Preparation Guide for **MBA Entrance Exams**

Data Interpretation & Logical Reasoning

Quantitative Aptitude, Verbal Ability, Data Interpretation and Logical Reasoning have been the areas of aptitude tested by management exams in last two decades. Majority of the exam papers have kept 1/3rd weightage of Quant and Verbal each, whereas Data Interpretation and Logical Reasoning, each has been kept to 1/6th of the test paper. Some important points about this section are:

- It generally is the 2nd section of the test
- As per the history, this section should have sets having 3 to 4 Qs each
- ere won't be any separate cut o for LR and DI. It's a single section

Generally, CAT test-takers consider DI-LR as the most di cult part of the test paper. Hence, it becomes very necessary to understand this section and its preparation plan.

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Data Interpretation

Charts/Graphs talk more than numbers do – it's an accepted rule in corporate world. Newspapers/Magazines and many other important report use charts/graphs to show data easily to its audience or reader. This justifies importance of Data Interpretation in post-MBA life.
Data Interpretation cannot be called a part of Mathematics because there is no theory, no property and no formula. It's a skill to be acquired and not knowledge to be remembered.
Typical varieties of Data Interpretation include Tables, Line Charts, Pie Charts, Bar Charts, Mixed Charts or any other unusual but structured representation of data. One more variety which has maintained its presence in entrance test papers is Caselets. These are sets of paragraphs which include numerical data in them which, generally, need to be put in a structure to be understood easily.
Primarily all sets can be further classified into:

1. **Calculation Based:** These are sets with questions which deal with percentage increase/decrease or nominal increase/decrease. They require a good control over basic calculation and approximation.
   Example: Which is the year in which ABC Ltd. has witnessed the highest percentage growth over the year?
2. **Counting Based:** These are generally large data sets in which aspirants are supposed to count the instances which meet the questions' needs. They require patience and focus to ensure that not a single mistake happens.
   Example: How many states (from the data given) have male literacy rate more than 80%, and female literacy rate less than 75%?

3. **Logic Based:** Sometimes charts prefer to give you data in ranges or with conditions where it's not possible to find the exact data. But one can surely be asked to find a number which can be arrived at if there is a need of maximizing or minimizing the number.
   Example: Maximum how many of the employees of the range 35 to 45 years would be above 40 years if average age of employees of this age group is 42 years?

4. **Structure Based:** These include some specials sets. Example: Goals of various teams in a tournament, sales-disposal data of a particular product in market etc. Such sets used to be no surprise in era of 2004 to 2008. Share of such sets have reduced since the CAT has gone online. They are, generally, time consuming sets and hence are very unlikely to be a part of any other exams with an exception of XAT.

Data Interpretation – Preparation Plan

1. **Calculation Skills:** A sound control over Mental Calculation is a very good advantage in any test paper. This advantage cannot be compensated by presence of "Basic Calculator" of CAT. Mental Calculation includes Tables till 20, knowledge of fractions from 1/1, 1/2, 1/3 till 1/20, basic addition and subtraction etc.
   Our Advice: Avoid use of Calculator during next 3 months. Strengthen your mental abilities by spending 10 minutes daily on basic operations.

2. **Approximation Skills and use of options:** A visible difference in preparation of DI and Quant is the fact that "Options are a very importance part of the Questions".

Typical steps of solving a DI Question should follow:
Step 1: Read the Question, understand the need.
Step 2: Have a look at the options and understand how accurately the answer need to be found.
Step 3: Now look at the Charts/Graphs and fetch the data required.
Step 4: Try to find the correct option and not the exact answer.
Let's take an example:

Suppose a question involves finding 1234 as a percentage of 5678 with four options as shown blow.
(1)32.54% (2) 13.67% (3) 21.73% (4) 26.78%
Since the options have an acceptable gap, there is no need to find the exact answer. Simple approximation and elimination will do.
Answer should be very close to 12 as a % of 56. i.e. 3 as a % of 14.
3/12 would produce a 25%. So the answer is less than 25%
3/15 would produce a 20%. So the answer is more than 20%.
Hence, we still don't know the exact answer but we have no doubt in marking option (c) as the correct option.
Our Advice: While solving DI Sets, ensure that you have a look at options before you jump into the calculation part. A sizeable practice will inculcate this habit eventually.

3. **Regular Practice:** It's a skill, so it demands to be a part of routine.
   Our Advise: Approximately 5 hours of DI solving every week. This should be 5 sittings of 1 hour each.

Logical Reasoning

This area of aptitude includes puzzles which need basic common sense + practice of variety of questions. Indeed, puzzles can be too random at times but there are some standard types of LR question types which are seen more often than others. Most important among them are the LR sets involving arrangement of data in a tabular structure. **For Example:** Five people live in five different cities with five different professions and have five different hobbies. Other important question types of LR include problems related to Directions, Blood Relation, Decision Making, Series, Coding – Decoding, Visual Reasoning, Cubes etc. It's visible from CAT papers of the last decade that CAT prefers sets in LR whereas exams of SNAP, IIFT, NMAT, XAT, MHCET, CMAT prefer independent questions. So, the importance of question types mentioned in above paragraph is more in exams other than CAT. Various entrance exams have shown greater inclination towards some of the types of questions:

- NMAT prefers independent LR questions which, although not very difficult to solve, are
- time consuming considering the format of exam.
- MHCET, apart from asking normal LR questions, asks unusual number of visual reasoning
- questions which are a rarity in other examinations.
- XAT has a section of "Decision Making". Generally 50% share of this section is made of LR
- questions.

  CMAT asks independent problems which are time consuming in nature, if not difficult.

  IIFT creates a mix of sets and independent questions.

  Apart from conventional LR questions, aspirants can expect syllogism and verbal reasoning questions as a part of LR section in some of the exams.

Logical Reasoning – Preparation Plan

One doesn't need revision in LR but surely needs sufficient practice. There are two stages of LR preparation:

1. A student starts getting LR Questions correct.
2. A student starts getting LR Questions correct in optimum time and with acceptable accuracy.

Only practice can make an aspirant reach from 1st to 2nd stage.
Exams of NMAT, CMAT are known for producing time consuming LR questions which come independently instead of coming in sets. They reduce speed of the test taker in these tests. CAT produced a time consuming LR section last year. XAT does it every year. So a regular practice is the only solution.
Our Advice: Approximately 5 hours of LR solving every week. This should be 5 sittings of 1 hour each. Ensure that all major varieties are given importance while choosing material for practice.

Strategy to get a high score in DI-LR section

Always remember that it is not important to attempt maximum number of questions. Rather try solving maximum correct answers. For this you must follow this three step strategy:

- Start with easy questions first. Questions that can be solved within a minute should be
- attempted first.
- Now, go back to the beginning and start again. This time, attempt questions that are time taking. Alternatively, you can attempt the next set of tough questions.
  At last, come to the final set of difficult questions. Attempt these questions at the end of the exam. If you are confident enough about scoring well in the exam (questions attempted so far), then you have an option leave this part.
- Once you are through all the questions, try to revise the section before moving on. Revising will help you estimate your accuracy level. And of course, you can rectify your mistakes. Try to maintain maximum accuracy level. Do not rush to attempt questions. But take care of what you attempt.

The most important thing you have to take care is the selection of questions. Eliminate questions which you are not confident about attempting. Leaving questions becomes important to score high. Leave the questions rather than attempting it wrong and wasting time. Also do not attempt those questions which will take up your time.

Tips to crack the DI section in CAT

Here are some skillful and adaptable tips to crack the DI section in CAT:

- Work towards developing the ability to understand voluminous data
- Familiarizing with different kinds of charts
- Practicing regularly
- Enhancing the mental math skills
- Bucking up with the speed would thus help in saving time
- Calculating the increase or decrease of percentage or comparing ratio is an essential skill of
- saving time
- Regularly solving DI sets that require reasoning skills and logic and increasing your familiarity
- with such sets would help you sail through
- Getting a clear idea of the DI sets well in advance by solving as many questions as possible
- Getting accustomed with DS questions, as they would help you score more
- Rejection of DI sets based on the volume of data is a complete NO-NO. More data does not
- necessarily mean a more difficult set and vice versa.
  Try not to solve all the questions at once. Try solving a bulk of some easy questions and some difficult ones at a time.
  Attempting questions that you can confidently answer in 2 to 2.5 minutes would prove to be a better idea
  Ration your time between the Quant and DI section would help you neither neglect nor spend excessive time on any of these areas

Trend of DI-LR in the CAT over a period of 8 years

CAT2019

- The DILR section, compared to previous few years, was much easier
- A couple of sets were relatively straightforward but some sets required a good deal of application
- About three sets – different types of gifts in 100 boxes, the 12 different junctions, and summation of two 6-
- digit numbers, were easy
  In the second slot, LR were more difficult than the first slot

CAT2018

- DILR section of 2018 was easier than previous three years.
- It had 32 questions with eight Non-MCQ and the theme of the sets was more conventional.
- A couple of sets had one 'difficult to crack' question each.
- In the DI sets, calculation wasn't required at all.

CAT 2017

- In the LR section, there were 8-10 analytics puzzles and 8-10 data based puzzles while.
- DI section had 8 sets of case lets focusing on reasoning and analytical ability.
- The DI section also had a bar graph which can be termed as difficult.
- The LR section of second slot was easier than the first slot as it had basic seating arrangement, puzzles and less exhaustive data calculations.

CAT 2016

- The DI-LR was by far the most difficult section of the test
- Even well prepared students struggled to attempt 50% of the questions
- The boundary between the LR and DI was blurred in this section
- A raw score of 30 should fetch 95%ile in this section and a score of 40 should fetch 99%ile
- There were no conventional DI questions. Puzzles dominated the Reasoning section

CAT 2015

- This was the most difficult part of the entire paper. It was highly calculation intensive and time consuming
- This was the most challenging section – Could be the final Decider
- The paper had 8 sets of 4 questions each. Total of 32 questions
- The easy, moderate and difficult sets were well distributed and well placed
- The sets based on – Tourist travel data (quarter wise), Time and Work based (Job A, Job B, Job C), Installed Capacity of 10 projects can be classified as easy and those sets which a well prepared CAT test taker will harp on
- The sets on cube arrangement, newspaper distribution & laptop distribution were tricky and needed a little more patience than the sets mentioned above
- The other 2 sets were time consuming and surely were time bombs. Not worth investing time and energy and that too on the day of CAT
- 20 attempts with 85% accuracy can be classified as a good score in this section.

CAT 2014

- DI was calculative
- There were 4 sets of 4 questions each
- One set which was an application of set theory which can be called easy
- One was a game based set – a little time consuming but manageable and it can be called moderate
- The other 2 sets were the typical sets which were calculative and were based around the typical percentage increase, percentage decrease formats. This subsection was calculative and hence time consuming

CAT 2013

- DI section was Moderate to Difficult
- The whole game was of question selection and prompt navigation through the paper
- A student with high ego or a high stickiness factor to a particular question or a particular genre of questions will find it difficult to reach the end of the paper. The one who plays on good accuracy will be the eventual winner
- As far as the Data Interpretation is concerned, the paper was easy and those regulation questions of percentage increase, percentage decrease, overall growth etc. were asked which helped increase the familiarity of the paper
- The overall section can be termed Moderate to Difficult and an aspirant with around 75% attempts with 90% accuracy should stand a fair chance at an IIM call

CAT 2012

- The difficulty level was high and the questions were designed to test the grasp of fundamentals
- Questions in Data Interpretation area were also not simple and involved convoluted calculations
- All the questions in DI came in sets of 3
- DS was absent from both the slots
- For the LR section, it was mandatory to spend the stipulated time on the prescribed section and it was only when the time ended for the first section that it was possible to move to the second section

A glance at a few DI solved questions

Question 1

A leading Pharmaceutical company in the country has the following financial performance. Study the table and answer the questions that follow. All figures in Rs. (Lakhs).

PARTICULARS	1997-98	1996- 97	1995 – 96	1994- 95
Total Income	3617	2695	1639	509
Raw Material	995	765	519	178
Overheads	973	663	374	77
Interest	191	130	104	77
Depreciation	130	104	77	55
Tax	62	137	0	0
Profit after tax	1263	854	503	103

1. Consumption of raw material as a percentage of total income has been the lowest in
   (a)1997-98 (b)1996-97 (c)1995 – 96 (d)1994-95
2. Growth rate of total income from the previous year has been the highest in (use the information from the table)
   (a)1995-96 (b)1994-95 (c)1996-97 (d)None of the above
3. Taxes as a percentage of profit before tax in the year 1996-97 were
   (a)16% (b)13.8% (c)15% (d)None of the above

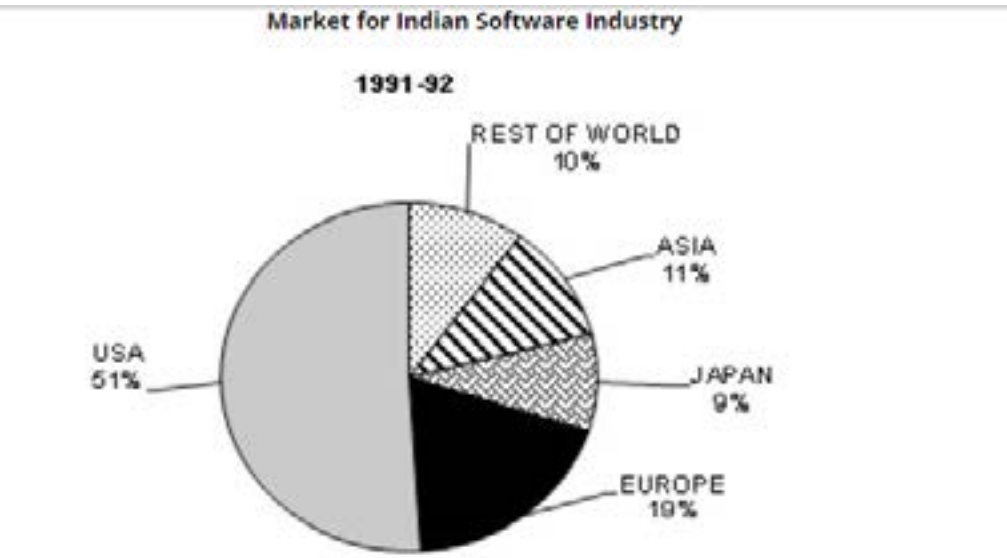
Answer

1. Here we have to compare the data of Raw material and Total Income, but mental calculation would be important. For 1997-98 it is slightly more than 1/4th, 1996-97 is less than 1/4th, 1995-96 is around 1/3rd and 1994-95 is again around 1/3rd. Hence, 1996-97 looks to be the least.
2. From the figure, 1995-96 is more than thrice whereas the others are not even double. Hence, 1995-96 is the obvious answer.
3. Pure calculation, 137/(854+137)=13.7% (approx.)

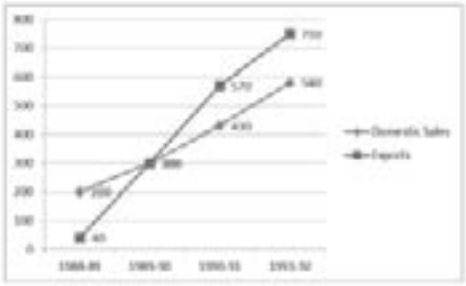
A glance at a few DI solved questions

Question 2

Read the graphs below and answer the questions on the basis of it.



Growth of Indian Software Industry



Size of Software Industry vis-a-vis Computer Industry

Years	Software as % of Computer Industry
1988-89	15%
1989-90	22%
1990-91	28%
1991-92	39%

1.Ratio of size of software industry in 1991-92 to that in 1990-91 was:
(a)1.33 (b)1.25 (c)1.40 (d)1.28

2.Express software exports to USA in 1991-92 as a percentage of the Computer industry size in 1991-92:
(a)13.5% (b)14% (c)11.22% (d)10%

3.If from 1988-89 to 1989-90, domestic software grows at the same rate as exports, what will be value of domestic market in 1989-90?
(a)1400 cr. (b)1500 cr. (c)1300 cr. (d)1600 cr.

Answer

1.Simple calculation type question wherein the ratio is (580+750)/(570+430) = 1330:1000 è 1.33

2.USA as a part of exports: 51%
Exports as a part of software industry: (750)/(750+580)= 57%
Software as a part of computer industry: 39%
USA as a prt of computer industry: 51% x 57% x 39% = 11.3% approximately 11.22%

3.Exports grew from 40 to 300 which is 7.5 times hence domestic would have been 7.5 x 200 = 1500 cr

A glance at a few DI solved questions

Question 3

Read the following case and answer the questions that follow:

It was realized by Endeavor Careers, that for creating awareness in the market, newspaper advertising is very effective but it should be done consistently. Times of Bharat (TOB) which claims to have 40% of the total market share brings out a weekly supplement "Education Times" in which the advertising cost for the range 0 to 240 sq.cm for 1-2 insertions with a validity period of 30 days is Rs. 50/cm2. For 3-5 insertion with a validity period of 60 days is Rs. 43/cm2 and 6 onwards insertions with validity pe¬riod of 90 days is Rs. 40/cm2. The cost for size of adver-tise- ment 241+ cm2 for 1-2 insertions with validity period 30 days is Rs. 50/cm2 and for 3-5 inser- tions with validity period 60 days is Rs. 40/cm2 and for 6 onwards insertion with validity period 90 days is Rs. 35/cm2. The expected response generation per insertion in TOB in the size 161- 200 cm2 is 40 and in the size 200 + cm2 is 50. Another great market player is Bharat Times with weekly supplement 'BT Horizons' and it claims to have 35% of the total market share and the cost of advertising in it for 1-2 insertions with validity period: No. of insertion + one week is Rs. 40/ cm2, for 3-6 insertions with validity period; No. of insertions + 2 weeks is Rs. 37/cm2 and for 7 inser¬tions onwards with validity period: no. of insertions + 3 weeks is Rs. 32/cm2. The expected response generation per insertion is 35 for 160-200 cm2 and 45 for 200+ cm2 size.

Please help Endeavor Careers with the correct decisions on the following plans.

1.If Endeavor looks to generating exactly 95 responses in 2 insertions, which newspaper combination should be selected?

(a)TOB (b)BT (c)One TOB and one BT (d) Data inadequate

2.Endeavor has decided to advertise in TOB but is con¬fused on length between 80 cm and 81 cm but is sure about the width, i.e., 3 cm and 3 insertions. What should be the length?

(a)80 cm (b) 81 cm (c) either 80 or 81 (d)Data inadequate

3.If Endeavor decides to go in for an advertising cam¬paign of 10 insertions – which will be the best option (in terms of cost) for a size of 243 cm2?

(a)BT (b)TOB (c)either BT or TOB (d)Data inadequate

Answer
Read the graphs below and answer the questions on the basis of it.

TOB	Rates				
40% market share	1-2 (30days)	3-5 (60days)	6+ (90 days)	Response	Size
0-240	50	43	40	40	161-200
241+	50	40	35	50	200+

BT Horizons	1-2 (t+1wk)	3-6 (t+2wk)	7+ (t+3wk)	Response	Size
Rates	40	37	32	35	161-200
				45	200+

1. Exactly 95 response can only be with 50 + 45 which is one TOB and one BT
2. On what basis is the length to be decided. It seems obvious to check the rates but here that should not be taken for granted.
3. In this question the basis of decision is clearly outlined to be cost. Hence in terms of cost TOB is 35 and BT is 32 so BT is the correct option.

A glance at a few LR solved questions

Question 1
Five friends, Amol, Mandar, Piyu, Shashi and Reena attended Sagar's birthday party, where they partook of the sumptuous snacks and dinner. Each of the five friends gifted Sagar a different article –a fountain pen, a cell phone, a shirt, a jacket and an I-Pod – and Sagar, in return, gifted each of them a different article – a video game, a sweater, a perfume, a calculator and a pair of sunglasses. The following is additional information about the gifts given by the friends and the gifts received from Sagar.
Amol gifted the shirt and received the video game in return.
Shashi did not gift the I-Pod but received the perfume in return.
Mandar did not gift an electronic item and received the calculator in return.
The person who gifted the jacket received the sweater in return and Reena received the pair of sunglasses.

A.Who among the following gifted the jacket?

1) Mandar
2) Shashi
3)Reena
4)None of these
B.Which of the following statements is true?
1)Two of the friends who did not gift electronic items, received electronic items in return
2)Piyu gifted the jacket and Shashi gifted the I-Pod
3)Shashi neither gifted nor did he receive an electronic item
4)The person who gifted the cell phone received the calculator in return
C.Which of the following is the correct combination of friend, article gifted and article received in return?
1)Piyu – Fountain Pen – Sunglasses
2)Shashi – I-Pod – Perfume
3)Reena – I-Pod – Sunglasses
4)None of these
D.Which of the following is false?
1)Only one friend whose name does not start with a vowel, received an electronic item in return
2)The friend whose name appears last in alphabetical order, gifted an electronic item and received a non-electronic item in return

3)In alphabetical order, the friend who gifted the I-Pod appears before at least two other friends
4)The friend whose name in alphabetical order appears in the middle neither gifted nor received an electronic item

Answer

From the given information, we know that Amol, Shashi, Mandar and Reena received the video game, perfume, calculator and sunglasses respectively. This means that Piyu received the sweater and we can then conclude that she gifted the jacket.
Since Mandar did not gift an electronic item, he could have gifted the fountain pen, the shirt or the jacket.
But we know that the shirt and the jacket were gifted by Amol and Piyu respectively.
So Mandar must have gifted the fountain pen.
We still need to figure out who gifted the cell phone and the I-Pod. Since we know that Shashi did not gift the I-Pod, Reena must have gifted the I-Pod and Shashi must have gifted the cell phone.
We can now match the friend's name with the gift given and the gift received as follows:
Amol – Shirt – Video Game; Mandar – Fountain Pen – Calculator; Piyu – Jacket – Sweater; Shashi –Cell Phone – Perfume; Reena – I-Pod – Sunglasses.
A.Piyu gifted the jacket.
B.Amol and Mandar gifted the shirt and the fountain pen respectively (non-electronic items) and received the video game and the calculator respectively (electronic items).
C.Reena gifted the I-Pod and received the pair of sunglasses in return.
D.Only Amol and Mandar received electronic items. So option 1 is true. Shashi gifted the cell phone and received the perfume. So option 2 is true.
Reena gifted the I-Pod and in alphabetical order, she would appear second last. So option 3 is not true.
In alphabetical order, Piyu appears in the middle and she gifted the jacket and received the sweater in return. So option 4 is true.

Question 2

Mark the answer.
I)If the item is a Major Objective in making the decision: that is. One of the outcomes or results sought by the decision maker.
II)If the item is a Major Factor in making the decision that is, a consideration, explicitly mentioned, in the passage, that is basic in determining the decision.
III)If the item is Minor factor in making the decision; that is a secondary consideration that affects the criteria tangentially, relating to a Major Factor rather than to an objective.
IV)If the item is a Major Assumption in making the decision; that is, a supposition or projection made by the decision maker before weighting the variables

Business Situation

Dr. Goodrich, an upcoming practitioner in Hailey Street, Heartville, felt he needed more room to set up a laboratory next to his clinic. He felt he would invest his savings in buying a few micro-

scopes and lab equipment to set up a new laboratory. A new ceramic factory had come up in the vicinity of Hartville and many families, mainly of those employed in the factory, had taken up residence in the adjoining area. Dr. Goodrich saw a potential increase in his clientele and wanted to cater to this new population. He felt that a small laboratory for testing blood, urine, sputum and other samples would expand his business. The only recourse would be to purchase a small cloth store adjoining his clinic owned by Mr. Terence Hill. This was a small shop, which was already declining due to the advent of a fashionable supermarket down town. Dr. Goodrich felt that Hill would be willing to sell his store at reasonable terms, and this was very important since after the setting up of his new laboratory, he would have very little capital to invest in the expansion of his clinic.
The following questions consist of items related to the passage above. Consider each item separately in terms of the passage and mark your answer.
5.Increase in child and adult population in Hartville 1) 2) 3) 4)
6.Acquisition of property for expanding clinic 1) 2) 3) 4)
7.Cost of Hill's property 1) 2) 3) 4)
8.State of the business of Hill's Cloth store 1) 2) 3) 4)
9.Quality of lab equipment that Goodrich intends to buy 1) 2) 3) 4)
10. Catering to the needs of patients will increase the business 1) 2) 3) 4)
Answer
In such questions it is best to analyse the case without looking at the questions asked. Here is a sample of such an analysis:

- **What is our objective:** To buy the neighbouring cloth store.
- **Major Factors:** Purchase price, the spending on repairs or modifications
- (Don't bother too much about minor factors, whatever is not major is minor)
- **Major Assumptions:** Our patients would not want to go to outside labs for their tests.

The patient population around the clinic will continue to reside there.
Q.5: From our list, we understand that it is one of the assumptions as he saw a potential increase in his clientele and wanted to cater to this new population.
Q.6: If we check with our list, we see that this is an assumption, since we have no clear way of forecasting or controlling this fact, yet it is still important.
Q.7: Checking from our list, this is indeed the purpose of this case – hence objective.
Q.8: The state of the business does not matter, since the key factor is whether Hill wants to sell or not. Hence, minor factor.
Q.9: Although the quality of equipment matters, he does not need to worry about it as far as this purchase decision is concerned.
Nor relevant – hence, minor factor.
Q.10: Again match with the checklist, you will realize that it is one of the assumptions. In some sense this is like a Critical Reasoning question.

A word from the experts

1.Try to visualize the problem or draw grids or tables and fit in conditions to help you solve the problem. This is best technique to solve logical reasoning. Just draw the figure first (Just like Geometr y)

2.Use the process of elimination a lot

3.Read the entire problem carefully. Sometimes, the questions are worded in a tricky way and the clue is right there. “My father has only one child and only son has a blue car” – means I am a son (not a daughter) and have a blue car

4.Sometimes, it is useful to see the answer choices in these problems and actually for the whole Data Analysis section. Many times, three out of 4 choices can be easily eliminated and the fourth one has to be the answer

5.Remember a quote from Sherlock Holmes “When you have eliminated the impossible, whatever remains, however impossible, must be the truth.”

6.The calculations are always very elementary. If you are ever doing a lengthy calculation in a reasoning problem, you might be attacking the wrong node

7.As there are no specific formulas to be remembered for these questions, your hard work lies in the practice