## WBCS (Main) Exam Paper - VI Practice Set

## Answers with Explanation

1. (c) Let the total no. of candidates $=x$
$\frac{50 \mathrm{x}-100(80-50)}{\mathrm{x}}=40$
$50 \mathrm{x}-3000=40 \mathrm{x}$
$10 x=3000$
$x=300$
2. (b) Suppose the average expenditure was $₹ x$.

The total expenditure $=40 \mathrm{x}$, when 5 more students join the mess, total expenditure $=40 \mathrm{x}+45$.
Now, the average expenditure
$=\frac{40 x+45}{40+5}=\frac{40 x+45}{45}$
Now, we have $\frac{40 x+45}{45}=x-1$
or $40 \mathrm{x}+45=45(\mathrm{x}-1)$
or $45 x-40 x=45+45$
or $5 x=90$
फ्याप्िधिय
$\therefore \mathrm{x}=18$
The original expenditure of the mess $=40 \times$ $18=₹ 720$
3. (b) A can write $\left(\frac{60}{20}\right)$ i.e. 3 pages in 1 hr
$\mathrm{A}+\mathrm{B}$ can write $\left(\frac{125}{25}\right)$ i.e. 5 pages in 1 hr
B can write $(5-3)$ i.e. 2 pages in 1 hr
B can write 46 pages in $=\frac{46}{2}=23 \mathrm{hrs}$.
4. (c) 25 men do the rest of the job in 12 days ( 12 $=33-20-1$ )
20 men can do the rest of the job in
$\frac{12 \times 25}{20}=15$ days
Thus the work would have been finished in 20 $+15=35$ days, that in $(35-33)=2$ days after the scheduled time.
5. (a) $3-\frac{4}{1+\frac{2}{\frac{16}{5}}} \Rightarrow 3-\frac{4}{1+\frac{10}{16}} \Rightarrow 3-\frac{64}{26}$

क्याष्पिर्य
$\Rightarrow \frac{14}{26}=\frac{7}{13}$
6. (a) Divisor $=(54 \times 5)=270=9 \times$ quotient

Quotient $=30$
Divident $=($ divisor $\times$ quotient $)+$ Remainder
$=(270 \times 30)+54$
$=8100+54$ फुणिएरन
$=8154$
7. (c) 1 man can complete the work $=6 \times 14=84$ days
1 woman can complete the work $=14 \times 12$
$=168$ days
1 child can complete the work in $=28 \times 9=$ 252 days
( 8 men +2 women +5 children)'s 1 day's work
$=\left(\frac{8}{84}+\frac{2}{168}+\frac{5}{252}\right)$
$=\frac{1}{84}\left(8+1+\frac{5}{3}\right)=\frac{32}{84 \times 3}=\frac{8}{63}$
They will do the work in $=\frac{63}{8}$ days
फ़ापिएन
8. (b) The number of stoppages $=\frac{180}{12}-1=14$
$\therefore$ Total time $=\left(\frac{180}{45}\right)$ hours $+12 \times 14$ min
$=4$ hours $+168 \mathrm{~min}=6$ hours 48 min
9. (b) ₹ $375=(100 \%-25 \%)$ of lost of chair $=75 \%$ of cost of chair

The cost of chair $=\frac{375 \times 100}{75}=₹ 500$
So, the required price to gain $40 \%$ profit
$=(100+40) \%$ of ₹ 500
$=\frac{140}{100} \times 500=₹ 700$
10. (c) Net change in entry fee
$=-35+40-\frac{35 \times 40}{100}$

$=-35+40-14$
$=-9 \%$
i.e. $9 \%$ decrease.
11. (b) After 1 year, Amount will be
$=3000+10 \%$ of $3000=₹ 3300$ he pays 1,000 , after completion of a year. After 2 year, Amount will be $=2300+10 \%$ of 2300 = ₹ 2530
After 3 year, Amount will be $=1530+10 \%$ of $1530=₹ 1683$
12. (a) $\mathrm{x}=4+\sqrt{15}, \mathrm{y}=4-\sqrt{15}$

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$x+y=8$ and $x y=1$
$\frac{x^{2}+y^{2}}{x^{3}+y^{3}}=\frac{(x+y)^{2}-2 x y}{(x+y)^{3}-3 x y(x+y)}$
$=\frac{(8)^{2}-2}{(8)^{3}-3(1)(8)}=\frac{62}{488}=\frac{31}{244}$
$\frac{x^{2}+y^{2}}{x^{3}+y^{3}}=\frac{31}{244}$
13. (a) $\lfloor 15=15 \times 14 \times \underline{13}$
$\underline{14}=14 \times \underline{13}$
$\underline{13}=\underline{13}$
$\underline{15}-\underline{14}-\underline{13}=15 \times 14 \times \underline{13}-14 \times \underline{13}-\underline{13}$
$=\underline{13} \times[210-14-1]$
$=195 \times 13$
$=15 \times 13 \times 13$

14. (c) Final $=\operatorname{Initial}(1-\text { Initial part drawn })^{n}$
$8=x\left(1-\frac{1}{5}\right)^{3}$
$8=x \times \frac{64}{125}$
$\frac{1000}{64}=x \Rightarrow x=\frac{125}{8}$ litres
फ़ापिर्ज
The capacity of vessel $=\frac{125}{8}$ litres
15. (c) If average cost of 1 pen $=₹ x$

Then, $27 \mathrm{x}+68 \times 3=501$
$\mathrm{x}=\frac{297}{27}$
$\mathrm{x}=₹ 11$
16. (c) Total present age $=26 \times 7=182$ years and 5 years before total age $=152-5 \times 7=147$ years
The number of persons $=6$
So, average age $=\frac{147}{6}=24.5$ years
17. (c) We know that $\mathrm{a}^{3}+\mathrm{b}^{3}+\mathrm{c}^{3}-3 a b c$
$\frac{1}{2} \times(a+b+c) \times\left[(a-b)^{2}+(b-c)^{2}+\right.$
$\left.(\mathrm{c}-\mathrm{a})^{2}\right]$ खुण्डिएन
$=\frac{1}{2}(213+214+216)\left[(-1)^{2}+(-2)^{2}+(3)^{2}\right]$
$=\frac{1}{2}(643 \times 14)=4501$
18. (b) B's marks= C's marks $+10 \%$ of 300
$=200+30=230$
A's marks $=$ B's marks $+20 \%$ of 300
$=230+60=290$
19. (c) C.P. of goods $=₹ 450$
overall profit $=20 \%$
खाजिएय
Total S.P. $=450+450 \times \frac{20}{100}=₹ 540$
S.P. of $\frac{1}{3}$ rd goods $=150-150 \times \frac{10}{100}$ $=₹ 135$
So, S.P. of rest goods $=₹(540-135)=₹ 405$
Profit $=$ Profit $=\frac{405-300}{300} \times 100=35 \%$
20. (b) Discount percent $=\frac{1200-1100}{1200} \times 100$

$$
=8 \frac{1}{3} \%
$$

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21. (c) A's speed : B's speed $=\sqrt{\frac{b}{a}}$

B's speed $=48 \mathrm{~km} / \mathrm{hr}$
$\mathrm{b}=25 \mathrm{hr}, \mathrm{a}=16 \mathrm{hr}$
A's speed $=48 \times \sqrt{\frac{25}{16}}=48 \times \frac{5}{4}=60 \mathrm{~km} / \mathrm{hr}$
22. (b) The circumference of roller $=132 \mathrm{~cm}$ $2 \pi \mathrm{r}=132 \mathrm{~cm}$
$\mathrm{r}=132 \times \frac{7}{22 \times 2}=21 \mathrm{~cm}$
Outer radius $=21 \mathrm{~cm}$
Inner radius $=(21-3) \mathrm{cm}=18 \mathrm{~cm}$ the length of roller $=42 \mathrm{~cm}$ the volume of iron roller $=$ $\mathrm{ph}\left(\mathrm{R}^{2}-\mathrm{r}^{2}\right)$
$=\frac{22}{7} \times 42\left[21^{2}-18^{2}\right]$
फ्याप्रिएन
$=\frac{22}{7} \times 42 \times 39 \times 3$
$=15444 \mathrm{~cm}^{3}$
23. (b)

the capacity of frustum $=\frac{1}{3} \pi \mathrm{~h}\left(\mathrm{r}^{2}+\mathrm{R}^{2}+\pi \mathrm{r}\right)$
$=\frac{1}{3} \times \frac{22}{7} \times 6[4+16+8]$
$=\frac{1}{3} \times \frac{22}{7} \times 6 \times 28$
$=176 \mathrm{~m}^{3}$
24. (c) $\mathrm{A} \propto \frac{1}{\mathrm{~B} \times \mathrm{C}}$
$A=\frac{K}{B \times C}$

$K=A \times B \times C$
$\because$ When $B=7, C=13$, then $A=65$
Now,
When $\mathrm{B}=5 \& \mathrm{C}=13$, then $\mathrm{K}=\mathrm{A} \times \mathrm{B} \times \mathrm{C}$ In this condition, $\mathrm{K}=7 \times 13 \times 65$
$A=\frac{K}{B \times C}$
$\mathrm{A}=\frac{7 \times 13 \times 65}{5 \times 13}$
$A=91$
25. (c) The amounts of Ramesh, Suresh and Mahesh $=54000: 36000: 48000=9: 6: 8$
The sum of ratios $=9+6+8=23$
Total profit earned $=\frac{23}{8} \times 56000=₹ 161000$
26. (b) Required angle $=\frac{360}{100} \times 35^{\circ}=126^{\circ}$
27. (c) Income from 'Income tax and Excise duty'
$=\frac{733 \times 45}{100}=₹ 329.85 \mathrm{cr}$

28. (d) Income from other sources other than market $\operatorname{tax}=\frac{165}{33} \times 67=₹ 335 \mathrm{cr}$
29. (a) Total time taken by boat to row a place and come back is
$=\frac{22.5}{6+1.5}+\frac{22.5}{6-1.5}=3+5=8$ hours
30. (d)

$\mathrm{MN}=17 \mathrm{~cm}$
$\mathrm{AN}=5 \mathrm{~cm}$
$C M=12 \mathrm{~cm}$
In $\triangle \mathrm{AON}$
$5^{2}+\mathrm{ON}^{2}=\mathrm{r}^{2}$
In $\Delta \mathrm{CMO}$
$12^{2}+\mathrm{OM}^{2}=\mathrm{r}^{2}$
From (i) and (ii) adding
If we go through the triplet $(5,12,13)$
In $\triangle \mathrm{ANO} \quad \mathrm{ON}=12$, then $\mathrm{r}=13$
In $\triangle \mathrm{CMO} \quad \mathrm{OM}=5$, then $\mathrm{r}=13$
31. (a) Total consumption in $2012=2200$ units Total consumption in $2013=2300$ units Increased percentage
$=\frac{2300-2200}{2200} \times 100=4.54 \%=4.54 \%$
32. (c) Let the total lead are $=8000 \mathrm{~kg}$.

So, the weight of metal $=8000 \times \frac{60}{100}$

$$
=4800 \mathrm{~kg}
$$

The weight of silver $=4800 \times \frac{3}{4 \times 100}=6 \mathrm{~kg}$
So, the mass of lead $=(4800-36) \mathrm{kg}$

$$
=4764 \mathrm{~kg}
$$

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33. (a) $\sqrt{\frac{0.324 \times 0.081 \times 4.624}{1.5625 \times 0.0289 \times 72.9 \times 64}}$
$=\sqrt{\frac{324 \times 81 \times 4624}{15625 \times 289 \times 729 \times 64}}$
$=\frac{18 \times 9 \times 68}{125 \times 17 \times 27 \times 8}=\frac{3}{125}=0.024$
34. (d) Let the average cost of the books be $=₹ \mathrm{x}$
$64(x-1)-50 x=76$
$64 \mathrm{x}-64-50 \mathrm{x}=76$
$14 x=140$
$\mathrm{x}=10$
35. (d) ATQ

The weight of $(\mathrm{A}+\mathrm{B}+\mathrm{C})=252 \mathrm{~kg}$
The weight of $(\mathrm{A}+\mathrm{B}+\mathrm{C}+\mathrm{D})=320 \mathrm{~kg}$
The weight of $\mathrm{D}=68 \mathrm{~kg}$
The weight of $\mathrm{E}=71 \mathrm{~kg}$

The weight of $(B+C+D+E)=316 \mathrm{~kg}$

The weight of $(\mathrm{B}+\mathrm{C}+\mathrm{D})=316-71=245$ kg ...(ii)
The weight of $\mathrm{A}=320-245=75 \mathrm{~kg}$
36. (a) Ratio of efficiency of $A, B$ and $C=6: 3: 2$ Time taken by all together to complete the work $=6$ days
Let total units of work $=(6+3+2) \times 6$ units $=66$ units
So, time taken by C to complete the work $66 / 2=33$ days

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37. (b) The ratio of two numbers $A \quad B$

$$
\left[\begin{array}{lll}
2 & : & 3 \\
\rightarrow 3 & : & 4<
\end{array}\right.
$$

after adding 8
only 1 unit increases
that means $=1$ unit $=8$
Sum of ratio $=2+3=5$ units
The value of 5 units $=5 \times 8=40$
38. (a) Let the distance $\mathrm{b} / \mathrm{w} \mathrm{A}$ and $\mathrm{B}=280 \mathrm{~km}$

The speed of $A=70 \mathrm{~km} / \mathrm{h}$
The speed of $B=80 \mathrm{~km} / \mathrm{hr}$
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$\mathrm{t}=\frac{140}{150}$
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$\mathrm{t}=56 \mathrm{~min}$
The two trains meet at $7: 56 \mathrm{AM}$.
39. (d) 1st Alloy

Tin : Iron $=(1: 2)_{\times 5 \times 3} \Rightarrow 15: 30$
2nd Alloy
Tin : Iron $=(2: 3)_{\times 3 \times 4} \Rightarrow 24: 36$
Required ratio $=39: 66=13: 22$
40. (a) Let the CP of Radio $=₹ 100$
$20 \%$ gain $=₹ 120$
Marked price $=\frac{120}{90} \times 100=₹ \frac{400}{3}$
Discount $=20 \%$
आ্ডাঙির্র
S.P. $=\frac{400}{3} \times \frac{80}{100}=₹ \frac{320}{3}$

Profit percent $=\frac{\frac{320}{3}-100}{100} \times 100$

$$
=\frac{20}{3} \%=6 \frac{2}{3} \%
$$

41. (c) Let M.P.= ₹ 100

CP for the dealer of ten two successive discounts is
$100 \times \frac{90}{100} \times \frac{80}{100}=₹ 72$
खुप्डियन
$10 \%$ of CP on transportation $=₹ 7.2$
Total $\mathrm{CP}=72+7.2=₹ 79.2$
The price to gain $15 \%$ should be
$=\frac{79.2}{100} \times 115=₹ 91.08$
42. (b)


Let total units of work $=180$ units
Units of work done by $(\mathrm{A}+\mathrm{B})$ in first 12 minutes $=(6+4) \times 12=120$ units Remaining units $=180-120=60$ units Time taken to fill remaining tank $=60 / 5=12$ days
Total time taken $=(12+12)$ minutes $=24$ minutes
43. (b) If $x+\frac{1}{x}=1$
$x^{2}+1-x=0$
$\mathrm{x}^{2}-\mathrm{x}+1=0$

$\frac{2}{x^{2}-x+1+1}=\frac{2}{0+1}=2$
44. (c) The cost price of camera $=₹ 600$

Profit percent $=20 \%$
$\mathrm{SP}=\frac{600}{100} \times 120=₹ 700$
Discount percent $=10 \%$
MP $=\frac{100}{90} \times 720=₹ 800$
45. (d)


Let total units of work $=60$ units
If A work for 5 days $+B$ work for 15 days +C work for 18 days $=5$ days work of $(\mathrm{A}+$ B) +10 days work of $(\mathrm{B}+\mathrm{C})+8$ days work of C So, unit of work done by $(\mathrm{A}+\mathrm{B})$ in 5 days $=2 \times 5=10$ units
So, units of work done by $(\mathrm{B}+\mathrm{C})$ in 10 days $=3 \times 10=30$ units Remaining units $=60-$ $(10+30)=20$ units Time taken by C to complete 20 units $=8$ days
So, time taken by C to complete the work
$=\frac{8}{20} \times 60=24$ days
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46. (d) ATQ

Total interest for 4 year $=4 \times 12=48 \%$
Total interest for 5 years at $15 \%$ p.a. $=75 \%$
Let the sum on each investment $=₹ \mathrm{x}$
$\frac{\mathrm{x} \times 75}{100}-\frac{\mathrm{x} \times 48}{100}=1350$
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$\frac{25 \times \mathrm{x}}{100}=1350$
$\mathrm{x}=\frac{1350 \times 100}{27}$
$\mathrm{x}=₹ 25000$
So, sum deposited in each case $=₹ 25000$
47. (a) Let the C.P. of bicycle be $=₹ x$
$\frac{125}{100} \times \frac{90 \mathrm{x}}{100}=\frac{110 \mathrm{x}}{100}+60$
खाডिিिन
$\frac{45 \mathrm{x}}{40}-\frac{110 \mathrm{x}}{100}=60$
$\frac{450 x-440 x}{400}=60$
$10 \mathrm{x}=60 \times 400$
x = ₹ 2400
48. (d)


फुपগিভর

The volume of cone $=$ volume of cylinders
$\frac{1}{3} \times \pi(14)^{2} \times 30=\pi r^{2} \times 6.4$
$\frac{14^{2} \times 10 \times 10}{64}=r^{2}$
$\mathrm{r}=\frac{14 \times 10}{8}=\frac{35}{2} \mathrm{~cm}$
So, diameter $=35 \mathrm{~cm}$
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49. (b)


Given $\angle \mathrm{CBD}=30^{\circ}$
$\angle \mathrm{CAD}=30^{\circ}$

Angle subtends by a single chord at the circumference are equal
$\angle \mathrm{APD}=180^{\circ}-110^{\circ}=70^{\circ}$
$\therefore \angle \mathrm{ADB}=180^{\circ}-100^{\circ}=80^{\circ}$
50. (d) $\mathrm{x}^{3}+\mathrm{y}^{3}+\mathrm{z}^{3}-3 \mathrm{xyz}$
$=\frac{1}{2}(x+y+z)\left[(x-y)^{2}+(y-z)^{2}+(z-x)^{2}\right]$
$=\frac{1}{2}(676)\left[0^{2}+1^{2}+1^{2}\right]$
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$=\frac{1}{2} \times 676 \times 2=676$
51. (c) Botany is related to plants. Similarly microbiology is related to Germs.
52. (d) The unit of energy is joule. Similarly, the unit of resistance is $\mathbf{o h m}$.
53. (c) $\mathrm{E}=5$ (place value)

PEN $=16+05+14=35$ (place value) Similarly,

$$
\text { PAGE }=16+1+7+5=\mathbf{2 9}
$$

54. (a)
55. (b) Equality, Liberty and Justic e is the fundamentals of Democracy.
56. (a) (a) $\mathbf{9 0} \div \mathbf{1 4}=\mathbf{6 . 4 2}$
(b) $156 \div 12=13$
(c) $160 \div 10=16$
(d) $132 \div 22=6$
57. (a)
58. (a)
59. (b) Except option (b) all are perfect squares.
60. (c) $\frac{\text { Village }}{5} \frac{\text { District }}{1} \frac{\text { State Country Continent }}{4} \frac{C}{2}$
61. (a) $(7-2)^{2}-2=23$
$(9-5)^{2}-5=11$
$(11-4)^{2}-4=45$
Similarly, $(10-3)^{2}-3=46$
62. (a) $7 \times 3=21, \quad 9 \times 3=27$
$4 \times 9=36, \quad 2 \times 9=18$
Similarly,
$9 \times 6=54, \quad 4 \times 6=\mathbf{2 4}$

63. (a)
64. (c)
65. (c)
66. (d) The number of people who knows all the languages

The number of people who do not know French
$=\frac{100}{540}=\frac{5}{27}$

## 

67. (a)


68．（c）${ }^{26}, \quad 38,12 \uparrow+12 \uparrow+12 \uparrow$
69．（c）
70．（d）


71．（b）


Conclusion－I－$\checkmark$

$$
\text { II - } \checkmark
$$

$$
\text { III }-\times
$$

72．（d）


Similarly，
S O ULFUL $\rightarrow$ R PTMEVK


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73．（b）how can you go $=$ ja da（ka）pa（i）


From the equation（ii）here $=$ na
74．（b） $14 \times 4 \div 7+12-8$
$=14 \times \frac{4}{7}+12-8=20-8=\mathbf{1 2}$
75．（c）


There are 29 triangles in the given figure－ AHL，LHG，GHM，HMB，GMF，BMF，BIF， CIF，FNC，CNJ，FNE，NEJ，EKJ，JKD，AGH， BHG，HBF，BFG，HFG，BCF，CJF，CJE，JEF， CFE，JED，ABG，CBG，BCE and CED

76．（b）


77．（c）Kidney is related to Nephron．Similarly，Central Nervous System is related to Neurons．

78．（c）


Position of y from last $=2$
Position of v from last $=5$
79．（b）Entomology is the study of insects．
Similarly，ophiology is the st udy of snakes．
80．（b）


Conclusion－I $-\times$ II $-x$

81．（a）



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Similarly，




82．（b）


Similarly，


83．（c）


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84．（c）

| $1^{3}=1$ | $6^{3}=216$ | $7^{3}=343$ |
| :---: | :---: | :---: |
| $2^{3}=8$ | $5^{3}=125$ | $8^{3}=512$ |
| $3^{3}=27$ | $4^{3}=64$ | $9^{3}=\mathbf{7 2 9}$ |
| 35 | 401 | 1575 |

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85．（d） $4 \times(2+6)=4 \times 8=32$
$5 \times(3+7)=5 \times 10=50$
Similarly，
$10 \times(8+10)=10 \times 20=\mathbf{2 0 0}$
86. (d)
87. (b) Convalesce $\frac{\text { Convenience }}{4}, \frac{\text { Converge }}{2}$
$\frac{\text { Converse }}{5}, \frac{\text { Convince }}{1}$
88. (b) (a) $34-30=4=(2)^{2}$
(b) $44-31=13$
(c) $61-12=49=(7)^{2}$

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(d) $25-21=4=(2)^{2}$

Except option (b), the difference of option (a),
(c) and (d) are perfect squares.
89. (a)

91. (c)

|  | Gaurav | Sandeep | Sachin |
| :--- | :---: | :---: | :---: |
| Before | 2 | 3 | 4 |
| After | 5 | 2 | 2 |

Gaurav work 21 stamps but from ratio it shows that 3 unit increases, thus
3 unit $=21 \mathrm{stamps}$
1 unit $=7$ stamps
Sachin loses 2 units i.e. 14 stamps
92. (d)

$\mathrm{AO}=\mathrm{BC}=4 \mathrm{~km}$ and $\mathrm{OD}=\mathrm{DC}-\mathrm{OC}=6 \mathrm{~km}$ $-3 \mathrm{~km}=3 \mathrm{~km}$
Required distance $\mathrm{AD}=\sqrt{\mathrm{AO}^{2}+\mathrm{OD}^{2}}$
$=\sqrt{4^{2}+3^{2}}=\sqrt{16+9}=\sqrt{25}=5 \mathrm{kms}$
93. (b) SITUATION
94. (d) Here, we allegate the legs of the deer and peacock.
Total number of animals $=80$
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Total number of legs $=200$


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Ratio of deers and Peacock $=1: 3$
The number of peacock $=\frac{3}{(1+3)} \times 80$

$$
=60 \text { peacock }
$$

95. (a)
96. (a) $6-7 \times 2+8$
$=6-14+8$

$=14-14=0$
97. (d)

98. (a)

99. (d)
100.(b)


Required Distance, $\mathrm{AD}=\mathrm{AB}+\mathrm{BD}$
$=25+5=30 \mathrm{kms}$


