

Mock CAT – 8

Answers and Explanations

1	c	2	d	3	c	4	b	5	c	6	d	7	b	8	a	9	c	10	d
11	b	12	c	13	b	14	c	15	d	16	a	17	b	18	c	19	d	20	b
21	b	22	b	23	c	24	a	25	c	26	d	27	b	28	c	29	b	30	a
31	b	32	c	33	b	34	d	35	b	36	d	37	b	38	a	39	b	40	c
41	b	42	d	43	c	44	c	45	a	46	a	47	a	48	d	49	c	50	a
51	a	52	d	53	a	54	a	55	b	56	d	57	a	58	c	59	d	60	d
61	c	62	b	63	a	64	d	65	b	66	b	67	b	68	d	69	d	70	c
71	b	72	b	73	a	74	d	75	a	76	a	77	b	78	c	79	b	80	d
81	b	82	b	83	c	84	d	85	c	86	a	87	d	88	b	89	b	90	c
91	b	92	d	93	d	94	c	95	b	96	a	97	a	98	a	99	c	100	d
101	a	102	c	103	a	104	d	105	a	106	b	107	d	108	a	109	b	110	c
111	a	112	a	113	a	114	b	115	d	116	c	117	c	118	c	119	b	120	b
121	b	122	b	123	d	124	c	125	b	126	c	127	d	128	b	129	d	130	a
131	b	132	d	133	d	134	c	135	d	136	c	137	c	138	a	139	a	140	b
141	b	142	b	143	d	144	d	145	c	146	c	147	a	148	a	149	a	150	a
151	b	152	d	153	b	154	a	155	d	156	c	157	d	158	c	159	d	160	b
161	c	162	d	163	b	164	b	165	a										

Scoring table

Section	Question number	Total questions	Total attempted	Total correct	Total wrong	Net score	Time taken
EU + RC	1 to 55	55					
QA	56 to 110	55					
DI + DS + AR	111 to 165	55					
Total		165					

1. c The author mentions this in the second para of the passage and then goes on to say – “including 50 gold medals and dozens more silver and bronze. In the men’s 1,500-meter run, for instance, Hicham El Guerrouj of Morocco grabbed gold, Bernard Lagat of Kenya took the silver....”. This makes choice (c) correct.
2. d This term is used in the third para where the author mentions – “Eight years ago in Atlanta, Nike ambushed basketball sponsor Champion by sneaking giant Swoosh signs into the arena. When the cameras panned the stands, TV audiences saw the Nike logo loud and clear, while Champion had nothing”. This is indicative of guerrilla tactics where Nike used clever tricks to steal Champion’s thunder. This makes choice (d) correct.
3. c The author has mentioned this incident in the fourth para and describes how Scott, the marketing chief was not sure about the huge increase but he was faced with a different question regarding whether this is enough or his division needs more money. This makes choice (c) correct.
4. b The author makes this point at various places in the passage - The seventh para – “Nike believes its newfound discipline will enable it to meet its targets of 15% average annual profit growth and revenue growth in the high single digits”. The sixth para – “In the old days, Nike operated pretty much on instinct. It took a guess as to how many pairs of shoes to churn out and hoped it could cram them all onto retailers’ shelves. Not anymore.” The fifth para – “In the past few years, the company has devoted as much energy to the mundane details of running a business — such as developing top-flight information systems, logistics, and supply-chain management — as it does to marketing coups and cutting-edge sneaker design”. All of them describe the blend of creativity and discipline that is being adopted by Nike.
5. c The first line of the ninth paragraph, describes the faltering of the iconoclastic company when Phil Knight stepped in. The events that led to it are described in the first lines of the eighth para. Options (a), (b) and (d) are mentioned explicitly. Phil Knight’s traveling was not a symptom of the company faltering but a personal decision. This makes choice (c) correct.
6. d The author mentions this in the second last para – “Meanwhile, Nike has started paying serious attention to its handful of acquisitions, once treated as more of an afterthought. After buying up Cole Haan almost 15 years ago, Nike struggled to add any real value at the dress-shoe outfit. But lately, Nike managers have figured out that by giving their acquired brands some independence, rather than forcing Nike’s testosterone-laced corporate culture on them, they can achieve better results”. This makes choice (d) correct which summarizes the change in policy.
7. b The author makes this point in paras five and six. Para five talks about a future policy decision and Kerry’s quote in the sixth para talks about the rationale, which is clearly to tax them heavily and invest that in areas such as “healthcare, public education” – human capital. This makes choice (b) correct.
8. a The author considers this scenario in para five. He mentions all reasons except (a) which states a relationship between this decision and interest rates, something which is not stated in the passage with regard to the GOP’s actions. This makes choice (a) correct.
9. c The author makes this point in the last line of the second para with reference to how American voters do not know enough about him and have misinterpreted policy stands for instance with likely tax decisions. This makes choice (c) correct.
10. d The author lists out the points on Kerry’s agenda in the opening lines of the third para and this makes it a specific detail question. The author does not mention Insurance costs and thus choice (d) is correct.
11. b The author makes this statement in the last line of para eleven. Prior to this, the author lists down reasons why his education funding policy is looked at askance – “Others worry that Kerry shortchanges preschool programs and aid for poor children”. Preschool programmes means early education and hence choice (b) is correct.
12. c The author makes this point in para twelve and he mentions – “but Kerry offers two goodies to tilt the table. To entice companies to bring home profits earned abroad, he dangles a one-time reduced 5% tax on repatriated earnings. And he promises to cut the top tax rate for all corporations from the current 35% to 33.5%”. Choice (d) is incorrect because it mentions the tax cut occurring at the bottom whereas Kerry proposes it in the top bracket. This makes choice (c) correct.
13. b The author uses these instances in the third and the sixth para. The author goes on to mention “But Puerto Ricans are so proud of their island that some of them can’t help embellishing a bit” and he qualifies these comments as chauvinism in the eighth Para.. This makes choice (b) the best option.
14. c The author makes this point in the last lines of the ninth para and mentions – “To my mind it’s a symbol of the extent to which this strategic Greater Antilles island, roughly 35 miles wide by 110 long, fourth largest in the Caribbean, has been coveted by four different nations at one time or another for over 500 years”. This is a specific detail question and it makes choice (c) correct.
15. d The author mentions the masks in the fifteenth and the sixteenth paras and mentions “...when thousands of islanders come to watch *bomba* dancers and revelers wearing *vejigante* masks”, “Originally they were intended to frighten the irreligious back into church; now the intent is to have fun”. This makes choice (d) correct.

16. a The author mentions the hotel in the eighteenth para and qualifies his comment by saying "Puerto Rico's best-known luxury resorts, the guest reclines at the top of the food chain, with a read-your-mind-and-do-it-for-you staff of around 2,000 people lined up below". This makes option (a) correct.
17. b A specific detail question, the answer is in the thirteenth para – "After Spain abolished forced servitude in 1873.....". This makes choice (b) correct.
18. c Usually travel pieces are descriptive and this is the same case here. Condescending describes an attitude of contempt, which is absent, and the author has not made a strong value judgment. His comments about their chauvinism are insightful but that is not the tone of the entire passage and is too narrow a choice. This makes choice (c) correct.
19. d The author mentions this in the sixth para where he states "But they wanted to get their rocks off, too. So why not add to all the reasons why the Western has gone into its famous decline the way the genre has steadily ignored the emotional lives of its characters?" This clearly makes choice (d) correct.
20. b The author starts describing the two movie houses in the second para. While talking about the house in *The Searchers* he says "That old place, the Edwards house, was square and cosy – it's what a pioneer would have put up, if he'd had the construction crew from a major studio ready to do it for him. It had bricks of stone cut to size somewhere, and lengths of timber from trees that don't actually grow in those parts". These comparisons are made to highlight the fact that it was tailor made for the film and was not how a normal house in Monument Valley looked like. This makes choice (b) correct.
21. b The author makes this point in para seven when he says "Moving on' could be a generative force that condoned infidelity, promiscuity and polygamy, a Western condition that's far from simply Mormon." This reflects a deprecatory attitude to "moving on" being interpreted as infidelity. This makes choice (b) correct.
22. b The author uses this word in the first line of para four. "I do not mean to be facetious about Ford's legendary place. He then gives reasons to support his negative opinion and this makes choice (b) correct.
23. c The author is evaluating these sets of differences in the third para. "The interesting thing about *The Missing* is the undercurrent of dissent Lily presents to Maggie's pioneering commitment which is more than Lucy or Debbie Edwards ever manage in *The Searchers*." Lily is the child in *The Missing* and so choice (c) is correct.
24. a The author delves into this in the fourth para. "So Debbie Edwards in *The Searchers* will turn into Natalie Wood, and no matter how hard her life is supposed to have been with that cruel Comanche chief Scar, somehow, after five years roaming the south-west, she has a hairdresser, false eyelashes, a very urban modern look and that knockout robe, in the dark, dusky pink. Somehow, somewhere, Scar is picking up *Seventeen* magazine for her. Olive Oatman, a real settler, was captured by Mojave Indians in the 1850s when she was 13. She was away five years, and when found her lower face was tattooed so it looked like a beard, to signify her slave status". The first few lines as well as the example of Olive Oatman prove that the film's picturisation is very far from reality where Natalie Wood's Hollywood presence is obvious. This makes choice (a) correct.
25. c This area is dealt with during question 5. Except choice c, the rest of the options are mentioned verbatim in the answer as given by the interviewee. This makes option (c) correct.
26. d This issue is dealt with in Question 6. The interviewee talks about how the image of Microsoft as a company that is evolutionary is not necessarily true in spite of the fact that 25 % of revenues come from one product that is used to fund the revolutionary projects. This makes choice (d) correct.
27. b The interviewee is responding (Question 7) to the popular allegations against Microsoft of being a company that builds on other companies' failures (fumbles). The interviewee refutes this and starts using sarcasm to elaborate on what he means – that Microsoft management meetings revolve around discussing other companies' fumbles which is absurd. He ends the question at "This is nonsense". Pedantic is incorrect as he is not showing off his language, and humour is not used in this case, he is painting an absurd picture to let the interviewer know that this is nonsense. Sarcastic is the correct option. This makes choice (b) correct.
28. c This issue is raised in Q 9, where the interviewer asks about the existence of the Chinese wall and mentions – "...thereby breaching the Chinese wall, the ethical boundary that's supposed to separate them?". This makes choice (c) correct.
29. b These issues are raised in questions 17 till 20. Its mentioned in question 20 that "This also happened to IBM and AT&T, with the latter being broken up". This makes choice (b) false and hence correct.
30. a A specific detail question, the answer is in the last line of the seventh para - "...his American record sales earned the King 45 gold records, still a record.". This makes choice (a) correct.Q1.7
31. b The author has described the life and contributions of a musician. Clearly choice (a) is incorrect as the passage is not written by Presley, choice (c) is incorrect because there is no analysis per se and choice (d) is wrong because the author is not sympathizing with any situation. Therefore, Choice (b) is correct.
32. c The answer is provided from paras 2 to 5. Option (c) best describes the chronology in the correct sequence.

33. b This quote appears in para eight. Before this Drew mentions "No one sang so many different kinds of music as well as he sang them at such a high level for such a long time — rock, gospel, country, standards". No where is it mentioned that these performers were his contemporaries, so choices (a) and (d) are incorrect. According to this para, then choice (b) is correct.
34. d The issue of influences is dealt with in paras 10 and 11. All of these have been mentioned as influences. Choices (a) and (b) — "... and Presley grew up as Gladys and Vernon Presley's only child. As a boy, Presley attended all-night gospel sings with Gladys, and soon enough, he and his parents formed a popular singing trio at church retreats, revivals, and county fairs". Choice (d) — "...he began to frequent the black R&B acts on Memphis' club-lined Beale Street". This makes choice (d) correct.
35. b A specific detail question, the answer is in the first para. "And performers' hips stayed in a nice straight line". This makes choice (b) false and therefore correct.
36. d Option (d) captures all the aspects of the paragraph.
37. b Options (a), (c) and (d) represent individual facets, only b captures the essence.
38. a All the details are covered in option (a).
39. b Captures all the details provided by the author.
40. c Options (a), (b) and (d) do not cover all the aspects of the paragraph, hence (c) is correct.
41. b The milk kept in the glass is still good. (milk is kept in the glass)
42. d It is important to write one's will himself. (itself cannot write the will)
43. c The kneading board was made of plastic. ('made of' is correct usage)
44. c Vivek had a strange political idea. (misplaced modifier)
45. a We had to swim for 20 minutes to reach the shore. (We do not reach 'for' the shore)
46. a This para deals with visiting a restaurant and presents an account of what transpires. The first sentence mentions how the headwaiter answered a lot of questions. Out of the options, sentence D mentions what some of those questions were. Sentence E describes what could be a possible perception by "him" — which is the headwaiter and hence sentence E is next. Sentence B is one of the observation regarding the waiters and sentence C describes whom they have replaced. Sentence F finishes the author's perception of these new waiters. This makes choice (a) correct.
47. a The first statement mentions a new problem that is plaguing Mohammed Fayed. Out of the options, sentence (c) is the most apt as it describes what this possibly could be. Sentence (b) starts off the accusation but doesn't describe what it is. Sentence (b) should follow sentence (c). Sentence (e) then, explicates upon it by mentioning the import of the accusation. Sentence (d) then goes on to mention why this would irritate the Harrods customer who prides himself on being a connoisseur. Sentence (f) then describes it exactly. This makes choice (a) correct.
48. d The first sentence describes ethnography and traces how it was first incorporated into mainstream research. Sentence D then takes it a step forward and mentions a research person who talks about how she first used it 13 years ago. The rest of the sentences are quotes made by her and are easier to understand in terms of the sequence. Sentence B then talks about her approach and sentence E is a comment on how this was perceived at the time. Sentence C is a reflective comment on how the times have changed with the last sentence F describing specific instances of the same. This makes choice (d) correct.
49. c The first sentence describes an observation. Out of the options provided, sentence D presents an example of a company in London issuing stock and is the next sentence. Sentence C comments introduces an analogy with an American company which went through the same "sequence of events". Sentence E then goes on to describe the fate of Priceline and sentence B mentions how these attributes were shared with Lastminute.com. sentence F qualifies the comment made in the first sentence by highlighting a difference between the two bubbles. This makes option (c) correct.
50. a The opening sentence introduces the existence of a story. Sentence C then goes on to mention who the story is about. Sentence B tells the reader about the plot of this story and sentence D then describes Sir Peter's reaction to a set of events. Sentence E completes the account of his action. This makes choice (a) correct, which sentence F remarking on the relevance of this story. This makes choice (a) correct.
51. a Sentence C and D can be possible first sentences, but sentence D is better because sentence C mentions an armada and D describes an event which is earlier in the chronology (1519). Sentence E then describes the objective of the Armada and sentence C describes the fate of the Armada and what happened in 1522. Sentence A mentions what had transpired and sentence B then makes a correction in terms of what is generally believed based on the sequence of events as had been mentioned. This makes choice (a) correct.
52. d Out of the options given, sentence D is the best option for the opening sentence. Sentence A then gives advice to a manager who is dealing with poor performance, sentence B mentions that these problems are difficult to solve and sentence C goes

on to describe why that is so. Sentence E, highlights the relevance of knowing this for a manager inspite of the fact that they are difficult to correct. This makes option D correct.

53. a Out of the options presented, besides choice (e), it is obvious that the rest are building up on sentences. So, it should be the first sentence, sentence (b) then talks more about this "man's judgment in the wider sense of the word" and sentence (d) goes back to Mr Hutton's case and looks at the fact that his prejudices have been clear for long. Sentence (c) then mentions "these" as being foremost in his mind, which makes it the next sentence. Sentence (a) talks about the Kelly report again and mentions a certain fact that merited a lot of media attention. This "fact" could only be "the most obvious fact" as mentioned in sentence (d). This makes choice (a) correct.
54. a Out of the options present, all options besides (d) builds on a previous sentence. Sentence D comments on an artist and an area where we did not excel. Sentence A then mentions why this was a surprise in his case, sentence C then surmises one of the reasons why this was so and describes how his art had shifted. Sentence B then mentions, how this was by chance and there was a possibility that he would involve himself in some other facet of painting. Sentence E then mentions why this did not happen and his foray into landscape painting was only experimental. This makes choice (a) correct.
55. b Out of the options given, sentence B introduces a film, and sentence D mentions what the opening situation shows hinting at the presence of a sixtysomething guy. Sentence C then goes on to describe the sixtysomething guy as the actor Jack Nicholson and sentence A, then explicates upon the attribute of the character he is playing in the movie. This makes choice (b) correct.

For questions 56 and 57:

	E	A	T	
	T	H	A	T
A	P	P	L	E

The hints are:

1. A has to be 1.
2. T has to be 9.
3. So E is 8
4. If three digit number added to 4 digit number to get a 5 digit number then the second digit of APPLE has to be zero.

Using all these we get

	8	1	9	
	9	2	1	9
1	0	0	3	8

56. d

57. a

58. c If x is the HCF of (x, y, z) then LCM of (x, y, z) has to be LCM of (y, z).

$$\begin{aligned}
 59. d \quad 17^{24} - 11^{24} &= (17^{12} - 11^{12})(17^{12} + 11^{12}) \\
 &= (17^6 - 11^6)(17^6 + 11^6)(17^{12} + 11^{12}) \\
 &= (17^3 - 11^3)(17^3 + 11^3)(17^6 + 11^6)(17^{12} + 11^{12}) \\
 &= (17 - 11)(17^2 + 11^2)(17^3 + 11^3)(17^4 + 11^4) \\
 &\quad (17^2 + 11^2 - 17 \times 11)(17^4 + 11^4 - 17^2 \times 11^2) \\
 &\quad (17^8 + 11^8 - 17^4 \times 11^4)
 \end{aligned}$$

60. d The maximum possible value of $MX_1 = 100$
And the minimum possible value of $MN_2 = 1$
So, the difference $MX_1 - MN_2 = 99$

61. c In set S_1 , 48 elements can be selected by ${}^{50}C_{48}$ ways (i.e. from 51 to 100) and other two elements in S_2 can be selected by ${}^{50}C_2$ ways (i.e. from 1 to 50)
So, the number of sets S_1 can be formed by ${}^{50}C_{48} \times {}^{50}C_2$ ways.

62. b The minimum possible value of $|MX_1 - MX_2| = 100 - 99 = 1$ and minimum possible value of $|MN_1 - MN_2| = 2 - 1 = 1$
Hence, $|MX_1 - MX_2| = |MN_1 - MN_2|$

63. a For maximum value of the fraction, denominator has to be minimum.

Compare the options

(a) and (b), $n^2 - n - 6 < n^2 - n$, $n > 3$,

(a) and (c), $n^2 - n - 6 < n^3 - n$, $n > 3$

(a) and (d), $n^2 - n - 6 < n^2 - 4$, $n > 3$

So, $n^2 - n - 6$ gives the minimum value.

Hence, the fraction $\frac{1}{n^2 - n - 6}$ will give the maximum value.

64. d $(n^{17} - n) \{(17 - 1)^n - 1\}$ is divided by 289 or 17×17 . Here $n^{17} - n$ is divided by 17. If $\{(17 - 1)^n - 1\}$ has to be divided by 17 only when n is even. Out of the given options only (d) is the answer.

65. b The number that he got was 25x2536. So, the number has to be multiple of 3. Among the choices only 4 is satisfied the condition.

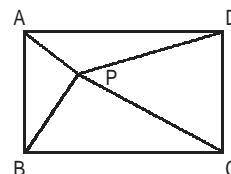
66. b If $AB = AC$, then it is isosceles triangle.
If $BD = DC$, then AD is the altitude to BC.

$$\text{Hence, } AD = \sqrt{10^2 - 8^2} = 6 \text{ cm.}$$

So, $ED = 1.5 \text{ cm.}$

$$\text{Hence, } CE = \frac{\sqrt{265}}{2} \text{ cm.}$$

67. b



For any point P in a rectangle

$$PA^2 + PC^2 = PB^2 + PD^2$$

$$\text{So } 3^2 + PC^2 = 4^2 + 2^2$$

$$\Rightarrow PC = \sqrt{11} \text{ m}$$

68. d We don't have their speeds. So we cannot determine the ratio of their times.

69. d We don't have their travelling distance because they can travel anywhere in the path. So we cannot determine the ratio of their speeds.

70. c $\angle AOD = 210^\circ$. [Because AB, BC, CD are of same length they subtend 70° each]

$$\text{Therefore } \angle AED = 105^\circ$$

$$\text{So, } \angle ADE = \frac{180 - 105}{2} = 37.5^\circ$$

71. b Each of A, B, C has completed $\frac{1}{3}$ of the work. So if A had worked for x days, B would have worked for 2x

days and C would have worked for $\frac{2x}{3}$ days.

$$\text{Hence } x + 2x + \frac{2x}{3} = 3$$

$$\therefore x = \frac{9}{11} \text{ days}$$

72. b $\frac{1}{n!} \left[\frac{n!}{(n-1)!1!} + \frac{n!}{(n-2)!2!} + \dots + \frac{n!}{(n-1)!1!} \right]$

$$= \frac{1}{n!} ({}^nC_1 + {}^nC_2 + \dots + {}^nC_{n-1})$$

$$= \frac{1}{n!} (1 + {}^nC_1 + {}^nC_2 + \dots + {}^nC_{n-1} + {}^nC_n - 2)$$

$$= \frac{1}{n!} (2^n - 2)$$

$$= \frac{(2^n - 2)}{n!}$$

73. a The odd numbers are 1, 3 and 5. The probability when 1 and 3 except 5 would be shown

$$\text{on the faces} = \left(\frac{2}{3}\right)^5$$

So, the required probability when product ends in 5

$$= 1 - \left(\frac{2}{3}\right)^5$$

74. d In 2n consecutive natural numbers, n numbers are even and n numbers are odd. If we take n + 1 number, one number has to be odd. So, probability of n + 1 number whose HCF is 1 = 1.

75. a (1) Number of natural numbers solution to $x + y + z = 15$ is ${}^{14}C_2 = 91$
(2) Number of whole number solution = ${}^{17}C_2 = 136$
Therefore number of solutions with zero = $136 - 91 = 45$.

Out of these there are 3 solutions with 2 zeroes. Remaining 42 solutions are with 1 zeroes.

Therefore total number of solutions are

$$\text{I. } 91 \times 2 \times 2 \times 2 = 728$$

$$\text{II. } 3 \times 2 = 6$$

$$\text{III. } 42 \times 2 \times 2 = 168$$

$$\text{i.e. } 728 + 6 + 168 = 902$$

76. a Total number of ways from A to C = $\frac{9!}{5! \times 4!} = 126$

$$\text{Number of ways from A to B} = \frac{4!}{2! \times 2!} = 6$$

$$\text{Number of ways from B to C} = \frac{5!}{3! \times 2!} = 10$$

Number of ways when a man cannot pass a point B = Total number of ways — (Number of ways from A to C) \times (Number of ways from B to C)
= $126 - 6 \times 10 = 66$

77. b Shaded region in $A = 32\pi - 16\pi - 16 = 16(\pi - 1)$ sq. m

$$\text{Region in B} = 32\pi - 16\pi - 8 \times 4(\sqrt{3} - 1) \text{ sq. m}$$

Therefore change = $-(16 - 8 \times 4 \times 0.73) = -7.36$ sq. m
Decrease of Rs. 73.6

78. c The sequence of the numbers follows this pattern.

Number	Last term of the number
1	1
2	3
3	6
4	10
\vdots	\vdots
N	$\frac{N(N+1)}{2}$

We have to find the value of N for the 2000th term. Using iteration we find that if $N = 62$, the last term that

ends with N is $\frac{1}{2} \times 62 \times 63 = 1953$.

Therefore, the next 63 terms are 63.

So the 2000th term is 63. So the remainder is 3.

79. b Sum of the two sides of a triangle is greater than the third side. So $x + xr > xr^2$, $x + xr^2 > xr$ and $xr + xr^2 > x$. Solving these we get r cannot be 1.65.

80. d The given triangle is an isosceles triangle. The point B can be anywhere. So we cannot find the coordinates of point B.

81. b If $\frac{x^2 + 12x + 12}{x^2 + 3x + 3} = k$, then

$$(k-1)x^2 + 3(k-4)x + 3(k-4) = 0$$

For all real values of x

$$b^2 - 4ac \geq 0 \Rightarrow 9(k-4)^2 - 12(k-4)(k-1) \geq 0$$

$$(k-4)(9k-36-12k+12) \geq 0$$

$$(k-4)(-3k-24) \geq 0$$

$$\therefore (k-4)(k+8) \leq 0$$

$$\therefore \text{Value of } k \text{ can lie between } -8 \text{ to } 4$$

$$\therefore \text{max } k = 4$$

82. b $y = \frac{x^2}{x^4 + 1}$

It will always be positive. But let's cross multiply
 $\Rightarrow yx^4 + 4 = x^2$
 $yx^4 - x^2 + 4 = 0$

$$x^2 = \frac{\pm \sqrt{1-4y^2}}{2y}$$

Now, $1 - 4y^2 > 0$
 $(2y)^2 - 1 \leq 0$

or $-\frac{1}{2} \leq y \leq \frac{1}{2}$

but $y > 0$ for x^2 to be positive.

$$\Rightarrow 0 < y \leq \frac{1}{2}$$

83. c **Ist case:**
 Total time taken = 2 hours
 If speed of A and B are S_a, S_b , then distances travelled by them are d_a, d_b respectively.
 Total distance travelled = $2(S_a + S_b)$

IInd case :

Time taken by A, $t_a = 2.5$ hrs,

Speed of A = $\frac{5}{6}S_a$, distance travelled by

$$A = \frac{5}{6}S_a \times 2.5 = d'_a$$

Time taken by B, $t_b = 1.5$ hrs,

Speed of B = $\frac{5}{4}S_b$, distance travelled by

$$B = \frac{5}{4}S_b \times 1.5 = d'_b$$

$$\text{Now } d'_a - d_a = 0.5$$

$$\frac{5}{6}S_a \times 2.5 - 2S_a = 0.5 \Rightarrow S_a = 6 \text{ km/h}$$

$$\therefore S_b = 4$$

$$\text{Total distance travelled} = 2(6 + 4) = 20 \text{ km}$$

84. d Powers are distributed as $n^2 - n$.
 So indices of 1 is $1^2 - 1 = 0$
 or $1^0 = 1^1$
 2's power is $2^2 - 2 = 4 - 2 = 2$
 3's power is $3^2 - 3 = 9 - 3 = 6$
 4's power is $4^2 - 4 = 16 - 4 = 12$
 5's power is $5^2 - 5 = 25 - 5 = 20$
 and so on.
 $75 = 25 \times 3 = 5^2 \times 3$
 We have to determine highest power of 5 then 5^2 which can divide this number. To determine the power

of 3 is immaterial because obviously power of 5^2 will be less than power of 3.

So we are concerned about finding highest power of 5^2 only. 10 contributes = $10^2 - 10 = 90$

5 will contribute = $5^2 - 5 = 20$.

Now, 15 contributes = $225 - 15 = 210$ power of 5.

20 contributes = $400 - 20 = 380$ power of 5.

25 contributes = $(625 - 25) \times 2 = 600 \times 2 = 1200$ (as $25 = 5^2$)

So highest power of 5 is 1900.

So highest power of 5^2 is 950.

So highest power of 75 that can divide the number is 950.

So answer is (d).

85. c $f(g(x)) = 5kx + 2k + 5$
 $g(f(x)) = 5kx + 25 + 2$
 $\therefore k = 11$

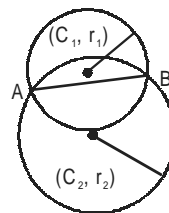
86. a By the similarity of the two triangles $\frac{PA}{PB} = \frac{PC}{PA} = \frac{CA}{AB}$

$$\text{Hence } \frac{PA}{PC+7} = \frac{PC}{PA} = \frac{6}{8}$$

$$6(PC+7) = 8PA \text{ and } 6PA = 8PC.$$

$$\text{Hence } PC = 9 \text{ cm}$$

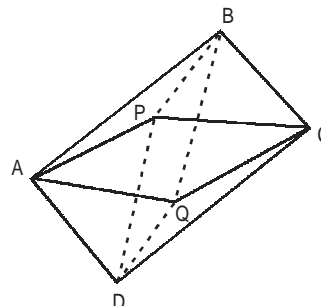
87. d



The figure gives the complete proof. If C_1 were to be divided by arc AB into two parts of equal areas, C_2 should cut the diameter of C_1 parallel to AB at two points, which immediately follows. Hence the correct option is (d).

88. b The only right-angled triangle whose sides are in A.P. and have lengths which are integers has sides in the ratio 3 : 4 : 5. Hence the smallest length must be divisible by 3. So the answer is 2001 cm in the given options.

89. b



$\triangle ADQ$ is congruent to $\triangle PBC$ ($\because AD = BC$;
 $AQ = PC$ and $\angle DAQ = \angle BCP$)
 $\therefore DQ = PB$
 and $\triangle APD$ is congruent to $\triangle BCQ$ ($\because AP = QC$;
 $AD = BC$ and $\angle PAD = \angle BCQ$)
 $\therefore PD = BQ$
 Therefore $PBQD$ is a parallelogram.

90. c Let the weights of A, B, C, D be x kg, $(x + 4)$ kg, $(x + 8)$ kg and $(x + 12)$ kg respectively. The minimum value of $x + 12$ if all these are natural numbers is 13 kg.

91. b The average of the above four weights is $x + 6$. Hence the average weight if $x = 4$ kg is 10 kg.

92. d The ratio of speeds of A, B is 3 : 1. So they would meet the first time when A takes a lead of one round over B. This happens when A makes 1.5 rounds and B makes 0.5 rounds. For B to complete the race it takes him $\frac{10}{0.5} \times 5 = 100$ minutes.

93. d We have to get the side OE
 Which is equal to $BC \sin 30 + DC \cos 30$

$$= 4 \times \frac{1}{2} + 2 \times \frac{\sqrt{3}}{2}$$

$$= 2 + \sqrt{3} \text{ m}$$

94. c $N = 2002 \times 2003 \times 2004 = 2^2 \times 1001 \times 2003 \times 1002$
 2003 is a prime number.
 Hence the L.C.M. (M, N) = $2003 \times M$, since $1001 \times 1002 \times 2^2$ divides N completely.

95. b We will use the rules:
 (1) if n is odd $a^n + b^n$ is divisible by $(a + b)$ and
 (2) if n is even/odd $a^n - b^n$ is divisible by $(a - b)$
 So $5^{4n} - 3^{2n} = 5^{8k} - 3^{4k}$ where k is odd.
 This is because H.C.F. $(n, 4) = 2$
 So $5^{8k} - 3^{4k} = (5^8)^k - (3^4)^k = (5^8 - 3^4) (\dots\dots\dots)$
 $= (5^4 - 3^2) (5^4 + 3^2) (\dots\dots\dots)$
 $= (5^2 - 3) (5^2 + 3) (5^4 + 3^2) (\dots\dots\dots)$
 This is divisible by 317, 7, 11 but not by 13.

96. a $\left(\frac{a}{b} + \frac{b}{a} + \frac{a}{c} + \frac{c}{a} + \frac{b}{c} + \frac{c}{b} \right)$

$$= (a + b + c) \left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right) - 3 = (20 \times 30) - 3 = 597$$

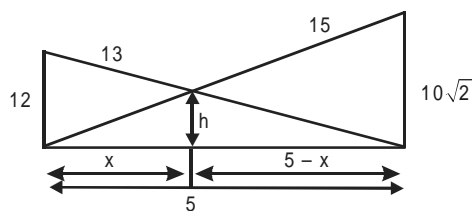
97. a Let the roots be α and $\frac{1}{\alpha}$.

Then $\alpha \times \frac{1}{\alpha} = k^2 - 24k + 144$

$$\Rightarrow k^2 - 24k + 143 = 0$$

$$\Rightarrow k = 11 \text{ or } 13.$$

98. a The configuration is clear in the adjacent diagram.



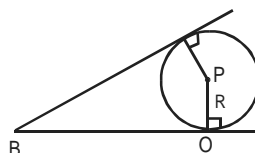
From the similar triangles, we have

$$\frac{x}{h} = \frac{5}{10\sqrt{2}}$$

$$\frac{5-x}{h} = \frac{5}{12}$$

$$\therefore h = \frac{60\sqrt{2}}{6+5\sqrt{2}} = 6.5 \text{ feet}$$

99. c



Considering one circle at corner B.
 $OP = R$

$$OB = 2R \quad (\because \angle OBP = 30^\circ)$$

$$BP = R\sqrt{3}$$

$$\therefore \text{Side } BC = 2R\sqrt{3} + 4R = 2R(2 + \sqrt{3})$$

$$\therefore \text{Area of circle} = \frac{\sqrt{3}}{4} \times 4R^2 (2 + \sqrt{3})^2$$

$$= \sqrt{3} R^2 (3 + 4 + 4\sqrt{3}) = R^2 (12 + 7\sqrt{3}) \text{ sq. units.}$$

100. d A visits every day. B except for the first week every week he visits on Thursday and Sunday as far as C is concerned he visits on Monday, Friday, Tuesday, Saturday, Thursday. Therefore all the three meet again in Thursday of third week.

101. a Let the ages are a, b, c respectively (should be consecutive numbers) $a = b - 1, c = b + 1$
 $(b - 1)(b) + (b - 1)(b + 1) + (b + 1)b = 74$
 $3b^2 = 75$
 $b = 5, c = 6$
 So $a = 4$ option (a).

102. c Assume α be the 3rd root.

$$\text{Sum of the roots, i.e. } 3 + 5 + \alpha = k^2$$

$$\text{Product of the roots, i.e. } 3 \times 5 \times \alpha = 5k$$

$$\text{So } 8 + \alpha = 9\alpha^2$$

$$\text{Then } \alpha = 1 \text{ or } -\frac{8}{9}$$

Hence the 3rd root is 1.

103. a
- | | Alloy A | Alloy B | Alloy C |
|----------|---|---------|--------------------------------|
| Silver : | x | x + 15 | $x + \frac{10 \times 90}{100}$ |
| Copper : | y | y | $y + \frac{10 \times 10}{100}$ |
| From B : | $\frac{x+15}{x+y+15} = \frac{90}{100} \Rightarrow x - 9y = -15$ | | |
| From C : | $\frac{x+9}{x+y+10} = \frac{84}{100} \Rightarrow 4x - 21y = -15$ | | |
| | $\therefore x = 12, y = 3$ | | |
| | $\therefore \text{ \%age of silver in A} = \frac{12}{15} \times 100 = 80\%$ | | |
104. d There are six faces in big cube. Each face takes 1 L paint. When we cut into 64 cubes then each cut gives two new faces. So, 9 cut gives 18 new faces. Hence, more paint is required 18 L.
105. a Let x be the amount of extra weight shown by the machine. d be the displayed weight.
 $\therefore (d - x)$ be the actual weight.
- $$\therefore \left(\frac{x}{d-x} \right) \times 100 = K_1 d$$
- K_1 = constant of proportionality.
- $$\frac{x}{d-x} = Kd \quad \left(\frac{K_1}{100} = K \right)$$
- Now the machine is showing 5 kg for 4 kg.
 $\therefore x = 1$
- $$\therefore \frac{1}{4} = K \times 5 \Rightarrow K = \frac{1}{20}$$
- Now, $x = ?$, $d = 10, K = \frac{1}{20}$
- $$\therefore \frac{x}{10-x} = \frac{1}{20} \times 10 \Rightarrow 2x = 10 - x \Rightarrow x = \frac{10}{3}$$
- \therefore Profit% for the false weight
- $$= \frac{\frac{10}{3}}{10 - \frac{10}{3}} \times 100 = 50\%$$
- But he gives 10% discount thereafter.
- $$\therefore \text{Resultant profit \%} = 50 - 10 - \frac{500}{100} = 35\%$$
106. b 1 min of false clock = $\frac{1}{6}$ min. of actual clock or
 10 min of actual clock = 60 min false clock or 180 min of actual clock = 60 \times 18 min in false clock.
 = 18 hr min false clock.
 \therefore 6 p.m Tuesday \rightarrow in the false clock.

107. d $f(x) = (x+2)(x+2)$ $g(x) = (x+3)(x+1)$
 $f(g(x)) = f[(x+1)(x+3)] = [(x+1)(x+3)+2]^2$
 $= (x^2 + 4x + 5)^2$
 $g(f(x)) = [(x+2)^2 + 3](x+2)^2 + 1$
 $= [(x^2 + 4x + 7)(x^2 + 4x + 5)]$
 $\therefore (x^2 + 4x + 5)^2 = (x^2 + 4x + 7)(x^2 + 4x + 5)$
 Now $x^2 + 4x + 5 \neq 0$ because minimum value = 1
 $(x^2 + 4x + 4) + 1 \geq 1$
 $\therefore x^2 + 4x + 5 = x^2 + 4x + 7$
 $\therefore 5 = 7$ not possible.
108. a Lets take volume of tank is L.C.M (20, 30) = 60 units.
- A fills up = $\frac{60}{20} = 3$ units/min.
- B fills up = $\frac{60}{30} = 2$ units/min.
- So uptill 12:06 P.M.
- | Water | Milk | Total | Left |
|-------|------|-------|------|
| 12 | 18 | 30 | 30 |
- The leak evacuates $\frac{60}{20} = 3$ units/min.
- So effective filling up/min after 12 : 06 p.m.
 $= 3 + 2 - 3 = 2$ units/min.
- So uptill 12:12 p.m.
- Total units filled up = $30 + 2 \times 6 = 42$ units
 where milk : water = 3 : 2
- At 12:12 p.m leak doubled so effective filling up after 12:12 p.m per minute
 $= 3 + 2 - 6 = -1$ unit
- So at 12:18 p.m (before water pouring).
 Total solution = $42 + 6 \times (-1) = 36$ units
 where Milk : Water = 3 : 2
- or Milk = $\frac{3}{5} \times 36$
- and water = $\frac{2}{5} \times 36$
- 24 units still vacant of the tank and that was suddenly filled up by Milkman so at 12 : 18 after water pouring
- Milk = $\frac{3 \times 36}{5}$
- Water = $\frac{2 \times 36}{5} + 24 = \frac{192}{5}$
- \therefore Milk : Water = $3 \times 36 : 192 = 9 : 16$.
109. b If we factorize 1296 we get
 $1296 = 2^4 \times 3^4$
 Therefore the total number of factors is $(4+1)(4+1) = 25$
 Therefore those numbers which have exactly 3 number of factors will be in the form of $2^2 \times 3^0$ or $2^0 \times 3^2$
 so there are only 2 such numbers 4 and 9.
110. c $5 \times b^2 + 2 \times b + a \times b^0 = 121 + 6 \times 11 + 9$
 $\Rightarrow 5b^2 + 2b + b - 2 = 196$
 $\Rightarrow 5b^2 + 3b = 198$

$$\Rightarrow 5b^2 + 3b - 198 = 0$$

$$\Rightarrow 5b^2 + 33b - 30b - 196 = 0$$

$$\Rightarrow b(5b + 33) - 6(5b - 33) = 0$$

$$\Rightarrow b = 6 \text{ or } \frac{33}{5}$$

So, b is 6.

Hence, $a + b = 4 + 6 = 10$

111. a

Employee category	Value per employee (in Rs. Million)
Technical, executive	7.6
Technical, non-executive	5.7
Non-technical, executive	6.7
Non-technical, non executive	4.4

112. a Value per employee for non-technical employees

$$= \frac{63.8}{12.1} = 5.3$$

Value per employee for technical employees

$$= \frac{84.01}{25.9} = 7.1$$

$$\text{Hence ratio} = \frac{5.3}{7.1} = 3 : 4$$

113. a Less than 31, executive has a value per employee

$$= \frac{5912}{484} = 12 +$$

On observation of the other value per employee for the employee set defined, this is the highest value per employee.

114. b The average value per employee for all employees of

$$\text{BOC Ltd. } \frac{247.8}{38} = 6.5$$

From explanation of question 111, we observe that 2 categories (technical, executive and non-technical, executive) have more value per employee than that for all employees.

115. d

	Less than 31	31 – 40	41 – 50	51 – 60
Value per employee	$\frac{144}{15} > 9$	$\frac{70}{8.3} < 9$	$\frac{139}{20} \approx 7$	$\frac{24.4}{8} = 3$

116. c By counting, it is 6.

Sep 26, 2002, Dec 26, 2002, Apr 03, 2003, Oct 01, 2003, Oct 16, 2003, Apr 16, 2004.

117. c By counting, it is 4.

Apr 03, 2003, Oct 16, 2003, Apr 16, 2004, May 03, 2004.

118. c By counting, it is 4.

Apr 03, 2003, Apr 16, 2003, May 02, 2003, Aug 16, 2003.

119. b Highest profit per unit in Premium Plan

= Rs. (10.8633 – 10.8315)

= Rs. 0.0318 (for the record dates in question)

Gains per unit in other plans for the given record dates is much lower.

120. b By counting, there are 14 record dates on which there is a gain in NAV value as compared to the value on the immediately preceding record date.

121. b

Model	Base cost	Extra km.	Extra hr.	Total
Qualis	1400	399	250	2049
Esteem	1200	504	170	1874
Indigo	1450	588	200	2238

122. b Lowest extra tariff is for Ambassador / Maruti Van (Non-A/C) = $5.5 \times 10 + 40$ = Rs. 95

Second lowest = $6.5 \times 10 + 65$ = Rs. 130

For Tat Sumo (Non-A/c)

123. d Best in what sense is not defined. Also duration of trip, distance, etc. not given.

124. c From the charts, the shoe size band 6–7 had the highest sales volume and the highest average price per pair in 2001. Hence, this band will have the highest sales value in 2001

125. b The average price per pair of shoe of size band 6–7 in 1999 = Rs. 225

Same for 2003 = Rs. 275

Hence average annual percentage increase

$$= \frac{50}{225 \times 4} \times 100 = 5.55\%$$

126. c The ratio of volumes of the size bands 6-7 and 11-13 = 120 : 90 = 4 : 3

The average price ratio of the same size bands = 260 : 75

$$\text{Hence required ratio} = \frac{4 \times 260}{3 \times 75} = \frac{1040}{225} \approx 4.5 = \frac{9}{2}$$

127. d From the graph, it is clear that the steepest percentage increase (on a low base) is for shoe size band 11–13 in year 2000 (an increase close to 50% over 1999).

128. b Simply by observing the bar chart.

129. d Data is given for only 5 cities in India. We cannot find the cities in India that had more than 3.5 million internet users in 2001.

130. a The required percentage = $\frac{15.8}{25.8} = 61\%$

131. b Observe from graph.

132. d No. of student is 4 - 7 yrs group in 1999 = 374 (16% of 2340)
No. of student in 4 - 7 yrs group in 2000 = 374 + 50 = 424

$$\% = \frac{424}{2010} \times 100 = 21\%$$

133. d Breakup of 2001 is not given.

134. c No. of students in 4 - 13 yrs range in 1999 = 1357
No. of students in 4 - 13 yrs range in 2000 = (1.1) (1357) = 1493
 \therefore No. of students in 13 - 19 yrs range = 2010 - 1493 = 517

135. d Total number of students in 5 years = 10490

$$\text{Hence average} = \frac{10490}{5} = 2098$$

136. c Let B_i ($i = 1$ to 6) denote boys such that

B_1 — — —
 B_2 — — —
 B_3 — — —
 B_4 — — —
 B_5 — — —
 B_6 — — —

where blanks signify girlfriends.

Note that there can be 10 boyfriends made by the girls. Now (a) is not possible since only other four girls can have a boyfriend each but not the sixth one. (b) is not possible because if two girls have three boyfriends and one girl has two boyfriends, then only two out of remaining three girls can have a boyfriend since number of boyfriends made is ten.

(c) is possible since four girls have two boyfriends each and the remaining two girls can have a boyfriend each.

137. c (a) is possible because if one girl has five boyfriends, then the other five girls can have one boyfriend each. (b) is also possible as two girls can have B_1 , B_2 and B_3 as common boyfriends and other four girls can have a boyfriend each. (c) is not possible because if three girls have two boyfriends each, then there can be four boyfriends made by other three girls (which is only possible if one more girl has two boyfriends).

For the questions 138 to 140:

Note that the sequence (in decreasing order of ages of siblings) can be ABCD, CABD, ACBD, ACDB, CADB, CDAB and in terms of gender M, F (male, female): MMFF, FMFM, MFFM, FFMM, FMFM and FMMF.

These can be arranged as possibilities:

MMFF \rightarrow ABCD, CABD, ACBD, ACDB, CADB

FMFM \rightarrow ABCD, CABD, ACBD, CDAB

MFFM \rightarrow ACDB, CADB, CDAB

FFMM \rightarrow CDAB

FMFM \rightarrow CADB, ACDB

FMMF \rightarrow ABCD, CABD, ACBD

138. a Note that from all given options, only (a) satisfies it.

139. a Note that from all given options, only (a) satisfies it.

140. b Note that from all given options, only (b) satisfies it.

For questions 141 to 143: In one day, the boss can do, with

one secretary absent, $\frac{1}{2} \left(\frac{1}{6}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2} \right)$ part of the job

$$= \frac{1}{12}, \frac{1}{8}, \frac{1}{6}, \frac{1}{4} = \frac{2}{24}, \frac{3}{24}, \frac{4}{24}, \frac{6}{24}$$

$$\text{Now for job to be finished, } \frac{2w + 3x + 4y + 6z}{24} = 1$$

$$\Rightarrow 2w + 3x + 4y + 6z = 24 \quad \dots (i)$$

where w, x, y, z are number of days for which secretaries A, B, C, D remains absent respectively.

141. b From eq. (i), x can't be odd as others are even.

142. b Note that if each secretary remained absent for at least one day, then the least value of w, x, y, z = must be 1. Also as x can't be odd therefore its least value will be 2. The possible values of (w, x, y, z) can be (4, 2, 1, 1), (2, 2, 2, 1), (1, 4, 1, 1) or (1, 2, 1, 2). Therefore the boss can finish work in 6, 7 or 8 days.

143. d For the given condition to satisfy, one of w, x, y, z must be zero and sum of other three must be equal to 6. But there can be more than one solution as
w = 1, x = 0, y = 4 and z = 1 or
w = 0, x = 2, y = 3 and z = 1.

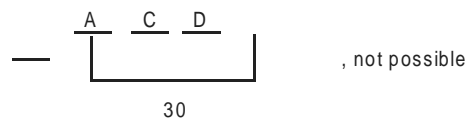
144. d The position of ball can be given sequentially as
C _ _ C _ _ C _ _ C _ _ C _ _ C _ _ C
where 12 blanks are to be filled by A, B and D
 \therefore D would've hold the ball for $12 - (3 + 5) = 4$ times

145. c The position of ball can be given sequentially as
C _ _ C _ _ C _ _ C _ _ C _ _ C _ _ C D
So D would've held the ball $12 - 8 + 1 = 5$ times.

146. c The position of ball can be given sequentially as
C D _ _ D _ _ D _ _ D _ _ D _ _ D _ _ D
where 14 blanks are to be filled by 3A, 5B and 6C.
 \therefore Maximum number of times D would've held the ball is 8.

For questions 147 to 150: The marks of topper and second topper will be E + 30 and D + 20 respectively while the marks of student getting the least number will be C - 20 or A - 30. Case I : Let A = E + 30, then A will be the topper and E will be the one getting the least marks. Also C - 20 \neq D \therefore D + 20 = B and the ranks of the students will be ABCDE or ABDC (rejected as A - E = 30 and B - D = 20, C - E = 20)

Case II : Let $A = D + 20$, then



147. a

148. a

149. a

150. a

151. b (a) and (d) explicitly support the writer's point of view. (c) is apologetic, and weak at best. (b) if true, would cast a doubt on the writer's averment.

152. d (a) demonstrates *Disinterestedness*, (c) explains further and (b) illustrates. Hence (d) is the answer.

153. b (a) lays down the concept of *Forethought*. (c) exemplifies it. (b) states an opportunistic, and hence, contrary point of view.

154. a (b) and (d) are highly misleading choices, don't get carried away. (c) is plausible, but a human being can be satisfied even at the cost of another's satisfaction. (a), if true, would maximize the balance of pleasure over pain, in the larger interest.

155. d (a), (b) and (c) while highly relevant, leads nowhere. Remember the semi-colon, and look for a logical complement, which is found in the contrast in (d).

156. c (a) while true, is outside the scope of our argument. (b) is irrelevant to the focus of our question i.e. genetics. (c) avoids extreme language, and matches the exploratory tone of the argument.

157. d The argument is dealing with specific cases, not 'all people' hence (c) is wrong. The argument mentions 'has been brought up' and this finds an echo in both (a) and (b).

158. c (b) is, of course, wrong, as there is no chance for volition in the lament. (a) is deceptively simple. (d) is simply not true. Fatalism is a view, or perhaps a basic emotional attitude, that every event occurs according to a fixed and inevitable destiny, over and above mere causality, and that what we do is wholly controlled by something independent of our choices and desires.

159. d The first is a physical, the second a psychological, and the third a moral description.

160. b (a) is an amusing choice, but unfortunately wrong. (c), if true, would have rendered the whole argument invalid. (b) fills the gap between the premises and the conclusion.

161. c Both statements are needed. Each statements Independently gives multiple possibilities. Hence, Combining we get only one value, i.e $N = 79$.

162. d Both the statements are not sufficient as we do not know whether these numbers are natural numbers.

163. b Each statement independently can give the answer. The concept is based on the fact that the number of digits is 1 more than the number before the decimal point of the log Value, when the log is taken to the base 10.

164. b Each statement independently gives the answer.
Note : $\sqrt{9}$ gives +3 and not -3. By convention we always take a positive root only.
The second statement gives the value of X as 0.

165. a Statement (I) is true for rectangle as well as a rhombus. Statement (II) is true for rhombus only. Hence, this statement is sufficient to determine the nature of ABCD.