KHOJ-2019
ANSWER KEY WITH SOLUTION
CLASS - 9

PART - I		PART - II		PART - III			
Q. No.	Answer	Q. No.	Answer	Q. No.	Answers	Q. No.	Answers
1	C	1	D	1	C	31	D
2	C	2	C	2	C	32	D
3	A	3	A	3	A	33	C
4	C	4	D	4	C	34	B
5	A	5	B	5	B		
6	A	6	C	6	A		
7	C	7	A	7	D		
8	B	8	D	8	B		
9	A	9	A	9	D		PART - IV
10	B	10	A	10	C	1	B
11	D	11	C	11	B	2	A
12	B	12	B	12	D	3	C
13	A	13	B	13	C	4	B
14	B	14	D	14	C	5	C
15	D	15	A	15	A	6	A
16	D	16	C	16	D	7	B
17	A	17	A	17	B	8	B
18	C	18	D	18	A	9	C
19	D	19	B	19	C	10	D
20	C	20	A	20	C	11	B
		21	D	21	C	12	B
		22	C	22	B	13	B
		23	A	23	D	14	A
		24	B	24	C	15	D
		25	C	25	A	16	A
		26	D	26	D		
		27	B	27	C		
		28	A	28	C		
		29	B	29	C		
		30	B	30	D		

PART - I

1. (c)

According to the given information:

It is clear from the above diagram that the colour of the side having question mark is green.

2. (c)

Given that,

$\div 33 \times 11 \div 9 \times 28 + 4 - 5$

after changing the sign $\div 33 \times 11 \div 9 \times 28 + 4 - 5$

$= -33 + 11 - 9 + 28 \div 4 \times 5$

$= -33 + 11 - 9 + 7 \times 5$

$= -42 + 46 = 4$

So, option (c) is correct answer.

3. (a)

18	5	1	19	15	14
R	E	A	S	O	N

As, $-2\downarrow \quad +2\downarrow \quad -2\downarrow \quad +2\downarrow \quad -2\downarrow \quad +2\downarrow$

16	7	25	21	13	16
P	G	Y	U	M	P

Similarly,

4	9	18	5	3	20
D	I	R	E	C	T

$-2\downarrow \quad +2\downarrow \quad -2\downarrow \quad +2\downarrow \quad -2\downarrow \quad +2\downarrow$

B	K	P	G	A	V
2	11	16	7	1	22

So, DIRECT will be coded as BKPGAV.

4. (c)

As, In 1st figure : $(6-5)^3 + 1^2 \Rightarrow 2$,

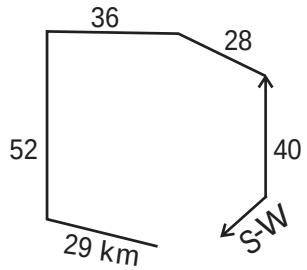
In 2nd figure : $(12-10)^3 + 2^2 \Rightarrow 12$ and

In 4th figure : $(24-20)^3 + 4^2 \Rightarrow 80$

Similarly, In 3rd figure : $(18-15)^3 + 3^2 \Rightarrow 36$

So, 36 will replace the question mark.

5. (a)



So option (a)

6. (a)

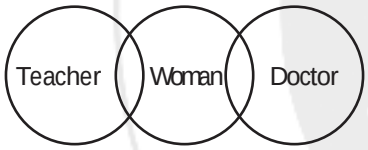
po ki top ma ⟶ Usha is playing cards

kop ja ki ma ⟶ Asha is playing tennis

po sur kop ⟶ Cards and tennis

So code for Asha is ja.

7. (c)



So option (c)

8. (b)

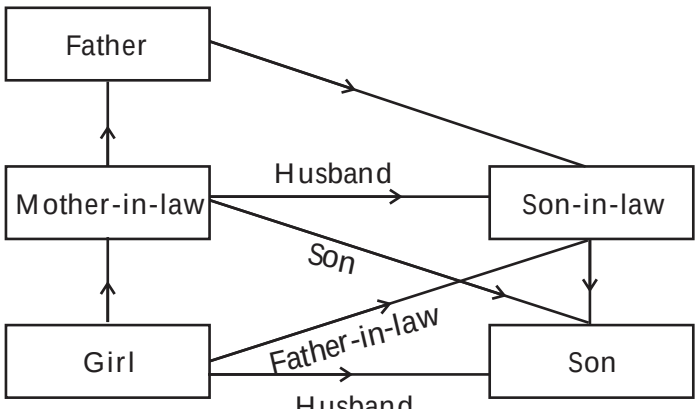
$[6^2-(4\times4)-1]=20-1=19\Rightarrow S$

$[4^2-(1\times7)-1]=9-1=8\Rightarrow H$

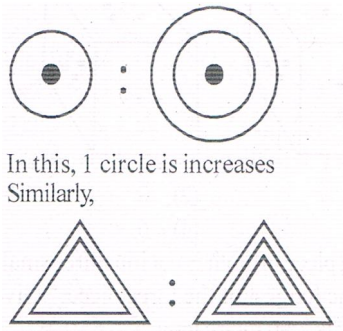
$[8^2-(5\times10)-1]=14-1=13\Rightarrow M$

Similarly, $[5^2-(5\times2)-1]=15-1=14\Rightarrow N$

9. (a) 13 represents non educated non working urban temales.
10. (b) 40
11. (d) 3 represents non-working rural male whose not educated.
12. (b) (70 + 9) = 79 So, option (b) is the correct answer.
13. (a) 50 + 1 + 60 = 111 So, option (a) is the correct answer.
14. (b)



15. (d) R E A S O N
ʁ E ∀ S O И

16. (d) 

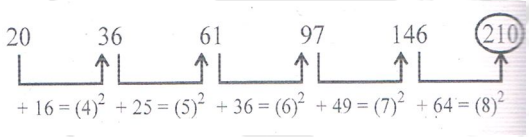
17. (a) 3 teachers are both players and Artists.

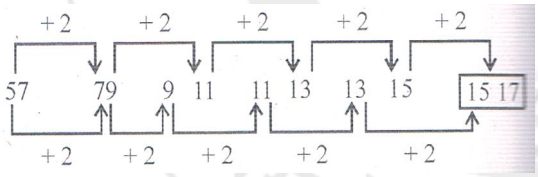
18. (c) 64:9::81:?

$\Rightarrow (\sqrt{64}=8):(8\text{'s next number}=9)$

$::(\sqrt{81}=9):(9\text{'s next number})$

$\Rightarrow 64:9::81:\boxed{10}$

19. (d) 

20. (c) 

PART - II

1. (d)

$15.01^2 + \sqrt{81.009} \times 32$

$15.01^2 \cong 15^2 = 225 \quad \Rightarrow \sqrt{81.009} \cong 9 \quad \Rightarrow \quad 225 + 9 \times 32 = 513$ **ANS.**

2. (c)

Suppose speed of person = x km / h

Total time taken = t hrs.

distance travelled = xt km.

Case-I Speed = x + 2

time = t - 2

distance = (x + 2) (t - 2)

xt = xt - 2x + 2t - 4

t - x = 2 .....(1)

Case-II Speed = x + 6

time = t - 4

distance = (x + 6) (t - 4)

xt = xt + 6t - 4x - 24

3t - 2x = 12 .....(2)

by (1) & (2)

3t - 2x = 12

2t - 2x = 4

\- + -

t = 8

x = 8 - 2 = 6 distance = 8 × 6 = 48 km. **ANS.**

3. (a)

Suppose radius of sphere = x cm

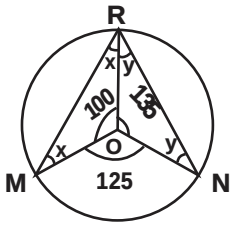
Volume of cylinder = $\pi \times 100 \times 5.4 \Rightarrow = \pi \times 540\ cm^3$

Volume of one sphere = $\frac{4}{3}\pi r^3$

So, $15 \times \frac{4}{3}\pi r^3 = \pi \times 540 \quad \Rightarrow \quad r^3 = \frac{540 \times 3}{4 \times 15} = 27$

$\boxed{r = 3}$ diameter = 6 cm. **ANS.**

4. (d)



reflex $\angle MON = 360 - 235 = 125^0$

In $\Delta ORM \Rightarrow x + x + 100 = 180 \Rightarrow x = 40^0$

In $\Delta ORN \Rightarrow y + y + 135 = 180^0 \Rightarrow y = \frac{45^0}{2}$

$\Rightarrow \quad \frac{x}{4} + \frac{1}{2}y \quad \Rightarrow \quad \frac{40}{4} + \frac{1}{2} \times \frac{45}{2} = \frac{85}{2} = 21\frac{1^0}{4}$ **ANS.**

5. (b)

P = 25600 r = 25% PA A = 28900 t = n years

$r = \frac{25}{4}\%$ compounded quaterly

$28900 = 25600 \left(1 + \frac{25}{4 \times 100}\right)^{4n} \Rightarrow \frac{28900}{25600} = \left(\frac{17}{16}\right)^{4n} \Rightarrow \left(\frac{17}{16}\right)^2 = \left(\frac{17}{16}\right)^{4n}$

$4n = 2 \quad \Rightarrow \quad n = \frac{1}{2}$ year. **ANS.**

6. (c)

Suppose MP = x

discount by A = 30% of x = 0.3x

discount by B = 20% of x = 0.2x

= 0.8x $\times$ 10% = 0.08x

Total = 0.2x + 0.08x = 0.28x

So, 0.3x - 0.28 x = 600

$0.02x = 600 \quad \Rightarrow \quad x = \frac{600 \times 100}{60x} = 30000\,\text{Rs.}$ **ANS.**

7. (a)

no. of total alphabet on odd position = 13

no. of vowels on odd position = 5

probability of odd vowels = $\frac{5}{13}$

8. (d)

$x^3+3xy^2=14,\ y^3+3yx^2=13 \quad \Rightarrow \quad (x+y)^3=x^3+y^3+3xy^2+3yx^2 \quad \Rightarrow$ 14 + 13 = 27

$(x+y)^3=27$

$x + y = 3$ ..... (1)

$(x-y)^3=x^3-y^3+3xy^2-3yx^2 \quad \Rightarrow 14-13=1$

$(x-y)=1$ .....(2)

by (1) & (2)

$x = 2,\ y = 1 \quad \Rightarrow \quad x^2+y^2=2^2+1=5$. **ANS.**

9. (a)

$a^2+2b=b^2+2a+5 \quad \Rightarrow \quad a^2-2a+1=b^2-2b+6 \quad \Rightarrow \quad a^2-2a+1=b^2-2b+1+5$

$(a-1)^2=(b-1)^2+5 \quad \Rightarrow \quad (a-1)^2-(b-1)^2=5 \quad \Rightarrow \quad (a+b-2)\ (a-b)=5$

$\because$ a & b are positive integer So a + b - 2 = 5, a - b = 1 hence b = 3. **ANS.**

10. (a)

In ΔADB

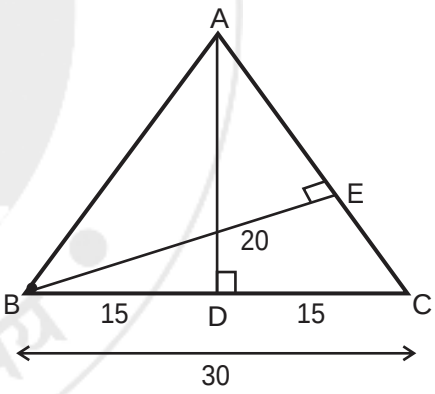
$AC^2=AD^2+CD^2=15^2+20^2$ = 225 + 400 = 625 = 25^2

So, AC = 25

area of $\Delta ABC=\frac{1}{\cancel{2}}\times 30\times \cancel{20}^{10}=300$

area of $\Delta ADC=\frac{1}{2}\ BE\times AC$

$300=\frac{1}{2}\times BE\times 25 \quad \Rightarrow \quad BE=\frac{300\times 2}{25}=24\,cm$ **ANS.**



11. (c)

$\frac{\left(7+4\sqrt{5}\right)+\left(4-2\sqrt{5}\right)-\left(10+5\sqrt{5}\right)}{6}=p+q\sqrt{5} \quad \Rightarrow \quad \frac{1-3\sqrt{5}}{6}=p+q\sqrt{5}$

On comparing we get, $p=\frac{1}{6},\ q=-\frac{1}{2} \quad \Rightarrow \quad So, \sqrt{p-q}=\sqrt{\frac{1}{6}+\frac{1}{2}}=\sqrt{\frac{8}{12}}=\frac{\sqrt{6}}{3}$ **ANS.**

12. (b)

$$\frac{\sqrt{5\sqrt{5\sqrt{5.....}}}+\sqrt{7\sqrt{7\sqrt{7.....}}}}{\sqrt{3\sqrt{3\sqrt{3.....}}}}$$

Consider- $y=\sqrt{5\sqrt{5\sqrt{5.....}}}$

$\Rightarrow \quad y = \sqrt{5y} \qquad \Rightarrow \qquad y^2 = 5y \qquad \Rightarrow y^2 - 5y = 0 \qquad \Rightarrow \; y\,(y - 5) = 0$

$\Rightarrow \; y = 0 \text{ or } y = 5$

So, $y = 5$

Similarly $x = \sqrt{7\sqrt{7\sqrt{7.....}}} \qquad \Rightarrow x = 7$

& $\quad z = \sqrt{3\sqrt{3\sqrt{3.....}}}$

$z = 3 \qquad$ So $\quad \frac{5+7}{3} = \frac{12}{3} = 4$ **ANS.**

13. (b)

In $\square ABCD$, $AB \parallel CD$ and $AB = CD$

So $\square ABCD$ is a parallelogram

Hence area of $\Delta ACD = \frac{1}{2}$ as $\square ABCD \quad \Rightarrow \quad \frac{1}{2} \times 66 = 33 cm^2$

14. (d)

Suppose Polynomial -

$p(x) = ax^3 + bx^2 + cx + d \quad \Rightarrow \qquad p(1) = a+b+c+d$

$1 = a+b+c+d \qquad$ .....(1)

$p(2) = 8a+4b+2c+d$

$2 = 8a+4b+2c+d \qquad$ .....(2)

$p(3) = 27a+9b+3c+d$

$3 = 27a+9b+3c+d \qquad$ .....(3)

$p(4) = 64a+16b+4c+d$

$5 = 64a+16b+4c+d \qquad$ .....(4)

$p(6) = 216a+36b+6c+d \qquad$ .....(5)

(2) – (1) | (3) – (2)

$7a + 3b + c = 1 \qquad$ .....(6)

$19a + 5b + c = 1 \qquad$ ....(7)

$(7)-(6) \Rightarrow 12a+2b=0 \qquad$ .....(9)

$(4)-(3) \Rightarrow 37a+7b+c=2 \qquad$ .....(8)

$(8)-(7) \Rightarrow 18a+2b=1 \qquad$ .....(10)

$(10)-(9) \Rightarrow 6a=1 \Rightarrow a=1/6 \qquad b=-1, c=\frac{17}{6}, d=-1$

So, p (6) = 16. **ANS.**

15. (a)

(n + 20) + (n + 21) + ---------- + (n + 100)

= 81 (n + 60)

= 9^2 (n + 60) So least value of n is 4.

16. (c)

For real $9-(n+2)^2 \geq 0$

$(n+2)^2 \leq 9 \quad \Rightarrow \quad -3 \leq (n+2) \leq 3 \quad \Rightarrow \quad -5 \leq n \leq 1$

So total integers -5, -4, -3, -2, -1, 0, 1. **ANS.**

17. (a)

$$\left(\frac{1}{a^2}+\frac{1}{b^2}+\frac{2}{(a+b)}\frac{(a+b)}{ab}\right)\left(\frac{ab}{(a+b)^2}\right) \Rightarrow \left(\frac{1}{a}+\frac{1}{b}\right)^2\left[\frac{ab}{(a+b)^2}\right]$$

$$\Rightarrow \left(\frac{(a+b)^2}{(ab)^2}\right)\left(\frac{ab}{(a+b)^2}\right) = \frac{1}{ab} = \frac{1}{2015}$$

18. (d)

$$(a-5)^2+(b-c)^2+(c-d)^2+(b+c+d-9)^2=0$$

for this each term must be zero.

So, a = 5, b = c, c = d

$b+c+d=9$

$c+c+d=9$

$3d=9$

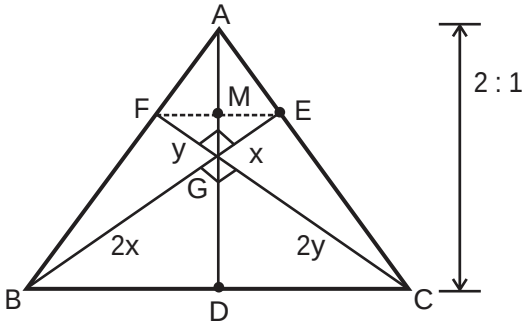
$d=3$

$d=c=b=3$

So, $(a+b+c)(b+c+d)$

$(5+3+3)(3+3+3) \quad \Rightarrow \quad 11\times 9 = 99$. **ANS.**

19. (b)



Let G be centroid, D, E, F be mid points of BC, CA, AB & M be mid point of FE.

Let BE = 3x, CF = 3y & AD = 30 (given)

So AG = 20, GD = 10, AM = MG = 10 (M is midpoint of AG)

BG = 2x, GE = x, CG = 2y, GF = y

Now, D is mid point of BC of ΔBGC. So D is circumcentre of ΔBGC.

Hence, BD = GD = CD = 10 So BC = 20

In ΔBGC

$$4y^2 + 4x^2 = 400 \qquad \Rightarrow x^2 + y^2 = 100$$

In ΔABC

$$3\left(AB^2 + BC^2 + CA^2\right) = 4\left(AD^2 + BF^2 + CF^2\right)$$

(side median property)

$$3\left(AB^2 + BC^2 + CA^2\right) = 4\left(900 + 9x^2 + 9y^2\right)$$

$$= 4 \times (900 + 900) = \frac{4 \times \overset{600}{\cancel{1800}}}{3} = 2400 \quad \Rightarrow \quad \frac{\left(AB+BC^2+CA^2\right)}{100} = 24 \text{ . } \textbf{ANS.}$$

20. (a)

Let no. be abc.

Since $a \times b \times c$ is prime, we should have two of them as 1 each and third a prime no.

So a, b, c $\in$ (2, 3, 5, 7)

If we take 2, then

112, 121, 211 $\rightarrow$ 3 numbers

for each numbers there are 3 no.

So total no. = 12. **ANS.**

21. (d)

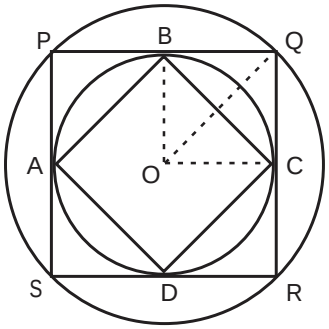
The last digit of 2015^n is 5 for all n for 2016^n is 6. the no. must be divisible by 10, should have 0 in last digit.

$2015^n \rightarrow 5$ (in last digit) $\Rightarrow$ $2016^n \rightarrow 6$ (in last digit)

5 + 6 = 11 (in last digit) So $2017^n \rightarrow$ should have 9 as last digit

So n should be 2 . **ANS.**

22. (c)



Let the radius of outer circle be r.

Perimeter of circle = $2\pi r$

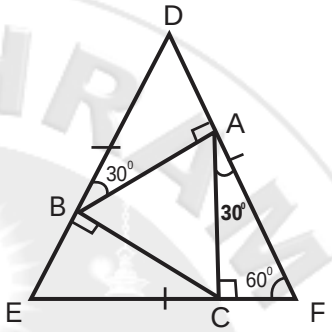
but $OQ = BC = r$ (diagonal of square BQCO]

So perimeter of ABCD = 4r $\Rightarrow$ Ratio = $\frac{2\pi r}{4r} = \frac{\pi}{2}$

23. (a)

Clearly ΔDEF is also equilateral Δ.

Let 2a be the side of ΔABC.



In ΔACF

$\angle CAF = 30^o$

$\angle AFC = 60^o$

So, $\angle AFC = 2 \times \angle CAF$

Hence, AF = 2CF

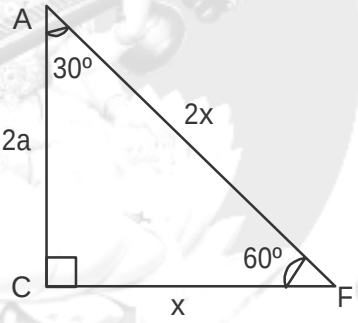
AF = 2x

by Pythagorous theorem-

$4x^2 = 4a^2 + x^2$

$3x^2 = 4a^2$

$x = \frac{2a}{\sqrt{3}}$



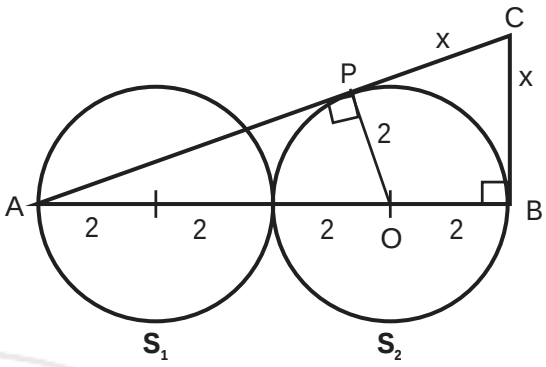
$AD = \frac{2a}{\sqrt{3}}$

So, $DF = \frac{6a}{\sqrt{3}}$

$$\frac{\text{area } \Delta DEF}{\text{area } \Delta ABC} = \frac{\frac{36a^2}{3}}{4a^2} = 3$$ **ANS.**

24. (b)

So OA = 6, OP = 2



In ΔAPO -

$$AP^2 = OA^2 - OP^2 = 36 - 4 = 32$$

$$\boxed{AP = 4\sqrt{2}}$$

Let PC = BC = x

In ΔABC -

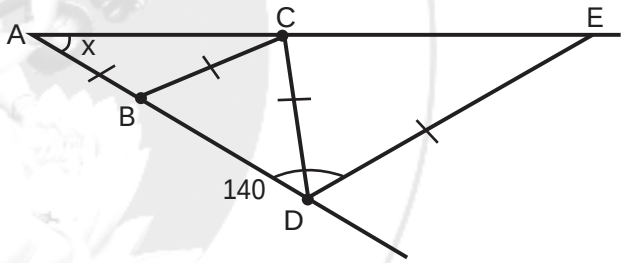
$$AC^2 = AB^2 + BC^2 \Rightarrow \left(4\sqrt{2}+x\right)^2 = 8^2 + x^2 \Rightarrow 32 + x^2 + 8\sqrt{2}\,x = 64 + x^2$$

$$8\sqrt{2}\,x = 32 \Rightarrow x = \frac{32}{8\sqrt{2}} \Rightarrow x = \frac{4\times\sqrt{2}}{2}$$

$$\boxed{x = 2\sqrt{2}}$$ So k = 2. **ANS.**

25. (c)

Suppose $\angle EAD = x$



So $\angle CED = 180 - 140 - x = 40 - x$

$\angle DCE = \angle CED = 40 - x$

$\angle BCA = x$

$\angle CBD = \angle CDB = 2x$

So at C -

$$\angle ACB + \angle BCD + \angle CDCE = 180^0$$

$$x + 180 - 4x + 40 - x = 180^0$$

$x = 10^0$ **ANS.**

26. (d)

We need to find the two digit no. that divide 265 - 5 = 260.

$260 = 2\times2\times5\times13$, the two digit factors 10, 13, 20, 26, 52, 65

So, 6 such numbers. **ANS.**

27. (b)

$$m^4+6m^3+11m^2+6m+1 = m^2\left[m^2+\frac{1}{m^2}+11+6m+\frac{6}{m}\right] = m^2\left[m^2+\frac{1}{m^2}+2+9+6\left(m+\frac{1}{m}\right)\right]$$

$$= m^2\left[\left(m+\frac{1}{m}\right)^2+6\left(m+\frac{1}{m}\right)+9\right] = m^2\left[\left(m+\frac{1}{m}+3\right)^2\right] = m^2\left[\frac{\left(m^2+3m+1\right)^2}{m^2}\right]$$

$$= \left(m^2+3m+1\right)^2 \qquad \text{So Square Root} = m^2+3m+1$$

28. (a)

Extend AD to G and EF to G.

$\Delta AGF \cong \Delta BEC$

So BC = DF

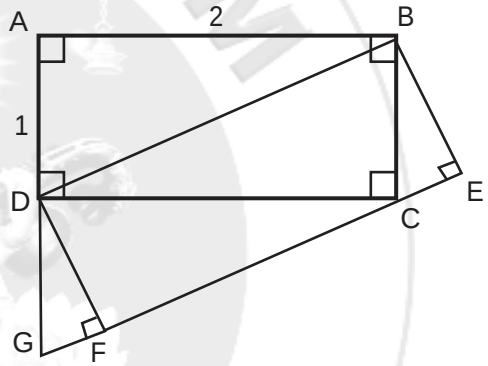
So area of Rect. DBEF = area of $\square DBCG$.

$\because \square DBCG$ is A Parallelogram.

So area $\square DBCG$ = 2 area ΔBCD

area $\square DBCG = 2 \times \frac{1}{2} \square ABCD$

area $\square DBCG = 2 \times 1 = 2$ **ANS.**



29. (b) n = 560560560560563

n = 560560560560560 + 3

n = 8K + 3 (K = 70070070070070)

So, $n^2 = 64K^2 + 16K + 9 \Rightarrow 8(8K + 2K + 1) + 1$ So when n^2 is divided by 8 Remainder is 1. **ANS.**

30. (b)

ΔAXY & ΔBXC are similar

So, $\frac{BC}{AY} = \frac{BX}{AX} \Rightarrow \frac{AY}{BC} = \frac{AX}{BX} \Rightarrow \frac{AY+BC}{BC} = \frac{AX+BX}{BX}$

$\Rightarrow \frac{DY}{BC} = \frac{AB}{BX} \Rightarrow DY \cdot BX = BC \times AB$

OR

let AD = BC = a

BX = AX = b $\Rightarrow$ AB = 2b

$\Delta AXY \cong \Delta BXC$

hence AY = BC = a

Now $BX \times DY = b \times 2a = 2ab$

area of Rectangle ABCD = 2ab hence option B.

PART - III

1.

Sol. (c)

Initial relative velocity = $v_1 - v_2$. Final relative velocity = 0

From $v^2 = u^2 - 2as \Rightarrow 0 = (v_1 - v_2)^2 - 2 \times a \times s$

$$\Rightarrow \quad s = \frac{(v_1 - v_2)^2}{2a}$$

If the distance between two cars is 's' then collision will take place. To avoid collision d > s.

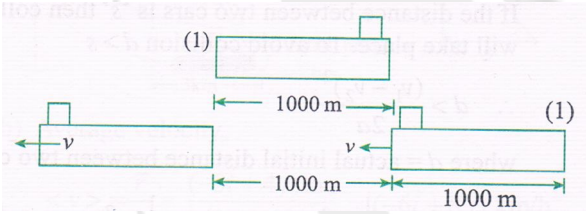
$$\therefore \quad d > \frac{(v_1 - v_2)^2}{2a}$$

where d = actual initial distance between two cars.

2.

Sol. (c)

With respect to the first train, the second train is approaching with a velocity of (100 m/s + 150 m/s) = 250 m/s. To completely cross the first train the second train has to travel a distance of 2000 m relative to first train.



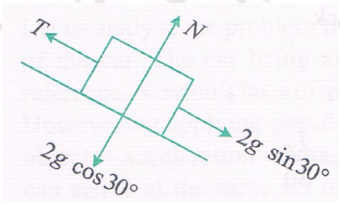
D = 1000 + 1000 = 2000 m $\Rightarrow$ relative speed v = 150 + 100 = 250 m/s

$$\therefore \text{Time} = \frac{\text{Distance}}{\text{Velocity}} = \frac{2000\,\text{m}}{250\,\text{m/s}} = 8\,\text{sec}$$

3.

Sol. (a)

FBD of 2 kg block



$T = 2g \sin 30^0$

$= 10$ N

4.

Sol. (c)

According to newton's III law, when we push water backwards, water apply force on us in forward direction

5.

Sol. (b) $v = at \Rightarrow a_1 t_1 = a_2 t_2 \quad \Rightarrow \frac{t_1}{t_2} = \frac{a_2}{a_1} = \frac{F/m_2}{F/m_1} = \frac{m_1}{m_2} = \frac{2}{4} = \frac{1}{2}$

6.

Sol. (a)

W = F. s. cos θ

when $\theta = 0^o \Rightarrow \cos\theta = 1$

$W_m = F.s.$

7.

Sol. (d)

$$G = \frac{Fr^2}{m_1 m_2}$$

Unit of $G = \frac{Nm^2}{kg^2} \Rightarrow \frac{kg\ m}{s^2} \times \frac{m^2}{kg^2} \Rightarrow \frac{m^3}{s^2\ kg} \Rightarrow m^3 s^{-2} kg^{-1}$

8.

Sol. (b) $v_e = \sqrt{\frac{2GM}{R}} = \sqrt{\frac{2 \times GMR}{R^2}} = \sqrt{2gR}$

$v_e' = \sqrt{2 \times g \times 4R} = 2\sqrt{2gR} = 2v_e$

9.

Sol. (d)

Inside the earth.

$g' = g\left(1 - \frac{d}{R}\right) \rightarrow$ Linear (increasing)

Outside the earth, $g' = \frac{g}{(1 + h/R)^2} \rightarrow$ exponential

(decreasing)

10.

Sol. (c)

Here net driving force

$= mg - \frac{mg}{2} = \frac{mg}{2}$ downward

Hence frction will act upward and its magnitude should be $f = \frac{mg}{2}$

If the block 'm' in stationary the friction between m and wall should be static.

If $f \le f_{lim}$

$\frac{mg}{2} \le \mu . N \Rightarrow \frac{mg}{2} \le \mu(mg) \Rightarrow \mu = \frac{1}{2}$

11.

Sol. (b)

Oily road has less friction. Vehicles moves forward due to friction exerted by ground in forward direction when friction is less vehicle slide.

12.

Sol. (d)

Relative density = $\frac{\text{density of object}}{\text{density of water}}$

Relative density $\rightarrow$ no unit

13.

Sol. (c)

$P = \rho gh$

pressure does not depends on area of the surface.

14.

Sol. (c)

Frequency = $\frac{54}{60} = \frac{9}{10}$ Hz $\Rightarrow$ $V = \lambda f = 10 \times \frac{9}{10} = 9 m/s$

15.

Sol. (a)

wavelength is distance between two particles in same phase

16.

Sol. (d) $F = 2mv = 2000$ N

$F = 2000$ N

$A = 1cm^2 = 10^{-4} m^2$ $\Rightarrow$ $P = \frac{F}{A} = \frac{2 \times 10^3}{10^{-4}} = 2 \times 10^7 N/m^2$

17.

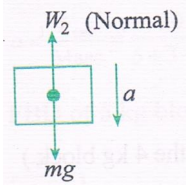
Sol. (b)

The feeling of weight comes from the experience of normal force acting on the feel of the person.

In stationary lift,

W = mg

When the lift moves downward with acceleration *a*,



So, $mg - W_2 = ma$

$W_2 = m(g - a)$

Now, $\frac{W}{W_2} = \frac{mg}{m(g-a)} = \frac{3}{2}$

$\frac{g}{g-a} = \frac{3}{2}$

2g = 3g – 3a

3a = g

$a = \frac{g}{3}$

18. (a)

Sol. Amalgam is alloy of mercury with another metal.

19. (c)

Sol. Non-metals are generally brittle.

20. (c)

Sol. The element which is mainly electroplated on car parts, bicycle handles to give shiny appearnce is chromium.

21.

Sol. (c)

Phosphrous is stored in water.

22. (b)

Sol. Fog, Mist, Cloud are aersol.

23.

Sol. (d)

y is gas, z is liquid, x is solid, kinetic energy in increasing order X < Z < Y

24.

Sol. (c)

When Aluminium react with NaOH it produces sodium hydroxide.

25. (a)

Sol. a deadly poisnous gas produce during in complete combustion is carbon monoxide.

26. (d)

Sol. Carbon is limiting reagent, 6 g of carbon will produce 22 g CO_2

27. (c)

The rate of evaporation decreases with increase in humidity.

28. (c)

Mass of solution - 100 + 34.7 = 134.7g

$$\text{Volume of solution} = \frac{\text{mass of solution}}{\text{density}} = \frac{134.7}{1.3} = 103.61\,m^3$$

$$(m/v)\,\% = \frac{\text{Mass of solute}}{\text{Volume of solution}} \times 100 = \frac{34.7}{103.61} \times 100 = 33.49\%$$

29. (c)

Sol. Weight of oxygen in compound = $12 \times 16 = 192$ u

Total weight of compound = $2 \times 27 + 3 \times 32 + 12 \times 16 = 342$ u

So, mass % of oxygen

$$= \frac{100 \times 192}{342} = 56.14\%$$

30. (d)

Sol. One mole of H_2SO_4 consist of $7 \times 6.022 \times 10^{23}$ atoms.

31. (d)

Sol. molecular weight of $Al_2O_3 = 2 \times 27 + 48 = 102$ gram

102 gram consist of $Al_2O_3 = 2 \times 6.022 \times 10^{23}$ ions

0.051 gram Al_2O_3 consist of

$$= \frac{0.051 \times 2 \times 6.022 \times 10^{23}}{10^2} = 6.022 \times 10^{20} \text{ ions}$$

32. (d)

Sol. Ideal gas eq^n PV = nRT

case (1) $P.V_1 = \frac{7}{28}RT$ eq^n (1)

case (2) $P.V_2 = \frac{7+14}{28}RT$ eq^n (2)

Where V_2 = 12 lit

Dividing eq^n (2) by (1)

$$\frac{P \times 12}{P \times V_1} = \frac{\frac{21}{28}RT}{\frac{7}{28}RT}$$

Solving this

$$\frac{12}{V_1} = 3 \quad \Rightarrow \quad V_1 = \frac{12}{3} = 4\,\text{lit}$$

33. (c)

Sol. The temperature at which celsius & faranhite scales shows same reading is $-40^0 C$

34. (b)

Sol. $^{39}_{19}K$ Neutrons = 20 $^{24}_{12}Mg$ Neutrons = 12

ratio = $\frac{20}{12}$ = 5/3

PART - IV

1. (b)

   The above stsatement is correct explanation of Agriculture.

2. (a)

   Separating grains from chaff is called: winnowing

3. (c)

   The organism is called fungi and its reproduce by spore formation.

4. (b)

   P organism is Amoeba and D is hydra both perform asexual method of Reproduction. (Binnary fission and budding)

5. (c)

   It is chloroplast which trap solar energy and convert it in chemical energy.

6. (a)

   It acts as semi permiable barrier to the outside of the cell. Allow flow of certain molecules in and out as needed.

7. (b)

   Less surface area of cell ensure more number of it so it can be present so many in a perticular area.

8. (b)

   Charles Darwin proposed the theory of evolution.

9. (c)

   It is meant to conserve both, the biodiversity and the culture of that area.

10. (d)

    The talking mechanism is performed by the birds to Attract the other bird.

11. (b)

    B+ is a biological technological concept a bacteria introduced in the plant to make it insect resistance.

12. (b)

    Scientist who discovered fermentation is Louis Pasteur

13. (b)

    In these statements only (b) is correct.

14. (a)

    Nitrogen is very essential for growth of the plant.

15. (d)

    Option D is correct.

16. (a)

    Malaria Is caused by Protozoa.