Ekoching
Your door to future

CAT_2015

(Memory based)

Verbal

1. According to popular wisdom, language is a cultural artifact or cultural invention or it is part of the leaning process or it is unique to Homo sapiens. But option(4) has been stated as the viewpoint of the cognitive researchers as can be seen in the lines 'Language is a complex specialized.....module'. The author also agrees with the cognitive researchers' view as he confirms to the view that language comes by instinct. He further corroborates this by saying that people know how to talk in the same manner as spiders know how to spin the web.

2. 2 "Spiders know how to spin webs" highlights the inherent qualities of living species. This analogy can be replaced in a similar way by "Bees collecting nectar" which is also a part of their inane trait. Options(1), (3), (4) mention traits which are acquired over a period of time by putting in some kind of effort in order to be adept at them.

3. 2 Refer to the last sentence of the 2nd paragraph of the passage. It states that 'In nature's talent show, we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale'. Hence, communicating with each other through voice modulation is the unique quality of human beings as per the passage.

4. 1 Refer to the 3rd paragraph of the passage where the author says that the researchers believe that the complexity of language is part of our biological birthright. He further illustrates the researchers' point of view that it cannot be taught. The author strengthens this view by quoting Oscar Wilde, making option(1) as the correct answer option. The rest of the options are not mentioned in the passage.

5. 4 Throughout the passage, the author is talking about language as a type of instinct that is existent is human beings and not any specific attribute or skill that is learnt by them over a period of time. In the first paragraph, the author claims 'But I prefer the admittedly quaint term instinct'. Similarly in the last paragraph of the passage, the author concludes by saying that 'Finally, since language is the product of a well engineered biological instinct, we shall see that it is not the nutty barrel of monkeys that entertainer columnists make it out to be'.

6. 2 only option 2 is true. (2) Used as an analogy for healthy human beings.

7. b US was more concerned with 'order' than with reforms of any kind.

8. d Latin Americans regarded it as economic imperialism.

9. a The Act of Bogota was most closely related to the Marshall Plan or Latin America.

10. c US preferred dictatorship to the spread of communism in Latin America.

11. b The President's initiative to present financial economic aid to Latin America has been presented as an example of his efforts to mend his 'Latin Ameriacn fences'. Thus he was not acting to continue to keep communism from intruding the country.
12. a The passage states that speeding up social reforms implied a risk of revolt, which could be avoided by maintaining status quo.

13. b The diverse cultural and socio-economic factors are a major problem affecting the Indian education system. (a) (c) and (d) are not stated in the passage.

14. d 'Grizzled mandarins' refers to bureaucrats. It would be unfair to label the mandarins as (a), (b) or (c).

15. c Those in charge of education are totally out of touch with the ground reality. This point is given in the fourth paragraph. Hence, it will not be necessary to mark (a), (b) or (d) as the answer.

16. a The author advocates decentralizing education planning and implementation to improve the education system. This point is given in the fourth paragraph. Hence, it will not be necessary to mark (b), (c) or (d) as the answer.

17. d None of the given statements can be related to primary education, on the basis of the passage.
18. a The author advocates greater community involvement for successful implementation of education policy. This point is given in the fourth paragraph. We are not sure about others.

19. 4. None of the following options fits to be the main idea of the passage

20. 3 In para number 2 "Each is torn ..." and then further in para 3 "Internal ..." These lines in paras 2 and 3 talk about external conflict being psychologically empty, and no psychological problems involved therein. This makes internal conflicts psychologically interesting.

21. 2 In paragraph 4, refer to line 11, "Chess may be psychologically..... rationally." According to the author, only when someone acts irrationally will that act be considered psychologically interesting and out of the given choices only option (2) qualifies, wherein adopting a defensive strategy against an aggressive opponent will be irrational. Option (3) is incorrect as the choice that the mountaineer would make would depend on external conditions and there would not be any internal conflicts as such, and the decisions that he would need to make would have to be rational.

22. 2 In the first paragraph refer to line 4- "Thus the "interests" of the players are generally in conflict." Choice (3) may also be correct but choice (2) is more appropriate as it is stated directly in the passage whereas choice (3) is an inference. Choice (1) is a consequence of applying game theory to a situation, not one of its pre-requisites, Therefore option 4 is also ruled out.

23. 3 In paragraph 4 lines 3 onwards- "The effort… genuine" According to this, in case of the detective , if the criminal remains passive, there is no conflict, whereas the scientist has to unravel the secrets of nature (which is "passive") by deduction .

24. 1. Its given in the last line of the 3rd paragraph and starting of 4th paragraph. Games like Tic-tactoe is played in a perfectly rational manner is psychologically no more interesting than chess which is played not quite rationally.

25. This question asks you to choose the statement that best describes the Essence or structure of the passage. The first two sentences of the passage give you information about children and walking. In the third sentence, the author asserts that the idea of walking when the time is right should be applied to the activity of teaching children to read. The fourth sentence tells what might happen if the idea were applied. Choice A accurately describes the Essence of the paragraph.

26. B shows the problem faced by a researcher, D. elaborates why this happens, A continues with it and C., by using 'however' introduces the way out of the problem. BDAC is correct answer.

27. Options 1 and 3 are very generalized statements. Option 2 is a repetition of the idea presented in the beginning of the paragraph. The para talks about how developed countries indulge in trade protectionism as a move against China and India's economic rise , under the guise of climate concern. Option 4 and 5 talk about the same thing but 4 goes along with the subtle suggestive tone of the para while 5 is more curt in its accusation of 'perpetrators of inequity'. Correct answer is 4.

28. The best answer for this question is D. Several pieces of explicitly stated information point to D as the best answer. The first sentence of the passage states that, in one respect, local property taxes "are superior to" state taxes as a way of financing public schools. The second sentence states what this superiority or advantage is in helping schools to avoid competition for funding. The third and fourth sentences tell more about this advantage.

29. In the paragraph the author suggests why the doctor loses some of his patients. Option 5 can be easily eliminated as the pronoun "these" has no antecedent in the para. Option 3 & 4 are farfetched as they are to do with the doctor's attitude towards the problem, which the para does not indicate in any way. Option 1 can also be done away with as it suggests those patients who fail to speak up and not about those who leave his treatment, as indicated in the para. Option 2 fits in perfectly as it speaks of those who
have no other alternative but to seek his treatment. Correct answer is 2.

30. The user of word 'rather' in B. indicates that it should follow 1. D. states that the competition depends on five basic competitive forces, A. continues with the same idea. C. states that not all industries have the same potential this is elaborated in 6. Correct answer is BDAC.

31. This question asks you to identify the essence in writing the whole passage. The author does not plainly state the essence; the essence must be determined on the basis of the information in the passage and how that information is organized. The first two sentences classify Shakespeare's plays into four categories and offer an explanation, endorsed by "some scholars." Note that up to this point in the passage, you know only that the author is

concerned about the kinds of plays Shakespeare wrote and with explaining why he may have written them when he did. The word “But”
in the sixth sentence of the passage informs you that the passage is about to change direction. The author states that there is evidence to suggest that the first explanation may be wrong. The ESSENCE of the passage, then, is not simply to describe the kinds of plays Shakespeare wrote, but rather to refute the explanation attributed to “some scholars” by providing evidence to suggest it may not be true. This purpose is described in choice B.

32. ADB is a clear sequence. So is CE. A has a suitable opening with A few months ago. The invitation and the response follow in DB. She in E has a clear reference to One senior in C. Correct answer is ADBCE.

33. The para is a description of the Jewry settlement,. (4) can be eliminated as it brings in a hint of skepticism. (3) is a mere repetition of an idea already discussed in the para (that of jews being tolerant). (5) can also be eliminated as it is brings an alien concept – that of Mattancherry’s popularity with the tourists . Between (1) and (2), we will eliminate (1) as it has a more conclusive tone, which is not in sync with the descriptive nature of the paragraph. Correct answer is 2.

34. CA gives the sequence of action. BD follows with reaction. The outcome is in E. CA outlines the consecutive bids. BD gives Mr. Shah's statements. Moreover in D adds to B. Correct answer is CABDE.

DILR

1. 2 In 1999, total number of Naya mixer-grinder = 124
   Number of Naya mixer-grinder disposed = 20% of 30 = 6
   Number of mixtures bought 124-80=44
   But 6 were disposed as well so total 44+6=50

2. 3 Number of Naya mixer-grinder disposed in 1999 ⇒ 6 Number of Naya mixer-grinder disposed in 2000 ⇒ 10 Total disposed by end of 2000 = 16

3. 4 Initial number of Purana mixer-grinder not available, hence cannot be determined.

4. 1 20 Purana mixer-grinder were purchased in 1999.

5. 4 Thailand and Japan (Maximum difference of 4 ranks (5 – 1) = 4)

6. 1 China (Maximum difference between 2 parameter is 2)

7. 2 Japan (Maximum difference of 4)

8. 4 Japan and Malaysia (Inferring from question 17)

9. 2 Only R9

10. 4 Statement (1) is not satisfied by R9. Statement (2) is not satisfied R2 & R3 Statement (3) is incorrect as there are five such region R1, R2, R3, R4 & R11. Statement (4) is correct.

11. 3 All three R9, R10, R11.
12. R1 and R4 are two common in crop 1 and crop3

The given basic information can be collated as below: (i) Six teams – A, B, C, D, E, F (ii) Matches scheduled in two stages – I & II. (ii) No team plays against the same team more than once. (iv) No ties permitted. As per the instructions given for stage – I, we can reach the following conclusions: (a) As B lost at least one match, hence A won all the 3 matches. (b) The two teams who lost all the matches cannot be A (as explained above), cannot be B (E lost to B), cannot be D (D won against C & F). Hence, the two teams must be C and F. (c) F did not play against the top team (i.e. A). We get the following table for stage – I. (To be read from rows)

	A	B	C	D	E	F
A	X	W	W	W		
B	L	X			W	W
C	L		X	L	L	
D			W	X		W
E		L	W		X	X
F		L		L	L	X

As per the instructions given for Stage-II, we can reach the following conclusions. (d) A lost both its matches against E and F. (e) F won against A, hence is the bottom team (out of C & F) which won both the matches ⇒ F won against C as well. This also means that C lost both its matches against B and F. (f) Apart from A and C, one more team lost both the matches in Stage-II. That team can neither be E (A lost to E), nor B (as C lost to B), nor F (as F won both its matches). Hence, the team must be D.
We get the following table for Stage-II.

	A	B	C	D	E	F
A	X				L	L
B		X	W	W		
C		L	X			L
D		L		X	L	
E	W			W	X	
F	W		W			X

13. 2 E & F defeated A. [Please note that in this question option (1) and (5) were the same]

14. 4 B, E & F won both the matches in Stage-II.
15. 5 D & F won exactly two matches in the event.
16. 5 B & E has most wins, 4 each.

17. 3
Day 1 Day 2 Day 3 Day 4 Day 5
Start price 100 90 100 110 120
End price 90 100 110 120 110
In the above table Harshit sold shares on Day 2, Day 3 and Day 4 whereas Dhara sold shares on Day 4 only. Therefore at the end of day 3 the price of Share is Rs. 110.

18. 2
Day 1 Day 2 Day 3 Day 4 Day 5
Start price 100 90 100 110 100
End price 90 100 110 100 100
Let initial amount with Harshit and Dhara is y. Total Money with Harshit = y - 900 + 1000 + 1100 + 1200 - 1100 = y + 1300 Total money with Dhara = y Therefore Harshit ended up with Rs.1300 more cash than Dhara. Therefore at the end of day 4 the price of Share is Rs. 100.

19. 1
Day 1 Day 2 Day 3 Day 4 Day 5
Start price 100 90 80 90 100
End price 90 80 90 100 110
Assume initial number of share with Harshit and Dhara is x. In the above table Harshit buy 10 share each on day 1, day 2 and sold 10 share on day 3, day 4 and day 5.
∴ Total shares with Harshit is x - 10. In the above table Dhara buy shares only on day 2. ∴ Total shares with Dhara is x + 10. ∴ Dhara had 20 shares more then Harshit. Therefore at the end of day 3 the price of share is Rs. 90.

20. 4
Day 1 Day 2 Day 3 Day 4 Day 5
Start price 100 110 120 130 120
End price 110 120 130 120 110
Let initial amount with Harshit and Dhara is Y. Harshit sold shares on Day 1, Day 2, Day 3 whereas buys shares on Day 4 and Day 5. Total Money with Harshit is = Y + 110 × 10 + 120 × 10 + 130 × 10 - 120 × 10 - 110 × 10 = Y + 1300 Total money with Dhara = Y + 1200 Total money with Dhara = Y + 120 × 10 + 130 × 10 + 120 × 10 = Y + 3700 Total money with Dhara & Harshit = 2Y + 5000. Therefore maximum possible increase is 5000.

As only Paul Zohos was having an Zohos number of zero so the minimum Zohos number among A, B, C, D, E, F, G, H should be 1 or greater than one. At the end of the third day F coauthored a paper with A and C. F had the minimum Zohos number among the 8 people. So if F's Zohos number is y, then A and C's Zohos number should change to (y + 1) after third day. As A and C decreased the average by maximum possible extent, it means C had the second-height Zohos number among all eight, as A had an Zohos number of infinity.

Suppose Zohos numbers of A, B, C, D, E, F, G, H are y + 1, b, y + 1, c, d, e, y, g, h respectively at the end of third day.
∴ (y + 1 + b + y + 1 + c + d + e + y + g + h) = 24 = (3 × 8) 3y + 2 + b + d + e + g + h = 24
When E co-authored with F, the average Zohos number reduced again, it means, E's Zohos number was not the same with A & C initially. As at the end of third day, 5 people had same Zohos number, they should be A, C and any 3 out of B, D, G, H. Suppose those 3 people are B, D, G. Then
(3y + 2 + y + 1 + y + 1 + y + 1 + e + h) = 24 6y + h + e = 19 ...(i)

On the fifth day E co-authored a paper with F and hence Zohos number of E changed to (y + 1). Also the average decreased by 0.5 that means the total decreased by
Hence, e - (y + 1) = 4 ⇒ e – y = 5

Putting the value of e in equation (i), we get 6y + h + (5 + y) = 19 7y + h = 14

Only possible value of y = 1 as h cannot be zero. So after 3rd round Zohos number of A, C, E, F were 2, 2, 6, 1 respectively.

21. 4 Only A, C, E changed their Zohos number, rest 5 did not change their Zohos number.

22. 2 At the end of conference 6 people including E were having an Zohos number of 2 and F was having 1 as Zohos number. So 8th person was having an Zohos number of [20 – (2 × 6 + 1)] = 7

23. 2 As at the end of 3rd round 5 people were having same Zohos number. A and C changed their Zohos number after coauthoring with F. So, the other 3 would have same Zohos number in the beginning.

24. 2 2

Player	Pakistan	South Africa	Australia
Yuvraj	40	<49	87
Virender	130	<49	<48
Kaif	28	51	<48
Saurav	<22	75	50
Rahul	<22	49	55
Top 3	198	175	192
Total	220	250	240

25. 3

26. 1

27. 2

28. 2

29. 2 Since Ramaya got calls from all colleges, she has to score marks in each section equal to at least the maximum of the cut-offs across colleges which means 45, 45, 46 & 45 in section A, B, C & D respectively. This makes her total to be 181 with which she will clear the overall cut-offs of all institutes also.

30. 3 Since we have to minimise the marks in a particular section, we will maximise the marks in other 3 sections. Let us assume that marks obtained in each of the three sections in which we are going to maximize the score, is equal to 50. Now, the lowest overall cut-off is 171 & second lowest is 175. Hence Gauri must have scored at least 175 – (50 + 50 + 50) = 25 marks in the remaining section. Lets confirm whether he can clear sectional cut-offs also with such a distribution. On seeing the sectional cut-offs, we conclude what they can be cleared with 50 marks each in section A, B & C and 25 marks in section D, which may enable Charlie to clear the sectional cut-off of section D for college 1, 2, 3 or 5. Hence answer is 25.s

31. 3 Since we have to maximize Minakshi's marks, let us take the base values of 50 marks in each section and try to reduce that by minimum values to ensure he doesn't get any call. We notice that by reducing the marks

32. 3 Maximum marks needed by Cetking student to clear all colleges cut-off will be 46 marks as thats the highest cutoff for section D more than any college.

QA

1. d Let us assume that he has Rs. 100. In this he can buy 50 oranges or 40 mangoes. In other words, the price of an orange is Rs. 2 and that of a mango is Rs. 2.50. Now if he decides to keep 10% of his money for taxi fares, he would be left with Rs. 90. Now if he buys 20 mangoes, he would spend Rs. 50 and will be left with Rs. 40, in which he can buy 20 oranges.

2. a Let there be 100 voters in all. So initially there were 40 of these who promised to vote for P, while 60 of them promised to vote for Q. On the last day, (15% of 40) = 6 voters shifted their interest from P to Q and (25% of 60) = 15 voters shifted their interest from Q to P. So finally, P would end up getting (40 – 6 + 15) = 49 votes and Q would end up getting (60 – 15 + 6) = 51 votes. Hence, margin of victory for Q = (51 – 49) = 2, which matches the data given in the question. Hence, there were 100 voters in all.

3. b Profit percentage in each case is
(i) 10%
(ii) (100 × 100)/ 900 = 100/9%
(iii) (100 - 100 / 1.1) / (100/1.1) = 10%
(iv) (100 x 100) / 9 = 200/19%

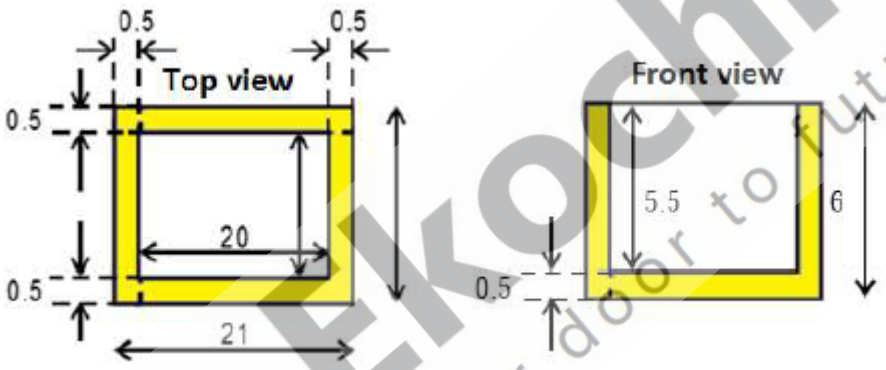
4. d Since n(n + 1) forms two consecutive integers, one of them will be even and hence the product will always be even. Also the sum of the squares of first n natural numbers is given by n(n+1)(2n+1)/6. Hence, our product will always be divisible by this. Also you will find that the product is always divisible by 3 (you can use any value of n to verify

this). However, we can find that the option (d) is not necessarily true. Only under certain situation does it hold good. e.g. if n = 118, (2n + 1) = 237 or if n = 236, then (n + 1) = 237 or if n itself is 237, etc.

5. The sum of the perimeters of the triangles = (Perimetes of the square) + 2 × (Sum of its diagonals). This is so because the bases of each triangle will be counted once. But since each of the other two sides of the triangles is common to two triangles, it will be counted twice. Since area of the square = 4, its side = 2 and perimeter = 8. Also its diagonal = $2\sqrt{2}$. So the required perimeter = $(8+ 2 \times 4\sqrt{2}) = 8(1 + \sqrt{2})$.

6. a In the given figure, the area of the circle = πr^2. To find the area of the circle, we need to find the length of the side of the square. We know that OR = OT + TR = OT + OS = 2r. So in the right-angled triangle ORS, we have OR = 2r, OS = r. So $SR^2 = OR^2 - OS^2$. But SR2 = Area of the square = $4r^2 - r^2 = 3r^2$. So the required ratio = $\pi/3$.

7. Area of the original paper = π(20)2 = 400π cm2. The total cut portion area = 4(π)(5)2 = 100π cm2 .
Therefore, area of the uncut (shaded) portion = (400 – 100) = 300π cm2. Hence, the required ratio = 300π : 100π = 3 : 1.



8. As it can be seen from the diagram, because of the thickness of the wall, the dimensions of the inside of the box is as follows: length = (21 – 0.5 – 0.5) = 20 cm, width = (11 – 0.5 – 0.5) = 10 cm and height = (6 – 0.5) = 5.5. Total number of faces to be painted = 4 walls + one base (as it is open from the top). The dimensions of two of the walls = (10 × 5.5), that of the remaining two walls = (20 × 5.5) and that of the base = (20 × 10). So the total area to be painted = 2 × (10 × 5.5) + 2 × (20 × 5.5) + (20 × 10) = 530 cm2. Since the total expense of painting this area is Rs. 70, the rate of painting = 70/530 = 0.13 = Re 0.1 per sq. cm.

9. c Let the original weight of the diamond be 10x. Hence, its original price will be $k(100x^2)$ . . . where k is a constant. The weights of the pieces after breaking are x, 2x, 3x and 4x. Therefore, their prices will be kx^2, $4kx^2$, $9kx^2$ and $16kx^2$. So the total price of the pieces = $(1 + 4 + 9 + 16)kx^2 = 30kx^2$.
Hence, the difference in the price of the original diamond and its pieces
= $100kx^2 - 30kx^2 = 70kx^2 = 70000$.
Hence, $kx^2 = 1000$ and the original price = $100kx^2 = 100 \times 1000 = 100000$ = Rs. 1 lakh.

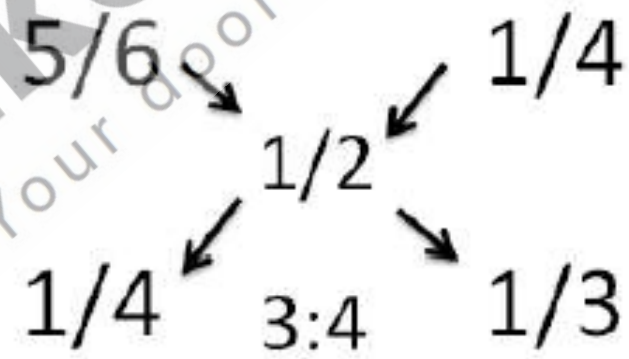
10. Let radius of the semicircle be R and radius of the circle be r. Let P be the centre of semicircle and Q be the centre of the circle. Draw QS parallel to BC. Now, ΔΔ PQS ~ PBC

$\therefore$= PQ / PB = QS/ BC
$\Rightarrow$(R+ r) / $\sqrt{2}$R = (R – r) /R
$\Rightarrow$ R + r = $\sqrt{2}$R - $\sqrt{2}$r
$\Rightarrow$ r(1 + $\sqrt{2}$)= R($\sqrt{2}$ - 1)
$\Rightarrow$ r = R ($\sqrt{2}$ - 1) / ($\sqrt{2}$ + 1) x ($\sqrt{2}$ - 1) / ($\sqrt{2}$ - 1)
$\Rightarrow$ r = R ($\sqrt{2}$ - 1)^2
Required Ratio = πr^2 / πR^2 X 2
= πR^2 ($\sqrt{2}$ - 1)^4 / πR2 X 2
=2($\sqrt{2}$ - 1)^4 : 1

11. . d In a mile race, Akshay can be given a start of 128 m by Bhairav. This means that Bhairav can afford to start after Akshay has travelled 128 m and still complete one mile with him. In other words, Bhairav can travel one mile, i.e. 1,600 m in the same time as Akshay can travel (1600 – 128) = 1,472 m.
Hence, the ratio of the speeds of Bhairav and Akshay = Ratio of the distances travelled by them in the same time = 1900/1472 = 25 : 23. Bhairav can give Chinmay a start of 4 miles. This means that in the time Bhairav runs 100 m, Chinmay only runs 96 m. So the ratio of the speeds of Bhairav and Chinmay = 100/96 = 25 : 24. Hence, we have B : A = 25 : 23 and

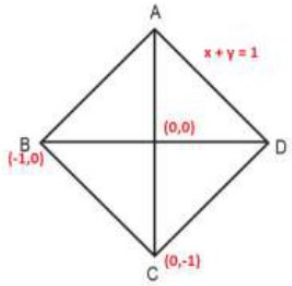
B : C = 25 : 24. So A : B : C = 23 : 25 : 24. This means that in the time Chinmay covers 24 m, Akshay only covers 23 m. In other words, Chinmay is faster than Akshay. So if they race for 1 ½ miles = 2,400 m, Chinmay will complete the race first and by this time Aksahy would only complete 2,300 m. In other words, Chinmay would beat Akshay by 100 m = 1/ 16 mile.

12. d We can solve this by alligation. But while we alligate, we have to be careful that it has to be done with respect to any one of the two liquids, viz. either A or B. We can verify that in both cases, we get the same result. e.g. the proportion of A in the first vessel is 5/6
and that in the second vessel is 1/4, and we finally require ½ parts of A. Similarly, the proportion of B in the first vessel is 1/6 that in the second vessel is 3/4 and finally we want it to be 1/2. With respect to liquid A.



13. b $x^2 + y^2 = 0.1$
$|x - y|^2 = x^2 + y^2 - 2xy$
$(0.2)^2 = 0.1 - 2xy$ or $2xy = 0.06$ or $xy = 0.03$
Now $|x| + |y| = \sqrt{(x^2 + y^2 - 2xy)} = \sqrt{(0.1 + 0.06)}$
$|x| + |y| = 0.40$
Hence, x = 0.3, y = 0.1 or vice versa.

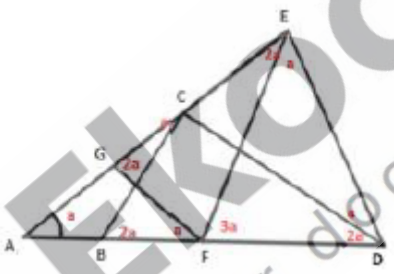
14. The gradient of the line AD is –1. Coordinates of B are (– 1, 0). Equation of line BC is x + y = –1.



15. b g(1) = f[f(1)] + 1 = 2 . Since f(1) has to be 1, else all the integers will not be covered. f(n) is the set of odd numbers and g(n) is the set of even numbers.

16. b f(1, 2) = f(0, f(1, 1)); Now f(1, 1) = f[0, f(1, 0)] = f[0, f(0, 1)] = f[0, 2] = 3 Hence, f(1, 2) = f(0, 3) = 4

17. Let ∠EAD = a. Then ∠AFG = a and also ∠ACB = a. Therefore, ∠CBD = 2a (exterior angle to ΔABC). Also ∠CDB = 2a (since CB = CD). Further, ∠FGC = 2a (exterior angle to ΔAFG). Since GF = EF, ∠FEG = 2a. Now ∠DCE = ∠DEC = b (say). Then ∠DEF = b – 2a. Note that ∠DCB = 180 – (a + b). Therefore, in ΔDCB, 180 – (a + b) + 2a + 2a = 180 or b = 3a. Further ∠EFD = ∠EDF = γ (say). Then ∠EDC = γ – 2a. If CD and EF meet at P, then ∠FPD = 180 – 5a (because b = 3a). Now in ΔPFD, 180 – 5a + γ + 2a = 180 or γ = 3a. Therefore, in ΔEFD, sa + 2γ = 180 or a + 6a = 180 or a = 26 or approximately 25.



18. b Since a bucket holds 5 litres of water, Tap A discharges 20 litres of water in 24 min or 5/6 litres of water in 1 minute. Tap B discharges 40 litres in 1 hours or 2/3 litres in 1 minute. Tap C discharges 10 litres in 20 min. or ½ litres in 1 minute If A, B & C are all opened simultaneously, total discharge = (5/6 + 2/3 + ½) = 2 litres in 1 minute. So in 2 hours, the discharge would be 240 litres, which should be the capacity of the tank.

19. c It is clear that the ratio of the distances between (Delhi-Chandigarh) : (Chandigarh-Shimla) = 3 : 4. The ratio of the speeds between (Delhi-Chandigarh) : (Chandigarh-Shimla) = 3 : 2. Let the distances be 3x & 4x respectively and speeds be 3y and 2y. So the time taken will be (x/y) and (2x/y) respectively. Since average speed is given as (Total Distance) / (Total Time) = (7x)/(x/y + 2x/y) = 7y/3 = 49. Hence y = 21. So the average speed from Chandigarh to Shimla = 2y = 42 kmph.

20. c HINT : Students please note that you need not apply any formula in this case. The middle term of an AP is always the average of all the terms. Hence, if we multiply the middle term by the number of terms, we should get the sum of all the terms of that AP. In our problem, we have to find the sum of first 7 terms and we have been given the 4th term (which is the middle term). Hence the required answer is 8 x 7 = 56.

21. d

Option	Location	Expenditure of Town A students	Expenditure of Town B students	Total Expenditure
(a)	33 km from A	33x1.2x30 = 1188	67x1.2x100 = 8040	1188+8040 = 9228
(b)	33 km from B	67x1.2x30= 2412	33x1.2x100 = 3960	2412+3960 = 6372
(c)	Town A	0	100x100x1.2 = 12000 12000	12000
(d)	Town B	30x100x1.2 = 3600	0	3600

Hence we find that the least expenditure will be incurred if the school is located in town B. HINT : Students please note that since there are more number of students from Town B, to minimise the total expenditure the school should be located as closer to town B as possible.
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22. d It is clear that since there are 39 people in the ratio 6 : 5 : 2, there are 18 men, 15 women and 6 children. Ratio of the work done by a man : woman = 2 : 1. The ratio of the work done by a woman : child = 3 : 1. Hence the ratio of work done in a day by a man : a woman : a child = 6 : 3 : 1. So the ratio of the work done in a day by 18 men, 15 women and 6 children would be (18x6) : (15x3) : (6x1) = 108:45:6. Hence the daily wage of Rs.1113 should be divided in this ratio. That makes it, Rs.756 for men, 315 for women and Rs.42 for children. Hence 6 children earn Rs.42 in a day. So the daily wage of a child should be equal to 42/6 = Rs.7

23. a $U_0 = 2^0 - 1 = 0$
$U_1 = 2^1 - 1 = 1$
$U_2 = 2^2 - 1 = 3$
$U_3 = 2^3 - 1 = 7$ and so on.
$\therefore U_{10} = 2^{10} - 1 = 1023$.

24. b Since there are two numbers which are < 1 (viz. x & y), it is obvious that the median will be less than 1. Hence (c) cannot be the answer. Since $x < 0.5$ and $0 < y < 1$, the median will not be < 0. Hence the answer is (b) between 0 and 1.

25. d Since, $0 < x < 1$, so $0 < x^2 < 1$ or $0 < 5x^2 < 5$. Similarly, as $0 < x < 1$, so $0 < x2 < 1$ or $0 < 3x^2/4 < ¾$ or $0 > -3x^2/4 > -3/4$ or $½ > (½ - 3x^2/4) > ½ - ¾$ i.e. $½ > 5x^2 > -¼$. So, we can see that 5x2 varies between 0 & 5, while $½ - 3x^2/4$ varies between ½ & -1/4. Hence there is a common zone of 0 to ½ between the two. Let us check for some key values of x. If x = 0, then $(½ - 3x^2/4) > 5x^2/4$. If x = 1, then $(1/2 - 3x^2/4) < 5x^2/4$. Hence between x = 0 & x = 1, there has to be some value of x for which $(½ - 3x^2/4) = 5x^2/4$, and this will be the maximum value of the given expression. Let us check for the same. If $(½ - 3x^2/4) = 5x2/4$, then $2x^2 = ½$. Or $x^2 = 1/4$. For Or $x2 = 1/4$, the value of $5x^2/4 = 5/16 = (½ - 3x^2/4)$.

26. a Let us evaluate each option. (b) since $0 < y < 1$ and $z > 1$, yz will always be < 1. (c) Since both x & y are not equal to 0, xy will never be 0. (d) y is a positive number < 1 and z

is a positive number > 1, hence ($y^2 - z^2$) is always negative. Since, (b), (c) and (d) are always true, the answer has to be (a). And this can be verified. For eg. If x = -2 and z = 3, then ($x^2 - z^2$) = 4 – 9 = -5, not a positive number.

27. b If you were to run two of three cycles of how she is counting, you will observe that the number that she counts on thumb are 1, 9, 17, 25 and so on. So it forms a pattern such that all the numbers that are 1 more than the multiples of 8 are counted on thumb. The closest multiple of 8 near 1994 is 1992. In other words she would count 1993 on thumb. So she would count 1994 on the index finger.

28. 4 Let number of elements in progression be n, then 1000 = 1 + (n-1) d
⇒ (n-1) d = 999 = 3^3 x 37
Possible values of d = 3, 37, 9, 111, 27, 333, 999 Hence 7 progressions.

29. 2 2x + y = 40 x ≤ y ⇒ y = 40 – 2x Values of x and y that satisfy the equation

X	Y
1	38
2	36
3	34
4	32
5	30
6	28
7	26
8	24
9	22
10	20
11	18
12	16
13	14

∴ 13 values of (x, y) satisfy the equation such that x ≤ y

30. 4
$\log_y x = (a \cdot \log_z y) = (b \cdot \log_x z) = ab$
$a = \log_y x / \log_z y$ and similarly $b = \log_y x / \log_x z$
$a \times b = \log_y x / \log_z y \times \log_y x / \log_x z = (\log_y x)^3$
⇒ $ab - a^3b^3 = 0$
Or, $a \times b (1 - a^2b^2) = 0$
Ab = + - 1
Only option (4) does not satisfy. Hence (4).

31. 2 Let the number be 10x + y so when number is reversed the number because 10y + x. So, the number increases by 18 Hence (10y + x) - (10x + y) = 9 (y - x) = 18 y - x = 2 So, the possible pairs of (x, y) is (3, 1) (4, 2) (5, 3) (6, 4), (7, 5) (8, 6) (9, 7) But we want the number other than 13 so, there are 6 possible numbers are there i.e. 24, 35, 46, 57, 68, 79. So total possible numbers are 6.

32. So, total people reading the newspaper in consecutive months i.e. July and August and August and Sept. is 2 + 7 = 9 people.

33. 2 Arithmetic mean is more by 1.8 means sum is more by 18. So ba – ab = 18 b > a because sum has gone up, e.g. 31 – 13 = 18 Hence, b – a = 2

34. Let OT be te tower.
Therefore, Height of tower = OT = 30 m
Let A and B be the two points on the level ground on the opposite side of tower OT.
Then, angle of elevation from $A = \angle TAO = 45o$
and angle of elevation from $B = \angle TBO = 60o$
Distance between AB = AO + OB = x + y (say)
Now, in right triangle ATO,
tan 45o = OT/AO = 30/x
= > x = 30/tan 45 = 30 m
and in right traingle BTO
tan 60o =OT/OB = 30/y
= > y = 30/tan 60 = 30/√3 = 30√3 / 3 = 17.32 m
Hence, the required distance = x + y = 30 + 17.32 = 47.32 m