



**Section : Verbal Ability**

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**QNo:- 1 ,Correct Answer:- C**

**Explanation:-** We are supposed to choose that option which shows octopuses are not really misfit among the class of 'cephalopods'. Refer to the first and second paragraph. 'Octopuses' just like other cephalopods are consumed not only by sea predators but also humans. So the right answer choice is option 'C'. Rest all other options make it a misfit.

**QNo:- 2 ,Correct Answer:- B**

**Explanation:-** Option 'B' can't be deduced from the passage. No where in the passage was this fact given that they can take colour of their predators. So statement given in option 'B' is not true about the camouflaging ability of the octopuses.

They simply take colours and sometimes textures of their surrounding to hide themselves. Hence rest of the options are true with respect to the passage.

**QNo:- 3 ,Correct Answer:- A**

**Explanation:-** Refer to the opening of introductory paragraph, "***They belong to Mollusca class Cephalopoda.....most are shelled invertebrates with a dorsal foot.***" And from the second passage we understand that in spite of lacking a shell covering them, they have other ways to save/hide themselves from the predators. So from all these facts we can infer that octopuses are most dissimilar to 'A'-sea snails.

**QNo:- 4 ,Correct Answer:- D**

**Explanation:-** Option 'D' provides us the statement that wouldn't weaken the camouflaging adeptness of cephalopods. This statement shows a situation where at least all the three cells- chromatophores, iridophores and leucophores are present which help the cephalopods in camouflaging themselves.

Camouflaging adeptness would be difficult if in the depths of sea radial muscle movements or transmission of neural signals become difficult. So option 'A' and 'B' get ruled out.

Refer to the third paragraph- "***Chromatophores are organs.....brown pigment granules.***" So the third colour is brown not green. It (C) also weakens the camouflaging adeptness of cephalopods.

**QNo:- 5 ,Correct Answer:- D**

**Explanation:-** In the given passage, the author is critical of engineering education without

the consideration of nontechnical aspects, such as cultural-social implications and potential harms of introducing the technological solutions. Engineering students have been taught to come up with 'best' technical innovations grounded in math and science, eventually relegating them to 'objectivity'.

So the appropriate claim made by the author is provided by option 'D'.

Rest all other options are supporting or appreciating the present engineering education, which is contrary to facts given in the passage. So they can be negated.

**QNo:- 6 ,Correct Answer:- C**

**Explanation:-** Except option 'C' all other options talk about how the dominant or privileged segments play the role of decision-makers, without considering its consequences on the marginalized section.

Whereas, option 'C' only highlights the sustainability of the devices built and their contribution towards greenhouse gas emissions, which will affect everyone equally, irrespective of social and economic differences.

**QNo:- 7 ,Correct Answer:- C**

**Explanation:-** Except option 'C', all other options explore the exploitation of technical aspects of medical science in an unjust way.

Option 'C' talks about incorrect assignment of people as female at birth which is a doing of humans only and technical ideals can't be blamed for it.

**QNo:- 8 ,Correct Answer:- B**

**Explanation:-** We are supposed to guess, which option doesn't add credence to author's suggestions about evolving engineering pedagogy. The right answer to this should be option 'B'. Refer to the first paragraph of the passage- "***This way of teaching.....solution process***"; shows that technical-social dualism should be avoided and in fact the two should be integrated in engineering for better sustainable results.

As option 'A', 'C' and 'D' all discuss involving environmental sustainability, needs of all the communities and a more responsible approach to technical design and problem solving respectively; author would approve of these.

**QNo:- 9 ,Correct Answer:- A**

**Explanation:-** The first paragraph discussed two terms- '**humans**' and their natural inclination towards '**music**'. Second passage explored link between musical and non-musical capacities like '**linguistic capacity**'. Third paragraph was based on how humans are '**symbol-makers**' too. And the last paragraph discussed '**modern humans**' and their

renewed interest in musicking. So the right option which mention all these terms is option 'A'. Rest all other options fail to take into account one or the other of these terms.

**QNo:- 10 ,Correct Answer:- A**

**Explanation:-** The only option that discusses the emergence of music/musicking is option 'A'. Rest all other option simply explore different aspects of musicing.

**QNo:- 11 ,Correct Answer:- A**

**Explanation:-** Throughout the passage the author tries to put forward this idea that humans are musicking creatures by default, irrespective of socio-cultural differences. So author is most likely to disagree with option 'A', hence it is the weakening sentence.

**QNo:- 12 ,Correct Answer:- B**

**Explanation:-** According to the passage the author's point of view is that not a particular human can make music but all do. The same is supported in the first paragraph and is highlighted in option 'B'.

**QNo:- 13 ,Correct Answer:- B**

**Explanation:-** Refer to the first two lines of the first paragrah, "***We begin with the emergence.....social institutions.***" Clearly by '*arena of thought*' author was refering to social science as being academic discipline. He states that social academic disciplines and intituitions overlap each other. Option 1 and 4 are ambiguous and can't be deduced from the passage. Option 3, talks about one and the same thing, so comparing the two as overlapping each other is illogical.

**QNo:- 14 ,Correct Answer:- B**

**Explanation:-** We have to state which of the given options can be a true inference based on the facts given in the passage. Refer to the second last sentence of the last paragraph- "***Natural languages are typical....., but not the execution of any human design***", shows that natural languages were not consciously developed or designed by the humans. So 'B' is the best answer.

Institutions of 'friendship' and 'joint stock' are completely two different arenas and are incomparable, so option 'A' can be ruled out.

Option 'C' is also false, because all the intuitions mentioned in it are in fact a result of conscious human action.

Option 'D' can also be negated as, 'culture' and 'tradition' are actually analytically isolated for explanatory and expository purposes. Refer to opening of second paragraph.

**QNo:- 15 ,Correct Answer:- A**

**Explanation:-** Right explanation of the line given in the question is provided by option 'A'. Refer to the second-half of the first paragraph, "**There are some institutions..... to be precise mixtures are the norm.**" 'Stock exchange' and 'black market' are both part of market domain, yet one is formal and other, informal. Rest all other options provide faulty interpretation of the given line, so they can be ruled out.

**QNo:- 16 ,Correct Answer:- D**

**Explanation:-** We are supposed to find out essence, that is the main idea of the passage. Option 'D' provides the right answer. Throughout the passage author has promulgated this idea that 'institutions' do not develop on their own in isolation. They are in fact layered with human's interventions and are intertwined with other institutions. Rest all other options provide individual examples of 'language', 'culture & tradition' and 'stock exchange & black market', to further reinforce the idea put forward by the author.

**QNo:- 17 ,Correct Answer:- 2143**

**Explanation:-** sentence 2 introduces that the issue of biodiversity loss and ecosystem collapse is caused due to several reasons. 2 and 1 are a pair. option 1 and 4 are pair as 4 carries forward the idea that there is no single tech solution to deal with this crisis. option 3 concludes the passage by preventing the active involvement of judiciary in these matters.

**QNo:- 18 ,Correct Answer:- 3142**

**Explanation:-** 3 introduces the state of cheerfulness linked with its effect on inner soul. 2 further sets forth the same idea by conveying about the genesis of this word. 4 and 2 are chrono pairs and also 2 concludes the passage by talking about the expansion of the meaning of this expression after the translations of the Bible.

**QNo:- 19 ,Correct Answer:- 2431**

**Explanation:-** 2 introduces the topic of food choices solely being governed by individual choices. 4 and 3 are cause-effect pair, also 4 continues the idea from 2 and 3 logically follows 4, as it further gives reasons for this liberty of choosing what to eat.

1 is plausibly the last sentence, because it narrows down the idea of governing food systems, specifically talking about women's role in it.

**QNo:- 20 ,Correct Answer:- D**

**Explanation:-** the correct option should be option 4. the passage talks about reasons for USP of 'Aage Badhein app.'

It stresses upon the fact that customization of the app according to the needs of the user, the main reason for it's success.

In the concluding part, the author's focus narrows down to rural and then household women who financially benefited from the app; which is a big thing because this is the group least likely to have had exposure to such digital platforms. Hence, the sentence would most strongly and plausibly fit in 4th bank.

**QNo:- 21 ,Correct Answer:- C**

**Explanation:-** The correct option is 3 as the passage focuses on tracing the trajectory of use/popularity of one of the most important ingredients of indian cuisine "Ghee" from first going down in late 20 and early 21st century.

surprisingly going up in last few years, and especially during the pandemic. the author is most likely to place the given sentence in blank 3, because in the line preceding it, he has talked about the renewed interest in use of Ghee. Chronologically its boom in pandemic-time would come next.

**QNo:- 22 ,Correct Answer:- D**

**Explanation:-** Option Band C can easily be eliminated because they either talk about only one aspect of the passage or have misinterpreted the idea of successful early non- hierarchical egalitarian societies respectively.

however, option A and D are more convincingly correct summaries, as they both talk about successful egalitarian societies in some ancient cities without the intervention of hierarchical, political or civic organizations.

But option (D) is a more appropriate and convincing choice, as it talks of the 'evidence' in support of these claims and not mere 'assumptions' option (A)

**QNo:- 23 ,Correct Answer:- B**

**Explanation:-** Option B includes all the principal subjects hence is the most appropriate summary.

A doesn't take the point of threat to freedom and privacy into account.

C and D though reflect this point of freedom and privacy, it missed out on the point of

taking same war-time psychological and behavioural manipulation into consideration.

**QNo:- 24 ,Correct Answer:- A**

**Explanation:-** The 3 options B, C and D are more or less imposing on the museums, the responsibility of preserving the artworks.  
Whereas the passage generally talks about museum artworks and the challenge to preserve them therefore only option A is the best.

## Section : DI & Reasoning

**QNo:- 25 ,Correct Answer:- 40**

**Explanation:-** Total number of domestic products = foreign products =  $320/2 = 160$   
 Domestic, Cosmetic, FDA approved products =  $160/2 = 80$   
 Foreign products having both approvals = 0  
 Domestic products having both approvals = 60  
 Let the number of domestic, cosmetic, both the approvals =  $x$   
 $\Rightarrow$  the number of domestic, nutrition, both the approvals =  $60 - x$   
 Total number of nutrition products = 140  
 $\Rightarrow$  total number of cosmetic products =  $320 - 140 = 180$   
 Number of foreign, nutrition products = 70  
 Let number of foreign, nutrition, FDA products =  $y$   
 $\Rightarrow$  number of foreign, nutrition, EU products =  $70 - y$   
 Also, number of foreign, cosmetic products =  $160 - 70 = 90$   
 Total FDA approved products = 200  
 Total foreign, FDA approved products = 70  
 Number of foreign, nutrition, FDA products =  $y$   
 $\Rightarrow$  number of foreign, cosmetic, FDA products =  $70 - y$   
 $\Rightarrow$  number of foreign, cosmetic, EU products =  $90 - (70 - y) = y + 20$   
 Number of cosmetic, FDA approved products = 120  
 $\Rightarrow$  number of nutrition, FDA approved products =  $200 - 120 = 80$   
 $\Rightarrow$  number of domestic, nutrition, FDA approved products =  $80 - y$   
 The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	$70 - y$	$y + 20$	0	90	$y$	$70 - y$	0	70	160
<b>Domestic</b>	80	$10 + x$	$x$	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
<b>Total</b>	120	$x + y + 30$	$x$	180	80	$120 - x$	$60 - x$	140	320

Solving,  $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic	Nutrition	Total
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	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	40	50	0	90	30	40	0	70	160
<b>Domestic</b>	80	10 + x	x	90	50	80 - x	60 - x	70	160
<b>Total</b>	120	60 + x	x	180	80	120 - x	60 - x	140	320

Now we can answer the questions

The number of foreign products that were FDA approved cosmetic products = 40

**QNo:- 26 ,Correct Answer:- C**

**Explanation:-** Total number of domestic products = foreign products =  $320/2 = 160$

Domestic, Cosmetic, FDA approved products =  $160/2 = 80$

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals = x

=> the number of domestic, nutrition, both the approvals =  $60 - x$

Total number of nutrition products = 140

=> total number of cosmetic products =  $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products = y

=> number of foreign, nutrition, EU products =  $70 - y$

Also, number of foreign, cosmetic products =  $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products = y

=> number of foreign, cosmetic, FDA products =  $70 - y$

=> number of foreign, cosmetic, EU products =  $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

=> number of nutrition, FDA approved products =  $200 - 120 = 80$

=> number of domestic, nutrition, FDA approved products =  $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	$70 - y$	$y + 20$	0	90	y	$70 - y$	0	70	160
<b>Domestic</b>	80	$10 + x$	x	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
<b>Total</b>	120	$x + y + 30$	x	180	80	$120 - x$	$60 - x$	140	320

Solving,  $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	40	50	0	90	30	40	0	70	160
<b>Domestic</b>	80	$10 + x$	x	90	50	$80 - x$	$60 - x$	70	160



<b>Total</b>	120	60 + x	x	180	80	120 - x	60 - x	140	320
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Now we can answer the questions

The number of cosmetic products which have FDA approval = 120

The number of cosmetic products which did not have FDA approval = 180 - 120 = 60

**QNo:- 27 ,Correct Answer:- A**

**Explanation:-** Total number of domestic products = foreign products = 320/2 = 160

Domestic, Cosmetic, FDA approved products = 160/2 = 80

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals = x

=> the number of domestic, nutrition, both the approvals = 60 - x

Total number of nutrition products = 140

=> total number of cosmetic products = 320 - 140 = 180

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products = y

=> number of foreign, nutrition, EU products = 70 - y

Also, number of foreign, cosmetic products = 160 - 70 = 90

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products = y

=> number of foreign, cosmetic, FDA products = 70 - y

=> number of foreign, cosmetic, EU products = 90 - (70 - y) = y + 20

Number of cosmetic, FDA approved products = 120

=> number of nutrition, FDA approved products = 200 - 120 = 80

=> number of domestic, nutrition, FDA approved products = 80 - y

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	70 - y	y + 20	0	90	y	70 - y	0	70	160
<b>Domestic</b>	80	10 + x	x	90	80 - y	50 - x + y	60 - x	70	160
<b>Total</b>	120	x + y + 30	x	180	80	120 - x	60 - x	140	320

Solving, 70 - y + 80 = 120 => y = 30

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	40	50	0	90	30	40	0	70	160
<b>Domestic</b>	80	10 + x	x	90	50	80 - x	60 - x	70	160
<b>Total</b>	120	60 + x	x	180	80	120 - x	60 - x	140	320



Now we can answer the questions

No value of region can be negative  $\Rightarrow 60 - x \geq 0 \Rightarrow x \leq 60$

The number of domestic, cosmetic products that had both the approvals =  $x$  is at most 60

Hence, the best represents is at least 10 and at most 60

**QNo:- 28 ,Correct Answer:- A**

**Explanation:-** Total number of domestic products = foreign products =  $320/2 = 160$

Domestic, Cosmetic, FDA approved products =  $160/2 = 80$

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals =  $x$

$\Rightarrow$  the number of domestic, nutrition, both the approvals =  $60 - x$

Total number of nutrition products = 140

$\Rightarrow$  total number of cosmetic products =  $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products =  $y$

$\Rightarrow$  number of foreign, nutrition, EU products =  $70 - y$

Also, number of foreign, cosmetic products =  $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products =  $y$

$\Rightarrow$  number of foreign, cosmetic, FDA products =  $70 - y$

$\Rightarrow$  number of foreign, cosmetic, EU products =  $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

$\Rightarrow$  number of nutrition, FDA approved products =  $200 - 120 = 80$

$\Rightarrow$  number of domestic, nutrition, FDA approved products =  $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	$70 - y$	$y + 20$	0	90	$y$	$70 - y$	0	70	160
<b>Domestic</b>	80	$10 + x$	$x$	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
<b>Total</b>	120	$x + y + 30$	$x$	180	80	$120 - x$	$60 - x$	140	320

Solving,  $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	40	50	0	90	30	40	0	70	160
<b>Domestic</b>	80	$10 + x$	$x$	90	50	$80 - x$	$60 - x$	70	160
<b>Total</b>	120	$60 + x$	$x$	180	80	$120 - x$	$60 - x$	140	320

Now we can answer the questions

The number of cosmetic products that did not have EU approval = 70

$$\Rightarrow 180 - (60 + x) = 70 \Rightarrow x = 50$$

The number of nutrition products that had both the approvals =  $60 - x = 10$

**QNo:- 29 ,Correct Answer:- 50**

**Explanation:-** Total number of domestic products = foreign products =  $320/2 = 160$

Domestic, Cosmetic, FDA approved products =  $160/2 = 80$

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals =  $x$

$\Rightarrow$  the number of domestic, nutrition, both the approvals =  $60 - x$

Total number of nutrition products = 140

$\Rightarrow$  total number of cosmetic products =  $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products =  $y$

$\Rightarrow$  number of foreign, nutrition, EU products =  $70 - y$

Also, number of foreign, cosmetic products =  $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products =  $y$

$\Rightarrow$  number of foreign, cosmetic, FDA products =  $70 - y$

$\Rightarrow$  number of foreign, cosmetic, EU products =  $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

$\Rightarrow$  number of nutrition, FDA approved products =  $200 - 120 = 80$

$\Rightarrow$  number of domestic, nutrition, FDA approved products =  $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	$70 - y$	$y + 20$	0	90	$y$	$70 - y$	0	70	160
<b>Domestic</b>	80	$10 + x$	$x$	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
<b>Total</b>	120	$x + y + 30$	$x$	180	80	$120 - x$	$60 - x$	140	320

Solving,  $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
<b>Foreign</b>	40	50	0	90	30	40	0	70	160
<b>Domestic</b>	80	$10 + x$	$x$	90	50	$80 - x$	$60 - x$	70	160
<b>Total</b>	120	$60 + x$	$x$	180	80	$120 - x$	$60 - x$	140	320

Now we can answer the questions

The number of nutrition products that did not have EU approval = 50

$$\Rightarrow 140 - (120 - x) = 50 \Rightarrow x = 30$$

The number of domestic, cosmetic products that did not have EU approval

$$= 90 - (10 + x) = 50$$

**QNo:- 30 ,Correct Answer:- 35**

**Explanation:-**

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

While making the route plan, the supplier goes to the locations in decreasing order of demand and if the last location is Ahmednagar, then it must have least demand (50 units)

So, the supplier must have supplied the order in the following manner-

C (70 or 100 units) > B (60 units) > D (50 units)  $\geq$  A (50 units)

The total distance (minimum) covered W – C – B – W – D – W – A

$$= 12 + 4 + 10 + 2 + 2 + 5 = 35 \text{ km}$$

**QNo:- 31 ,Correct Answer:- 38**

**Explanation:-**

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210



<b>3</b>	50	40	100	30	220
<b>4</b>	50	40	100	50	240
<b>5</b>	50	60	70	30	210
<b>6</b>	50	60	70	50	230
<b>7</b>	50	60	100	30	240
<b>8</b>	50	60	100	50	260
<b>9</b>	70	40	70	30	210
<b>10</b>	70	40	70	50	230
<b>11</b>	70	40	100	30	240
<b>12</b>	70	40	100	50	260
<b>13</b>	70	60	70	30	230
<b>14</b>	70	60	70	50	250
<b>15</b>	70	60	100	30	260
<b>16</b>	70	60	100	50	280

The total number of widgets delivered in a day = 250 units

Only possible combination,

A (70 units) + B (60 units) + C (70 units) + D (50 units) = 250 units

Order of delivery, A (70 units)  $\geq$  C (70 units)  $>$  B (60 units)  $>$  D (50 units)

The total distance (minimum) covered  $W - A - W - C - B - W - D$

$= 5 + 5 + 12 + 4 + 10 + 2 = 38$  km

**QNo:- 32 ,Correct Answer:- D**

**Explanation:-**

<b>Case</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>Total</b>
<b>1</b>	50	40	70	30	190
<b>2</b>	50	40	70	50	210
<b>3</b>	50	40	100	30	220
<b>4</b>	50	40	100	50	240
<b>5</b>	50	60	70	30	210
<b>6</b>	50	60	70	50	230
<b>7</b>	50	60	100	30	240
<b>8</b>	50	60	100	50	260
<b>9</b>	70	40	70	30	210
<b>10</b>	70	40	70	50	230
<b>11</b>	70	40	100	30	240
<b>12</b>	70	40	100	50	260
<b>13</b>	70	60	70	30	230
<b>14</b>	70	60	70	50	250
<b>15</b>	70	60	100	30	260
<b>16</b>	70	60	100	50	280



The total number of widgets delivered in a day = 260 units  
 Also, the route ends at Bikrampore, only order possible  
 $C (100 \text{ units}) > A (70 \text{ units}) > D (50 \text{ units}) > B (40 \text{ units})$   
 Required chance =  $70\% \times 60\% \times 60\% \times 30\% = 7.56\%$

**QNo:- 33 ,Correct Answer:- C**

**Explanation:-**

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

If the first location visited from the warehouse is Ahmednagar, possible cases

Case	A	B	C	D	Total
<b>9<sup>th</sup></b>	70	40	70	30	210
Distance covered $W - A - W - C - B - W - D$ $= 5 + 5 + 12 + 4 + 10 + 2 = 38 \text{ km}$ $A (70 \text{ units}) \geq C (70 \text{ units}) > B (40 \text{ units}) > D (30 \text{ units})$ Chance = $60\% \times 30\% \times 30\% \times 40\% = 2.16\%$					
<b>10<sup>th</sup></b>	70	40	70	50	230
Distance covered $W - A - W - C - D - W - B$ $= 5 + 5 + 12 + 6 + 2 + 10 = 40 \text{ km}$ $A (70 \text{ units}) \geq C (70 \text{ units}) > D (50 \text{ units}) > B (40 \text{ units})$ Chance = $60\% \times 30\% \times 60\% \times 30\% = 3.24\%$					
<b>13<sup>th</sup></b>	70	60	70	30	230



Distance covered W – A – W – C – B – W – D = 5 + 5 + 12 + 4 + 10 + 2 = 38 km A (70 units) ≥ C (70 units) > B (60 units) > D (30 units) Chance = 60% × 30% × 70% × 40% = 5.04%					
<b>14<sup>th</sup></b>	70	60	70	50	250
Distance covered W – A – W – C – B – W – D = 5 + 5 + 12 + 4 + 10 + 2 = 38 km A (70 units) ≥ C (70 units) > B (60 units) > D (50 units) Chance = 60% × 30% × 70% × 60% = 7.56%					

Total chance = 2.16% + 3.24% + 5.04% + 7.56% = 18%  
 The chance that the total distance covered is 40 km  
 = 3.24%/18% × 100 = 18%

**QNo:- 34 ,Correct Answer:- B**

**Explanation:-**

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

If Ahmednagar is not the first location to be visited in a route, possible cases

Case	A	B	C	D	Total
1	50	40	70	30	190
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					
2	50	40	70	50	210



Distance covered W – C – D – W – A – B = 12 + 6 + 2 + 5 + 6 = 31 km					
<b>3</b>	50	40	100	30	220
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					
<b>4</b>	50	40	100	50	240
Distance covered W – C – D – W – A – B = 12 + 6 + 2 + 5 + 6 = 31 km					
<b>5</b>	50	60	70	30	210
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = <b>29 km</b>					
<b>6</b>	50	60	70	50	230
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = <b>29 km</b>					
<b>7</b>	50	60	100	30	240
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = <b>29 km</b>					
<b>8</b>	50	60	100	50	260
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = <b>29 km</b>					
<b>11</b>	70	40	100	30	240
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					
<b>12</b>	70	40	100	50	260
Distance covered W – C – W – A – W – D – W – B = 12 + 12 + 5 + 5 + 2 + 2 + 10 + 10 = 58 km					
<b>15</b>	70	60	100	30	260
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					
<b>16</b>	70	60	100	50	280
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					

The total route distance is 29 km is in 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> case having widgets delivered 210, 230, 240 and 260 respectively

The only possible value among options is 210

**QNo:- 35 ,Correct Answer:- B**

**Explanation:-** The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D



<b>Revenue (in Rs. Crores)</b>	90	100	23	50	90	90	70	20	60	30	100	70
<b>Cost (in Rs. Crores)</b>	85	75	20	40	65	40	60	50	30	30	30	70
<b>Profit (in Rs. Crores)</b>	5	25	3	10	25	50	10	-30	30	0	70	0
<b>Employee Strength</b>	150	210	325	400	140	240	325	410	150	250	325	400
<b>New Hires</b>	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Considering all the three years,  
Profit of Company C in 2021 = 70 crores is the highest annual profit

**QNo:- 36 ,Correct Answer:- C**

**Explanation:-** The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
<b>Revenue (in Rs. Crores)</b>	90	100	23	50	90	90	70	20	60	30	100	70
<b>Cost (in Rs. Crores)</b>	85	75	20	40	65	40	60	50	30	30	30	70
<b>Profit (in Rs. Crores)</b>	5	25	3	10	25	50	10	-30	30	0	70	0
<b>Employee Strength</b>	150	210	325	400	140	240	325	410	150	250	325	400
<b>New Hires</b>	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Loss of Company D in 2020 = 30 crores is the highest annual loss in any of the years

**QNo:- 37 ,Correct Answer:- A**

**Explanation:-** The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
<b>Revenue (in Rs. Crores)</b>	90	100	23	50	90	90	70	20	60	30	100	70



<b>Cost (in Rs. Crores)</b>	85	75	20	40	65	40	60	50	30	30	30	70
<b>Profit (in Rs. Crores)</b>	5	25	3	10	25	50	10	-30	30	0	70	0
<b>Employee Strength</b>	150	210	325	400	140	240	325	410	150	250	325	400
<b>New Hires</b>	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Performance = Annual Profit / Annual Cost

For year 2019,

Performance of A =  $5/85 = 1/17$

Performance of B =  $25/75 = 1/3$

Performance of C =  $3/20$

Performance of D =  $10/40 = 1/4$

Hence, the company that had the lowest performance ratio is company A

**QNo:- 38 ,Correct Answer:- B**

**Explanation:-** The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
<b>Revenue (in Rs. Crores)</b>	90	100	23	50	90	90	70	20	60	30	100	70
<b>Cost (in Rs. Crores)</b>	85	75	20	40	65	40	60	50	30	30	30	70
<b>Profit (in Rs. Crores)</b>	5	25	3	10	25	50	10	-30	30	0	70	0
<b>Employee Strength</b>	150	210	325	400	140	240	325	410	150	250	325	400
<b>New Hires</b>	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Total number of employees lost in any year = Employee strength in that year + New Hires in that year – Employee strength in next year

	Total number of employees lost in		
	2019	2020	Total
<b>Company A</b>	$150 + 20 - 140 = 30$	$140 + 35 - 150 = 25$	55
<b>Company B</b>	$210 + 35 - 240 = 5$	$240 + 45 - 250 = 35$	40
<b>Company C</b>	$325 + 45 - 325 = 45$	$325 + 40 - 325 = 40$	85
<b>Company D</b>	$400 + 30 - 410 = 20$	$410 + 35 - 400 = 45$	65

The total number of employees lost in 2019 and 2020 was least for company B

**QNo:- 39 ,Correct Answer:- B**

**Explanation:-** The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
Revenue (in Rs. Crores)	90	100	23	50	90	90	70	20	60	30	100	70
Cost (in Rs. Crores)	85	75	20	40	65	40	60	50	30	30	30	70
Profit (in Rs. Crores)	5	25	3	10	25	50	10	-30	30	0	70	0
Employee Strength	150	210	325	400	140	240	325	410	150	250	325	400
New Hires	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

For year 2020,

	Profit	Employee strength	Profit per employee
<b>Company A</b>	25	$(140 + 150)/2 = 145$	$25/145 = 100/580$
<b>Company B</b>	50	$(240 + 250)/2 = 245$	$50/245 = 100/490$
<b>Company C</b>	10	$(325 + 325)/2 = 325$	$10/325 = 100/3250$
<b>Company D</b>	-30	$(410 + 400)/2 = 405$	$-30/405$

Hence, for year 2020, company B had the highest profit per employee

**QNo:- 40 ,Correct Answer:- 84**

**Explanation:-** Let the total number of households each met over the two days =  $2h$

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri =  $n$

=> the number of TRICCEK sold on day 2 by Tohri =  $100 - n$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	$n$	$100 - n$	100
	Number of households met	$h - 15$	$h + 15$	$2h$
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	$2h - 1$	1	$2h$



	Success Rate	$100/(2h - 1)$	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	h	h	2h
	Success Rate	50/h	50/h	

Tohri's success rate was twice that of Lahur's on the first day,  
 $\Rightarrow n/(h - 15) = 2 \times (50/h)$   
 Solving,  $nh = 100h - 1500$   
 Also, Tohri's success rate was 75% of Lahur's on the second day,  
 $\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$   
 Solving,  $200h - 2nh = 75h + 1125$   
 Substituting the value of  $nh$ ,  
 $\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$   
 $\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$   
 Substituting again,  
 $25n = 2500 - 1500 = 1000 \Rightarrow n = 40$

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	40	60	100
	Number of households met	10	40	50
	Success Rate	4	1.5	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	49	1	50
	Success Rate	2.04	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions  
 Total number of households met by Tohri, Hokli and Lahur on the first day  
 $= 10 + 49 + 25 = 84$

**QNo:- 41 ,Correct Answer:- 40**

**Explanation:-** Let the total number of households each met over the two days =  $2h$   
 Total number of items sold by each over the two days = 100  
 Let the number of TRICCEK sold on day 1 by Tohri =  $n$   
 $\Rightarrow$  the number of TRICCEK sold on day 2 by Tohri =  $100 - n$   
 The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	n	$100 - n$	100
	Number of households met	$h - 15$	$h + 15$	$2h$
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
Hokli	Number of TRICCEK sold	100	0	100



	Number of households met	$2h - 1$	1	2h
	Success Rate	$100/(2h - 1)$	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	h	h	2h
	Success Rate	$50/h$	$50/h$	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

Solving,  $nh = 100h - 1500$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

Solving,  $200h - 2nh = 75h + 1125$

Substituting the value of  $nh$ ,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	40	60	100
	Number of households met	10	40	50
	Success Rate	4	1.5	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	49	1	50
	Success Rate	2.04	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

The number of TRICCEK items sold by Tohri on the first day = 40

**QNo:- 42 ,Correct Answer:- B**

**Explanation:-** Let the total number of households each met over the two days =  $2h$

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri =  $n$

$$\Rightarrow \text{the number of TRICCEK sold on day 2 by Tohri} = 100 - n$$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	$n$	$100 - n$	100
	Number of households met	$h - 15$	$h + 15$	$2h$
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
Hokli	Number of TRICCEK sold	100	0	100



	Number of households met	$2h - 1$	1	$2h$
	Success Rate	$100/(2h - 1)$	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	$h$	$h$	$2h$
	Success Rate	$50/h$	$50/h$	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

Solving,  $nh = 100h - 1500$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

Solving,  $200h - 2nh = 75h + 1125$

Substituting the value of  $nh$ ,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	40	60	100
	Number of households met	10	40	50
	Success Rate	4	1.5	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	49	1	50
	Success Rate	2.04	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

The number of households Lahur met on the second day = 25

Hence, between 21 and 29

**QNo:- 43 ,Correct Answer:- B**

**Explanation:-** Let the total number of households each met over the two days =  $2h$

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri =  $n$

$$\Rightarrow \text{the number of TRICCEK sold on day 2 by Tohri} = 100 - n$$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	$n$	$100 - n$	100
	Number of households met	$h - 15$	$h + 15$	$2h$
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	



Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	2h – 1	1	2h
	Success Rate	100/(2h – 1)	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	h	h	2h
	Success Rate	50/h	50/h	

Tohri’s success rate was twice that of Lahur’s on the first day,

=>  $n/(h - 15) = 2 \times (50/h)$

Solving,  $nh = 100h - 1500$

Also, Tohri’s success rate was 75% of Lahur’s on the second day,

=>  $(100 - n)/h + 15 = (75/100) \times (50/h)$

Solving,  $200h - 2nh = 75h + 1125$

Substituting the value of  $nh$ ,

=>  $200h - 2(100h - 1500) = 75h + 1125$

=>  $3000 = 75h + 1125 \Rightarrow h = 25$

Substituting again,

$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	40	60	100
	Number of households met	10	40	50
	Success Rate	4	1.5	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	49	1	50
	Success Rate	2.04	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

The number of households Tohri met on the first day = 10

Hence, 10 or less

**QNo:- 44 ,Correct Answer:- A**

**Explanation:-** Let the total number of households each met over the two days = 2h

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri = n

=> the number of TRICCEK sold on day 2 by Tohri = 100 – n

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	n	100 – n	100
	Number of households met	h – 15	h + 15	2h



	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	$2h - 1$	1	$2h$
	Success Rate	$100/(2h - 1)$	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	$h$	$h$	$2h$
	Success Rate	$50/h$	$50/h$	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

$$\text{Solving, } nh = 100h - 1500$$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

$$\text{Solving, } 200h - 2nh = 75h + 1125$$

Substituting the value of  $nh$ ,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	40	60	100
	Number of households met	10	40	50
	Success Rate	4	1.5	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	49	1	50
	Success Rate	2.04	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

Going by options,

1. Among the three, Tohri had the highest success rate on the second day.

Lahur had the highest success rate on the second day

Hence, statement 1 is false.

2. Tohri had a higher success rate on the first day compared to the second day.

Statement 2 is true

3. Among the three, Tohri had the highest success rate on the first day.

Statement 3 is true

4. Among the three, Lahur had the lowest success rate on the first day.

Statement 4 is true

## Section : Quantitative Ability

**QNo:- 45 ,Correct Answer:- C**

**Explanation:-** Since,  $f(x) \geq 0$  and  $f(2) = 0$   
 $\Rightarrow$  Both the roots of the quadratic polynomial are equal to 2  
Let the quadratic polynomial be  $f(x) = ax^2 + bx + c$   
Sum of roots =  $2 + 2 = -b/a \Rightarrow b = -4a$   
Product of roots =  $2 \times 2 = c/a \Rightarrow c = 4a$   
Also,  $f(4) = 6 \Rightarrow 16a + 4b + c = 6$   
Substituting and solving,  
 $16a + 4(-4a) + 4a = 6$   
 $\Rightarrow a = 1.5, b = -6$  and  $c = 6$   
 $f(-2) = 1.5(-2)^2 + (-6)(-2) + 6 = 24$

**QNo:- 46 ,Correct Answer:- 4**

**Explanation:-**  $(x^2 - 10)x^2 - 3x - 10 = 1$

Case 1 $(x^2 - 10)^0 = 1$ $\Rightarrow x^2 - 3x - 10 = 0$ $\Rightarrow (x + 2)(x - 5) = 0$ $\Rightarrow x = -2$ or $5$ Two integral solutions	Case 2 $(1)x^2 - 3x - 10 = 1$ $\Rightarrow x^2 - 10 = 1$ $\Rightarrow x = \pm \sqrt{11}$ No integral solutions	Case 3 $(-1)\text{even} = 1$ $\Rightarrow x^2 - 10 = -1$ $\Rightarrow x^2 = 9$ $\Rightarrow x = -3$ or $3$ (for both $-3$ and $3, x^2 - 3x - 10 = \text{even}$ ) Two integral solutions
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Total integral solutions = 4

**QNo:- 47 ,Correct Answer:- D**

**Explanation:-** Total income of Manu for 1st nine months =  $4000 \times 9 = \text{Rs } 36000$   
Total expenditure for 1<sup>st</sup> nine months =  $3500 \times 9 = \text{Rs } 31500$   
Total savings for the 1<sup>st</sup> nine months =  $36000 - 31500 = \text{Rs } 4500$   
Total annual saving =  $550 \times 12 = \text{Rs } 6600$   
Total saving for the last three months =  $6600 - 4500 = \text{Rs } 2100$   
Total expenditure for the last three months =  $3700 \times 3 = \text{Rs } 11100$   
Total income for the last three months =  $2100 + 11100 = \text{Rs } 13200$   
Income per month for the remaining 3 months =  $13200/3 = \text{Rs } 4400$

**QNo:- 48 ,Correct Answer:- 6**

**Explanation:-** Time taken by Anu =  $5t$ , Tanu =  $8t$  and Manu =  $10t$  (where  $t$  is in hours)  
Let job =  $40t$  (LCM of  $5t, 8t$  and  $10t$ )





Efficiency of Anu, A = 8 units/hour

Efficiency of Tanu, T = 5 units/hour

Efficiency of Manu, M = 4 units/hour

$$A + T + M = 40t/(4 \times 8)$$

Solving, total job =  $40t = 544$  units

Job done by Anu and Tanu in 6 days working 6 hrs 40 mins (=  $20/3$  hrs)

$$= (8 + 5) \times 6 \times 20/3 = 520 \text{ units}$$

Remaining job =  $544 - 520 = 24$  units

Time taken by Manu to complete the remaining job =  $24/4 = 6$  hours

**QNo:- 49 ,Correct Answer:- B**

**Explanation:-** Let the marks scored by Amit be A and by other candidates be B, C, D and E

$$\text{Given, } A + B + C + D + E = 38 \times 5 = 190$$

Exactly three of them scored above 32 and no two student scored same marks

Lowest marks scored by Amit, when rest scored the maximum

$$\text{Let } B = 32, C = 48, D = 49 \text{ and } E = 50$$

$$\Rightarrow \text{Lowest marks scored by Amit} = 190 - (32 + 48 + 49 + 50) = 11$$

Highest marks scored by Amit = 31

$$\text{such that } B = 32, C + D + E = 190 - (31 + 32) = 127$$

$$\text{Required difference} = 31 - 11 = 20$$

**QNo:- 50 ,Correct Answer:- 24**

**Explanation:-** Let the number of correct answered questions = x, wrong = y and unattempted = z

$$\text{Given, } x + y + z = 75$$

$$\text{Also, } 3x - y + z = 97$$

$$\text{Subtracting, } 2x - 2y = 22$$

$$\Rightarrow x - y = 11$$

$$\text{Also, } z > x + y$$

$$\Rightarrow x + y \text{ (maximum)} = 37 \text{ (such that } z = 38)$$

$$\Rightarrow 2x = 48 \text{ (maximum)}$$

$$\Rightarrow x = 24 \text{ (maximum)}$$

**QNo:- 51 ,Correct Answer:- 10**

**Explanation:-** Let the number of sides of A and B be a and 2a respectively

Given,

$$\frac{(a - 2) \times 180^\circ}{a} : \frac{(2a - 2) \times 180^\circ}{2a} = 3:4$$

$$\Rightarrow (a - 2)/(a - 1) = 3/4$$

$$\text{Solving, } 4a - 8 = 3a - 3$$



=> a = 5

Hence, the number of sides of B = 2a = 10

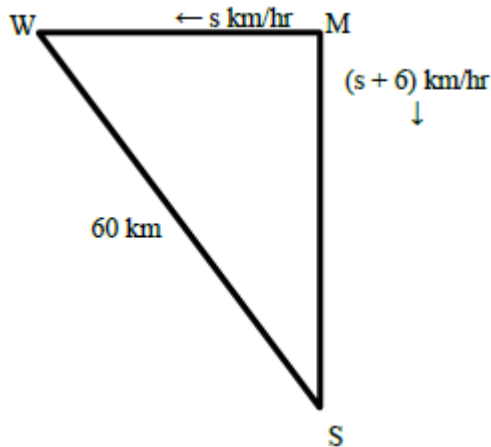
**QNo:- 52 ,Correct Answer:- C**

**Explanation:-** Let the volume of each container = 16x

Transferred	1 <sup>st</sup> container		2 <sup>nd</sup> container	
	Sugar Syrup	Milk	Sugar Syrup	Milk
Half filled	8x	0	0	8x
50% of 1 <sup>st</sup> to 2 <sup>nd</sup>	-4x	-0	+4x	+0
Left	4x	0	4x	8x
50% of 2 <sup>nd</sup> to 1 <sup>st</sup>	+2x	+4x	-2x	-4x
Left	6x	4x	2x	4x
50% of 1 <sup>st</sup> to 2 <sup>nd</sup>	-3x	-2x	+3x	+2x
Left	3x	2x	5x	6x

Required ratio = 5:6

**QNo:- 53 ,Correct Answer:- B**



**Explanation:-**

Let the meeting point is M.

Let the speed of the ship that goes West

= s km/hr

=> the speed of the ship that goes South

= (s + 6) km/hr

In 2 hrs, distance covered by ship (West)

MW = 2s

And distance covered by ship (South)

MS = 2s + 12

Given, distance between them after 2 hrs

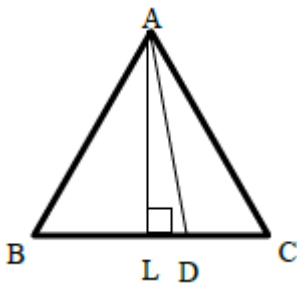
WS = 60 km

Applying Pythagoras theorem,

$$\begin{aligned} MW^2 + MS^2 &= WS^2 \\ \Rightarrow (2s)^2 + (2s + 12)^2 &= 60^2 \\ \Rightarrow 4s^2 + 4s^2 + 144 + 48s &= 3600 \\ \Rightarrow 8s^2 + 48s - 3456 &= 0 \\ \Rightarrow s^2 + 6s - 432 &= 0 \\ \Rightarrow (s - 18)(s + 24) &= 0 \\ \Rightarrow s &= 18 \text{ or } -24 \text{ (rejected)} \end{aligned}$$

Hence, the speed of slower ship = 18 km/hr

**QNo:- 54 ,Correct Answer:- A**



**Explanation:-**

The side of equilateral triangle = 3 cm  
Since, area triangle ADC =  $\frac{1}{2} \times$  area triangle ABD  
D divides BC in the ratio 2:1  
 $\Rightarrow BD = \frac{2}{3} \times 3 = 2$  cm  
The height of equilateral triangle ABC,  
 $AL = \frac{\sqrt{3}}{2} \times 3 = \frac{3\sqrt{3}}{2}$  cm  
Also, AL divides BC in the ratio 1:1  
 $\Rightarrow BL = \frac{1}{2} \times 3 = \frac{3}{2}$  cm  
 $\Rightarrow LD = BD - BL = 2 - \frac{3}{2} = \frac{1}{2}$  cm  
In triangle ALD,  
 $AD^2 = AL^2 + LD^2$   
 $AD^2 = (\frac{3\sqrt{3}}{2})^2 + (\frac{1}{2})^2$   
 $AD = \sqrt{7}$  cm

**QNo:- 55 ,Correct Answer:- C**

**Explanation:-** Number of integers  $> 2000$  are  
4 digit numbers =  $4 \times 5 \times 4 \times 3 = 240$   
5 digit numbers =  $5 \times 5 \times 4 \times 3 \times 2 = 600$   
6 digit numbers =  $5 \times 5 \times 4 \times 3 \times 2 \times 1 = 600$   
Total =  $240 + 600 + 600 = 1440$

**QNo:- 56 ,Correct Answer:- B**

**Explanation:-** Let the third root of the cubic equation  $f(x) = 5x^3 + cx^2 - 10x + 9 = 0$  is  $p$

Sum of roots =  $r - r + p = -c/5 \Rightarrow p = -c/5$

Sum of roots taken two at a time =  $r(-r) + rp + (-r)p = -10/5 = -2$

$\Rightarrow -r^2 = -2 \Rightarrow r = \pm\sqrt{2}$

Product of roots =  $r(-r)p = -9/5 \Rightarrow p = 9/10$

Substituting and solving,

$9/10 = -c/5$

$\Rightarrow c = -9/2$

**QNo:- 57 ,Correct Answer:- A**

**Explanation:-** Day 1, number of bacteria = 100

Day 2,  $1/2 \times 100 = 50$  more bacteria produces, total = 150

Day 3,  $1/3 \times 150 = 50$  more bacteria produces, total = 200

Day 4,  $1/4 \times 200 = 50$  more bacteria produces, total = 250

And so on

This forms an AP with 1<sup>st</sup> term as 100 and common difference = 50

Let the required day =  $d^{\text{th}}$  day

Solving,  $100 + (d - 1) 50 \geq 1000$

$\Rightarrow (d - 1) \geq 18$

$\Rightarrow d \geq 19$

Hence, on 19<sup>th</sup> day, the total number of bacteria will be more than or equal to 1000

**QNo:- 58 ,Correct Answer:- B**

**Explanation:-** Let the total number of registered voters =  $300x$

$\Rightarrow$  total number of votes casted =  $240x$

Number of votes one candidate received = 30% of  $240x = 72x$

Remaining votes =  $240x - 72x = 168x$

Number of votes received by other three candidates

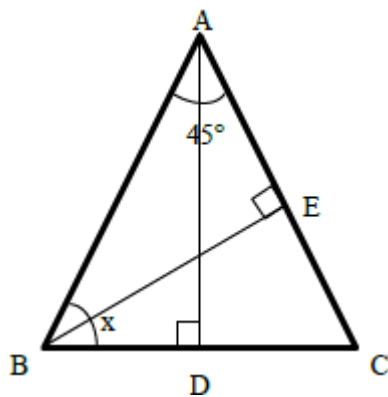
$1/6 \times 168x = 28x$ ,  $2/6 \times 168x = 56x$  and  $3/6 \times 168x = 84x$

Given,  $84x - 72x = 2512$

$\Rightarrow 12x = 2512$

$\Rightarrow 300x = 62800$

**QNo:- 59 ,Correct Answer:- D**

**Explanation:-**

In triangle AEB,

Let  $AE = BE = a$

$\Rightarrow AB = a\sqrt{2}$

In triangle ADB,

$\sin x = AD/AB$

$\Rightarrow AD = AB \sin x$

$= a\sqrt{2} \sin x$

Required ratio,

$AD/BE$

$= (a\sqrt{2} \sin x)/a$

$= \sqrt{2} \sin x$

**QNo:- 60 ,Correct Answer:- 20**

**Explanation:-** Let total investment by Mr. Pinto =  $15P$

$1/5 \times 15P = 3P$  at 6% SI

$1/3 \times 15P = 5P$  at 10% SI

Remaining,  $15P - (3P + 5P) = 7P$  at 1% SI

Let the required number of years =  $t$

Total simple interest =  $(3P \times 6/100 + 5P \times 10/100 + 7P \times 1/100) \times t \geq 15P$

Solving,  $75P/100 \times t \geq 15P$

$\Rightarrow t \geq 20$

Hence, the minimum number of years = 20 years

**QNo:- 61 ,Correct Answer:- B**

**Explanation:-** We know,  $(7!)! = 5040!$  and  $(8!)! = 40320!$

Hence, the maximum value that can divide  $15000!$  is  $(7!)!$

**QNo:- 62 ,Correct Answer:- 14**

**Explanation:-** Given,  $a_1 + a_2 + a_3 + \dots + a_N = 300N$

Also,  $6a_1 + a_2 + a_3 + \dots + a_N = 400N$

Subtracting,  $5a_1 = 100N$

$\Rightarrow a_1 = 20N$

Now, starting from  $N = 1$

$\Rightarrow a_1 = 20$  is the only value, the average required is 300, not possible

$N = 2 \Rightarrow a_1 = 40$  and  $a_2 = 560$ , such that average = 300, possible

$N = 3, 4, \dots, 15$

At  $N = 15$ ,  $a_1 = 300 = a_2 = a_3 = \dots = a_{15}$ , average = 300, possible

At  $N = 16$ ,  $a_1 = 320$  and since the sequence is non-decreasing,

$a_2, a_3, a_4, \dots \geq 320$  and cannot have average = 300, not possible

Hence, possible values of  $a_1 = 14$  (for  $N = 2$  to 15, inclusive)

**QNo:- 63 ,Correct Answer:- C**

**Explanation:-**  $A_n = 3 + 7 + 11 + 15 + \dots$

$$A_n = n/2 [2 \times 3 + (n - 1) 4]$$

$$A_n = n/2 (6 + 4n - 4)$$

$$A_n = 2n^2 + n$$

$$\frac{1}{25} \sum_1^{25} A_n = \frac{1}{25} \sum_1^{25} (2n^2 + n) = \frac{1}{25} \left( 2 \sum_1^{25} n^2 + \sum_1^{25} n \right)$$

$$= \frac{1}{25} \left[ \frac{2 \times 25 \times 26 \times 51}{6} + \frac{25 \times 26}{2} \right]$$

$$= 442 + 13$$

$$= 455$$

**QNo:- 64 ,Correct Answer:- 12**

**Explanation:-** Given,  $f(x^2 - x) = 5$

Putting  $x = 1$ ,  $f(0) = 5$

$$f(1) + f(0) - 1 = 0 \Rightarrow f(1) = -4$$

$$f(2) + f(1) - 1 = 0 \Rightarrow f(2) = 5$$

$$f(3) + f(2) - 1 = 0 \Rightarrow f(3) = -4$$

$$f(4) + f(3) - 1 = 0 \Rightarrow f(4) = 5$$

$$f(5) + f(4) - 1 = 0 \Rightarrow f(5) = -4$$

And so on

$f(\text{odd value}) = -4$  and  $f(\text{even value}) = 5$

Also,  $g(x) = x^2$



$$\begin{aligned} f(g(5)) + g(f(5)) &= f(25) + g(-4) \\ &= -4 + 16 = 12 \end{aligned}$$

**QNo:- 65 ,Correct Answer:- 47**

**Explanation:-**  $(4 - \log_2 n)/(3 - \log_4 n) < 0$

$$(4 - \log_2 n)(3 - \log_4 n)/(3 - \log_4 n)^2 < 0$$

$$(4 - \log_2 n)(3 - \log_4 n) < 0$$

$$\Rightarrow 4 - \log_2 n < 0 \text{ and } 3 - \log_4 n > 0$$

$$\Rightarrow 4 < \log_2 n \text{ and } 3 > \log_4 n$$

$$\Rightarrow n > 2^4 = 16 \text{ and } n < 4^3 = 64$$

$$\Rightarrow 16 < n < 64$$

Hence, the number of integral solutions for  $n = 47$

**QNo:- 66 ,Correct Answer:- B**

**Explanation:-** Given,  $a + 2b = 6$  where  $a$  and  $b$  are non-negative real numbers

The maximum value of  $a + b = 6$  when  $a = 6$  and  $b = 0$

And the minimum value of  $a + b = 3$  when  $a = 0$  and  $b = 3$

Hence, the required average =  $(6 + 3)/2 = 4.5$