frac{a_0}{v_0} t$$

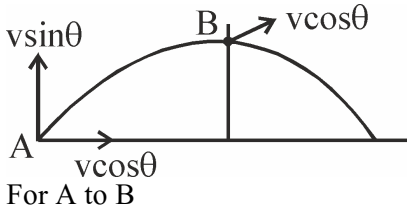
By taking antilog

$$\frac{v_0 - v}{v_0} = e^{-\frac{a_0}{v_0} t}$$

$$\Rightarrow v = v_0\left(1 - e^{-\frac{a_0}{v_0} t}\right)$$

This is for exponential graph shown in option (4)

33. Ans (3)



For A to B

$v_x = v\cos\theta$

$$\text{Average } v_y = \langle v_y \rangle = \frac{v\sin\theta + 0}{2}$$

$$\langle v_y \rangle = \frac{v\sin\theta}{2}$$

So average velocity between A to B

$$= \sqrt{(v\cos\theta)^2 + \left(\frac{v\sin\theta}{2}\right)^2}$$

$$= \frac{v}{2}\sqrt{4\cos^2\theta + \sin^2\theta}$$

$$= \frac{v}{2}\sqrt{3\cos^2\theta + 1}$$

34. Ans (1)

The compartments have a spring system between them. Firstly, the engine comes to rest; then the compartment attached to it will come to rest.

35. Ans (3)

Force = $\frac{dp}{dt}$ = slope of p-t graph. which is maximum at R.

36. Ans (2)

Newton's III law

37. Ans (3)

Forces acting on the ball are as shown in figure.

The three concurrent forces are in equilibrium.

Using Lami's theorem.

$$\frac{T_1}{\sin 150^\circ} = \frac{T_2}{\sin 120^\circ} = \frac{10}{\sin 90^\circ}$$

$$\Rightarrow \quad \frac{T_1}{\sin 30^\circ} = \frac{T_2}{\sin 60^\circ} = \frac{10}{1} \Rightarrow \frac{T_1}{T_2} = \frac{\sin 30^\circ}{\sin 60^\circ} = \frac{1}{\sqrt{3}}$$

$\therefore$ $T_1 = 10 \sin 30^\circ = 10 \times 0.5 = 5$ N and $T_2 = 10 \sin 60^\circ = 10 \times \frac{\sqrt{3}}{2} = 5\sqrt{3}$N

38. Ans (3)

$F = m_1 (4)$, $F = m_2 (6)$

$$a = \frac{F}{m_1 + m_2} = \frac{F}{\frac{F}{4} + \frac{F}{6}}$$

$$a = \frac{4 \times 6}{4 + 6} = 2.4 \text{ ms}^{-2}$$

39. Ans (2)

Apparent weight = mg + ma

$$= 60\left(g + \frac{m}{5}\right) = \frac{6g}{5} \times 60 = 72g$$

$= 72 \times 10$ N $= 720$ N

40. Ans (4)

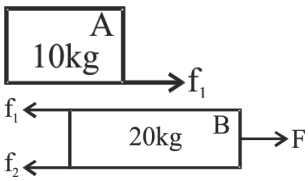
$v = u + at$

$0 = 10 - \mu \times gt$

$0 = 10 - \mu \times 10 \times 2$

$\mu = 0.5$

41. Ans (3)



$(f_1)_{lim} = \mu_1 N_1$

$= (0.2)(10g)$

$= 20$ N

$(f_2)_{lim} = \mu_2 N_2$

$= (0.5)(30g)$

$= 150$ N

Slipping at ground will begin.

Only when, $F > (f_2)_{limit}$

So, $F > 150$

42. Ans (1)

$a = \frac{f}{m}$

max. $a = \frac{f_{lim}}{m} = \frac{\mu mg}{m}$

$= 0.3 \times 10 = 3$ m/s^2

43. Ans (3)

For upward climbing $T = m(g + a)$

and for downward $T = m(g - a)$

Rope breaks when $T \geq$ Breaking strength

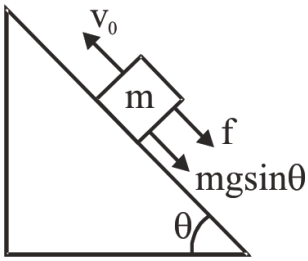
In III option

$T = m(g + a) = 50(10 + 6.5) = 825$ N

44. Ans (2)

According to question

$mg\sin\theta = f$



net retarding force

$f + mg\sin\theta = ma$

$2mg\sin\theta = ma$

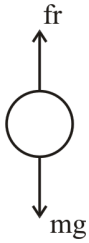
we know that

$0 = u^2 + 2as$

$0 = v_0^2 + 2(-2g\sin\theta) \times S$

$$\Rightarrow \quad S = \frac{v_0^2}{4g \sin\theta}$$

45. Ans (1)



$mg - fr = m \times 8$

$fr = m(9 - 8) \Rightarrow fr = m\,(g - 8)$

$fr = m(10 - 8) = 2N$

62. Ans (4)

$[Na^+] = [OH] = \dfrac{0.023}{23 \times 0.1} = 10^{-2}M$

POH = 2, PH = 12

66. Ans (2)

$A + 3B \rightarrow 2C$

$\Rightarrow$ 3 mole B $\rightarrow$ 2 mole C

1 mole B $\rightarrow$ mole C

15 mole B $\rightarrow \dfrac{2}{3} \times 15 = 10$ mole of C produced

70. Ans (2)

$PCl_5 \rightleftharpoons PCl_3 + Cl_2$

1 0 0

1–α α α

or $\dfrac{\text{Normal mol. wt.}}{\text{Exp. mol. wt}} = 1 + \alpha$

$\therefore \alpha = 0.68$ or 68 %

78. Ans (2)

$BrO_3^- + Br^- \rightarrow Br_2$

to calculate n factor of Br^-

$E_w = \dfrac{M}{n}$

81. Ans (2)

eq (2) × 3 – eq(1) = eq (3)

(–110) × 3 – (–1130) = ΔH

ΔH = +800 KJ

84. Ans (2)

NCERT Pg. # 174 (Para - 2)

87. Ans (1)

$\Delta G = \Delta H - T\Delta S$,

At equilibrium, $\Delta G = 0$, $\Delta H = T\Delta S$

$30000 = T \times 100$

T = 300 K or 27°C

91. Ans (2)

NCERT Page # 09

96. Ans (2)

NCERT XI Pg.# 7

115. Ans (1)

NCERT Pg. # 20,21

116. Ans (1)

NCERT-XIth Pg # 24, 2nd para

117. Ans (3)

NCERT XI Pg. No. # 23

121. Ans (4)

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132. Ans (4)

NCERT (XIth) Pg. # 35, 36, 37

135. Ans (3)

NCERT-XI Pg. # 38, 39

136. Ans (3)

NCERT XI, Pg. # 39, para-01

137. Ans (3)

NCERT Pg. # 39

139. Ans (3)

NCERT (XI) Pg. # 35, para-2

140. Ans (3)

NCERT (XI) Pg. # 42

146. Ans (3)

NCERT XI, Page # 88

147. Ans (4)

NCERT XI, Page # 87

148. Ans (3)

NCERT (XI) Pg. # 90, fig.6.5

156. Ans (4)

NCERT XIth Pg.#97

160. Ans (1)
NCERT XI Pg.# 69(E)

165. Ans (1)
NCERT XI Pg # 74 (E & H)

167. Ans (4)
NCERT XI Eng Pg # 72 para 4 line 9,10,11,12

168. Ans (3)
NCERT (XI) Pg. # 74

170. Ans (1)
NCERT (XIth) Pg. # 73

177. Ans (2)
NCERT (XI) Pg. # 81

178. Ans (3)
NCERT Pg. # 80,81

179. Ans (3)
NCERT (XI) Pg. # 75