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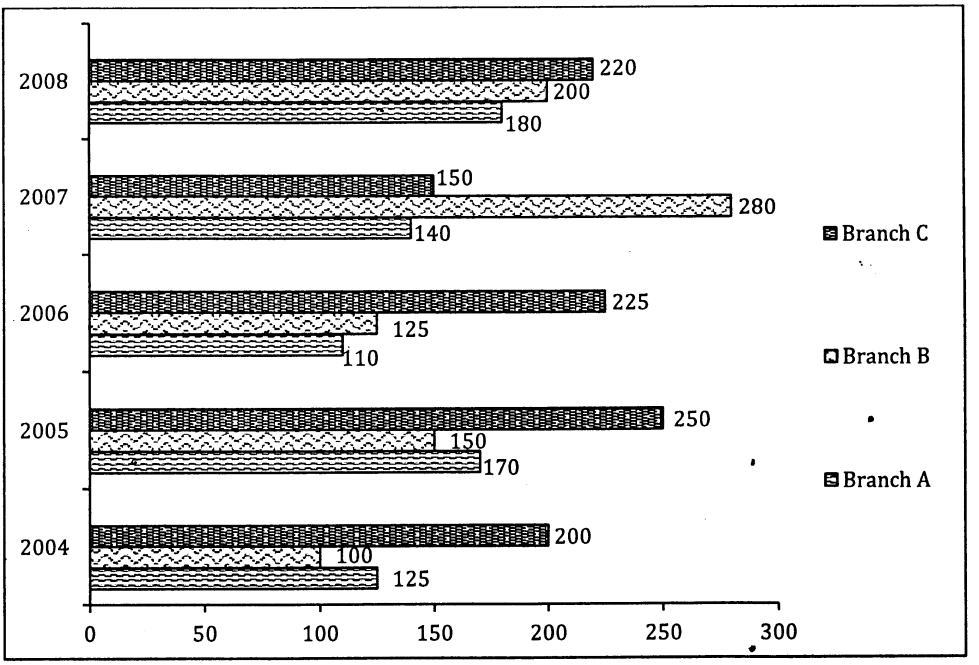
1 Data Interpretation and Analysis

PRACTICE TEST I

Instructions for questions 1 to 3: Answer the questions based on the following information:

The graph below shows the number of students studying in branches 'A', 'B' and 'C' of 'XYZ College of Engineering' from 2004 to 2008.



1. What is the difference in percentage change in the number of students of branch A and branch C in the year 2008?

   (1) 28.57 (2) 46.67 (3) 64.29 (4) 18.1

2. By what percentage is- the total number of students studying in branch B greater than those in branch C, in the year 2007?

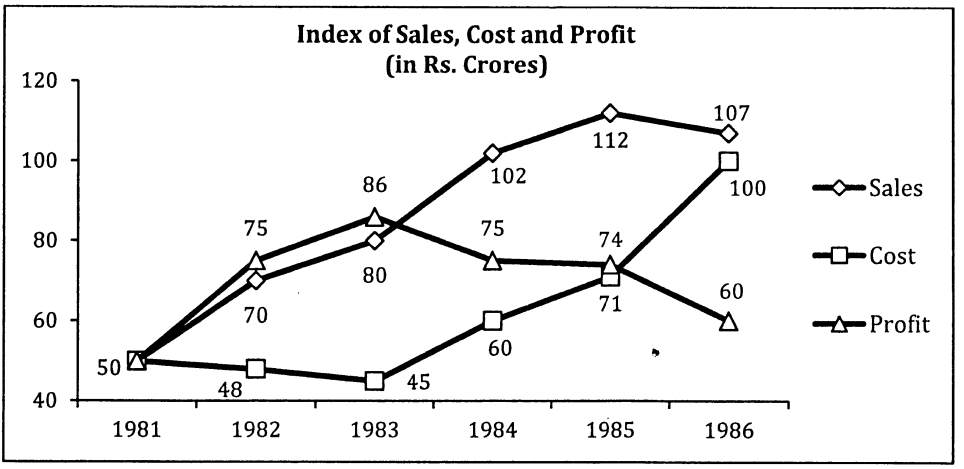
   (1) 86.67% (2) 87.67% (3) 86.76% (4) 86%

3. What is the percentage change in the number of students of branch B for the year 2006?

   (1) 17% (2) 16.67% (3) – 16.67% (4) – 17%

Instructions for questions 4 to 8: Answer the questions based on the following information:

The graph given below shows the Index of Sales, Cost and Profit (in Rs. Crores) for the 6 years from 1981 to 1986.



The following information can be used to solve the questions.

- Profit = Sales – Cost
- Base year for all 3 indices is 1981.

4. What is the increase (in Rs. Crores) in the sales from 1981 to 1986?

(1) Rs. 75 (2) Rs. 80 (3) Rs. 57 (4) Cannot be determined

5. If the value of sales in 1982 is Rs. 400 Crores, then what would be the value of sales in 1986?

(1) Rs. 586.7 Crores (2) Rs. 625.9 Crores (3) Rs. 611.4 Crores (4) Cannot be determined

6. In which year was the profit the highest?

(1) 1983 (2) 1984 (3) 1985 (4) Cannot be determined

7. If the base year for Profit Index is changed to 1982, then what would be the Profit Index for 1986?

(1) 90 (2) 85 (3) 112.5 (4) None of these

8. What is the difference between the average Sales Index and the average Cost Index over the given period?

(1) 28.5 (2) 24.5 (3) 21.7 (4) 26.3

Instructions for questions 9 to 15: Answer the questions based on the following information:

The following table gives the annual sales (Rs. crores) for five different companies P, Q, R, S and T for six consecutive years 1991, 1992, 1993, 1994, 1995 and 1996.

Companies	Annual Sales (Rs. Crores)					
	1991	1992	1993	1994	1995	1996
P	864	900	875	1000	975	970
Q	785	1040	980	1060	980	1200
R	620	780	820	910	940	1000
S	695	790	740	800	850	900
T	740	850	520	980	460	900

9. The average annual sales (in Rs. crores) of company Q during the given period were

(1) 986.5 (2) 1060 (3) 1007.5 (4) 995.5

10. The sales of company T in 1995 are approximately what percentage of the sales of company P in 1992?

(1) 51% (2) 40% (3) 47% (4) 60%

11. What is the growth rate of company P in 1991?

(1) 11% (2) 40% (3) 5% (4) Cannot be determined

12. The simple annual growth rate of sales of company S from 1991 to 1996 is approximately equal to

(1) 8% (2) 4% (3) 9% (4) 6%

13. The compound annual growth rate of the sales of company R for the period 1991 to 1996 is closest to

(1) 16% (2) 10% (3) 22% (4) 18%

14. If the 5 companies together have a 50% market share in that industry in 1994, then what is the approximate market share (in percentage) of Q in 1994? Market share of a particular company in a given year is the sales of that company in that year as a percentage of the total sales in that industry for the same year.

(1) 13% (2) 11% (3) 14% (4) 9%

15. If the compound annual growth rate for the period 1996 to 1998 for company T is 15%, then what can be the sales (in Rs. Crores) of company T in 1998?

(1) 1170.75 (2) 1190.25 (3) 1225.25 (4) Cannot be determined

2 Tables and Caselets

PRACTICE TEST I

Instructions for questions 1 to 5: Answer questions based on the following information

Years / City	2005	2006	2007	2008	2009	2010
Allahabad	1200	1350	1410	1492	1520	1600
Chennai	1020	1050	1065	1088	1135	1170
Kolkata	1340	1365	1400	1425	1475	1520
Mumbai	1824	1950	2045	2060	2180	2350
Bangalore	1642	1752	1840	1965	2010	2254
Pune	1610	1740	1810	1960	2064	2210

1. The total number of buildings constructed across all the given cities in 2006 forms what approximate percentage of the total number of buildings constructed across the same cities in 2009?

   (1) 78.66% (2) 82.55% (3) 85.44% (4) 88.66% (5) 90.44%

2. What is the difference between the total number of buildings constructed in 2005 and 2008 across all cities?

   (1) 1354 (2) 1294 (3) 1454 (4) 1346 (5) 1406

3. What is the total number of buildings constructed across all 6 cities over the given period?

   (1) 42567 (2) 45787 (3) 47787 (4) 46787 (5) None of the above

4. What is the percent increase in the number of buildings constructed in Mumbai in 2007 over the previous year?

   (1) 3.35% (2) 3.87% (3) 4% (4) 4.27% (5) 4.87%

5. What is the ratio of the total number of buildings constructed in Allahabad to the total number of buildings constructed in Pune over the given period?

   (1) $\frac{542}{729}$ (2) $\frac{249}{328}$ (3) $\frac{221}{296}$ (4) $\frac{1027}{1485}$ (5) None of the above

Instructions for questions 6 to 10: Answer questions based on the following information

Auditions for a talent show were held in regions 'A', 'B' and 'C' of Maharashtra. The table below shows the number of participants who qualified for the second round and those who were rejected.

Year	Regions							
	A		B		C		Total	
	Q	R	Q	R	Q	R	Q	R
2006	200		400			250	850	650
2007	150	350			300			1150
2008				500	275	225	725	1025
Total	600	750		1150		925	2425	

Q: Qualified R: Rejected

6. How many people participated in the auditions in the year 2007?

   (1) 2825 (2) 2000 (3) 2425 (4) 2500 (5) 2025

7. The number of rejected candidates from region B in 2006 is what percentage of the total number of candidates in the same year?

(1) 46.15% (2) 61.54% (3) 20% (4) 26.67% (5) 16.67%

8. In the year 2008, the qualified participants were awarded a trophy. If the total amount spent on these trophies was Rs. 50,000 in region A, what was the total amount spent in region B in 2008?

(1) Rs. 40,000 (2) Rs. 80,000 (3) Rs. 55,000 (4) None of these (5) Cannot be determined

9. In region A, what is the ratio of the total number of participants who qualified for the next round to those who were rejected?

(1) 3 : 4 (2) 4 : 3 (3) 5 : 4 (4) 4 : 5 (5) 8 : 5

10. In which year were the rejections, expressed as a percentage of the total participation for that year, the highest?

(1) 2006 (2) 2007 (3) 2008 (4) 2007 and 2008 (5) Cannot be determined

PRACTICE TEST II

Instructions for questions 1 to 5: Answer questions based on the following information

An institute offers a degree with specializations available in Science, Commerce and Arts. 35% of the total students in the institute are girls. The number of boys studying Commerce in the institute is 416 which is 40% of the total number of boys in the institute. 45% of the girls in the institute study Arts. The number of boys and girls studying Commerce is in the ratio of 4 : 1. 25% of the boys in the institute study Science.

1. How many girls study Science in this institute?

(1) 104 (2) 194 (3) 252 (4) 354 (5) None of these

2. The number of girls studying Commerce is what percent of the number of boys studying Science?

(1) 15% (2) 25% (3) 30% (4) 40% (5) 45%

3. What is the ratio of the number of boys studying Arts to the number of girls studying Arts?

(1) 3 : 2 (2) 91 : 73 (3) 13 : 9 (4) 123 : 109 (5) 61 : 54

4. What is the total number of students in the institute?

(1) 1600 (2) 1540 (3) 1640 (4) 1800 (5) 1720

5. What is the total number of students studying Commerce in the college?

(1) 520 (2) 616 (3) 464 (4) 572 (5) 490

Instructions for questions 6 to 10: Answer questions based on the following information

In a city XYZ, all the people read some newspaper everyday. 5478 people like to read only Times of India. 1420 people like to read only Economic Times and 2684 people like to read only Hindustan Times. 2060 people like to read only DNA and 4686 people like to read only The Hindu. 4062 people like to read only Employment News. 2466 people like to read Times of India as well as Employment News. 1540 people like to read Economic Times as well as Employment News. 3542 people like to read Times of India as well as The Hindu.

6. The total number of people reading Times of India forms what percent of the total number of people reading a newspaper?

(1) 32% (2) 41% (3) 45% (4) 22% (5) 36%

7. The total number of people reading Employment News forms what percent of the total number of people reading some newspaper?

(1) 19% (2) 24% (3) 29% (4) 34% (5) 39%

8. The total number of people reading only Hindustan Times and only DNA forms what percent of the total number of people reading some newspaper?

(1) 15% (2) 11% (3) 23% (4) 17% (5) 19%

9. The total number of people reading only The Hindu forms what percent of the total number of people reading some newspaper?

(1) 7% (2) 9% (3) 13% (4) 15% (5) 17%

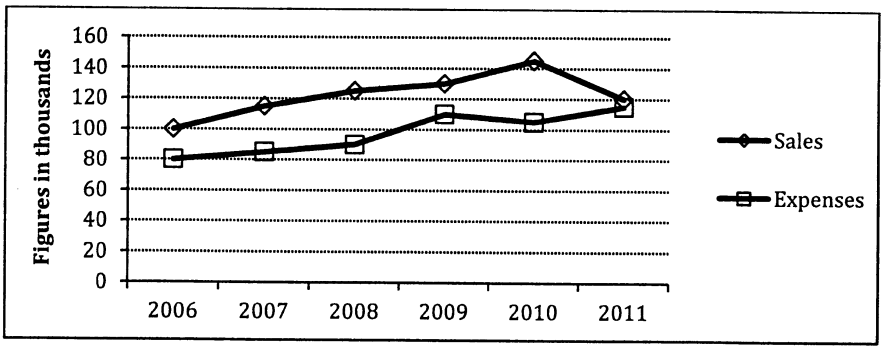
10. How many people read only one newspaper?

(1) 16328 (2) 11642 (3) 20390 (4) 15544 (5) None of the above

3 Charts and Diagrams

PRACTICE TEST I

Instructions for questions 1 to 5: Answer questions based on the following information:



The given graph gives the sales and expense figure of a company over the years 2006 to 2011.

1. In which year is the profit maximum?
   (1) 2011 (2) 2010 (3) 2007 (4) 2006 (5) 2008

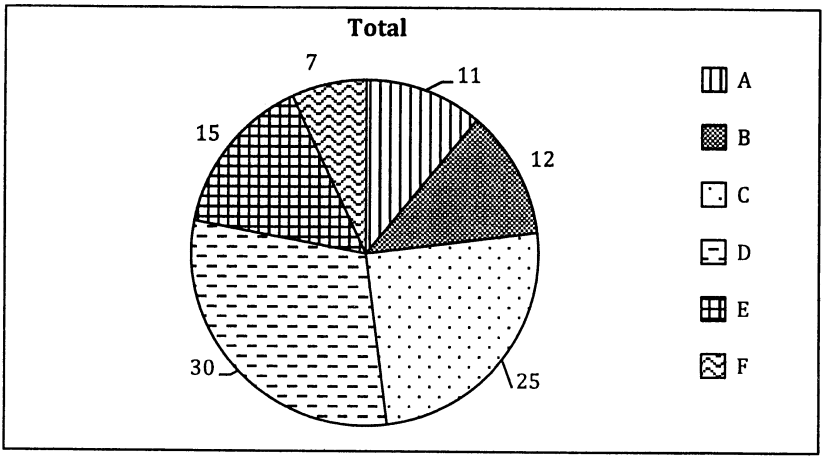
2. What is the ratio of the expenses in 2008 to that in 2010?
   (1) 6 : 7 (2) 7 : 6 (3) 7 : 5 (4) 5 : 7 (5) None of these

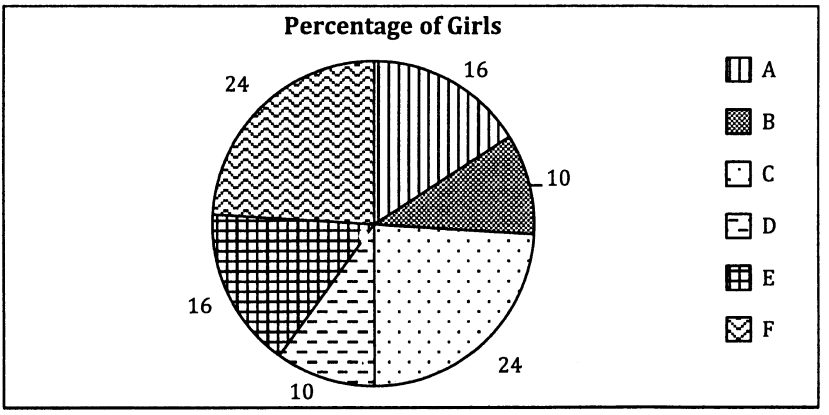
3. What is the difference between the profit in 2006 and the profit in 2009?
   (1) 10 (2) 5 (3) 20 (4) 15 (5) 0

4. What is the overall profit (in thousands) over the given period?
   (1) 110 (2) 130 (3) 150 (4) 160 (5) 170

5. The sales in 2008 form what percentage of the sales in 2006?
   (1) 110 (2) 105 (3) 112.5 (4) 115 (5) 117.5

Instructions for questions 6 to 10: Answer questions based on the following information:





The first pie chart shows the percentage of students in different sections and the second pie chart shows the percentage of girls in each section.
The total number of students across all sections is 2500.

6. How many boys are there in section D?

(1) 700 (2) 650 (3) 660 (4) 675 (5) 680

7. What is the angle subtended by the number of students in section B?

(1) 43.2 (2) 43 (3) 42.8 (4) 45 (5) 46

8. What is the ratio of the number of girls in section C to that in section E?

(1) 2 : 5 (2) 5 : 2 (3) 4 : 3 (4) 3 : 4 (5) None of these

9. The number of boys in section F is what approximate percentage of the number of girls in section A?

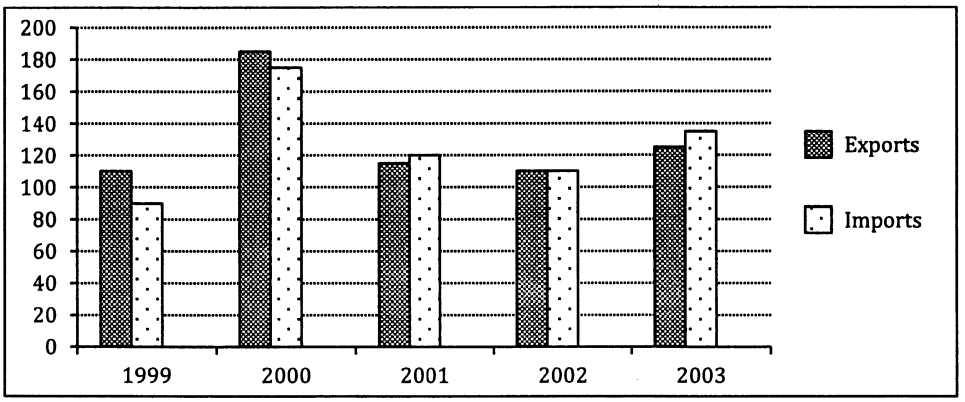
(1) 350 (2) 320 (3) 300 (4) 330 (5) 340

10. What is the difference between the number of students in section D and section E?

(1) 350 (2) 300 (3) 400 (4) 325 (5) 375

PRACTICE TEST II

Instructions for questions 1 to 5: Answer questions based on the following information:



The given graph shows the exports and imports of a country for the period 1999-2003.

9. How many grandsons does Esha have?

(1) 1 (2) 2 (3) 3 (4) 4 (5) Cannot be determined

10. Who are Boman's aunt's In-laws?

(1) Chaaru and Hitarth (2) Chaaru and Dinkar (3) Esha and Dinkar
(4) Hitarth and Esha (5) Cannot be determined

PRACTICE TEST II

1. Introducing Shriya to his daughter, Kush tells his daughter that she is his brother's wife's mother-in-law's daughter. How is Shriya related to Kush?

(1) Sister (2) Mother (3) Sister-in-law (4) None of above (5) Cannot be determined

2. X does not have any siblings. If Y tells X that "My father is your father's son", then how is Y related to X?

(1) X and Y are the same persons (2) Brother (3) Father
(4) Son (5) Cannot be determined

3. While pointing to a picture, A said to B: "This man is your father's brother's only sister's mother's husband." How is B related to the man in the picture?

(1) Son (2) Grandfather (3) Grandchild (4) Cousin (5) None of these

4. Two kids Aryan and Aditya are playing in a ground. Aryan's mother's husband's mother has a single daughter who is the only sister of Aditya's father who has only one son. How are Aryan and Aditya related?

(1) Brother (2) Cousins (3) Siblings (4) Not related (5) Cannot be determined

5. Pawan says "My father's mother's mother's brother's son's only daughter is the mother of Raghav." How are Pawan and Raghav related?

(1) First cousins (2) Second cousins (3) Brother (4) Third cousins (5) None of these

Instructions for questions 6 to 10: Answer questions based on the following information.

P#Q means Q is the husband of P.
P*Q means Q is the wife of P.
P-Q means Q is the father of P.
P/Q means Q is the mother of P.
P%Q means Q is the brother of P.
P@Q means Q is the sister of P.
P+Q means Q is the son of P.
P÷Q means Q is the daughter of P.

6. If A*B@C/D#E, then how is A related to E?

(1) Daughter-in-law (2) Son-in-law (3) Father-in-law (4) Mother-in-law (5) Son

7. If A#B%C@D/E, then which of the following is true?

(1) D is A's sister-in-law (2) E is B's mother-in-law (3) A is E's daughter-in-law
(4) Only (1) and (3) (5) (1), (2) and (3)

8. Which of the following means that A is the niece of D?

(1) D@C+A@B (2) A/B÷C+D (3) D%C÷A@B
(4) More than one of above (5) None of these

9. If A+C*B÷E%D, then what is the relationship between A and D?

(1) A is D's grandmother (2) A is D's mother (3) D is A's son
(4) A is D's grandfather (5) D is A's grandson

10. Which of the following means that A is D's uncle and E is B's daughter?

(1) A%B*C÷E%D (2) A@B#C÷D%E (3) B%A@D÷C#E
(4) A%B*C÷D%E (5) None of these

1. What is the maximum difference between exports and imports of the same year?
   (1) 18 (2) 19 (3) 21 (4) 22 (5) 20

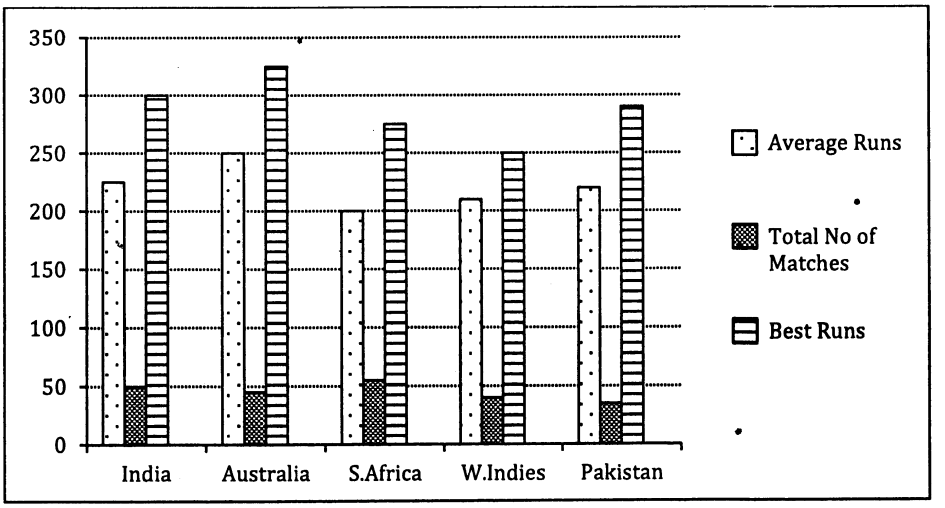
2. What is the ratio between exports in the year 1999 and exports in the year 2003?
   (1) 25 : 22 (2) 21 : 26 (3) 26 : 21 (4) 22 : 25 (5) None of these

3. The imports in 2000 form what percentage of exports in 2003?
   (1) 120 (2) 130 (3) 140 (4) 145 (5) 135

4. What is the difference between sum of exports in the year 1999 and 2000 and sum of imports in the year 2002 and 2003?
   (1) 55 (2) 50 (3) 60 (4) 65 (5) 45

5. What is the total difference between exports and imports over these years?
   (1) 15 (2) 18 (3) 12 (4) 21 (5) 10

Instructions for questions 6 to 10: Answer questions based on the following information:



The given graph shows average runs, total number of matches played and best runs scored in a cricket tournament by India, Australia, South Africa, West Indies and Pakistan.

6. What is the difference between the total runs scored by India and Pakistan?
   (1) 3500 (2) 3550 (3) 3600 (4) 3400 (5) 3450

7. What is the ratio of the total runs made by Australia and W.Indies?
   (1) 75 : 56 (2) 56 : 75 (3) 76 : 55 (4) 55 : 78 (5) None of these

8. Which country has the minimum total runs?
   (1) India (2) Australia (3) W.Indies (4) S.Africa (5) Pakistan

9. Which country has the lowest difference between average runs and best runs?
   (1) India (2) Australia (3) S.Africa (4) W.Indies (5) Pakistan

10. What is the total number of runs scored by S.Africa?
    (1) 11050 (2) 11100 (3) 11000 (4) 10050 (5) 10090

4 Relationships

PRACTICE TEST I

Instructions for questions 1 to 5: Answer questions based on the following information.

In a family of 8, each member except one is a doctor who treats a specific medical condition. No two members of the family treat the same medical condition. Wife of Anant, the oldest member of the family, treats people who stammer. Armaan, one of Antara's sons, treats people suffering from amnesia and is married to the person who is not a doctor. Anant's only grandchild Ananya treats patients suffering from dyslexia. Anshumaan treats dumbness and is the husband of the doctor who is Antara's daughter and who specializes in the treatment of the deaf. Ananya's paternal uncle Anshul, who is also the son of Anant, treats blindness and is unmarried. The member of the family who treats crippled people is the father of Anshul and father-in-law of Anjali, who is the mother of Ananya. The name of the member of family not mentioned is Anjana.

1. Which member of the family can be the doctor who treats deafness?

   (1) Anjali (2) Antara (3) Anjana (4) Anant (5) More than of the above

2. What is the relation of Armaan with Ananya?

   (1) Father (2) Paternal uncle (3) Maternal uncle (4) Brother (5) None of above

3. How is Anant related to Anshumaan?

   (1) Brother (2) Father (3) Brother-in-law (4) Father-in-law (5) Cannot be determined

4. How is Ananya related to Anjana?

   (1) Daughter (2) Son (3) Niece (4) Nephew (5) Cannot be determined

5. What is the medical condition that Antara treats?

   (1) Deafness (2) Stammering (3) Crippledness
   (4) None of the above (5) Cannot be determined

Instructions for questions 6 to 10: Answer questions based on the following information.

Aliya is the youngest member of the family. Her cousin Boman's paternal grandmother, Chaaru, is her maternal grandmother, while Bomans' maternal grandfather, Dinkar, is her paternal grandfather. Mother of Aliya's father, Fenil and Boman's mother, Geet is Esha. Hitharth is Fenil and Geet's father-in-law. Ilesh, Geet's husband is very fond of Jugal, his only brother-in-law's son. Kajri warns her brother Ilesh not to spoil her son Jugal by pampering him too much.

6. How is Dinkar's daughter related to Jugal's father?

   (1) Sister-in-law (2) Sister (3) Wife (4) Daughter (5) Niece

7. What is the total number of females in the family?

   (1) 4 (2) 5 (3) 6 (4) None of above (5) Cannot be determined

8. What is the relationship of Hitarth with Boman and Kajri respectively?

   (1) Father, Paternal grandfather (2) Maternal grandfather, Father
   (3) Maternal grandfather, Father-in-law (4) Paternal grandfather, Father
   (5) Paternal grandfather, Father-in-law

5 Directions and Arrangements

PRACTICE TEST I

1. Raghav started walking from a point and walked 16m towards the west. He then took a left turn and walked 7m. He again took a left turn and walked 7m. Finally, he took a right turn and walked for 5m. What is the distance between his initial and final position?

   (1) 12m (2) 15m (3) 16m (4) 17m (5) None of these

Instructions for questions 2 to 5: Answer questions based on the following information.

A, B, C, D, E, F, G, and H are eight friends sitting around a circular table (facing the centre). They like exactly one of the following subjects viz., English, Hindi, History, Geography, Physics, Chemistry, Biology and Mathematics (in no particular order). The following points are known about their seating arrangement:

a. A sits opposite the person who likes History
b. The person who likes Chemistry sits to the immediate right of E.
c. G is adjacent to D and the person who likes Physics.
d. H is to the left of A and likes English.
e. B sits to the immediate left of the person who likes History and is adjacent to G who likes Hindi.
f. C is sitting exactly opposite D and is adjacent to F who likes Geography.
g. H does not sit next to someone who likes Biology or Hindi.

2. Which subject does A likes?

   (1) English (2) Hindi (3) Physics (4) Mathematics (5) Chemistry

3. Which person likes Physics?

   (1) E (2) D (3) B (4) G (5) C

4. How many people are sitting between H and G, when counted clockwise?

   (1) Zero (2) One (3) Two (4) Three (5) four

5. Who is sitting diagonally opposite G?

   (1) C (2) The person who likes history (3) E
   (4) H (5) The person who likes geography

Instructions for questions 6 to 9: Answer questions based on the following information.

Four boys A, B, C, D and four girls P, Q, R, S are playing merry go round in such a way that they face the centre and form a circle. No two girls or no two boys are next to each other. A is to the immediate left of R, who is opposite to Q. P and Q have only C between them. P is opposite to S, who is to the immediate right of B.

6. Which of the following is an acceptable arrangement of the players in clockwise direction?

   (1) A, R, D, P, C, Q, B, S (2) C, Q, P, D, S, B, A, R
   (3) D, R, A, S, B, Q, P, C (4) Q, C, P, D, R, A, S, B

7. If B is the only person between R and S, then who is opposite B?

   (1) A (2) Q (3) C (4) D

8. Who is the only person between P and R?

(1) B or C (2) A or D (3) S or A (4) D or C

9. Which of the following persons are opposite each other?

(1) P and S (2) B and Q (3) C and D (4) A and B

Instructions for questions 10 and 11: Answer questions based on the following information.

Prakash, Pratap, Praveen and Pranay are either of a painter, actor, writer or author, not necessarily in that order. At the moment, each one of them is carrying a certain item i.e. pen, glasses, coat and hat. No two of them share the same profession or carry the same item. Following information is also known about them.

1. The author is carrying glasses.
2. Praveen is not a painter but is carrying a pen.
3. Pranay is a writer but is not carrying a hat.
4. Prakash is neither a painter nor an actor.

10. Who is carrying a hat?

(1) Prakash (2) Praveen (3) Pranay (4) Pratap (5) Cannot be determined

11. Which of the following is the right combination?

(1) Praveen – Actor – Glasses (2) Pratap – Author – Glasses (3) Pranay – Writer - Coat
(4) Prakash – Painter – Hat (5) None of these

PRACTICE TEST II

Instructions for questions 1 to 5: Answer questions based on the following information.

A, B, C, D and E are five males who along with their wives P, Q, R, S and T like own one car each from Honda, Santro, BMW, Ferrari and Merc. The cars are red, blue, yellow, white and black in no specific order. The car that these people drive is of the colour that they like. The following details are also known:

a. E's wife likes Merc.
b. Q's husband likes the red car.
c. A and S form a pair and drive the Honda.
d. D does not like red and yellow colours; R likes yellow and B likes red.
e. C and P like the same car, which is not Santro.
f. D's wife does not like any colour that starts with the letter B.
g. D likes the Ferrari.

1. Who is the wife of E?

(1) P (2) Q (3) R (4) S (5) T

2. Which of the following are a couple?

(1) D and T (2) B and R (3) D and Q (4) E and S (5) None of these

3. Who is the husband of R?

(1) A (2) B (3) C (4) D (5) E

4. Which of these cars does E have?

(1) Red (2) Yellow (3) Black (4) Blue (5) White

5. Which of these cars is black in colour?

(1) Honda (2) Santro (3) Ferrari (4) Merc (5) Cannot be determined

Instructions for questions 6 to 9: Answer questions based on the following information.

A, B, C, D and E work in the same company and have been on a trip to different branches viz. P, Q, R, S and T, located in Mumbai, Delhi, Kolkata, Chennai and Hyderabad (in no specific order) in the months January, February, March, April and May, again not necessarily in the same order. The following information is given:-

a. D went to the city with the longest name in the month with the least number of days.
b. A, B and C went on trips in months having 31 days each such that A went in a month not starting with 'M'.
c. The person who had his trip in April came to Mumbai.
d. Branch Q is located in Chennai and branch T is located in Kolkata.
e. A visited branch R in Delhi.
f. The person who visited Kolkata went in the month of May and E went to branch P.

6. The person who visited Chennai went there in which month?

(1) January (2) February (3) March (4) April (5) May

7. Which city did E visit?

(1) Delhi (2) Mumbai (3) Hyderabad (4) Kolkata (5) Chennai

8. Which branch did B visit?

(1) P (2) Q (3) R (4) S (5) Cannot be determined

9. Who visited branch R?

(1) E (2) D (3) B (4) A (5) C

6 Series and Analogies

PRACTICE TEST I

Instructions for questions 1 to 8: Find the missing term(s).

1. 5, 8, 7, 15, 11, 29, 17, 50, __

(1) 27 (2) 55 (3) 25 (4) 78 (5) 52

2. 2, 4, 8, 14, 22, 32, 16, 8, __

(1) 2 (2) 4 (3) 6 (4) 7 (5) 8

3. 7, 21, 3, 42, 14, 28, __

(1) 3 (2) 2 (3) 1 (4) 35 (5) 42

4. 2, 13, 8, 4, 26, 16, 6, __

(1) 45 (2) 12 (3) 39 (4) 26 (5) 18

5. 0.5, 0.5, 2, __, 288, 7200

(1) 2.5 (2) 15 (3) 121 (4) 18 (5) 111

6. 14, 30, 124, 750, __

(1) 6008 (2) 1046 (3) 4508 (4) 5008 (5) 6004

7. 36,150, 392, 810, 1452, __

(1) 2700 (2) 2366 (3) 3600 (4) 2765 (5) 2500

8. BC5, E5, GK18, M13, __

(1) QS36 (2) UV43 (3) QS13 (4) TU42 (5) Q17

Instructions for questions 9 and 10: Find the odd man out.

9. 44, 94, 248, 623, 721

(1) 44 (2) 94 (3) 248 (4) 623 (5) 721

10. $\frac{27}{45}, \frac{39}{65}, \frac{57}{95}, \frac{51}{85}, \frac{48}{75}$

(1) $\frac{48}{75}$ (2) $\frac{51}{85}$ (3) $\frac{27}{45}$ (4) $\frac{39}{65}$ (5) $\frac{57}{95}$

Instructions for question 11: Given below is a group of numbers. One term does not fit the series. Find the term which will replace the odd man out.

11. 1, 4, 27, 256, 2125, 46656

(1) 3025 (2) 3125 (3) 46666 (4) 625 (5) 81

Instructions for questions 12 and 13: Find the missing number.

12. 36 : 729 : : 43 : __

(1) 512 (2) 1221 (3) 729 (4) 343 (5) 216

13. 147 : 53 : : 168 : __

(1) 44 (2) 47 (3) 35 (4) 30 (5) 32

PRACTICE TEST II

Instructions for questions 1 to 3: Find the missing term.

1. CCC : EEEEE : : BB : __

(1) AAA (2) FFFFFF (3) DDD (4) FFF (5) EEE

2. PJ : 36 : : TN : __

(1) 25 (2) 49 (3) 36 (4) 64 (5) 9

3. 343 : 56 : : 512 : __

(1) 72 (2) 66 (3) 71 (4) 68 (5) 69

Instructions for questions 4 to 7: Answer questions based on the sequence given below:

YLJ4 α 7Y β 2 δ VH5E θ MPQ λ U π 8XT σ 9Y6UW3R2S

4. If all the numbers in the given sequence are replaced by 2, what will the 3rd element to the right of the 17th letter from the right end?

(1) 8 (2) 2 (3) X (4) U (5) π

5. How many letters in the sequence are immediately preceded by a letter?

(1) 7 (2) 5 (3) 6 (4) 4 (5) 3

6. Find the odd man out from the options given below.

(1) Y4Y (2) βVE (3) Mλ8 (4) EPπ (5) X9U

7. How many symbols in the sequence are immediately preceded by a number and immediately followed by a letter?

(1) 1 (2) 2 (3) 3 (4) 4 (5) 5

8. Complete the series: 47 α, 7 β γ, 2V δ, 5 θ E, __

(1) 96Y (2) 8TX (3) 6WU (4) 2SR (5) 8XT

Instructions for questions 9 and 10: Answer questions based on the sequence given below:

159467810130004123003487048132480130567802139

9. How many digits are immediately preceded by a digit which is a multiple of 3 and immediately followed by a digit which is a multiple of 4?

(1) 5 (2) 4 (3) 2 (4) 3 (5) 1

10. Four of the following group of elements are similar in some way and form a group. Find the odd man out which does not belong to the group.

(1) 11 (2) 81 (3) 74 (4) 35 (5) 38

Instructions for questions 11 and 12: Answer questions based on the sequence given below:

AUOERIWQYKMFNLHPZVXTBDJSCG

Each letter gets a numerical value based on its position in the above sequence starting from 1 for 'A', 2 for 'U', 3 for 'O' and so on.

11. In the above sequence, the value of 'J' is equal to the total value of which of the following pairs?

(1) V and E (2) X and O (3) Z and R (4) P and W (5) None of these

12. In the sequence, if all the prime positioned letters are dropped, then which letter is eighth to the left of the fifth to the right of the seventh letter from the right end?

(1) T (2) L (3) H (4) P (5) None of these

7 Codes

PRACTICE TEST I

1. If in a certain code, the word 'limitations' is written as 'milititanso' and 'philosophy' is written as 'ilphoposhy', then how will the word 'metamorphosis' be written in the same code?

   (1) tamerpomsohis (2) tamerpmosohis (3) tamerpmosihos
   (4) temarpmosihos (5) tamerpomsihos

2. If in a certain code, the word 'maroon' has been written as 'monpnpqszbln', then which word will be written as 'ackmzbbdjl' in the same code?

   (1) jlacc (2) kcalb (3) jcalc (4) black (5) Cannot be determined

3. In a certain code, the word 'cricket' has been coded as 'dqjbldu', then how will the word 'tennis' be coded in this code?

   (1) ufmoht (2) ufoojt (3) udoojr (4) uodmjr (5) udomjr

4. In a certain coding system, the word 'lemon' is written as 'xrgjv', while the word 'monster' is written as 'gjvkarh'. How will the word 'monsoon' be written when the same code is used?

   (1) gjkvjjv (2) gjvkjjv (3) gvjkjjv (4) gkvkjjv (5) None of these

Instructions for questions 5 and 6: Answer questions based on the following information:

In a certain code 'flower' is coded as 'ise', while 'marigolds' is coded as 'grkhs'.

5. How will be the word 'turmoil' be coded in this system?

   (1) trll (2) tril (3) trli (4) uril (5) Cannot be determined

6. How will be the word 'microsoft' be coded in this coding system?

   (1) kcojt (2) mcoot (3) kcqot (4) mcqot (5) kjqot

7. If in a certain code, the word 'definition' is coded as 'neiiintfod', then how is the word 'sardonic' written in the same code?

   (1) canodris (2) cinodras (3) cirodnas (4) candoris (5) cindoras

8. In a certain code language if "PHLOX" is coded as "KUOBC" and "FLOCK" is coded as "UYLPP", then which word is coded as "KELKB"?

   (1) LADEN (2) PLONK (3) IMPLY (4) PROXY (5) PROUD

9. In a certain coding system, the word 'life' is coded as 12212732. Then how will the word 'death' be coded in the same system?

   (1) 49103038 (2) 49103938 (3) 459103038
   (4) 49010338 (5) Cannot be determined

10. If in a certain language, SPACE is coded as 96541 and CASELET as 4591713, how is PLATE coded in the same language?

    (1) 76513 (2) 56731 (3) 67531 (4) 76531 (5) 67513

11. If in a certain language C is coded as 6, I as 72, N as 182, T as 380 and Z as 650, then how is the word KITES coded in this language?

(1) 11072839020432 (2) 1007238002432 (3) 1107328020432
(4) 1107238020342 (5) 1107238020432

12. In a certain code language if "HELLBOY" is coded as "553" and "PHANTOM" is coded as "609", then how is the word "BATMAN" coded in that language?

(1) 357 (2) 592 (3) 295 (4) 469

13. In a certain coding system "Red stands for anger" is written as "mail tail bail pail" and "Green stands for prosperity" is written as "tail rail sail bail". Then which among the following can be the encoded form of "Stand for yourself"?

(1) Tail bail nail (2) Jail bail tail (3) Tail hail bail
(4) More than one of above (5) Cannot be determined

PRACTICE TEST II

1. In a certain coding system "He is a boy" is coded as "red pink white purple", "She is a girl" as "Yellow white red brown" and "Boy is not girl" as "pink green yellow white", then what are the codes for She, not, a and boy respectively?

(1) Brown, green, white, pink (2) Brown, green, red, purple
(3) Yellow, white, green, purple (4) Yellow, red, pink, brown
(5) Brown, green, red, pink

2. If a 'Comet' is called a 'Moon', 'Moon' is called 'Earth', 'Earth' is called 'Sun', 'Sun' is called 'Silky-way', 'Silky-way' is called 'Glace', then where do human beings reside?

(1) Glace (2) Moon (3) Earth (4) Sun (5) Silky way

3. If 'nose' is 'tongue', 'tongue' is 'eye', 'eye' is 'ear', 'ear' is 'hand' and 'hand' is 'leg', then with which organ of the body do we hear?

(1) Hand (2) Leg (3) Tongue (4) Ear (5) Eye

Instructions for questions 4 to 7: Refer to the data below and answer the questions that follow.

A ÷ B means (A × B) + 2
A % B means max (A, B)
A × B means remainder obtained when greater of A and B is divided by the smaller
A @ B means min (B^2 + A, 100)

4. What is the value of 7 × 3 % 5 @ 8 ÷ 2?

(1) 138 (2) 32 (3) 140 (4) 132 (5) 34

5. What is the value of 9 @ 7 % 3 × 5 ÷ 6?

(1) 2 (2) 18 (3) 5 (4) 15 (5) 20

6. How many of the following statements are true?

i. 10 × 6 ÷ 4 % 2 = 7
ii. 5 @ 3 ÷ 2 % 1 = 7
iii. 8 ÷ 4 % 7 × 9 = 7
iv. 2 × 3 @ 4 × 6 = 7

(1) 0 (2) 1 (3) 2 (4) 3 (5) 4

7. Which of the following expression will give a negative value?

(1) (−3) % 2 @ (−5) × 4 (2) 4 ÷ (−6) % 3 @ 7 (3) 8 @ (−9) × 7 ÷ (−6)
(4) None of the above (5) More than one of above

Instructions for questions 8 to 12: Answer questions based on the following information:

A + B means A is not greater than B
A × B means A is equal to B
A / B means A is not greater than or equal to B
A @ B means that A not less than or equal to B
A − B means A is not less than B

Each of the following questions consists of a statement followed by two conclusions.
Mark option

(1) If only conclusion (I) follows
(2) If only conclusion (II) follows
(3) If both conclusion (I) and (II) follows
(4) If neither conclusion (I) nor conclusion (II) follows
(5) If either conclusion (I) or conclusion (II) follows

8. Statement: P − Q, Q/R, R/S
Conclusions: I) S @ Q
II) P + R

9. Statement: A/B, B @ C, C − D
Conclusions: I) A/D
II) A @ D

10. Statement: A − B, B − C, A × D
Conclusions: I) D @ C
II) D × C

11. Statement: A × B, B − C, D + A
Conclusions: I) D × C
II) D + B

12. Statement: A + B, A @ C, A × D
Conclusions: I) C + B
II) B − D

8 Logical Puzzles

PRACTICE TEST I

1. Each vowel of the word 'BOURNE' is replaced by the next letter in the alphabet and each consonant is replaced by the letter just preceding it in the alphabet. Now, the substituted letters are arranged in alphabetical order. Which of the following will now be the third letter from the right?

   (1) Q (2) U (3) N (4) P (5) R

2. How many such digits are present in the number '4291683' each of which is as far away from the beginning of the number as when the digits are arranged in ascending order within the number ?

   (1) None (2) One (3) Two (4) Three (5) More than three

3. In the word 'INGLOURIOUS', the fifth letter is interchanged with the seventh letter, the third letter is interchanged with the ninth letter and the first letter is interchanged with the eleventh letter. Which letter would come before the letter 'G' in the newly formed word?

   (1) N (2) L (3) U (4) O (5) I

4. The position of the first and the fifth digits in the number '56492187' is interchanged. Similarly, the position of the second and the sixth digits is interchanged and so on. Which of the following will be the fourth digit from the left after the rearrangement?

   (1) 2 (2) 9 (3) 5 (4) 7 (5) 0

5. How many pairs of letters in the word 'CRASHED' have as many letters between them in the word as in the alphabet?

   (1) One (2) Two (3) Three (4) Four (5) Nil

6. How many pairs of letters in the word 'FUNCTIONAL' have as many letters between them in the word as in the alphabet?

   (1) One (2) Two (3) Three (4) Four (5) More than four

7. How many pairs of letters in the word 'MALAYSIA' have as many letters between them in the word as in the alphabet?

   (1) Nil (2) One (3) Two (4) Three (5) More than three

8. How many pairs of letters in the word 'WEATHER' have as many letters between them in the word as in the alphabet?

   (1) One (2) Two (3) Three (4) Four (5) More than four

9. How many meaningful five-letter words can be formed using the second, third, fourth, eighth and ninth letter of the word 'HARMONIST' exactly once?

   (1) 0 (2) 1 (3) 2 (4) 3 (5) 4

10. If it is possible to make a meaningful five-letter word using the second, fifth, eighth, eleventh and twelfth letter of the word 'AMALGAMATION' exactly once, which of the following will be the second letter of that word? If no such word can be formed, give X as the answer and if more than one such word can formed, give Y as the answer.

(1) A (2) M (3) N (4) X (5) Y

PRACTICE TEST II

1. If it is possible to make only one valid four-letter English word using the first, second, fourth and seventh letters of the word RAVENOUS exactly once, which of the following will be the first letter of that word? If no such word can be made, give 'X' as the answer and if more than one such word can be made, give 'Y' as the answer.

(1) U (2) R (3) E (4) X (5) Y

Instruction for questions 2 and 3: The following questions are based on the five three-digit numbers given below.

794 736 782 775 718

2. If the position of the first and second digit of each number is interchanged, which of the following will now be the third digit of the second lowest number?

(1) 2 (2) 4 (3) 5 (4) 6 (5) 8

3. If the position of the first and last digit of each number is interchanged, which of the following will now be the second lowest number?

(1) 794 (2) 736 (3) 782 (4) 775 (5) 718

Instructions for questions 4 and 5: Answer the questions based on the following information:

In a gym, there are 5 different weights A, B, C, D and E.

i. B weighs twice as much as C
ii. A weighs 4 times as much as B
iii. D weighs 3 times as much as E
iv. E weighs five and half times as much as B

The weights are measured in pounds and all of them have integral values.

4. How many weights are heavier than E?

(1) 1 (2) 4 (3) 3 (4) 5 (5) 2

5. Which of the following can be the total weight of the lightest and the heaviest weights?

(1) 304 pounds (2) 202 pounds (3) 104 pounds (4) 274 pounds (5) 442 pounds

6. Sagar is ranked seventh from the top and thirty fourth from the bottom in a class. How many students are there in this class?

(1) 39 (2) 40 (3) 41 (4) 42 (5) 43

7. In a row of boys, Sumit is 5th from the left and Kishor is 33rd from the right. If they interchange their positions, Sumit becomes 25th from the left. How many boys are there in the row?

(1) 45 (2) 47 (3) 53 (4) 57 (5) 59

8. There are 10 stations A to J in that order on the route of a local train. A train starts from A for station J. It takes 6 minutes for the train to travel between any 2 stations and it stops for 2 minutes at each of the stations. If the train reached G at 6: 13 pm, then at what time did the train depart from B?

(1) 5:26 pm (2) 5:25 pm (3) 5:15 pm (4) 5:36 pm (5) 5:35 pm

9. A lazy spider wants to reach the top of a 10 feet wall. It starts from the bottom and climbs 2 feet in an hour. Exhausted, it hangs here for the next 5 hours and sleeps. Every time it sleeps, it slips 1 foot backwards. How many hours will it take for it to reach the top of the wall?

(1) 30 (2) 60 (3) 49 (4) 25 (5) 54

10. Nirmit's father proposed to give him pocket money in a very peculiar manner. There was a bowl in which he used to put Rs. 8 at the beginning of every day and Nirmit was supposed to take half the amount present in the bowl at the end of every day. Three days later, after day-end, it turned out that there were Rs. 20 left in the bowl. How much pocket money did Nirmit get for these three days in all?

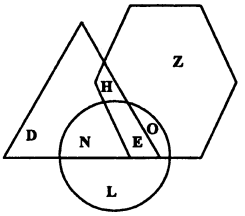
(1) 42 (2) 64 (3) 104 (4) 108 (5) 36

9 Venn Diagrams

PRACTICE TEST I

Instructions for questions 1 to 5: Answer questions based on the following information:

In the following diagram, three classes of population are represented by three figures. The triangle represents the group of sportspersons, the circle represents teachers and the hexagon represents married people.



1. Which letter represents the group of married people who are teachers but not sportspersons?
   (1) H (2) E (3) M (4) O (5) None of these

2. Which letter represents the group of sportspersons who are married but not teachers?
   (1) H (2) E (3) M (4) D (5) None of these

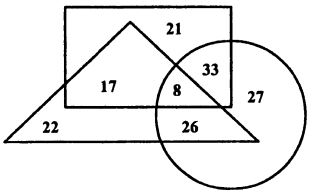
3. Which letter represents the teachers who are neither sportspersons nor married?
   (1) O (2) M (3) D (4) Z (5) None of these

4. Which letter represents the married sportspersons who are teachers?
   (1) H (2) O (3) M (4) D (5) None of these

5. Which letter represents married people who are neither teachers not sportspersons?
   (1) Z (2) O (3) H (4) D (5) None of these

Instructions for questions 6 to 10: Answer questions based on the following information:

The following questions are based on the diagram given below.



165 people were surveyed to know the festivals they celebrate. In the figure, the rectangle represents the number of people who celebrate Diwali, the circle represents the number of people who celebrate Navratri and the triangle represents the number of people who celebrate Holi.

6. How many people surveyed celebrate exactly one festival?
   (1) 59 (2) 60 (3) 70 (4) 79 (5) 69

7. How many people celebrate Diwali and Holi but not Navratri?
   (1) 17 (2) 25 (3) 60 (4) 68 (5) None of these

8. How many people do not celebrate at least one festival?

(1) 0 (2) 9 (3) 11 (4) 10 (5) Cannot be determined

9. What is the difference in the number of people who celebrate all the festivals and those who celebrate a maximum of two festivals?

(1) 138 (2) 145 (3) 147 (4) 149 (5) 157

10. If among those people who celebrate all the festivals, 3 people stopped celebrating Holi, but continue celebrating the other two festivals, then how many people now celebrate exactly two of the three festivals?

(1) 87 (2) 84 (3) 76 (4) 79 (5) None of these

PRACTICE TEST II

Instructions for questions 1 to 5: Answer questions based on the following information:

A radio station conducted a survey to find out the preference of its listeners. The result of the survey was as follows:
A total of 115 listeners liked rock music, 120 listeners liked jazz, while 145 people liked listening to Indian classical music. Among these, 64 listeners liked only rock and jazz music, 25 liked listening to only rock music and Indian classical, while 11 liked only Indian classical and jazz. There were 25 listeners who liked all three types of music. A total of 250 people were surveyed.

1. How many listeners liked rock music only?

(1) Zero (2) One (3) Two (4) None of these

2. How many listeners liked at least two forms of music?

(1) 120 (2) 100 (3) 125 (4) 115

3. How many listeners liked Indian classical or jazz but not rock music?

(1) 115 (2) 104 (3) 11 (4) 150

4. How many people surveyed did not like listening to any of the three forms of music?

(1) 125 (2) 25 (3) 20 (4) 130

5. How many listeners liked exactly one of the three forms of music?

(1) 105 (2) 125 (3) 145 (4) None of these

Instructions for questions 6 to 10: Answer questions based on the following information:

In a survey conducted by a shopping mall, 90 customers were asked which segment of the store they liked the most. 25 said they liked the books segment, 45 liked the clothes segment, and 38 preferred the jewellery segment. The number of customers who liked all the three segments is equal to the number of customers who liked the clothes and jewellery segments, but not the books segment. 15 customers liked both the books as well as the clothes segments; 8 customers liked both the books and jewellery segments; while 6 customers liked both the clothes as well as the jewellery segments.

6. How many customers liked the jewellery segment but not the books and the clothes segments?

(1) 18 (2) 27 (3) 24 (4) None of these

7. How many customers liked exactly two segments?

(1) 17 (2) 23 (3) 20 (4) 29

8. How many customers did not like the books segment at all?

(1) 75 (2) 65 (3) 57 (4) None of these

9. How many of these customers liked both the books and the clothes segments, but not the jewellery segment?

(1) 15 (2) 12 (3) 20 (4) 14

10. How many customers liked at least one of the three segments?

(1) 82 (2) 62 (3) 59 (4) None of these

10 Numerical Logic

PRACTICE TEST I

Instructions for questions 1 to 5: Answer the following questions on the basis of this data.

A string of numbers is fed into a computing machine. It processes the input and gives an output in the following manner:
Input: 43, 72, 59, 19, 94, 85
Step 1: 12, 14, 45, 9, 36, 40
Step 2: 25, 27, 91, 17, 73, 79
Step 3: 17, 25, 27, 73, 79, 91
Step 4: 50, 29, 53, 58, 130, 82
Step 5: 45, 63, 18, 27, 99, 54

1. If the input is '23, 65, 17, 38, 52, 85', then what is the output at the end of Step 5?

(1) 9, 36, 495, 45, 99, 9 (2) 18, 54, 63, 18, 45, 99 (3) 18, 27, 54, 63, 108, 72
(4) 9, 36, 45, 9, 495, 99 (5) 9, 45, 72, 63, 99, 54

2. If the output in Step 2 is '127, 35, 73, 39, 85, 31', then which among the following can be the input string if all the numbers in the input string are two digit numbers?

(1) 79, 63, 49, 45, 77, 28 (2) 97, 29, 62, 45, 67, 44 (3) 97, 92, 94, 54, 76, 28
(4) More than one of the above (5) None of these

3. If the input is '41, 42, 43, 44, 45, 46', what is the 4th term in Step 4?

(1) 31 (2) 17 (3) 10 (4) 9 (5) Cannot be determined

4. If Step 1 and Step 2 are interchanged, then what will be Step 5, if the input is '11, 22, 33, 44, 55, 66'?

(1) 9, 81, 72, 45, 18, 45 (2) 9, 81, 27, 45, 18, 45 (3) 1, 9, 36, 5, 20, 61
(4) 1, 9, 27, 45, 18, 45 (5) 1, 9, 27, 5, 18, 45

5. If the input is '15, 31, 19, 24, 69, 86', then in which step is any number repeated twice?

(1) Step 1 (2) Step 4 (3) Step 5 (4) Step 4 and Step 5 (5) Step 1, Step 4 and Step 5

Instructions for questions 6 to 8: Answer the following questions on the basis of this data.

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement

Input : great now 44 32 16 fever always 66
Step I : 66 great now 44 32 16 fever always
Step II : 66 always great now 44 32 16 fever
Step III : 66 always 44 great now 32 16 fever
Step IV : 66 always 44 fever great now 32 16
Step V : 66 always 44 fever 32 great now 16
Step VI : 66 always 44 fever 32 great 16 now
Step VI is the last step of the rearrangement.
As per the rules followed in the above steps, answer the questions that follow.

6. If the input is "hari tall 31 9 74 58 rear out" which of the following will be the last step?

(1) VII (2) VIII (3) IX (4) X (5) None of these

7. If Step III is "89 care 74 winner shy 43 29 hall, then which of the following is definitely the input?

(1) care shy winner 74 43 29 hall 89 (2) 89 care winner 74 shy 43 29 hall
(3) 74 winner 89 care shy 43 29 hall (4) Cannot be determined
(5) None of these

8. If step IV of an input is "54 bore 45 dear 13 26 teeth pear", then which of the following will be the last step?

(1) VI (2) VII (3) VIII (4) IX (5) None of these

Instructions for questions 9 to 12: Answer the following questions on the basis of this data.

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement

Input : Mamta 88 41 Jaya Sushma 65 59 Maya
Step I : Sushma Mamta 88 41 Jaya 65 59 Maya
Step II : Sushma 41 Mamta 88 Jaya 65 59 Maya
Step III : Sushma 41 Maya Mamta 88 Jaya 65 59
Step IV: Sushma 41 Maya 59 Mamta 88 Jaya 65
Step V : Sushma 41 Maya 59 Mamta 65 88 Jaya
Step VI : Sushma 41 Maya 59 Mamta 65 Jaya 88
Step VI : is the last step of the rearrangement of the above input.

As per the rules followed in the above steps, answer each question given below:

9. If an input is "32 big small 58 49 out in 25" which of the following will be step V?

(1) small 25 out 32 in big 49 58 (2) small 25 out 32 in 49 58 big
(3) small 25 out 32 in 49 big 58 (4) There will be no such step
(5) None of these

10. If a particular input is "16 dinesh nehra 28 43 61 rohit ishant" which of the following steps will be the penultimate step?

(1) IV (2) V (3) VI (4) VII (5) None of these

11. If the input is "stump wicket 41 67 catch over 13 47", how many steps will be required to complete the rearrangement?

(1) Four (2) Five (3) Six (4) Seven (5) None of these

12. If step IV is "red 9 orange 12 25 38 black grey", then which of the following steps will be the last step?

(1) VI (2) VII (3) VIII (4) IX (5) None of these

PRACTICE TEST II

Instructions for questions 1 to 3: Answer the following questions on the basis of this data.

A cube is formed of 216 smaller cubes. Each pair of opposite faces of the cube is painted in the same colour. No two pairs of opposite faces are painted in the same colour. The three colours used to paint the cube are red, green and blue.

1. How many smaller cubes will have only red and blue colours on them?

(1) 64 (2) 48 (3) 24 (4) 20 (5) 16

2. How many smaller cubes will have exactly three colours on them?

(1) 0 (2) 2 (3) 8 (4) 16 (5) None of these

3. How many smaller cubes will have only green colour on them?

(1) 32 (2) 48 (3) 56 (4) 64 (5) 96

4. There are 60 notes, one of which is a counterfeit note. It is known that the counterfeit note is heavier than that of a genuine note. What is the minimum number of iterations of weighing required to find the counterfeit note?

(1) 3 (2) 4 (3) 5 (4) 6 (5) 7

Instructions for questions 5 to 8: Answer the following questions on the basis of this data.

In the following questions, rows of numbers are given. The resultant number in each row is to be found separately based on the following rules and the question below the rows of numbers are to be answered. The operation of numbers progresses from left to right.

1) If a square is followed by a cube, take the square of the number whose cube is given.
2) If a cube is followed by a square, take the cube of the number whose square is given.
3) If an odd number is followed by an even number, none of which is a square or cube of any number, then take the LCM of the two numbers.
4) If an even number is followed by an odd number, none of which is a square or cube of any number, then take the HCF of the two numbers.

5. 216 49 81
162 405 343

What is the sum of the digits of the sum of the resultants of the two rows?

(1) 4 (2) 10 (3) 14 (4) 22 (5) 31

6. 21 28 63
p 24 147

If p is the resultant of the first row, then what is the resultant of the second row?

(1) 1 (2) 168 (3) 1176 (4) 21 (5) None of these

7. 25 8 p
3 18 45

If the resultants of both the rows are equal, then what is the value of p?

(1) 27 (2) 9 (3) 18 (4) 81 (5) Cannot be determined

8. Resultant of which of the following rows is 64?

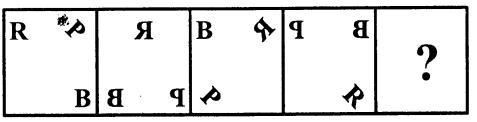
(1) 48 32 64 (2) 16 729 512 (3) 108 135 16
(4) More than one of the above (5) None of these

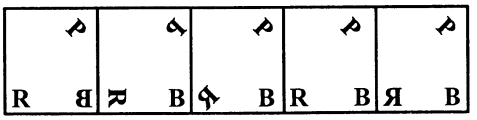
11 Visual Reasoning

PRACTICE TEST I

Instructions for questions 1 to 9: Given below are two sets of figures, the 'Problem Figures' and the 'Answer Figures' marked 1, 2, 3, 4 and 5. Which figure from 1, 2, 3, 4 and 5 should be in place of the question mark to continue the series?

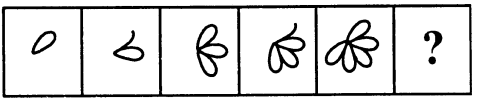
1.

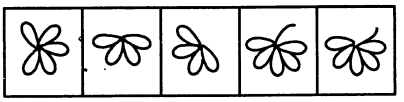




(1) (2) (3) (4) (5)

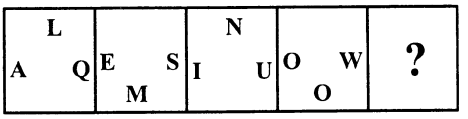
2.

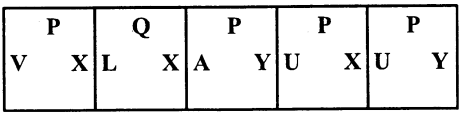




(1) (2) (3) (4) (5)

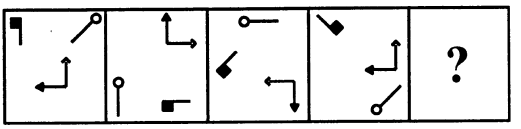
3.

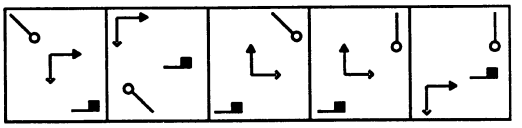




(1) (2) (3) (4) (5)

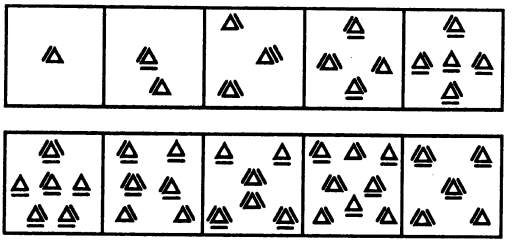
4.





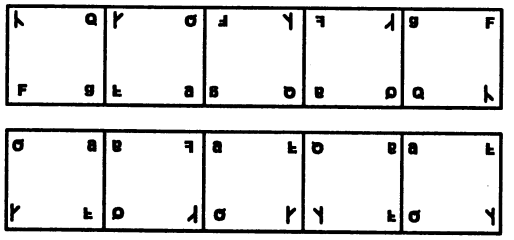
(1) (2) (3) (4) (5)

5.



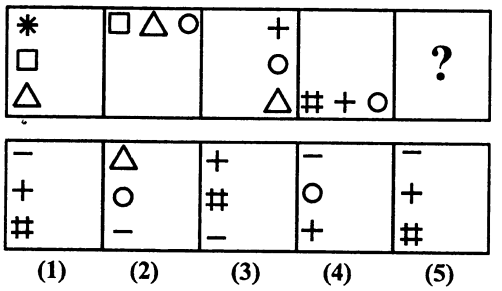
(1) (2) (3) (4) (5)

6.



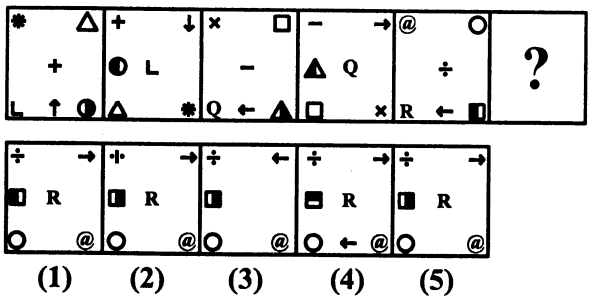
(1) (2) (3) (4) (5)

7.



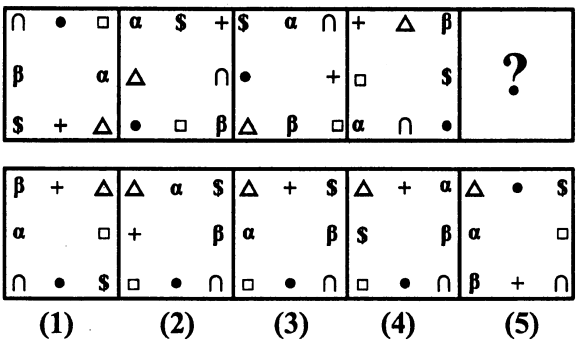
(1) (2) (3) (4) (5)

8.



(1) (2) (3) (4) (5)

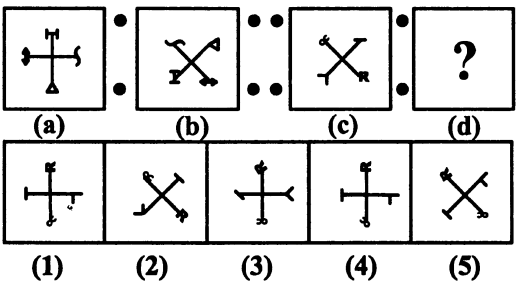
9.



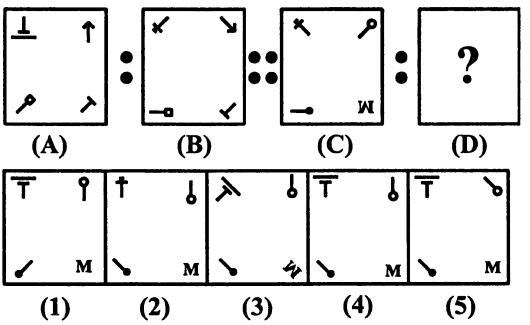
PRACTICE TEST II

Instructions for questions 1 to 4: In the question below, figure (B) is related to figure (A) in a certain way. Determine which of the 'Answer Figures' would come in place of question mark so as to have a similar relationship between figure (C) and (D).

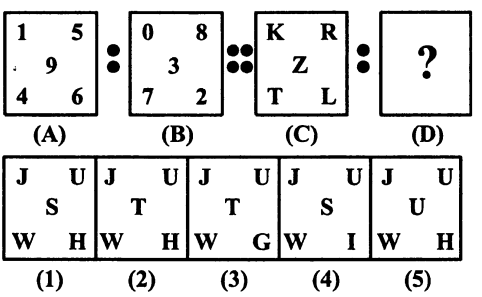
1.



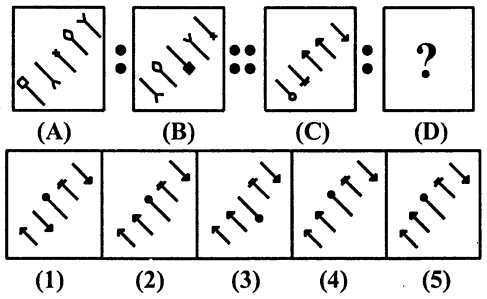
2.



3.

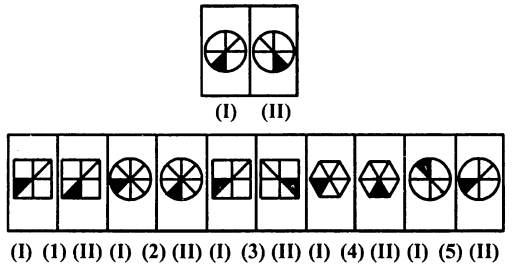


4.

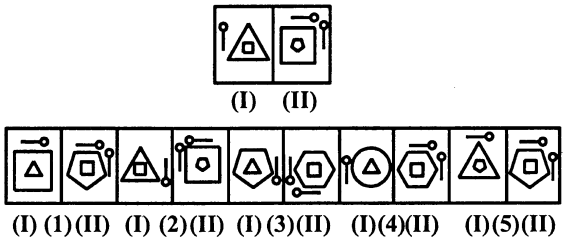


Instructions for questions 5 and 6: In each of the following questions, a related pair of figures is given followed by five numbered pairs. Select a pair that has a relationship similar to that of the original pair.

5.

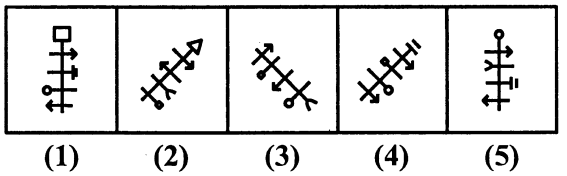


6.

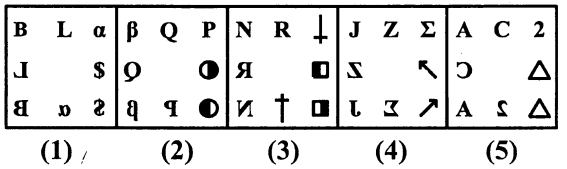


Instructions for questions 7 to 11: Given below are five figures, out of which four are similar in a certain manner. Find the figure which differs from all other figures.

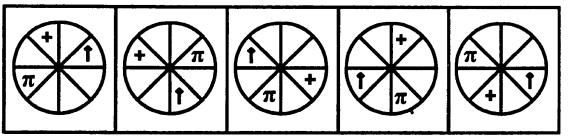
7.



8.

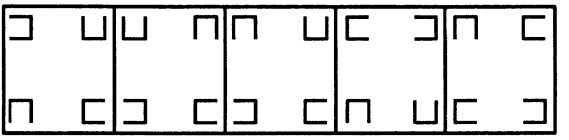


9.



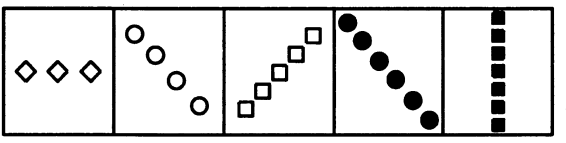
(1) (2) (3) (4) (5)

10.



(1) (2) (3) (4) (5)

11.



(1) (2) (3) (4) (5)

12 Selection Criteria

PRACTICE TEST I

Instructions for questions 1 to 5: Answer the following questions based on the information given below.

Mrs. X is planning the family's annual summer vacation. Help her select the package deal(s) that meet the following requirements:

a. The duration of the trip can be from 6 to 8 days.
b. The total cost of the trip should not exceed Rs. 50,000. This includes both travel and accommodation.
c. The family consists of Mrs. X, her husband and their 2 children. Therefore, the total cost should be calculated for 4 people – 2 adults and 2 children.
d. The package should include a visit to at least 2 locations.
e. The package deal should be valid for the month of May.

If a holiday package satisfies all the above conditions except:

f. Condition (a) alone, and is for a maximum duration of 10 days including 2 Sundays, then it can be selected.
g. Condition (b) alone, and is less than Rs. 80,000, but includes air travel, then it should be discussed with the husband.
h. Condition (d) alone, but a variety of activities are included in the package, then it should be discussed with the children.

Mark option:

1. If the package deal should be selected
2. If the package deal should not be selected
3. If the package deal should be discussed with the husband
4. If the package deal should be discussed with the children
5. If the data is insufficient

1. ABC Tours offers an eight-day summer holiday package to the North. The highlights of this trip would be white water rafting in Rishikesh and mountain trekking at the foothills of the Himalayas. The total cost (all inclusive) is Rs. 15,000 per person, Rs. 25,000 for a couple and Rs. 40,000 for a family of four. This offer is valid till 31st May.

2. DEF Tours has a special discount on its summer bonanza package, valid only from 1st April to 31st May. The cost per head is Rs. 10,000 though there are no group/multiple person discounts. The destinations include Kovalam beach and the backwaters of Kerela. There will be only one planned trip in May starting on 1st May for 10 days.

3. GHI Travels offers a year round package comprising of 2 days at Corbett National Park, followed by 5 days in Kulu Manali. The cost of food and accommodation is Rs. 15,000 per adult and Rs. 12,000 per child. Travel by train is Rs. 1,000 per head. They also have an alliance with CheapAir, which offers round trip air tickets at Rs. 6,000 per head.

4. JKL Tours is offering a special discount on its Simply South package, valid till 31st March. The package includes a 6 day trip to Mysore, Ooty and Coorg. The travel cost is Rs. 2,000 per head. Food and accommodation is Rs. 10,000 per adult and Rs. 8,000 per child.

8.

Name of candidate	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
Armaan Malhotra	✓	?	✓	✓	✓	(b) is unknown	Data insufficient

Armaan satisfies all the conditions except (b).
Though it has been mentioned that he has completed his post graduation in marketing with a first class, there is no mention that a first class means greater than 65%.
A first class can be defined as any percentage.
Therefore, the data is insufficient about the percentage of marks obtained in the post graduation exam.
Hence, **option 5.**

9.

Name of candidate	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
J.P. Shukla	✓	✓	✓	✓	×	(e) is not satisfied but (f) is satisfied	Refer case to the General Manager

The candidate fulfils all criteria except (e) as his work experience is less than 2 years.
However, he has been working as a Marketing manager for more than a year. Hence, he satisfies condition (f).
Hence, his case should be referred to the General Manger.
Hence, **option 3.**

10.

Name of candidate	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
Anjali Gupta	✓	✓	✓	✓	✓	All conditions are satisfied	Selected

The candidate fulfills all the criteria given and hence, can be selected.
Hence, **option 1.**

PRACTICE TEST II

1. Whenever the conditions are given in an unnumbered format, it is always better to number them as follows:

1. The candidate should be based in Mumbai.
2. He should be a first class (minimum 60%) graduate.
3. He should have at least 8 years of work experience.
4. He should have worked with a reputed builder on a project of a residential complex.
5. He should have a recommendation from at least 1 contractor.
6. Any one condition from (a) to (f) should be satisfied.

Name of Candidate	(1)	(2)	(3)	(4)	(5)	(6)	Comment	Outcome
Pratik	✓	✓	✓	✓	✓	✓	All conditions are satisfied	Selected as he satisfies (a) and (e)

The candidate satisfies all the basic conditions and additionally satisfies conditions (a) and (e). Hence, he is selected.
Hence, **option 2.**

2.

Name of Candidate	(1)	(2)	(3)	(4)	(5)	(6)	Comment	Outcome
Mandar	?	✓	✓	✓	✓	✓	Condition 1 is unknown	Data Insufficient

Mandar satisfies all the basic conditions apart from (a) along with additional condition (d). However, there is no information on whether his base is Mumbai.
Hence, it is not clear whether he is to be selected or rejected.
Hence, **option 4.**

3.

Name of Candidate	(1)	(2)	(3)	(4)	(5)	(6)	Comment	Outcome
Nirali	✓	✓	✓	✓	✓	✓	All conditions are satisfied	Selected as she satisfies (b)

Nirali satisfies all the basic conditions as well as condition (b) as her fee is less than Rs. 40 lakhs.
It is not sure whether she satisfies condition (f) as her expertise in 3D modeling software in not mentioned.
Hence, she can be selected only on the basis of additional criterion (b) and not on the basis of (f).
Hence, **option 4.**

4.

Name of Candidate	(1)	(2)	(3)	(4)	(5)	(6)	Comment	Outcome
Jinay	✓	✓	✓	×	✓	✓	Condition 4 is not satisfied	Rejected

The data mentions that Jinay has only designed a commercial complex.
This implies that Jinay has not designed a residential complex.
Hence, he does not satisfy condition (4).
Hence, he is rejected.
Hence, **option 1.**

5.

Name of Candidate	(1)	(2)	(3)	(4)	(5)	(6)	Comment	Outcome
Ankita	✓	✓	✓	✓	✓	×	Condition 6 is not satisfied	Rejected

Ankita satisfies all the conditions from (1) to (5), but does not satisfy any of the 6 conditions from (a) to (f).
Hence, she is rejected.
Hence, **option 2.**

6. Roshan Singh Sodhi satisfies all five conditions and so has to be selected.
Hence, **option 4.**

7. Since Taarak Mehta has completed his post graduation in Commerce with 50 percent marks, condition (ii) not satisfied.
Since he has no other degree, the alternate condition also does not apply.
Hence, he should not be selected.
Hence, **option 5.**

8. Daya Gada's work experience details have not been given at all.
Therefore, it cannot be decided whether she satisfies condition (iii) or the alternate condition (or both or none).
Hence, the given data is inadequate to take a decision.
Hence, **option 1.**

9. Babita satisfies all the given conditions except, condition (v).
It is given that Babita selected 90 marks in the selection process (and not 90 percent marks).
Since the total marks of the selection process are not known, the required percentage cannot be calculated.
Therefore, it cannot be said if Babita satisifes condition (v).
Therefore, the given data is inadequate to take a decision.
Hence, **option 1.**

10. Since Atmaram Bhide has less than 65 percent marks in his graduation in commerce, he does not satisfy condition (i).
Since there is no alternate condition possible for this condition, he cannot be selected.
Hence, **option 5.**

perpendicular to the first pin is added such that the heads of both pins face each other.
In options 1 and 2, though the sides of the elements increase by 1, the position of the pin is not correct. Hence, we can eliminate options 1 and 2.
In option 4, we have a circle. The number of sides of a circle is infinite. Hence, option 4 does not satisfy the relationship of increase in sides. Hence, we can eliminate option 4.
Option 5 does not satisfy the condition of increase in number of sides by 1. Hence, we can eliminate option 5.
The figure in option 3 satisfies all the conditions.
Hence, **option 3**.

7. We observe that each figure rotates by a certain angle which does not follow a particular pattern. Also there occurs some amount of replacement in each figure.
Each figure has 2 arrows. In all figures except (4), both the arrows face opposite directions.
In figure (4), both the arrows point in the same direction.
Hence, figure (4) differs from all the other figures.
Hence, **option 4**.

8. We observe that all the five figures have 8 elements and the overall position of all the elements remains the same in all the figures.
We observe that the 8 elements consist of a group of 4 elements and a group of their mirror images.
All the figures except figure (3) satisfy this condition.
In figure (3), the water image of the pair of perpendicular lines is taken.
Hence, **option 3**.

9. We observe that '+', π and the arrow are consecutive elements in this order when seen clockwise.
However, in figure (1), '+', π, and the arrow are consecutive elements in this order when seen anticlockwise.
Hence, figure (1) differs from the rest of the others.
Hence, **option 1**.

10. The pattern when we go from one element to another (from top left corner in clockwise order) in all 5 frames is a as given below:
(1) to (2) ⇒ 90°, 180°, 0°, 90° (All clockwise)
(2) to (3) ⇒ 180°, 180°, 0°, 0° (All clockwise)
(3) to (4) ⇒ 90°, 90°, 90°, 90° (All anticlockwise)
(1) to (2) ⇒ 90° (Clockwise), 180° (Clockwise), 90° (Anticlockwise), 90° (Anticlockwise)
Thus, there is no specific pattern in the rotation.
Hence, there has to be some other pattern.
We observe that in each frame, the elements open up in all 4 directions i.e. North, East, South and West. However, in frame (5), the elements open up only in South, West and North. Hence, figure (5) differs from the other figures.
Hence, **option 5**.

11. The number of elements increases by 1 in each figure and the elements rotate clockwise by 45° and 90° in alternate figures.
However, option 4 does not follow the pattern as it rotates anticlockwise by 90°.
Hence, **option 4**.

SELECTION CRITERIA

PRACTICE TEST I

1.

Tour operator	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
ABC Tours	✓	✓	✓	✓	✓	All conditions are satisfied	Select

The package offered by ABC Tours satisfies all the basic conditions given and should be selected.
Hence, **option 1.**

2.

Tour operator	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
DEF Tours	?	✓	✓	✓	✓	(a) is not satisfied. Data insufficient for (f).	Data Insufficient

The package starting on 1st May satisfies all the conditions except condition (a). The trip that starts on 1st May satisfies condition (e) if 1st May is a Friday, Saturday or Sunday. However, if 1st May is any other day i.e. Monday to Thursday, the tour does not include 2 Sundays. In such a case, condition (e) does not get satisfied. Hence, in the absence of data regarding the day on which 1st May falls, we cannot come to a definite decision.
Hence, **option 5.**

3.

Tour operator	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
GHI Travels	✓	×	✓	✓	✓	(b) is not satisfied but (g) is satisfied.	Discuss with husband

The cost of food and accommodation together only is (15000 × 2 + 12000 × 2) = Rs. 54,000. Since this cost is already greater than Rs. 50,000, condition (b) is violated. Hence, we check the travel cost for 4 people by train as well as by air. Train travel for four persons is Rs. 4,000, making the total cost of the trip Rs. 58,000. However, air travel for four persons is Rs. 24,000, making the total cost of the trip Rs. 78,000. Hence, condition (g) is satisfied. The rest of the conditions are also satisfied. Hence, this trip should be discussed with the husband.
Hence, **option 3.**

4.

Tour operator	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
JKL Tours	✓	✓	✓	✓	×	(e) is not satisfied	Not selected

This package satisfies all conditions except condition (e), since it is valid only till 31st March. Therefore, the package is not selected.
Hence, **option 2.**

5.

Tour operator	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
MNO Travels	✓	✓	✓	×	✓	(d) is not satisfied but (h) is satisfied	Discuss with children

If Mrs. X accepts a twin sharing basis, the cost comes out to Rs. 48,000. Thus, this package satisfies all the conditions except condition (d) since it includes only one location. However, since it offers a variety of activities, it satisfies condition (h), it should be discussed with the children.
Hence, **option 4.**

6.

Name of candidate	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
Akshat Shah	✓	✓	✓	×	✓	(d) is not satisfied	Rejected

First check all the independent conditions i.e. (a), (b) and (d). The candidate has scored 72% and 66% in his graduation and post graduation respectively. Hence, he satisfies conditions (a) and (b).
However, the candidate does not fulfill condition (d) as he is not fluent in Hindi. Hence, he is rejected.
Since (d) is not satisfied we do not need to check the conditions for (c) and (e).
Hence, **option 2.**

7.

Name of candidate	(a)	(b)	(c)	(d)	(e)	Comment	Outcome
Rita Sabarwal	✓	✓	×	✓	✓	(c) is not satisfied but (g) is satisfied.	Refer case to the Director

The candidate's age is more than 35 years in 2009. Hence, she fulfils all the conditions except (c).
However, she has more than 5 years of work experience as a marketing officer.
Hence, her case is to be referred to the Director.
Hence, **option 4.**

Note: We need not consider the logic for this element. This is because all answer options have the same orientation for this element. Hence the flag does not help in eliminating answer options.

The line with a circle rotates anticlockwise by 45° and 90° in alternate frames starting from the first frame. Hence, in the fifth frame, the line should rotate anticlockwise by 90° such that the circle on top of the line points in the south-east direction. Hence, options 2, 4 and 5 can be eliminated.

The pair of arrows rotates clockwise by 90° and 180° in alternate frames starting from the first frame. Hence, in the fifth frame, the pair of arrows should rotate clockwise by 180° such that one arrow points down and the other points to the right. Hence, option 3 can be eliminated.

Hence, **option 1.**

5. In each subsequent figure, the number of triangles increases by one.

Therefore, the sixth frame should have six triangles.

Hence, options 4 and 5 can be eliminated.

Similarly, the number of lines increases by two.

Hence, options 2 and 3 can be eliminated.

Hence, **option 1.**

6. From the first frame to the second, each element is replaced by its water image.

From the second frame to the third, each element moves clockwise by one step and is replaced by its mirror image.

This pattern is followed in alternate frames.

Therefore, from the fifth frame to the sixth, each element should be replaced by its water image.

The correct figure is given in option 3.

Hence, **option 3.**

7. In successive frames, the group of elements rotates clockwise by 90° (moves to the right by 1 step each).

Here, we observe that one element gets replaced in each frame. Hence, number each element to understand the pattern.

Hence, we give numbers 1, 2 and 3 to the position of the triangle, square and '*' respectively in the first frame.

Between frames 1 and 2, elements 1 and 2 interchange their position and element 3 gets replaced.

Between frames 2 and 3, elements 2 and 3 interchange their position and element 1 gets replaced.

Between frames 3 and 4, elements 1 and 2 again interchange their position and element 3 gets replaced.

This pattern is repeated in alternate frames.

Hence, in the fifth frame, elements 1 and 2 should interchange their position and element 3 should get replaced.

Hence, the fifth frame should have '+' at the top, '#' in the middle and '–' at the bottom.

Hence, **option 3.**

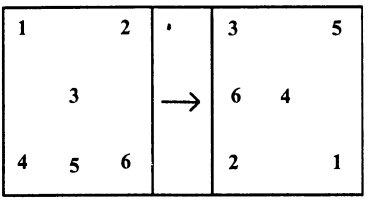
8. Here, we observe that all the elements in frame 1 are present in frame 2, but absent in frame 3.

Similarly, all the elements in frame 3 are present in frame 4, but absent in frame 5.

Hence, in this problem a pair of frames forms a series.

Hence, to find the sixth frame, we need to apply the common pattern (if any) to frame 5.

If we number all the elements in the first frame, we get the second frame using the following arrangement.



Also, elements 5 and 6 i.e. the arrow rotate by 180° while the shaded circle's mirror image is taken from the first frame to the second frame.

The same pattern applies in frames 3 and 4.

Hence, the fifth frame also follows the same pattern.

Hence, the arrow in frame 5 should rotate by 180° and point to the right in frame 6. Hence, option 3 can be eliminated.

Also, the '÷' sign should have the same orientation in the fifth and sixth frames. Hence, option 2 can be eliminated.

The shaded square in frame 6 should be such that the shaded part is vertical and on the right side. Hence, options 1 and 4 can be eliminated.

Hence, **option 5.**

9. Between frames 1 and 2, the elements present in the corners interchange their position with the elements present 1.5 steps ahead if we go clockwise.

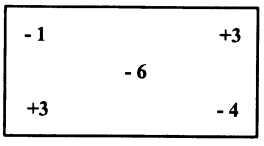
Between frames 3 and 4, the elements in the corners interchange their position with the elements adjacent to them in clockwise order. These patterns are repeated alternately.
Hence, **option 3**.

PRACTICE TEST II

1. The lines in figure (a) rotate anticlockwise by 135° while the elements at the tip of the lines rotates clockwise by 45° to give figure (b).
If the same logic is applied to figure (c), we get the figure given in option 4.
Hence, **option 4.**

2. From (A) to (B), the bottom-left element rotates clockwise by 45°. Hence, in (D), the element at the bottom left should be aligned diagonally with the circle pointing to the south-east. Hence, option 1 can be eliminated.
Similarly, the bottom-right element rotates clockwise by 90°. Hence, in (D), the element at the bottom right 'M', should be vertical with 'M' having its standard alignment. Hence, option 3 can be eliminated.
Also, the top-right element rotates clockwise by 135°. Hence, in (D), the element at the top right should be vertical with the circle pointing down. Hence, option 5 can be eliminated.
Finally, the top-left element rotates clockwise by 45°. Also, the smaller and bigger lines interchange their positions. Hence, in (D), the element at the top left should be vertical such that the larger line is above the smaller line.
Hence, option 2 can be eliminated.
Hence, **option 4.**

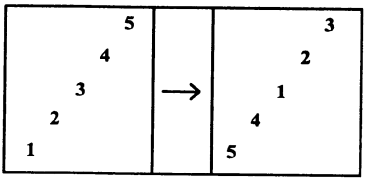
3. To obtain figure (B) from figure (A) we have to add or subtract numbers in the following manner:



Hence, to find (D), replace each alphabet by another which satisfies the relationship given above.
Hence K is replaced by J, which is 1 alphabet before K.
R is replaced by U, which is 3 alphabets after R.
T is replaced by W, which is 3 alphabets after T.
L is replaced by H, which is 4 alphabets before L.
Z is replaced by T, which is 6 alphabets before Z.
Hence, **option 2.**

Note: 'J', 'U' and 'W' are present in all options and in the same position. Hence, we can get the correct answer even if we do not check for their pattern.

4. If we number the elements in the first figure from bottom to top as 1, 2, 3, 4 and 5 respectively, we get the second figure as shown below:



Element 1 in Figure (A) is rotated clockwise by 180° and the transparent square at its tip is shaded.
Elements 2, 3 and 5 in Figure (A) are rotated clockwise by 180°.
Element 4 just changes its position. Its orientation remains the same.
Hence, from (C) to (D), we'll start from element 4. This element should move from position 4 to 2 and its alignment should remain as it is.
Hence, options 1, 4 and 5 can be eliminated.
We observe that in options 2 and 3, all the elements apart from the one at position 3 are similar. Hence, we focus only on this element.
As seen above, element 1 in (C) should rotate clockwise by 180° and the circle at its tip should become shaded.
Hence, option 3 can be eliminated.
Hence, **option 2.**

5. In the original pair, figure (II) is the mirror image of figure (I).
Though the pattern seems like an anticlockwise rotation of the circle by 45°, it is not so because the two perpendicular lines within the circle remain as they are.
The only pair among the options which is a mirror image of each other is option 3.
Hence, **option 3.**

6. In the original pair, both the geometrical figures are replaced by figures with one more side each. The pin shifts one position clockwise direction and another pin

There are 12 edges in a cube.
Since the colour green is unwanted, the cubes on the green faces cannot be considered.
There are 2 faces coloured green, each having 4 edges.
Hence, $2 \times 4 = 8$ edges cannot be considered.
Therefore there are only $12 - 8 = 4$ edges on which the cubes have only red and blue colour.
So, the number of cubes having only red and blue colour on them
= (Number of edges under consideration) × $(n-2)^1$
$= 4 \times (6-2)^1 = 16$
Hence, **option 5.**

2. All the smaller cubes that form the corners of the larger cube have 3 coloured faces.
Since no two pairs of opposite faces have the same colour on them, no two adjacent sides are painted in the same colour.
Therefore, all the corners of the original cube will have three different colours on them.
Total number of corners in a cube = 8
Therefore, 8 smaller cubes will have exactly three colours on them.
Hence, **option 3.**

3. The number of smaller cubes having exactly one colour on them
= Number of faces × $(n-2)^2$
$= 6 \times (6-2)^2 = 96$
Since 2 faces each are coloured only red, blue and green, the number of cubes having only green colour has to be $(1/3)^{rd}$ of the total number of cubes having a single colour.
Hence, number of cubes having only green colour on them = $96/3 = 32$
Hence, **option 1.**

4. Make 3 groups of 20 notes each and compare any two groups.
If the weight of these two groups is the same, the counterfeit note has to be in the third group.
Now, divide this third group in three parts of 7, 7 and 6 notes respectively.
Compare the two groups of 7 notes each.
If the weight of these two groups is the same, the counterfeit note has to be in the third group.
Again, divide this third group in three parts of 2 notes each and compare any two groups.
If the weight of these two groups is the same, the counterfeit note has to be in the third group.
Now, the two notes in this group can be compared to give the counterfeit note.
Thus, four iterations are needed.
Hence, **option 2.**

5. In the first row, 216 is the cube of 6 while 49 is the square of 7. Therefore, apply rule 2 and obtain $7^3 = 343$.
Now 343 is followed by 81, which is a square of 9.
Therefore, again apply rule 2 and obtain $9^3 = 729$. So the resultant of the first row is 729.
In the second row 162 is followed by 405. Neither number is a perfect square or cube.
Hence, apply rule 3 and obtain the HCF of 162 and 405 i.e. 81.
81 (square of 9) is followed by 343 (cube of 7).
Hence, apply rule 1 to get $7^2 = 49$.
Hence, the two resultants are 729 + 49 = 778
Sum of digits of the sum of the two resultants
= 7 + 7 + 8 = 22
Hence, **option 4.**

6. In the first row 21 is followed by 28.
Neither number is a perfect square or perfect cube.
Therefore, apply rule 3 to get the LCM of 21 and 28 i.e. 84.
Now, 84 is followed by 63.
Again, neither number is a perfect square or perfect cube.
Therefore, apply rule 4 to get the HCF of 84 and 63 i.e. 21.
Hence, the resultant of the first row i.e. p is 21.
In the second row 21 is followed by 24.
Therefore, apply rule 3 to get the LCM of 21 and 24
i.e. 168.
Now, 168 is followed by 147.
Therefore, apply rule 4 to get the HCF of 168 and 147 i.e. 21.
So the resultant of the second row is 21.
Hence, **option 4.**

7. Since all the terms in the second row are given, first find the resultant of the second row.
3 is followed by 18 and none of the two is a square or a cube.
Therefore, apply rule 3 to get the LCM of 3 and 18
i.e. 18.
Now 18 is followed by 45 and neither of the two is a square or a cube.

Therefore, apply rule 4 to get the HCF of 18 and 45
i.e. 9.
Hence, the resultant of the second row is 9.
Now, in the first row 25 is followed by 8.
25 is a perfect square while 8 is a perfect cube.
Therefore, apply rule 1.
8 is the cube of 2.
Hence, the resultant of 25 and 8 would be
$2^2 = 4$
The resultant of 4 and p is 9, since the resultant of the first and second row is equal.
Since 4 is a square, p has to be a cube otherwise none of the rules can be applied.
Therefore, here again rule 1 should be applied.
9 is the square of 3.
Hence, p should be the cube of 3 i.e. 27
Hence, **option 1**.

8. For option 1, none of the rules apply.
For option 2,
16 followed by 729 is 81(9^2) (Rule 1)
81 followed by 512 is 64(8^2) (Rule 1)
Hence, this could be a possible answer.
For option 3,
108 followed by 135 is the HCF of 108 and 135 i.e. 27 (Rule 4)
27 followed by 28 is not defined by any rule.
Hence, the resultant of this row cannot be determined.
Hence, **option 2**.

VISUAL REASONING

PRACTICE TEST I

1. In successive frames, 'P' is first rotated anticlockwise by 45° and then its mirror image is taken. Also, 'P' moves 1 step clockwise in each frame. Hence, in the fifth frame, 'P' should be at the top-right corner and the curve in 'P' should be on the right hand side. Hence, option 2 can be eliminated.
In successive frames, the mirror image of 'B' is taken. Also, 'B' or its mirror image move clockwise by 90° in each frame. Hence, in the fifth frame, 'B' should be at the bottom right corner and the curves in 'B' should be on the right hand side. Hence, option 1 can be eliminated.
Between frames 1 and 2, the mirror image of 'R' is taken. Between frames 2 and 3, this mirror image is now rotated anticlockwise by 45°. This pattern repeats in every alternate frame. Also, from frames 1 to 3, 'R' moves 0.5 steps clockwise. From frame 3 to 4, 'R' moves 1 step clockwise. Hence, from frame 4 to 5, 'R' should again move 1 step clockwise Hence, in the fifth frame, 'R' should be in its normal shape and should be at the bottom left corner. Hence, options 3 and 5 can be eliminated.
Hence, **option 4**.

2. In successive frames the figure rotates clockwise by 45°. Hence, the figure in frame 5 should rotate by 45°. Hence, options 1, 2 and 3 can be eliminated.
Also, if we count the standalone line in frames 2 and 4 as 0.5 petals, the total number of petals in each frame is
1, 1.5, 3, 3.5 and 5 respectively.
Hence, starting from the first frame, 0.5 and 1.5 petals are added in alternate frames. Hence, 0.5 petals should be added in the final frame.
Also, the added half petal should start adjacent to the existing petals. Option 4 does not satisfy this condition. Hence, option 4 can be eliminated.
Hence, **option 5**.

3. The letters at the top centre and the bottom centre in alternate frames are consecutive alphabets L, M, N and O.
Hence, the fifth frame should have the next alphabet i.e. 'P' at the top centre. Hence, option 2 can be eliminated.
The letters at the centre left form a series of consecutive vowels i.e. A, E, I, and O.
Hence, the fifth frame should have the next vowel i.e. U at the centre left. Hence, options 1 and 3 can be eliminated.
The letters at the centre right in successive frames are alternating alphabets i.e. Q, S, U and W.
Hence, the fifth frame should have Y (X gets skipped) at the centre right. Hence, option 4 can be eliminated.
Hence, **option 5**.

4. Here, each frame has 3 elements i.e. a flag, a pair of arrows and a line with a circle on top.
The actual positions of these 3 elements in each frame do not show any obvious pattern. Hence, we look for a pattern in the rotation of each element.
The flag rotates anticlockwise by 90° and 45° in alternate frames starting from the first frame. Hence, in the fifth frame, the flag should rotate anticlockwise by 45° such that the actual flag points up.

= Total number of customers surveyed – Total number of customers who liked the books segment= 90 – 25 = 65
Hence, **option 2.**

9. Number of customers who liked the books and clothes segments, but not the jewellery segment = 12.
Hence, **option 2.**

10. Customers who liked at least one of the three segments
= 27 + 3 + 12 + 3 + 27 + 5 + 5 = 82
Hence, **option 1.**

Alternatively,
Customers who have liked at least one of the three segments
= Total number of people surveyed – Total number of people who did not like any segment
= 90 – 8 (8 people did not like any of the 3 segments) = 82
Hence, **option 1.**

Numerical Logic

PRACTICE TEST I

1. The given algorithm can be expressed as
Step 1: Multiply the two digits of each number given in the input.
Step 2: Multiply each number by 2. Then, starting from the first number alternately add and subtract 1
Step 3: Arrange the numbers in ascending order.
Step 4: Square each digit of the number and add the squares.
Step 5: Take the reverse of the number. Find the difference between the original number and its reverse.
Applying this algorithm to the input given in the question, the steps would be as follows:
Input: 23, 65, 17, 38, 52, 85
Step 1: 6, 30, 7, 24, 10, 40
Step 2: 13, 59, 15, 47, 21, 79
Step 3: 13, 15, 21, 47, 59, 79
Step 4: 10, 26, 5, 65, 106, 130
Step 5: 9, 36, 45, 9, 495, 99
This is the last step of the process.
Hence, **option 4.**

2. According to the algorithm deduced in the solution to the previous question, the output in step 2 is obtained when each number of step 1 is multiplied by 2 and 1 is added/subtracted to alternate numbers, starting from the first number.
Hence, to find the output of step 1, apply the logic in reverse i.e. subtract and add 1 from alternate numbers starting from the first.
Hence, the output of step 2 becomes 126, 36, 72, 40, 84, 32.
Now, take the half of these numbers to get the output of step 1.
Hence, output of step 1 is 63, 18, 36, 20, 42, 16
In step 1, the digits of the number in the original number are multiplied.
Hence, the first number in the input should be such that the product of its digits is 63, the second number should give a product 18 and so on.
So the alternatives for each number in the input are as follows (considering that the numbers in the input are two-digit numbers):

1	2	3	4	5	6
79	29	49	45	67	28
97	36	66	54	76	44
	63	94			82
	92				

The correct answer option should have one combination from each column.
Only option 3 satisfies this condition.
Hence, **option 3.**

3. Applying the algorithm obtained in the solution to the first question, the steps for the given input are as follows
Input: 41, 42, 43, 44, 45, 46
Step 1: 4, 8, 12, 16, 20, 24
Step 2: 9, 15, 25, 31, 41, 47
Step 3: 9, 15, 25, 31, 41, 47
Step 4: 81, 26, 29, 10, 17, 65
Hence, the 4th term in step 4 is 10.
Hence, **option 3.**

4. Input: 11, 22, 33, 44, 55, 66
Now Step 1 will be the Step 2 of the original algorithm and Step 2 will be the Step 1 of the original algorithm.
Thus, in the first step we will double each and alternately add and subtract 1 from each doubled number.
Therefore Step 1: 23, 43, 67, 87, 111, 131
Now, we will multiply the digits of each number.
Therefore Step 2: 6, 12, 42, 56, 1, 3
Now, from step 3 onwards, the process remains the same.
Step 3: 1, 3, 6, 12, 42, 56

Step 4: 1, 9, 36, 5, 20, 61
Step 5: 9, 81, 27, 45, 18, 45
Hence, **option 2.**

5. Applying the algorithm obtained in the solution to the first problem:
Input: 15, 31, 19, 24, 69, 86
Step 1: 5, 3, 9, 8, 54, 48
Step 2: 11, 5, 19, 15, 109, 95
Step 3: 5, 11, 15, 19, 95, 109
Step 4: 25, 2, 26, 82, 106, 82
Step 5: 27, 18, 36, 54, 495, 54
Hence, 82 occurs twice in Step 4, while 54 occurs twice in Step 5.
Hence, **option 4.**

Note: Once you observe that there is no number repeated in step 1, options 1 and 5 can be directly eliminated.

6. The logic here is that words and numbers are placed alternately (starting with a number) such that numbers are arranged in descending order while words are arranged in alphabetical order. In a particular step, if a word (or number) is already at the place where it is supposed to be, the next term is arranged.
Input : hari tall 31 9 74 58 rear out
Step I : 74 hari tall 31 9 58 rear out
Step II : 74 hari 58 tall 31 9 rear out
Step III : 74 hari 58 out tall 31 9 rear
Step IV : 74 hari 58 out 31 tall 9 rear
Step V : 74 hari 58 out 31 rear tall 9
Step VI : 74 hari 58 out 31 rear 9 tall
Since this is the final rearrangement, step VI will be the last step. However, step VI is not given in the options.
Hence, **option 5.**

7. Since this logic involves only rearrangement, step II could consist of multiple combinations that could lead to the given step III.
Consequently, the input also cannot be determined.
Hence, **option 4.**

Note: The question asks for "definitely the input" and so we cannot determine the exact input. However, had the question asked for "Which of these is a possible input?", we could have tried to identify it.

8. Step IV : 54 bore 45 dear 13 26 teeth pear
Step V : 54 bore 45 dear 26 13 teeth pear
Step VI : 54 bore 45 dear 26 pear 13 teeth
Since step VI corresponds to the final rearrangement, step VI will be the last step.
Hence, **option 1.**

9. The logic here is that words and numbers are placed alternately (starting with a word) such that words are arranged in a reverse alphabetical order while numbers are arranged in ascending order. In a particular step, if a word (or number) is already at the place where it is supposed to be, the next term is arranged.
Input : 32 big small 58 49 out in 25
Step I : small 32 big 58 49 out in 25
Step II : small 25 32 big 58 49 out in
Step III : small 25 out 32 big 58 49 in
Step IV : small 25 out 32 in big 58 49
Step V : small 25 out 32 in 49 big 58
So step V is small 25 out 32 in 49 big 58.
Hence, **option 3.**

10. Input : 16 dinesh nehra 28 43 61 rohit ishant
Step I : rohit 16 dinesh nehra 28 43 61 ishant
Step II : rohit 16 nehra dinesh 28 43 61 ishant
Step III : rohit 16 nehra 28 dinesh 43 61 ishant
Step IV : rohit 16 nehra 28 ishant dinesh 43 61
Step V : rohit 16 nehra 28 ishant 43 dinesh 61
The penultimate step is nothing but the second-last step.
Since step V corresponds to the final output, step IV will be the penultimate step.
Hence, **option 1.**

11. Input: stump wicket 41 67 catch over 13 47
Step I : wicket stump 41 67 catch over 13 47
Step II : wicket 13 stump 41 67 catch over 47
Step III : wicket 13 stump 41 over 67 catch 47
Step IV : wicket 13 stump 41 over 47 67 catch
Step V : wicket 13 stump 41 over 47 catch 67
This is the final arrangement.
Thus, five steps will be required to complete the rearrangement.
Hence, **option 2.**

12. Step IV: red 9 orange 12 25 38 black grey
Step V: red 9 orange 12 grey 25 38 black
Step VI: red 9 orange 12 grey 25 black 38
Since step VI is the final arrangement, step VI will be the last step.
Hence, **option 1.**

PRACTICE TEST II

1. The larger cube is formed of 216 smaller cubes.
Therefore, the dimensions of the larger cube $= 6 \times 6 \times 6$
All the smaller cubes on the edges (excluding the 8 cubes at the corners) of the larger cube have exactly two colours on them.

6. Compare the position of the first letter of the word with the position of the subsequent letters.
Repeat this process for all the subsequent letters.
The pairs that satisfy the given condition are FC, ON, NL and OL i.e. 4 pairs.
Hence, **option 4.**

7. Compare the position of the first letter of the word with the position of the subsequent letters.
Repeat this process for all the subsequent letters.
No pair of letters satisfies the given condition in the word 'MALAYSIA'.
Hence, **option 1.**

8. Compare the position of the first letter of the word with the position of the subsequent letters.
Repeat this process for all the subsequent letters.
The pairs that satisfy this condition are WT and EH i.e. 2 pairs.
Hence, **option 2.**

9. The second, third, fourth, eighth and ninth letters of the word 'HARMONIST' are A, R, M, S and T respectively.
The five-letter words that can be formed using these letters exactly once are SMART, MARTS and TRAMS. Thus, there are 3 words that can be formed satisfying the given condition.
Hence, **option 4.**

10. The second, fifth, eighth, eleventh and twelfth letter of the word 'AMALGAMATION' are M, G, A, O and N respectively.
The five-letter words that can be formed using these letters exactly once are MANGO and AMONG.
Since more than one word can be formed satisfying the conditions, Y is to be marked as the answer.
Hence, **option 5.**

PRACTICE TEST II

1. The first, second, fourth and seventh letters of the word 'RAVENOUS' are R, A, E and U.
The only valid four-letter word that can be formed using these letters exactly once is UREA.
The first letter in UREA is U.
Hence, **option 1.**

2. If the position of the first and second digit of each number is interchanged, the new numbers are:
974 376 872 775 178
Now, 376 (derived from 736) is the second lowest number and its last digit is 6.
Hence, **option 4.**

3. When the position of the first and last digit of each number is interchanged, the new numbers are:
497 637 287 577 817
Now, 497 (derived from 794) is the second lowest number.
Hence, **option 1.**

4. Here, the exact relationship between each weight is known.
Hence, represent them by mathematical equations.
Let C's weight be n.
$B = 2C = 2n$
$A = 4B = 8n$
$E = 5.5B = 5.5 \times 2n = 11n$
$D = 3E = 33n$
$\therefore D > E > A > B > C$
Hence, only D is heavier than E.
Hence, **option 1.**

5. From the solution to the question above, the total of the lightest and the heaviest weight is $n + 33n = 34n$.
Since all the weights have an integral value, the total value of these 2 weights has to be a multiple of 34.
Among the options given, only 442 is a multiple of 34.
Hence, **option 5.**

6. Number of students in the class
= Position from top + Position from bottom − 1
= 7 + 34 − 1 = 40
Hence, **option 2.**

7. Kishor is initially 33rd from the right.
When Sumit comes to this place, he becomes 25th from left.
Thus, the 25th place from the left is the same as the 33rd place from the right.
$\therefore$ Total number of boys in the row
= (position of Kishor from left) + (position of Kishor from right) − 1
= 25 + 33 − 1 = 57
Hence, **option 4.**

8. The train stops for 2 minutes at each station and takes 6 minutes to travel between any two stations.

Hence, in all 8 minutes are spent between the instances when the train starts from two consecutive stations.
So, the time spent between the starting of the trains from the stations B and F is 8 × 4 = 32 minutes
It takes 6 minutes for the train to reach G from F.
∴ The total time taken from B to G = 32 + 6
= 38 minutes
So, the train departed from B at 6:13 – 38 minutes = 5:35 pm
Hence, **option 5.**

9. The spider climbs 2 feet every hour and then slips backwards by 1 foot in the next 5 hours.
Hence, in 6 hours, the spider climbs 1 foot.
Hence, in 48 hours, it will climb 8 feet.
Then in the next 1 hour, it will climb 2 feet and reach the top of the wall.
Hence, the total time taken by the spider to reach the top of the wall is 49 hours.
Hence, **option 3.**

10. There were Rs. 20 in the bowl after day-end on the third day. Since Nirmit was supposed to take half the amount in the bowl, Nirmit must have taken Rs. 20 on the third day. This means that there must have been Rs. 40 in the bowl on the third day, out of which Rs. 8 were added by Nirmit's father.
Hence, before that, there must be 40 – 8
= Rs. 32 in the bowl after 2 days.
Hence, Nirmit must have taken Rs. 32 on the second day as pocket money.
This means that there were Rs. 64 in the bowl on the second day after Nirmit's father added Rs. 8 to it.
Hence, at the end of the first day there must be 64 – 8 = Rs. 56 in the bowl.
Hence, Nirmit must have taken Rs. 56 on the first day as his pocket money.
So, the total amount of money Nirmit took in 3 days as pocket money = 56 + 32 + 20
= Rs. 108
Hence, **option 4.**

VENN DIAGRAMS

PRACTICE TEST I

1. The hexagon represents married people, the circle represents teachers and the triangle represents sportspersons. Thus, the group of married people who are teachers but not sportspersons corresponds to the area which is within the hexagon and circle but outside the triangle.
It can be seen from the figure that this area is represented by the letter O.
Hence, **option 4.**

2. The sportspersons who are married but are not teachers corresponds to the area within the triangle and hexagon but outside the circle.
The letter H corresponds to this area.
Hence, **option 1.**

3. The teachers who are neither sportspersons nor married should correspond to the area within the circle but outside the hexagon as well as triangle.
The letter L corresponds to this area.
However, L is not among the options.
Hence, **option 5.**

4. Married sportspersons who are teachers correspond to the area common to all three figures i.e the area within the circle, triangle as well as hexagon.
The letter E corresponds to this area.
Hence, **option 5.**

5. Married people who are neither teachers nor sportspersons correspond to the area within the hexagon but outside the triangle as well as the circle.
The letter Z corresponds to this area.
Hence, **option 1.**

6. The figure given above is to be read as follows:

1) A number lying in exactly one geometrical shape indicates the number of people celebrating only one festival i.e. the festival depicted by that geometrical shape.
For instance, since 21 lies only in the rectangle and not in the circle or triangle, the number of people celebrating only Diwali is 21

2) A number lying in two geometrical shapes indicates the number of people celebrating exactly two festivals.
For instance, since 33 lies only in the rectangle and circle, but not in the triangle, the number of people celebrating Diwali and Navratri, but not Holi, is 33

3) A number lying in all three shapes indicates the number of people celebrating all three festivals.
Since 8 lies in all three shapes, the number of people celebrating all 3 festivals is 8.

Hence, the number of people celebrating exactly one festival is:
Diwali : 21
Holi: 22
Navratri: 27
Hence, the total number of people celebrating exactly one festival is 21 + 22 + 27 = 70
Hence, **option 3.**

7. The number of people celebrating both Diwali and Holi but not Navratri is given by the number lying within the rectangle and the triangle, but outside the circle i.e. the number 17.
Therefore, the number of people who celebrate Diwali and Holi but not Navratri
= 17
Hence, **option 1.**

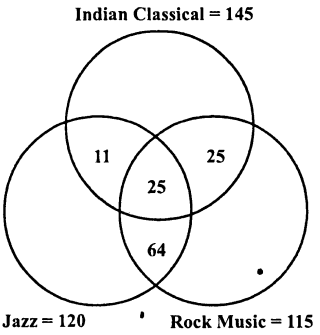
8. The number of people who do not celebrate at least one festival implies the number of people who do not celebrate any festival.
Since the number of people who celebrate one festival, two festivals and three festivals is known, number of people who do not celebrate any festival
= (Total number of people surveyed) – (Number of people who celebrate at least one festival)
The total number of people surveyed was 165.
From the figure above, the number of people who celebrate at least one festival
= 22 + 17 + 21 + 33 + 8 + 26 + 27 = 154
Total number of people surveyed = 165
Therefore, the number of people who do not celebrate any festival = 165 – 154 = 11
Hence, **option 3.**

9. The number of people who celebrate all three festivals is indicated by a number lying in all three geometrical shapes i.e. 8.
Hence, 8 people celebrate all three festivals.
The number of people who celebrate a maximum of two festivals
= Total number of people surveyed – Number of people who celebrate all the three festivals
= 165 – 8 = 157.
Therefore, difference in the number of people who celebrate all the festivals and those who celebrate a maximum of two festivals
= 157 – 8 = 149
Hence, **option 4.**

10. Number of people originally celebrating all 3 festivals = 8
Number of people originally celebrating Diwali and Navratri, but not Holi = 33
Since 3 people now do not celebrate Holi, but continue to celebrate the other two festivals, the total number of people now celebrating Diwali and Navratri, but not Holi = 33 + 3 = 36
From the figure above,
The number of people celebrating both Diwali and Holi, but not Navratri = 17
The number of people celebrating both Holi and Navratri but not Diwali = 26
Therefore, the number of people who now celebrate exactly two festivals = 36 + 17 + 26 = 79
Hence, **option 4.**

PRACTICE TEST II

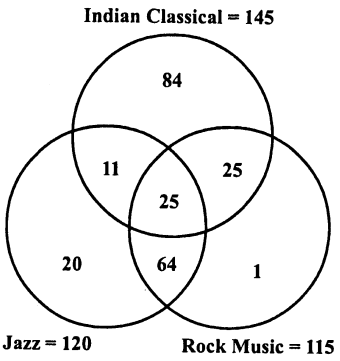
1.



The given data can be shown in terms of a Venn diagram as depicted above:
∴ Number of listeners who preferred only rock music = 115 – (64 + 25 + 25) = 1
Hence, **option 2.**

2. The listeners who liked at least 2 forms of music imply those who either liked exactly two forms of music or liked three forms of music.
If rock music, jazz and Indian classical music are denoted as R, J and C respectively, then the number of people who liked at least two forms of music is given as:
$(R \& J) + (R \& C) + (J \& C) + (R \& J \& C)$
= 64 + 25 + 11 + 25 = 125
Here, $(R \& J)$ implies the number of listeners who like rock music and jazz, but not Indian classical music. The other brackets can be read similarly.
Hence, **option 3.**

3.



The completed Venn diagram is as shown above.

The number of listeners who liked Indian classical music only

= 145 – (11 + 25 + 25) = 84

The number of listeners who liked jazz only

= 120 – (11 + 25 + 64) = 20

Number of listeners who liked Indian classical music or jazz but not rock music

= (People who like only Indian classical music) + (People who like only jazz) + (People who like both Indian classical music and jazz but not rock)

= 84 + 20 + 11 = 115

Hence, **option 1.**

4. Consider the filled up Venn Diagram in the solution to the previous question. Each number there denoted the number of people who liked at least one form of music. So, the total number of people who liked at least one of the three forms of music

= 84 + 11 + 25 + 25 + 20 + 64 + 1 = 230

The total number of people surveyed = 250

∴ The total number of people who did not like any of the three forms of music = 250 – 230

= 20

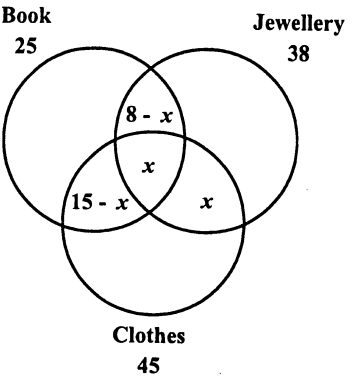
Hence, **option 3.**

5. Number of people who liked exactly one form of music

= (People who liked only rock) + (people who liked only jazz) + (people who liked only Indian classical) = 1 + 20 + 84 = 105

Hence, **option 1.**

6. The given data can be represented in the form of a Venn diagram as shown below :



The number of customers who liked the jewellery segment but not the books and clothes segment implies the number of customers who liked only the jewellery segment.

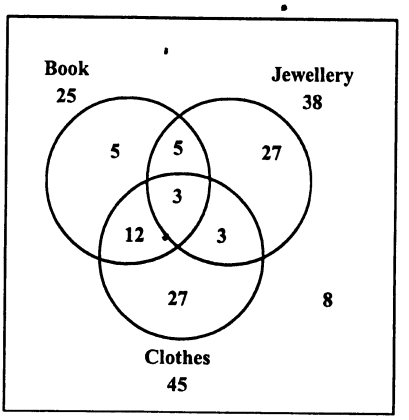
Total number of customers who have liked both the clothes and the jewellery segments

= 6

∴ $2x = 6$

∴ $x = 3$

Substituting the value of x, the Venn diagram looks as follows:



∴ The number of customers who liked the jewellery segment but not the books and clothes segments = 27

Hence, **option 2.**

7. Number of customers who liked exactly two segments

= (People who liked books and clothes) + (People who liked books and jewellery) + (People who liked clothes and jewellery)

= 12 + 5 + 3 = 20

Hence, **option 3.**

8. Customers who did not like the books segment at all

Had it been 'stands', either of 'tail' or 'bail' could have been used to code it.
Hence, either of options 1, 2 or 3 could have been its encoded form.
However, the code for 'stand' cannot be found.
Hence, the coded form of 'Stand for yourself' cannot be found.
Hence, **option 5.**

PRACTICE TEST II

1. The word common to all the three original sentences is 'is', while that in the coded sentences is 'white'. So 'is' is coded as 'white'
Now, in the first and the second sentence, the common words are 'is' and 'a', while in their coded representations, the common words are 'white' and 'red'. Since 'is' is coded as 'white', 'a' is coded as 'red'.
The word common to the first and third sentence, besides 'is', is 'boy' and the word common in their
coded sentences is 'white' and 'pink'.
Since 'is' is coded as 'white', 'boy' is coded as 'pink'.
The only word left in the first sentence is 'he' and the word left in the code is 'purple'.
Therefore, 'he' is coded as 'purple'.
Similarly, comparing the first and the second sentence, 'girl' is coded as 'yellow and 'she' as 'brown'.
The only remaining word in the third sentence is 'not'. So it is coded as 'green'.
Therefore, the codes for 'she', 'not, 'a' and 'boy' are 'brown', 'green', 'red' and 'pink'
Hence, **option 5.**

Alternatively,
'Is' is coded as 'white' and 'a' is coded as 'red'.
Hence, the third colour in the answer options should be red.
Hence, options 1, 3 and 4 can be eliminated.
Now, in options 2 and 5, the colour that differs ('pink' or 'purple') is the one used for 'boy'.
The word common to the first and third sentence besides 'is' is 'boy' and the word common in their coded sentences is 'white' and 'pink'.
Hence, 'boy' is coded as 'pink'.
Hence, option 2 can be eliminated.
Hence, **option 5.**

2. In such cases, one can use previously known information.
Human beings reside on 'Earth'.
In the given system, 'Earth' is called 'Sun'.
Hence, **option 4.**

3. The 'ear' is used to hear.
However, in this system, 'ear' is called 'hand'.
Hence, we hear using the 'hand'.
Hence, **option 1.**

4. Whenever the given mathematical operations are relatively complicated, it is easier to work with only two numbers a t a time, take the resultant and then go on to the next step.
Start from the left.
7×3 = rem(larger number/smaller number)
= rem(7/3) = 1
1 % 5 = max(1, 5) = 5
5 @ 8 = min $(8^2 + 5, 100)$ = min(69, 100) = 69
$69 \div 2 = (69 \times 2) + 2 = 140$
Hence, **option 3.**

5. 9 @ 7 = min$(7^2 + 9, 100)$ = min(58, 100) = 58
58 % 3 = max(58, 3) = 58
58×5 = rem(58/5) = 3
$3 \div 6 = (3 \times 6) + 2 = 20$
Hence, **option 5.**

6. $10 \times 6 \div 4$ % 2 = $4 \div 4$ % 2 = 18 % 2 = 18
Hence, statement (i) is not true.
5 @ $3 \div 2$ % 1 = $14 \div 2$ % 1 = 30 % 1 = 30
Hence, statement (ii) is not true.
$8 \div 4$ % 7×9 = 34 % 7×9 = 34×9 = 7
Hence, statement (iii) is true.
2×3 @ 4×6 = 1 @ 4×6 = 17×6 = 5
Hence, statement (iv) is not true.
Hence, only one statement is true.
Hence, **option 2.**

7. (−3) % 2 @ (−5) × 4 = 2 @ (−5) × 4 = 27 × 4
= 3
The expression in option 1 yields a positive value.
Hence, option 1 can be eliminated.
Now, $4 \div (-6)$ % 3 @ 7 = −22 % 3 @ 7 = 3 @ 7
= 52
The expression in option 2 also yields a positive value.
Hence, option 2 can be eliminated.
This implies that either only option 3 will be true or none of the expressions will be true.
More than one expression will not be true.
Hence, option 5 can be eliminated.
8 @ (−9) × $7 \div (-6)$ = 89 × $7 \div (-6)$ = $5 \div (-6)$
= −28
The expression in option 3 yields a negative value.
Hence, **option 3.**

8. According to the statements
$P - Q \rightarrow P \geq Q$

Q/R → Q < R
R/S → R < S
∴ Q < R < S and Q ≤ P

Conclusion (i): S @ Q → S > Q which is definitely true.

Conclusion (ii): P + R → P ≤ R. This may or may not be true.
Hence, only Conclusion (i) follows.
Hence, **option 1.**

9. A/B → A < B
B @ C → B > C
C – D → C ≥ D
∴ B > C ≥ D and B > A
Hence, A can be less than D, equal to D, or greater than D

Conclusion (i): A/D → A < D, which may or may not be true.

Conclusion (ii): A @ D → A > D, which may or may not be true.
So, neither conclusion follows.
Hence, **option 4.**

10. A – B → A ≥ B
B – C → B ≥ C
A × D → A = D
∴ D = A ≥ B ≥ C
So, either D = C or D > C

Conclusion (i): D @ C → D > C

Conclusion (ii): D × C → D = C
At any given instant, either one of the two conclusions has to be true.
Hence, either conclusion follows.
Hence, **option 5.**

11. A × B → A = B
B – C → B ≥ C
D + A → D ≤ A
∴ D ≤ A = B ≥ C

Conclusion (i): D × C → D = C, which is not true in all cases.

Conclusion (ii): D + B → D ≤ B, which is true.
Hence, only Conclusion (ii) follows
Hence, **option 2.**

12. A + B → A ≤ B
A @ C → A > C
A × D → A = D
∴ C < A = D ≤ B

Conclusion (i): C + B → C ≤ B, which is not true because C can never be equal to B.

Conclusion (ii): B – D → B ≥ D, which is true.
Hence, only Conclusion (ii) follows.
Hence, **option 2.**

LOGICAL PUZZLES

PRACTICE TEST I

1. BOURNE ... Original word
Since O, U and E are the vowels in the word, they are replaced by the letter following them in the alphabet i.e. P, V and F respectively.
Since B, R and N are the consonants in the word, they are replaced by the letter preceding them in the alphabet i.e. A, P and M respectively.
Thus, after replacing the vowels and consonants as per the given conditions, we get APVQMF as the new word.
After arranging these new letters in alphabetical order, we get AFMPQV
Thus, 'P' is the third letter from the right.
Hence, **option 4.**

2. The question basically means that we need to find digits that do not change their position within the number when they are arranged in ascending order.
On arranging the digits in ascending order, we get
4291683 → 1234689
As can be seen, the digits '2', '6' and '8' satisfy the given condition.
Thus, there are three such digits.
Hence, **option 4.**

3. INGLOURIOUS ... Original word
After interchanging the position of the letters according to the given conditions, the new word is: SNOLRUOIGUI
Now, the letter just before G is I.
Hence, **option 5.**

4. When the digits are interchanged as per the given conditions, the new number is 21875649
The fourth digit from the left is now 7.
Hence, **option 4.**

Note: The manner in which the four digits are interchanged, the entire set of the first four digits gets interchanged with the entire set of last four digits.

5. Compare the position of the first letter of the word with the position of the subsequent letters.
Repeat this process for all the subsequent letters.
The pairs that satisfy the given conditions are CA and ED i.e. 2 pairs.
Hence, **option 2.**

replaced by 'd', 'm' and 'r' respectively. So, 'tennis' is coded as 'udomjr'
Hence, **option 5.**

4. The number of letters in the original and the coded word is the same in both the cases, but the letters are different.
Hence, this may be a replacement code in which each letter has been replaced by a single letter.
Observe that the letters 'm', n', 'o' and 'e' are common in 'lemon' and 'monster', while the letters 'g', 'j', 'v' and 'r' are common in their coded forms.
Now, 'g' occurs in the coded word in the same position as 'm' in the original word in both the cases.
Hence, 'm' is coded as 'g'.
In a similar manner, it can be concluded that 'o' is coded as 'j', 'n' as 'v' and 'e' as 'r'.
Since a letter in the original word and its corresponding coded letter occur in the same position, it can be concluded that 's' is coded as 'k'.
Therefore, 'monsoon' is coded as 'gjvkjjv'
Hence, **option 2.**

5. The number of letters in the word 'flower' is 6, while in its coded form is 3.
The number of letters in 'marigolds' is 9, while in its coded form is 5.
Hence, it can be inferred that groups of letters in the original word are combined as per some pattern to give the letters of the code.
Replace each letter in the original words as well as in the code with its position in the alphabet.
Consider the letters 'f' and 'l'. The position of these two letters in the alphabet is 6 and 12 respectively.
Now, the letter 'i' in the code has a position 9 in the alphabet. 9 is the arithmetic mean of 6 and 12.
Similarly, if 'o' and 'w' are considered, their positions are 15 and 23 respectively. The position of 's' is 19 (which is the arithmetic mean of 15 and 23).
Finally, the positions of 'e' and 'r' are 5 and 18. The arithmetic mean of these numbers is not an integer.
Hence, in this case, these letters are replaced by the letters that appears first in the original word i.e. 'e'.
Hence, the pattern is that if the arithmetic mean of the position of two letters is an integer, the letters are replaced by the letter present at the arithmetic mean's position.
On the other hand, if the arithmetic mean of the position of two letters is not an integer, they are replaced by the letter appearing earlier in the word.
Finally, as seen in 'marigolds', a letter that does not form a group is repeated as it is.
Now, consider the word 'turmoil'.
Following this system, 'tu' will be replaced by 't', 'rm' will be replaced by 'r', 'oi' is replaced by 'l', while 'l' will remain as it is.
Hence, the coded form of the word 'turmoil' is 'trll'
Hence, **option 1.**

6. Applying the system of coding given in the solution to the previous problem, replace 'mi' by 'k', 'cr' by 'c', 'os' by 'q', 'of ' by 'o' and 't' remains as it is.
So, the coded form of 'microsoft' is 'kcqot'.
Hence, **option 3.**

7. The letters in the original word and the coded word are the same, but their positions are different, so it is a rearrangement code.
Consider the original word and its code one below the other.
D E F I N I T I O N
N E I I I N T F O D
Observe that the first and last letters interchange positions, while the second and ninth letters stay as they are.
The third and the eighth letters interchange positions, but the fourth and the seventh letters stay as they are.
Finally, the fifth and the sixth letters interchange positions.
Apply this code to 'sardonic'.
S A R D O N I C becomes
C A N D O R I S
Hence, **option 4.**

8. The letters in the original word and the coded word are not the same, so it has to be a replacement code.
Replace each letter in the original word and in the code with its position in the alphabet.
PHLOX ⇒ 16 8 12 15 24 and FLOCK ⇒ 6 12 15 3 11
KUOBC ⇒ 11 21 15 2 3 and UYLPP ⇒ 21 25 12 16 16
Observe that in both the cases, starting from the first letter, alternate letters follow a common pattern.
For letters at odd places, the sum of the position of the two letters is 27 while for

letters at even places, the difference of the position of the two letters is 13.
For instance, in the first case P + K = L + O = X + C = 27 and H ~ U = O ~ B = 13
Consider the coded word 'KELKB'. Hence, the letters that have been replaced by 'K', 'L' and 'B' should be replacements for 27 – K, 27 – L and 27 – B i.e. 16, 15 and 2 respectively.
Hence, the partially filled word is P_O_Y.
The only word among the options that has this combination is 'PROXY'.
Hence, **option 4.**

9. The position of the individual letters in the alphabet for the word 'life' is 12, 9, 6, 5.
Hence, the position of the first alphabet is used as the first number. The sum of the first and second position (12 + 9 = 21) is used as the second number in the code.
Similarly, the sum of the second and third position (21 + 6 = 27) is used as the third number and 27 + 5 = 32 is used as the fourth number.
Applying this coding system, the code obtained for 'death' is as follows:

Letter	D	E	A	T	H
Position in the alphabet	4	5	1	20	8
Code	4	9	10	30	38

So, the word 'death' is coded as 49103038
Hence, **option 1.**

10. Notice that in both cases, the number at the position of 'S' is '9'.
Similarly, the number at the position of 'A' is '5'.
Hence, it is likely that the letters have been randomly coded as a specific number and the letter is replaced by that number in the same position.
The letters common in both the words are S, A, C and E while the numbers common in both the codes are 9, 5, 4 and 1.
Comparing the positions of the letters and the numbers for both the words, S, A, C and E are coded as 9, 5, 4 and 1 respectively.
Since the only letter left in the first word is P, it is coded as 6.
Similarly, it can be concluded that L and T are coded as 7 and 3 respectively.
Therefore, PLATE is coded as 67531
Hence, **option 3.**

11. Here position of C in the alphabet is 3 and it is coded as 3 × 2 = 6
Position of I in the alphabet is 9 and it is coded as
9 × 8 = 72
All the other codes given also follow the same logic.
Thus, in this language, if the position of a letter in the alphabet is n, then each letter is coded as $n \times (n - 1)$.
The position of the individual letters of 'KITES' is 11, 9, 20, 5, 19.
Therefore, the codes of the letters of the word KITES are as follows
K = 11 × 10 = 110
I = 72
T = 380
E = 5 × 4 = 20
S = 19 × 18 = 342
So, KITES is coded as 1107238020342.
Hence, **option 4.**

12. Since words are coded as numbers, the position of each letter may be a possible logic used for coding.
Consider the word 'HELLBOY'
The position of each letter of this word in the alphabet is 8, 5, 12, 12, 2, 15, 25.
The sum of these positions is
8 + 5 + 12 + 12 + 2 + 15 + 25 = 79
Now, 553 = 79 × 7
Similarly, Consider the word 'PHANTOM'
The position of each letter of this word in the alphabet is 16, 8, 1, 14, 20, 14, 13.
The sum of these positions is
16 + 8 + 1 + 14 + 20 + 15 + 13 = 87
Now, 609 = 87 × 7
Hence, the logic is
(sum of the positions of letters in the word) × 7
Similarly, apply this logic to BATMAN
Word: BATMAN
Logic: (sum of the positions of letters in the word) × 7
Code: (2 + 1 + 20 + 13 + 1 + 14) × 7 = 357
Hence, **option 1.**

13. In the two given sentences, the words 'stands' and 'for' are common.
In the coded sentences given here, the words 'tail' and 'bail' are common.
Hence, the words 'tail' and 'bail' are the encoded forms of the words 'stands' and 'for', though not necessarily in that order.
In the given sentence, 'for' can be replaced by either 'tail' or 'bail'.
However, note that the word used in the final message is 'stand' and not 'stands'.

Similarly, the second term, 'E' which is the 5th term of the alphabet is present five times.
Similarly, the first term of the second pair i.e. 'B' is present twice as it is the second letter of the alphabet.
Hence, the missing term should be a letter present as many times as its position in the alphabet.
The only option which satisfies this condition is FFFFFF which is present 6 times.
Hence, **option 2.**

2. Consider the first pair.
Since the first term consists of letters only, while the second term consists of numbers, the relationship has to be based on the position of the respective letters in the alphabet.
The position of P and J in the alphabet is 16 and 10 respectively.
Hence, 36 can be represented either as $P + J + 10$ or as $(P - J)^2$.
Now, consider the second pair.
The position of T and N in the alphabet is 20 and 14 respectively.
If the first pattern applies, the representation of TN should be $20 + 14 + 10 = 44$.
However, this number is not present in the options. Hence, this pattern does not apply.
Now, $(T - N)^2 = (20 - 14)^2 = 36$. This number is present as option 3.
Hence, **option 3.**

3. The analogy is of the form $n^3 : (n)(n + 1)$
The analogy can be expressed as:
$7^3 : 7 \times 8 :: 8^3 : \underline{8 \times 9}$
Therefore, the missing term should be 72.
Hence, **option 1.**

4. After replacing all the numbers in the sequence by 2, we get a sequence as shown below:
YLJ2α2Yβ2δVH2EθMPQλUπ2XTσ2Y2UW2R2S
The 17th letter from the right is 'Y' and the 3rd element to its right is '2'.
Hence, **option 2.**

Note: Note that the question asks for the 17th letter from the right and NOT the 17th element from the right. Had the question asked for the 17th element from the right, that element would have been 'Q' and the 3rd element to its right would have been 'π'.

5. The letters which are preceded by a letter in the given sequence are L, J, H, P, Q, T and W.
Therefore, there are 7 letters in all which satisfy the given condition.
Hence, **option 1.**

6. In each term in the options, the 2nd and 3rd elements are 3 and 6 steps respectively after the 1st element.
In other words, there are 2 elements between each element of the group.
In option 1,'4' is 3 steps after Y and 'Y' is 6 steps after Y.
All options, except option 4 follow this pattern.
In option 4, there are 3 elements between 'P' and 'π'.
Hence, **option 4.**

7. The only symbol which is immediately preceded by a number and immediately followed by a letter is δ.
It is preceded by 2 and followed by V.
Hence, **option 1.**

8. The first element of each term in this series is the series of consecutive numbers as they appear in the original sequence. Now, in each term, these consecutive numbers are followed by the element 2 steps ahead and 1 step ahead in the sequence.
So, the first element of the next term should be the number appearing after 5 in the sequence i.e. 8. The second term should be the element 2 places ahead of 8 i.e. T and the third term should be the element one place ahead of 8 i.e. X. So, the missing term should be 8TX.
Hence, **option 2.**

9. The underlined digits satisfy the criteria given in the problem:
1594678101300041230034870481324801305678021 39
Thus, there are 4 digits that are immediately preced by a multiple of 3 and immediately followed by a multiple of 4.
Hence, **option 2.**

10. Observe that apart from 81, no other number is present in that form in the given series i.e. there is an '81' directly present in the series but there is no '11', '74', '35' or '39' directly present in the series.
15946781013000412300348704813248013056780213 9
Hence, **option 2.**

11. As per the rules of this sequence, the value of 'J' is 23.

Hence the sum of the correct pair should be 23.
V + E = 18 + 4 = 22
X + O = 19 + 3 = 22
Z + R = 17 + 5 = 22
P + W = 16 + 7 = 23
Hence, J = P + W
Hence, **option 4.**

12. Since the prime positioned letters are to be removed, the second, third, fifth, seventh etc letters need to be removed from the series.
After removing the prime positioned letters the sequence will be:
AEIQYKFLHPVTBDSCG
Now, the 7th letter from the right end is 'V', 5th letter to its right is 'C' and the 8th letter to the left of 'C' is 'L'.
Hence, **option 2.**

CODES

PRACTICE TEST I

1. In both 'limitations' as well as 'philosophy', the letters in the original word are the same as the ones in the coded word.
Therefore the code may be a rearrangement code.
Observe that in the original word as well as in the code, the first four letters are the same. However, their positions have changed.
The letters 'limi' have been written as 'mili'.
Similarly the next four letters are also the same, but their positions have been changed.
The letters 'phil' have been written as 'ilph'.
Thus, it can be said that the letters interchange positions in groups of two or the group of 4 letters shifts by two places either to the left or the right.
When such groups of 4 are formed, the last group of the word 'limitations' contains only 3 letters 'ons'. Hence, after shifting by 2 places, this group becomes 'nso'.
Hence, the number of letters which remain, when all the groups of four letters have been made, are included in one group and again shifted by two places.
When this logic is applied to the word 'metamorphosis', the coded word so obtained is 'tamerpmosihos'
Hence, **option 3.**

2. The original word 'maroon' contains six letters while the coded word contains twelve letters. Moreover there are hardly any letters that recur in the original and the coded words.
Therefore, it has to be a replacement code wherein each letter is replaced by two letters.
In the word 'maroon', there are 2 'o's while in the code the group 'np' appears twice.
Hence, 'o' is represented as 'np'.
Now, 'n' and 'p' are letters adjacent to 'o' in the alphabet.
Similarly, observe that there is a group 'ln' in the code. This should be the representation for 'm' in the original word. This applies throughout the word.
Observe that the group representing the first letter of the word appears last in the code, the group representing the second letter of the word appears second last in the code and so on.
Hence, the pattern is that the original word is reversed and then each letter of the word is replaced by its adjacent letters.
Consider the code 'ackmzbbdjl'.
First find the letters of the original word and then reverse it.
Breaking the code into groups of 2 and applying the pattern, the word obtained is 'black'.
However, this is the reverse of the original word.
Hence, the original word is 'kcalb'.
Hence, **option 2.**

3. Since the letters in the original word and in its coded form are different it is a replacement code.
Consider the letters at the odd positions (1st, 3rd, 5th and so on) of the word 'cricket'.
In the code, 'd' appears at c's position, 'j' appears at i's position, 'l' appears at k's position and 'u' appears at t's position.
Thus, the letters at odd positions are replaced by letters that are one place ahead in the alphabet.
Now, consider the letters at the even positions (2nd, 4th, 6th and so on) of the word 'cricket'.
In the code, 'q' appears at r's position, 'b' appears at c's position and 'd' appears at e's position.
Thus, the letters at even positions are replaced by letters that are one place before them in the alphabet.
Apply this pattern to the word 'tennis'. So, 't', 'n' and 'i' are replaced by 'u', 'o' and 'j' respectively. Similarly, 'e', 'n' and 's' are

7. Consider the table obtained in the solution to the first question.
E visited Mumbai.
Hence, **option 2.**

8. Consider the table obtained in the solution to the first question.
B visited either branch T or branch Q.
Since the actual branch cannot be identified, the answer cannot be determined.
Hence, **option 5.**

9. Consider the table obtained in the solution to the first question.
A visited branch R.
Hence, **option 4.**

SERIES AND ANALOGIES

PRACTICE TEST I

1. The difference between consecutive terms is +3, −1, +8, −4, +18, −12, +33.
Thus, the difference does not show a pattern.
Since there are 8 terms already given, this may be an alternate series.
If we consider the terms at alternate positions, we get two different series, 5, 7, 11, 17 and 8, 15, 29, 50.
Taking the difference of terms in both the series, we get a pattern: the difference is 2, 4 and 6 for the first series and 7, 14, and 21 for the second series.
Since the missing term is the 9^{th} term, it should follow the pattern of the first series.
Hence, the missing term should be 17 + 8 = 25
Hence, **option 3.**

2. Observe that the series first increases and then consistently decrease.
Consider the first 5 terms of the series and take the difference between consecutive terms.
This difference is +2, +4, +6, +8 and +10.
Now, observe that each successive term is half the preceding term. Thus, the pattern after the fifth term is that each term is divided by 2.
Hence, the next term should be 8/2 = 4.
Hence, **option 2.**

3. If the terms from left to right are numbered, we observe the following pattern:
2^{nd} term = 1^{st} term × 3^{rd} term i.e. 21 = 7 × 3.
Similarly, 4^{th} term = 3^{rd} term × 5^{th} term i.e. 42 = 3 × 14.
Hence, a term at an even position is multiplied by the term just preceding it and just succeeding it.
Hence, 6^{th} term = 5^{th} term × 7^{th} term
i.e. 28 = 14 × Missing Term
Hence, the missing term = 28/14 = 2.
Hence, **option 2.**

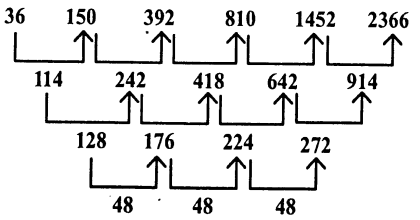
4. At first glance, the terms seem independent but on observation of the terms we see that:
4^{th} term = 1^{st} term × 2
5^{th} term = 2^{nd} term × 2
6^{th} term = 3rd term × 2
7^{th} term = 1^{st} term × 3
Hence, we see that the 4^{th}, 5^{th} and 6^{th} terms are twice the first three terms respectively.
Since, the 7^{th} term is thrice the 1^{st} term, the 8^{th} term should be thrice the 2^{nd} term.
Hence, the 8^{th} term should be 13 × 3 = 39
Hence, **option 3.**

5. Since the terms of the series increase sharply, the series should be multiplicative in nature.
So, divide each term by the term just preceding it.
On doing so, the successive quotients are 1, 4 and 25.
We observe that each quotient is the square of a natural number i.e. the 1^{st} quotient is 1^2, 2^{nd} quotient is equal to 2^2, the 5^{th} quotient is equal to 5^2 and so on.
Hence, the 3^{rd} and 4^{th} quotients should be 3^2 and 4^2 respectively i.e. 9 and 16 respectively.
Hence, the 4^{th} term should be 2 × 9 = 18 and the
5^{th} term should be 18 × 16 = 288.
Hence, **option 4.**

6. Since the terms increase sharply, the series may be multiplicative. Also, observe that successive terms are not completely divisible by preceding terms.
Consecutive terms can be written as: 30 = (14 × 2) + 2124 = (30 × 4) + 4750
= (124 × 6) + 6
Hence, the series is of the form Current term = (Previous term × n) + n where 'n' is successive multiples of 2.
Hence, the 5^{th} term should be (750 × 8) + 8
= 6008
Hence, **option 1.**

7. The pattern here is ($n^2 + n^3$) where n is a consecutive prime number starting from 3.
Hence, the series can be expressed as:
$3^2 + 3^3$, $5^2 + 5^3$, $7^2 + 7^3$ and $11^2 + 11^3$
Hence, the missing term is
$13^2 + 13^3 = 169 + 2197 = 2366$
Hence, **option 2.**

Alternatively,
The pattern shown above is difficult to guess. In such a case, successive differences may help.
1st level difference: 114, 242, 418, 642
2nd level difference: 128, 176, 224
(This is the difference of the numbers in the 1st level)
3rd level difference: 48, 48
We observe that the 3rd level difference is constant.
Hence, add 48 to the last term of the 2nd level difference i.e. to 224 in order to get 272.
Now, add 272 to 642 to get 914 (This is a first level difference).
Finally, add 914 to the last term of the series i.e. to 1452 in order to get 2366.
This can also be seen in the figure below:



Hence, the missing term is 2366.
Hence, **option 2.**

8. Consider the position in the alphabet for each letter given in the series.
B + C ⇒ 2 + 3 = 5
E ⇒ 5 = 5
G + K ⇒ 7 + 11 = 18
M ⇒ 13 = 13
Hence, we observe that the sum of the alphabetical position of the letters is equal to the number given in each term.
In the various answer options given,
Q ⇒ 17, S ⇒ 19, U ⇒ 21, V ⇒ 22 and T ⇒ 20
Hence, we observe that options 3 and 4 do not satisfy the condition that the sum of position of letters should be equal to the number.
Hence, we can eliminate options 3 and 4.
Now, observe that in alternate terms, there are 2 and 1 letters respectively.
Since the 4th term had one letter, the 5th term should have 2 letters.
Hence, we can eliminate option 5.
Also, in the original series, the position of each alphabet given is a prime number.
In option 2, the position of V is 22 i.e. a composite number.
In option 1, the position of both Q and S is a prime number i.e. 17 and 19.
Hence, we can eliminate option 2.
Hence, **option 1.**

9. The numbers do not show any relationship in terms of difference or product.
Hence, we need to look at the terms with respect to their digits.
The product of digits in each term apart from the 5th term is a perfect square i.e. 4 × 4 = 16, 9 × 4 = 36,
2 × 4 × 8 = 64, 6 × 2 × 3 = 36.
In the 5th term, 7 × 2 × 1 = 14, which is not a perfect square.
Hence, **option 5.**

10. Each of the given terms except the 5th can be expressed as 3/5.
The 5th term can be reduced to 16/25.
Hence, **option 1.**

11. Since the value of the terms increases sharply, the series may be based on multiples, powers or factorials.
We observe that each term follows the pattern $(n)^n$.
Thus, $(1)^1 = 1$, $(2)^2 = 4$, $(3)^3 = 27$, $(4)^4 = 256$, $(5)^5 = 3125$ and $(6)^6 = 46656$
Hence, the 5th term should be replaced by 3125.
Hence, **option 2.**

12. 729 can be written as $(27)^2$ or as $(9)^3$
Now, 36 and $(27)^2$ do not show an evident relationship, but 9 is the sum of the two digits 3 and 6 of the first term.
Hence, the analogy can be expressed as:
$36 : (3 + 6)^3 :: 43 : \underline{(4 + 3)^3}$
Therefore, the missing term should be $(7)^3$ = 343
Hence, **option 4.**

13. 147 + 53 = 200 and 147 − 53 = 94
For 2 given numbers, multiple relationships may exist.
Hence, we need to look at the answer options as well.
Now, if the pattern of subtraction applies, the missing term should be 168 − 94 = 74.
However, none of the options has 74 as an answer.
If the pattern of addition applies, the sum of the two terms should be 200.
Therefore, the missing term is 200 − 168 = 32.
Hence, **option 5.**

PRACTICE TEST II

1. The first term of the first pair 'C' which is the 3rd letter of the alphabet is present thrice.

9. Consider the two cases obtained in the solution to the first question.
In each case, P and S are opposite each other.
Hence, **option 1**.

10. Praveen is not a painter and he is carrying a pen.
Hence, put a cross against painter in Praveen's column.
Also, the author is carrying glasses.
Since Praveen is carrying a pen, he cannot be the author.
Hence, put a cross against author as well as in Praveen's column.

	Prakesh	Pratap	Praveen	Pranay	Item
Printer			×		
Actor					
Writer					
Author			×		glasses
Item			pen		

Pranay is a writer.
Hence, put crosses against all the professions except writer in Pranay's column and put a tick against writer. Since no two people share the same profession, put a cross in all the cells in the row of writer except that of Pranay.
Hence, the only option left for Praveen's profession is an actor. So Praveen is an actor.
Hence, put a tick against actor in Praveen's column and a cross against all the other people in the actor's row.
Pranay is not carrying a hat. Since he is not an author, he is not even carrying glasses.
As Praveen is carrying a pen, Pranay cannot carry a pen as well. So Pranay is carrying a coat.

	Prakesh	Pratap	Praveen	Pranay	Item
Printer			×	×	
Actor	×	×	✓	×	
Writer	×	×	×	✓	
Author			×	×	glasses
Item			pen	coat	

Now, Prakash is neither an actor nor a painter.
Hence, the only option left for Prakash's profession is to be an author.
Therefore, Prakash carries glasses. (Since the author carries glasses).

	Prakesh	Pratap	Praveen	Pranay	Item
Printer	×		×	×	
Actor	×	×	✓	×	
Writer	×	×	×	✓	
Author	✓	×	×	×	glasses
Item	glasses		pen	coat	

Hence, Pratap is the painter and carries a hat.
Hence, the finished table looks as shown below.

	Prakesh	Pratap	Praveen	Pranay	Item
Printer	×	✓	×	×	hat
Actor	×	×	✓	×	Pen
Writer	×	×	×	✓	coat
Author	✓	×	×	×	glasses
Item	glasses	hat	pen	coat	

From the table, Pratap carries the hat.
Hence, **option 4**.

11. From the table in the solution to the first question, the right combination is Pranay – Writer – Coat
Hence, **option 3**.

PRACTICE TEST II

1. Create a table with the names of the males filled in and the female, car and colour forming the other three columns.
From (c), S is A's wife and they drive the Honda.
Similarly, P is C's wife.
Now, from (d), D does not like either red or yellow.
However, from (b) and (d), R likes yellow and Q likes red.
Therefore, neither R nor Q can be D's wife.
Therefore, T has to be D's wife.
From (f), since D's wife does not like any colour starts from the letter B, she cannot like the blue or black car.
Therefore, D and his wife can only like the white car.
Also, from (g), D drives the Ferrari.
Thus, we get, D-T-Ferrari-White as the correct combination for D.
From (a), (c) and (g), E, A and D drive the Merc, Honda and Ferrari respectively.
From (e), since C does not drive the Santro, C has to drive the BMW.
Therefore, B can only drive the Santro.
Thus, each male gets matched to each car.
From (b) and (d), B is Q's husband and they like the red car.
Thus, we get B-Q-Santro-Red as the correct combination for B.
Therefore, E's wife can only be R.
Since R likes the yellow car, the correct combination for E is: E-R-Merc-Yellow.
The combination for A is: A-S-Honda-Blue/Black
The combination for C is : C-P-BMW-Blue/Black
Thus, the final arrangement is as shown below:

Husband	wife	Car	Colour
A	S	Honda	Black/blue
B	Q	Santro	Red
C	P	BMW	Black/blue
D	T	Ferrari	white
E	R	Merc	Yellow

Thus, from the table above, R is E's wife.
Hence, **option 3.**

2. Consider the table obtained in the solution to the first question.
D and T are a couple.
Hence, **option 1.**

3. Consider the table obtained in the solution to the first question.
E is the husband of R.
Hence, **option 5.**

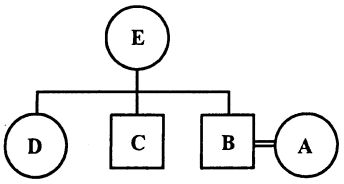
4. Consider the table obtained in the solution to the first question.
E has the yellow car (Merc).
Hence, **option 2.**

5. Consider the table obtained in the solution to the first question.
Either the Honda or the BMW is black in colour.
Since the actual car cannot be identified, the answer cannot be determined.
Hence, **option 5.**

6. D went to the city with the longest name in the month with the least number of days.
Therefore, D went to Hyderabad in February.
It is given that branches, Q, T and R are in Chennai, Kolkata and Delhi respectively.
Also, it is given that E visited branch P.
Therefore, D visited branch S in Hyderabad in February.
Now, A travelled in a month having 31 days and not starting with 'M'.
Therefore, A visited branch R in Delhi in January.
B and C also travelled in months having 31 days.
Therefore, B and C travelled in March and May (in no specific order).
Therefore, E could only have travelled in April.
The person travelling in April came to Mumbai. Also, E visited branch P.
Therefore, E visited branch P in Mumbai in April.
Branch T is in Kolkata and the person who visited Kolkata went in May.
$\therefore$ Branch T = Kolkata = May
and
Branch Q = Chennai = March.
Thus, the final arrangement is as shown below:

Employee	Branch	City	Month
D	S	Hyderabad	February
B/C	T	Kolkata	May
B/C	Q	Chennai	March
A	R	Delhi	January
E	P	Mumbai	April

Thus, from the table above, the person who visited Chennai went there in March.
Hence, **option 3.**



From the tree above:
D is A's sister-in-law
A is E's daughter-in-law.
E is B's mother and not mother-in-law.
Hence, only statements (1) and (3) are true.
Hence, **option 4.**

8. If A has to be the niece of D, A has to be female.
In option 1; C + A means A is C's son.
Hence, A is male.
Hence, option 1 can be eliminated.
In option 2; A/B means that B is A's mother.
However, the gender of A is not clear.
Hence, option 2 can be eliminated.
This means that either only statement 3 is true or none of the statements are true. In any case, more than one statement cannot be true.
Hence, option 4 can also be eliminated.
Consider option 3:
C ÷ A means that A is C's daughter.
D%C means that C is D's brother.
Hence, A is D's niece. Though the gender of D is unclear, A is still D's niece in either case.
Thus, the relationship in option 3 denotes that A is the niece of D.
Hence, **option 3.**

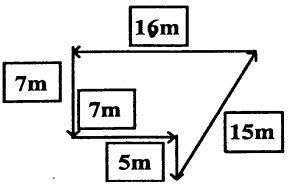
9. E%D means that D is E's brother.
B÷E means that E is B's daughter.
Hence, D is B's son.
C*B means that B is C's wife.
Hence, C and B are D's father and mother respectively.
Hence, options 2 and 3 can be eliminated.
A+C means that C is A's son.
Hence, D is A's grandson.
Since the gender of A is not known, we cannot say whether A is the grandmother or grandfather of D.
So, the exact relationship cannot be found.
Hence, **option 5.**

10. As per the given conditions, A is male and E is female.
In option 1, A%B means that B is A's brother.
However, A's gender cannot be determined.
Hence, option 1 can be eliminated.
In option 2, A@B means that B is A's sister.
Again, A's gender cannot be determined.
Hence, option 2 can be eliminated.
In option 3, using the same logic as in option 2, the gender of A is unknown but C#E means that E is C's husband.
Hence, E is male instead of female.
Hence, option 3 can also be eliminated.
In option 4, A is male but D%E means that E is D's brother.
Hence, E is male instead of female.
Hence, option 4 can also be eliminated.
Hence, **option 5.**

DIRECTIONS AND ARRANGEMENTS

PRACTICE TEST I

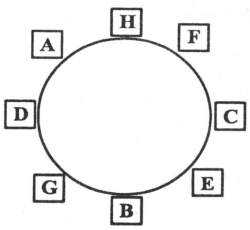
1. The path followed by Raghav can be traced as shown below.
To find the distance between his original and final position, find the horizontal as well as vertical distance between his original and final position.
The horizontal distance between his initial and final position = 16 – 7 = 9m. The difference in sign is because the horizontal displacement is in opposite direction.
The vertical distance between his initial and final position = 7 + 5 = 12m. Here the distance gets added because the vertical displacement is in the same direction.
∴ The distance (x) between his initial and final position is given by:
$x^2 = (9)^2 + (12)^2 = 81 + 144 = 225$
∴ Distance = x = 15m



Hence, **option 2.**

2. Number the seats 1-8 in a clockwise manner and let A be on seat 1. So, seats 1 and 5 will be opposite each other. Similarly, seats 2 and 6, 3 and 7 as well as 4 and 8 will be opposite each other.
Since A sits opposite the person who likes History, this person is on seat number 5.
B is to the immediate left of the person who likes History and is adjacent to G who likes Hindi.
All the people are facing the centre.
Therefore, B and G are on seat numbers 6 and 7 respectively.
Also, G = Hindi

G is adjacent to D and the person who likes Physics.
Therefore, D should be on seat number 8 and should not like Physics.
Since B is the other neighbour of G, B likes Physics.
So, B = Physics.
F = Geography
C is exactly opposite D and is adjacent to F.
Therefore, C has to be on seat number 4.
Thus, the person who likes History and the person who likes Geography are the neighbours of C.
The person who likes History is on seat number 5.
Therefore, the person who likes Geography (F) has to be on seat number 3.
Now, H can be on seat number 2 (to the immediate left of A) or on seat number 5 (opposite A).
But it is given that H is to the left of A.
Therefore H is on seat number 2 and E is on seat number 5.
So, E = History
H = English
Now, the person who likes Chemistry is to the immediate right of E.
So, C = Ghemistry.
Now, A can like either Mathematics or Biology.
H sits next to A but does not sit next to someone who likes Biology.
Therefore, A = Mathematics and D = Biology
Thus, the final arrangement is:



Thus, from the arrangement above, A likes Mathematics.
Hence, **option 4.**

3. Consider the final arrangement obtained in the solution to the first question.
B likes Physics.
Hence, **option 3.**

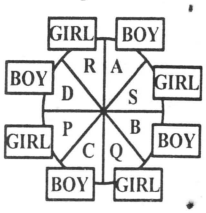
4. Consider the final arrangement obtained in the solution to the first question.
There are four people (F, C, E and B) sitting between H and G, when counted clockwise.
Hence, **option 5.**

5. Consider the final arrangement obtained in the solution to the first question.
F (the person who likes Geography) is sitting diagonally opposite G.
Hence, **option 5.**

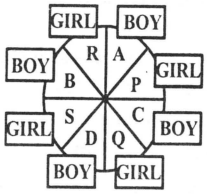
6. It is known that the four boys and four girls are not next to each other, therefore boys and girls are seated alternately.
From the given data:

- A to left of R
- R opposite to Q
- C is the only one between P and Q, Thus P-C-Q or Q-C-P
- P opposite to S
- S to right of B

Note that the positions of A, R and Q are already fixed.
Now, P-C-Q and Q-C-P imply that P can be seated on the clockwise or anticlockwise side of Q.
Based on this position, S has to be opposite P and to the right of B.
Finally, the remaining position is taken up by D.
Going through the conditions there are 2 cases possible:



CASE I



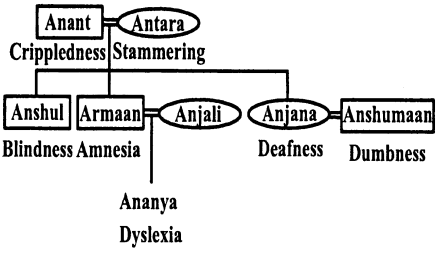
CASE II

From Case I in clockwise direction, starting from Q, the combination of Q-C-P-D-R-A-S-B is valid.
The other 3 combinations are invalid.
Hence, **option 4.**.

7. Consider the two cases obtained in the solution to the first question.
If B is the only person between R and S, case II becomes the valid case. In this case, C is opposite B.
Hence, **option 3.**

8. Consider the two cases obtained in the solution to the first question.
From case I, D is between P and R.
From case II, A is between P and R.
Hence, either A or D can be between P and R.
Hence, **option 2.**

It is also given that Ananya's paternal uncle, Anshul is the son of Anant and is unmarried. This provides two points of information.
Anshul is Anant's son and that Anant has at least one more son whose daughter is Ananya. This is because Anshul is Ananya's paternal uncle i.e. the brother of Ananya's father.
The member of the family who treats crippled people is Anshul's father i.e. Anant.
Hence, Anant treats crippled people.
Since Anjali is Ananya's mother and Anant's daughter-in-law, Anjali is married to Anant's other son.
Antara's son Armaan treats those who suffer from amnesia, while his wife is not a doctor.
Also, Antara has a daughter who treats deaf people and that daughter's husband is Anshumaan, who treats dumbness.
There are 8 people in the family. There is only one couple (Anant and his wife) in the first generation and only one person (Ananya) in the third generation.
Hence, the remaining 5 people i.e. Anshul, Anjali and her husband, Antara's daughter and Anshumaan should belong to the second generation.
Hence, Antara has to be Anant's wife.
Since, Armaan is Antara's married son, he has to be married to Anjali.
The only person left now is Anjana. Hence, she should be Antara's daughter and should be married to Anshumaan.
Only Ananya's gender is unknown.
Now, the family tree is complete and is as shown below:



The medical condition that each member of the family treats has been mentioned below their names in the family tree.
From the family tree it is seen that Anjana treats deafness.
Hence, **option 3.**

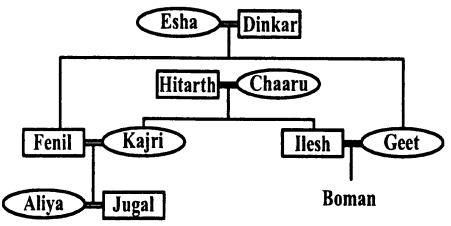
2. Referring to the family tree in the solution to the first problem, Armaan is Ananya's father.
Hence, **option 1.**

3. Referring to the family tree in the solution to the first problem, Anant is Anshumaan's father-in-law.
Hence, **option 4.**

4. Referring to the family tree in the solution to the first problem, we can see that Ananya can be either a niece or nephew of Anjana.
This is because Ananya's gender is not known.
Hence, **option 5.**

5. From the family tree in the solution to the first problem, Antara is Anant's wife.
Since Anant's wife treats stammering, Antara treats stammering.
Hence, **option 2.**

6. Chaaru is Bomans's paternal grandmother and Aliya's maternal grandmother.
Therefore, Chaaru is the mother of Boman's father and Aliya's mother.
Dinkar is Boman's maternal grandfather and Aliya's paternal grandfather.
Therefore, Dinkar is the father of Boman's mother and Aliya's father.
Now, Fenil is Aliya's father and Geet is Boman's mother. Esha is the mother of Fenil and Geet.
Therefore, Esha is Dinkar's wife.
Now, Hitarth is Fenil and Geet's father-in-law.
So Hitarth is the father of Fenil's wife and Geet's husband.
Therefore, Hitarth is Chaaru's husband.
Ilesh is Geet's husband. So Fenil is Ilesh's brother-in-law. Jugal is Ilesh's brother-in-law's son.
Since Ilesh has only one brother in law, Jugal has to be Fenil's son. Jugal is also Kajri's son.
Therefore, Kajri is Fenil's wife.
The data mentions "Her cousin Boman" with respect to Aliya.
Hence, Aliya has to be female while Boman's gender is unclear.
Thus, the final family tree is as shown below.
Though Hitarth and Chaaru are shown below Esha and Dinkar, they belong to the same generation. This representation is just to ensure ease in drawing the family tree.



Now, Dinkar' daughter is Geet and Jugal's father is Fenil.
From the family tree, Geet is Fenil's sister.
Hence, **option 2.**

7. From the family tree in the solution to the first problem, Esha, Chaaru, Kajri, Geet and Aliya are definitely females.
However, Boman's gender is not known.
Hence the total number of females in the family can be either 5 or 6 (depending on Boman's gender).
Hence, a unique number cannot be determined.
Hence, **option 5.**

8. From the family tree in the solution to the first problem, Hitarth is Boman's paternal grandfather.
At the same time, Hitarth is also Kajri's father.
Hence, **option 4.**

Note: As soon as you identify that Hitarth is Boman's paternal grandfather, options 1, 2 and 3 can be eliminated.

9. From the family tree in the solution to the first problem, Aliya, Jugal and Boman are the grandchildren of Esha.
However, Boman's gender is not known.
Hence, the exact number of grandsons cannot be found out.
It can be either 1 or 2 (depending on Boman's gender).
Hence, **option 5.**

10. From the family tree in the solution to the first problem, Boman's aunt is Kajri.
Kajri's in-laws are Dinkar and Esha.
Hence, **option 3.**

PRACTICE TEST II

1. Kush's brother's wife is Kush's sister-in-law. This sister-in-law's mother-in-law has to be the mother of Kush's brother and so the mother of Kush as well. Kush's mother's daughter has to be Kush's sister. However, this lady is Shriya. Thus, Shriya is Kush's sister.
Hence, **option 1.**

2. If Y's father is X's father's son, Y's father can either be a sibling of X or can be X himself.
X does not have any siblings.
Hence, Y's father has to be X himself.
However, Y's gender is not known.
So, Y can be either X's son or daughter.
Therefore, the exact relationship cannot be found.
Hence, **option 5.**

3. B's father's brother's only sister is B's father's only sister i.e. B's aunt.
This aunt's mother is thus B's paternal grandmother and this mother's husband is B's paternal grandfather.
Since B's gender is not known, B has to be the grandchild of the man in the picture.
Hence, **option 3.**

4. Aryan's mother's husband is Aryan's father.
Thus, Aryan's father's mother is Aryan's grandmother.
This grandmother's daughter is Aryan's aunt; who is also the sister of Aditya's father.
Since Aditya's father has only one son, this son has to be Aditya.
Thus, Aryan and Aditya are cousins.
Hence, **option 2.**

5. Since Pawan's father's mother's mother is Pawan's great grandmother, look at this relationship from the point of view of Pawan's father.
Pawan's father's grandmother's brother's son is the first cousin of Pawan's father's mother.
This person's only daughter is Pawan's father's cousin. Thus, Pawan's father and this lady are second cousins.
Since this lady is the mother of Raghav, Pawan and Raghav are third cousins.
Hence, **option 4.**

6. Since the relationship of A with E is to be found, start with A and first find A's gender.
A*B means B is A's wife.
Hence, A has to be male.
Hence, options 1 and 4 can be eliminated.
B@C means C is B's sister.
Hence, C is A's sister-in-law.
C/D means D is C's mother.
Hence, D is B's mother and A's mother-in-law.
D#E means E is D's husband.
Hence, E is A's father-in-law.
Hence, A is E's son-in-law.
Hence, **option 2.**

7. When multiple relationships are to be checked, it is easier done using a family tree diagram.
The relationship between the various individuals mentioned can be shown as follows

= 1040 – 416 – 260 = 364
Thus we get the following table:

Subject	Boys	Girls
Arts	364	252
Commerce	416	104
Science	260	204

Thus, 204 girls study Science in the institute.
Hence, **option 5.**

2. Consider the table obtained in the solution to the first question.
Number of girls studying Commerce = 104
Number of boys studying Science = 260
∴ Required percentage = (104 / 260) × 100 = 40%
Hence, **option 4.**

3. Consider the table obtained in the solution to the first question.
Number of boys studying Arts = 364
Number of girls studying Arts = 252
∴ Required ratio = 364 : 252 = 13 : 9
Hence, **option 3.**

4. Consider the table obtained in the solution to the first question.
The total number of students in the institute = 1040 + 560 = 1600
Hence, **option 1.**

5. Consider the table obtained in the solution to the first question.
Total number of students studying Commerce = 416 + 104 = 520
Hence, **option 1.**

6. Total number of people in the city who read newspapers = 5478 + 1420 + 2684 + 2060 + 4686 + 4062 + 2466 + 1540 + 3542 = 27938
5478 people read only Times of India, 2466 people read Times of India as well as Employment News and 3542 people read Times of India as well as The Hindu.
∴ The required percentage
= (5478 + 2466 + 3542) × 100 / 27938
= (11486/27938) × 100 = 41.11% ≈ 41%
Hence, **option 2.**

7. Total number of people in the city reading some newspaper = 27938
4062 people read only Employment News, 2466 people reading Times of India as well as Employment News and 1540 people read Economic Times as well as Employment News.
∴ Required percentage = (4062 + 2466 + 1540) × 100 / 27938 = (8068/27938) × 100 = 28.88% ≈ 29%
Hence, **option 3.**

8. Total number of people in the city reading some newspaper = 27938
2684 people read only Hindustan Times and 2060 people read only DNA.
∴ The required Percentage
= (2684 + 2060) × 100/27938
= (4744/27938) × 100 = 16.98 ≈ 17%
Hence, **option 4.**

9. Total number of people in the city who read some newspaper = 27938
4686 people read only The Hindu.
∴ The required percentage
= 4686 × 100/27938 = 16.77 ≈ 17%
Hence, **option 5.**

10. Total number of people in the city who read only one newspaper
= 5478 + 1420 + 2684 + 2060 + 4686 + 4062 = 20390
Hence, **option 3.**

CHARTS AND DIAGRAMS

PRACTICE TEST I

1. Profit = Sales – Expenses
Profit for each year (in thousands) is:
2006 : 100 – 80 = 20
2007 : 115 – 85 = 30
2008 : 125 – 90 = 35
2009 : 130 – 110 = 20
2010 : 145 – 105 = 40
2011 : 120 – 115 = 5
Thus, the profit is maximum in 2010.
Hence, **option 2.**

2. Expenses in 2008 = 90 thousand
Expenses in 2010 = 105 thousand
∴ Required ratio = 90 : 105 = 6 : 7
Hence, **option 1.**

3. Consider the solution to the first question.
The profit in 2006 as well as in 2009 is 20000.
Therefore, the required difference = 0.
Hence, **option 5.**

4. Consider the solution to the first question.
Profit (in thousands) over the given period
= 20 + 30 + 35 + 20 + 40 + 5 = 150
Hence, **option 3.**

5. Sales in 2006 = 80 thousand
Sales in 2008 = 90 thousand

$$\therefore \text{Percentage} = \frac{90}{80} \times 100 = 112.5\%$$

Hence, **option 3.**

6. Section D has $\frac{30}{100} \times 2500 = 750$ students

10% of this group are girls i.e. there are 75 girls in section D.

∴ Number of boys in section D = 750 – 75 = 675

Hence, **option 4.**

7. Section B has 12% of the students

∴ Angle subtended by the number of students in section B = (12 × 360)/100 = 43.2°

Hence, **option 1.**

8. Number of girls in section C = 24% of 25% of 2500

Number of girls in section E = 16% of 15% of 2500

$\therefore$ Ratio $= \frac{24 \times 25 \times 2500}{16 \times 15 \times 2500} = 5 : 2$

Hence, **option 2.**

9. Number of girls in section F = 0.24 × 0.07 × 2500 = 42

∴ Number of boys in section F = 175 – 42 = 133

Number of girls in section A = 0.16 × 0.11 × 2500 = 44

So percentage $= \frac{133}{44} \times 100 = 302\%$

Option 3 is the closest answer.

Hence, **option 3.**

10. Sections D and E have 30% and 15% of the total students respectively.

Difference $= \frac{30 - 15}{100} \times 2500 = 375$

Hence, **option 5.**

PRACTICE TEST II

1. The maximum difference between exports and imports within the same year is 20 (in the year 1999).

Hence, **option 5.**

2. Exports in 1999 = 110

Exports in 2003 = 125

Therefore,

Ratio $= \frac{110}{125} = 22:25$

Hence, **option 4.**

3. Imports in 2000 = 175

Exports in 2003 = 125

$\therefore$ Percent $= \frac{175}{125} \times 100 = 140\%$

Hence, **option 3.**

4. Sum of exports in 1999 and 2000 = 110 + 185 = 295

Sum of imports in 2002 and 2003 = 110 + 135 = 245

∴ The required difference = 295 – 245 = 50

Hence, **option 2.**

5. The total difference between exports and imports over the given period = (110 + 185 +115 + 110 + 125) – (90 + 175 + 120 + 110 + 135) = 15

Hence, **option 1.**

6. Total runs scored = Average runs × Total number of matches

Total runs scored by India = 225 × 50 = 11250

Total runs scored by Pakistan = 220 × 35 = 7700

∴ Difference = 11250 – 7700 = 3550

Hence, **option 2.**

7. Total runs = Average runs × Total matches

Total runs by Australia = 250 × 45

Total runs by W.Indies = 210 × 40

Ratio $= \frac{250 \times 45}{210 \times 40} = 75:56$

Hence, **option 1.**

8. This need not be calculated. It can be answered by observation.

Total runs = Average runs × Total number of matches

Since Pakistan has the lowest average as well as the lowest total number of matches, Pakistan has the minimum total runs.

Hence, **option 5.**

9. W.Indies has the lowest difference between average runs and best runs.

Hence, **option 4.**

10. Total runs = Average runs × Total number of matches

Total runs = 200 × 55 = 11000

Hence, **option 3.**

RELATIONSHIPS

PRACTICE TEST I

1. Anant is the oldest member of the family and it is given that his wife treats those who stammer. Start the family tree from this point. Find a person who can be linked to Anant.

It is given that Ananya is Anant's only grandchild. Hence, it can be concluded that anyone else mentioned as a son or daughter cannot be Anant's grandchild and will, in all probability, be Anant's child.

Hence, **option 2.**

15. The compound annual growth rate (CAGR) for company T from 1996 to 1998 is given by,
CAGR = (Sales for 1998/Sales for 1996)$^{1/n}$ – 1
∴ 0.15 = (Sales for 1998/900)$^{1/2}$ – 1
∴ Sales for 1998 = $(0.15 + 1)^2 \times 900$
∴ Sales for 1998 = Rs. 1190.25 crores.
Hence, **option 2.**

TABLES AND CASELETS

PRACTICE TEST I

1. The total number of buildings constructed across all 6 cities in 2006 = 1350 + 1050 + 1365 + 1950 + 1752 + 1740 = 9207
The total number of buildings constructed across all 6 cities in 2009 = 1520 + 1135 + 1475 + 2180 + 2010 + 2064 = 10384
∴ The required percentage
= (9207/10384) × 100 = 88.66%
Hence, **option 4.**

2. The total number of buildings constructed in 2005 across all cities
= 1200 + 1020 + 1340 + 1824 + 1642 + 1610 = 8636
The total number of buildings constructed in 2008 across all cities
= 1492 + 1088 + 1425 + 2060 + 1965 + 1960 = 9990
∴ The required difference = 9990 – 8636 = 1354
Hence, **option 1.**

3. The total number of buildings constructed across all 6 cities over the given period
= 8636 + 9207 + 9570 + 9990 + 10384 + 11104 = 58891
Hence, **option 5.**

Note: In the actual exam, this question can been solved faster if we look at the previous two questions. Note that in the first two questions, we have already found the total number of buildings constructed across all cities for 2005, 2006, 2008 and 2009. So, in this question, we should find the total number of buildings for only 2007 and 2010. Note that had this question been the first of the set, we would have had to calculate the total value for each year. However, the advantage there would have been that the questions seen earlier would get answered faster.

4. Number of buildings constructed in Mumbai in 2006 and 2007 is 1950 and 2045 respectively.
Required percentage increase
= (2045 – 1950) × 100/1950 = 4.87%
Hence, **option 5.**

5. The total number of buildings constructed in Allahabad over the given period
= 1200 + 1350 + 1410 + 1492 + 1520 + 1600 = 8572
The total number of buildings constructed in Pune over the given period
= 1610 + 1740 + 1810 + 1960 + 2064 + 2210 = 11394
∴ The required ratio = 8572/11394
= 4286/5697
Hence, **option 5.**

6. The number of participants who qualified in the year 2008 in region A is given as:
Year 2006 + Year 2007 + Year 2008 = Total
∴ Number of participants qualified in region A in Year 2008 = 600 – (200 + 150) = 250
Now, the total number of participants who qualified in the year 2007 = 2425 – (850 + 725) = 850
Also, the total number of participants rejected in all the years taken together = 650 + 1150 + 1025 = 2825
Using these figures and proceeding ahead in the same manner, we can fill up the entire table, which is shown below:

Year	Regions							
	A		B		C		Total	
	Q	R	Q	R	Q	R	Q	R
2006	200	100	400	300	250	250	850	650
2007	150	350	400	350	300	450	850	1150
2008	250	300	200	500	275	225	725	1025
Total	600	750	1000	1150	825	925	2425	2825

From the table, The total number of participants in the year 2007
= Total Qualified + Total Rejected
= 850 + 1150 = 2000
Hence, **option 2.**

7. From the table filled in the solution to the previous problem:
The total number of participants in the year 2006 = 850 + 650 = 1500
The number of participants rejected from region B in the year 2006 = 300

$$\therefore \text{Percentage} = \frac{300}{1500} \times 100 = 20\%$$

Hence, **option 3.**

8. Region A:
The number of qualified participants in 2008 = 250
Total amount spent on 250 trophies in 2008 = Rs.50,000
Hence, cost of a single trophy = (50000/250) = Rs. 200

Region B:
The number of qualified participants = 200
However, we do not know whether a single trophy costs the same in region A as well as region B.
In the absence of the cost per trophy, it is not possible to find the total amount spent in region B in 2008.
Hence, the total cost cannot be determined.
Hence, **option 5.**

Note: If the cost of a single trophy is the same in both the regions, the total cost in region B will be 200 × 200 = Rs. 40,000
In region A:
The total number of participants who qualified for the next round = 600
The total number of participants who were rejected = 750
So, the required ratio = 600 : 750 = 4 : 5
Hence, **option 4.**

9. In 2006,
Total participants = 850 + 650 = 1500
Number of rejected participants = 650

$$\therefore \text{Percentage} = \frac{650}{1500} \times 100 = 43.33\%$$

Note: Observe that in 2006, the number of qualified candidates is more than the number of rejected candidates. Hence, the number of rejected candidates for this year has to be < 50% of the total number of candidates for that year. On the other hand, in 2007 and 2008, the number of rejected candidates is more than the number of qualified candidates. Hence, the required percentage in both those years has to be > 50%. As a result, the option for year 2006 (i.e. option 1) can be eliminated without performing the calculation shown above.

In 2007,
Total participants = 850 + 1150 = 2000
Number of rejected participants = 1150

$$\therefore \text{Percentage} = \frac{1150}{2000} \times 100 = 57.5\%$$

In 2008,
Total participants = 725 + 1025 = 1750
Number of rejected participants = 1025

$$\therefore \text{Percentage} = \frac{1025}{1750} \times 100 = 58.57\%$$

Hence, **option 3.**

PRACTICE TEST II

1. Number of boys studying Commerce is 416 which is 40% of the total number of boys.
∴ Total number of boys in the institute

$$= \frac{(416 \times 100)}{40} = 1040$$

Since girls are 35% of the total number of students in the institute, boys form the remaining 65%.
∴ Total number of girls in the institute

$$= \frac{(1040 \times 35)}{65} = 560$$

Total number of students = 1040 + 560 = 1600
Now, 45% of the girls study Arts.
∴ The total number of girls studying Arts

$$= \frac{(45 \times 560)}{100} = 252$$

Number of boys and girls studying Commerce is in the ratio of 4 : 1.
∴ The total number of girls studying Commerce

$$= \frac{416}{4} = 104$$

∴ The total number of girls studying Science
= 560 – 252 – 104 = 204
25% of the boys study Science
∴ Number of boys studying Science

$$= \frac{(25 \times 1040)}{100} = 260$$

∴ The total number of boys studying Arts

13 Practice Test Solutions

DATA INTERPRETATION AND ANALYSIS

PRACTICE TEST I

1. Note that since the base year is not mentioned, the percentage change in the number of students is to be calculated using the previous year i.e. 2007 as a base year.
Percentage change in the number of students of branch A

$$= \frac{(180 - 140)}{140} \times 100 = 28.57\%$$

Percentage change in the number of students of branch C $= \frac{(220 - 150)}{150} \times 100 = 46.67\%$

Since the difference in percentage change is required, what we need is only the difference between the two percentage values calculated earlier.
Difference in percentage change = |% change of branch A - % change of branch C|=|28.57 -46.67| = 18.1
Hence, **option 4.**

2. Number of students in branch B in 2007= 280
Number of students in branch C in 2007= 150
Since we are taking the number of students studying in C in 2007 as a reference to compare the number of students studying in B in 2007, C becomes the base value.

$\therefore$ Percentage difference $= \frac{280 - 150}{150} \times 100$

= 86.67%
Hence, **option 1.**

3. Since no base year is given, the percentage change for 2006 is taken with respect to the corresponding figure for 2005.
In 2006, number of students in branch B = 125
In 2005, number of students in branch B = 150

$\therefore$ Percentage change $= \frac{125 - 150}{150} \times 100$

= -16.67%

Hence, **option 3.**

4. The data given are the index values, not the actual sales figures.
Since we do not know the actual sales figure for any of the years, it is not possible to use the index values and get the sales figures for 1981 to 1986.
Hence, we cannot find the increase in sales from 1981 to 1986.
Hence, **option 4.**

Note: What we do know in this question is that if the sales were Rs. 50 crores in 1981, they would have been Rs. 107 crores in 1986. The actual sales value also has to increase by the same factor. This logic applies to all years. So, had we known the sales value for even a single year, we could have found the sales value for 1981 and correspondingly for 1986.

5. As explained in the question above, since the actual sales value for a particular year is known, the sales value for any two years can be found.
The Sales Index is 70 in 1982 and 107 in 1986.
If a Sales Index of 70 corresponds to a sales figure of Rs. 400 Crores, then the Sales Index of 107 corresponds to a value

$$= \frac{400 \times 107}{70} = \text{Rs. } 611.4 \text{ crores}$$

Hence, **option 3.**

6. Looking at the indices of profit we see that in the year 1983 the value of the profit is the highest.
Hence, **option 1.**

7. From the graph, we can see that Base Profit Index of 50 in 1981 rises to an index of 60 in 1986.
$\because$ The base year for the profit index is changed to 1982, the base index becomes 75.
$\therefore$ If the Base Index is changed to 75, then a corresponding rise in the profit index in 1986 would be

$$= \frac{60 \times 75}{50} = 90$$

Hence, **option 1.**

8. The average sales index over the six years

$$= \frac{50 + 70 + 80 + 102 + 112 + 107}{6} = 86.8$$

The average cost index over the six years

$$= \frac{50 + 48 + 45 + 60 + 71 + 100}{6} = 62.3$$

∴ The difference between the Average Sales Index and the Average Cost Index over the given period = 86.8 – 62.3 = 24.5

Hence, **option 2.**

9. The average annual sales of company Q during the given period i.e.1991 to 1996

$$= \frac{\text{Total sales for all six years}}{\text{Total number of years}}$$

$$= \frac{785 + 1040 + 980 + 1060 + 980 + 1200}{6}$$

= Rs.1007.5 crores

Hence, **option 3.**

10. Sales of company T in 1995 = Rs. 460 crores

Sales of company P in 1992 = Rs. 900 crores

Though 460 as a percentage of 900 can be directly and easily calculated, we can also look at a technique of elimination here.

Using calculations, the required percentage = (460/900) × 100 = 51% (approximately)

Since 50% of 900 is 450, the required percentage has to be greater than 50%.

Hence, options 2 and 3 can be eliminated.

Now, 50% of 900 = 450 and 60% of 900 = 540

460 is closer to 450 than to 540.

So, the required percentage has to closer to 50% than to 60%. So, the required percentage is 51% (considering that the only options available now are 51% and 60%).

Hence, **option 1.**

11. Since no base year is given, the growth rate of company P in 1991 should be found compared to the previous year i.e. 1990

∵ The data for 1990 is not provided, the growth rate for 1991 cannot be determined.

Hence, **option 4.**

12. The simple annual growth rate is given by the overall growth rate in the given period divided by the number of units of time in that period.

The simple annual growth rate for company S from 1991 to 1996

$$= \frac{\left(\frac{\text{Sales for 1996} - \text{Sales for 1991}}{\text{Sales for 1991}}\right)}{\text{Total number of years}} \times 100$$

$$= \frac{1}{5} \times \left(\frac{900 - 695}{695}\right) \times 100 = 5.9\%$$

Hence, **option 4.**

13. The compound annual growth rate (CAGR) for company R from 1991 to 1996 is given by,

$$\text{CAGR} = \left(\frac{\text{Sales for 1996}}{\text{Sales for 1991}}\right)^{\frac{1}{n}} - 1$$

Here, n is the number of years

$$\therefore r = \left(\frac{1000}{620}\right)^{\frac{1}{5}} - 1$$

where r is the CAGR for company R.

The above formula can be simplified as,

$1000 = 620 \times (1 + r)^5$

$\therefore 1.6129 = (1 + r)^5$

Now, among the four options given, check each answer option and see which option is closest to the value 1.6129.

Here, it makes sense to start with an option which is neither the largest value nor the smallest value so that elimination of options can be done quickly.

For instance, consider option 4 i.e $r = 6\%$

$\therefore (1 + 0.06)^5 = (1.06)^5 = 1.262$

This value is quite smaller compared to 1.6129.

This also means that the value obtained using $r = 4\%$ will be even smaller.

Hence, options 2 and 4 can be eliminated.

Now, we can consider either 8% or 9%. At the end of this calculation, we will get our answer.

Consider $r = 8\%$

$\therefore (1 + 0.08)^5 = (1.08)^5 = 1.36$

Since this is also less than 1.6129, option 1 can also be eliminated.

So, $r = 10\%$

Hence, **option 2.**

Note: You can crosscheck this by taking $r = 9\%$. For this value, we get the RHS as 1.412 Even though this value is not equal to 1.6129, it is closest to this value. Hence, we mark $r = 10\%$ as the answer.

14. Total sales of the 5 companies in 1994 = 1000 + 1060 + 910 + 800 + 980 = Rs. 4750 crores

The total sales of these 5 companies, however, forms only 50% of the entire market share.

∴ The total sales in that industry in 1994 is twice the total sales of these 5 companies

∴ The total market share = 2 × 4750 = Rs. 9500 Crores

$$\therefore \text{Q's market share in 1994} = \frac{1060 \times 100}{9500}$$

= 11.15%

5. Ankita completed her graduation with 70% marks and has been working for the last 11 years. She had architected a residential complex for a reputed builder in Mumbai. She is based in Mumbai and has a recommendation from 2 contractors. She demands a fee of Rs. 42 lakhs.

(1) She is selected- satisfies (d)
(2) She is rejected
(3) She is selected- satisfies (b) and (d)
(4) Data inadequate
(5) None of these

Instructions for questions 6 to 10: Answer the following questions based on the information given below.

An organisation has decided to recruit an Accounts Manager. They have set the conditions specified below, for recruitment.

The candidate must:

i. Be a Commerce graduate with atleast 65 percent marks.
ii. Be a Post Graduate in commerce with atleast 55 percent marks.
iii. Have work experience, post qualification, of atleast two years as an Accounts Manager in an organization.
iv. Not be younger than 25 years and not be older than 40 years as on May 1, 2011.
v. Have secured at least 75 percent marks in the selection process.

In case a candidate satisfies all the given criteria except –

(A) Condition (iii) above but has work experience of at least five years as Assistant Accounts Manager in an organization, his/her case is to referred to the GM–Accounts
(B) Condition (ii) above but has successfully completed CA/ICWA, the case is to be referred to the Director Finance.

In each question below, the details of a specific candidate are given. You have to take an appropriate decision in each case based on the information provided and the conditions given above and mark the correct decision as your answer. You are not to assume anything other than the information provided in each case. All the cases are given to you as on May 1, 2011.

6. Roshan Singh Sodhi is a Commerce graduate with 70 percent marks. He has been working as the Accounts Manager in an organization for the past three years after completing his post graduation in Commerce with 56 percent marks. He was born on 28th May 1982. He has secured 82 percent marks in the selection process.

(1) The data provided is not adequate to take a decision.
(2) The case is to be referred to GM – Accounts.
(3) The case is to be referred to Director – Finance.
(4) The candidate is to be selected.
(5) The candidate is not to be selected.

7. Taarak Mehta was born on 21st August 1974. He has been working as Assistant Accounts Manager in an organization for the past five years after completing his post graduation in Commerce with 50 percent marks. He has not acquired another qualification after this. He has secured 77 percent marks in both the selection process and graduation in Commerce. Please state:

(1) if the data provided is not adequate to take a decision.
(2) if the case is to be referred to GM – Accounts.
(3) if the case is to be referred to Director – Finance.
(4) if the candidate is to be selected.
(5) if the candidate is not to be selected.

8. Daya Gada has secured 86 percent marks in graduation in commerce and 61 percent marks in post graduation in Commerce. She has secured 75 percent marks in the selection process. She was born on 1st April 1984. She has also successfully completed her CA. Please decide:

   (1) if the data provided is not adequate to take a decision.
   (2) if the case is to be referred to GM – Accounts.
   (3) if the case is to be referred to Director – Finance.
   (4) if the candidate is to be selected.
   (5) if the candidate is not to be selected.

9. Babita was born on 5th January 1985. She has been working as Accounts Manager in an organization after completing her graduation in Commerce with 75 percent marks and post graduation in Commerce with 59 percent marks. She has secured 90 marks in the selection process. Please decide:

   (1) if the data provided is not adequate to take a decision.
   (2) if the case is to be referred to GM – Accounts.
   (3) if the case is to be referred to Director – Finance.
   (4) if the candidate is to be selected.
   (5) if the candidate is not to be selected.

10. Atmaram Bhide was born on 15th March 1976. He has secured 85 percent in the selection process. He has been working as the Accounts Manager in an organization for the last two years after completing his post graduation in Commerce with 68 percent marks. He has secured 64 percent marks in his graduation in commerce. Please tell the selection panel:

   (1) if the data provided is not adequate to take a decision..
   (2) if the case is to be referred to GM – Accounts.
   (3) if the case is to be referred to Director – Finance.
   (4) if the candidate is to be selected.
   (5) if the candidate is not to be selected.

5. MNO Travels offers a Go Goa package with special discounts from February to October. Their 5 night/6 day package, inclusive of travel, food and accommodation, costs Rs. 15,000 per head. Twin sharing works out to Rs. 24,000 per couple. This cost includes the following activities: water sports, snorkelling, a boat ride for dolphin spotting and even deep sea diving.

Instructions for questions 6 to 10: Answer the following questions based on the information given below.

A company wants to select a candidate for the post of a marketing manager based on the following criteria:

(a) The candidate must have secured at least 55% in graduation.
(b) He/she should have a post graduate degree with specialization in marketing and must have secured at least 65% in it.
(c) The age of the candidate must not be less than 25 years and more than 35 years.
(d) The candidate should be fluent in both, English and Hindi.
(e) The candidate should have at least 2 years of work experience.
(f) If the candidate does not satisfy condition (e), but if he/she was a marketing manager in a company for at least a year then his/her case is to be referred to the General Manager.
(g) If the candidate does not satisfy condition (c) only, but if he/she has at least 5 years of work experience as a Marketing Officer then his/her case should be referred to the Director.

Based on the above information, decide the course of action in each of the following cases. Today is 01 January 2009. If you are unable to decide the course of action based on the given information, mark your answer as 'insufficient data'.

Mark option:

(1) If the candidate is to be selected
(2) If the candidate is to be rejected
(3) If the case to be referred to the General Manager
(4) If the case to be referred to the Director
(5) If the data given is insufficient

6. Akshat Shah completed his graduation in the year 2000 and secured 72% marks in it. He was born on 4th August, 1982. He did his post graduation in marketing with 66% marks and is currently working in a reputed company as a marketing manager since 2005. He is fluent only in English, Marathi and Gujarati.

7. Rita Sabarwal was born on 13th November, 1971 and she has been working in a bank as a marketing officer since 12th December, 2003. She has completed her graduation with 57% marks and post graduation in marketing with 68% marks. She is fluent in four regional languages as well as English and Hindi.

8. Armaan Malhotra is a graduate with 56% marks and has completed his post graduation in marketing with a first class. He has been working in a company as a marketing head since the last 4 years. He is fluent in English and Hindi and his date of birth is 1st January 1982.

9. J.P. Shukla is 28 years old and has been working in an organization since 1st May, 2007 as a marketing manager. He secured 67% in his graduation degree and 66% in the post graduation with specialization in marketing. He is fluent in English and Hindi.

10. Anjali Gupta was born on 30th June, 1981 and is a graduate with 70% marks and a post graduate in marketing with 65% marks. She is fluent in English and Hindi. She has been working as a Marketing Officer since the last 6 years.

PRACTICE TEST II

Instructions for questions 1 to 5: Answer the following questions based on the information given below.

Leading Builders require an architect for the construction of their new commercial complex. He will be selected on the basis of the following criteria:

The candidate should be based in Mumbai. He should be a first class (minimum 60%) graduate with at least 8 years of work experience. He should have worked with a reputed builder on a project of a residential complex and should have a recommendation from at least 1 contractor. In addition to this, he should satisfy at least one of the following conditions:

(a) He should have a team of least 10 members.
(b) He must not demand a fee of more than Rs. 40 lakhs.
(c) He should be a post graduate in architecture.
(d) He should have built a commercial complex for a reputed firm.
(e) His projects should have won at least 2 awards for architecture.
(f) He should be able to use CAD and 3D modeling software.

Based on the above information, decide the course of action in each of the following cases. Today is 01 January 2009.

1. Pratik is based in Mumbai and has a team of around 20 members. He has been working since the last 15 years, and has completed his graduation with 65% marks in the year 1993. His last project of a residential complex won 2 awards and he has recommendations from 2 contractors.

(1) He is selected – satisfies (a), (d) and (e)
(2) He is selected – satisfies (a) and (e)
(3) He is rejected
(4) Data inadequate
(5) None of these

2. Mandar is an architect who passed his graduation with 62% marks. He has designed a commercial complex and a residential complex for a reputed organization and has a recommendation from 1 local contractor. He has been in the field of architecture for the last 16 years and has a team of 7 members.

(1) He is selected – satisfies (d)
(2) He is rejected
(3) He is selected – satisfies (a) and (d)
(4) Data insufficient
(5) None of these

3. Nirali passed in the year 1999 from Mumbai University with 72% marks. She started working in the year 2000 and has a team of 9 members. She has been recommended by 2 contractors. Based in Mumbai, she has made a residential complex for a reputed builder and demands a fee of Rs. 32 lakhs for a project. She is an expert in using CAD and image rendering software.

(1) She is selected – satisfies (b), (d) and (f)
(2) She is rejected
(3) She is selected – satisfies (b) and (f)
(4) She is selected – satisfies only (b)
(5) Data inadequate

4. Jinay has worked with a reputed company for 8 years and has a team of 14 members. He did his graduation with 66% marks from Delhi University and post graduation with 67% from Mumbai University. He is based in Mumbai and has only designed a commercial complex for a reputed builder. He demands a fee of Rs. 20 lakhs and has a recommendation from 2 contractors.

(1) He is rejected
(2) He is selected
(3) He is selected – satisfies (a), (b) and (d).
(4) He is selected – satisfies (a) and (d).
(5) He is selected – satisfies (b) and (d).

DATA INTERPRETATION

&

LOGICAL REASONING

Practice Tests

VERBAL ABILITY

Practice Tests