VARC

Solution 1

The second choice can be seen in the last sentence of the second last paragraph: "the elephants of Decimated herds, especially orphans who've watched the death of their parents and elders from poaching and culling, exhibit behavior typically associated with…. Humans…"
Again, the evidence for choice 2 can been found in the second last paragraph; anthropocentric means concerning humans or brought by/caused by humans. Thus both options 2 and 3 can be safely eliminated. The clue to the choice 4 can be found in the third paragraph, which says that elephants are profoundly social creatures. For option1 we have no evidence.

Solution 2

This question is just another way of asking the central idea of the question. Here we have been asked to express the overall argument of the passage. Though option 4 is visible in the paragraph, it is not the central idea. The central idea seems to be Focusing on the change in the elephants' attitude towards humans. Option 1 captures the key argument of the passage.

Like option 4, option 2, though true as per the passage, is not the key focus of the passage. Option 3 might look like a good choice, but there is a flaw in the option. The passage is not Focusing on the relationship between elephants and humans, though the passage starts on that Note. The author is more focused on bringing to our attention the aggressive behavior of Elephants and tries to find out the causes of that aggression. Option 1 is the best choice because bulk of the passage is dedicated to how and why the elephants behave aggressively (species-wide-trauma-related response)

Solution 3

To answer this question, we must first carefully read the question. The question wants us to address the problem of aggression in elephants, suggesting that we must pick the option that brings a solution to the problem of elephant aggression.

Option 1 goes out because the testosterone issue is not at all a concern or the bone of contention. Moreover, by understanding it, how would we be able to address the problem concerning Elephant aggression. Option 2 could indeed help us address the problem of elephant aggression because the trauma. Experienced by elephants is very similar to stress disorder in humans, and because elephants are social creatures just as humans are, insights gained from treating post-traumatic stress disorder in humans might help us address the problem of elephant aggression. Option 2 is the right choice

Both option 3 and 4 are not likely to contribute in any ways to addressing the problem of elephant aggression. If yes, then there must a strong evidence for that in the passage, but we have no such evidence.

Solution 4

The fabric has been frayed is a figurative expression in which the elephant society has been compared to a fabric that humans have frayed. Choice 2, by stating that it is a metaphor, properly captures the essence of the statement. Option 1 is incorrect because the statement is not a description but an assertion of a condition that exists today. Both option 3 and 4 are not in tune with the author's purpose. The author is not exaggerating the disintegration of elephant society. He is, in fact, being quite sympathetic.

Option 4 suggests that the society has become frail on its own, without any external cause. But Human activity is the cause and that has frayed the fabric. Thus, option 4 too is not correctly expressing the idea given in the question.

Solution 5

The hint to the right answer is there in the first para. The author says that there is intentionality associated with the word 'violence', suggesting that there is a reason behind human and elephant aggression towards each other. Option 1 is thus the right choice.

Option 2 says 'systematically destroyed'. There is no evidence of 'systematic destruction' of elephant herds by humans. It is an extreme choice. Option 3 is true as per the passage, but that is not the reason behind the author's using the term 'violence' to describe the recent change in the human-elephant relationship. Option 4 is incorrect but the author is focusing on elephants' aggression towards humans, something that should not be necessarily interpreted as 'killing'

Solution 6

The clue to the right answer is given in the last sentence of the first para and first sentence of the second para. The last sentence of the first para says "the lie is that blame for the plastic problem is wasteful consumers and that changing our individual habits will fix it." The author suggests that changing consumer habits may not be a solution to the problem. He further adds in the second para "Recycling plastic is to saving the Earth what hammering a nail is to halting a falling skyscraper". He suggests that neither recycling nor change in consumer behavior is going to solve the problem. The right answer is 3

Solution 7

The answer to this question can be directly found in the passage. The author has used the word 'lie' in the first para. He says "The lie is that blame for the plastic problem is wasteful consumers and that changing our individual habits will fix it". The first part gives us the answer: the lie is the blame for the plastic problem is consumers. Thus, option 1 is the right choice. Since, the answer is directly stated and we have got the right choice, there is no point in disproving the

others.

Solution 8

This is one of the simplest questions in this paper. You have to search the options and you will find the right answer. Except for the air pollution effect, everything is given in the passage. Thus option 2 is the right choice.

Solution 9

The clue to the right answer can be found in the last sentence of the paragraph. Right from the start the author says that there is no point in blaming consumers and in recycling plastics. The problem is likely to persist until we change the legal framework. The last part of the para says "Our huge problem with plastic is the result of a permissive legal framework that has allowed the uncontrolled rise of plastic pollution, despite clear evidence of the harm it causes to local communities and the world's oceans." If we pass regulations targeted at producers of plastics, we might be able to change the situation.

Thus option 4 is the right choice.

Solution 10

The authors opinion about Keep America Beautiful can be found in the following lines in thesecond last paragraph of the passage: This clever misdirection has led journalist and author Heather Rogers to describe Keep America Beautiful as the first corporate greenwashing front, as it has helped shift the public focus to consumer recycling behavior and actively thwarted legislation…. From this sentence we can infer that the author believes that Keep America Beautiful diverted people's attention away from the role of corporates in plastic pollution.

Solution 11

This is a very good question. We must touch the right area of the passage to arrive at the answer. The clue to the answer lies in the last paragraph, which says "Since the 1970s, depression has come to be viewed as a cognitive or neurological defect in the individual, and never a consequence of circumstances. All of this simply escalates the sense of responsibility each of us feels for our own feelings, and with it, the sense of failure when things go badly."
The author suggests that before 1970 people thought that depression was a result of one's circumstances. Option b is incorrect, as it speaks about how depression could be cured, while the passage has nothing about it.
As the second part of the extract suggests, people, after 1970, became more responsible towards their happiness, as it became clear that depression was not a result of circumstances but of neurological or cognitive defects.
Option 1 is the best choice.

Solution 12

This is a slightly tricky question. To answer this question correctly, we have to correctly identify the author's argument or view. The author's views can be found in many parts of the passage. The author's views are clearly expressed in the second paragraph:
As the science grows more sophisticated and technologies become more intimate with our thoughts and bodies, a clear trend is emerging. Where happiness indicators were once used as a basis to reform society, challenging the obsession with money that G.D.P. measurement entrenches, they are increasingly used as a basis to transform or discipline individuals.
The author in the last sentence says that happiness indicators are used as a basis to transform or discipline individuals. Option 4 clearly weakens the author's argument by saying that stakeholders are moving away from collecting data on the well-being of individuals. Thus, option 4 is undermining or weakening the author's argument
All the other three choices are supportive of the author's views given in the paragraph.

Solution 13

Option 1 is clearly stated in the second paragraph of the passage. The second para says:
cities such as Dubai, which has pledged to become the "happiest city in the world," dream up ever-more elaborate and intrusive ways of collecting data on well-being — to the point where there is now talk of using CCTV cameras to monitor facial expressions in public spaces…
Thus, option 1 is the right choice. There is no evidence for option 2 and 3, while option 4 says that it is on its way to becoming one of the world's happiest cities. However, the passage says that Dubai wants to become. It doesn't mean that it is likely to become the happiest city in the World.

Solution 14

The clue to the right answer is in the first paragraph; towards the end the author says that Wearable devices are helping us to reduce stress. In other words, they are disciplining individuals to be happy. Option 3 is not so good a choice because though it is trying to make us happy, it does not say that it will entirely overcome depression in individuals. Option 3 is too extreme an interpretation of what is given in the passage.

Solution 15

The clue to the right answer is given in the very first sentence of the passage. The author right at the start says that economists have ignored psychology. From this we can infer that he would like economists to incorporate psychological findings in their research work. Option 3 becomes the right choice.

Solution 16

This is a very easy question and right at the start of the passage the clue to the right answer can

be found. The passage says "a mouse should not be born with something that its parents have learned during their lifetime". Thus the author suggests that they should not have been born with Acquired characteristics during their lifetime. We should not be tempted with option 4 because Though it looks good, it is not the right choice. Fear is just one characteristics that is likely to be inherited, while the passage points at a broader conclusion that can be derived from this experiment. So the inheritance may not necessarily be of fears, but of anything that the parents might have acquired in their lifetime.

Solution 17

The hint to the right answer can be found in the second paragraph of the passage. The second para says: The traditional, and still dominant, view is that adaptations – from the human brain to the peacock's tail – are fully and satisfactorily explained by natural selection (and subsequent inheritance). Yet [new evidence] from genomics, epigenetics and developmental biology indicates] that evolution is more complex than we once assumed. .
Thus 1 is the best choice, as the author attributes inheritance to much more than natural selection and mendelian gentics. The other negative opinions expressed in the other options cannot be seen anywhere in the passage.

Solution 18

To answer this question correctly, we have to understand the main message of the passage. The main idea is that there is a lot more to inheritance than just natural selection and genetics. So if there is a study that affirms the sole influence of natural selection and inheritance on evolution than the author's main argument would be weakened. We can see clear evidence in these lines: All these tugs represent the influence of developmental factors, including epigenetics, antibodies and hormones passed on by parents, as well as the ecological legacies and culture they bequeath.

Solution 19

This too is an easy question, the clue to the right answer can be seen here in these lines: We can see clear evidence in these lines: All these tugs represent the influence of developmental factors, including epigenetics, antibodies and hormones passed on by parents, as well as the ecological legacies and culture they bequeath.

Solution 20

The clue to the right answer is there right in the first paragraph. The author says: Between the old imperialist memorial and the proposed nationalist one, India's contribution to the Second World war is airbrushed out of existence. The phrase 'airbrushed out of existence' has that regret in the tone. Thus 1 is the right choice.

Solution 21

Passage Overview: In the passage the author seems to be stressing on "India's contribution to the Second world war, and its consequences, something which has been ignored both by academicians and

the Indian government" This question is a kind of interpretation question. If we don't know the meaning of the phrase 'mood music', we must try to the see the context in which it has been used. By the way, 'mood Music' is recorded music that is played in the background to make the audience relax. So if you know the meaning, you can straightaway mark 3 as the answer. A backdrop is a background just as mood music is played in the background. Even from the passage it is clear that to the Indian government and Indian academicians, India's contribution to the second world war is just a little ore than a mood music, in other words it is not a significant contribution, something that the

Author seems to be lamenting. Option 3 is the right choice.

Solution 23: This is a very easy question, as the clue to the right answer is directly visible in the passage. The first sentence of the second paragraph says that the 'omission was not absent-minded, suggesting that it was deliberate. He further adds that the omission "accurately reflected the fact that both academic history and popular memory have yet to come to terms with India's Second World War". The other choices are neither stated nor implied in the paragraph.

Solution 24 This is a slightly difficult question, but can be solved by the process of elimination. Though the passage nowhere directly states the reason why India has not so far acknowledged its role in the Second World War, the hint is there in the second paragraph. The last sentence of the second paragraph says: With partition and the onset of the India-Pakistan rivalry, both of the new nations needed fresh stories for self-legitimization rather than focusing on shared wartime experiences. "Self-legitimization" would mean self-assertion, or establishing oneself as a strong legal entity. This makes option 3 the right choice. Moreover, none of the other options have any hint in the paragraph. Option 1 and 4 go out because the author asserts that India did make a significant contribution to the war. Option might seem a tempting choice, but there is no hint for it.

Solution 25 This is an average difficulty question. Right from the start we can sense that sentence 1 is likely to start the paragraph. It introduces the idea of 'impartiality and objectivity'. Sentences 2,3 and 4 form one unit because they all revolve around Twitter. The algorithm that statement 4 talks about must be about algorithm that twitter would be using. The pronoun 'it' in statement 2 refers to Twitter. Thus 2 must come after 3. 32 is a pair. The problem of transparency in statement 2 is further elaborated in statement 4. Statement 2 says that the problem of transparency lies in something…statement 4 takes over by saying ..we are only told some of the basic principles..(the problem of transparency is continued).

Solution 26 This is a dubious question, and deserves a challenge. All the sentences can come together and form a coherent paragraph. 'this factoid' in statement 2 can be found in statement 5. Thus 5 and 2 form a pair. 1 opens the paragraph. Impossibility of translation in 3 and impossibility of bumblebee flight are connected. Thus 1523 form a coherent paragraph. Statement 4 can come in the concluding lines. This question has no odd sentence. The source of the passage can be found here

Solution 27 This is a difficult question as there very little to choose from two sequences 1423 and 1432. Both the sequences are plausible, though 1 and 4 will come before 2 and 3. 'the canopy' in statement 4 refers to the woodland's canopy in statement 1. Thus 1 and 4 form a pair. The hunting process the swifts is described in statement 3, and this hunting is not just confined to woodlands is what statement 2 says. Thus 3 and 2 form a pair. The right sequence is 1432.

Solution 28 This question, though it looks a little challenging, is in fact quite simple. You must read the passage twice to get some basic understanding of it. The first sentence says that scientific knowledge can be approached from a number of perspectives. Studying something from the perspective of a particular profession would lead to institutionalization of that knowledge. Though it helps, it restricts knowledge production to a domain of few, which results in power centered in the hands of few, preventing the non-professional actors from offering their ideas. The above simplification helps us arrive at option 1 as the right choice. Options 3 and 4 are against the author's stand in the passage. Option 2 is not the core message, but an inference that can be derived from the above passage.

Solution 29 This is a slightly tricky question in which we have to pick the options after carefully comparing them with the others. The first sentence says that artificial embryo twinning is low-tech. The second sentence says that it mimics the natural process that creates identical twins. Option 1 very much captures the key ideas. In option 2, the word 'unlike' shows dissimilarity, but the passage focuses on similarity, not dissimilarity. Option 2 goes out. Option 3 says twins are formed during fertilization, but the passage says that the twins are formed after fertilization. Option 4 is close to 1 but does not clearly specify the exact time when the embryo splits into two. Moreover, the passage says mimics, while option 4 says 'close to', which is a slight distortion of the facts as given in the passage.

Solution 30: Both options 2 and 3 are very close. Option a goes out because the paragraph says that landscape became an independent genre of art of form, while the option says it became a major subject of art. This is a distortion of the fact given in the passage. Option 2 too has some distortions; while the passage says that conceptualization of landscape as geometric object is related to the European conceptualization of the organism as a geometric object, the option says that three-dimensional understanding of the organism led to a similar approach…. It should be geometric understanding of the organism. Option 3 best captures the author's position, which in the passage is clearly visible as "Renaissance artists also facilitated an understanding of the structure of landscape". Option 4 is incorrect because it distorts the fact by saying the Renaissance artists were responsible, while the passage says that they facilitated.

Solution 31 There is little doubt that statement 2 will open the paragraph. The sentence says that democracy and high levels of inequality are simple incompatible. Why? Because very rich people will always use money to maintain their political and economic power. Thus 2 and 4 form a pair. Statement 1 says that now apart from the rich people we have another group: the unwitting enablers. What they do is described in sentence 3. Thus 2413 is the right sequence.

Solution 32: This question is of a very high difficulty. It would be difficult for us to arrive at the answer because we don't see any sentence that can start the paragraph. Statement 2 and 5 form a pair and must go together. Statement 2 says people will have to fool themselves and statement 5 says how they should fool themselves. Now we must find two more statements that can go together. Those two are statements 1 and 3. Both 1 and 3 speak of time inconsistency, 1 speaks of time inconsistency in most cases, while 3 speaks of time inconsistency in specific cases. Thus 1325 form a coherent para, there is no place for statement 4, as it does not connect with any other sentence.

Solution 33: Though it would be difficult for us to create a coherent paragraph in this question, we can find the odd one out by looking for the sentence that does not match with any other sentence.

Statement 3 is likely to open the paragraph, 2 will take the idea ahead as it explains to us the cause of that displacement, which in this case is caused by erosion. Statement 4 says that since displacement due to erosion is well spread over a long period of time, it remains invisible. Finally, we have the conclusion in statement 1. Statement 5 does not seem to connect with any of the sentences.

Solution 34 : The clue to the sequence lies in the pronoun 'it', and in the phrase 'had come back', which suggests that it must have gone first, and then it must have come back. The pronoun 'it' refers to a disease, and is most likely to refer to the noun 'skin cancer'. Also, we must look for that sentence in which 'the skin cancer' must have gone back. Sentence 1 has the noun 'skin cancer' and says that the treatment had gone well. This connects sentence 1 with 3. 13 is a pair. Statement 4 is likely to start the paragraph because it opens the idea by suggesting that something had started. So the idea goes like this: it started with a lump and no one knew what it was. Thus, 4 and 2 form a pair. After this must have come the diagnosis. Thus 4213 is the right sequence.

LRDI

It is given that the satellites serving either B, C or S do not serve O. From (1), let the number of satellites serving B, C and S be 2K, K, K respectively.
Let the number of satellites exclusively serving B be x.
From (3), the number of satellites exclusively serving C and exclusively serving S will each be 0.3x
From (4), the number of satellites serving O is same as the number of satellites serving only C and S.
Let that number be y. Since the number of satellites serving C is same as the number of satellites serving S, we can say that (number of satellites serving only B and C) + 0.3x + 100 + y = (number of satellites serving only B and S) + 0.3x + 100 + y
Let the number of satellites serving only B and C = the number of satellites serving only B and S = Z
Therefore, the venn diagram will be as follows
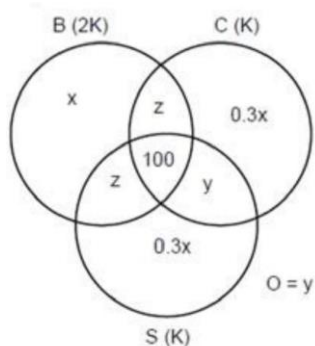
Given that there are a total of 1600 satellites
$$\Rightarrow x + z + 0.3x + z + 100 + y + 0.3x + y = 1600 \quad 1.6x + 2y + 2z = 1500 \text{ --------------- (1)}$$

Also K = 0.3x + z + y +100 Satellites serving B = 2K = x + 2z + 100

$$\Rightarrow 2(0.3x + z + y + 100) = x + 2z + 100 \quad 0.4x = 2y + 100 \quad x = 5y + 250 \text{ -----------(2)}$$

Substituting (2) in (1), we will get

$$1.6 (5y + 250) + 2y + 2z = 1500 \quad 10y + 2z = 1100 \quad Z = 550 - 5y \text{ ------------ (3)}$$

Question 1:

The number of satellites serving C = z + 0.3x + 100 + y
= (550 – 5y) + 0.3(5y + 250) + 100 + y
= 725 – 2.5y
This number will be maximum when y is minimum. Minimum value of y is 0. Therefore, the maximum number of satellites serving C will be 725.

From ③, z = 550 – 5y

Since the number of satellites cannot be negative,

$z \geq 0 \Rightarrow 550 - 5y \geq 0$

$y \leq 110$

Maximum value of y is 110.

When y = 110, the number of satellites serving C will be 725 – 2.5 × 110 = 450.

This will be the minimum number of satellites serving C. The number of satellites serving C must be between 450 and 725.

Question 2: From 2, the number of satellites serving B exclusively is x = 5y + 250 This is minimum when y is minimum. Minimum value of y = 0. The minimum number of satellites serving B exclusively = 5 × 0 + 250 = 250.

Question 3: Given that at least 100 satellites serve 0; we can say in this case that y ≥ 100.

Number of satellites serving s = 0.3x + z +100 + y=725 – 2.5y

This is minimum when y is maximum, i.e. 110, (from③) Minimum number of satellites serving = 725 – 2.5 ×100 = 450.

This is maximum when y is minimum, i.e., 100 in this case.

Maximum number of satellites serving = 725 – 2.5 ×100 = 475

Therefore, the number of satellites serving S is at most 475

Question 4: The number of satellites serving at least two of B, C or S = number of satellites serving exactly two of B, C or S + Number of satellites serving all the three

= z + z + y + 100 = 2(550 – 5y) + y + 100

= 1200 – 9y.

Given that this is equal to 1200 1200 – 9y = 1200

=> y = 0 If y = 0, x = 5y + 250

= 250 z = 550 – 5y

= 550

No. of satellites serving

C = k = z + 0.3x + 100 + y

= 550 + 0.3 × 250 + 100 + y

= 725

No. of satellites serving

B = 2k = 2 × 725 = 1450.

From the given options, we can say that the option "the number of satellites serving C cannot be uniquely determined" must be FALSE

Solution

It is given that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression.

So 40 + (40 + x) + (40 + 2x) = 150

Or x = 10
April 2016 = 40
May 2016 = 50
June 2016 = 60
Also, the same case holds for October, November, December of 2016.

100 + (100 + x) + (100 + 2x) = 360
Or x = 20

October 2016 = 100

November 2016 = 120

December 2016 = 140

	2016			2017	
Quarter	Month	Sales Figures	Quarter	Month	Sales Figures
Q₁ (240)	January	80	Q₁ (380)	January	120
	February	60		February	100
	March	100		March	160
Q₂ (150)	April	40	Q₂ (200)	April	60
	May	50		May	75
	June	60		June	65
Q₃ (250)	July	75	Q₃ (220)	July	60
	August	120		August	90
	September	55		September	70
Q₄ (360)	October	100	Q₄ (500)	October	150
	November	120		November	170
	December	140		December	180

Sales in December 2017 = 180
Sales in December 2016 = 140
Percentage increase $= \frac{40}{100} \times 100 = 28.57\%$

	2017	2016	Percentage increase
Q₁	380	240	$\frac{140}{240} \times 100 = 58.33$
Q₂	200	150	$\frac{50}{150} \times 100 = 33.33$
Q₃	220	250	$\frac{-30}{250} \times 100 = -12$
Q₄	500	360	$\frac{140}{560} \times 100 = 38.88$

So the percentage increase in the sales is highest for Q1

$\rightarrow Q_1$ of 2017 compared with Q_4 of 2016

$$= \frac{380 - 360}{360} \times 100 = 5.55\% \text{ increase.}$$

$\rightarrow Q_2$ of 2016 compared with Q_1 of 2016

$$= \frac{150 - 240}{240} \times 100 = -37.5\% \text{ increase or } 37.5\% \text{ decrease}$$

$\rightarrow Q_4$ of 2017 with compared with Q_3 of 2017

There is an increase from 220 to 500 .

$\rightarrow Q_2$ of 2017 with compared with Q_1 of 2017

$$= \frac{200 - 380}{380} \times 100 = -47.36 \text{ or } 47.36\% \text{ decrease}$$

The ATM dispenses only 500, 200 and 100 notes and since 500 rupee notes is the preference, it has to dispense more 500 rupee notes than the other two notes combined.

The following ways are possible: Hence, a total of seven ways are possible.
Ans : 7

Question 2: To serve the maximum number of customers with 500 rupee notes as preference, we need to minimize the number of 500 rupee notes that can be served to any person. From the above solution, the minimum number of 500 rupee notes that the ATM can dispense to any person with 500 rupee notes as his/her preference is 8. Hence, with fifty 500 rupee notes, a total of 6 persons can be served.
Ans : 6

Question 3: Since there are a limited number of 500 rupee notes, we can minimize the number of 500 rupee notes dispensed to each customer, while ensuring that each customer is served at most 20 notes. If no 500 rupee notes is dispensed, the minimum number of notes that must be dispensed is 25 (all 200

rupee notes). This is not possible. If one 500 rupee note is dispensed, the minimum number of notes is 14 (one 500 rupee note, twelve 200 rupee notes and one 100 rupee note). This is also not possible. If two 500 rupee notes are dispensed, the minimum number of notes is 22 (two 500 rupee notes and twenty 200 rupee notes). If three 500 rupee notes are dispensed, the minimum number of notes is 21 (three 500 rupee notes, seventeen 200 rupee notes and one 100 rupee note). If four 500 rupee notes are dispensed, the minimum number of notes is 19 (four 500 rupee notes and fifteen 200 rupee notes). Hence, the minimum number of 500 rupee notes that can be dispensed to any person is 4. With fifty 500 rupee notes, a maximum of 12 persons can be served.
Ans : 12

Question 4: To dispense the smallest possible number of notes to a person with 500 rupee notes as his/her preference, the ATM should dispense all 500 rupee notes. Hence, minimum number of notes required to serve any person with 500 rupee notes as his/her preference = 10 (all of 500 rupees). Total number of 500 rupee notes required to serve 50 customers with 500 rupee notes as his/her preference = 10 × 50 = 500 To minimize the number of notes to be served to a person with 100 rupee notes as his/her preference, we can maximize the number of 500 rupee notes served to him, keeping the 100 rupee notes more than the sum of the other two denominations. This is possible if the machine serves eight 500 rupee notes and ten 100 rupee notes. Hence, the total number of 500 rupee notes required to serve 50 customers with 100 rupee notes as his/her preference = 8 × 50 = 400 Total number of 500 rupee notes required in the given scenario = 500 + 400 = 900 Ans : 900

Note: Given that the ATM dispenses 500, 200 and 100 rupee notes. A possible interpretation of this is that at least one note of each denomination is dispensed. However, as there is no additional information supporting this, you should also consider the cases in which not all the three denominations are dispensed.

Name	Gender	Institute	Major	Minor
Adriana	F	P		F
Bandita	F	Z		F
Chitra	F	Z		F
Daisy	F	q		O
Amit	M	q		
Barun	M	Y	O	F
Chetan	M	X	F	
Deb	M			

Daisy minors in operations (O) so other three must have minored in Finance (F). Let Adriana and Ded be from the some institute P. Daisy and Amit are from some institute q. So Bandita and Chitra must be from z as only two females are from z. Female student from y majors in operations so daisy cannot be from Y so daisy is from X so is Amit. So Adriana and Deb are form Y

	Gender	Institute	Major	Minor
Adriana	F	Y	O	M
Bandita	F	Z	F/O	M
Chitra	F	Z	F/O	M
Daisy	F	X	F/M	O
Amit	M	X	F	O/M
Barun	M	Y	O	F
Chetan	M	X	F	O/M
Deb	M	Y	M	F

Question 1: Chitra and Bandita. Ans : Chitra and Bandita

Question 2: Deb minors in Finance. Ans : Finance

Question 3: Amit majors in finance. Ans : Finance

Question 4: Given one female student majors in finance.

If chitra majors in finance, Bandita majors in operations.
Ans : Operations

Solution: Given that n × n square matrix to be filled with numerals so that no two adjacent cells have the same numeral.
Also, two cells are called adjacent if they touch each other horizontally, vertically or diagonally. As per the given definition, in the following matrix, the following are the cases of adjacent cells.

A_1	A_2	

(or)

A_1		
A_2		

(or)

A_1		
	A_2	
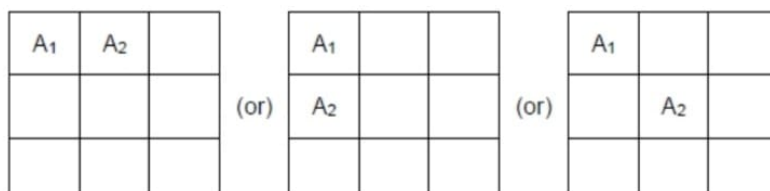
Question1: As per the information, we've the following diagram for a 3 x 3 matrix to have minimum number of numerals. So, we require 4 elements to have all different numerals. Ans : 4

1	2	1
3	4	3
1	2	1

Question 2: As per the information, we've the following diagram for a 5 x 5 matrix to have minimum number of numerals.

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

 So, we require 4 elements to have all different numerals. Ans : 4

Question 3: Even if one mistake is allowed, then also there won't be any change in the solution given above. Ans : 4

Question 4: Given that all the cells adjacent to any particular cell must have different numerals, which is satisfied only when there are at least 9 numerals.
Ans : 9

Solution:
 According to 1 and 2, we get Also, from 4, we get 2 cases:
From (5)
If total number of low (L) pipes = 3 of high (H) pipes = 6
number of medium (M) pipes = 11
Also if number of low (L) pipes = 4 number of high (H) pipes = 8
number of medium (M) pipes = 8 P7 and P8 can be HH or MM

Therefore, two cases arise for P1 – P10

1	2	3	4	5	6	7	8	9	10
H	M	H	M	H	L	M	M	H	M
H	M	H	M	H	L	H	H	M	H

Combining (1) & (2), we get the following possible cases for P1 – P 20

Case 1:
H M H M H L H H M H M H M H M L M L M L No. (L) = 4 No. (H) = 8 No. (M) = 8
Case 2: H M H M H L H H M H
        L M H M H M L M L M No.
(L) = 4, No. (H) = 8, and No. (M) = 8

Case 3: H M H M H L H H M H
        M L H M H M L M L M
No. (L) = 4 No. (H) = 8 No. (M) = 8

Solution:

Given, Indu was recruited and Indu scored 100% in exactly one section.
Jatin scored 100% in exactly one section
=> Jatin's scored are

DI	WE	GA
20	16	14

Composite score = 20 x + 2 + 16 + 14 = 70
Indu's score is 70 – 10 =60
If Indu scores 20 in DI,
Indus's score in GA = 60 – 40 – 8 = 12

In this case, Indu will not quality

Hence, Indu scored 20 in GA.
=> Score in DI =$\frac{60-20-8}{2} = \frac{32}{2} = 16$

Danish, Harini and Indu scored 20 in GA
Score of Danish is 2(8) + 15 + 20 = 51
Hence, Score of Ajay is 2(8) + 20 + 16 = 52
(As Ajay scores either 19 or 20 in DI, the composite score cannot be 51)

	DI	WE	GA	TOTAL
A	8	20	16	52
B		9	11	
C	19	4	12	54
D	8	15	20	51
E	12	18	16`	58
F	15	7	10	47
G	14	>14	6	
H	5		20	
I	16	8	20	60
J	20	16	14	70

Question 1: (Jatin's composite score was more than that of Danish) and (Indu scored less than Chetan in DI).
Ans : Both 1 and 2

Question 2: If Bala scores 20 in DI, Score = 2(20) + 9 + 11 = 60, which is the same as that of Indu.

Not possible Hence, Bala scored same as Jatin in DI must be false.
Ans : Bala scored same as Jatin in DI

Question 3: Ans: 13

Question 4: Ans: 14

Solution:

	Research	Teaching	Administration
BUREAUCRATS	3x	3x	4x
EDUCATIONALIST	m>n	n	0
POLITICIAN	y	y	3y

 Total = 24
Bureaucrats are in the ratio 3 : 3 : 4 only value will be 3, 3, 4.
So x = 1

Educationalist : n<m<o and m= o+n/2

Politicians are in ratio 1 : 1 : 3
only value will be 1, 1, 3.

Possible value of m, n, o are 3, 2, 4 and 3, 1, 5.

	R	T	A	
B	3	3	4	10
E	3	2	4	9
P	1	1	3	5
	7	6	11	24

	R	T	A	
B	3	3	4	10
E	3	1	5	9
P	1	1	3	5
	7	5	12	24

Since x, y ,and z are in G.P. and x<y<z, let x=a, y=ar and z= ar^2 where a>0 and r>1.
It is also given that, 15x, 16y and 12z are in A.P.
Therefore, 2×16y=5x+12z
Substituting the values of x, y and z we get,
32ar= 5a + $12ar^2$

$$=> 32r = 5 + 12ar^2$$
$$=> 12r^2 - 32r + 5 = 0$$

On solving the above quadratic equation we get r=1/6 or 5/2.

Since r>1, therefore r=5/2.

QA

Solution 68: Let the rate of each filling pipes be 'x lts/hr'

similarly, the rate of each draining pipes be 'y lts/hr'.

As per the first condition,
Capacity of tank = (6x - 5y)×6..........(i)

Similarly, from the second condition,
Capacity of tank = (5x - 6y) × 60.....(ii)

On equating (i) and (ii), we get
(6x - 5y) × 6 = (5x - 6y)×60
or,
6x - 5y = 50x - 60y
or,
44x = 55y or, 4x = 5y
or,
x = 1.25y

Therefore, the capacity of the tank = (6x - 5y) × 6 = (7.5y - 5y) × 6 = 15y
Its Effective rate of 2 filling pipes and 1 draining pipe = (2x - y) = (2.5y - y) = 1.5y

Hence, the required time = 15y/1.5y=10 hours.

Solution 69

x ^{2016} y ^{2017} = ½ ..(1)
and
x ^{2016} y^{2019}= 8 .....(2)

Dividing (1) by (2),

$$\frac{x^2}{y^2} = \frac{1}{16}$$
$$\frac{x}{y} = \frac{1}{4} \ i.e. \ x = \pm\frac{1}{4}y$$
$$and \ x^{2016}y^{2019} = 8 \ \ldots\ldots. (2)$$
$$Dividing \ (1) by \ (2) \frac{x^2}{y^2} = \frac{1}{16} \ \frac{x}{y} = \frac{1}{4}$$

$$i.e. \ x = \pm\frac{1}{4}y \ \left(\pm\frac{1}{4}y\right)^{2018} y^{2017} = \frac{1}{2}$$
$$y^{4035} = 2^{4035}$$
$$y = 2$$

$$Therefore, x = \pm\frac{1}{4}y \quad \left(\pm\frac{1}{4}y\right)^{2018}$$
$$y^{2017} = \frac{1}{2}$$
$$y^{4035} = 2^{4035}$$
$$y = 2$$
$$Therefore, x = \pm\frac{1}{4} \ y = \pm\frac{1}{2}$$
$$Hence, x^2 + y^3 = \frac{1}{4} + 8 = \frac{33}{4}$$

Solution 70

Let the time taken for car 1 to reach P from A be x hours.
Speed of car 1=AP/x
Given BP=3AP
Car 2 starts from B to A and reaches P one hour after car 1 reaches P.

Speed of car 2= $\frac{3AP}{X+1}$

Therefore, $\frac{3AP}{X+1} = \frac{1}{2}\left(\frac{AP}{X}\right) OR \ X = \frac{1}{5}$

Time taken for car 1 to reach P from A is 12 min.

Solution 71: 5+ log $_3$a= 2^3 =8 =>a= 27

Similarly, 4a+12+ log $_2$ b= 125

Since,a=27, 4(27) + 12+ log $_2$ b= 125=> b= 32

Solution 72

Let the quantities of the paints A and B in the mixture sold be a litres and b litres respectively.
Value at which the entire mixture is sold=264
Profit percent made=10%

Value at which the entire mixture is bought = $264 \times \frac{100}{110} = 240$

Price at which the entire mixture is bought=24 per litre
Let the cost of B be x per litre.
Cost of A=(x+8)per litre

$\frac{(x+8)a+xb}{10} = 24$

Maximum cost of B will occur when a is minimum. b<=a.

So, minimum a is 5. Corresponding b is 5.

Then (x+8)(5)+x(5)=240 x=20

Solution 73

Let the 6 cm long chord be x cm away from the centre of the circle. Let the radius of the circle be r cm. The perpendiculars from the centre of the circle to the chords bisect the chords.
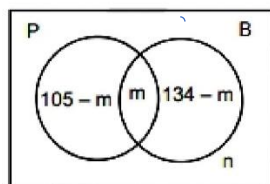$r^2 = x^2 + 3^2 = (x+1)^2 + 2^2$
Solving, $x = 2$ and $r = \sqrt{13}$

Solution 74: Let the number of students who like both pizza and burger be 'm' .
The number of students who like neither of them be n

From venn diagram 105 – m + m + 134 – m + n = 200 m – n = 39

∴ The possible values of (m, n) are (39, 0) (40, 1)……..(105, 66)
∴ The number of students who like only burger is lies in the range [134 – 105, 134 – 39] = [29, 95]
∴ From options, 93 is a possible answer

Solution 75: Let the average age of people aged 51 years and above be x years.
Let the average age of people aged below 51 years be y years.
Let the number of people aged below 51 years be N.
Given, the average age of all the people in the apartment complex is 38 years.
Therefore, $\frac{x \times 30 + y \times N}{30 + N} = 38$ …….(1)
We want to maximize y, which occurs when x is minimum i.e. for x=51.
Substituting the value of x in (1) we get, 390 =N×(38-y)
Again, when y is maximum, N is also maximum i.e. 39
Therefore, maximum value of y = 28.

Solution 76: Any equilateral triangle formed by joining the midpoints of the sides of another equilateral triangle will have its side equal to half the side of the second equilateral triangle.
Side of T1 = 24 cm Side of T2 = 12 cm Side of T3 = 6 cm and so on.

Sum of the areas of all the triangles = $\frac{\sqrt{3}}{4}(24^2 + 12^2 + 6^2 + \cdots) = \frac{\sqrt{3}}{4}\left(\frac{576}{1-\frac{1}{4}}\right) + 192\sqrt{3}$

Solution 77

$u^2 + (u - 2v - 1)^2 = -4v(u+v)$

$\Rightarrow u^2 + u^2 + 4v^2 + 1 - 4uv + 4v - 2u + 4vu + 4v^2 = 0$

$\Rightarrow 2u^2 - 2u + 8v^2 + 4v + 1 = 0$

$\Rightarrow 2\left(u^2 - u + \frac{1}{4}\right) + 2\left(4v^2 + 2v + \frac{1}{4}\right) = 0$

$\Rightarrow 2\left(u - \frac{1}{2}\right)^2 + 2\left(2v + \frac{1}{2}\right)^2 = 0$

$\Rightarrow u - \frac{1}{2} = 0; 2v + \frac{1}{2} = 0$

$u = \frac{1}{2}$ and $v = -\frac{1}{4}$

$u + 3v = \frac{1}{2} - \frac{3}{4} = -\frac{1}{4}$

Solution 78

Givne that: $2^x = 3^{\log_5 2}$

$\Rightarrow 2^x = 2^{\log_5 3}$

$\Rightarrow x = \log_5 3$

$\Rightarrow x = \log_5 \frac{3*5}{5}$

$\Rightarrow x = \log_5 5 + \log_5 \frac{3}{5}$

$\Rightarrow x = 1 + \log_5 \frac{3}{5}.$

Solution 79

Let the other two numbers be y and z.

As per the condition

73yz - 37yz = 720

Or 36yz=720

Or yz=20

Minimum possible sum of the squares of the other two numbers would occur when y = z i.e. y z = = 20
Hence the required sum = 40.

Solution 80:
Let the area of ABCD be 100. Side of ABCD = 10
Area of EFGH is 62.5 => Side of EFGH = √62.5
Triangles AEH, BFE, CGF and DHG are congruent by ASA.
Let AE = BF = CG = DH = x; EB = FC = DG = AH = 10 -xx
AE^2 + AH^2= EH^2
X^2+ (10-X)^2= (√62.5) ^{2}
, x = 2.5 or 7.5
Since it's given that CG is longer than EB, CG = 7.5 and EB = 2.5.
Therefore, EB : CG = 1 : 3

Solution 81: We are given that diameter of base = 8 ft. Therefore, the radius of circular base = 8/2 = 4 ft

In triangle OAB and OCD

$\frac{OA}{AB} = \frac{OC}{CD} \Rightarrow AB = 3 \times \frac{4}{12} = 1\,ft.$

Therefore, the volume of remaining part = Volume of entire cone - Volume of smaller cone

$\Rightarrow \frac{1}{3} \times \pi \times 4^2 \times 12 - \frac{1}{3} \times \pi \times 1 \times 3$

$\Rightarrow \frac{1}{3} \times \pi \times 189 \Rightarrow \frac{22}{7 \times 3} \times 189 \Rightarrow 198$ cubic ft

Solution 82

$\log_{12} 81 = p \Rightarrow \log_{12} 3^4 = p$

$\Rightarrow 4\log_{12} 3 = p$

$\Rightarrow \frac{p}{4} = \log_{12} 3$

$3\left(\dfrac{4-p}{4+p}\right) = 3\left(\dfrac{1-\dfrac{p}{4}}{1+\dfrac{p}{4}}\right)$

$= 3\left(\dfrac{1-\log_{12} 3}{1+\log_{12} 3}\right)$

$= 3\left(\dfrac{\log_{12} 12 - \log_{12} 3}{\log_{12} 12 + \log_{12} 3}\right)$

$= 3\left(\dfrac{\log(12/3)}{\log(12/3)}\right)$

$= 3\dfrac{\log 4}{\log 36} = 3\log_{36} 4$

$= \log_6 8$

Solution 83: Train T starts at 3 PM and train S starts at 4 PM.
Let the speed of train T be t.
=> Speed of train S = 0.75t.
When the trains meet, train t would have traveled for one more hour than train S.
Let us assume that the 2 trains meet x hours after 3 PM. Trains S would have traveled for x-1 hours.
Distance traveled by train T = xt

Distance traveled by train S = (x-1)*0.75t = 0.75xt-0.75t
We know that train T has traveled three fifths of the distance.
Therefore, train S should have traveled two-fifths the distance between the 2 cities.
=> (xt)/(0.75xt-0.75t) = 3/2 2xt = 2.25xt-2.25t 0.25x = 2.25 x = 9 hours.
Train T takes 9 hours to cover three-fifths the distance. Therefore, to cover the entire distance, train T
will take 9*(5/3) = 15 hours.
Therefore, 15 is the correct answer.

Solution 84: Let the number of students who studying only H be h, only E be e, only H and P but not E be
x, only E and P but not H be y

Given only P = 0 All three = 10; Studying only H and E but not P = 20
Given
number of students studying H = Number of students studying E = h + x + 20 + 10 = e + y + 20 + 10 h + x =
e + y
total number of students = 74
Therefore, h + x + 20 + 10 + e + y = 74 h + x + e + y = 44 h + x + h + x = 44 h + x = 22
Therefore, the number of students studying H = h + x + 20 + 10 = 22 + 20 + 10 = 52.

Solution 85: Let the cost price of peanuts for the wholesaler be x per kg.
Cost price of walnuts for the wholesaler is 3x per kg. The wholesaler sold 8 kg of peanuts at 10% profit
and 16 kg of walnuts at 20% profit to a shopkeeper.

Total cost price to the shopkeeper = (8)(x)(1.1) + 16(3x)(1.2) = 66.4x

The shopkeeper lost 5 kg walnuts and 3 kg peanuts.
The shopkeeper sold the mixture of 11 kg walnuts and 5 kg peanuts.
His total selling price=166(16) = 2656
His total cost price $2656\left(\frac{100}{125}\right) = 2124.8 => 66.4X = 2124.8$
X= 32
Price at which the wholesaler bought walnuts = 3x = 96/- per kg

Solution 86 Let the average score of the aspirant in all the tests be x. Let the number of tests be n. The
aspirant's average score for the first 10 tests and last 10 tests are 20 and 30 respectively.
$$\frac{nx - 200}{n - 10} = x + 1 \ and \ \frac{nx - 300}{n - 10} = x - 1$$
Solving, we get n=60

Solution 87:
Let the number of marbles with Raju and Lalitha initially be 4x and 9x. Let the number of marbles that
Lalitha gave to Raju be y.
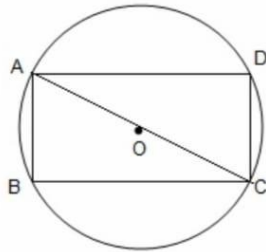It has been given that (4x+y)/(9x-y) = 5/6

24x + 6y = 45x − 5y

11y = 21x

y/x = 21/11

Fraction of original marbles given to Raju by Lalitha = y/9x (As Lalitha had 9x marbles initially).

y/9x = 21/99 = 7/33.

Solution 88

We know that AC is the diameter and $\angle$ ABC = 90°. AC = 2*13 = 26 cm

In right angle triangle ABC,

$$AC^2 = AB^2 + BC^2$$

$$\Rightarrow AB^2 + BC^2 = 26^2$$

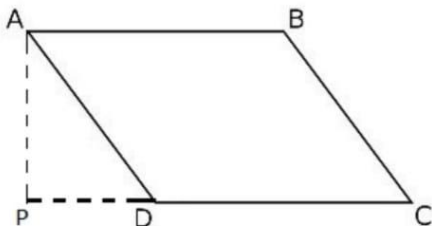$$\Rightarrow AB^2 + BC^2 = 676$$

Let us check with the options.

Option (A): $24^2 + 10^2 = 676$.

Option (B): $25^2 + 9^2 = 706 \neq 676$.

Option (C): $25^2 + 10^2 = 725 \neq 676$.

Option (D): $24^2 + 12^2 = 720 \neq 676$.

Solution 89

Area of the parallelogram ABCD = (base)(height) = (CD)(AP) = 72 sq.cm.

(CD)(AP) = 72 9(AP) = 72 => AP = 8

$$DP = \sqrt{AD^2 - AP^2} = \sqrt{16^2 - 8^2} = 8\sqrt{3}$$
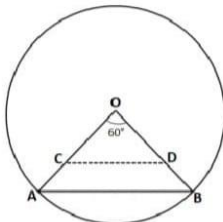
Area of triangle $APD = \frac{1}{2}(AP)(PD) = 32\sqrt{3}$

Solution 90

It is given that radius of the circle = 1 cm

Chord AB subtends an angle of 60° on the centre of the given circle. R be the region bounded the radii OA, OB and the arc AB.

Therefore, $R = \dfrac{60°}{360°} \times \text{Area of the circle} = \dfrac{1}{6} \times \pi \times (1)^2 = \dfrac{\pi}{6}$ sq. cm

It is given that OC = OD and area of triangle OCD is half that of R. Let OC = OD = x.

Area of triangle COD $= \dfrac{1}{2} \times OC \times OD \times \sin 60°$

$\dfrac{\pi}{6 \times 2} = \dfrac{1}{2} \times x \times x \times \dfrac{\sqrt{3}}{2}$

$\Rightarrow x^2 = \dfrac{\pi}{3\sqrt{3}}$

$\Rightarrow x = \left(\dfrac{\pi}{3\sqrt{3}}\right)^{\frac{1}{2}}$ cm.

Solution 91

As the digits appear in ascending order in the numbers, number of ways of forming a n-digit number using the 9 digits $= {}^9C_n$

Number of possible two-digit numbers which can be formed =

$${}^9C_2 + {}^9C_3 + {}^9C_4 + {}^9C_5 + {}^9C_6 + {}^9C_7 + {}^9C_8 + {}^9C_9$$

$$= 2^9 - (9C_1 + {}^9C_1)$$

$$= 512 - (1+9) = 502$$

Solution 92

$0.25 \leq 2^x \leq 200$

Possible values of x satisfying the above inequality are –2, –1, 0, 1, 2, 3, 4, 5, 6, 7.

When x = 0, 1, 2, 4 and 6, $2^x + 2$ is divisible by 3 or 4.

The number of values of x is 5

Solution 93

f(x+2) = f(x) + f(x+1)

f(11) = 91

Let f(12) = a

f(13) = 91 + a

f(14) = 91 + 2a

f(15) = 182 + 3a.

This is also equal to 617.

182 + 3a = 617 => a = 145

f(10) = f(12) - f(11) = 145 - 91 = 54

Solution 94

A got 36 marks but falls short of pass marks by 68%.

Maximum possible score is N.

Pass mark is 45% of N. 32% of 45% of N = 36 => N = 250

Solution 95: The selling price of the mixture is Rs.40/kg.
Let a be the quantity of tea A in the mixture and b be the quantity of tea B in the mixture.
It has been given that the profit is 10% if the 2 varieties are mixed in the ratio 3:2
Let the cost price of the mixture be x.
It has been given that 1.1x = 40

Solution 96

Let each instalment be ₹x. Equating the present value of both the instalments to the money

borrowed,

$$\frac{x}{1.1} + \frac{x}{1.1^2} = 210000$$

x=121000

Solution 97

$f(x) = \min\left(2x^2, 52-5x\right)$

The maximum possible value of this function will be attained when $2x^2 = 52-5x$.

$2x^2 + 5x - 52 = 0$

$(2x+13)(x-4) = 0$

$\Rightarrow x = \dfrac{-13}{2}$ or $x = 4$

Since x has to be positive integer, we can discard the case $x = \dfrac{-13}{2}$.

$x = 4$ is the point at which the function attains the maximum value.

putting $x = 4$ in the original function, we get, $2x^2 = 2*4^2 = 32$.

Or the maximum value of f(x) = 32

Solution 98

Let the time taken by Partha to cover 60 km be x hours.

As per the condition, Narayan will cover 60 km in x-4 hours.

Therefore, Speed of Partha = 60/x
And Speed of Narayan = 60/(x−4)

It is also given that Partha reaches the mid-point of A and B two hours before Narayan reaches B. Hence,

$\Rightarrow \dfrac{30}{\frac{60}{x}} + 2 = \dfrac{60}{\frac{60}{(x-4)}}$

$\dfrac{x}{2} + 2 = x - 4$

$\dfrac{x+4}{2} = x - 4$

$x + 4 = 2x - 8$

$x = 12$

OR Partha will take 12 hours to cross 60 km.

$\Rightarrow$ Speed of Partha = 60/12=5 Kmph.

Solution 99

Let the rates of work of each human and each robot be H and R respectively (both in units/day).

$$15H + 5R = \frac{1}{30} \quad \ldots \ldots (1)$$

$$5H + 15R = \frac{1}{60} \quad \ldots \ldots (2)$$

$$3(1) - (2) => 40H = \frac{1}{12}$$

$$H = \frac{1}{480}$$

In a day, 15 humans can complete 15H i.e. $\frac{1}{32}th$ of the job.

15 humans can complete the job in 32 days

Solution 100

Let the time taken by A to finish the job be "a" days.

Time taken by B to finish the job $= \frac{5}{4}a$ days.

Part of the job completed when A and B worked together for 4 days $= 1 = \frac{1}{2} - \frac{5}{100} = \frac{9}{20}$

$$4\left(\frac{1}{a} + \frac{1}{\frac{5a}{4}} \right) = \frac{9}{20} \Rightarrow a = 16$$

Time taken by B alone to complete the entire job = 5a/4 = 20 days.