CAT 2004 (November) Answer Key

1.	3	**41.**	4	**81.**	3	**121.**	2
2.	1	**42.**	2	**82.**	2	**122.**	4
3.	2	**43.**	1	**83.**	4	**123.**	3
4.	1	**44.**	2	**84.**	2		
5.	4	**45.**	1	**85.**	2		
6.	2	**46.**	3	**86.**	3		
7.	1	**47.**	2	**87.**	3		
8.	4	**48.**	1	**88.**	4		
9.	4	**49.**	3	**89.**	3		
10.	3	**50.**	4	**90.**	2		
11.	1	**51.**	4	**91.**	1		
12.	4	**52.**	3	**92.**	4		
13.	4	**53.**	4	**93.**	1		
14.	1	**54.**	3	**94.**	4		
15.	3	**55.**	2	**95.**	2		
16.	2	**56.**	2	**96.**	2		
17.	2	**57.**	2	**97.**	1		
18.	2	**58.**	3	**98.**	2		
19.	1	**59.**	4	**99.**	4		
20.	4	**60.**	2	**100.**	2		
21.	3	**61.**	3	**101.**	1		
22.	2	**62.**	2	**102.**	2		
23.	4	**63.**	1	**103.**	3		
24.	1	**64.**	3	**104.**	3		
25.	1	**65.**	3	**105.**	1		
26.	1	**66.**	3	**106.**	1		
27.	2	**67.**	3	**107.**	4		
28.	1	**68.**	2	**108.**	1		
29.	3	**69.**	4	**109.**	4		
30.	2	**70.**	2	**110.**	3		
31.	4	**71.**	1	**111.**	2		
32.	4	**72.**	1	**112.**	4		
33.	3	**73.**	4	**113.**	1		
34.	3	**74.**	3	**114.**	3		
35.	1	**75.**	1	**115.**	3		
36.	4	**76.**	4	**116.**	3		
37.	3	**77.**	1	**117.**	3		
38.	3	**78.**	2	**118.**	3		
39.	4	**79.**	1	**119.**	1		
40.	1	**80.**	4	**120.**	3		

CAT 2004 (November) Solutions

1. Canada (C) ; Netherlands(N) ; India (I) ; UK (UK) ; USA (U)

University	1	2	3	4
	-	C/UK	X	X
	N/I	-	N	X
	N/I	-	X	X
	-	C/UK	X	UK
	N/I	-	X	X

5	6	7	8
-	X	C/UK	X
N/I	X	-	X
N/I	X	-	I
-	X	C/UK	X
N/I	U	-	X

*Day 2,3 From Country table you can fix university 3,4,6,8. *US can't be in 1 or 5 because it is in 6.

2. Option 1.

3. University 4 belongs to UK and exactly one of the other two universities 2 or 7 definitely belongs to UK and the other belongs to Canada. Thus in either case the students from two universities visited the page.

4. As for 4 of the universities the countries are already decided in the table. Out of the remaining 4 universities ; 1 or 5 belong to either Netherlands or India one each. The remaining two universities i.e. 2 or 7 belong to either Canada or UK one each. Thus the total universities belonging to any country cannot be more than 2. Thus None i.e. the first option.

5. Leaving Japan & Malaysia, rest all show maximum dissimilarity.

6. Among the options in Japan, D has been ranked first compared to its rank 5th under India. That is the maximum difference. Hence Japan.

7. Leaving China rest all countries at least show a dissimilarity difference of 2.

8. Again in the countries Thailand & Japan , D has been ranked 5th and 1st respectively.

9. Simple visual observation. The minimum of Dubey and maximum of Dubey ,both are higher than the respective values of other families.

10. Similarly we can conclude that Coomar family will have the lowest average income because all the three values are comparatively lesser in total.

11. Highest income and lowest expenditure is shown by a member of the Ahuja family.

12. A bit lengthy if you start calculating but if visual observation with a certain amount of reasoning is applied, you will easily locate Dubey family, as the income and expenditure in the Dubey family's case is almost same, thus it will have the lowest savings. That you can also judge from the middle line that represents income = expenditure. Thus 4th option.

13. Aggregate of grades of tara:-(4+x+x+x+y)/5 =2.4 × 5 = 12. The question also states that the person has the same score in exactly three of the subjects. Now if one of the subjects has 4 marks, this means from the remaining 4 subjects, we have to get a score of 8 marks. If you take the three same subjects to have 2, 2, 2 then the fourth also becomes 2, but the questions states exactly three thus i.e. not possible. Now the only possibility remains is that Tara must have received the same marks in the two subjects as she has got in Finance i.e. 4 marks. Thus she has three B grades and two F grades. Now to answer the question, out of the four options given neither Ismet, nor Hari nor Jagdeep has B or F grade in operations. Only Manab has B grade and he could have the same grade as Tara. Thus 4th option.

14. 0+2+2+x+y = 16 i.e x+y = 12 hence x = y = 6. Hence Grade A.

15. Fazal obtained B grade in strategy, so Utkarsh also gets B grade in marketing.Now from here we can calculate that Utkarsh would have obtained D grade in Finance.

16. We can calculate that Gowri gets C grade in strategy. Now Hari has scored only 2 points from strategy and finance combined. Hence it is Hari.

17. 20% of newly bought grinder is disposed off in 2 years exactly. Therefore, 20% of 30(1997) and 20% of 50 (1998 i.e 80-30) = 16.

18. It will be the difference in the operational grinders plus the grinders being disposed off in that year. Hence , 44 + 6 = 50.

19. 10 were disposed in 1997, so the newly added were in 1997 were 30. Therefore 6 will be discarded in 1999. Hence the total newly added is 6+14 = 20.

20. Because we do not have the data about how many grinders were disposed off in 1996 ,we can not calculate the newly added of that year and so we can not calculate the disposal of 1998 and hence so for the year 2000.

21. Incorporating both the statements :-
1) 2P + 1G < 1P + 2 G …From this G> P
2) 1P + 2 O = 1 O + 2 G ; P + O = 2G => G = P + O /2, …From this O > G
Hence O is the greatest.

22. If we use the first statement then in 21 coin throws there can be a possibility that there are 10 H and 10 T and the last can be a head or tail. There is another possibility of 12 T and 9 H. So first statement cannot give the answer. Out of these two possibilities, first cannot be true as in that case the net result is either one head extra or one tail extra. But with one extra head or tail he cannot reach at either end. Considering the second possibility, he can go additional 3 tails, means he should have reached at the blue mark.
From the second statement, when we incorporate 2nd statement we can always be sure that man will be at the blue mark.

23. With the given data nothing can be concluded.
Using the first statement, we can conclude that 7 notes of 5 & 10 were used combined and 6 notes of 1 & 2 were used combined. Price is a multiple of 10 hence there has to be 4 (2 rupee) & 2(1 rupee) notes to make it 10. In the first group of 5 & 10 rupee notes, various possibilities can arise for example:- 2(5 rupee) or 4 (5 rupee) or 6(5 rupee) etc. , which will result in different prices.

24. Using the first statement , lets assume A B C D are the four people with A having the highest score, B the second best , C third and D least. Then A will vote B, B will vote A, C will also vote A. In case if D votes B still with the tie A will win because of better score. Hence first statement is sufficient to answer.

25. Statement 1 doesn't give any useful information .But looking at the statement 2 ,we can say that when 3 boys

	were on the top 5 and rashmi was 3rd among the girls and we also know that in overall rank kumar secured 6th .Therefore Kumar is ranked higher than Rashmi.
26.	From I st Statement , 20 % of Zakib > 25% of Supriyo, So 30% of Zakib > 37.5% of Supriyo, hence cannot comment anything From the second statement we know that 13% of Supriyo > 10 % of Zakib. Hence 39% of S > 30% of Z .and supriyo spends 40 % on education which will definitely be higher.
27.	In this question we can not find the M-index of Virender and yuvraj conclusively .So among Rahul and Sourav , Saurav will have a higher M-index for sure of 50 compared to Rahul's 49.
28.	First let us calculate the complete data. 1)Pakistan :- 90% is 198 .Therefore total against Pakistan is 220. Hence the other two batsman(R & S) could have scored 22 together. 2)South Africa :- 70% is equal to 175. Therefore total is 250 and 75 has been scored by (V & Y). 3)Australia :- 80% is 192 .Hence total is 240 and 48 has been scored by the other two batsmen (K & V). R- index is difference between maximum and minimum. We are looking for lowest R-index possible. Scores of kaif : 28, 51 and between 0-48 against Australia.Mimimum R-index for kaif is possible when his score against Australia is also 28 making the R-index to be 22.If he scores 0 against Australia then the R-index is 51. For Rahul:- 49,55 and between 0-22 against Pakistan.So minimum he scores against Pakistan anywhere between 0-22.Lets assume he scores maximum 22 ,still his R-index will be 55-22 = 33 and if he scores 0 then 55. Similarly yuvraj's R-index varies between 47-87 . Hence any of these three can have minimum R-index.
29.	M-index can be calculated only for two players :- S- 50 & R 49.
30.	Lets say Yuvraj scored 0 against south Africa.Then his total is 127. V can never be lesser. K-28 + 51 + 48(Australia assumed) =127 .So can not say. S – 75 + 50 + 0-22(Pakistan) .Might be,might not be.Cannot say. R- 49 + 55 + 0-22(Pakistan) .Even if he scores maximum 22 the total is 126 which is less than yuvraj's minimum possible score of 127. Hence we can be sure about only Rahul.
31.	You can see out of the four options given, all have been determined except the 4th option because it could be one or two; hence 4th option is the answer.
32.	See the 4th option, if both America and Africa have one expert in population studies, then the no. of experts in population studies remain 5 only, but it is given to be 6. Thus one out of these two continents have to provide 2 experts of population studies, hence 4th option is the answer.
33.	From statement (a) let the no. of labour experts be x, then the no. of experts in the other categories will be 2x each. Now $x + 2x + 2x + 2x = 21 \Rightarrow x = 3$. Thus labour experts are 3 and experts in other three categories are 6 each. From statement (d) if one less Australasian expert is there, then let the experts from America be 2y and then the experts from each of the other four continents will be y each. Now as in this case one expert from Australasia is taken less hence the total no. of remaining experts becomes 20. Therefore $y + y + y + 2y = 20 \Rightarrow y = 4$. This implies experts from America are $4 \times 2 = 8$ and experts from Australasia are $4 + 1 = 5$ (because one was subtracted initially). The experts from the remaining two continents are 4 each. Now these inferences and from the other information provided a table can be made as given below.

	Expert In	Labour	Health
Continent	Africa	0	At least 1*
	America	1	At least 1$
	Australasia	1	1
	Europe	1	1
	Total	**3**	**6**

Population Studies	Refugee Relocation	Total
At least 1*	At least 1*	4
At least 1$	At least 1$	8
1 + 1 (given Mike & Alfans)	1	5
1	1	4
6	**6**	21

It can seen that four Americans and one African are still there to be allotted in various expertise areas and out of those five persons, two are to be put in Health, one is to be put in Population studies and two are to be put in Refugee relocation. *It can be seen from the table that one more expert is there from Africa which will be put in one of the three categories except Labour. $ It can be further seen from the table that there are 4 more experts from America, which will be put in three categories of Health, Population Studies and Refugee Relocation as per the information given in the further questions, with a condition of maximum limit being 3 from any continent to a particular area.
Now each of the questions is to be taken. independently.
If Ramos is the lone American expert in Population, this implies the remaining four experts from America have to be put two each in Health and RR. Thus in totality there will be three experts in these areas from America, thus 3rd option is not true.

34.	Out of the four Americans, if you try to put them in other areas except refugee relocation even then only 3 persons (two in health and one in population) can be allotted i.e. at least one person from America besides Alex is minimum there. On the higher side it can be maximum two because a maximum of three persons can be taken from a continent for any particular area. Thus 3rd option is the answer
35.	**Table – I.** The table giving about the 1st two rounds

Team	**Goals For**	**Goals Against**	**First Round**	**Second Round**	**Points**
Germany	3	1	(1,0)	(2,1)	6
Argentina	2	0	(1,0)	(1,0)	6
Spain	5	2	(0,1)	(5,1)	3
Pakistan	2	1	(2,0)	(0,1)	3
New Zealand	1	6	(0,1)	(1,5)	0
South Africa	1	4	(0,2)	(1,2)	0

Results of the first two rounds:

Germany beat Spain and South Africa by (1, 0) and (2, 1) respectively.

Spain beat New Zealand by (5, 1) and lost to Germany by (0, 1).
Argentina beat New Zealand and Pakistan by (1, 0) and (1, 0) respectively.
Pakistan beat South Africa by (2, 0) and lost to Argentina by (1, 0).

Results of the third round:

The third round matches played were Spain Vs Pakistan, Germany Vs New Zealand and Argentina Vs South Africa which were all draws.

Table – II

The table gives the information about the 4th and the 5th rounds

Games Played	Won	Lost	Won Against	Lost to
2	1 (3, 0)	1	Argentina	Pakistan
2	-	2	-	Spain, Ge
2	2	-	Argentina, South Africa	-
2	2 (1, 0) and (1, 0)	-	New Zealand, Germany	-
2	-	2		Pakistan, Africa
2	1 (3,0)	1	New Zealand	Spain

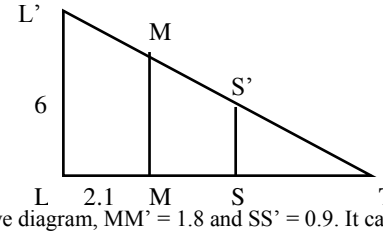
Refer Table I – **Option 1.** (1st Round)

36. Refer Table I – **Option 4.**

37. If we go by options, taking 1st option as Argentina, we can see that the total points scored by Argentina are 6(1st 2 rounds) + 1(3rd round) + 0 (4th and 5th rounds) = 7.
Similarly we can see that the total points scored by Germany are 6(1st 2 rounds) + 1(3rd round) + 3 (4th and 5th rounds) = 10. And we can see that the total points scored by Spain are 3(1st 2 rounds) + 1(3rd round) + 6 (4th and 5th rounds) = 10. So Argentina is out of race. Now we have to consider the goal difference of Germany and Spain. For Germany:
Goals for: 3(1st 2 rounds) + 0 (4th round) + 3 (5th round) = 6.
Goals against: 1(1st 2 rounds) + 1(4th round) + 0 (5th round) = 2. Hence goal difference = 4.
Now for Spain:
Goals for: 5(1st 2 rounds). Goals against: 2(1st 2 rounds). This is giving a goal difference of 3. But since Spain has won both its 4th and 5th round matches, so there has to be a minimum goal difference of 1 in both the matches. So goal difference in case of Spain has to be at least 5. So Spain must have been the other team that qualified. So answer is 3rd option.

38. As per the explanation given for the previous question, we can see that Argentina is out of race. We have considered the cases of Germany and Spain as well. Now we look into the case of Pakistan. Total points scored by Pakistan are 3(1st 2 rounds) + 1(3rd round) + 6 (4th and 5th rounds) = 10. So we have to look for goal difference of Pakistan.
For Pakistan:
Goals for: 2(1st 2 rounds) + 1 (4th round) + 1 (5th round) = 4.
Goals against: 1(1st 2 rounds) + 0(4th round) + 0 (5th round) = 1. Hence goal difference = 3. Since it is less than the minimum goal difference of Spain, hence Spain must have finished at the top of the pool after five rounds of matches. So answer is 3rd option

39.



In the above diagram, MM' = 1.8 and SS' = 0.9. It can be shown that the three triangles, TLL', TMM' and TSS' are similar to each other. In triangles TSS' and TMM', SS'/MM' = TS/TM = 0.9/1.8 = ½. So, TM = 2TS. In triangles TMM' and TLL', MM'/LL' = TM/TL = 1.8/ 6. Substituting for TL = 2TS + 2.1 and solving yields TS = MS = 0.45.

40. The milkman has 100 litres of mixture. When he sells 25 litres of the mixture, he is removing ¼ of the milk and ¼ of the water in the original mixture. So, he is left with 15 litres of water and 60 litres of milk. He now adds 25 litres of water to the mixture. The new mixture will now contain (15 + 25) = 40 litres of warer and 60 litres of milk. Thus, the required ratio is 2 : 3.

41. In a 100 metres race, when Karan runs 100 metres, Arjun runs 90 metres. Since time is constant, the ratio of distances is equal to the ratio of speeds. So, the ratio of speeds of Karan and Arjun is 100 : 90 = 10 : 9. In the second case, Karan will have to run 110 metres to complete the race. In this case, the ratio of distances traveled will be equal to the ratio of speeds 10 : 9. So, when Karan runs 110 metres, Arjun will run (110 x 9)/10 = 99 metres, i.e., he needs to cover 1 metre to complete the race.In other words, Karan beats Arjun by 1 metre.

42. This problem is the same problem as finding the number of diagonals of a n-sided polygon, stated in different words. We know that the number of diagonals is ${}^nC_2 - n$. So n is simply calculated by ${}^nC_2 - n = 28 / 2 = 14$. Check with the options it fits for n = 7.
(None of the other options is a divisor of 14.)

43. If the first 11 terms have the same sum as the first 19 terms, then the sum of terms 12 to 19 (8 terms) must be zero. This means that the 15th term is just negative and 16th term is just positive – or vice-versa.
Or that zero lies between the 15th and the 16th terms.
For 30 terms, 15 will be negative and 15 will be positive. So their sum will be zero.

44. Suppose the distance the man travels is D km and he takes time T hours when he travels at 10 kmph. When he travels at 15 kmph he travels in (T – 2) hours. So, D = 10T = 15(T – 2). Solving for T gives T = 6 hours. If he reaches at 1:00 p.m., he must have left 6 hours earlier, i.e., at 7 a.m. If he wants to reach at 12 noon, he must cover the distance D in 5 hours. So, D = 10 x 6 = 5S or S = 12 kmph.

45. If there are n members in S_1 in January and b members are added each month, then in July, there are $n + 6b$ members. If there are n members in S_2 in January, then there are nr^6 members in July. Since the number of members in S_1 and S_2 in July is the same, $n + 6b = nr^6$. Substituting for $b = 10.5n$, we get $64n = nr^6$ or $r^6 = 64$. Solving this equation yields $r = 2$.

46. If $x = y = 0$, then $x + y = xy = 0$. Also, if $x = y = 2$, then $x + y = xy = 4$.

47. Substitute the values of x to get f(0) = p and f(1) = p – 3. Now if f(0) and f(1) are of the opposite signs, then f(0) is positive, and f(1) is negative.
This will happen if p is more than 0 and less than 3.

48. The number n is greater than 10,000,000,000. Since the sum of the digits is 2, one of the above zeroes will be replaced by 1. This can happen in 10 ways. And one of no. made can be 20,000,000,000, which can happen in only one way. Thus the total no. of numbers made will be 11, which is given in 1st option.

49. If a = b = c= 1, then we get r as 1 / (1 + 1) = ½
If a = 2, b = -1 and c = -1, then we get r as 2 / (-1 – 1) = -1. There are no other values which r can take.

50. The function y is a recursive one $y=\frac{1}{2+\frac{1}{3+y}}$

$y=\frac{3+y}{7+2y}$

$2y^2+6y-3=0$ on solving we get $\frac{-3\pm\sqrt{15}}{2}$

As y is a positive number so $\frac{\sqrt{15}+3}{2}$ is the answer

51. If a is greater than zero and b is less than zero, then the term f(x) will always be positive. The minimum value of a positive function is zero, which is the value that f(x) takes for x = 0.

52. The relative speeds of the boats is 15 km / h.
In one minute the distance would be 15 / 60 = 1/4 km.

53. Start from the minimum possible option, if the no. of families happen to be 2, then the maximum no. of adults possible is 4 and the minimum no. of children are 6 (3 for each family). Now if the six chidren are broken among boys and girls so that the boys are more than girls than their no. become 4 and 2. In that case the adults and boys become equal, which breaks the condition given in the question and is thus wrong. If boys and girls are taken to be 3 and 3, then the condition specifying that boys are more than girl is broken. Taking the second lowest option 3, the maximum no. of adults become 6 and minimum no. of chidren become 9, which can be breakon as 5 boys and 4 girls. Now 6 > 5 > 4 > 3 i.e. adults > boys > girls > families. Thus 4th option is becomes the answer.

54. Machine I:

Number of nuts produced in one minute = 100
To produce 1000 nuts time required = 10 min
Cleaning time for nuts = 5 min
Over all time to produce 1000 nuts = 15 min.
Over all time to produce 9000 = 138 min - 5 min = 133 min … (1)
Machine II:
To produce 75 bolts time required = 1 min To produce 1500 bolts time required = 20 min
Cleaning time for bolts = 10 in.
Effective time to produce 1500 bolts = 30 min
Effective time to produce 9000 bolts = 30 × 6 - 10 = 170 min … (2)
From (1) and (2)
Minimum time = 170 minutes

55. Let the longer side have side 2x. The shorter side has length 2. So original ratio of long : short side is 2x : 2 or x : 1. After folding the original long side becomes 2x / 2 = x. The new ratio is 2 : x This is equal to x : 1
Equating we get x / 1 = 2 / x ; x = √2
The area of the smaller rectangle is 2x = 2√2.

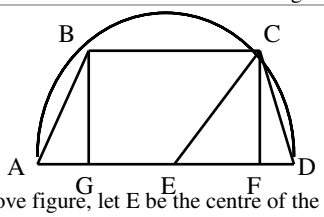
56. Take the radii of the circles as 3x and 4x.
Distance PQ is 7x. Considering similar triangles PSQ and OPR, we can say that SQ / OQ = PR / OP
3x / OQ = 4x / 28, Or OQ = 21. This gives us the value of PQ as OP – PQ = 28 – 21 = 7. But this is also equal to sum of the 2 radii = 3x + 4x = 7x. That means 7x = 7, x = 1, or the radii are 3 and 4. For q. 56 : The ratio is 7 : 21 = 1 : 3

57. Refer above

58. Triangle OQS has two sides 21 and 3. So the third side will be √ ($21^2 - 3^2$) = 12√3

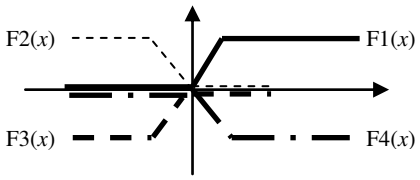
59. Angle CBE is 65°. So angle COE will be double of that = 65*2 = 130. Now triangle COE is an isosceles triangle, with the radii forming the two sides.
So angles OCE and CEO (call them both x) are equal.
2x + 130 = 180, x = 25 Since AC and ED are parallel, angle DEC will also have value x = 25 degree.

60.



In the above figure, let E be the centre of the semi-circle and CF ⊥ AD and BG ⊥ AD. The radius of the semi-circle = ED = EC = 4. Using the semi-perimeter formula, A(ΔCED) = √15. But, A(ΔCED) = ½ x ED x CF. So, CF = √15/2. In ΔCFD, Using Pythagoras theorem, $FD^2 = CD^2 - CF^2 = 4 - (\sqrt{15}/2)^2$. So, FD = 0.5. Since ABCD is an isosceles trapezium, AG = FD = 0.5. So, BC = GF = 8 – 0.5 – 0.5 = 7.

61. The problem becomes very simple if we plot the graphs of each of the curves.



We can now see easily that f1(x)f2(x) will always be zero, because for positive x, f2(x) is zero and for negative x, f1(x) is 0. Also, for positive x, f2(x) is zero and for negative x, f4(x) is 0. So their product is also zero.

62. Check the options for the following x values, -2, -1, 0, 1 and 2, you can conclude that option 2 is true.

63. If group B contains 23 questions, then there are 46 marks for group B. Now start plugging in the options.
If C = 1, then marks for group C is 3.
Group A will have (100 – 23 – 1) = 76 questions.
Total marks of the test will be 76 + 46 + 3 = 125.
We now need to check if in this case A carries 60% weightage or not. 76/125 > 60%, but just about.
Even if C becomes 2, then it is going to drop.
So answer is c = 1.

64. C has 8 questions and 24 marks.
Let B have 13 questions, so no of marks is 26
So A will now have 100 – 13 – 8 = 79 questions and 79 marks. Total marks in this scenario is 79 + 24 + 26 = 129.
Now we check the two conditions.
Is B > 20 %. At 26 / 129, it is just about.
Is A > 60%. At 79 / 129, it is just about.
If B drops by even 1 question, condition of B > 20% is going to be violated. So answer is 13 or 14.

65. The circumference of the ground is 2πr.
In 0.5 min distance covered is πr / 2
In 1 min distance covered is 1 * πr / 2 = πr / 2

	In 2 min distance covered is 2 * πr / 4 = πr / 2 In 4 min distance covered is 4 * πr / 8 = πr / 2 So in total of 7.5 min, a distance of 4*πr / 2 = 2πr or 1 round is covered. Time taken to cover the next round will be 8 + 16 + 32 + 64 = 120 minutes. So ratio of times taken is 120 / 7.5 = 240 / 15 = 16 : 1 This is the ratio of times for the second and first round, but it will be the same for any two successive rounds.
66.	Using the values of a_1, a_2 and the expression for a_j, the given series is 81.33, -19, -100.33, -81.33, 19, 100.33, 81.33, -19, ….. When the terms of this series are added, it is seen the the sum of every 6 terms, i.e., terms 1 – 6, terms 7 – 12, terms 13 – 18, and so on, is 0. The sum of the first 6002 terms is the same as the sum of 1000 sets of 6 terms and the last two terms. The last two terms are 81.33 and –19. Since the sum of each set of 6 terms is 0, the sum of the first 6002 terms is (1000 x 0) + 81.33 – 19 = 62.33.
67.	Any $a^3 + b^3$ will always be divisible by a + b. So $15^3 + 23^3$ will always be divisible by 15 + 23 = 38. Anything that is divisible by 38, will be divisible by 19.
68.	In order to reach point B from point A, we have to take 3 North steps and 5 West steps. Any path, say for eg, the corner path N N N W W W W W is an arrangement of these 3 Ns and 5 Ws. A total of 8! / (3! * 5!) arrangements are possible.= 56
69.	Let us assume that the outer circle had a radius = 8. So circle C1 will have a radius = 2. Circle C2 will have a radius = 1. Circle C3 will have a radius = 1 / 2 Sum of areas of C1, C2, C3… is 4 + 1 + 1 / 4 + …. So this is equal to 4 / (1 – 1 / 4) = 16 / 3 Original circle's area is $8^2 = 64$. Unshaded area to total area is (64 – 16 / 3) / 64. = (1 – 1 / 12) = 11 / 12
70.	We need to check with different values of *x*. If *x* = 2, u = 1 – 6 + 12 = 7. 2^7 is not 256. If *x* = 4, u = 4 – 12 + 12 = 4. 2^4 is 256. So the unique solution is *x* = 4.
71.	The color for the first strip has 4 choices. Subsequently we have 3 choices for each of the strips. So total no. of choices is 4 * 3^5 = 12 * 81, hence 1st opt
72.	Suppose *S* is the side of the cube. Then, DF = AG = CE = $S\sqrt{3}$, since these are the longest diagonals of a cube. These three diagonals are the sides of an equilateral triangle. In an equilateral triangle, the circumradius is $(1/\sqrt{3})$ times the side. So, the circumradius of the equilateral triangle is $(1/\sqrt{3})(S\sqrt{3}) = S$.
73.	Consider the square made by the two radii and the tangents to the circle which form the right triangle. It will have a diagonal of length – $2\sqrt{2}$. The point where the diagonal is intersected by the circle is at a distance equal to $2\sqrt{2} – 2$ from the vertex of the two walls. Let the radius of the small circle be r. Now the above distance is also equal to $r + r\sqrt{2}$ So $r + r\sqrt{2} = 2\sqrt{2} – 2$ Or $r = (2\sqrt{2} – 2) / (\sqrt{2} + 1)$ $= (2\sqrt{2} – 2) / (\sqrt{2} + 1) * (\sqrt{2} – 1) / (\sqrt{2} – 1)$ $= (2\sqrt{2} – 2) * (\sqrt{2} – 1) / (2 – 1) \Rightarrow 6 – 4\sqrt{2}$.
74.	If a place is as peaceful as a resort hotel out of season, the corridors cannot be anything but *empty*. *Hollow* is ruled out because we most often use it in the sense of importance of something. For a physically vacant place, the preferred word is *empty*.
75.	If people talk to each other in low-pitched voices, they cannot be *stentorian* or *loud* (the two are synonyms). *Faded* is out of question because it does not make any sense.
76.	If a person is led into scowling, his temper has obviously been set off.
77.	Both *strolled* and *stormed* need some preposition to make them meaningful. So they are ruled out. *Prowled* will not make sense in this context.
78.	The statement given is neither *devious* (indirect) nor *tactful*. Between *blunt* and *pretentious*, the former is definitely better because it implies the idea of lack of tact or grace over not having done one's due.
79.	The dues will increase with the accumulation of interest over unpaid amount and fines imposed thereon. Obviously, taxes are not imposed on unpaid taxes nor is principal in any way related to accumulation of dues.
80.	Normally, bank accounts and royalty funds are attached, i.e. rendered immune from any kind of operation in such cases. *Impounded* is used often in cases involving any physical property like vehicles etc. The words *closed* and *detached* are not meaningful in the present case.
82.	*Smashing* an auto in such a case will yield nothing. *Frozen* too does not make much sense, it is much more applicable to bank accounts etc. *Dismantling* and *seizing* it might yield something of value, but between the two, the dept. will better gain by seizing and selling it rather than dismantling it *per se*. (and selling it in pieces later)
83.	Options 2 and 4 are possible candidates, out of which the latter is the better one because it is a wrong-doer we are talking of, and not a wronged person, which option 2 indicates.
84.	B should have been "… pleaded guilty to ….". D should have been "….sentenced to …."
85.	Sentence C should have read like: "…… *she took a shower*…." Because taking shower means to take the instrument in one's hands.
86.	B should be changed to "…. efforts bore fruit……" C should have read like : "Everyone complimented ……"
87.	Option 1 is superfluous as it is full of many excess words. Option 2 is ungrammatical and so is true of option 4.
88.	*Estimated at* is used in a financial sense, so option 3 is ruled out. Option 1 is ungrammatical and so is opt 2.
90.	The phrase *made a bolt* does not make any sense.
91.	It should have been "…. *pass marks*…."
92.	In the fourth option, the intended meaning of *fallout* is result but the problem is: *fallout* is not used in this sense. Hence the answer.
93.	E is in logical continuation of B. The two neighbours being discussed in A are the two mentioned in D only, therefore D-A is a logical pair.
94.	The combination D-B is given on platter. But we cannot piggyback on it as it is present in all the options. Considerable help is provided by B-A as A certainly serves to amplify the idea given in B. Of the two options 2 and 4, the latter is a bit better because of a good general opening line.
95.	A bit of GK can help you here. Sentence D supports the idea given in line E and E explains B. So B-D-E is a good combination. B is by all accounts, a good opening comment and CA is not at all a logical pair, which leaves us with option 2.
96.	In this and the following question, you are supposed to distill the essence of the paragraph and present the bare soul, without excluding anything essential to the overall meaning. The rest of the choices given lack one or the other thing in terms of meaning, or misrepresent/ distort what is said in the para.
97.	The rest of the choices given lack one or the other thing in terms of meaning, or misrepresent/ distort what is said in the para.
98.	Refer to the last line of the 4th para. The rest of the options are not justifiable in the context of the article.
99.	Refer to the last lines of the 6th and the 4th paras.
100.	Refer to the first line of the 4th para. Even the rest of the examples given support this contention only that in

	reality, the industry has not produced anything radical so far in the name of change.
101.	Last para, read it carefully – the opening comments and the related example.
102.	The second line of the penultimate paragraph hints at this thing only.
103.	Please refer to the 4th line of the very first paragraph.
104.	Please read carefully the 5th para from the top.
105.	Options 2 and 3 are fully justified in the light of the 5th and 6th paras from the top. The 4th option is also justifiable in the light of the 5th paragraph. There is no support whatsoever for option 1.
106.	Refer to para 6, line 1.
107.	Please read the 3rd para carefully.
108.	Refer to the first paragraph.
109.	Refer to the 1st line of the penultimate para.
110.	Please read the 4th para.
111.	Para 3, last few lines
112.	Para 1, last two lines.
113.	Please refer back the last few lines of the 2nd para.
114.	Refer to the lines "there is no need ….." and "…..the vast majority….." from the last paragraph.
115.	Please refer back to the 3rd paragraph. Option 2 is not correct because it is a secondary comment made by another scientist.
116.	Options 1, 2 and 4 indicate their ferocious nature, while 3 does not.
117.	Refer to the last two lines of the very first paragraph.
118.	Options 4 and 2 actually support the hypothesis. Option 1 is based on pure hunch. The Tsavo lions' proposed similarity with the Pleistocene lions implies that the two groups should be alike as possible, but if the difference mentioned in Option 3 is true it obviously creates doubts about the truth of the theory.
119.	E supports the efficiency idea given in C. D is obviously commenting on efficiency. Hence the answer.
120.	C-B make a good pair because both mention pyramids. A is a logical culmination because it contrasts well with the preceding lines.
121.	In option 1, the idea of research giving us definitive answers is unnecessary as it is not supported by the para. Options 3 and 4 are not duly representative of the contents of the paragraph.
122.	Only option 4 captures the meaning in full measure.
123.	Option 3 talks of *exacerbating injustice*, which is the same idea conveyed by *compounded injustice* mentioned in the para. Option 3 is preferable to option 1 because the latter omits many significant details like the protest by the local communities. Option 4 is talking of only raw materials while there are other concessions also.