Dear Student,

Before you even begin turning over the leaves of this book, ask yourself:

Why do I need this Book?
A major part of one's learning experience in school and college is purely academic with little exposure to opportunities that objectively test or help demonstrate one's aptitude or logical thinking skills.

It isn't surprising when many times students who have always hogged the limelight in school and college suffer a rude shock when their own peers and probable dark horses later steal the show in competitive examination.

The reason is as glaring and simple to understand as is the difference between the orientations of the preparedness involved in each.

Competitive exams do not test our knowledge per se, but the different ways the same knowledge may be applied to practical or life-like situations.

So, as you may now allow yourself to turn a few pages and have an overview, let TCYonline.com guide you through the book that would not only prove enlightening but also rewarding.

What is General Aptitude?
The dictionary meaning of "aptitude" is "flair" or "talent", which means something innate or inherent. Thus, "General Aptitude" in competitive exams comprises questions that require neither use of any formulae nor lengthy calculation, nor even much of brain racking. Questions pertaining to series, direction sense, blood relations, coding–decoding can be solved by anyone with or without any prior learning. Occasionally, a solution to a tricky problem may arrive within seconds from a completely unexpected quarter. However, many times students are unable to solve questions not because of the lack of aptitude but because of the lack of the build-up of a problem-solving temperament that remains passive when not stimulated enough by a constant exposure to similar questions.

What is Reasoning Ability? Why do Competitive Exams put so much Emphasis on this?
Reasoning Ability is the ability to conjure different possible scenarios under a stated set of premises and/ or conditions. It also involves appraising the scenarios on account of their satisfying or defying additional conditions presented in form of questions. Thus, the questions here appear mostly in form of problem statements with a series of follow-up questions. Competitive exams particularly test this ability as the number of variables in real-life situations are diverse and are valid under a set of assumptions. Candidates quick on apprehending situations and building different scenarios are thus the ones that are better equipped to handle similar situations which are very much a fact of everyday life in routine interactions/ transactions with supervisors, subordinates, peers, customers, other stakeholders in an office or a bank, insurance company or a public supplies department.

What is Quantitative Aptitude? Why do Competitive Exams test this?
The purview of quantitative aptitude is limited to the level where it gets applied again to real-life situations. Thus, it has much to do with elementary topics that require little effort on the part of the candidate to
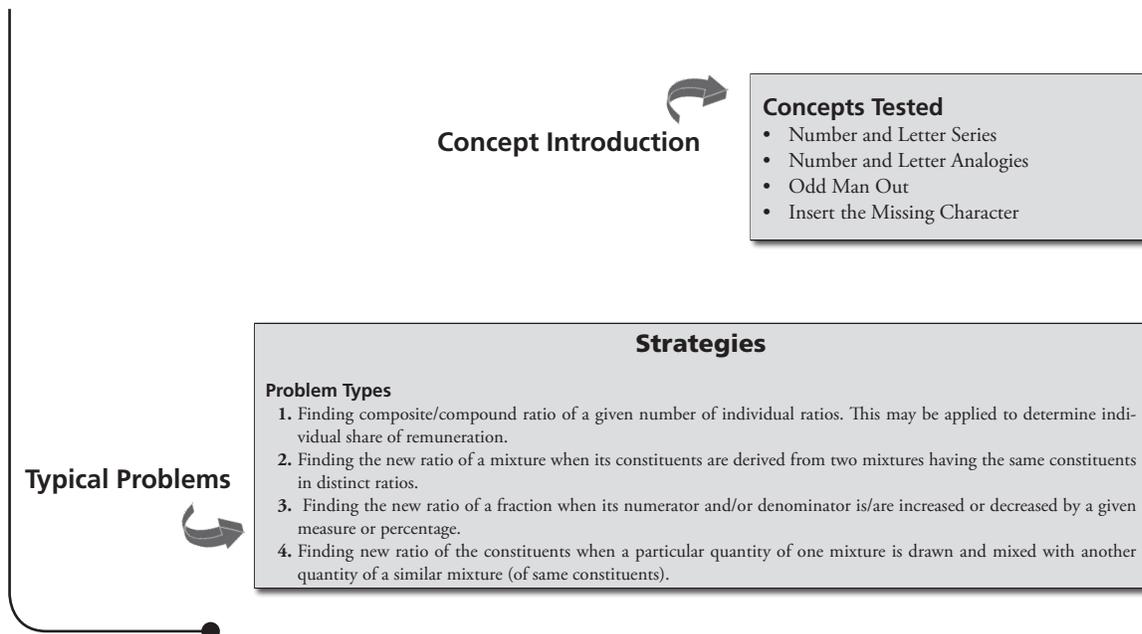
remember complicated or lengthy formulae. Any candidate would be obviously expected to quantify and compare or contrast information in a purely objective manner to satisfy and make sense to his subject of communication or interaction – a customer, boss, client or even a computer. Besides this, he might be expected to submit daily reports, thus keeping his supervisor abreast of the performance or health of key indicators determining his area of function or domain. Thus, there would be nothing wrong on the part of the test-taker to test simple skills in percentages, ratio, rate problems (time and work) or counting techniques (permutation and combinations) and data collation and interpretation. Besides, concepts of geometry pertaining to figures that very much form part of real-life scenarios viz. calculating area of a plot or field (that might be in the shape of a square or rectangle or circle), getting a job done by committing a specified number of workers to it, etc. are also put to test. The weightage ascribed to this section by various examinations is thus as below:

Examination	Weightage of Quantitative Aptitude (%)	Remarks
Campus placements	33	Other sections are: Verbal ability, Reasoning ability
Banking sector (PO & clerical)	20	Four other sections
Civil Services Aptitude Test (CSAT)	25 (along with Data Interpretation	
MBA (Tier II)	20–25	Percentage varies for different Institutes

How is this Book useful towards Developing Skills in Reasoning and Quantitative Ability?
The pedagogy of the book is closely aligned with the most effective approach towards developing both. The step-wise approach below makes it very evident.

Understand the Problem Types

Concept Introduction

Concepts Tested
- Number and Letter Series
- Number and Letter Analogies
- Odd Man Out
- Insert the Missing Character

Strategies

Problem Types
1. Finding composite/compound ratio of a given number of individual ratios. This may be applied to determine individual share of remuneration.
2. Finding the new ratio of a mixture when its constituents are derived from two mixtures having the same constituents in distinct ratios.
3. Finding the new ratio of a fraction when its numerator and/or denominator is/are increased or decreased by a given measure or percentage.
4. Finding new ratio of the constituents when a particular quantity of one mixture is drawn and mixed with another quantity of a similar mixture (of same constituents).

Typical Problems

Know the Strategy

Effective Technique

I. **Identify the series type:** A series may be of either of the below types:
  • Ascending (subsequent terms are increasing)
  • Descending (subsequent terms are decreasing)

II. **Estimate the quantum of increase or decrease:**
  • If the subsequent terms show a gradual increase/decrease, that is the subsequent terms are not far from the pre-ceding terms, the logic involves one of addition or subtraction.
  • If the subsequent terms are becoming significantly bigger/smaller than the preceding ones, the logic involves either of the below types:
   (a) Successive multiplication/division with or without subsequent addition or subtraction. The operation to be performed must always follow a pattern.
   (b) Successive addition or subtraction of squares or cubes of natural numbers. The operation to be performed

General Strategy
1. Data Table is the simplest way in which data can be used as absolute values are mentioned comparison between values becomes difficult as the data is not in pictorial form (graph, pi figure), so use of bow tie method to determine quickly which of the given fractions is grea example, while comparing 2/3 and 3/4, we need to multiply in the below manner:

$$\frac{2}{3} \diagup\!\!\!\!\diagdown \frac{3}{4}$$

Now since $2 \times 4 < 3 \times 3$, so $3/4 > 2/3$. The numerator of the fraction that forms part of th indicative of the greater fraction. This helps quickly compare percentage changes and arriv solv

Important Learning

Circular Arrangement
I. To find pattern of Circular Arrangement, remember
  (a) Persons sitting in a circle are assumed to be equidistant from each other (i.e. from either neighbour). Th means that no two persons shall be opposite each other in event of total number of persons being an od
  (b) Persons sitting in a circle are assumed to be facing the centre, unless mentioned otherwise.
  (c) "Left" or "Right" means "Immediate Left" or "Immediate Right".
  (d) "n" places away means "$n - 1$" positions in between

General Strategy: Statement–Course of Action
The given statement can be a
1. Problem
2. Policy Decision
3. Positive Situation

Course of Action (CoA):
1. "Problem" shall have a "Solution" as a "CoA".
2. "Policy Decision" shall have a "Follow up Action".
3. "Positive Situation" shall have an action such that retains/affirms the positive situation.

Characteristics of a "CoA"
 1. Should solve or mitigate the problem.
 2. Should be proportionate (e.g. a course of action can never be using a gun to get rid of mosquitoes or killing an irri-tating housefly with a sword).
 3. Should give the result in reasonable time (e.g. a course of action is not valid for a doctor to give medicine for a head-ache 2 days after its diagnosis).
 4. Should be practically implementable, that is feasible or doable.

General Strategy
1. Interpretation of an expression by means of a Venn diagram makes it easy to visualise the problem and clearly the area (united /intersected) or elements that are asked.
2. Knowledge of expressions like:
  (a) Exactly or only
  (b) At least
  (c) At most
  help in interpreting the individual questions based on Venn diagrams correctly.
3. The two, three or four sets based on Venn diagram must be represented as below.

Important Interpretation
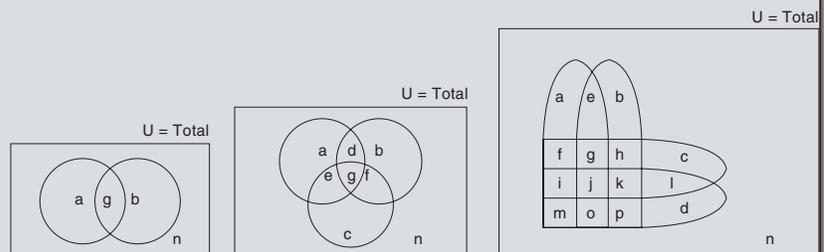
Practice to Complete your Learning ●

Graded Practice Exercises

Practice Exercises

Directions for Questions 1–4: Read the following information carefully and answer the questions that follow:

Six dwarfs L-1, L-2, L-3, L-4, L-5, and L-6, who are friends, compare their heights and make the following observations:

L-4 is taller than L-3.
L-2 is the shortest of all.
L-6 is taller than only one person.
L-5 is taller than L-4, but is not the tallest.

1. The number of persons taller than L-3 is the same as the number of persons shorter than
    (A) L-5   (B) L-3
    (C) L-4   (D) L-1
    (E) Cannot be determined

Challenge Yourself ●

Multiple concepts in one problem; data organisation; seemingly difficult yet easy problems.

1. An electronics shop was selling articles at high discount. Kajal went to buy 3 articles from the shop. The MRP of the first article bought is 33.33% less than that of the second article bought. The MRP of the third article bought is 300% more than the discount availed on the second article. The discount availed by Kajal on the first article is 30% less than that availed on the third article. Additionally, Kajal receives a discount of an amount equal to the sum of the discounts on the first two articles

Challengers

Directions for Questions 1–3: Read the below information carefully and answer the questions that follow. There are 4 streams of Engineering in ABM Institute of Technology, namely ECE, CSE, IT and Mechanical. The number of students in ECE stream is 100 whereas the number of students in CSE and IT streams is in the ratio 13:12. The number of girls in CSE stream and the number of boys in Mechanical stream are in the ratio 8:5. The number of girls in Mechanical stream is equal to number of students in ECE stream. The ratio of boys to girls in IT stream is 1:3. The number of boys in CSE stream is 50. The number of students in Mechanical stream is 3 times the

1. What % of students in CSE, IT and Mechanical streams are boys?
    (A) 31.3%   (B) 33.8%   (C) 37.5%
    (D) 32.5%   (E) None of these

2. If the ratio of boys to girls in ECE stream is 2:3, how much percent is the number of girls in ECE, CSE and Mechanical streams more than the number of boys in ECE, IT, CSE and Mechanical streams?
    (A) 42.3%   (B) 41.17%   (C) 44.38%
    (D) 41.8%   (E) None of these

3. One evening, Bharat, Rajat, Deepak and Salil left their homes to buy grocery from the neighbourhood

Challengers

1. Sunita has to choose at least 1 candy from 5 Éclairs, 8 Mango Byte and 3 Jelly Bean. In how many ways can she do the same?
    (A) 206   (B) 215   (C) $2^{16} - 1$
    (D) $2^8 - 1$ (E) None of these

2. It is given that the number $3xy412$ is divisible by 12. How many such numbers exist if both x and y are less than 5?
    (A) 10   (B) 12   (C) 15
    (D) 18   (E) None of these

3. A class teacher proposes to distribute all 15 prizes of a particular type to top 4 scorers in a test. If the students say that the top scorers would not accept any number less than 2, in how many ways can the teacher distribute the prizes among the toppers?
    (A) 110   (B) 130   (C) 120
    (D) 140   (E) None of these

More Practice

Mixed Graded Practice Tests

Directions for Questions 19–20: In each of the following questions, three statements followed by three or four conclusions marked I, II, III and IV are given. Consider the statements to be true even though they seem to be at variance with the commonly known facts and find out which of the given conclusions logically follow(s) from the statements, disregarding the commonly known facts.

19. Statements:
All chicks are hens.
All hens are cocks.
No fowl is a cock.
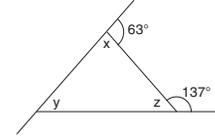 **Conclusions:**
I. All chicks are cocks.   II. All hens are fowl.
III. No chick is fowl.   IV. No fowl is hen.
   (A) Only I, III and IV follow
   (B) Only II follows
   (C) Only III and IV follow

23. In how many different ways can the letters of the word "INDIA" be arranged such that the consonants occupy even positions?
   (A) 3   (B) 6   (C) 2
   (D) 5   (E) None of these

24. In the given figure, find the measures of $\angle x$, $\angle y$ and $\angle z$.

   (A) 43º, 117º, 20º   (B) 117º, 43º, 20º
   (C) 20º, 117º, 43º   (D) 117º, 20º , 43º
   (E) 43º, 20º, 117º

Check your Performance and Problem-Solving Approach

Through answers and explanations (figure, illustrations, etc.) to Practice Exercises and tests.

Answer Key with Alternative Solution where required

Answer Key

Practice Exercises

1. (C)	**2.** (D)	**3.** (A)	**4.** (B)	**5.** (A)	**6.** (B)
8. (C)	**9.** (B)	**10.** (D)	**11.** (A)	**12.** (C)	**13.** (A)
15. (C)	**16.** (A)	**17.** (D)	**18.** (C)	**19.** (B)	**20.** (A)
22. (C)	**23.** (D)	**24.** (A)	**25.** (D)	**26.** (A)	**27.** (D)
29. (A)	**30.** (B)	**31.** (D)	**32.** (D)	**33.** (E)	**34.** (A)

Challengers

1. (E)	**2.** (A)	**3.** (D)	**4.** (D)	**5.** (B)

Answers with Explanation

Practice Exercises

1. (C)
Total number of outcomes = 4
(i) x even, y odd
(ii) x even, y even
(iii) x odd, y odd
(iv) x odd, y even
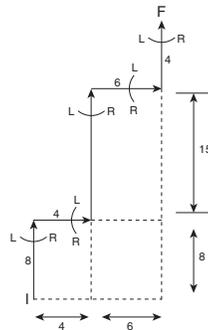Now,

Probability that one of the balls hits the

$$\left(\frac{2}{3}\right)^3 = \frac{19}{27}$$

Alternative solution:

Probability of hitting at least once = ^3C

$$+ {}^3C_2 \left(\frac{1}{3}\right)^2 \left(\frac{2}{3}\right) + {}^3C_3 \left(\frac{1}{3}\right)^3 \left(\frac{2}{3}\right)^0$$

Explanation with Illustration

31. (C)

Hence, vertical distance between I (Intact) and F (Intact) points is either 10 km or 27 km.

90° anti-clockw
and North are W

34. (E)
Solving (a): P ÷

Happy Learning!

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