CAT 2007 Answer Key

1.	2	**21.**	3	**41.**	2	**61.**	1
2.	5	**22.**	3	**42.**	3	**62.**	2
3.	1	**23.**	2	**43.**	1	**63.**	1
4.	3	**24.**	1	**44.**	4	**64.**	3
5.	3	**25.**	4	**45.**	2	**65.**	5
6.	5	**26.**	1	**46.**	4	**66.**	4
7.	3	**27.**	4	**47.**	2	**67.**	5
8.	2	**28.**	5	**48.**	3	**68.**	2
9.	1	**29.**	5	**49.**	2	**69.**	1
10.	1	**30.**	1	**50.**	4	**70.**	5
11.	4	**31.**	4	**51.**	1	**71.**	2
12.	2	**32.**	3	**52.**	2	**72.**	4
13.	3	**33.**	5	**53.**	2	**73.**	1
14.	2	**34.**	2	**54.**	1	**74.**	5
15.	4	**35.**	3	**55.**	5	**75.**	3
16.	4	**36.**	5	**56.**	3		
17.	1	**37.**	1	**57.**	2		
18.	5	**38.**	1	**58.**	1		
19.	2	**39.**	5	**59.**	3		
20.	4	**40.**	2	**60.**	5		

CAT 2007 Solutions

1. When every element of even no. set is 1 less than the corresponding element of odd number set the difference of there average is also equal to 1

2. 10 year ago total age of 8 people = 231 years
3 year later total age of 8 people
= 231 + 8 × 3 – 60 = 195 years
After another 3 year total age of 8 people
= 195 + 8 × 3 – 60 = 159 years
Current total age of 8 member = 159 + 8 × 4
= 191 years

$\therefore$ average age of 8 members $= \frac{191}{8} = 24$ years

3. $f(1) = 3600$, $f(1) + f(2) = n^2 f(n)$
$3,600 + f(2) = 4(f2)$
$\Rightarrow 3(f2) = 3,600$
$f(2) = 1,200$ similarly $= f(3) = 600$, $f(4)$
$= 360$ $f(5) = 240$, $f(6) = 170$, $f(7) = 128$, $f(8)$
$= 100$ and $f(9) = 80$

4. In 18 ways we can pay the bill the ways are

50 Misos	10 Misos	1 Miso
2	0	7
1	5	7
1	4	17
1	3	27
1	2	37
1	1	47
1	0	57
0	1	97
0	2	87
0	3	77
0	4	67
0	5	57
0	6	47
0	7	37
0	8	27
0	9	17
0	10	7
0	0	107

5. The check was for Rs. 18.56.
Let x be the number of Rupee in the cheque, and y be the number of Paise.
Then $100y + x – 50 = 3(100x + y)$.
Therefore $97y – 299x = 50$.
There are many integer solutions, but we need one where $0 <= x <= 99$ and $0 <= y <= 99$.
One such pair of numbers is $y = 56$, $x = 18$.
So the cheque was for Rs. 18.56.

6. $\frac{1}{m} + \frac{4}{n} = \frac{1}{12} \Rightarrow \frac{n+4m}{mn} = \frac{1}{12}$
$12n + 48m = mn \Rightarrow 12n = m\,(n – 48)$
$m = \frac{12n}{n-48} \Rightarrow$ As m, n are positive integers and n is less than 60 only 3 values of n i.e 49, 51, 57 satisfy the condition

7. Let the average of class 2 be x and Class 1 be x – 1 (from A)
$\therefore 45 \times 100 = 50 \times x + 50\,(x – 1)$
$= 50\,(x + x – 1] \Rightarrow 100x – 50 = 4,500$
$100x = 4,550 \Rightarrow x = 45.5$
$\therefore$ average of class 2 be 45.5 and class 1 be 44.5
From 2 we can find out that weight of Deepak would be 45 – (– 45) = 90 kg.
Hence by combining 1 and 2 we can get this equation

$$\frac{44.5 \times 50 + D - P}{50} = \frac{45.5 \times 50 - D + P}{50} + 1$$

Putting value of the D we can find the value of P.

8. Taking the maximum value of diameter as 10 and radius as 5, the volume of the spherical tank happens to be $\frac{4}{3} \times 3.14 \times 5^3$
$\Rightarrow$ it happens to be 523 Kilolitres.
But the internal diameter is given to be at least 8.
Now because the exact value is not given, it cannot be determined whether it can be done or not by the 1st statement.
From 2nd statement we can find out the volume in cubic cm. of the material of tank that is we will get the value of R^3- r^3 as the external diameter is given in the question itself so therefore we can find the value of small r i.e. internal radius and by this we can find out the internal volume and will be able to confirmed whether or not tank capacity is adequate to meet ABC's requirement.

9. The minimum possible value of $x^2 + y^2 + z^2$ is at (29, 30, 30)

10. It is not possible with this condition
As if OM = 2 OL, square would not be possible.

11. The question should be started from the total time taken to travel both ways as 11 hours (it started from B at 8.00 am and reached back at 8.00 pm with a break of one hour in between from 3.00 pm to 4.00 pm at LOCAL time A).
Now the equation becomes as $\frac{3000}{x-50} + \frac{3000}{x+50} = 11$.
Either the equation can be solved or going to the next question it can be seen that the only possible satisfying this could be 550 kmph.
It being given that while going it was in the reverse of the wind direction, the relative speed happens to be 500 kmph.
The time will be $\frac{3000}{50} = 6$ hrs.
From 8.00 it should have reached at 2.00 p.m.
Given is 3.00 p.m. at A, hence there is a difference of 1 hr.

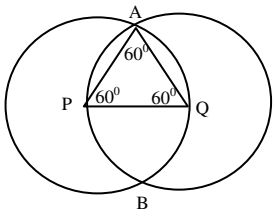
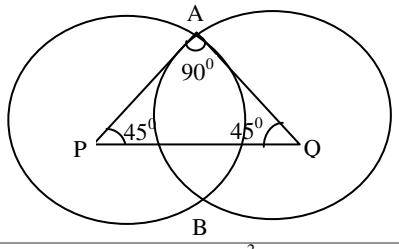
12. As calculated above it happens to be 550.

13. Option B is having the maximum positive and negative return.
So if we combine this Question & next question we will find that investing 36 % in option B and 64 % in option C would give guaranteed return of 0.2 % in either situation of rise in the stock market or fall in the stock market.
Other Answer choices give less guaranteed return than 0.2 %.

14. Same explanation as above.

15. Put the value of n and check from the options.
If we put n as 6, each pair in set would be having

	6 enemies i.e. if the sets are (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6), (4, 5), (4, 6), and (5, 6). Enemies of (1, 2) would be (3, 4), (3, 5), (3, 6), (4, 5), (4, 6), and (5, 6). i.e. 6 enemies.
16.	Considering the same situation as above, if we take (1, 2) & (1, 3) as 2 sets. Their common friends would be (1, 4), (1, 5), (1, 6), and (2, 3) i.e. their common element with the missing element and one set of their non common element. So total of 4 pairs. Put the value of n as 6.
17.	Put the value of n as 6 and K as 4, the total no. of players would be 18. So 1 option is satisfy. Alternatively since every time is having one player common with two other teams. Total no. of players would be always No. of teams X (No of players in each time -1)
18.	Only one case is possible i.e. is 7,744.
19.	Put in value of x as 20 & 40 make an equation with the given information it would be 5 (240 + 20B + 400C) = 3 (240 + 40B + 1600C). Now putting the value of x as 40 & 60 make an equation with the given it would be 3(240 + 40B + 1,600C) = 2(240 + 60B + 3,600C). Solving the two equations simultaneously, we get the value of B & C as 10 & $\frac{1}{10}$ respectively. Now the number of units of that would maximize the profits would be multiple of 10. Arbitrarily putting the value as 100 we get the profit as 760 putting the value as 99 and 101 decreases the profits. So the maximum profit is achieved at 100 units and hence it should be produced.
20.	Same explanation as above
21.	The difference in the fixed value is 11 which should be covered by the value of n. For Darjeeling Tea the value of n becomes constant after 100. So till 100, the gap would be covered at the rate of .05 × 100 = 5. After 100 the gap would be covered at the rate of .15 because the value of Darjeeling tea would become constant. So the remaining value of $\frac{6}{.15}$ would be equal to 40 days. Hence the total no. of days would be 100 + 40 = 140 days. Hence 120 days from January 01 would be May 20.
22.	Two cases are possible Case 1: if the center of the circles lie at the perimeter of the other than the 3 points would make an equilateral triangle with the value of each angle be 60^0 Case 2: if the centers do not lie at the perimeter of each other, then the radius of 1 would be tangent to the other and would make an angle of 90^0 with the radius of the other and the other two angle would be 45^0 each. This would also be the minimum value.

	Hence the value of the angle AQP would lie between 45 and 60.  
23.	Let quadratic function, $f(x) = ax^2 + bx + c$ $f(1) = 3$, $a\,(1)^2 + b(1) + c = 3$, $a + b + c = 3$ ----- (1) f(0) = 1, $a\,(0)^2 + b(0) + c = 1$, $c = 1$ --------- (2) using (1) and (2), $a + b = 2$ ------- (3) $\frac{df(x)}{dx} = 2ax + b = 0$ it attains maximum at $x = 1$, therefore $2a(1) + b = 0$ ---------(4) Using (3) and (4), we get $a = -2$ and $b = 4$ Therefore $f(10) = -2(10)^2 + 4(10) + 1 = -159$
24.	The question defines the function as $a_n = pb_{n-1}$ and $b_n = q\,b_{n-1}$ for even $n > 1$ $a_n = pa_{n-1}$ and $b_n = q\,a_{n-1}$ for odd $n > 1$ Take P as 3, Q as 5 as those are given to be positive. Thus a_1 and b_1 happens to be 3 & 5 respectively as they are given to be the same as p & q. Now find a_2 as 3 × 5 = 15. Find b_2 as 5 × 5 = 25. Similarly find the value of a_3 as 3 × 15 = 45 and b_3 as 5 × 15 = 75. Similarly a_4, b_4 are found to be 225 & 375 respectively. Putting the value of $a_4 + b_4$ as 600 in all the choices only one of the choice gives the answer as 600 and hence that is the answer.
25.	p is given to be $\frac{1}{3}$, Q as $\frac{2}{3}$. Thus a_1 and b_1 happens to be $\frac{1}{3}$ & $\frac{2}{3}$ respectively as they are given to be the same as p & q. Now find a_2 as $\frac{1}{3} \times \frac{2}{3} = \frac{2}{9}$. Find b_2 as $\frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$. Similarly find the value of a_3 as $\frac{1}{3} \times \frac{2}{9} = \frac{2}{27}$ and b_3 as $\frac{2}{3} \times \frac{2}{9} = \frac{4}{27}$. Similarly a_4, b_4 are found to be $\frac{4}{81}$ & $\frac{8}{81}$ respectively. Now the further values of a_5, b_5, a_6, b_6, a_7, b_7, a_8, b_8, a_9, b_9 happen to be $\frac{4}{243}$, $\frac{8}{243}$, $\frac{8}{729}$, $\frac{16}{729}$,

	$\frac{8}{2187}, \frac{16}{2187}, \frac{16}{6561}, \frac{32}{6561}, \frac{16}{19683}, \frac{32}{19683}$ respectively. As a_9 gives a value which is less than $\frac{1}{100}$. Thus it is the smallest odd value that gives you the answer.
26.	We have to mix O & Q. This is the only case possible.
27.	Going by options, P & S is not possible because none of them has fat in it. The ratio in which we should mix P and Q to get 10 % fat is 4 : 1. Solving it further for protein, we get protein as 22 %. So it is also not possible. For P & R, we get protein as 27.5 %. So it is also ruled out. Out of Q & S and R & S, protein content is at least 30 % but considering the cost factor, it is less for Q and S.
28.	Going by options, 2 : 1: 3, gives carbohydrate content is 51 %. So it is not possible. 4 : 1 : 2 gives carbohydrate content as 60 %. 2 : 1: 4 gives carbohydrate content as 50 %. 3 : 1: 2 gives carbohydrate content as 56.6 %. 4 : 1: 1 gives carbohydrate content as 62.5 %. Now considering the cost; with 4 : 1 : 2, we get the cost as 85.71. And with 4 : 1: 1, we get cost as 83.33.
29.	Going by options, O & P gives us only 25 % protein. So not possible. R & S gives us only 25 % carbohydrate. So also not possible. P & S gives us only 2.5 % minerals. So this is also not possible. Q & R gives us only 7.5 % carbohydrates. So this is also not possible. All conditions are satisfied for O & S.
30.	Using statement A, if 60 % of top performers are not athletes implies that 40 % of top performers are athletes which comprise 10 students. So total academic performers = 400. Hence statement A alone is sufficient.
31.	Given D > E, B > C. Also C's rank would be either 4 or 5. From 1st statement, we get that rank of A is 5, hence rank of C is 4. But we do not get any information about the ranks of any other person. So either B or D got the highest rank. So this statement is not sufficient. 2nd statement is also not sufficient as from this statement; we cannot infer rank of any person. Hence combining the two statements, we get rank of A → 5, C → 4, B → 3, E → 2, D → 1.
32.	If we take total employees as 100, then males = 30, females = 70. Female engineers = 70 × 0.1 = 7. Using 1st statement, there are 25 engineers. Since there are 7 female engineers, so there are 18 male engineers. So % age can be calculated. So this statement is sufficient. Using statement B, we get male engineers as 8.4.
	So % age can again be calculated. Since both the statements are individually sufficient to answer the given question, so answer is 3rd option.
33.	At the half – time, score could have been 0-3 or 1-4 or 2-5 and so on for M & M to its opponent. Using statement A, we get the goals scored by M & M but we do not get any information about the goals scored by the opponent. So this statement individually is not sufficient. Using statement B, we get the information about the opponent but not of M & M. So on combining the two statements, we get the final scoreline as 4-4 or 5-4. So we are not sure whether M & M won or not. So answer is 5th option.
34. – 37.	Given the SP for the year 2006 was Rs. 125 and maximum production capacity is 2000 units. If we analyse the given table carefully, we get that the fixed costs are Material, Labour, Consumables and Operating cost of machines. Other costs i.e. Rent of building, Rates and taxes, Repair and maintenance expenses and Selling and Marketing expenses are fixed. The multiplying factors of Material costs and Labour costs are 50 and 20 respectively. There is no fixed pattern for consumables but we can notice that with increase of 100 units, there is a price decrease of Rs. 200. And the multiplying factor of Operating cost of machines is 30. Also fixed costs are approximately 1,200 + 400 + 800 + 5,800 = Rs. 8,200. Variable costs for given number of units needs to be calculated separately.
34.	Using the multiplying factors given above, we get the total cost of 1400 units as Rs. 1,49,400 approximately. Hence cost / unit = $\frac{149600}{1400}$ = Rs. 107 approximately.
35.	If production is x units, then the cost of production is $50x + 30x + 20x + 8{,}200 + 1{,}400 = 125x$. Solving this equation, we get x = 384.
36.	For 1400 units, we can calculate the profit as Rs. 16,650. For 1800 units, we get the profit as Rs. 24,150 and for 2000 units, we get the profit as Rs. 27,900.
37.	Maximum profit would be obtained at 1700 units. On calculation, we get the profit as Rs. 25,400 approximately.
38. – 41.	

	Male (M)	No. of Males	Vegetarian (V)
Class 12	0.60	48	0.40
Class 11	0.55	44	0.50
Secondary Section	0.45	288	0.55
Total	0.475	380	0.53

	No. of Vegetarian	Total No. of Students
Class 12	32	80
Class 11	40	80
Secondary Section	352	640
Total	424	800

38. % of vegetarian students in class 12 = $\frac{32}{80} \times 100 = 40\%$

39. 25 % of 32 = 8
∴ No. of male non-vegetarian = 48 – 8 = 40 &
No. of female vegetarian = 32 – 8 = 24
∴ Difference = 40 – 24 = 16

40. % of male students in secondary section = $\frac{288}{640} \times 100 = 45\%$

41. Secondary Section:

	VEG.	NONVEG.	TOTAL
Males	176	112	288
Females	176	176	352
Total	352	288	640

42. Cost of Malaysia = (11,000 + 6,000) + (10,000 + 8,000) + (8,000 + 4,000) = 47,000
Is lowest of all

43. Cost in India = 8,500 + 9,000 = 17,500 is expensive of all.

44.

	India	**Thailand**
Cost in Dollars	3,000 + 5,000 = 8,000$	4,500 + 6,000 = 10,500$
Cost in Bahts	8,000 × 40.928 × $\frac{32.89}{40.928} = 263120$	10,500 × 32.89 = 3,45,345

Cost in India = 2,63,120 + 15,000 = 2,78,120 bahts.
Cost in Thailand = 3,45,345 bahts
∴ Difference = 67,225 bahts

45. Initial cost was 5,500 × 40.92 = 2,25,104 this cost remains the same now 1 USD is 35 INR.
So the no. of USD is this divided by 35.
Which equals 6,431.54.
So the difference is 9,000 – 6,431 = 2,500 USD and thus it is answer.

46. The shortest route occurs to be A-C-F-J

Route	**Kms**	**Price**
A - C	790	1350
C – F	410	430
F - J	970	1150
TOTAL	2170	2930

So, the price for travelling is Rs.2930.

47. The lowest price occurs at route A-H-J.

Path	Distance	Price
A - H	1950	1850
H - J	400	425
TOTAL	2350	2275

Now if the company charges 5% below the minimum price of Rs.2275 then it should charge 0.95 × 2275 = Rs.2161.

48. If C, D, H are not available then from the table it can be seen that the minimum price is from the route A – F – J i.e. is 2,850.

49. Since the margin is 10 % and the minimum cost from A to J is on the route A – H – J i.e. 2,275.
The cost would be $2275 \times \frac{100}{110}$ which comes out to be 2,068.5 and the distance traveled is 2,350 so cost per km would be $\frac{2,068.5}{2,350} = 0.88$

50. Since the minimum cost has to be taken the same route as above i.e. A – H – J has to be taken so the distance traveled of this route would be 2,350 km.

51. A clear hint is given in the first line of the passage. … 'Human biology does nothing to structure human society'.
The next para carries the idea forward and talks about reciprocal roles and their role in co coordinating human behavior.
Therefore this is the thematic highlight of this passage.

52. Refer to the last paragraph.
This clearly shows that a father playing his role "tongue in cheek" would have been acceptable if biological linkages structured human society.

53. The statement tells us that some roles are so absorbing or interesting that the distinction between the role being played and the underlying self gets blurred.
Refer to the first line of the fifth para.

54. A – 'returned to home' is a wrong usage.
B – It should be 'lay my hands upon'.
D – It should be 'a Shaliach, a sort of ……. …
C and E – The right answer.

55. A – 'In recession' is a wrong usage.
B – The right answer.
C – Usage of words assuming and hypothetically amounts to redundancy.
D – It should be 'a temporary stimulus'.
E – Instead of verb 'affect'. The usage should be of noun, 'effect'.

56. A – instead of 'told'. It should be 'it is sometimes said.'
B & D – The right answers.
C – The phrase is 'handed down to us.'
D – After 'hence' the subject is missing.

57. Refer to the end of the first paragraph. The writer uses the expression "like a Madonna from a Madonna" to illustrate the fact that the artist does not create anything new but deepens and purifies the old, so the difference in two artistic creations is due to the difference in artistic interpretation.

58. Refer to the last few lines of the passage.
The sea and 'other creation' help Rilke to "understand the situation of the poet, his place and function in this age".

59. Refer to the beginning of the 2nd paragraph.
"Such a period was the Renaissance …."
The writer goes on to discuss how the poets and artists of this period could break away from the old order and explore the new.

60. The author looks at an organization as a person and takes the example of acquisitions and mergers to explain the importance of characters in an organization.

	The personification of the organization is thus used as a textual device so that macro level theories are better understood.
61.	As the concluding sentence, it talks about what has been said in the whole paragraph. It reiterates what has been stated in the first line……. 'photographs still retain……' and also talks about the 'technical development' referred to in the rest of the lines.'
62.	The writer gives the details of Mma Ramotswe's inventory, her few possessions, and then goes on to add that she had 'human intuition and intelligence' which were sufficient to run a detective agency. These two things are obviously never included in an inventory.
63.	The attempt to describe a relationship among rules, paradigms and normal science begins from the very first sentence itself and finds manifestation in the second and third paragraphs as well.
64.	The term refers to a sense of inherent loyalty - not to something as narrow as a laboratory but to a certain form of scientific inquiry. We also lack information on the trends / patterns.
65.	Please refer to the penultimate line of the second paragraph which says … *if the coherence is to be understood…… some specification of common ground……* Besides, also refer to the succeeding line to get the complete answer. The answer gets more support from these lines in the first paragraph… *quasi-standard illustrations of a given speciality*. The rest of the choices are not supportable in the context of the passage.
66.	*Council* is a collective noun and will take a singular verb. The critics can only criticize and not *censor* anything.
67.	*Farther* is used for distance while further means to a greater degree. The appropriate word in the second sentence is *historic*, meaning – of great importance. Mistrust means ill placed trust whereas the old man does not seem to believe much in new technology. Films are based on *true* stories. *Compliment* means to praise while *complement* means to complete.
68.	*Regretfully* is the best option. It is an expression of disappointment. Sensuous is the appropriate usage. It relates to the pleasure of senses. *Besides* is the correct word, *beside* is a preposition. *Stationary* means immobile, hence the correct option. Water rises *above* the danger mark and not *over* the danger mark.
69.	The fourth line of paragraph 3 talks about the "confounding effects of natural variation in additional variables besides the one of interest", thus conveying the differences in the evolution of isolated islands and the potential inherent in studying such differences.
70.	Please refer to these lines from the second and third paragraphs, *Prediction in history, as in other historical sciences, ….. .* and *While neither astronomers studying galaxy formation nor human historians….*
71.	Please refer to the second line of the third paragraph which explicitly talks about this fact.
72.	*It* of line C refers to the *validity* being discussed in E. Thus EC is a good combination. BD is also a great combination as D tends to support B.
73.	Line A talks of two types of experiences, medical and natural, an idea which is further built on by the last line E which refers to the third discourse. Note the word these in line D which refers to the three frameworks. B gels very well with D, which should lead us to option 1.
74.	In a logically sequenced paragraph we should first talk of the overall changes brought about in the political dispensation followed by the changes in mass media. This gives us BC. Note carefully *such developments* which alludes to B and C and also *a different group of analysts* in *E,* which is linked very well with *external analysts in* D. Hence BCDE.
75.	C makes the strongest link with A as it elaborates upon the squatters mentioned in A. C also begins to speak about the squatters at the authors farm and this thought is carried forward by B. The "maize" clue then leads us to E. Hence A-C-B-E-D is the answer.