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Preface

Dear Aspirant,

Quantitative Ability and Data Interpretation Take Off booklet consists of 10 tests. Tests 1 to 4 are based on CAT Test Pattern. Tests 5 to 10 are based on the patterns of Non-CAT Tests like SNAP, IIFT and XAT.

These tests are representative of the actual sections of various Management entrance exams. In certain tests (SNAP and IIFT), you will encounter questions on Analytical Reasoning and Logical Reasoning as well. This has been done to enable you to experience the sections as they occur in actual exams.

Do not attempt the tests in quick succession; a gap of at least 3 days must elapse before you move on to the next test.

The main objective of this book is to gear you up for the Quantitative Ability and Data Interpretation Sections of the various Management Entrance Exams.

All the Best

CL Educate Team

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Test 1 - CAT

Note: All questions carry 3 marks each. Each wrong answer will attract a penalty of 1 mark.

Number of questions: 30 **Time: 70 mins**

Quantitative Ability & Data Interpretation

1. Let A be a two-digit number and B be another two-digit number formed by reversing the digits of A.
If A + B + (Product of digits of the number A) = 145, then what is the sum of the digits of A?

(a) 12 (b) 10 (c) 13 (d) 11

2. Given that $f(1) = 1$, $f(2x) = 4f(x) + 6$ and $f(x + 2) = f(x) + 12x + 12$ for all real values of x. What is the value of f(20)?

(a) 502 (b) 1068 (c) 1198 (d) 4678

3. Samyak's wrist watch lagged behind by 12 min on Thursday at 6:00 am while it was 16 min ahead on Saturday at 9:00 pm in the same week. At what time did the watch show the correct time?

(a) 9 pm on Friday (b) 9 am on Friday

(c) 1:30 pm on friday (d) 12:30 am on saturday

Directions for questions 4 and 5: Answer the questions on the basis of the information given below.

Five friends namely _ Anu, Banu, Cara, Dia and Emily _ are playing on the sea shore and collecting pebbles. Pebbles collected by each of them are of red or blue or green colours only. The aggregate number of red, blue and green pebbles collected by the five friends was 15, 11 and 22 respectively. The following table provides partial information about the number of pebbles collected by each of the friends.

	Red	Blue	Green	Total
Anu			4	10
Banu		3		
Cara	4			
Dia				
Emily				

The number of blue coloured pebbles with each of the friends is a prime number. The number of pebbles of each colour with Emily is same. Number of pebbles with Cara is double the number of pebbles with Emily. Total number of pebbles with Banu is 50% more than the total number of pebbles with Dia. Ratio of the number of red pebbles to the number of green pebbles with Banu as well as Dia is 1 : 2.

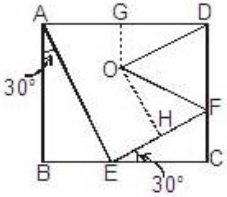
4. For how many friends the ratio of number of blue pebbles to the number of green pebbles is 1 : 2?

(a) 1 (b) 2 (c) 3 (d) 4

5. What is the ratio of total number of pebbles with A and D?

(a) 5:4 (b) 4:5 (c) 4:3 (d) 3:4

6. In the figure given below, ABCD is a rectangle such that $AB : AD = \sqrt{3} : 2$. The measure of $\angle BAE$ as well as $\angle FEC = 30°$. If GO and OH are the perpendicular bisectors of AD and EF respectively, find the measure of $\angle DOF$.



(a) 30° (b) 45° (c) 60° (d) Cannot be determined

7. Ajay, Vijay and Dhananjay purchased 1, 10 and 25 notebooks for a total of Rs.14, Rs.130 and Rs.300 respectively from a stationery shop. In his transaction with Ajay and Dhananjay, the shopkeeper made a profit of p% and q% respectively such that p = 2q. How much profit did the shopkeeper make in his transaction with Vijay? (Assume that the shopkeeper bought each note book at the same price.)

(a) 0% (b) 25% (c) 28% (d) 30%

8. A book-shelf can accommodate 6 books from left to right. If 10 identical books on each of the languages French, German, Spanish and English are available, in how many ways can the book-shelf be filled such that books on the same language are not put adjacently?

(a) $\frac{{}^{40}P_6}{6!}$ (b) 10×9^5 (c) $\frac{{}^{6}P_4}{2!}$ (d) 4×3^5

Directions for question 9: Following question is followed by two statements, I and II. Answer each question using the following instructions:

Mark:

(a) if the question can be answered by using either of the statements alone.

(b) if the question can be answered by using one of the statements alone but not by using the other
statement alone.

(c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

(d) if the question cannot be answered even by using both the statements together.

9. Is X a perfect square? $(X \neq 0)$

I. X can be written as the sum of three positive distinct integers in only one way.

II. $7 \times X$ is a perfect square.

10. If $S_n = 1^2 - 2^2 + 3^2 - 4^2 + \ldots + (2n-1)^2 - (2n)^2 + (2n+1)^2$, then which of the following is correct?

(a) $S_{10} = 321$ (b) $S_{100} = 21301$ (c) $S_{25} = 1336$ (d) $S_{50} = 5151$

11. A tower stands at a point Q on the ground. The angle of elevation of the top of the tower from a point R which is south of Q is 60°. The angle of elevation of the top of the tower from a point S to the west of R is 30°. If the height of the tower is 10 m, then find the distance between the points S and R.

(a) $10\sqrt{\frac{8}{3}}$ m (b) $10\sqrt{3}$ m (c) $10\sqrt{\frac{7}{3}}$ m (d) None of these

Directions for questions 12 to 14: Answer the questions on the basis of the information given below.

Bicycle industry 1997-2002

	1997-98	1998-99	1999-2000	2000-01	2001-02
Production ('000 units)	7,721	8,907	9,913	10,895	9,813
Export Quantity ('000 units)	1,204	1,092.2	1,009	949.2	750.7
Export value (Rs. crore)	147.6	144.4	141.0	128.8	95.0
Total sales (Rs. crore)	892.1	841.3	965.9	1,002.3	1,021.8

Domestic sales (`000 units) = Production - Export quantity

Domestic sales (Rs. crore) = Total sales - Export value

12. The highest approximate average export price per bicycle in any one of the time periods given was

(a) Rs. 1,320 (b) Rs. 1,360 (c) Rs. 1,400 (d) Rs. 1,270

13. What is the largest percentage increase in domestic consumption (in terms of the number of cycles) for any time period over the previous time period?

(a) 20% (b) 14% (c) 27% (d) 18%

14. What was the percentage change in capacity utilisation in 2001-02 over that in 1997-98, if the capacity increased by 40% during that period? [Capacity utilisation = (Production/Capacity) × 100]

(a) 9% decrease (b) 5% decrease (c) 5% increase (d) 18% increase

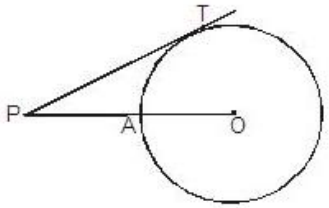
15. How many multiples of 18 are less than 3500 and are 2 more than the square of a natural number?

(a) 6 (b) 7 (c) 5 (d) 8

16. If $a^{3-x}b^{5x} = a^{x+5}b^{3x}$, then $x\left(\frac{\log b}{\log a}\right)$ is equal to

(a) log a (b) log b (c) x log a (d) None of these

17. In the figure given below, O is the center of the circle with radius 2 cm. PT is a tangent to the circle. What is the length of the line segment PA, if the length of the line segment PT is $2\sqrt{3}$ cm?



(a) 1.5 cm (b) 2 cm (c) 2.5 cm (d) 3 cm

18. Anil completes an assignment in 10 to 15 days and Mukesh takes 15 to 20 days to finish the same assignment. If they work on alternate days and both of them take a break together on every third day, then which of the following is correct regarding the number of days in which the assignment may be completed?

(a) Less than or equal to 25 days (b) More than 18 days

(c) More than or equal to 17 days (d) More than 25 days

19. Each of Amit, Bosco, Chris and Deepak bought 56 pencils each out of which a total of 64 pencils were found to be broken. If the number of unbroken pencils with Chris is 60% and 75% more than that of Amit and Bosco respectively, then find the number of broken pencils with Deepak.

(a) 16 (b) 17 (c) 18 (d) 19

20. A square ABCD has vertices A (-1, 3), B (3, 3), C (3, -1) and D (-1, -1). The points P and Q lie on AB and BC respectively such that AP : PB is 2 : 3 and BQ : QC is 3 : 1. The line AQ and PD intersect at the point S. Find the slope of the line CS.

(a) $-\frac{11}{9}$ (b) $-\frac{10}{9}$ (c) $-\frac{4}{3}$ (d) $-\frac{5}{3}$

21. For which of the following values of p, the equation $x^3 + px^2 + x + p = 0$ will have either no real roots or exactly two real roots between x = 1 and x = -1?

(a) $p = -\frac{6}{13}$ (b) $p = -\frac{13}{5}$ (c) $p = \frac{6}{13}$ (d) All of these

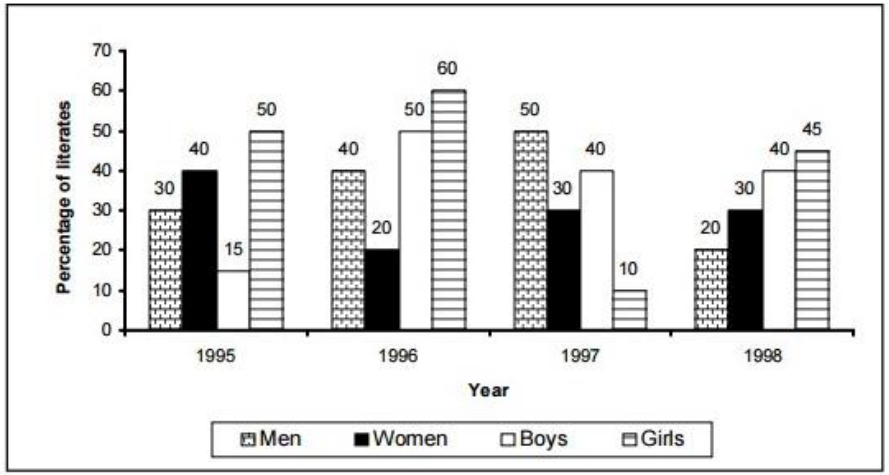
22. Rectangular tiles each of size 70 cm by 20 cm are to be laid horizontally on a rectangular floor of size 120 cm × 130 cm, such that tiles do not overlap. A tile can be placed in any orientation so long as its edges are parallel to the edges of the floor. No tile should overshoot any edge of the floor. The maximum possible number of tiles that can be accommodated on the floor is

(a) 12 (b) 11 (c) 10 (d) 9

Directions for questions 23 to 25: Answer the questions on the basis of the information given below.

There were 2 lakhs, 3 lakhs, 4 lakhs, and 5 lakhs men in a town over a period of 4 years from 1995 to 1998 respectively. In the same period, the number of women increased at the rate of 10% every year, beginning at 1.3 lakh in 1995. The number of boys in the town increased at 5% per year. In 1998 the number of boys was 1.2 lakh. Number of girls increased at 25% every year and in 1998 the number of girls was 1 lakh.

The graph below shows the percentage of literates in the town between 1995 and 1998.



23. In which year was the number of literates in the town maximum?

(a) 1995 (b) 1996 (c) 1997 (d) 1998

24. In 1996, what was the approximate ratio of number of literate women to number of literate boys?

(a) 0.45 (b) 0.52 (c) 0.4 (d) 0.35

25. What was the approximate percentage increase in the number of literate girls from 1997 to 1998?

(a) 463% (b) 560% (c) 426% (d) 526%

26. What is the remainder when 8^{643} is divided by 132?

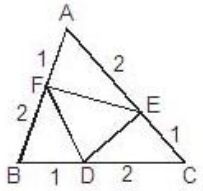
(a) 28 (b) 80 (c) 112 (d) 116

27. If $x^2 + y^2 = 3axy$, $y^2 + z^2 = 4byz$ and $z^2 + x^2 = 5czx$, then which of the following conditions is satisfied?

(a) $a^2 + b^2 + c^2 - 12abc - 4 = 0$ (b) $9a^2 + 16b^2 + 25c^2 - abc = 0$

(c) $9a^2 + 16b^2 + 25c^2 - 60abc - 4 = 0$ (d) $9a^2 + 16b^2 + 25c^2 - 60abc + 4 = 0$

28. In ΔABC, D, E and F are points of trisection of BC, AC and AB respectively. Which of the following statements is not true?



(a) Area of $\Delta EDC = \frac{2}{9}$ area ΔABC (b) Area of $\Delta FBD = \frac{2}{7}$ area of BFEC

(c) Area of $\Delta DEF = \frac{1}{3}$ area of Δ ABC (d) None of these

29. Mrs. and Mr. Tarak travel from Delhi to Agra and break the journey at Mathura in-between. Somewhere between Delhi and Mathura, Mrs Tarak asks, "How far have we travelled?" Mr Tarak replies, "Half as far as the distance from here to Mathura." Somewhere between Mathura and Agra, exactly 300 km from the point where she asked the first question, Mrs Tarak asks, "How far have we to go?" Mr Tarak replies, "Half as far as the distance from Mathura to here." The distance between Delhi to Agra is

(a) 200 km (b) 400 km (c) 450 km (d) 300 km

30. Find the number of positive integer solutions for the equation $7x + 3y = 123$, such that x is always
less than y.

(a) 5 (b) 6 (c) 3 (d) 4

Test 2 - CAT

Note: All questions carry 3 marks each. Each wrong answer will attract a penalty of 1 mark.

Number of questions: 30 **Time: 70 mins**

Quantitative Ability & Data Interpretation

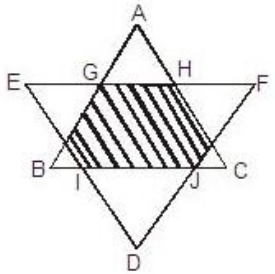
1. Find the sum of the last three digits of S, where S = 871 × 873 × 875 × 878 × 881 × 883.

(a) 12 (b) 5 (c) 15 (d) 7

2. If $f_1(x) = \frac{1}{1+x}$ and $f_n(x) = \frac{1}{1+f_{n-1}(x)}$, then find the value of $f_{100}(a)$.

(a) 0.618 (b) 0.666 (c) 0.714 (d) 0.684

3. DABC and DDEF are both equilateral with EF || BC and the figure given below is symmetric about the line segment AD. The ratio of perimeter of the triangles DAGH : DDIJ : DABC : DDEF = 3:4:6:7 respectively. Find the area of the shaded region as a fraction of the area of the figure given below.



(a) $\frac{1}{2}$ (b) $\frac{17}{40}$ (c) $\frac{5}{12}$ (d) $\frac{13}{30}$

4. The cost of 6 desks is equal to the aggregate cost of 6 chairs and 1 table. The aggregate cost of 6 desks and 3 tables is equal to the cost of 12 chairs. Which of the following statements is false?

(Assume that the cost of each chair is the same and this holds true for the desks as well as the tables.)

(a) The cost of 5 tables is equal to the aggregate cost of 5 chairs and 2 desks.

(b) The cost of 5 chairs is equal to the cost of 4 desks.

(c) The cost of 2 desks is equal to the aggregate cost of 1 chair and 1 table.

(d) The cost of 3 desks is equal to the aggregate cost of 2 chairs and 1 table.

5. In a cricket match if a batsman can score 0, 1, 2, 3, 4 or 6 runs of a ball, then find the number of different sequences in which he can score exactly 30 runs of an over. (Assume that an over consists of only 6 balls and there were no extras and no run outs.)

(a) 86 (b) 71 (c) 56 (d) 65

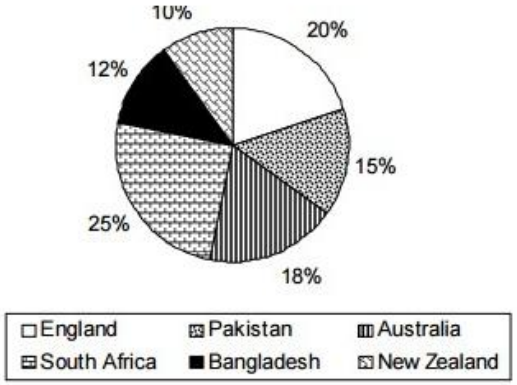
6. The co-ordinates of the vertices of a triangle are A(2, 5), B(-3, 0) and C(-2, 4). A line `L' passes through the centroid of the triangle ABC and the point (1, 1). What is the shortest distance of this line from the origin?

(a) 0 units (b) 1 unit (c) $\frac{1}{\sqrt{2}}$ units (d) $\sqrt{2}$ units

Directions for questions 7 and 8: Answer the questions on the basis of the information given below.

The following pie chart provides information about the number of runs scored by Sachin against each of the six teams _ England, Pakistan, Australia, South Africa, Bangladesh and New Zealand _ as a percentage of the total number of runs scored by Sachin in the year 2007.

Assume that the mentioned teams are the only teams against which Sachin scored runs in the year 2007.



The following table provides information about the number of runs scored by Sachin in 4's and 6's against each of the mentioned teams in the year 2007. The total number of runs scored by Sachin against South Africa in 6's as a percentage of the total number of runs scored by him against New Zealand is 18%.

	4's	6's
England	240	96
Pakistan	160	120
Australia	280	144
South Africa	200	72
Bangladesh	120	180
New Zealand	160	240

7. What is the number of runs scored by Sachin in 4's against Australia as a percentage of the total number of runs scored by him against England?

(a) 35% (b) 40% (c) 38% (d) None of these

8. Against which team the number of runs that were not scored by Sachin in 4's or 6's is second largest?

(a) Pakistan (b) South Africa (c) Bangladesh (d) England

9. N is a set of first few multiples of 2, such that exactly 17 numbers in N are divisible by 9. Which of the following is necessarily true?

(a) Only 10 numbers in N are divisible by 15. (b) There are 153 numbers in N.

(c) There are more than 300 numbers in N. (d) Both (a) and (b)

10. If $x = 3 + 3^{\frac{1}{3}} + 3^{\frac{5}{3}}$, then find the value of $x^3 - 9x^2$.

(a) 81 (b) 111 (c) 186 (d) 192

Directions for question 11: Following question is followed by two statements, I and II. Answer each question using the following instructions:

Mark:

(a) if the question can be answered by using either of the statements alone.

(b) if the question can be answered by using one of the statements alone but not by using the other
statement alone.

(c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

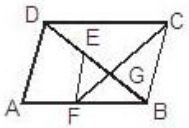
(d) if the question cannot be answered even by using both the statements together.

11. A cylinder of base area 10 sq. cm contains water up to a height of 10 cm. A smaller cylindrical block is dropped into this cylinder. By what height does the water rise in the cylinder?

I. The volume of the block is 100 cm^3.

II. The smaller cylindrical block gets completely immersed in the water.

12. In the adjoining figure, ABCD is a parallelogram. If AD is parallel to FE and $\frac{AF}{FB} = \frac{2}{3}$, then find $\frac{BG}{GD}$.



(a) $\frac{3}{5}$ (b) $\frac{3}{8}$ (c) $\frac{1}{2}$ (d)

13. Train X and train Y travel at 120 km/hr and 110 km/hr respectively. Points P and Q are marked on the railway track such that PQ is a straight line. Time taken by train X to completely cross a stationary pole is 4 seconds. Time taken by train Y and train X to completely cross the line PQ from the instant the front end of respective trains cross point P is 36 seconds and 31 seconds respectively. What is the length of the train Y?

(a) 200 m (b) 240 m (c) 180 m (d) 250 m

14. What is the value of the following expression?

$$\frac{1}{2^2+0} + \frac{1}{5^2+3} + \frac{1}{8^2+6} + \frac{1}{11^2+9} + \ldots\ldots\ldots + \frac{1}{29^2+27}$$

(a) $\frac{9}{28}$ (b) $\frac{10}{31}$ (c) $\frac{9}{29}$ (d) $\frac{15}{31}$

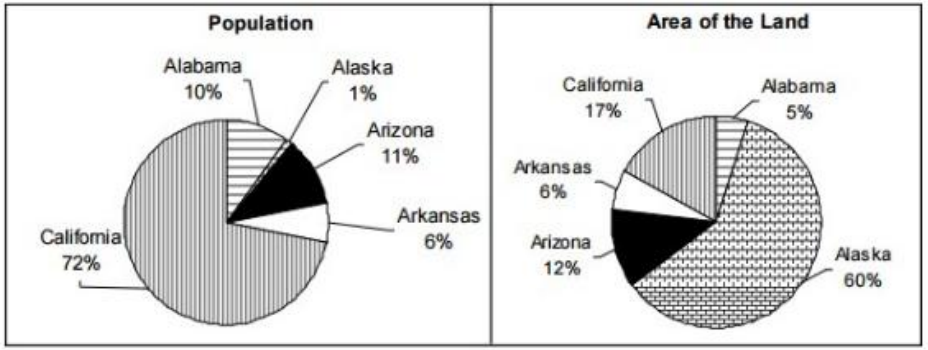
15. In Jantar-Mantar, time is determined by length of the shadow of the central stick. At 8.00 am, angle of elevation of the sun was 30° and length of the shadow was 9 m. Find the angle of elevation of the sun at 3.00 pm, if length of the shadow at that moment was $3\sqrt{3}$ m.

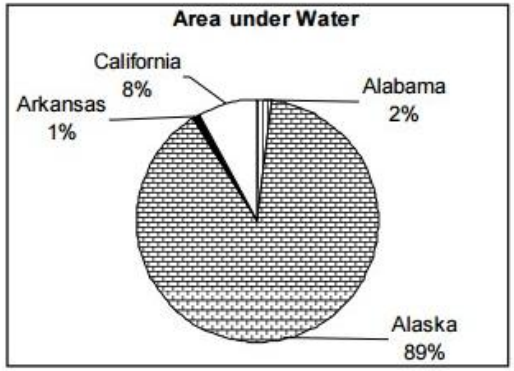
(a) Slightly less than 45° (b) 45°

(c) Slightly more than 45° (d) Either (a) or (c)

Directions for questions 16 to 18: Answer the questions on the basis of the information given below.

The pie charts given below represent three quantities _ "Population", "Area of the Land" and the "Area under Water" _ of five US states _ Alabama, Arkansas, Arizona, Alaska and California _ as a percentage of the respective total values of the three mentioned quantities of the five states. "Population Density" is defined as the number of persons living in one square mile area of land.





16. If "Population Density" of the state Arizona is 17.3 and its "Area of the Land" is 68,181 sq. miles, then find the "Population Density" of Alaska.

(a) 3.1 (b) 0.3 (c) 1.7 (d) 1.9

17. Which of these five states has the highest value of "Population Density"?

(a) Alabama (b) Arizona (c) Alaska (d) California

18. If "Area of the Land" of Alaska is 98,282 sq. miles and the sum of "Area under Water" of the five states is 102,201 sq. miles, then what is the sum of "Total Area (Land + Water)" of states Arizona, Arkansas and California?

(a) 58959 sq. miles (b) 66529 sq. miles (c) 95268 sq. miles (d) 68758 sq. miles

19. If $N = 2^3 \times 3^2$, then how many sets of 2 distinct factors of N are coprime to each other?

(a) 20 (b) 19 (c) 18 (d) 17

20. Raman and Sohan are brothers whose shops are located at a distance of 20 km and 24 km respectively from their home. Both of them start at the same time from home every day and reach their respective shops exactly at 10 a.m. When they decided to swap shops for a day, Raman started 8 minutes earlier than Sohan. If both of them reached on time, what is the speed of Sohan?

(a) 66 km/hr (b) 60 km/hr (c) 54 km/hr (d) 48 km/hr

21. A circle is inscribed in an equilateral triangle and a square is inscribed in the circle. The ratio of the area of the triangle to that of the square is

(a) $\sqrt{3} : \sqrt{2}$ (b) $9 : 2\sqrt{3}$ (c) $2 : 3\sqrt{3}$ (d) None of these

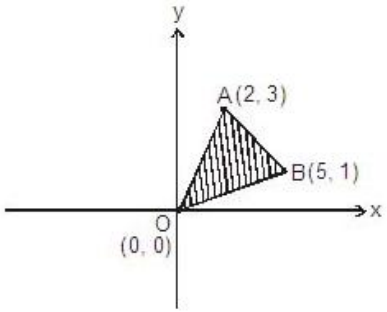
22. Out of the 6 consecutive terms of an increasing arithmetic progression (A.P.), the first 3 terms are negative and the remaining 3 terms are positive. If the common difference of the A.P. is an integer not greater than 4 and if one of the 6 terms of the given A.P. is -1, then the difference between the maximum and the minimum possible value of the arithmetic means of the distinct A.P's satisfying the given condition is

(a) 0 (b) 1 (c) 2 (d) Cannot be determined

23. Three integers are chosen at random without replacement from the first 20 positive integers. The probability that their product is even is

(a) $\frac{2}{19}$ (b) $\frac{17}{19}$ (c) $\frac{3}{17}$ (d) $\frac{15}{17}$

24. Find the solution set of the shaded region in the diagram below.



(a) $2x + 3y - 13 \le 0, 5y - x \ge 0, 2y - 3x \le 0$ (b) $3x + 2y - 13 \le 0, 2y - 3x \le 0, 5y - x \le 0$

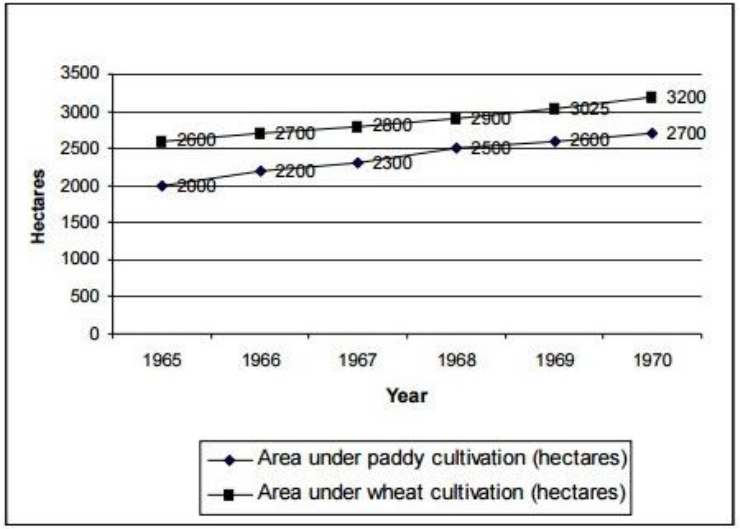
(c) $5x - y \ge 0, 2y - 3x \ge 0, 2x + 3y - 13 \le 0$ (d) $3x - 2y \le 0, 2x + 3y - 13 \ge 0, 5y - x \le 0$

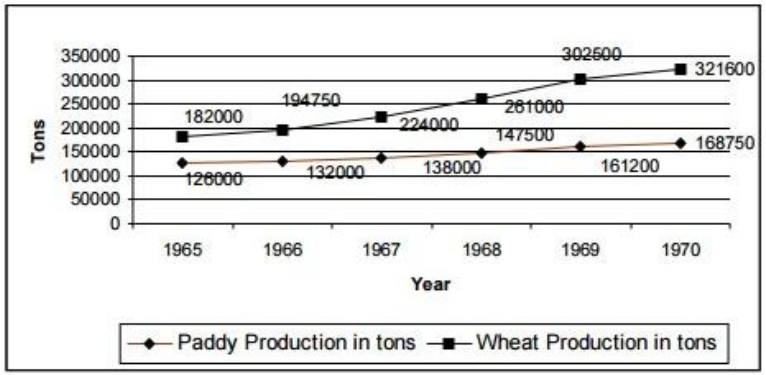
Directions for questions 25 to 27: Answer the questions on the basis of the information given below.

The following line graphs give the land area under paddy cultivation and wheat cultivation and the respective production for period 1965-70.

Yield is defined in terms of tons per hectare.

Land utilisation is defined in terms of hectares per ton.





25. Increase in yield compared to the previous year for wheat is the lowest for which of the following years?

(a) 1965-66 (b) 1966-67 (c) 1968-69 (d) 1969-70

26. In 1967, what area under paddy should be put under wheat in order to have the same yield for wheat and paddy as the collective average yield for 1967? (Assume the total production for both wheat and paddy remain the same as given.)

(a) 328.6 hectares (b) 368.4 hectares (c) 342.5 hectares (d) 356.3 hectares

27. If the land area for paddy increases by 5% in 1970-71 and production of paddy increases to 1,75,000 tons, then the yield for 1971 as compared to that in 1970 will

(a) increase by 1.2% (b) decrease by 0.12% (c) decrease by 1.2% (d) increase by 0.12%

Directions for question 28: Following question is followed by two statements, I and II. Answer each question using the following instructions:

Mark:

(a) if the question can be answered by using either of the statements alone.

(b) if the question can be answered by using one of the statements alone but not by using the other
statement alone.

(c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

(d) if the question cannot be answered even by using both the statements together.

28. In a DABC, AB is extended to AB' and AC is extended AC'. What is the percentage increase in the area of DABC.

I. DABC = 6 sq. units and $\angle BAC = 60^\circ$.

II. AB is increased by 20% and AC is increased to 130%

29. Find the value of `x' if $625^{\log_{36} 6} + 12^{\log_7 49} = 11^{\log_x 169}$ and $x > 0, x \neq 1$.

(a) 10 (b) 13 (c) 11 (d) 17

30. Hariharan is fond of shopping. He took an amount more than Rs. 10 but less than Rs. 20 with him in the form of one-rupee notes and 20-paisa coins. When he came back, he had as many one rupee notes as he originally had 20-paisa coins and as many 20-paisa coins as he originally had one-rupee notes. Total was also reduced by two-third. Thus, he spent ...

(a) Rs. 10.20 (b) Rs. 9.30 (c) Rs. 9.60 (d) Rs. 4.28

Test 3 - CAT

Note: All questions carry 3 marks each. Each wrong answer will attract a penalty of 1 mark.

Number of questions: 30 **Time: 70 mins**

Quantitative Ability & Data Interpretation

1. What is the last digit of $22^{33^{44}}$?

(a) 0 (b) 2 (c) 4 (d) 6

2. If all the roots of the equation $x^4 - 4x^3 + ax^2 + bx + 1 = 0$ are positive, then find the value of
`a' and `b', where x, a and b are real numbers.

(a) 4 and 6 (b) 6 and -4 (c) $\frac{1}{2}$ and $\frac{7}{2}$ (d) $\frac{7}{2}$ and $-\frac{1}{2}$

3. If the 2nd term of a geometric progression is 6 and the 5th term is 48, then what is the 10th term?

(a) 2236 (b) 1246 (c) 1536 (d) 2146

4. A solution contains 20 L of pure milk. 20% of this is taken out. Another 20% of the remaining solution is taken out and finally 20% of the contents left is taken out. The total content taken out is replaced with water. Find the ratio of milk to water in the final solution.

(a) 1 : 5 (b) 12 : 38 (c) 488 : 512 (d) 512 : 488

5. A five letters word having distinct alphabets is formed using the five alphabets `C', `O', `I', `W' and `T'. All such possible five letters words are written in an alphabetical order from CIOTW to WTOIC.
What will be the 60th word written?

(a) OTWIC (b) OTCIW (c) OIWTC (d) OCTIW

6. The four vertices of a square lying in the X-Y plane are equidistant from the point (1,2). If one of the vertices is (3,4) then which of the following represents the area (in sq. units) of the square?

(a) 8 (b) 4 (c) 32 (d) 16

Directions for questions 7 to 9: Answer the questions on the basis of the information given below.

Beyond the cheque-post				
	Net profit (Rs. in crore)		Percentage of profits disbursed as dividend	
	1997-98	1998-99	1997-98	1998-99
L & T	471	531	35	45
IDBI	259	501	45	45
Tata Steel	282	322	40	40
M & M	229	251	55	55
Apollo Tyres	31	41	40	40
Colgate	46	42.5	30	30
Indian Hotels	129	138	85	85
Hoechst Marion	20	37.5	45	40
EIH	96	123	50	50
Bajaj Electricals	6	7	38	30
Torrent Pharma	36	40	60	50
George Williamson	25	28	60	75

7. Which company disbursed the highest dividend in 1997-98?

(a) Bajaj Electrical (b) L & T (c) IDBI (d) M & M

8. What is the percentage increase in net profits of M & M in 1998-99?

(a) 9.6% (b) 9.1% (c) 8.8% (d) 9.9%

9. Which company showed the second highest percentage increase in profits in 1998-99?

(a) IDBI (b) Hoechst Marion (c) Apollo Tyres (d) L & T

10. If $X = \{4^n - 3n - 1 : n \in N\}$ and $Y = \{9(n - 1) : n \in N\}$, then

(a) $X \subseteq Y$ (b) $X \subset Y$ (c) $Y \subseteq X$ (d) $Y \subset X$

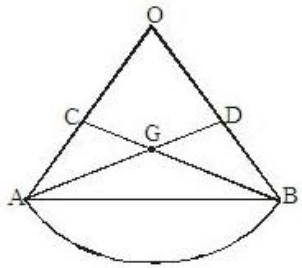
11. Let $\{a_n\}$ be a unique sequence of positive numbers satisfying the following properties:

$a_1 = 64800 = 30a_2$ and $a_n \times a_{n+1} = a_{n-1}$

Which of the following numbers is a perfect square?

(a) $36a_3$ (b) $\frac{50}{a_7}$ (c) $12a_4$ (d) $5a_2$

12. In the following figure, arc AB is a quadrant of the circle with center at point O and radius 4 units. Further, OC = OD, OC:OA = 3:4.



What is the area (in square units) of the ΔAGC?

(a) $\frac{2}{3}$ (b) $\frac{7}{8}$ (c) $\frac{3}{2}$ (d) $\frac{6}{7}$

13. A shopkeeper planned to sell 100 shirts each priced at Rs.1020 in a particular year. Each shirt, if it had been sold at the mentioned price would have possibly earned him a 20% profit. However, 50 out of these 100 shirts were sold at a discount of Rs.100 on each shirt during the festival season. Find the maximum possible number of shirts one could

have bought during the festival season with an amount that is same as the profit earned by the shopkeeper in the entire year.

(a) 10 (b) 11 (c) 12 (d) 13

14. Heera deposited Rs. 1,000 at the start of year 2002 in a bank offering interest of 10% compounded
annually. However, she used to withdraw a fixed amount at the end of every year. When she withdrew that fixed amount at the end of 2004, she discovered that no money is left in her deposit. Find that fixed amount.

(a) Rs. 364.61 (b) Rs. 402.11 (c) Rs. 430.25 (d) Rs. 492.95

Directions for questions 15 to 17: Answer the questions on the basis of the information given below.

People of all ages enjoy visiting a zoo, especially children (people below the age of 15). On a Sunday, many people visited the zoo. All of them came as a family of two people or more than two people, where there was at least one child per family. The entry details of some families, as recorded by the zoo's ticketing system is given below. The age of any person is taken as the integral number of years he/she has lived so far.

Family	Age of the eldest member (yrs)	Age of the youngest member (yrs)	Average age of all the children (yrs)
Datta family	50	8	10.4
Rathi family	19	4	11.5
Gupta family	15	6	12.3

15. Gupta family came with 25 people out of which 20 were children. What is the average age of members of Gupta family?

(a) 21.25 years (b) 13.04 years (c) 12.84 years (d) 11.65 years

16. What is the minimum possible number of people of Rathi family who visited the zoo?

(a) 4 (b) 5 (c) 6 (d) 3

17. If the average age of members of Datta family visiting the zoo is 14 years, then what is the least number of members in Datta family?

(a) 7 (b) 8 (c) 11 (d) 10

18. The number of factors common to 30^{11} and 20^{13} is

(a) 144 (b) 169 (c) 156 (d) 168

19. If $15x + 20y = 375$, then find the minimum possible value of $\sqrt{x^2 + y^2}$, where x and y are natural numbers.

(a) 17 (b) 14 (c) 16 (d) 15

Directions for question 20: Following question is followed by two statements, I and II. Answer each question using the following instructions:

Mark:

(a) if the question can be answered by using either of the statements alone.

(b) if the question can be answered by using one of the statements alone but not by using the other
statement alone.

(c) if the question can be answered by using both the statements together, but cannot be answered
by using either statement alone.

(d) if the question cannot be answered even by using both the statements together.

20. There are `n' distinct balls in a box. What is the value of `n'? $(n \neq 1)$

I. The number of ways of choosing 2 balls from the box is equal to the number of balls.

II. The total number of ways of choosing at least one ball from the box is 15.

21. A ladder, 65 ft long, is leaning against a straight wall. Its lower end is 25 ft away from the bottom of the wall. How much farther away will it be from the bottom of the wall if the upper end is moved down along the wall by 8 ft?

(a) 8 ft (b) 10 ft (c) 14 ft (d) 52 ft

22. Dexter and Deedee started biking at 4:00 am and 6:00 am respectively from the opposite ends on a highway 240 km long. On the way, Dexter's bike got punctured and it took him 2 hours to mend his vehicle. Deedee also faced an engine malfunction at some point on the way because of which her bike slowed down to 50% of her initial speed for the remaining part of the journey. They finally met each other at 10:00 am. If Deedee's initial speed was 28 kmph and her speed reduces after integer number of hours, which of the following could not be the speed of Dexter's?

(a) 30 kmph (b) 35.5 kmph (c) 39 kmph (d) 42.5 kmph

23. Find the equation of circle passing through the points of intersection of $x^2 + y^2 - 2x + 4y = 0$ and
$x^2 + y^2 - 2x + 3 = 0$ and passing through the point (1, 2).

(a) $17x^2 + 17y^2 - 24x + 14y - 33 = 0$ (b) $17x^2 + 17y^2 - 34x - 14y + 33 = 0$

(c) $5x^2 + 5y^2 - 10x - 24y + 33 = 0$ (d) $17x^2 + 17y^2 - 24x + 24y - 33 = 0$

24. 1388 , 3309 and 7151 were divided by a certain three digit number. The remainders in all the three cases was found to be the same. What was the remainder?

(a) 17 (b) 32 (c) 113 (d) 11

25. Let x, y be two independent variables and $f(x)=a\sqrt{x}$, where `a' is a non-zero constant. If f(x), f(y) and f(x + y) indicate the sides of a triangle, then the area (in sq. units) of the triangle is

(a) $=\frac{a}{2}f(xy)$ (b) $\frac{a^2}{2}f\left(x^2+y^2\right)$ (c) $\frac{a^2}{2}f\left(x^2+y^2-xy\right)$ (d) $\frac{a^2}{2}f(xy)$

26. A solid right circular cone having slant height L and radius r is cut from the vertex along the height h (from top to bottom) in two identical pieces. What is the ratio of the total surface area of any such piece to the total surface area of the original cone?

(a) $\frac{h}{\pi r+\pi L}$ (b) $\frac{1}{2}\left[1+\frac{h^2}{\pi r^2+\pi rL}\right]$ (c) $\frac{1}{2}+\frac{h}{\pi r+\pi L}$ (d) $\frac{1}{2}+\frac{h^2}{\pi r^2+\pi L^2}$

Directions for questions 27 and 28: Answer the questions on the basis of the information given below.

The following table gives the export figures of wheat, rice, and maize from a particular country FUNLAND for a period of 10 years (1993 - 2002).

Year	Wheat		Rice		Maize	
	'000 kg	Value(in Rs. crore)	'000 kg	Value(in Rs. crore)	'000 kg	Value(in Rs. Lakh)
1993	45666	38.2	89656	57.4	1432	343
1994	49089	39.4	84556	56.8	1266	361
1995	55454	39.6	106766	57.2	1392	372
1996	53343	39.6	138786	59	1255	378
1997	65454	40.5	135565	59.4	1385	392
1998	76636	40.7	152787	59.2	1504	385
1999	88787	40.9	186545	61.1	1596	403
2000	87678	42	183434	61.7	1705	409
2001	90897	43.1	206565	62.6	1835	421
2002	108987	44.6	215656	63.4	1812	438

27. Which of the following years marked the third highest difference between rice and maize exports
(in kgs) from FUNLAND?

25. Let x, y be two independent variables and $f(x)=a\sqrt{x}$, where `a' is a non-zero constant. If f(x), f(y) and f(x + y) indicate the sides of a triangle, then the area (in sq. units) of the triangle is

(a) $=\frac{a}{2}f(xy)$ (b) $\frac{a^2}{2}f(x^2+y^2)$ (c) $\frac{a^2}{2}f(x^2+y^2-xy)$ (d) $\frac{a^2}{2}f(xy)$

26. A solid right circular cone having slant height L and radius r is cut from the vertex along the height h (from top to bottom) in two identical pieces. What is the ratio of the total surface area of any such piece to the total surface area of the original cone?

(a) $\frac{h}{\pi r+\pi L}$ (b) $\frac{1}{2}\left[1+\frac{h^2}{\pi r^2+\pi rL}\right]$ (c) $\frac{1}{2}+\frac{h}{\pi r+\pi L}$ (d) $\frac{1}{2}+\frac{h^2}{\pi r^2+\pi L^2}$

Directions for questions 27 and 28: Answer the questions on the basis of the information given below.

The following table gives the export figures of wheat, rice, and maize from a particular country FUNLAND for a period of 10 years (1993 - 2002).

Year	Wheat		Rice		Maize	
	'000 kg	Value(in Rs. crore)	'000 kg	Value(in Rs. crore)	'000 kg	Value(in Rs. Lakh)
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2001	90897	43.1	206565	62.6	1835	421
2002	108987	44.6	215656	63.4	1812	438

27. Which of the following years marked the third highest difference between rice and maize exports
(in kgs) from FUNLAND?

(a) 2001 (b) 2000 (c) 1999 (d) 1998

28. What is the approximate average export price of rice over the given period in FUNLAND?

(a) Rs 400/tone (b) Rs 4/kg (c) Rs 40/kg (d) Rs 400/kg

29. In a test comprising 100 questions, four marks are awarded for every question answered correctly. The number of marks deducted for every question answered wrongly and for every question left unattempted is 2 and 1 respectively. If a student got 64 marks in the test, then which of the following can be the number of questions solved wrongly by the student?

(a) 12 (b) 25 (c) 44 (d) 56

30. From a point X, on the surface of a sphere of radius 3 cm, two ants "Chinti" and "Pinti" started moving along two different circular paths, each having the maximum possible radius, on the surface of the sphere, that lie in two different planes which are inclined at an angle of 45° to each other. If Chinti and Pinti take 18 sec and 6 sec respectively to complete one revolution along their respective circular paths, then after how much time will they meet again after they start from X?

(a) 27 seconds (b) 18 seconds (c) 9 seconds (d) Never

Test 4 - CAT

Note: All questions carry 3 marks each. Each wrong answer will attract a penalty of 1 mark.

Number of questions: 30 **Time: 70 mins**

Quantitative Ability & Data Interpretation

1. Let $\{V_n\}$ be a sequence such that $V_1 = 2$, $V_2 = 1$ and $2\times V_n - 3\times V_{n-1} + V_{n-2} = 0$ for $n > 2$, then find the value of V_9.

(a) $\frac{1}{128}$ (b) $\frac{1}{256}$ (c) $\frac{1}{64}$ (d) $\frac{1}{32}$

2. Find the range of values of `x that satisfies the inequality $\log(x^2 - 5x + 7) < 0$.

(a) $-2 < x < 3$ (b) $-3 < x < -2$ (c) $-3 < x < 2$ (d) $2 < x < 3$

3. In a dance academy, there are 60 students learning the bharatnatyam dance, 50 students learning the classical dance and 65 students learning the disco dance. 18 students are learning both the bharatnatyam and the classical dance. 20 students are learning both the disco and the bharatnatyam dance. 27 students are learning both the disco and the classical dance. All the students are learning at least one of the three dances. What is the maximum number of students that could be learning all the three dances?

(a) 15 (b) 18 (c) 20 (d) 22

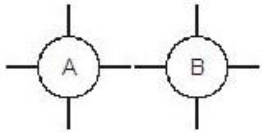
4. A cylinder is inscribed inside a cone having base radius 21 cm and height 21 cm. Find the maximum possible volume of the cylinder.

(a) 4312 cm^3 (b) 2156 cm^3 (c) 3638.25 cm^3 (d) 3802.80 cm^3

5. In a 100 m straight tunnel AB made on a river, boat X enters from end A and boat Y enters from the opposite end B at the same time. There is a safety point O inside the tunnel at which boat Y should reach before boat X to avoid collision. The speed of boat X, boat Y and the stream is 60 m/s,
30 m/s and 10 m/s respectively. Find the minimum possible distance OA.

(a) 77.78 m (b) 63.79 m (c) 52.48 m (d) 55.56 m

6. There are two circular tables A and B placed side by side. Each of them has 4 chairs as marked below. From a set of 8 people, how many distinct ways of seating 4 on each table is possible?



(a) ${}^8C_4 \times 4! \times 4!$ (b) ${}^8C_4 \times 3! \times 3!$ (c) $4! \times 4!$ (d) $3! \times 3!$

Directions for questions 7 and 8: Answer the questions on the basis of the information given below.

The following table provides information about twenty Presidents of United States of America. They belong to one out of the three different parties namely Democrat (d), Whig (W), and Republic (R). The table also provides information about the tenure of their Presidentship and the state which they belong to. The dates in the "Duration of Service" should be read as Year - Month - Date. For example, 1841 - 04 - 06 should be read as 6th of April in the year 1841.

S.No.	Persons	Party	Duration of Service (Both Inclusive)	State
1	John Tyler	W	1841-04-06 to 1845-03-03	Virginia
2	James K. Polk	D	1845-03-04 to 1849-08-01	Tennessee
3	Zachary Taylor	W	1849-08-02 to 1850-07-09	Louisiana
4	Millard Fillmore	W	1850-07-10 to 1853-11-03	New York
5	Franklin Pierce	D	1853-11-04 to 1857-03-03	New Hampshire
6	James Buchanan	D	1857-03-04 to 1861-09-03	Pennsylvania
7	Abraham Lincoln	R	1861-09-04 to 1865-04-15	Illinois
8	Andrew Johnson	R	1865-04-16 to 1869-03-03	Tennessee
9	Ulysses S. Grant	R	1869-03-04 to 1877-12-30	Illinois
10	Rutherford B. Hayes	R	1877-12-31 to 1881-03-03	Ohio
11	James Garfield	R	1881-03-04 to 1881-09-19	Ohio
12	Chester A. Arthur	R	1881-09-20 to 1886-03-03	New York
13	Grover Cleveland	D	1886-03-04 to 1889-03-03	New York
14	Benjamin Harrison	R	1889-03-04 to 1893-03-03	Indiana
15	Grover Cleveland	D	1893-03-04 to 1898-03-03	New York
16	William McKinley	R	1898-03-04 to 1901-09-13	Ohio
17	Theodore Roosevelt	R	1901-09-14 to 1909-03-03	New York
18	William Howard Taft	R	1909-03-04 to 1913-03-03	Ohio
19	Woodrow Wilson	D	1913-03-04 to 1921-03-03	New Jersey
20	Warren G. Harding	R	1921-03-04 to 1927-03-09	Ohio

7. How many of these persons belonged to the Republic party and were the President of United States of America for a tenure ranging from 2 to 5 years?

(a) Five (b) Six (c) Seven (d) Eight

8. A group out of these presidents is formed in which, for every person in the group there is at least one more person in the group who belonged to the same party and the same state as him/her. The number of Presidents in this group cannot exceed

(a) 9 (b) 11 (c) 10 (d) 12

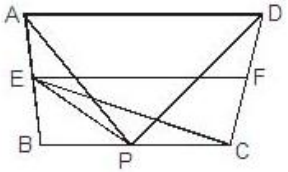
9. A five-digit number is formed using the digits 1, 3, 5, 7 and 9 without repetition. What is the sum of all such possible numbers?

(a) 6666600 (b) 6666660 (c) 6666666 (d) None of these

10. If, $2f\left(\frac{x}{1-x}\right)+f\left(\frac{1}{x-1}\right)=\frac{3}{x-1}$ find the value of f(- 1). [`x' assumes all real values except 1.]

(a) 1 (b) - 1 (c) 2 (d) - 2

11. In the figure given below, P and E are the mid-points of sides BC and AB respectively. AD, BC and EF are parallel to each other. If the area of DABP is 4 sq. units, then find the area of DECP.



(a) 2 sq. units (b) 3 sq. units (c) $\frac{3}{2}$ sq. units (d) 1 sq. unit

12. Three beakers - A, B and C - each contain 100 ml of milk-water solution. The ratio of milk to water in the beakers A, B and C is 1 : 3, 1 : 4 and 2 : 3 respectively. 40 ml of solution is transferred from beaker A to beaker C and then 28 ml of solution is transferred from beaker C to beaker B. Find the final ratio of milk in the beakers A, B and C.

(a) 3 : 6 : 8 (b) 6 : 15 : 20 (c) 15 : 28 : 42 (d) None of these.

13. When `A' and `B' are working alone, they can complete a piece of work in 25 days and 30 days respectively. On day 1, `B' started the work and `A' joined `B' from day 3 onwards. Find after how many days will the work be completed?

(a) 13 (b) 14 (c) 15 (d) 16

Directions for question 14: Following question is followed by two statements, I and II. Answer each question using the following instructions:

Mark (a) if the question can be answered by using one of the statements alone but not by using the other statement alone.

Mark (b) if the question can be answered by using either of the statements alone.

Mark (c) if the question can be answered by using both the statements together but not by either of the statements alone.

Mark (d) if the question cannot be answered on the basis of the two statements.

14. Is $b^2 + 2ab - 48a^2 > 0$?

I: $ax^2 + bx + 4a > 0$, for every real x.

II: $2ax^2 + (\sqrt{4b})x + 3 = 0$ for only one real x.

15. Delhi Metro carries passengers on three different lines i.e. Green, Pink and White. A train runs on only one of the three lines. On a particular day the number of passengers carried on Green line was 517, on Pink line was 799 and on White line was 1128. The price of the ticket on White line is
Rs 8/- per person, on Pink line is Rs 12/- per person and on Green line is Rs 14/- per person. If the number of passengers carried by each train was the same, then what could be the maximum average revenue per train for Delhi Metro on that day?

(a) Rs.497.10 (b) Rs.550.00 (c) Rs.623.70 (d) Rs.587.30

16. Two numbers have 36 factors each and HCF of these two numbers is 36. What is the minimum possible LCM of these two numbers if the power of any prime factor in these two numbers is not more than 3?

(a) $2^3 \times 3^3 \times 5^2 \times 7$ (b) $2^2 \times 3^2 \times 5^3 \times 7^3$

(c) $2^3 \times 3^3 \times 5^2 \times 7^2$ (d) $2^3 \times 3^2 \times 5^3 \times 7^2$

17. What is the minimum possible positive value of a constant `a' for which the system of equations $3ax + y = 2$ and $2ax^2 + y^2 = 1$ has a real solution?

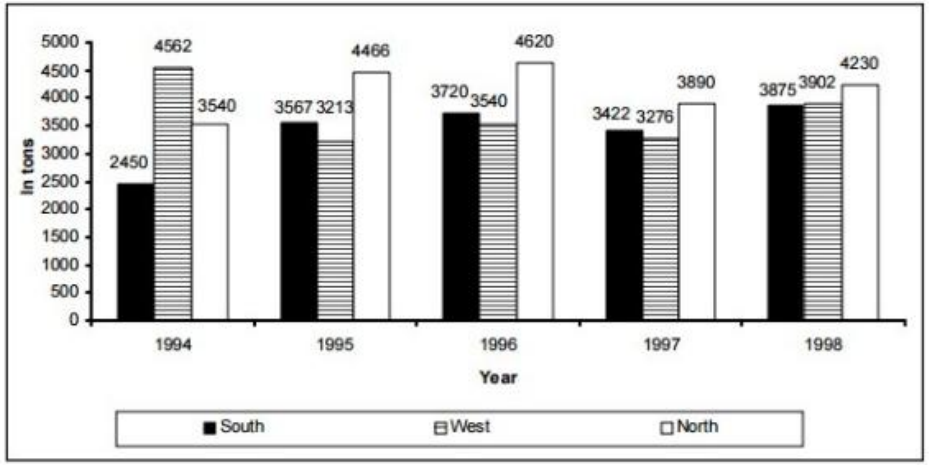
(a) $\frac{3}{5}$ (b) $\frac{4}{5}$ (c) $\frac{2}{5}$ (d) $\frac{2}{3}$

18. Triangle ABC has vertices at points A (0, 0), B (8, 0) and C (0, 6). P and Q are midpoints of sides
AB and AC respectively. On side BC, points S and R are chosen such that PS is parallel to QR. If the length of the line segments CR and BS are integers, then which of the following is a possible value of the ratio $\frac{\text{area}(\Delta PBR)}{\text{area}(\Delta CSQ)}$?

(a) 8 : 7 (b) 7 : 6 (c) 6 : 5 (d) 5 : 4

Directions for questions 19 to 21: Answer the questions on the basis of the information given below.

The following bar graph shows the production of food grains in the three grain-producing regions of Maharashtra for the period 1994 to 1998.



Note: These are the only grain producing regions of Maharashtra.

19. What is the percentage contribution of the south region to the total amount of grain produced in the state in 1995?

(a) 31.3% (b) 31.7% (c) 32.3% (d) 23.21%

20. Which region and in which year has shown maximum percentage increase in production as compared to the previous year?

(a) West, 1996 (b) South, 1995 (c) West, 1998 (d) North, 1997

21. What is the ratio of the total grain production in South region to the total grain production in North region in the given period?

(a) 1 : 1.1 (b) 1 : 1.2 (c) 1 : 1.5 (d) 1 : 1.6

22. If $a^2b^3c = \frac{256}{27}$, then find the minimum value of (a + b + c), where a, b and c are positive real numbers.

(a) 3 (b) 4 (c) 6 (d) 9

23. There is a circle inscribed in a square, a square inscribed in that circle, again a circle inscribed in that square and so on. If all the squares are labelled S_1, S_2, S_3, ... in the decreasing order of size, and if the side of S_1 is `x' units long, then what is the length of the side of S_{35}?

(a) $\frac{x}{2^{17}}$ (b) $\frac{x}{35}$ (c) $\frac{x}{2^{17}\sqrt{2}}$ (d) $\frac{x}{2^{18}}$

24. A person closes his account in an investment scheme by withdrawing Rs. 10,000. One year ago he had withdrawn Rs. 6,000. Two years ago he had withdrawn Rs. 5,000. Three years ago he had not withdrawn any money. How much money had he deposited approximately at the time of opening the account 4 years ago, if the compound interest is 10% when compounded annually?

(a) Rs. 15,470 (b) Rs. 16,500 (c) Rs. 17,280 (d) None of these

25. A function `f' is defined for positive integer values

$$f_n(x) = f_{n-1}(x) + \frac{1}{(x+n-1)\times(x+n)} \text{ ('n' is a natural number)}$$

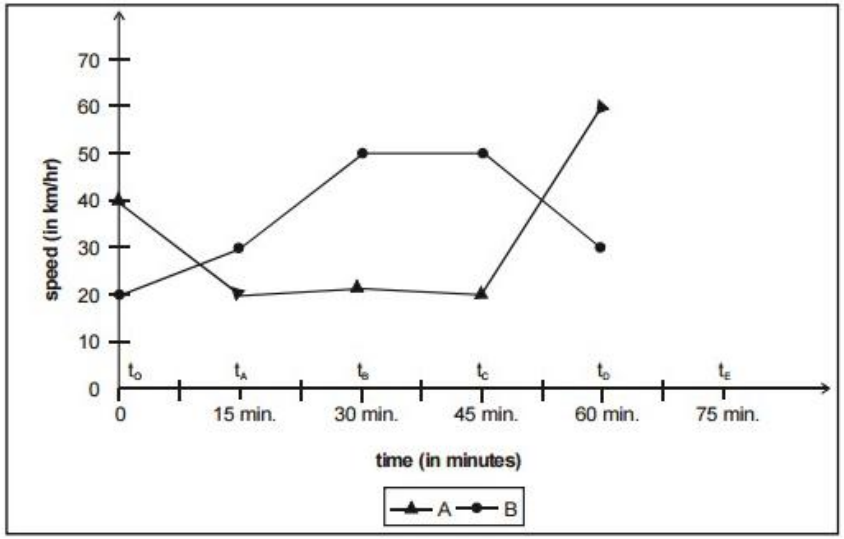
$$= \frac{1}{x+10} \text{ for } n = 0$$

What is the value of $f_4(1) - f_2(1)$?

(a) 10 (b) $\frac{1}{10}$ (c) 1 (d) $\frac{2}{15}$

Directions for questions 26 to 28: Answer the questions on the basis of the information given below.

Study the speed-time graph of two cars A & B and answer the questions that follow.



26. In the time interval t_C to t_D, the difference in the distances covered by A & B is:

(a) 2.5 km, A covering more than B (b) 0 km

(c) 1.25 km, B covering more than A (d) 2.5 km, B covering more than A.

27. What is the average speed of B between time interval t_A & t_C?

(a) 90 km/hr (b) 100 km/hr (c) 45 km/hr (d) 80 km/hr

28. Suppose A and B had equal speeds at t_x and t_y minutes after t_o and before ($t_x < t_y$).The ratios of their common speeds at t_x and at t_y, expressed as a percentage of the average speed of B in the interval t_o to t_D are:

(a) 93% & 140% (b) 80% & 130% (c) 80% & 140% (d) 67% & 108%

29. In the linear equation $\left(1+\frac{1}{a}\right)x+\left(1-\frac{1}{a}\right)y=a$ where, `x' and `y' are real numbers, the unknown constant `a' is a natural number such that $2 \le a \le 100$. For how many even values of `a', the equation will have exactly one positive integral solution?

(a) 50 (b) 45 (c) 35 (d) 30

30. In a rectangle ABCD, points E and F are midpoints of the sides AD and BC respectively. A vertical tower GT stands at a point G on the line EF such that $\angle ATD = 90^\circ$ and $\angle BTC = 60^\circ$. If AB = 20m and AD = 8m, then find the ratio $\frac{EG}{FG}$.

(a) $\frac{25}{27}$ (b) $\frac{26}{27}$ (c) $\frac{23}{25}$ (d) $\frac{23}{27}$

Test 5 - SNAP

Note: All questions carry 1 mark each. Each wrong answer will attract a penalty of 0.25 mark.

Number of questions: 70 **Time: 60 mins**

Section I: Quantitative Ability & Data Interpretation & Data Sufficiency

1. Two prime numbers - P_1 and P_2 ($P_1 < P_2$) are called twin primes if they differ by 2. (e.g. 11, 13 or 41, 43 etc.) If P_1 and P_2 are twin primes with $P_2 > 23$, then which of the following numbers would always divide $P_1 + P_2$?

(a) 12 (b) 8 (c) 24 (d) None of these

2. Out of a group of swans, seven times half of the square root of the number of swans were seen going away from the bank of a river and only one pair remained in the water. How many swans were there in the group?

(a) 9 (b) 16 (c) 25 (d) 36

3. Find the missing term in the given series: 16, 23, 28, 38, ? ,62, 70

(a) 52 (b) 49 (c) 48 (d) 50

4. Find the approximate value of the expression S, where

$S = (2.22)^2 + (3.33)^2 + (4.44)^2 + 52(1.11)^2$

(a) 100 (b) 121 (c) 98.98 (d) 64

5. The least common multiple of two natural numbers x and y is 399. What is the minimum possible sum of the digits of the number x (given x > y)?

(a) 3 (b) 7 (c) 1 (d) None of these

6. In an equilateral triangle ABC, a perpendicular is drawn from the orthocentre O meeting the side
BC at D such that OD = 4 cm. What is the area of the triangle ABC?

(a) $24\sqrt{3}$ cm^2 (b) $48\sqrt{3}$ cm^2 (c) 24 cm^2 (d) $12\sqrt{3}$ cm^2

7. A, B and C are the angles of a ΔABC and if A = 4B, then

(a) B is always less than 45°

(b) B is always less than 30°

(c) B is always less than 36°

(d) None of the above is necessarily correct

8. A rectangular reservoir of 1000 m^3 capacity has length and height equal to 5 m and 20 m respectively. If 200 m^3 of water is taken out of the reservoir, find the drop in the level of water (in meters) in the reservoir.

(a) 8 m (b) 4 m (c) 2 m (d) 1 m

9. A box contains 4 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. One ball is selected and it is found to be blue. What is the probability that it is the smallest blue ball?

(a) $\frac{1}{16}$ (b) $\frac{2}{11}$ (c) $\frac{2}{9}$ (d) $\frac{1}{5}$

10. 50 litres of a cocktail of `vodka' and `lime cordial' contains 32 litres of vodka. In the first round, 10 litres of the cocktail is taken out and is replaced by water. In the second round, 20 litres of cocktail is taken out and is replaced by lime cordial. The percentage of vodka in the final concoctions is

(a) 17.28% (b) 20.56% (c) 28.8% (d) 30.72%

11. A can is full of paint out of which 5 L is removed and it is substituted by a thinning liquid. The process is repeated once more. Now the ratio of volume of paint to the volume of thinning liquid is 49 : 15. What is the capacity of the can?

(a) 20 L (b) 60 L (c) 40 L (d) 50 L

12. A dealer offers a cash discount of 20% and he further allows 16 articles to a dozen to a particularly sticky bargainer and still makes a profit of 20%. How much percentage above the cost price were his wares listed?

(a) 100% (b) 80% (c) 75% (d) $66\frac{2}{3}\%$

13. The cost price of 16 apples is equal to the selling price of 10 apples. The cost price of 12 oranges is equal to the selling price of 16 oranges and the cost price of 6 mangoes is equal to the selling price of 4 mangoes. If the ratio of the cost price of 1 apple, 1 orange and 1 mango is
1 : 1 : 2 respectively, then find the net profit percent on the sale of 1 apple, 2 oranges and 2 mangoes.

(a) 25% (b) 30% (c) 35% (d) 40%

14. `A' finishes a work in a certain number of days. He got two assistants who work $\frac{3}{4}$ times as fast as him. If all the three work together, then in what fraction of time would they finish the job as compared to A working alone?

(a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{2}{3}$ (d) $\frac{2}{5}$

15. A does a work in 90 days, B in 40 days and C in 12 days. They work one after another for a day each, starting with A followed by B and then by C. If the total wages received is Rs. 360 and
A, B and C share it in the ratio of the work done, find their respective individual wages.

(a) Rs. 40, Rs. 60 and Rs. 260 (b) Rs. 36, Rs. 81 and Rs. 243

(c) Rs. 42, Rs. 86 and Rs. 232 (d) None of these

16. A person saves Rs. 200 more each year than in the previous year. If he started with Rs. 400 in the first year, then how many years would he take to save Rs. 18,000 (excluding interest)?

(a) 10 years (b) 12 years (c) 15 years (d) None of these

17. A man invests a principal in a simple interest based scheme, such that the rate of interest increases in a geometric progression every year with the common ratio 2. If the amount becomes four times in 4 years, then in how many years will it become 52 times?

(a) 5 years (b) 8 years (c) 13 years (d) None of these

18. A train without stopping travels at an average speed of 60 km/hr and with stoppages at an average speed of 40 km/hr. What is the total time taken by the train for stoppages on a route of length 300 km?

(a) 10 hrs (b) 20 hrs (c) 5 hrs (d) 2.5 hrs

19. There are 6 students in a class. The ages (in years) of exactly three students are prime numbers and the ages (in years) of the other three students are even numbers. If the ages (in years) of all the

6 students in the class are in an arithmetic progression, then what is the average age (in years) of the students in the class?

(a) 5.5 (b) 6 (c) 4.5 (d) Cannot be determined

20. An outgoing batch of students want to gift a PA system worth Rs. 4,200 to their school. If the teachers offer to pay 50% more than the students, and an external benefactor gives three times the teachers' contribution, then how much should the teachers donate?

(a) Rs. 600 (b) Rs. 840 (c) Rs. 900 (d) Rs. 1,200

21. The cost price of an item increases by 10% first, then by 10% and finally again by10%. If the last 10% increase is equivalent to an increase of Rs. 121, what was the first 10% equivalent to?

(a) Rs. 100 (b) Rs. 110 (c) Rs. 13.31 (d) None of these

22. Find the range of values of x that satisfies the inequality $x^2 - 7x + 12 \le 0$.

(a) $3 \le x \le 4$ (b) $-3 \le x \le 4$ (c) $-4 \le x \le -3$ (d) $-4 \le x \le 3$

23. If (x - y + z):(y - z + 2w):(2x + z - w) = 2 : 3 : 5, then find the value of S, where S is (3x + 3z - 2w):w.

(a) 7 : 1 (b) 6 : 1 (c) 13 : 2 (d) None of these

24. What is the total number of ways in which Robert can distribute 9 distinct chocolates among his
8 sons such that each son gets at least one chocolate?

(a) 72 × 8! (b) 36 × 8! (c) 144 × 8! (d) 9!

25. In a sample of 2000 people, 1650 people said that they prefer Greg and only 1075 people said that they prefer Saurav. What is the minimum possible number of people who preferred both of them?

(a) 350 (b) 725 (c) 925 (d) Cannot be determined

26. Ajay was born between October 6th and 10th (6th and 10th excluding). His year of birth is also known. What is the probability of Ajay being born on a Saturday?

(a) 0 or $\frac{1}{3}$ (b) $\frac{1}{7}$ or $\frac{3}{7}$ (c) $\frac{1}{3}$ or $\frac{1}{7}$ (d) Cannot be determined

Directions for questions 27 to 32: Answer the questions on the basis of the information given below.

Each question is followed by two statements I and II.

Mark your answers:

(a) If one of the statement alone is sufficient to answer the question but the other statement alone is not sufficient.

(b) If either of the statement I or statement II is sufficient to answer the question.

(c) If both statements together are required to answer the question.

(d) If the question cannot be answered even by using both the statements together.

27. How many people read English newspapers assuming that only English and Hindi newspapers are read?

I. Number of people reading Hindi newspapers only, is 100.

II. Number of people reading English or Hindi or both newspapers, is 300.

28. What is the area of the triangle ABC?

I. ABC is an isosceles right-angled triangle.

II. The length of the largest side of the triangle ABC is 10 units.

29. Is $x + y > 0$?

I. $x \geq 4$

II. $|y| \leq 3$

30. DPS RK Puram chartered bus is equipped for 60 students to go on a field trip. Vasant Valley School chartered bus is equipped for 80 students. How much does each student of Vasant Valley School pay to go on a field trip by the bus?

I. The total amount paid by the students for the field trip was the same for the two given schools.

II. Each student from Vasant Valley paid Rs. 50 less than each student from DPS RK Puram for
the field trip.

31. In quadrilateral ABCD, AB = 5 cm and CD = 3 cm. Find the area of the quadrilateral ABCD.

I. ABCD is a cyclic quadrilateral.

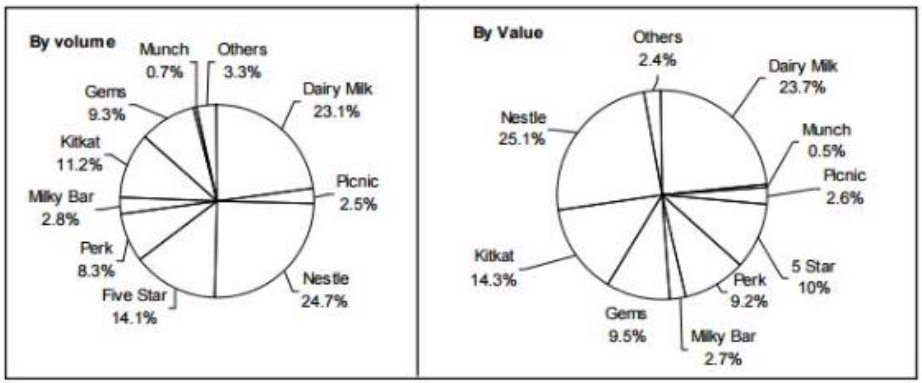
II. AB = BC and CD = AD.

32. Each floor of a three-storey building (including the ground - floor) is occupied and a total of 15 people live in the building. How many people live on the first floor?

I. The number of people living on the ground floor is an odd number.

II. The number of people living on the first floor is twice the number living on the second floor.

Directions for Questions 33 to 36: Answer the questions based on the diagrams which provide information about standing of various brands in chocolate market.



33. Which is the costliest brand (not including `others' category)?

(a) Gems (b) Dairy Milk (c) Kitkat (d) Data insufficient

34. Which of the following brand is priced above average market price?

(a) Munch (b) Milky Bar (c) Perk (d) Five Star

35. The price of Nestle is higher than the average market price by how many rupees?

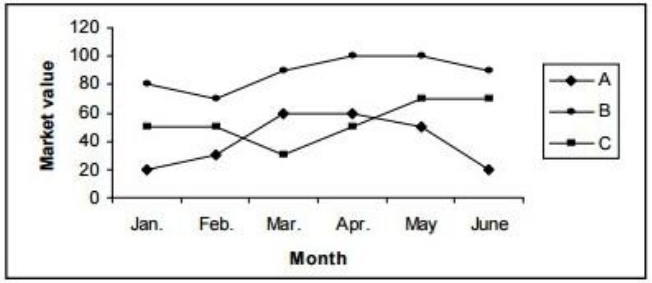
(a) Rs. 1.50 (b) Rs. 2 (c) Rs. 2.50 (d) Data insufficient

36. If Bar-one accounts for 28% by volume of the others category, then the sales of Bar-one is equal to (Assume total markets = 10,000 tons)

(a) 84.8 tons (b) 92,400 kg (c) 9,240 kg (d) 84,800 kg

Directions for questions 37 to 40: Answer the questions based on the data presented in the graph below.

The following graph shows the market value (in terms of preference) of products A, B and C in the first six months of a year.



37. The market value of product C in May is what percent of its value in February?

(a) 120% (b) 140% (c) 160% (d) 105%

38. Which product has shown the maximum percentage increase in its market value in March as compared to the previous month?

(a) A (b) B (c) C (d) Cannot be determined

39. The market value of product B in May increases from its value in February by ____.

(a) 30% (b) 20% (c) 43% (d) 50%

40. How many months have shown the market value of product C above its average market value?

(a) 1 (b) 2 (c) 3 (d) 4

Section II: Analytical & Logical Reasoning

Directions for questions 41 and 42: Answer the questions on the basis of the information given below.

X_1, X_2, X_3, X_4, X_5, and X_6 are 6 persons, of which only two persons have the same height. Let all persons in each of the triplets (X_1, X_2, X_3); (X_4, X_5, X_6); (X_2, X_3, X_4); (X_5, X_6,X_1); (X_1, X_3 ,X_6) and (X_4, X_2,X_5) be of different heights.

41. The persons with same height can be:

(a) X_1 and X_4 (b) X_2 and X_6 (c) X_3 and X_5 (d) Either (a) or (b) or (c)

42. How many different pairs of the persons are possible which may have the same height?

(a) 1 (b) 2 (c) 3 (d) 4

43.

A	B	C
D	E(5)	F
G	H	I(6)

Given above is a 3 × 3 grid with each unit box filled with natural numbers less than 10. All the nine boxes are filled with distinct natural numbers. If the sum of numbers in each row, each column and each diagonal is 15, then which of the following numbers is filled in box B?

(a) 3 (b) 8 (c) 9 (d) 3 or 9

Directions for questions 44 to 46: Answer the questions on the basis of the information given below.

A group of three persons must be selected from six individuals - Keshto, Omprakash, Sanjiv Kumar, Tuntun, Vijayendra and Wahida - according to the following conditions.

(i) Either Omprakash or Vijyendra must be selected but neither Vijayendra nor Sanjiv Kumar can be selected with Omprakash.

(ii) Either Sanjiv Kumar or Keshto or both must be selected.

44. If Vijayendra is not selected, which pair of individuals must be among those selected?

(a) Omprakash and Wahida (b) Tuntun and Keshto

(c) Tuntun and Omprakash (d) Omprakash and Keshto

45. If Sanjiv Kumar is selected, which of the following individuals must also be among the people selected?

(a) Wahida (b) Vijayendra

(c) Omprakash (d) Tuntun

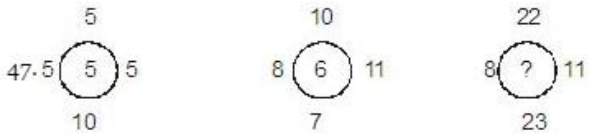
46. Which of the following pairs of persons cannot be two of the three persons that are selected?

(a) Vijayendra and Wahida (b) Omprakash and Wahida

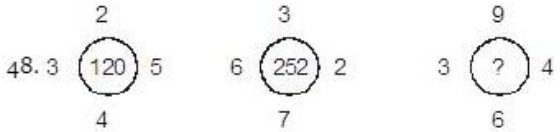
(c) Keshto and Omprakash (d) Tuntun and Wahida

Directions for questions 47 and 48:Answer the questions on the basis of the information given below.

Study the pattern of arrangement of numbers and find out how would you get the number in the middle using the four numbers around it. Hence find out what number would come in the place of `?'.



(a) 1 (b) 8 (c) 3 (d) 7



(a) 728 (b) 621 (c) 684 (d) 648

49. If ENTER is coded as DMSDQ and WELCOME is coded as VDKBNLD, then what will be the code for ENJOYMENT?

(a) DIMNXDLMS (b) DMNIXLDSM (c) DMINXLDMS (d) DMINLXDMS

50. Find the missing term in the following series.

101, 1111, 11211, 112211, ? , 11222211

(a) 1122211 (b) 112211 (c) 1112211 (d) 11222111

Directions for questions 51 to 53: Answer the questions on the basis of the information given below.

A sequence of operations is defined as follows:

Step 1: Let x = y = z = 0.

Step 2: Let $p = x^2 - 2z$.

Step 3: Let x = x + 1.

Step 4: Let z = z + 1.

Step 5: Go to step 2.

We start with step 1 and reach step 5. We follow the algorithm seven times. On seventh occasion we stop at step 5.

51. The final value of p is

(a) 16 (b) 28 (c) 8 (d) 24

52. The seventh value of p exceeds its fourth value by

(a) 16 (b) 27 (c) 15 (d) 21

53. The sum total of all values of p after stage 7 is

(a) 24 (b) 35 (c) 49 (d) 50

54. If PHILANTHROPY is coded as NALIHPYPORHT, then what is the code for the word PLEBISCITE?

(a) BIELPETICS (b) IBELEPTICS (c) SBELPETICI (d) IBELPETICS

55. If TABLE is coded as 40 and CHAIR is coded as 39, then what is the code for DESK?

(a) 49 (b) 39 (c) 29 (d) 59

56. There are five two-dimensional figures drawn one inside the other.

Given below are the few facts:

I. The hexagon is large enough to hold the triangle.

II. The circle is not the outermost figure.

III. Triangle is large enough to hold the square.

IV. The figure immediately inside the pentagon is the hexagon.

V. Triangle is smaller than the circle.

Which is the innermost figure?

(a) Hexagon (b) Circle (c) Triangle (d) Square

57. Consider the facts given below.

I. Sushma finished her graduation five years ago from today.

II. Geeta finished her graduation three years before Sushma and joined the teaching profession the same year in which Sushma entered college.

III. Aarti finished her graduation three years after Sushma.

IV. Geeta taught both Sushma and Aarti during their graduation.

If Geeta is still teaching, for how many years has Geeta been a teacher? (Assume that the duration
of graduation is 3 years)

(a) 3 years (b) 5 years (c) 8 years (d) 10 years

58. Each of A, B, C, D and E went away from their respective home cities in India to one of the five different cities during their holidays. Goa is one of the cities visited which has Sea.

Given below are few facts:

I. B and E cannot afford going to Singapore.

II. A stays at Goa.

III. D and E went to places away from sea.

IV. C loves visiting foreign countries.

Who went to Goa?

(a) A (b) B (c) C (d) D

Directions for questions 59 and 60: Answer the questions on the basis of the information given below.

A family consists of five members A_1, A_2, A_3, A_4 and A_5.

Following is the information regarding these members.

(i) A_5 has a daughter-in-law.

(ii) A_4 offers her prayings after A_2 has gone for a walk.

(iii) A_5 has two sons and an unmarried daughter.

(iv) A_1 is the brother-in-law of the mentioned daughter-in-law.

(v) A_2 and his father give help to A_2's wife A_4.

(vi) Sister of A_2 likes to dance with the wife of A_2.

(vii) A_1 and A_2 go for morning walk everyday.

59. Who is the daughter of A_5?

(a) A_1 (b) A_2 (c) A_3 (d) A_4

60. How is A_5 related to A_2?

(a) Father (b) Brother (c) Father-in-law (d) Sister-in-law

61. Pointing to Ashu, Aru said, ``He is the brother of the father of my father's daughter''. How is Ashu related to Aru?

(a) Father (b) Brother (c) Cousin (d) Uncle

Directions for question 62: In the question given below, there are two or three statements followed by four conclusions numbered I, II, III and IV. You have to take the variance with commonly known facts and then decide which of the given conclusions logically follow (s) from the given statements.

62. **Statements :** Some staplers are rubbers.

Some rubbers are pens.

No rod is a stapler.

Conclusions : I. Some staplers are pens.

II. Some rods are not rubbers.

III. Some rubbers are not rods.

IV. Some staplers are not pens.

(a) Either II or III. (b) III and either I or IV.

(c) III only. (d) Only II.

Directions for question 63: In the question given below there is a statement followed by two assumptions numbered I and II. Consider the statement and decide which of the given assumptions is implicit in it.

Give answer as:

(a) If only assumption I is implicit.

(b) If only assumption II is implicit.

(c) If either I or II is implicit.

(d) If both I and II are implicit.

63. **Statement:** Many historians have done more harm than good by distorting truth.

Assumptions:I. People believe what is reported by the historians.

II. Historians are seldom expected to depict the truth.

64. Although chess has been a popular pastime for the Turks for a very long time and is played on a wide scale at an amateur level, yet participation by the country in prize-money competitions is almost negligible.

Which of the following positions is best supported by the information presented above?

(a) Most prize-money chess competitions are held outside Turkey.

(b) Turks are generally very rich and are not interested in wealth acquisition.

(c) Turks play chess for pleasure and few wish to take up chess as a profession.

(d) Turks do not want to waste money on the entry fees of prize-money chess competitions.

Directions for question 65: Answer the question based on the short paragraphs given below.

65. In times to come, environment will not only become a major area of concern and global pressure, it

will also emerge as an area of good business. We will develop expertise in the areas of efficiency, conservation and environment management in an integrated manner so that we equip ourselves to meet the emerging norms.

Based on the above, which of the following is correct?

(a) In future, environment will become an area of good business due to many opportunities arising out of global pressure and concern, but as we do not yet have an expertise developed in issues related to environment, we will not be able to utilize the business opportunity.

(b) In future, environment will become an area of good business due to the many opportunities arising out of global pressure and concern and an expertise developed in issues related to environment will enable us to utilize the business opportunity.

(c) Global pressure and concern on environment related issues is forcing us to develop expertise in new areas while killing the present business opportunities.

(d) Right now, global pressure and concern on environment related issues is forcing us to develop
expertise in new areas while in the future, environment management in an integrated manner will be good business.

Directions for questions 66 to 69: Four alternative summaries are given below each text. Choose the option that best captures the essence of the text.

66. In Mr Wolfe's fictional university the pleasures of the body take absolute precedence over the life of the mind. Students "hook up" with indiscriminate zeal. Brainless jocks rule the roost, while impoverished nerds are reduced to ghost-writing their essays for them. The university administration is utterly indifferent to anything except the dogmas of political correctness (men and women are forced to share the same bathrooms in the name of gender equality). The Bacchanalia takes place to the soundtrack of hate-fuelled gangsta rap.

(a) Mr. Wolfe's university is marked by the cerebral being dismissed for the politically correct

(b) Mr Wolfe's University is marked by the physical being dominant over the cerebral in addition to the curious attitude of the administration

(c) Mr. Wolfe is creating a University that showcases the prevalent values in the society

(d) Mr. Wolfe's university is an idyllic haven for the rich and the beautiful whereas the intelligent and
the hard working suffer

67. Waller has an academic historian's disdain for the simplifying instincts of popular writers: "Cutting-edge science is usually a messy, difficult and uncertain business." It's only with hindsight that everything seems clear-cut: "Those in the right are then hailed as heroes and their erstwhile rivals damned as bloody-minded egoists." To set the record straight, Waller knocks a few scientific greats off their pedestals and revives the fortunes of some "also-rans". Scientists now scorned for backing the wrong horse often followed impeccable methods.

(a) Waller brings his own perspective to evaluating scientists with the sensitivity to the nature of the profession

(b) Waller brings his perspective to evaluating scientists with complete ignorance of the nature of

their work

(c) Waller qualifies most scientists as being egotists and he maintains this distinction as being
based on the understanding of the nature of the profession

(d) Waller is disdainful of some scientists.

68. No one doubts that there are significant economic forces pushing parents to invest so heavily in their children's outcome from an early age. But taking all the discomfort, disappointment and even the play out of development, especially while increasing pressure for success, turns out to be misguided by just about 180 degrees. With few challenges all their own, kids are unable to forge their creative adaptations to the normal vicissitudes of life. That not only makes them risk-averse, it makes them psychologically fragile, riddled with anxiety. In the process they're robbed of identity, meaning and a sense of accomplishment, to say nothing of a shot at real happiness. Forget, too, about perseverance, not simply a moral virtue but a necessary life skill. These turn out to be the spreading psychic fault lines of 21st-century youth. Whether we want to or not, we're on our way to creating a nation of wimps.

(a) The insecurity of the parents is being passed on to their children leading to a nation of insecure
generations

(b) The pressures of parenthood at a young age has led to many of them oppressing their children
and causing great harm

(c) The social context of the present leads to parents pushing their children in a certain manner with
disastrous implications

(d) Children are now put under so much pressure that their parents also partake in the stress
vicariously

69. College, it seems, is where the fragility factor is now making its greatest mark. It's where intellectual and developmental tracks converge as the emotional training wheels come off. By all accounts, psychological distress is rampant on college campuses. It takes a variety of forms, including anxiety and depression—which are increasingly regarded as two faces of the same coin—binge drinking and substance abuse, self-mutilation and other forms of disconnection. The mental state of students is now so precarious for so many that, says Steven Hyman, provost of Harvard University and former director of the National Institute of Mental Health, "it is interfering with the core mission of the university."

(a) Various symptoms point to the physical pressure the students are subjected to and the consequent result

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(a) Various symptoms point to the physical pressure the students are subjected to and the consequent result

(b) The Universities have now become extremely competitive and in the absence of adequate supervision, they create issues where none exist

(c) Various symptoms point to the deteriorating psychological state of students in Universities

(d) The mental state of students is precariously positioned.

Directions for question 70: Select the set of words that best expresses a relationship similar to the set in capitals.

70. Enemy : Weapons : Army

(a) Earthquake : Tremors : Landslide (b) Disaster : Aid : Refugees

(c) Flood : Sand bags : Water (d) Fire : Water : Firemen

Test 6 - SNAP

Note: All questions carry 1 mark each. Each wrong answer will attract a penalty of 0.25 mark.

Number of questions: 70 **Time: 60 mins**

Section I: Quantitative Ability & Data Interpretation & Data Sufficiency

1. A special educational trip to Germany comprises 25 writers, 20 doctors, 18 dentists and 12 bankers. They spent altogether $ 1330. Five writers spent as much as 4 doctors, 12 doctors spent as much as 9 dentists, and 6 dentists spent as much as 8 bankers. Thus, the doctors spent ...

(a) $ 350 (b) $ 420 (c) $ 210 (d) $ 195

2. Chari prepared a special die where six faces are marked with 1, 2, 3, 4, 5 and 5. There is no 6 on any face. If Chari rolls 3 such dice simultaneously, then what is the chance of getting a sum of 14 on the top face?

(a) More than 25% (b) Between 20% and 25%

(c) Between 10% and 20% (d) Between 5% and 10%

3. What is the wrong term in the series?

1, 1.5, 3, 6, 22.5, 78.75, 315.

(a) 1 (b) 6 (c) 22.5 (d) 315

4. Prahlad takes a cube of 1 metre edge-length, and meticulously cuts smaller cubes, each of edge-length 1mm, from the parent cube. He joins these smaller cubes end-to-end. Thus, the total length of this `cube-rope' will be ...

(a) 100 m (b) 1 km (c) 1,000 km (d) 10 m

5. Complete the series: 0, 6, 24, 60, 120, ?

(a) 210 (b) 120 (c) 180 (d) 150

6. A ship 156 km away from the shore springs a leak which admits 7/3 tons of water in 6.5 min. A pump throws out water at the rate of 15 tons in 1 hour. If 68 tons of water can sink the ship, find the lowest average speed just enough to reach the shore.

(a) 20 kmph (b) 15 kmph (c) 10 kmph (d) 25 kmph

7. Ravi bought some candies at Rs. 50 each, some chocolates at Rs. 40 each, some fruits at Rs. 25 each and some doughnuts at Rs. 10 each. The average price of the items was Rs. 30 per item. Thus, he bought at least ...

(a) 3 candies, 1 chocolate, 3 fruits and 5 doughnuts

(b) 1 candy, 2 chocolates, 2 fruits and 1 doughnuts

(c) 1 candy, 1 chocolate, 1 fruit and 2 doughnuts

(d) 1 candy, 1 chocolate, 2 fruits and 1 doughnut

8. Raghu invests a sum of money with the bank at a certain rate of simple interest. He receives a sum of Rs. 645 at the end of the fourth year and Rs.690 at the end of the fifth year. Find the amount invested by him.

(a) Rs. 465 (b) Rs. 500 (c) Rs. 555 (d) Rs. 180

9. A, B and C invested their money in the ratio 3 : 4 : 5 respectively. The total amount invested by them was Rs. 4,60,000 and the profit earned was 40% of the amount

invested. If they invested for the time period in the ratio 5 : 4 : 3, then what was the profit (in Rs.) received by B?

(a) 56,000 (b) 60,000 (c) 64,000 (d) 68,000

10. The HCF of two numbers is 37 and their sum is 518. What is the difference between numbers, if the difference between them is the minimum possible?

(a) 148 (b) 111 (c) 74 (d) 37

11. Coins are to be put into seven boxes so that each box contains at least one coin. At most 3 of the boxes can contain the same number of coins, and no two other boxes can contain an equal number of coins. What is the least possible number of coins needed?

(a) 13 (b) 14 (c) 17 (d) 18

12. A group of workers was given a job. From the second day onwards, one worker was withdrawn each day. The job was finished when the last worker was withdrawn. If no worker had been withdrawn, the group would have finished the job in two-third of the time. How many workers were there in the group?

(a) 2 (b) 3 (c) 5 (d) 10

13. The graph of the cost of providing school dinner versus the number of children is a straight line not passing through the origin and increases as the number of pupils increases. For 200 students the cost is Rs. 9 each, for 300 students the cost is Rs 8 each. The cost (in Rs.) per student for 600 students will be

(a) 8 (b) 6 (c) 7 (d) 5

14. A man walks from P to Q and cycles from Q to P, a distance of 37.5 km in all spending 2 hours and 40 minutes. He would have taken 2/3 hours less had he chosen to cycle the entire distance of 37.5 km. What would have been the time taken by him if he had chosen to walk both the ways?

(a) 3.5 hours (b) 3.33 hours (c) 3.66 hours (d) 3.75 hours

15. PQR ltd. declares a dividend of 15% on a share of par value Rs. 125. How much money should be invested to get an annual dividend of Rs. 225 given that the share is available at a premium of Rs.115?

(a) Rs. 2,400 (b) Rs. 4,100 (c) Rs. 3,260 (d) Rs. 2,880

16. There are two women participating in a chess tournament. Every participant played two games with every other participant. The number of games played by the men among themselves exceeded the number of games that the men played against the women by 66. How many participants were there in the tournament?

(a) 16 (b) 15 (c) 14 (d) 13

17. A train is travelling at a speed of 72 km/hr. It takes 3 seconds to enter a tunnel and 30 seconds more to pass through it completely. What is the length of the tunnel (in meters)?

(a) 480 (b) 540 (c) 600 (d) 660

18. The sweet seller sells 3/5th part of sweets at a profit of 10% and remaining at a loss of 5%. If the total profit is Rs.1,500, then what is the total cost price of sweets?

(a) Rs.36,500 (b) Rs.37,000 (c) Rs.37,500 (d) None of these

19. If $(p-q)x^2+(q-r)x+(r-p)=0$, then the roots of this quadratic equation are

(a) (p - q) and (r - p) (b) $1 \text{ and } \frac{r-p}{p-q}$ (c) (p - q) and (q - r) (d) None of these

20. If α and β are the roots of equation $ax^2 + bx + c = 0$, then the value of $\frac{1}{a\alpha+b}+\frac{1}{a\beta+b}$ is

(a) $\frac{b}{ac}$ (b) $\frac{a}{bc}$ (c) $\frac{c}{ab}$ (d) None of these

21. The length of a rectangular plot is increased by 25%. To keep its area unchanged, the breadth of the plot should be

(a) reduced by 20% (b) increased by 25% (c) reduced by 25% (d) increased by 20%

22. Two spinning machines A and B together can produce 3,00,000 meters of cloth in 10 hrs. If B alone can produce the same length of cloth in 15 hrs, what length (in meters) of cloth can A produce alone in 10 hrs?

(a) 1,00,000 (b) 2,00,000 (c) 1,50,000 (d) 50,000

23. Tim has finished fencing rd of the area of rectangular garden which is 10 ft wide. When he finishes fencing another 60 sq. ft of the garden, he would have finished th of the area. What is the length of the garden?

(a) 60 ft (b) 72 ft (c) 84 ft (d) 80 ft

24. What is the unit's digit of the number $N = 7^{256} - 3^{256}$?

(a) 1 (b) 4 (c) 0 (d) 7

25. Ram sold an item for Rs.624 and earned a profit of 20%, whereas Shyam sold an item for Rs.1024 and earned a profit of 33.33%. What is the overall selling price of both the items, if the overall profit earned is 25%?

(a) Rs.1,540 (b) Rs.1,610 (c) Rs.1,520 (d) None of these

26. If $\frac{a}{7}=\frac{b}{5}=\frac{c}{9}$, then find the value of $\frac{(ab+bc+ca)}{b^2}$.

(a) $\frac{143}{25}$ (b) $\frac{127}{25}$ (c) $\frac{27}{5}$ (d) $\frac{139}{25}$

27. At simple interest, Rs. 5,000 becomes Rs. 6,000 in four years. Now, if the rate of simple interest is doubled, then in how much time from now will Rs. 6,000 become Rs. 10,000?

(a) 76 months (b) 72 months (c) 84 months (d) 80 months

28. A class with `n' students is organized into four groups keeping the following conditions:

I. Each student belongs to exactly two groups.

II. Each pair of groups has exactly one student in common.

Then,

(a) n = 12 (b) n = 6 (c) n = 8 (d) n = 18

29. `A' is the average of the consecutive natural numbers $a_n, a_{n+1}, a_{n+2}, \ldots, a_m$ and `B' is the average of the consecutive natural numbers $a_1, a_2, a_3 \ldots, a_n, a_{n+1}, a_{n+2}, \ldots, a_m, a_{m+1}, a_{m+2}, \ldots a_{2m}$. Find the difference between A and B.

(a) $\frac{(a_n-a_1)+(a_m-a_{2m})}{2}$ (b) $\frac{(a_1-a_n)+(a_m-a_{2m})}{2}$

(c) $\frac{(a_n-a_m)+(a_1-a_{2m})}{2}$ (d) None of these

30. In how many ways can 8 identical white pawns and 8 identical black pawns be placed on a square mini-chessboard having only 16 small squares, so that no two pawns of the same colour are at adjacent places in either vertical or horizontal direction?

(a) 8! × 8! (b) 2 (c) 1 (d) 4

31. If a, b, c > 0 and d < 0 where a, b, c, d are integers. Given that a + b + c + d = 16, find the maximum possible value of a × b × c × d.

(a) -1 (b) -125 (c) -15 (d) -256

32. Three dogs cost as much as 5 cats, 5 cats cost as much as 10 goats and 16 goats cost as much as 2 horses. If the cost of a horse is Rs. 48, then what is the cost of 5 dogs?

(a) Rs. 50 (b) Rs. 100 (c) Rs. 150 (d) Rs. 200

Directions for questions 33 to 35: Answer the questions on the basis of the information given below.

Widgets are produced by Ghasitaram & Co. in batches of multiples of 1,000 pieces. Widgets being a high in demand item, whatever is produced gets sold immediately leading to zero inventory carrying costs. Due to economies of scale, at higher production levels, the cost of production comes down leading to lower cost price and selling price per unit. This is summarised in the following table.

Production (in unit)	1000	2000	3000	4000	5000	6000
Selling price per unit (Rs.)	225	215	175	160	140	120
Cost price per unit (Rs.)	135	120	118	110	105	95

Profitability = Profit percentage.

33. At what production level will there be maximum profit percentage?

(a) 1,000 (b) 2,000 (c) 6,000 (d) None of these

34. At what production level is the profit (in Rs.) per unit minimum?

(a) 4,000 (b) 5,000 (c) 6,000 (d) Both (b) and (c)

35. If two lots from production of 1,000 and 6,000 are mixed together, what is the approximate profit percentage, if sold at Rs. 175 per unit?

(a) 60% (b) 74% (c) 80% (d) None of these

Directions for questions 36 to 38: Answer the questions on the basis of the information given below.

The following is a student's report card from a two hours management entrance test. For every correct answer she gets 3 marks, but for every wrong answer she loses 1 mark.

Test area	No. of questions	Attempted questions	Wrong answers
I. Reading comprehension (RC)	50	43	13
II. Problem solving (PS)	50	32	06
III. Verbal ability (VA)	50	38	11
IV. Data interpretation (DI)	40	32	09

36. What percentage of the total maximum score did the candidate score?

(a) 49% (b) 45% (c) 50% (d) 66.5%

37. Assuming that the candidate was given an extra half an hour due to the absent-mindedness of the supervisor and that she completed all 190 questions. What should her accuracy rate have been in questions that were attempted in the last half an hour to fetch her at least 70% of the total score after negative marking?

(a) 86.66% (b) 93.33% (c) 90% (d) 96.66%

38. What were the least marks scored by the candidate in any section?

(a) 71 (b) 77 (c) 70 (d) 60

Directions for question 39: Given question is followed by two statements, I and II. Answer the question using the following instructions:

Choose (a) if the question can be answered by one of the statements alone, but cannot be answered by using the other statement alone.

Choose (b) if the question can be answered by using either statement alone.

Choose (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose (d) if the question cannot be answered even by using both the statements together.

39. Who stole the necklace if only one of Raju and Ravi speaks the truth?

I. "Raju stole the necklace. I always speak the truth," says Ravi.

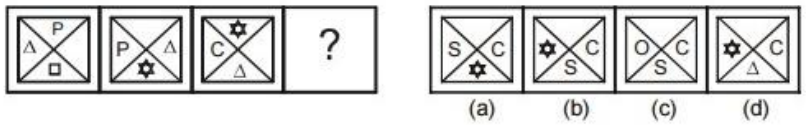
II. "Ravi always speaks the lie," says Raju.

40. Ratio of the cost price of articles `A' to that of `B' is 4:5 and that of their selling price is 7:6. If the profit obtained on selling article A is 40%, then what is the profit/loss percentage obtained on selling article B?

(a) 4% Profit (b) 4% Loss (c) 8% Profit (d) 8% Loss

Section II: Analytical & Logical Reasoning

41. A series of figures has been shown on the left. Find the figure in place of (?) from the figures on the right.



Directions for questions 42 to 44: Answer the questions on the basis of information given below.

A solid cube, painted red on three adjacent sides and black on the other three sides, is cut into 64 smaller cubes of equal size.

42. How many cubes have at least one side painted red ?

(a) 16 (b) 24 (c) 37 (d) 32

43. How many cubes are there which are painted both red and black?

(a) 0 (b) 4 (c) 18 (d) 16

44. How many cubes have all the three sides painted black?

(a) 1 (b) 16 (c) 8 (d) 4

Directions for questions 45 to 47: Answer the questions on the basis of information given below.

In a language test in a school, it is found that 880 people know Tamil, 690 people know Telgu and 675 people know Hindi. The number of people who know Tamil and Hindi were 460, Hindi and Telgu were 345 and Telgu and Tamil were 430. In total 1200 people have taken a test and 190 people know all the three languages.

45. Find out the number of people who don't know any of the three languages?

(a) 50 (b) 32 (c) 0 (d) 190

46. How many people are there who know only Tamil?

(a) 420 (b) 450 (c) 180 (d) 10

47. How many people know two or more languages?

(a) 460 (b) 1045 (c) 1235 (d) 855

Directions for questions 48 to 50: Answer the questions on the basis of information given below.

Farokh, Ganesh, Hariprasad, Ismail and Jon are the five jockeys who participated in a race. They were riding the horses - Lucky, Magic, Naughty, Old-Boy and Power - not necessarily in the same order. The jockeys were given the numbers 401, 402, 403, 404 and 405, where the order is not necessarily the same.

Following things were further observed:

(i) Ganesh completed the race before 403, who in turn crossed the final line before Magic.

(ii) Power stood third in the race, while Jon was the second to complete it.

(iii) Hariprasad was numbered 404 and was not riding Old-Boy.

(vi) Exactly one horse touched the final line between Magic and Lucky.

(v) Ismail, although finished the race after Farokh and was numbered 405, was not the last to finish the race.

48. Who won the race?

(a) Farokh (b) Ganesh (c) Hariprasad (d) Ismail

49. Farokh was certainly not given the number ____.

(a) 401 (b) 402 (c) 403 (d) None of these

50. Which of the following cannot be an acceptable sequence of order of completing the race? (The order is: 1st, 2nd, 3rd, 4th and 5th.)

I. 401, 402, 403, 404 and 405

II. 402, 401, 403, 405 and 404

III. 403, 402, 401, 405 and 404

(a) I and III only (b) II and III only (c) II only (d) I only

Directions for questions 51 and 52: Answer the following questions on the basis of information given below.

51. Mary needs snacks for all of the students going on the field trip. She bought 9 boxes of granola bars containing a total of 88 bars. She wanted variety, so she purchased 3 different flavors. The almond chunky granola bars were packed 8 to a box, the chewy chocolate chip bars came 10 to a box, and the raisin nut package containing 12 per box. She bought the most boxes of almond chunky but had the most raisin nut bars. How many boxes of each flavor did she buy?

(a) 2 box - almond chunky
4 box - chewy chocolate chip
3 box - raisin nut granola bar

(b) 4 box - almond chunky
3 box - chewy chocolate chip
2 box - raisin nut granola bar

(c) 3 box - almond chunky
2 box - chewy chocolate chip
4 box - raisin nut granola bars

(d) 4 box - almond chunky
2 box - chewy chocolate chip
3 box - raisin nut granola bars

52. At a recent birthday party there were four mothers and their children aged 1, 2, 3 and 4 years. From the clues below can you work out whose child is whose and their relevant ages?

It was Jane's child's birthday party. Brian is not the oldest child. Sarah had Anne just over a year ago. Laura's child will be 3 next birthday. Daniel is older than Charlie. Teresa's child is the oldest. Charlie is older than Laura's child.

(a) Jane with Charlie who is 3.
Teresa with Daniel who is 4.
Laura with Brian who is 2.
Sarah with Anne who is 1.

(b) Sarah with Anne who is 3.
Teresa with Daniel who is 4.
Laura with Brian who is 2.
Jane with Charlie who is 1.

(c) Jane with Charlie who is 3.
Laura with Brian who is 4.
Teresa with Daniel who is 2.
Sarah with Anne who is 1.

(d) Sarah with Anne who is 3.
Laura with Brian who is 4.
Teresa with Daniel who is 2.
Jane with Charlie who is 1.

Directions for questions 53 to 55: Answer the questions on the basis of information given below.

Study the information given below:

(i) A is the father of the two children, B and D, whose sex are different.

(ii) C is B's spouse.

(iii) E is of the same sex as D.

(iv) B and C have two children: F who is of the same sex as B and G who is of the same sex as C.

(v) E's mother, H, who is married to L, is the sister of D's mother, M.

(vi) E and E's spouse, I, have two children, J and K, who are of the same sex as I.

No person have married more than once, and no children have been born out of wedlock. The only restrictions on marriage are that marriage to sibling, to a direct descendant, or to more than one person at the same time is forbidden.

53. F is ...

(a) G's brother (b) G's sister (c) B's daughter (d) D's niece or nephew

54. According to the rules, D can marry ...

(a) F only (b) G only (c) J only (d) F, J, or K

55. If L and H divorced, H could marry ...

I. D

II. F

III. D or G

(a) I only (b) II only (c) III only (d) II or III, but not both

56. Which of he following must be true?

(a) There are more females than males in F and K's generation.

(b) J is a male.

(c) D is of the same sex as G.

(d) G is of the same sex as K.

57. The Indian cricket team had to be selected for Sharjah Cup: there were only batsmen, only bowlers and all-rounders who were both batsmen and bowlers. For every three batsmen there was one who was only bowler. For every two only bowlers there was one who was only batsman. If the team comprised of 16 players, then how many all-rounders were selected?

(a) 8 (b) 3 (c) 4 (d) 5

58. Kya-Kya is an interesting island. Somehow due to an ancient `twoquestotrueofalso' genetic mutation, all its inhabitants answer questions in two sentences. One of these sentences is always true and the other is always false.

Xenophobiaca, Terophobiaca and Tinkalaka, have run away from the city of Mumbai with the prized pillow used by Maikalal Jaikishen. In trying to locate their whereabouts and

find out more about them, an inspector got the following information from Kya-Kya residents Eer, Beer and Phatte.

Eer: "Terophobiaca is a female. Tinkalaka is Xenophobiaca's brother."

Beer: "Xenophobiaca and Terophobiaca are both Tinkalaka's children. Tinkalaka has identical twins."

Phatte: "Terophobiaca is male. Xenophobiaca is male."

Which of the following statements is true?

(a) Tinkalaka is the father of Xenophobiaca and Terophobiaca.

(b) Tinkalaka is the mother of Xenophobiaca and Terophobiaca.

(c) Terophobiaca is Tinkalaka's daughter.

(d) Terophobiaca is Tinkalaka's brother.

Directions for questions 59 to 61: Answer the questions on the basis of information given below.

Six students - A, B, C, D, E and F - took a test . Each of them was assigned rank based on the marks obtained by them out of 25 (Student with maximum marks is assigned first rank and so on).

It is also known that:

(i) Marks scored by each student was a distinct positive integer. Marks scored by them are in arithmetic progression such that common difference is twice the first term.

(ii) Marks scored by B are more than exactly 4 students and three times than the marks scored by D.

(iii) Absolute difference in the ranks of C and E is same as the absolute difference in the ranks of A and F.

(iv) Marks scored by F are the least among all the students.

59. Who was ranked first if E was ranked fourth?

(a) A (b) C (c) F (d) Cannot be determined

60. What were the marks scored by D?

(a) 3 (b) 5 (c) 6 (d) Either (a) or (c)

61. If marks scored by A were 7, then which of the following could be the rank of E?

(a) First (b) Second (c) Third (d) Fifth

Directions for questions 62 to 65: Answer the questions based on the short paragraphs given below.

62. Two most important claimants to any company are creditors and shareholders and so the Corporate Governance and good corporate practice must satisfy both these claimants. In this regard, MTNL has a unique distinction of servicing its shareholders. Your company is the first major Navratna Company, which has resolved to have its own Corporate Governance code, for which necessary steps are being taken. Towards this direction, an audit committee of the board has been formed, which is playing a very vital role in evolving best policies and to see that all the systems are in place for the maximization of revenue and minimization of expenditure.

Based on the above paragraph, what reasons can prevent the corporate resolution for governance code from being implemented?

(a) The audit committee fails to define the accounting policies and systems.

(b) The role which the audit committee of the board has to play gets fulfilled.

(c) The direction that the audit committee has taken is wrong.

(d) The accounting policies and systems for the maximization of revenue and minimization of
expenses are in place.

63. "Natural phenomena provide the birth of a child. Scientifically, the blood of the parents flows in the veins of the child. Inanimate things can be divided by measure of scale or way of weights and measures. But animate things must be considered as one person, as a whole."

We can infer from the above passage that

(a) a child can be treated like a property.

(b) by becoming father, one does get the right to own and control the child.

(c) the mother, by keeping the child in the womb for nine months and delivering the child, becomes
entitled to own and control the child.

(d) a child could not be treated as an `inanimate object'.

64. Project finance is generally considered to be a high-risk area. In the context of the financial sector reforms and the emerging economic and industrial scenario, this financial activity has become all the more risky. Many projects that had been assisted during the last three to four years have finished implementation only recently and are yet to achieve breakeven levels of operation. In the sphere of project finance itself, the NPA (non-performing assets) levels of peer institutions and banks are also high.

Based on the above, which of the following is not correct?

(a) Once the assisted companies establish their operations, risk factors will diminish in importance.

(b) The overall NPAs will show an upward trend once the companies start showing signs of
stabilization.

(c) Non-performing assets as a percentage of total assets has remained high.

(d) The level of NPAs can come down by playing a more proactive role in the management of
borrower concerns.

65. The April 1 class action for Pizza Hut has been filed at a superior court in Washington in and for King County. Bharati's brief alleges the chain `intentionally failed to publicly disclose its continued use of beef product in its pizza and other food items sold as vegetarian'.

Pizza Hut spokesperson Patty Sullivan denied the claim. "There are no beef products in the Veggie Lover's pizza . . . the pizza sauce is pure. It does not contain beef or chicken flavouring," she said.

Bharati said, "I am not surprised when their initial reaction is to deny. First, we are going to have them admit it. Just as you saw how McDonald's denied it. It took McDonald's three months to apologize and admit. It's too early perhaps for Pizza Hut."

We can infer from Bharati's statement that

(a) Pizza Hut fully discloses all ingredients in view of dietary requirements of customers.

(b) Pizza Hut had lied about what was contained in its vegetarian pizzas.

(c) Bharati had fought and won a settlement from McDonald's.

(d) Pizza Hut may take some time to publicly acknowledge its disclosure lapse.

Directions for questions 66 to 69: Four alternative summaries are given below each text. Choose the

option that best captures the essence of the text.

66. Rhetoric is the counterpart of Dialectic. Both alike are concerned with such things as come, more or less, within the general ken of all men and belong to no definite science. Accordingly all men make use, more or less, of both; for to a certain extent all men attempt to discuss statements and to maintain them, to defend themselves and to attack others. Ordinary people do this either at random or through practice and from acquired habit.

(a) Rhetoric and dialectic are used by all in a non-scientific manner

(b) Argumentative people take recourse to dialectic and rhetoric

(c) Dialectic and rhetoric are habits that can be acquired after much practice

(d) Rhetoric and dialectic are used by everybody because of the function they serve

67. In the United States there had been a desire at the turn of the century to escape from the dogmatic identification of liberty and the market. The progressive era, with its programme of regulating the robber barons, ushered in a more critical attitude. Historians Charles and Mary Beard wrote an iconoclastic account of the constitution, listing the economic holdings of the framers. The message was evident: The American constitution was not an absolute and universal ideal, but the juridical framework of sectional financial interests (and hence, government was justified in acting against those interests, even where its actions appeared unconstitutional).

(a) The progressive era marked the public questioning of the American constitution and its implications
on the market

(b) The progressive era marked questioning of the American constitution and revealing biases behind
it

(c) The American constitution was questioned widely and its framers could not defend it adequately

(d) The American constitution is a travesty of justice as revealed by the criticism in the progressive
era

68. The Romans, after this, declared to the Britons, that they should not be able for the future to undergo the fatigue of such laborious expeditions; and that it was beneath the dignity of the Roman state to harass so great and brave an army, both by land and sea, against base and vagabond robbers; but that they ought to apply themselves to the use of arms, and to fight bravely in defending to the utmost of their power, their country, riches, wives, children, and, what is dearer than all these, their liberty and lives. As soon as they had given them this exhortation, they commanded all the men of the island that were fit for war, to appear together at London, because the Romans were about to return home.

(a) The Romans in England were dissatisfied with the living conditions in England and decided to return

(b) The Romans wanted England to acknowledge the great help that they were rendering

(c) The Romans were blackmailing the English in order to demand land in exchange for their help.

(d) The Romans in England decided to not be under the control of the Britons and fight wars

69. "Lady Betty" and her story have become the stuff of legend in Roscommon and the surrounding area. Her rise to infamy is the stuff Hollywood scripts are made of. She was one of the most bloodthirsty and feared women in all of Irish history. She moved up from Kerry to Roscommon for
reasons best known to herself in the late 18th century, and lived in total poverty on the West side of the county. A single mother with a young son, she was (very unusually for the

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reasons best known to herself in the late 18th century, and lived in total poverty on the West side of the county. A single mother with a young son, she was (very unusually for the times) literate, and taught her child to read and write. She also taught him that nothing matters in the world but money. When he was old enough, this well educated urchin headed to America to seek his fortune.

(a) Lady Betty's son went on to star in a Hollywood film

(b) Hollywood gives credence to real life stories

(c) Lady Betty's son's success was largely due to her efforts

(d) Lady Betty has been renowned for being infamous and her different way of life

Directions for question 70: The following question consist of two words each that have a certain relationship with each other followed by alternatives. Select the alternative that has the same relationship as depicted in the original pair of words.

70. gladiator : arena

(a) participant : team (b) commuter : train

(c) patient : ward (d) lawyer : courtroom

Test 7 - IIFT

Note: All questions carry 1 mark each. Each wrong answer will attract a penalty of 0.33 mark.

Number of questions: 66 **Time: 60 mins**

part - 1

1. A number of three digits in base 7, when expressed in base 9, has its digits reversed in order. What is the number in decimal system?

(A) 248 (B) 369 (C) 124 (D) (d) None of these

2. If $\frac{x}{y} = \frac{6}{7}$ and $\frac{y}{z} = \frac{21}{6}$, then find the value of $\frac{(3z-4x)}{(z+x)}$.

(A) $-\frac{3}{2}$ (B) $-\frac{9}{4}$ (C) -2 (D) $-\frac{5}{2}$

3. The expression $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} + \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ is equal to

(A) 6 (B) $2(\sqrt{3}+\sqrt{2})$ (C) 10 (D) $2(\sqrt{3}-\sqrt{2})$

4. A slab of ice of 11 inches in length, 8 inches in breadth, and 2 inches in thickness was melted and resolidified into the form of a rod of 8 inches diameter. The length of such a rod is nearest to

(A) 3 inches (B) 3.5 inches (C) 4 inches (D) 4.5 inches

5. A rectangular garden has an area of 2,000 m^2 and its length and breadth are in the ratio 5 : 4. A road of uniform width runs inside the garden around the perimeter and has an area of 344 m^2. The width of the road (in meters) is

(A) 3 (B) 3.5 (C) 4 (D) 2

6. The area of a parallelogram ABCD is A sq. cm. The distance between AB and DC is `$d_1$' cm and the distance between BC and AD is `d_2' cm. Find the perimeter of the parallelogram ABCD.

(A) $\frac{2A(d_1+d_2)}{d_1d_2}$ (B) $\frac{2A(d_1d_2)}{d_1+d_2}$ (C) $\frac{Ad_1d_2}{d_1+d_2}$ (D) $\frac{A(d_1+d_2)}{2d_1d_2}$

7. Nitin, the great biotechnologist, is experimenting with two stains of bacteria named HH and CC. Bacteria HH and CC compound at the rate of 10% in 30 minutes and 5% in an hour respectively. These two stains were mixed at certain ratio in the midnight. At 3.00 a.m. the same morning, HH and CC were found to be in equal proportion. Find the ratio in which they were mixed.

(A) 15:17 (B) 13:8 (C) 9:14 (D) 5:14

8. A beaker contains alcohol and water in the ratio 4:1 respectively. When 15 L of this mixture is replaced with water, the ratio of alcohol and water in the beaker becomes 1:4. How many liters of alcohol was present initially in the beaker?

(A) 24 liters (B) 16 liters (C) 20 liters (D) 12 liters

9. A shopkeeper gives a discount of 12%, whenever a customer makes cash payment. Let `z' denote the percentage above the cost price that the shopkeeper must mark up the price of the article
[`z' is an integer] in order to make a profit of k %(k<100). Which of the following is not a possible value of k?

(A) 54 (B) 76 (C) 96 (D) 32

10. In an assembly line, three robotic arms - R_1, R_2 and R_3 - are working together. R_1 alone takes 10 hrs to complete a single product but R_2 and R_3 working together take 4 hrs for the completion of the same product. If all of them worked together and completed 14 products, then for how many hours did they work?

(A) 20 hrs. (B) 28 hrs. (C) 40 hrs. (D) 54 hrs.

11. Distance between two stations is `d' km. A train moves with the speed of `m' km/hr and reaches other station late by 2 hours. Calculate the speed (in kmph) with which train must travel to reach in time, where `t' is the actual time.

(A) $\frac{m}{t+2}$ (B) $\frac{m \times t}{t+2}$ (C) $\frac{m \times (t+2)}{t}$ (D) $\frac{m}{t(t+2)}$

12. Let α and β are the roots of the quadratic equation $x^2 + ax + b = 0$ and γ and δ be the roots of the quadratic equation $x^2 + bx + a = 0$. If $(\alpha-\beta-\gamma+\delta)(\alpha-\beta+\gamma-\delta) = 0$ and $a \neq b$, then which of the following values of `a' and `b' are possible?

(A) a = - 3 and b = - 6 (B) a = 0 and b = - 5

(C) a = 4 and b = 0 (D) a = - 7 and b = 3

13. If $\log_7 (x^4 - x^2) - \log_{49} (x^4 + 1 - 2x^2) = 6$, then which of the following is a possible value of `x'? (A) 7 (B) 49 (C) 343 (D) 1000

14. Which of the following values of `x', satisfy the inequality $2^x + 4^x < 6$?

(A) $-\infty < x < 1$ (B) $-3 < x < -2$ (C) $1 < x < \infty$ (D) None of these

15. In a class of 25 students, each student plays one or more of the three games -. cricket, football and tennis. Five students play all the three games. For each game, exactly five students are there who play neither of the other two games. If 13 students play football, then how many students play cricket and tennis but not football?

(A) 5 (B) 2 (C) 1 (D) Cannot be determined.

16. Jack speaks truth in cases and Jill lies in $\frac{1}{5}$ cases. What is the percentage of cases in which both Jack and Jill contradict each other in stating a fact?

(A) 60% (B) 35% (C) 20% (D) 15%

17. Khursheed builds a tank in his office, which has three taps attached to it. While the first tap can fill the tank in 10 hours, the second one takes 180% of time the first one take to fill it completely. A third tap is attached to the tank, which empties it in 30 hours. One day, in order to fill the tank, Khursheed opens the first tap and after two hours opens the second tap as well. However, at the end of the fifth hour, he realizes that the third tap has been kept open right from the beginning and closes it. If he closes first tap 2 hours before second tap, what will be the total time required to fill the tank?

(A) 9 hours 48 minutes (B) 9 hours 30 minutes

(C) 8 hours 30 minutes (D) 8 hours 48 minutes

18. The digging work of the underpass by Gammon on the Moolchand-Saket stretch requires thirty-six men to complete the work in twelve days. As a part of the task if Gammon were to hire forty-eight women, they can complete the same work in eighteen days. Sixteen men and sixteen women started working and worked for ten days. Due to time bound schedule the work had to be completed in remaining three days, for which how many more men are to be employed?

(A) 32 (B) 36 (C) 40 (D) 45

19. Smartwork Distribution Company, a subsidiary of a major telecom products manufacturer Teleworld, is forecasting the branch wise sales for the coming year. Mumbai branch with current yearly sales of Rs. 156.6 lakh is expected to achieve a sales growth of 8%; Delhi branch with current sales of Rs. 80 lakh is expected to grow by

12.5%; and Bangalore branch with sales of Rs. 54.8 lakh is expected to increase sales by 6.2%. What is the Smartwork's expected sales growth for the coming year?

(A) 10% (B) 9.1% (C) 8.9% (D) 9.8%

20. A wire, if bent into a square, encloses an area of 324 cm^2. This wire is cut into two pieces; with the bigger piece having a length two-third of the original wire's length. Now, if an equilateral triangle and a square are formed with the bigger and the smaller piece respectively, what will be the difference between the areas enclosed by the two pieces?

(A) $4\sqrt{3}\left(16+3\sqrt{3}\right)\ cm^2$ (B) $16\sqrt{3}\left(4+\sqrt{3}\right)\ cm^2$

(C) $8\sqrt{3}\left(8+3\sqrt{3}\right)\ cm^2$ (D) None of these

21. Mr. Hariharan wanted to give some amount of money to his two children - Sameer and Karan, so that, compounded annually in the future the money would be used for their higher studies. He divides a sum of Rs. 26,840/- between his two children of age 6 years and 8 years respectively in such a way that each would receive the same amount at 20% p.a. compound interest compounded annually when he attains the age of 20 years. What would be the original share of the elder child?

(A) Rs. 14,400 (B) Rs. 16,420 (C) Rs. 15,840 (D) None of these

22. Two runners - Arvind and Saurabh - are practicing on the circular racing track, for the international racing tournament to be held in coming month. Both Arvind and Saurabh start from the same point on the circular track. Arvind completes one round of the track in 2 minute and Saurabh takes 2 minutes to complete one round. Arvind maintains the same speed throughout the practice, Saurabh halves his speed after the completion of each round. After completion of five rounds by Saurabh, a boy started counting the number of times the two racers meet till the completion of 7th round by Saurabh. What is the number counted by the boy? (Assume that the speed of Saurabh remains steady throughout each round and changes only after the completion of that round.)

(A) 96 (B) 95 (C) 93 (D) 94

23. Because of increase in expenses, Harshad curtailed some of the monthly household. Harshad, the operations manager of the company whose monthly is to Rs.27,000 is unable to pay for all the expenditures. He finds that there is a deficit of Rs.1,800 between his earnings and expenses in the first month. This deficit, because of inflationary pressure, will keep on increasing by Rs.600 every month. Harshad has a saving of Rs. 63,000, which will be used to fill this deficit. After his savings get exhausted, Harshad would start borrowing from his friends and company. How soon will he start borrowing?

(A) 7th month (B) 9th month (C) 11th month (D) 13th month

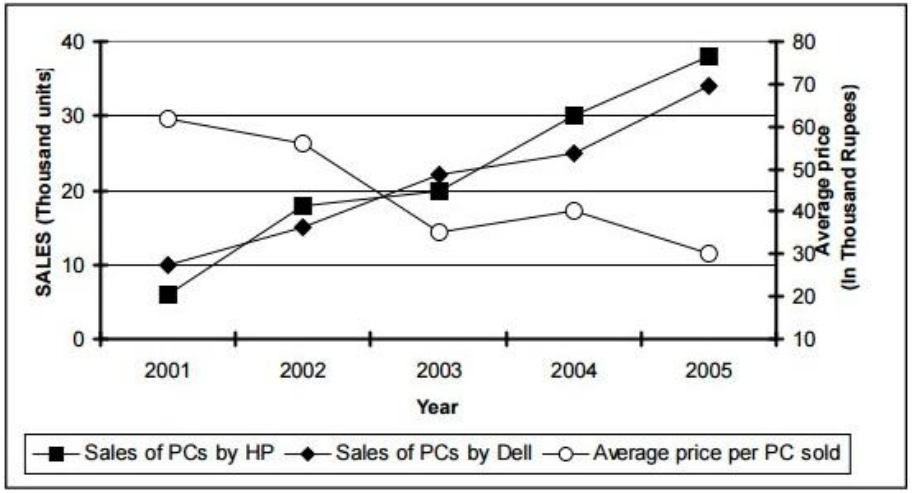
24. In 2007, Hemant Dubey was allotted 680 shares of Reliance Oil and Natural Gas ltd. in the initial public offer at the face value of Rs.15 per share. In 2008, Reliance Oil and Natural Gas ltd. declared a bonus at the rate of 8:17. In 2009, the company again declared the bonus at the rate of 3:5. In 2010, the company declared a dividend of 16.67%. Find the dividend (in Rs.) received by Hemant Dubey?

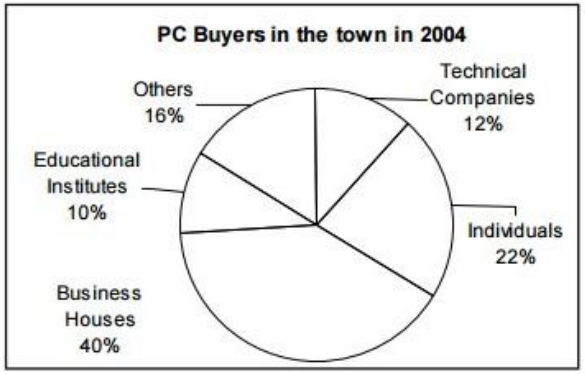
(A) Rs.4,000 (B) Rs. 3,600 (C) Rs. 4,500 (D) None of these

part - 2

Directions for questions 25 to 27: Answer the questions on the basis of the information given below.

The line graph and pie chart below show the sales (in units) of Personal Computers(PCs) from 2001 to 2005 in a town and the profile of PC buyers in 2004 in the same town. There are only two companies selling PCs in that town - Dell and HP.





25. How many PCs purchased by Educational Institutes in the town in 2004 were made by Dell?

(A) 5500 (B) 2500 (C) 3000 (D) Cannot be determined

26. If the number of PCs purchased by Business Houses in the town in 2004 were 7% more than that in 2003, then what percentage of the total PCs sold in the town in 2003 were purchased by business houses?

(A) 53% (B) 51% (C) 49% (D) 47%

27. If in 2006, sales of PCs of Dell and HP in the town increases over 2005 by 12% and 10% respectively and the average price per unit of PC increases by 5% over the previous year, then what will be the percentage increase in the net sales (in Rs.) of PCs in the town in 2006 over 2005?

(A) 13.1% (B) 16.6% (C) 19.2% (D) 22.4%

Directions for questions 28 to 32: Answer the questions on the basis of the information given below.

The table shows the growth of regular monthly investment at 7% return compounded annually.

Number of years	Monthly investment			
	Rs. 50	Rs. 100	Rs. 250	Rs. 500
	Amount after x years			
2	1292	2583	6458	12915
5	3601	7201	18003	36005
10	8705	17409	43524	87047
20	26198	52397	130991	261983

28. How much can be the interest earned on an investment for a 5-year period with monthly investment of Rs. 100?

(A) Rs. 1,201 (B) Rs. 6,001 (C) Rs. 601 (D) Rs. 608

29. Find the approximate ratio of interest earned on 10-year period to the interest earned on a 5-year period with monthly investment of Rs. 100?

(A) 2 : 9 (B) 4 : 1 (C) 4 : 9 (D) 9 : 2

30. How much less interest would be earned on a Rs. 500 monthly investment for 10 years than a Rs. 250 monthly investment for 20 years?

(A) Rs. 45,844 (B) Rs. 43,944 (C) Rs. 35,004 (D) Rs. 37,832

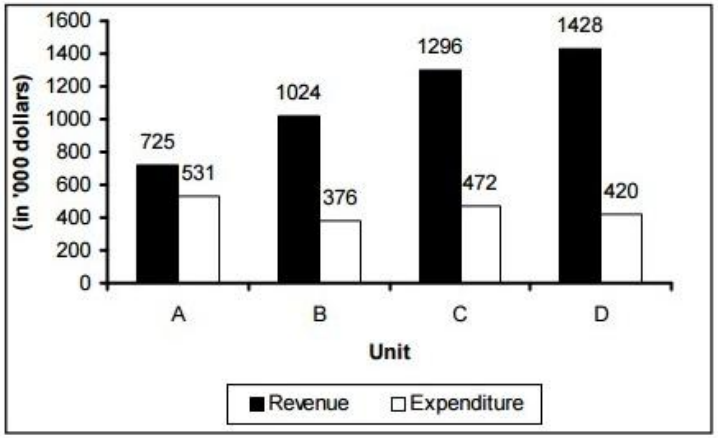
31. What can be the total interest earned for 10-year period with monthly investment of Rs. 100?

(A) Rs. 5379 (B) Rs. 5,782 (C) Rs. 5,652 (D) Rs. 5,409

32. How much more can be earned on a Rs. 50 monthly investment for 10 years than on a Rs. 100 monthly investment for 5 years?

(A) Rs. 1,500 (B) Rs. 1,504 (C) Rs. 701 (D) Rs. 832

Directions for questions 33 to 35: Answer the questions on the basis of the information given below.



Note: All the figures in thousand dollars

Profit = Revenue - Expenditure.

A, B, C, D are four units of XYZ Ltd. In order to show high profitability, the actual figures for these four units were manipulated in the graph in the following way.

A showed that his revenue increased by 25% and his expenditure decreased by 25%.

B showed that his revenue increased by $33\frac{1}{3}$% and his expenditure decreased by $33\frac{1}{3}$%.

C showed that his revenue increased by 20% and his expenditure decreased by 20%.

D showed that his revenue increased by $16\frac{2}{3}$% and his expenditure decreased by $16\frac{2}{3}$%.

33. If the Actual Revenue Profit (ARP) is (Actual Revenue - Manipulated Expenditure) and Actual Expenditure Profit (AEP) is (Manipulated Revenue - Actual Expenditure), then for which unit is the ratio $\frac{ARP}{AEP}$ the lowest?

(A) A (B) B (C) C (D) D

34. Later on the actual expenditure of D was increased by $16\frac{2}{3}$% and the actual revenue of D was decreased by $16\frac{2}{3}$%. By what percentage did the manipulated profit for D change?

(A) 33.33% (B) 40% (C) 57% (D) 24%

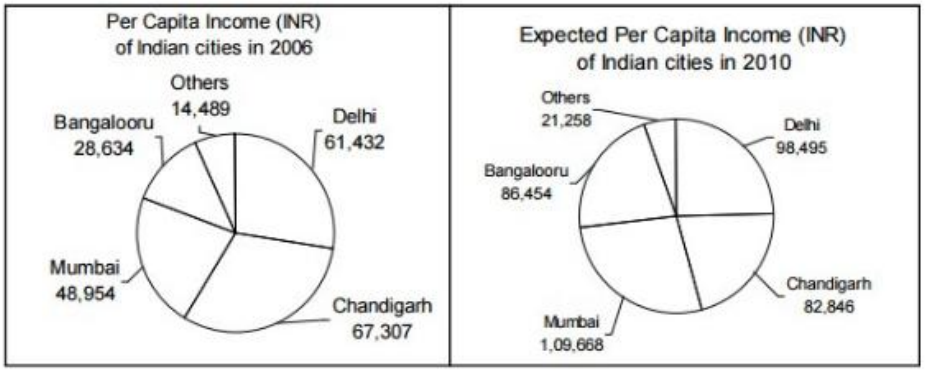
35. Vigilance department came to know about all these manipulations. All the units which showed increased profits were fined 50% of the manipulated profits. Which unit earned profit even after bearing the fine?

(A) B (B) C (C) D (D) Both (C) and (D)

Directions for questions 36 to 40: Answer the questions on the basis of the information given below.

The following graphs show the per capita income of India and its major cities in 2006 and the corresponding expected figures in 2010.

Per capita income of a city or country is defined as GDP of that city or country divided by the population of that city or country.



Per Capita Income of India in 2006 = Rs. 24,380.

Expected Per Capita Income of India in 2010 = Rs. 42,460.

36. If India's per capita income is expected to grow by the same rate annually from 2006 to 2010, then find the expected per capita income of India in 2008.

(A) Rs. 34,219 (B) Rs. 30,254 (C) Rs. 33,325 (D) Rs. 32,174

37. Per capita income of Mumbai and Bangalooru combined in 2006 is Rs. 38,804 and is expected to be Rs. 98,049 in 2010. Per capita income of Delhi and Chandigarh combined in 2006 is Rs.65,804 and is expected to be Rs.89,476 in 2010. What cannot be the correct increasing order for the 4 cities in terms of their growth rate in population?

(A) Delhi < Mumbai < Banglooru < Chandigarh

(B) Delhi < Mumbai < Chandigarh < Bangalooru

(C) Delhi < Bangalooru < Chandigarh < Mumbai

(D) Mumbai < Bangalooru < Delhi < Chandigarh

38. If all the cities of India have equal population in 2006, then find the number of cities in India.

(A) 15 (B) 26 (C) 38 (D) Cannot be determined

39. If the annual rate of growth of per capita income of an Indian city is expected to be constant from 2006 to 2010, then what is the ratio of per capita income of Delhi in 2007 to that of Chandigarh in 2009?

(A) 0.64 (B) 0.75 (C) 0.88 (D) 0.91

40. For which of the following cities, is the ratio of expected per capita in 2010 to the per capita income in 2006 the maximum?

(A) Delhi (B) Bangalooru (C) Mumbai (D) Chandigarh

part - 3

Directions for questions 41 to 44: Answer the questions on the basis of the information given below.

Six students, addressing to the principal, delivered lectures on `inclusion of extra curricular activities in the day schedule' in a school. Each student emphasised for the

inclusion of a different activity. The lectures were delivered on successive days starting on Monday and culminating on Saturday, one on each day.

The first names of the students in no particular order are: Sameer, Dheeraj, Ranjit, Rohit, Karan and Jyoti. The last name of the students in no particular order are: Verma, Thapa, Malhotra, Roy, Sharma and Tyagi.

Some information is given below.

A. Sameer and the student who favoured the inclusion of Singing as an extra curricular activity have been the students of the school for over 3 years. Sharma and the student who delivered the lecture on Saturday have been the students of the school for less than 3 years.

B. Dheeraj Thapa's lecture, who favoured Dancing as an extra curricular activity, was delivered on Wednesday.

C. Roy favoured the inclusion of Acting as an extra curricular activity. He delivered his lecture a day before Sharma's lecture.

D. Ranjit favoured the inclusion of Drawing as an extra curricular activity.

E. Jyoti's lecture was delivered on Thursday.

F. Rohit, whose lecture was delivered just a day before Tyagi's, favoured the inclusion of Gardening as an extra curricular activity.

G. Karan's last name is not Malhotra.

H. The lecture delivered on Monday favoured the inclusion of Painting as an extra curricular activity.

41. Which of the following students favoured the inclusion of Singing as an extra curricular activity?

(A) Jyoti (B) Sameer (C) Karan (D) None of these

42. Which of the following combinations of the day and the suggested activity is correct?

(A) Friday - Gardening (B) Thursday - Gardening

(C) Saturday - Singing (D) Friday - Singing

43. Who emphasised on the inclusion of Painting as an extra curricular activity?

(A) Malhotra (B) Verma (C) Sharma (D) Tyagi

44. Sharma wanted to include which of the following activities?

(A) Gardening (B) Singing (C) Drawing (D) None of these

Directions for questions 45 to 48: Answer the questions on the basis of the information given below:

Six sweets A, B, C, D, E, and F are being ranked in terms of taste. The sweets can be ranked from best to worst as superior, very good, good, fair and poor. More than one sweet can have the same rank. Ranks are considered consecutive, if they are next to each other, for example, superior and very good are consecutive whereas superior and good are not. Any sweet that is ranked as poor is disqualified.

The following information is available about the ranking.

I. The ranks of B and E are consecutive.

II. The ranks of D and F are consecutive.

III. The rank of A is higher than that of C.

IV. The rank of B is higher than that of E.

45. If A and D have the same rank, and if F is disqualified, then which one of the following must be true?

(A) B is ranked very good (B) C is ranked fair

(C) C is also ranked poor (D) C is ranked good

46. If none of the sweets is disqualified, and E receives a higher rank than only one of the D and F, then which one of the following must be true?

(A) Exactly one sweet is ranked superior

(B) Exactly one sweet is ranked very good

(C) Exactly two sweets are ranked very good

(D) At least one sweet is ranked very good or at least one sweet is ranked good

47. If E ranks higher than A, then using which one of the following rank of all six sweets can be determined?

(A) C ranks fair (B) C and D have the same rank

(C) C and F have the same rank (D) C ranks higher than F

48. Dibyanshu went to sabji mandi and asked a vendor that if he gave him as much money as he had with him then he would spend Rs.10. After having done the same Dibyanshu repeated the operation at a second and a third vendor, after which he had no money left with him.

How much money he had at starting?

(A) Rs. 8.75 (B) Rs. 10.45 (C) Rs. 11.5 (D) Rs. 7.5

49. Four people have been suspected of having cheated in the semester exams. However, only one of them has cheated. Only one of the following statements by 4 people is true.

Dipan said that he did not cheat.

Jugal said that Dipan was lying.

Sarmistha said that Jugal was lying.

Jitender said that Jugal cheated.

Who among the following are not the cheaters?

(A) Dipan, Jugal, Sarmistha (B) Dipan, Sarmistha, Jitender

(C) Jugal, Sarmistha, Jitender (D) Cannot be determined

50. If `DOER' is coded as `WLVI', `BAKE' is coded as `YZPV', then what is the code for the word `MUST'?

(A) NFHG (B) FRHP (C) KEXH (D) NVTU

51. If `BACK' stands for `DYEI' and `FRONT' stands for `HPQLV', then `RIGHT' stands for

(A) PKEJR (B) TKIJV (C) PGEFR (D) TGIFV

Directions for questions 52 to 54: Answer the questions on the basis of the information given below:

U, V, W, X, Y and Z are members of a family in which there are three generations and two married couples. The different professions in the family are professor, doctor, manager, banker, housewife and lawyer.

I. Y is married to U who is a professor.

II. X, who is a housewife, is the mother of U.

III. V is the grandfather of W who is a doctor.

IV. Y, who is the father of the doctor, is not a banker.

V. Z is the granddaughter of X and is a manager.

52. Which of the family members is the banker?

(A) Y (B) V (C) W (D) None of these

53. What is the profession of Y?

(A) Manager (B) Doctor (C) Lawyer (D) None of these

54. How many female members are there in the family?

(A) Two (B) Three (C) Four (D) Cannot be determined

Directions for questions 55 and 56: Following steps are used to convert a given messages in a certain code language.

Step 1: The vowels used in the original message are replaced by their immediate next alphabet.

Step 2: All the alphabets with even position number will become upper case (Capital letter) and other will be in lower case (Small letter), irrespective of their position in the original message. Example: D, F, R, s, y etc.

Step 3: After executing steps 1 and 2, the codes obtained for each word in the original message are reversed.

55. What is the code for the message "come as you are"?

(A) BrF yPv Bs cPmF (B) FmPc sB VPy FrB

(C) BRF yPv Bs cPmF (D) FmPc sB VPy FRB

56. What is the code for the message "swim across to moon"?

(A) swJm ssPRcB PT NPPm (B) mJws ssPRcB PT NPPm

(C) mJws ssRPcB PT NPPm (D) NPPm PT ssPRcB mJws

57. Find the missing term in the following series.

23 26 32 35 ? 44 48....

(A) 38 (B) 40 (C) 43 (D) 36

Directions for questions 58 and 59: Answer the questions on the basis of the information given below.

Five friends - Amit, Betty, Cathy, Danny and Earl - each play one of the five games - Football, Badminton, Table Tennis, Carrom and Softball. Also, each one of them likes to eat one of Chinese, South Indian, Gujarati, Italian or Mughlai food. Football, Table Tennis and Softball are all ball-games. Table Tennis and Carrom are indoor games.

A. Amit does not like South Indian and Mughlai food.

B Neither Betty nor Danny play ball - games and one of them likes Italian food.

C. Cathy hates Mughlai food and plays an indoor ball game.

D. Earl likes Chinese food and plays Softball.

58. Which food does Amit like and which game does he play?

(A) Italian, Table Tennis (B) Mughlai, Carrom

(C) Gujarati, Football (D) Cannot be determined

59. Who likes Italian food?

(A) Betty (B) Cathy (C) Danny (D) Cannot be determined

60. Twelve philosophers participate in an international meet. At some point, one of the philosophers commented, "In our talks, one lie has been told". Immediately following this comment, another philosopher commented, "Now two lies have been told." which, in turn, was followed by third such comment, "Now three lies have been told.". The philosophers continued to comment until the twelfth philosopher commented, "Now 12 lies have been told." If it turned out that at least one philosopher stated the correct number of lies that had been told before he made the claim, then how many lies did the 12 philosophers, actually tell?

(A) 10 (B) 12 (C) 7 (D) 2

Directions for questions 61 and 62: In each of the following questions, four statements followed by four conclusions numbered I, II, III, IV are given. Consider the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions carefully and decide which of the given conclusions logically follow.

61. **Statements:**

(a) Some rats are cats.

(b) All cats are deer.

(c) No deer is a rabbit.

(d) All rabbits are donkeys.

Conclusions:

I. No deer is a donkey.

II. Some deer are donkeys.

III. Some donkeys are rats.

IV. Some deer are rats.

(A) I and III follow (B) II and IV follow

(C) Either I or II and IV follow (D) None follows

62. **Statements:**

(a) Some keys are curtains.

(b) All curtains are locks.

(c) All locks are numbers.

(d) No number is an alphabet.

Conclusions:

I. Some keys are numbers.

II. All curtains are numbers.

III. Some locks are keys.

IV. No alphabet is a curtain.

(A) Only I and III follow (B) Only II and I follow

(C) Only II and IV follow (D) All follow

Directions for question 63 to 64: In each of the questions a statement is followed by two assumptions.

These assumptions may or may not be implicit in the statement. Identify the assumption implicit in the statement and mark your response in accordance with the following code.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Both assumptions I and II are implicit

(D) Neither assumption I nor II is implicit

63. **Statement:** The government wants to make a change in the adoption laws as per which only married couples will be allowed to adopt children.

Assumption I: Married people need children more than the unmarried ones.

AssumptionII: Married people will make better parents as compared to people who are unmarried.

64. **Statement:** Producers prefer to sign George, a pedestrian actor, over others for their films despite the fact that he doesn't have a hit film to his name.

Assumption I: George, irrespective of his acting skills, is a very bankable actor.

AssumptionII: George is very handsome and charming.

65. What is the expected number of tosses for an unbiased coin to get 2 consecutive heads?

(A) 3 (B) 4 (C) 5 (D) 6

66. Sixteen cricket teams playing IPL series are ranked 1 to 16 on the basis of their previous performance. In first knockout round, the team ranked 1 plays a game against the team ranked 16 in match 1 and the team ranked 2 plays against the team ranked 15 in match 2 and so on. In next round, the winner of match 1 plays against the winner of last match, the winner of match 2 plays against the winner of match 7 and so on. This continues in subsequent rounds. Find the probability that the top 2 teams will play the final match against each other? If a match ends in a tie, then bowling is done to decide the winner.

(A) 0.625 (B) 0.0625 (C) 0.0125 (D) 0.015625

Test 8 - IIFT

Note: All questions carry 1 mark each. Each wrong answer will attract a penalty of 0.33 mark.

Number of questions: 66 **Time: 60 mins**

part - 1

1. In a survey, it was shown that Hindi and Marathi are the only languages spoken in Kothar village. In this village, one-tenth of the population speaks neither Hindi nor Marathi, one-fifth of the population can't speak Marathi and three-seventh of the population can't speak Hindi. In a literacy campaign, the people knowing neither of the languages in that village were taught either Hindi or Marathi in the ratio 4 : 3. After campaign, approximately what percentage of the villagers could speak Hindi only.

(A) 10% (B) 14% (C) 18% (D) 16%

2. Find the value of 36 × S if

$$S = \frac{6}{(2)\times(3)\times(4)}\times\frac{1}{2}+\frac{7}{(3)\times(4)\times(5)}\times\frac{1}{2^2}+\frac{8}{(4)\times(5)\times(6)}\times\frac{1}{2^3}+\ldots\ldots\ldots\ldots \text{ till infinite terms.}$$

(A) 4 (B) 4.5 (C) 5 (D) 6

3. In the year 2005, Mumbai observed severe floods. To gauge the impact of the floods, Mr. Feroz, made an aerial survey of the city in a helicopter. When his helicopter was vertically above the "Corporate Tower" building, Mr. Feroz observed the angle of depression of the top of the "Business Tower" building to be 30°. The helicopter kept moving at the same vertical level and after 5 seconds, it was vertically above the "Business Tower" building, from where he observed the angle of depression of the top of the "Corporate Tower" to be 60°. He learnt that "Business Tower" building was 120 m taller than the "Corporate Tower" building. Which of the following is true?

(A) The helicopter was 180 m above the top of the "Corporate Tower" building.

(B) The helicopter was 160 m above the "Business Tower" building.

(C) The helicopter was 280 m above the ground.

(D) None of these

4. Deep, Salil and Harsha can fix a defect in `m', `2m' and `3m' days respectively (where `m' is an integer). All the three mentioned persons started working together. Deep continued to work till the defect was fixed, but Harsha left two days and Salil one day before the defect was fixed. Which of the following is true?

(A) Salil cannot take 16 days to complete the defect alone.

(B) Salil cannot take 60 days to complete the defect alone.

(C) Salil cannot take 40 days to complete the defect alone.

(D) None of these

5. There are two containers, each containing equal quantities of the milk and water. In the first container, the respective ratio of water and milk is 2 : 3 and in the second container the respective ratio of water to milk is 1 : 4. Now, these two containers are emptied in a tub in the volume ratio 3 : 4. Which of the following is not true?

(A) The ratio of water and milk in the resulting mixture is less than three-fourth.

(B) The ratio of water and milk is the resulting mixture is greater than two-fifth.

(C) The ratio of water and milk in the resulting mixture is less than three-fifth.

(D) The ratio of water and milk in the resulting mixture is less than two-third.

6. Ketan purchased one share of `Bharat Bijlee' on 1st April 2005 at Rs. 355. He sold it off on
1st April 2006 at Rs. 978. Find his percentage profit if rupee devalued by 4% during that period due to inflation.

(A) 165% (B) 158% (C) 187% (D) 183%

7. In ΔABC, D and E are points on side AC such that AD : DE : EC is 2 : 1 : 1. BD and BE are joined. Point F divides BD in the ratio 1:2 and point G divides BE in the ratio 2:1. Find the ratio of the area of $(\Delta AFG + \Delta BFG)$ to the area of the ΔABC.

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

8. Anuj started writing some natural numbers starting from one and calculated the sum. Later he realized that he forgot to add two consecutive odd numbers and calculated the wrong sum as 2024. Find the numbers that Anuj missed.

(A) 29 and 31 (B) 27 and 29 (C) 31 and 33 (D) 26 and 28

9. In a recently held cricket tournament, Narender Singh Dhoni was out for 22 runs, which increases his average for the tournament from 16 to 17. How many runs would Dhoni have to score in that inning to bring his average upto 20?

(A) 35 (B) 40 (C) 42 (D) None of these

10. 75% of the managers of a multinational company are level G managers and the rest are a level F manager. 80% of the level G managers and 20% of level F managers are entitled to free lunch. What is the total number of managers in the company if 63 managers are not entitled to free lunch?

(A) 180 (B) 160 (C) 240 (D) 220

11. Consider a four-digit number `9ab1', where `a' and `b' are digits. How many such four-digit numbers are possible such that 9 > a > b > 1?

(A) 35 (B) 100 (C) 21 (D) 27

12. Find the value of K, where $K = \frac{(0.625+0.576)^2 - (0.625-0.576)^2}{0.625 \times 0.576}$.

(A) 1 (B) $\frac{1}{4}$ (C) 4 (D) None of these

13. Due to a hole at the bottom of the bucket, a tap takes 2 more minutes to completely fill the bucket. Due to the leakage of water through this hole, a bucket filled completely with water gets emptied in 4 minutes. In how much time can the tap fill the bucket, if there was no hole at the bottom of the bucket?

(A) 8 minutes (B) 2 minutes(C) 4 minutes (D) 6 minutes

14. ITC increased the selling price of their cigarette brand "Gold Leaf" by 20% because of which their profit percentage increased from 10% to 15%. What was the corresponding percentage increase in the cost price of the cigarette brand "Gold Leaf" ?

(A) 14.78% (B) 11.11% (C) 9.09% (D) 7%

15. Himanshu has purchased an apartment in a Lotus World apartment by paying an amount of Rs. 25,70,000. He decides to do some interior decoration in the shop before shifting for which he spends a total of Rs. 1,30,000. However, before shifting, he gets a good offer from Pawan and sells the apartment to Pawan at a profit of 18% percent. Pawan shortly afterwards decides that he will be better off buy a house in another location and decides to sell the apartment back to Himanshu. If Pawan loses a total of Rs. 1,86,000, what would be his loss as a percentage of selling price?

(A) 6.2% (B) 5.8% (C) 6.74% (D) None of these

16. Karan and Arjun decide to go from Mumbai to Goa for attending New Year Party and board two different trains for that purpose. While Karan takes the first train that leaves for Goa, Arjun decides to wait for some time and take a faster train. On the way, Karan

sitting by the window seat noticed that the train boarded by Arjun crossed him in 18 seconds. Now the faster train can travel 240 km in 4 hours, while the slower train takes one and a half times as much time to do it. If the faster train has taken 54 seconds to cross the entire length of the slower train, find the difference between the lengths of the two trains.

(A) 125 m (B) 150 m (C) 75 m (D) 100 m

17. A customer care service branch of WIPRO in Mumbai observes that it receives an email at an interval of every 8 minutes from Canada office, at every 15 minutes from New Jersey office, at the interval of 20 minutes from Texas office and after every 27 minutes it gets the call from Manhattan office. If at 4:00 o'clock in the evening, it has received the emails simultaneously from all the four offices, then at which time it will receive the emails again at the same time from all offices?

(A) 10:20 a.m. (B) 10:00 a.m. (C) 09:40 a.m. (D) 11:00 a.m.

18. Parshuram works as a contractor for Public Work Department and supplies cement for construction work. He has two varieties of cement _ Birla cement and Bharati cement. The two varieties of cement cost Rs. 63 per kg and Rs. 37.5 per kg respectively. How many kilograms of the second variety must Parshuram mix with 28 kg of the first variety, so that he may on selling the mixture at Rs. 60 per kg gain 25% on the outlay?

(A) 48 kg (B) 32 kg (C) 40 kg (D) None of these

19. The Bangalore Rajdhani-R007, which is scheduled to travel on Delhi-Pune-Bangalore route and Bangalore Rajdhani-R096, which is scheduled to travel on Bangalore-Pune-Delhi route, start at the same time from Delhi and Bangalore stations and proceed towards each other at speeds15 m/s and 25 m/s respectively. When the two trains meet, it is found that one train has traveled 72 km more than the other. What is the distance between two Delhi and Bangalore stations?

(A) 144 km (B) 192 km (C) 256 km (D) None of these

-

20. Ananya had some money in the denomination of 25 paise, 50 paise and 1 Rupee coins. Ananya met her friends - Disha and Maitri - each of whom had several coins of each of the three denominations. Ananya first gave one-fourth of her 1 Rupee coins to Disha and in return receives the same number of 25 paise coins. Next she gave all 50 paise coins to Maitri and in return gets thirty six 1 Rupee coins which increases the number of 1 Rupee coins with Ananya to 50% more than the original number. If the number of 25 paise coins with Ananya now is 33, find the number of 25 paise and 1 Rupee coins originally with her.

(A) 30 and 12 (B) 32 and 16 (C) 32 and 15 (D) 30 and 16

21. An overhead tank in the form of a cuboid is filled by two pumps - P1 and P2. P1 can fill the tank in 6 hours while P2 can fill the tank in 9 hours. There is a pump P3 which can empty the tank in 12 hours. Both the inlet pumps are opened simultaneously. The caretaker of the house, before going out on a work, sets a timer to open P3 when the tank is 22.22% filled so that tank is exactly filled up by the time he is back. Due to some technical problem P3 didn't open at all. If the caretaker comes back as per the plan, for how much time was the tank over flowed with?

(A) 48 minutes (B) 1 hour 12 minutes

(C) 1 hour 36 minutes (D) 1 hour 48 minutes

22. City Care hospital provided vaccines for Polio to 500 children. It was found that 150 children were given a single dose of vaccine-A, 150 children were given a single dose of vaccine-B whereas 200 children were given a single dose of each of vaccine-A and vaccine-B. Each of the 500 children chosen has 60% chance of contracting polio. Vaccine-A reduces the probability of contracting polio by 20%, while vaccine-B reduces the probability by 30%. The two vaccines when given together, work independently. If a child, selected randomly from the chosen 500 children, contract polio then what is the probability that the selected child was given vaccine-A?

(A) 0.43 (B) 0.28 (C) 0.37 (D) None of these

23. What is the number of ways in which a mixed double table tennis game can be played amongst 8 brother-sister pairs, if no two siblings can play in the same game?

(A) 1568 (B) 840 (C) 1176 (D) None of these

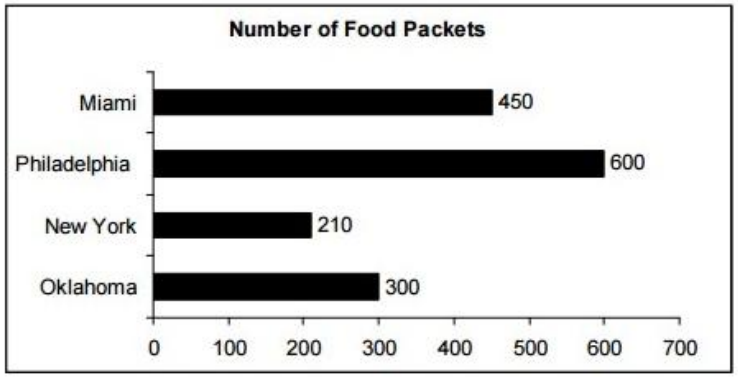
24. A bouncing ball is dropped from a height of 60 meters. The ball bounces back five-sixth of the distance each time before coming to rest. Find the total distance traversed by the ball?

(A) 620 m (B) 640 m (C) 660 m (D) 680 m

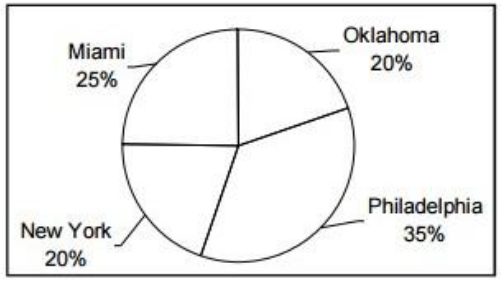
part - 2

Directions for questions 25 and 26: Answer the questions on the basis of the information given below.

Four cities of US have been brutally devastated by Hurricane Katrina and the relief operations are on. The following representation shows the number of food packets distributed by four different helicopter teams in each city on a particular day.



Wastage is defined as the number of food packets left unconsumed by the people of these cities.



The following pie-chart provides data about the percentage of food packets actually consumed by each individual city out of total number of food packets consumed by the people in the four cities.

25. Which of the following is the approximate percentage of wastage in Philadelphia out of the combined wastage done in all the cities, if the combined wastage of all the cities is 25% of the total packets consumed?

(A) 47.6% (B) 52.3% (C) 50.2% (D) 55.8%

26. Given that the total number of packets consumed is 800 and the helicopter teams helping New York and Miami together form only one team only, as a result of which the consumption of both Oklahoma and Philadelphia drop by 30% each. The approximate percentage of the total wastage as the wastage of Philadelphia lies in between

(A) 49% and 52.55% (B) 51% and 53.5% (C) 53.9% and 54.1% (D) 53.9% and 55.2%

Directions for questions 27 to 29: Answer the questions on the basis of the information given below.

In a flower shop, eleven different varieties of flowers namely A, B, C, D, E, F, G, H, I, J and K are sold. The following table provides information about the number of flowers of each variety available in the shop in the beginning of each of the given five days.

Flowers	day 1	day 2	day 3	day 4	day 5
A	195	250	241	230	215
B	233	212	209	183	222
C	226	262	194	246	195
D	241	204	208	191	186
E	189	199	261	225	210
F	207	276	179	184	211
G	213	182	228	216	192
H	185	197	241	219	235
I	214	254	233	191	182
J	183	211	239	245	190
K	227	194	178	257	220

27. On the day 4, all the flowers of varieties G, H, I, J and K were found to be damaged. A magician regenerates new flowers equal in number to the total number of damaged flowers. The new flowers
generated by the magician are of varieties A, B, C, D, E and F and the number of new flowers of each variety generated by the magician is same. Find the total number of flowers of variety
B available in the flower shop on the day 4.

(A) 371 (B) 372 (C) 373 (D) 374

28. If T denotes fifty percent of the total number of available flowers of varieties D and I on day 1, 2 and 3 taken together, W denotes eighty percent of the aggregate number of available flowers of varieties D and I on day 4 and 5 taken together and M denotes twenty percent of aggregate number of available flowers of varieties D and I on day 4 and 5 taken together, then find the value of
(T - M + 2W).

(A) 1726 (B) 1727 (C) 1728 (D) 1729

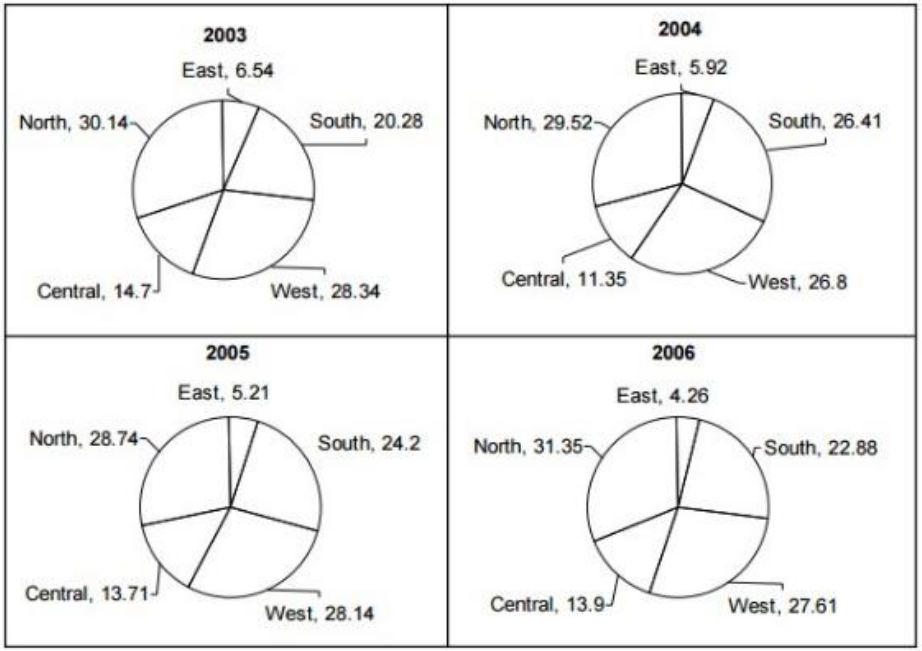
29. Aggregate number of flowers of varieties A, B, C and K across all the five days form what percentage of aggregate number of flowers of all varieties across all the five days ?

(A) 31.24% (B) 37.16% (C) 39.33% (D) 35.67%

Directions for questions 30 to 33: Answer the questions on the basis of the information given below.

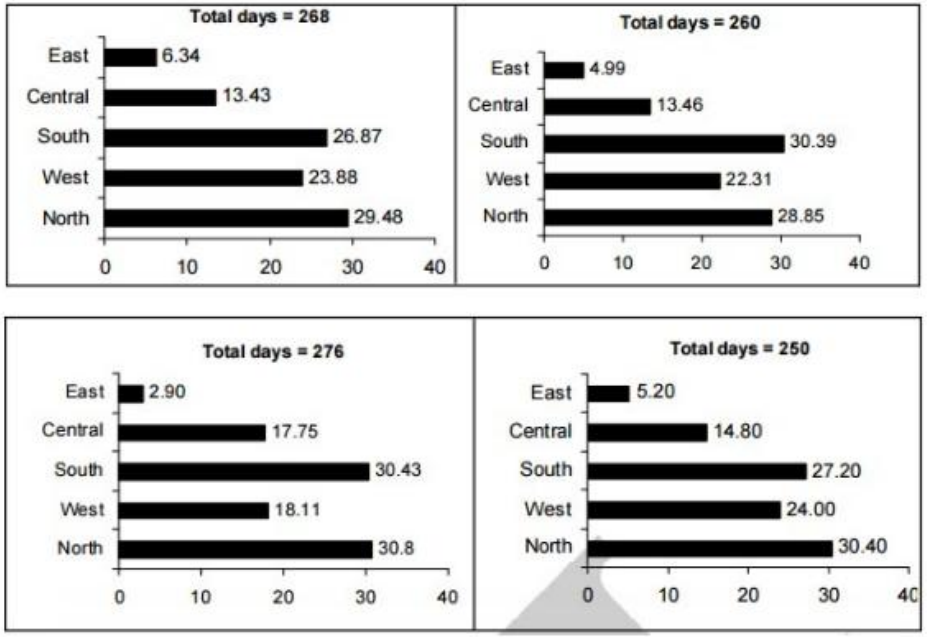
The charts given below shows the shares of SMS votes of five different regions of India in the Indian Idiot contest from 2003-2006 and the distribution of topmost voter (region that voted most on a particular day).

SMS VOTE SHAREs



Distribution of topmost voter 2003 to 2006

(On a scale of per 100 days of voting)



30. Mark the correct statement.

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(A) Between 2003-2006, the year in which SMS vote share value for south was maximum, also saw it standing as the 2nd highest in terms of number of days as topmost voter.

(B) At least one region had a consistent increase in SMS vote share.

(C) None except North, itself, crossed the number of days as topmost voter it had in the year 2003.

(D) Combined SMS share of East and South changed by a larger margin in 2004 over 2003 as compared to 2006 over 2005.

31. Mark the correct statement.

(A) The years in which South's SMS vote share increased over the previous year were the same years when North's number of days as topmost voter decreased.

(B) In 2005 all regions gained in terms of number of days as topmost voters than in 2003.

(C) The year in which East had its best performance in terms of number of days as topmost voter was 2003.

(D) Change in number of days as topmost voter for Central Zone for the year 2006 over 2005 was
more than 15 times that of year 2004 over 2003.

32. Mark the correct statement.

(A) Combined number of days as topmost voter for West and East was maximum in 2004.

(B) The maximum number of days as topmost voter for Central Zone in a year was less than the minimum one for West.

(C) Percentage change in SMS vote share of South in 2006 over 2003 was more than percentage change in SMS share of Central Zone in 2005 over 2004.

(D) The year in which most regions had a increase in the SMS vote share over the previous year was 2004.

33. Mark the correct statement.

(A) Central and East combined had more number of days as topmost voter than the West Zone in all 4 years together.

(B) In two of the four years, West had the same rank in SMS vote share as the one in number of days as topmost voter.

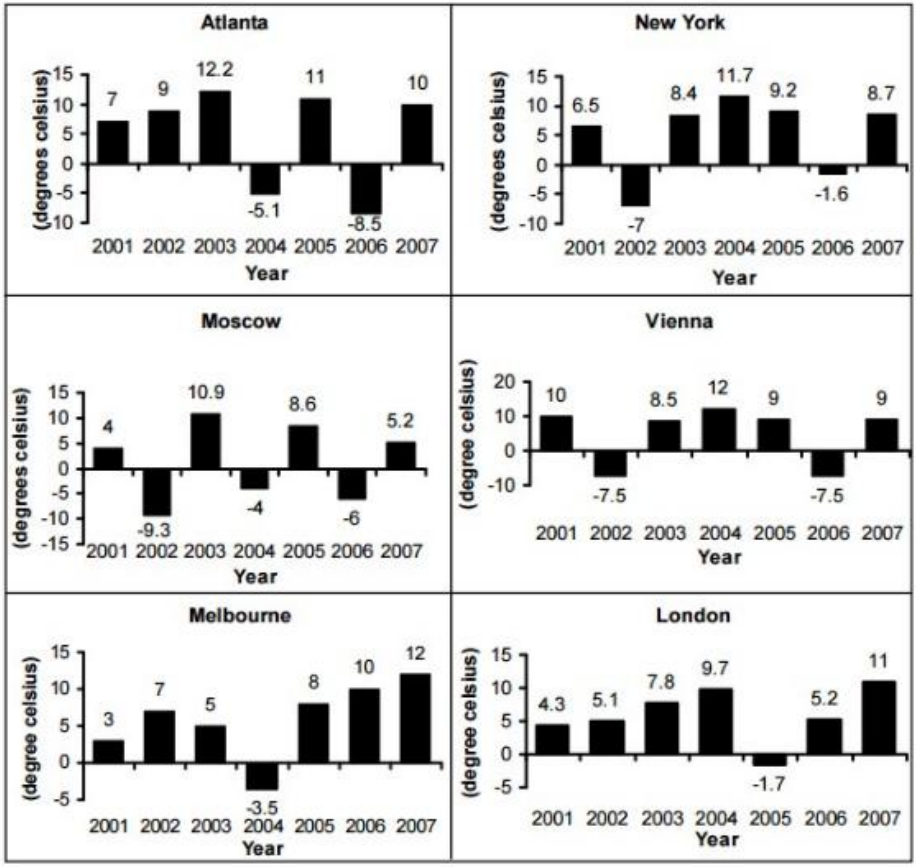
(C) There was only one year where North failed to top in the number of days as topmost voter.

(D) The percentage of total number of days (in 4 years) where North was the topmost voter is more than 30%.

Directions for questions 34 and 35: Answer the question on the basis of information given below.

The graphs below shows the temperature in degree celsius for six cities for the period 2001 to 2007.

Atlanta New York



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Moscow Vienna

Melbourne London

34. Mark the correct statement.

(A) The highest temperature fluctuation among the mentioned cities for the period 2001-2007 was in Moscow.

(B) The least temperature fluctuation for the period 2001-2007 was in Melbourne.

(C) In 2005 if the cities were ranked (descending order) on the base of temperature increase over the previous year, then Moscow would be ranked second.

(D) The average temperature for the period 2001-2007 is the third least for - Vienna.

35. Mark the correct statement.

(A) The percentage increase in temperature in 2005 over 2002 is the maximum for Vienna.

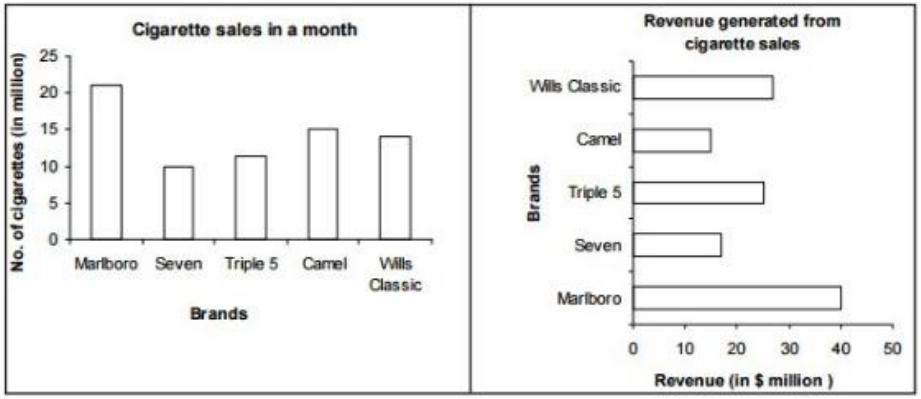
(B) The percentage increase in temperature in 2007 over 2001 is the lowest for Moscow.

(C) The percentage increase in temperature in 2005 over 2002 is the least for Melbourne.

(D) The percentage increase in temperature in 2007 over 2001 is the third highest for Atlanta.

Directions for questions 36 to 40: Answer the question on the basis of information given below.

Following graphs give the data of the number of cigarettes sold and the amount of revenue generated by five different cigarette brands in a single month.



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36. What is the average price of a pack of ten cigarettes of Wills Classic?

(A) $35 (B) $28 (C) $19 (D) $14

37. By what percent, a Marlboro cigarette is cheaper/costlier than a Triple 5 cigarette?

(A) 21% cheaper (B) 17% cheaper (C) 17% costlier (D) 21% costlier

38. If a standard pack of cigarette contains 20 cigarettes, then what is the difference (In the number of packs) between the brand selling the maximum and the minimum number of packs?

(A) 1 million (B) 1.5 million (C) 0.5 million (D) 0.55 million

39. If the prices of a single cigarette of Seven and Camel are interchanged with their respective number of cigarettes sold remaining constant, then what will be the percentage change in the revenue of Camel?

(A) 70% increase (B) 7% increase (C) 7% decrease (D) Cannot be determined

40. Which is the most favourite brand in the market?

(A) Marlboro (B) Camel (C) Wills Classic (D) Data Insufficient

part - 3

Directions for questions 41 to 45: Read the given information and answer the following questions based on it.

Six friends namely Sharad, Ujjawal, Brijesh, Jeetu, Bharti and Abhi have passed out from the different universities with specilization in one of the fields. No two friends have neither passed from the same university nor they have the same area of specialization. The six universities are Delhi, Mumbai, Kolkata, Madras, Punjab and Rajasthan and the fields of specialization are Marketing, Finance, Operations, System, Information Technology (IT) and Human Resource (HR).

Further, more information is given as

(a) The one who is passed out from Mumbai university is specialized in System.

(b) Sharad is specialized in HR from Delhi University.

(c) Jeetu has passed out from Punjab university.

(d) Ujjawal is specialized in Operations and Abhi is specialized in Marketing.

(e) Brijesh and Abhi are not passed out from Rajasthan and Kolkata university respectively. Brijesh is specialized in Finance.

41. Who is specialized in the `IT'?

(A) Jeetu (B) Bharti (C) Abhi (D) Sharad

42. Who is passed out from `Mumbai University'?

(A) Brijesh (B) Ujjawal (C) Abhi (D) Bharti

43. If Abhi is passed out of `Rajasthan University', then who is passed out of `Kolkata University'?

(A) Ujjawal (B) Brijesh (C) Bharti (D) Cannot be determined

44. If Brijesh is passed out of `Madras University', then Ujjawal is passed out of which of the following university?

(A) Delhi (B) Rajasthan (C) Kolkata (D) Madras

45. Which of the following may not be a possible combination of University and Specialization?

(A) Rajasthan - Operations (B) Madras - Marketing

(C) Kolkata - Finance (D) None of these

Directions for questions 46 to 48: Answer the questions on the basis of the information given below.

There are five male scientists and three female scientists in a conference. The male scientists are Raman, Amar, Hargovind, Ravinder and Shekhar; the female scientists are Deep, Sen and Nath. Each person delivers a report to the assembly as follows:

Each female scientist delivers her report only after a male scientist. The first scientist who delivers his report is Shekhar, and Amar delivers immediately after him.

46. How many ways can they deliver their reports in the conference?

(A) 36 (B) 72 (C) 144 (D) 160

47. Among the following, which will not be an appropriate order of delivering reports?

(A) Shekhar, Amar, Sen, Hargovind, Ravinder, Deep, Raman, Nath

(B) Shekhar, Amar, Sen, Hargovind, Deep, Ravinder, Raman, Nath

(C) Shekhar, Amar, Hargovind, Deep, Ravinder, Sen, Raman, Nath

(D) Shekhar, Amar, Hargovind, Deep, Sen, Ravinder, Raman, Nath

48. If Sen speaks at the fifth position and Ravinder speaks at last position. Then among the following, which will be an appropriate order of delivering reports?

(A) Shekhar, Amar, Hargovind, Deep, Sen, Raman, Nath, Ravinder

(B) Shekhar, Amar, Deep, Raman, Sen, Hargovind, Nath, Ravinder

(C) Shekhar, Amar, Deep, Raman, Sen, Nath, Hargovind, Ravinder

(D) Shekhar, Amar, Sen, Raman, Deep, Hargovind, Nath, Ravinder

Directions for questions 49 and 50: Answer the questions on the basis of the information given below.

Four teams:_ India, Pakistan, Srilanka and Bangladesh_ participated in the Asian Cricket Championship.
A match happens between two teams and a team must play exactly one match with each of the other teams. A match can result in win for a team and loss for the other or a draw. Three points are awarded to the winning team in each match and the losing team doesn't get any points. In case the match ends in a draw, one point is awarded to each of the two teams. At the end of the championship, India had seven points, Pakistan also had seven points whereas Bangladesh and Srilanka both had just one point each.

Match Schedule

		Draw	If not Draw	
			Winning Team	Losing Team
18-6-2006	India vs Srilanka			
19-6-2006	Pakistan vs Bangladesh			
20-6-2007	India vs Bangladesh			
21-6-2007	Pakistan vs Srilanka			
22-6-2008	Bangladesh vs Srilanka			
23-6-2008	India vs Pakistan			

49. Based on the information given above, in how many ways can the above Match Schedule be filled?

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

50. Which of the following statements could be true?

(I) Only one of the six matches ended in a draw.

(II) Srilanka vs Bangladesh match ended in a draw.

(III) India vs Pakistan match ended in a draw.

(A) (I) and (II) only (B) (I) and (III) only

(C) (II) and (III) only (D) (I), (II), (III)

Directions for questions 51 to 53: Read the given information and answer the following questions
based on it.

Neeta shared the following information with Nandini.

"I live with a brother of mine who sent a box of chocolates to another brother of mine who is in the army. The army officer met your sister, an engineer, while she was in Delhi. He gave her that box of chocolates. Your sister passed the box to your father's only son, a

lecturer, who in turn passed it on to my cousin who is a Doctor. The doctor passed the box to another brother of mine stationed at Shillong. He practices Law. The Lawyer passed the box to my mother's youngest son, who is a Chef at Taj Ganges. A sister of mine who is a Chartered Accountant received this box by courier. None of brothers practice the same profession."

51. How many brothers, does Neeta have?

(A) 2 (B) 3 (C) 4 (D) Cannot be determined

52. Out of the following, Neeta's brothers DO NOT practice which of the following professions?

(A) Tantrik (B) Chef (C) Armed Forces (D) Cannot be determined

53. What does Nandini's brother do?

(A) Law (B) Teaching (C) Medicine (D) Armed combat

Directions for questions 54 to 57: Answer the questions on the basis of the information given below.

Thirty-Six motorbikes from Germany, France, Brazil, Argentina and Mexico participated in the contest `Motor Bike of the Year'. Each bike was classified in one of the six categories:-

(i) Touring

(ii) Sport Touring

(iii) Cruiser

(iv) Standard

(v) Sport and

(vi) Motocross

Some additional information regarding the motorbikes is given below.

A. The number of Standard motorbikes is exactly half the number of Touring motorbikes as well as the number of Cruiser motorbikes and the number of Sport Touring motorbikes is exactly one-third of the number of Sport motorbikes as well as the number of Motocross motorbikes.

B. There is no Touring motorbike from Brazil or Mexico.

C. There is neither Sport Touring motorbike nor Standard motorbike from Germany or Argentina. Excepting the facts stated above, there is at least one motorbike of each category from each one of the given five countries.

D. There are at most three motorbikes of any single category from any single country.

E. Had there been two motorbikes less from Germany, the number of motorbikes from France would have been twice the number of motorbikes from Germany as well as the number of motorbikes from Brazil.

F. The number of motorbikes from Argentina and Mexico are equal and less than seven each.

G. CBR1000RR is the only Touring motorbike from Argentina and CBR1000R and CBR600RR are the only Touring motorbikes from France.

54. For how many countries, the exact number of motorbikes of each of the six categories cannot be determined?

(A) Four (B) Three (C) Two (D) One

55. What is the ratio of the number of Sport motorbikes from France and Motocross motorbikes from Mexico?

(A) 4 : 3 (B) 3 : 1 (C) 3 : 2 (D) 1 : 1

56. If it is known that there are two Sport motorbikes from Germany, then what is the ratio of the number of Motocross motorbikes from Brazil and Argentina?

(A) 1 : 2 (B) 2 : 1 (C) 1 : 1 (D) Cannot be determined

57. Which of the following statements can be true?

A. The difference between the number of Touring motorbikes from Germany and the number of Motocross motorbikes from Germany is 0.

B. The difference between the number of Sport motorbikes from France and the number of Sport motorbikes from Argentina is 0.

C. The difference between the number of Sport motorbikes from France and the number of Sport motorbikes from Brazil is 2.

D. The difference between the number of Cruiser motorbikes from France and the number of Cruiser motorbikes from Mexico is 0.

(A) A and B (B) B and D (C) A and D (D) A and C

Directions for question 58 to 60: Read the following instructions and answer the following questions.

After the discussion at a board meeting, the criteria for recruitment of manager in ABC Heavy Electronics Ltd. were finalized as follows. The candidate must:

(i) Be a Mechanical/Electronics engineer and should have obtained at least 55 percent marks in B. Tech.

(ii) Be at least 30 years and not more than 40 years old as on 09.06.2011.

(iii) Have secured at least 50 percent marks in the entrance examination.

(iv) Have secured at least 60 percent marks in the personal interview.

(v) Have post-qualification work experience of at least 6 years in heavy electronics sector.

However if the candidate satisfies all the above-mentioned criteria except:

(a) Criteria (i), but has secured at least 75% percent marks in post-graduation, the case may be referred to the General Manager of the organization.

(b) Criteria (ii), but has post-qualification experience of at least eight years as Assistant Manager in any such equivalent firm, the case may be referred to the Managing Director of the organization.

Based on the above criteria and information provided on each of the candidates in the questions below. You have to decide which course of action should be taken against each candidate. Without assuming any
thing regarding any candidate, the decision should be based on information provided. All these cases are given to you as on 01.01.2012.

58. Anurag Mittal was born on 25th May 1971. He secured 70% marks in B. Tech. in Mechanical in the year 2004. He is working as Assistant Manager in a heavy electronics sector of company X in Bhopal since 2nd August 2004. He had secured 55% marks in both entrance examination and personal interview.

(A) Candidate is to be selected.

(B) Candidate is not to be selected.

(C) The case is to be referred to General Manager of the organization.

(D) The case is to be referred to Managing Director of the organization.

59. Harshita Mehra has been working in a chemical firm for the past 9 years after completing her B. Tech. in Chemical in with 65% marks. She has secured 61% marks in

personal interview and 58% marks in the entrance examination. She was born on 18th December 1968.

(A) Candidate is to be selected.

(B) Candidate is not to be selected.

(C) The case is to be referred to General Manager of the organization.

(D) The case is to be referred to Managing Director of the organization.

60. Govardhan Mishra was born on 10th September 1960. He has secured 75% marks in both entrance examination and personal interview. He has been working as an Assistant Manager for the last 9 years in an organization after completing his post-graduation in engineering with 78% marks.

(A) Candidate is to be selected.

(B) Candidate is not to be selected.

(C) The case is to be referred to General Manager of the organization.

(D) The case is to be referred to Managing Director of the organization.

Directions for question 61 to 62: In each of the questions a statement is followed by two assumptions.

These assumptions may or may not be implicit in the statement. Identify the assumption implicit in the statement and mark your response in accordance with the following code.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Both assumptions I and II are implicit

(D) Neither assumption I nor II is implicit

61. **Statement:** Tanu asked her servant to get vegetables from the market.

AssumptionI: The servant will be able to purchase the vegetables.

AssumptionII: The servant will be able to locate the vegetable market.

62. **Statement:** Women's rights activists want the parliament to pass the bill that reserves 33% of the seats in parliament for women at the earliest.

AssumptionI: The passing of the bill will lead to empowerment of women in the political arena.

Assumption II: The passing of the bill will lead to a reduction in the crimes against women.

Directions for questions 63 and 64: In making decisions about important questions, it is desirable to be able to distinguish between `strong' arguments and `weak' arguments. `Strong' arguments are those that are both important and directly related to the question. `Weak' arguments are those that are of minor importance and also may not be directly related to the question or may be related to a trivial aspect of the question. Each question below is followed by two arguments numbered II and I. You have to decide which of the arguments is a `strong' argument and which is a `weak ' argument.

Then mark:

(A) argument I is strong

(B) argument Il is strong

(C) both I and II are Strong

(D) Neither I nor II is strong

(D) Neither assumption I nor II is implicit

61. **Statement:** Tanu asked her servant to get vegetables from the market.

AssumptionI: The servant will be able to purchase the vegetables.

AssumptionII: The servant will be able to locate the vegetable market.

62. **Statement:** Women's rights activists want the parliament to pass the bill that reserves 33% of the seats in parliament for women at the earliest.

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Then mark:

(A) argument I is strong

(B) argument Il is strong

(C) both I and II are Strong

(D) Neither I nor II is strong

63. **Question:** Should Indian Railways be privatized to generate more profits?

Argument I. No, privatization is not the only means to profit; reforms and their rigorous implementation will eliminate the need for privatization.

Argument II. No, the Indian Railways needs to fulfill some social responsibilities and cannot overlook them.

64. **Question:** Should Delhi circle rates be revised (circle rates are the government's valuation of land in the city - differentiated into eight categories, A to H - below which a realty deal cannot be registered)?

Argument I. Yes, the current rates are much below real property values in the city.

Argument II. Yes, this will lead to reduction in the black money component in property deals.

65. Nine blue balls and 12 black balls are placed in 2 boxes. What can be the maximum possible probability that a ball picked from any of the boxes is blue?

(A) $\frac{3}{7}$ (B) $\frac{4}{7}$ (C) $\frac{1}{2}$ (D) $\frac{7}{10}$

66. A man alone can plant rice in a field in 4 days and his wife alone can complete that job in 6 days. Due to a fight, only one of them works in the field on a day. What is the probability that the work will be completed in not more than 5 days?

(A) $\frac{3}{4}$ (B) $\frac{4}{7}$ (C) $\frac{25}{37}$ (D) $\frac{5}{7}$

Test 9 - XAT

Number of questions: 28 **Time: 40 mins**

Note: Questions in each sections have been alloted different mark(s), which are indicated on the right hand side of each question. Negative marks (1/4th of the marks alloted to each question) may be deducted for incorrect answers.

Data Interpretation & Quantitative Ability

Directions for questions 1 and 2: Answer the questions on the basis of the information given below.

Out of the first 100 natural numbers, a number N exists such that it has the maximum possible number of factors M.

1. What is the value of M? **1**

(A) 8 (B) 9 (C) 10 (D) 12 (E) 16

2. How many such different values of N exist? **1**

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

3. If a number has exactly 7 composite factors except the number itself, then find the minimum possible sum of all the prime factors of this number? **1**

(A) 2 (B) 3 (C) 5 (D) 7 (E) 10

4. Between 1350 and 2450, how many natural numbers when divided by 11, 8 and 6 gives remainder
2, 3 and 5 respectively? **1.5**

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

5. If $f(x) = 90x^2 + 20x + 1$, then find the sum of digits of f(11111). **1.5**

(A) 111 (B) 11 (C) 1111 (D) 11011 (E) 101

6. The polynomial equation $x^3 - px^2 + qx - 100 = 0$ (p, q > 0) has three integral roots, two of which are equal. Which of the following can never be true about p and q? **1**

(A) p + q = 303 (B) q - p = 75 (C) 2p + q = 162

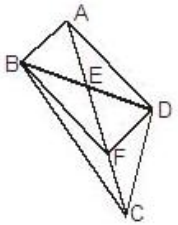
(D) 2q - p = 116 (E) None of these

7. Find the minimum possible value of $\frac{(5+x)(7+x)}{(1+x)}$. (x is real number.) **1**

(A) $2(2\sqrt{6}+5)$ (B) $2\sqrt{5}+6$ (C) $2(2\sqrt{5}+6)$

(D) $4(\sqrt{6}+2)$ (E) $6\sqrt{5}+2$

8. In the figure given below, AD = CD and AE = EF = CF = BE = DE = 1 unit. Find the ratio of the area of the circumcircle of BFD to the area of the quadrilateral ABCD. **0.5**



(A) $\pi : \sqrt{2}$ (B) $2\pi : 3\sqrt{3}$ (C) $\pi : \sqrt{3}$ (D) $\pi : 2\sqrt{2}$ (E) Data Insufficient

9. Arkava and Bimal can complete a piece of work in 14 days and 35 days respectively. Arkava and Bimal start working together and one third of the work done by them in a day

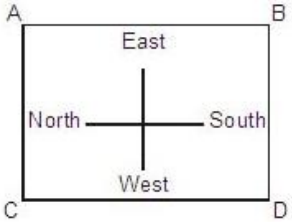
is destroyed at the end of the day. In how many days the work will be completed? **0.5**

(A) 7 days (B) 10 days (C) 12 days (D) 14 days (E) None of these

10. Ratio of the number of chocolates with A, B, C, D and E is 6:7:8:9:10 respectively. How many of them have more than 20% of the total number of chocolates? **0.5**

(A) 0 (B) 1 (C) 2 (D) 3 (E) None of these

11. Four persons A, B, C and D are standing on the four corners of a square field as shown in the figure. While answering the questions, keep in mind the directions as shown in the figure. **0.5**



From the position shown in the above figure, A, B, C and D walk across the field along the diagonals to reach the opposite vertex from where B and C walk in anticlockwise direction, and A and D in clockwise direction along the sides. Each one covers one side of the square. Now indicate which one of the following is true?

(A) C is to the north-west of the centre of the field

(B) B is to the north-east of the centre of the field

(C) A is to the south-west of the centre of the field

(D) A is to the north-west of the centre of the field

(E) None of the above

Directions for questions 12 and 13: Answer the questions on the basis of the information given below.

The distance between towns A and B is less than 100 miles. Pinky starts from A and after 10 hours comes across a milestone indicating the distance from A to that point as a two digit number. She proceeds further at the same speed and 2 hours later comes to another milestone which shows its distance from A as a two digit number having the same digits as in the first milestone, but in the reverse order.

12. The distance covered by Pinky when she reaches the second milestone is **1**

(A) 63 miles (B) 54 miles (C) 72 miles (D) 75 miles (E) Data insufficient

13. What is Pinky's speed? **1**

(A) 6 miles/hr (B) 4.5 miles/hr (C) 5 miles/hr (D) 5.5 miles/hr (E) Data insufficient

14. Let $b_1, b_2, b_3 \cdots$ be positive quantities which are in AP and $S_r = b_1 + b_2 + b_3 + \cdots + b_r (r = 1, 2, 3, \cdots)$.

If $\frac{S_m}{S_n} = \left(\frac{m}{n}\right)^2$ for every m and n, then $\frac{b_m}{b_n}$ = **1.5**

(A) $\frac{m}{n}$ (B) $\frac{2m-1}{2n-1}$ (C) $\frac{2m-1}{2n+1}$ (D) $\frac{m}{n-1}$ (E) None of these

15. There are four persons - A, B, C and D - standing in a queue. Four distinct numbers are written on the shirt of each of these four persons such that each shirt contains exactly one number. The number written on all the shirts is a positive integer. It is also known that the numbers written on the shirts of A, B and C is in a arithmetic progression and the number written on the shirts of B, C and D is in a geometric progression. If the difference between the numbers written on the shirts of D and A is 48, then find the sum of the numbers written on the shirts of all the four persons. **1**

(A) 333 (B) 321 (C) 348 (D) 318 (E) None of these

16. An eight-digit telephone number consists of exactly two zeroes. One of the digit is repeated thrice. Remaining three digits are all distinct. If the first three digits (from left to right) are 987, then find the probability of having only one 9, one 8 and one 7 in the telephone number **1**

(A) $\frac{5}{47}$ (B) $\frac{1}{18}$ (C) $\frac{5}{23}$ (D) $\frac{1}{20}$ (E) $\frac{1}{10}$

Question Nos. 17 and 18 are followed by two statements labeled as I and II. Decide if these statements are sufficient to conclusively answer the question. Choose the appropriate answer from the options given below.

(A) Statement I alone is sufficient to answer the question.

(B) Statement II alone is sufficient to answer the question.

(C) Statement I and statement II together are sufficient, but neither of the two alone is sufficient to

answer the question.

(D) Either statement I or statement II alone is sufficient to answer the question.

(E) Neither statement I nor statement II is necessary to answer the question.

17. The average age of the members in a gymnastic team is 27 with no member having age less than
4 years. The age of all the members in the team is an integer in years. Find the number of possible values of the age of a particular member. **1**

I. The new average age of the members in the team is two more than the number of members in the team after that particular member was excluded.

II. The new average age of the members in the team is twice the age of that particular member if he is excluded from the team.

18. Consider a quadratic equation $ax^2 + bx + c = 0$ where a, b, c are real numbers. If `k' is the arithmetic mean of the roots of this equation, then is the value of $ax^2 + bx + c$ at $x = k$ greater than 0? **1.5**

I. The expression $ax^2 + bx + c$ attains a definite maximum value and both the roots of the equation are real and negative.

II. The expression $ax^2 + bx + c$ attains a definite minimum value and both the roots of the equation are real and negative.

Answer questions nos. 19 to 22 based on the following information.

The following table provides information about the quantity (in tons) of 6 different mineral ores - Iron, Mica, Zinc, Copper, Tin and Sulphur - produced in eleven different countries - Syria, Pakistan, Sri Lanka, India, South Africa, Nigeria, Australia, Russia, Argentina, France and Bolivia - in the year 2006-07. Assume that these six mentioned mineral ores are the only mineral ores produced in these eleven mentioned countries.

	Iron	Mica	Zinc	Copper	Tin	Sulphur
Syria	2437	1167	546	3124	1769	1529
Pakistan	2145	1256	254	2510	1235	1124
Sri Lanka	2965	498	169	3856	981	987
India	1635	1789	674	2165	1692	854
South Africa	1879	1647	589	1987	879	1897
Nigeria	1555	666	555	3987	568	1654
Australia	1269	1298	254	3569	1899	2158
Russia	259	1367	871	2457	2154	456
Argentina	687	1987	657	2719	1458	1487
France	1659	2459	548	2689	2156	2113
Bolivia	899	2368	198	4574	1324	1045

19. For which country the quantity of Mica produced as a percentage of the total quantity of mineral ores produced in that country is highest among these eleven mentioned countries? **1**

(A) Argentina (B) France (C) Bolivia (D) India (E) Russia

20. For how many countries the ratio of the quantity of Iron to the quantity of Mica produced is greater than the ratio of the quantity of Tin to the quantity of Sulphur produced in that particular country?

(A) 7 (B) 8 (C) 5 (D) 6 (E) 10 **1**

21. Find the quantity of Iron produced in India as a percentage of the total quantity of mineral ores produced in India. **1**

(A) 13.24% (B) 15.34% (C) 22.12% (D) 27.49% (E) 18.56%

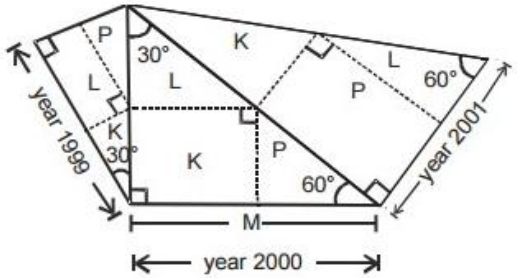
22. For which country the ratio of the absolute difference between the quantities of Tin and Copper produced to the quantity of Zinc produced in that country fourth lowest among these eleven mentioned countries? **1**

(A) Argentina (B) France (C) Syria (D) South Africa (E) India

Answer questions nos. 23 to 25 based on the following information.

KEHDONA Perfumeries Ltd. makes only three deodorant brands "khusphus", "phusphus" & "LUSPHUS". In any given year, the total produced number of bottles of any deodorant brand in a year is given by the area occupied by it in the corresponding triangle of total production in square units. Within any triangle, the midpoints of sides are joined to make out the volume produced of a particular brand.(P, K or L)

Year wise production Diagram:



M = 1000 units, P ≡ Phusphus, L ≡ Lusphus, K ≡ Khusphus

23. In the year 1999, cost price per bottle of KHUSPHUS is 20% higher than that of LUSPHUS which costs 10% less than that of PHUSPHUS. In the same year, KHUSPHUS was sold at 10% profit at Rs. 80/bottle. If the overall profit of the company was 10% in the year 1999; a pack of 3 deodorants containing one bottle each of these brands was sold at **1**

(A) Rs. 215.25 (B) Rs. 175.25 (C) Rs. 220.75 (D) Rs. 245.35 (E) Rs. 252.35

24. From 1999 to 2001, the percentage contribution of PHUSPHUS in the total production of KEHDONA perfumeries Ltd. has changed by **1.5**

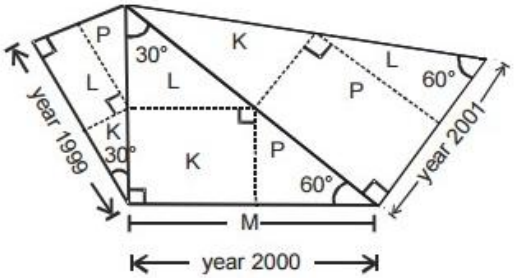
(A) 25% (B) 50% (C) 100% (D) 75% (E) 80%

25. The ratio of the total production of KHUSPHUS to that of LUSPHUS from 1999 to 2001 is : **0.5**

(A) 1.065 (B) 0.938 (C) 1.025 (D) 0.945 (E) None of these

Answer questions nos. 26 to 28 based on the following information.

Kumar studies on all the days in a week. The following line graph provides information about the total number of hours for which Kumar studied on Tuesday and Friday in each of the ten weeks and the total number of hours for which Kumar studied in each of the ten weeks - I, II, III, IV, V, VI, VII, VIII, IX and X.



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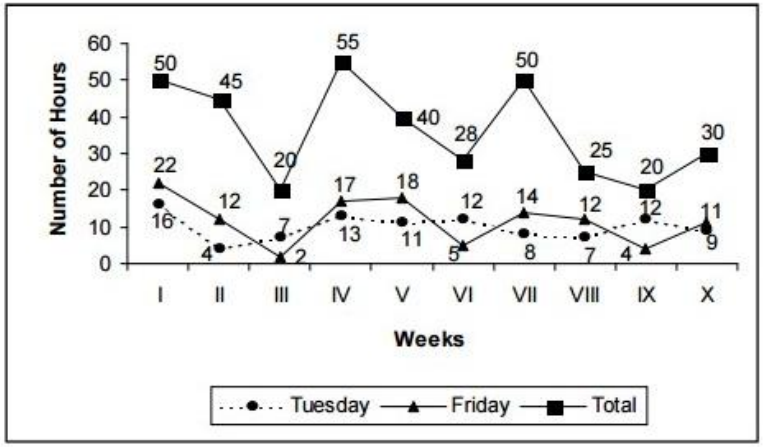
Answer questions nos. 26 to 28 based on the following information.

Kumar studies on all the days in a week. The following line graph provides information about the total number of hours for which Kumar studied on Tuesday and Friday in each of the ten weeks and the total number of hours for which Kumar studied in each of the ten weeks - I, II, III, IV, V, VI, VII, VIII, IX and X.



26. In which week is the total number of hours for which Kumar studied on days except Tuesday and Friday the maximum? **1**

(A) VII (B) I (C) IV (D) III (E) II

27. In which week did the number of hours for which Kumar studied on Tuesday witnessed the maximum percentage increase? **1**

(A) II (B) IV (C) III (D) IX (E) None of these

28. What is the difference between the average number of hours per week for which Kumar studied in the mentioned ten weeks and the average number of hours per 5 days (Sunday, Monday, Wednesday, Thursday, Saturday) for which he studied in the mentioned ten weeks? **1**

(A) 21.6 hrs (B) 20.4 hrs (C) 22 hrs (D) 22.6 hrs (E) 22.4 hrs

Test 10 - XAT

Number of questions: 28 **Time: 40 mins**

Note: All questions carry 1 mark each. In each section, for first five incorrect attempts there is a penalty of 1/3 marks each and subsequent incorrect attempts attract a penalty of half a mark each.

Data Interpretation & Quantitative Ability

1. What is the range of the values of y - co-ordinate on the curve $y = 2x^2$ which lie inside the region bounded by the curves $2x - 1 = 0$, $y - 4 = 0$, $x + y = 6$ and the X - axis?

(A) $\frac{1}{2} < y < \frac{9}{2}$ (B) $\frac{1}{2} \le y \le \frac{3}{2}$ (C) $\frac{1}{2} \le y \le 4$

(D) $\frac{1}{2} < y < 4$ (E) None of the above

2. In ΔPQR, the length of each side is 6 cm. S and T are two points on sides QR and PR respectively such that QS : SR = PT : TR = 1 : 2. If the points P and S are joined and a line is drawn parallel to PS, passing through T and meeting QR at X, then what will be the length of TX?

(A) $\frac{2}{3}\sqrt{7}$ cm (B) $\frac{4}{3}\sqrt{7}$ cm (C) $\frac{6}{5}\sqrt{11}$ cm (D) $\frac{3}{5}\sqrt{11}$ cm (E) None of the above

3. Let $R_1, R_2 \ldots R_n$ be `n' rectangles with their length and breadth in the ratio 2 : 1. For $n \ge 1$, the length of the diagonal R_n is the breadth of the rectangle R_{n+1}. If the breadth of R_1 is 1cm, then what is the length of R_n(in cm)?

(A) $5^{\frac{n-1}{2}}$ (B) $2 \times 5^{n-1}$ (C) $10^{\frac{n-1}{2}}$ (D) $10^{\frac{n-1}{2}} \times 2^{\frac{3-n}{2}}$ (E) None of the above

4. A milkman has 100 litres solution of milk and water such that the concentration of milk is 20%. He mixes another 200 litres of milk and water solution into it such that the final concentration of milk becomes X %.

What can be said about X?

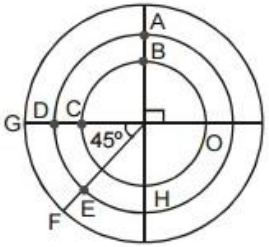
(A) $6.66 \le X \le 73.33$ (B) $5 \le X \le 60$ (C) $10 \le X \le 80.33$ (D) $20 \le X \le 100$ (E) None of the above

5. ABCD is a parallelogram. If the lengths of its diagonals are $\sqrt{37}$ units and $\sqrt{93}$ units, and product of its two sides is 28 square units, then what is the area (in sq. units) of the parallelogram?

(A) 15 (B) $14\sqrt{3}$ (C) $16\sqrt{2}$ (D) $15\sqrt{7}$ (E) None of the above

6. The Registration number of Lisa's car is a 10-digit number. Though she forgets the last four digits, she can recall that the product of those digits is an odd number which has more than two factors. How many trials would guarantee access to the online details of the vehicle?

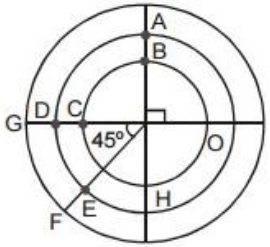
(A) 625 (B) 608 (C) 612 (D) 624 (E) 613

7. 

In the figure given above there are 3 concentric circular paths with radii 12 cm, 6 cm and 3 cm. Which of the following correctly gives the measurement of three alternate paths in ascending order?

more than two factors. How many trials would guarantee access to the online details of the vehicle?

(A) 625 (B) 608 (C) 612 (D) 624 (E) 613

7. 

In the figure given above there are 3 concentric circular paths with radii 12 cm, 6 cm and 3 cm. Which of the following correctly gives the measurement of three alternate paths in ascending order?

(**Note:** The distance between any two points is the shortest possible along the given path.)

I. ABCDEF

II. ADEF

III. ABOHCGF

(A) II, I, III (B) I, II, III (C) III, II, I (D) III, I, II (E) None of the above

8. Three poles P_1, P_2 and P_3 stand in a row, in the same order. The heights of P_1, P_2 and P_3 are 4, 8 and 12 metres respectively. The distance between P_1 and P_2 and the distance between P_2 and P_3 are 10 and 14 metres respectively. The top of P_1 is joined with the foot of P_3 and the foot of P_1 is joined with the top of P_3. If the two lines intersect at the point X, then what is the distance (in meters) between X and the foot of P_2?

(A) 3 (B) $\frac{24}{11}$ (C) 5 (D) 4 (E) $\frac{25}{9}$

9. A manufacturer produces two types of products A and B, both of which are subjected to two operations X and Y. Each unit of A takes 5 hours of operation X and 3 hours of operation Y whereas each unit of B takes 4 hours of operation X and 4 hours of operation Y. There are 23 machines on which operation X can be performed and 17 machines on which operation Y can be performed. Each machine is operated for 10 hours every day. The profit per unit of A and B are Rs 7/- and Rs 4/- respectively. If the manufacturer utilizes all his resources for producing these two types of items, what is the maximum profit (in Rs) that the manufacturer can make?

(A) 290 (B) 322 (C) 294 (D) 168 (E) None of the above

10. In a B-School, 60% of the total students are male and 60% of the total students are engineers. At least 40% of the male students are non-engineers. If the total number of female non-engineer students as a percentage of the total number of male non-engineer students is x%, then what is the maximum possible value of x?

(A) 16.67 (B) 25 (C) 33.33 (D) 50 (E) 66.67

11. The first four factors of a number N are in A.P. If N is less than 2000, then how many values of N are possible? (It is known that N has at least one prime factor less than 10.)

(A) 177 (B) 187 (C) 186 (D) 176 (E) 178

12. If a, b are real numbers such that the value of $a^2 + 5b^2 + 4ab - 6b + 3$ is -6, then the value of a + b is

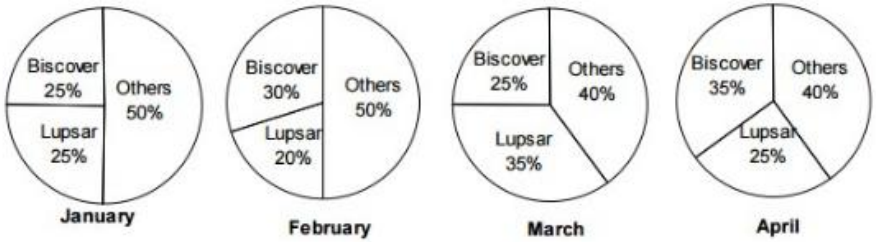
(A) 6 (B) 9 (C) 0 (D) 4 (E) -3

Answer questions nos. 13 to 15 based on the following information.

The total sales, average price per motorcycle, average price per Lupsar motorcycle and average price per Biscover motorcycle for the first four months of the year 2010 of a company XYZ is summarized in the table given below.

Month	Total Sale (in Rs.)	Average Price/ Motorcycle (in Rs.)	Average Price/ Lupsar (in Rs.)	Average Price/ Biscover (in Rs.)
Jan	46788000	38990	55760	43470
Feb	55440000	39600	56550	44100
Mar	70380000	39100	55900	43800
Apr	63712000	39820	57200	44350

The pie-chart gives the percentage contribution by different types of motorcycles towards the total number of motorcycles sold for the four months.



13. Compared to January, the total sales (in Rs.) of Lupsar in April

(A) increased by 26.77% (B) increased by 42.38% (C) increased by 18.34% (D) increased by 36.78% (E) Cannot be determined

14. Average price for all the other motorcycles except Lupsar and Biscover is highest for

(A) January (B) February (C) March

(D) April (E) Cannot be determined

15. Compared to February, the percentage contribution in total sales (in Rs.) from Biscover in March

(A) decreased by 9.07% (B) decreased by 16.16% (C) decreased by 19.27% (D) decreased by 12.34% (E) Cannot be determined

Answer questions nos. 16 and 17 based on the following information.

Caretel Telecom sells three types of connections i.e. CDMA, GSM and Edge. The following table shows the percentage contribution of these three connections towards sales and their profit percentage.

	Sales Contribution	Profit Percentage
CDMA	50%	
GSM		30%
Edge		

It is also known that sales contribution of GSM is 40% less than that of CDMA whereas the profit percentage of CDMA is $33\frac{1}{3}$% more than that of GSM.

16. If the Edge connections accounts for 26.5% of the total cost, then the total profit percentage of Caretel is approximately

(A) 21% (B) 25% (C) 17% (D) 24% (E) 16%

17. What is the ratio of the cost incurred on CDMA connections to that on GSM connections?

(A) 61 : 21 (B) 65 : 42 (C) 41 : 21 (D) 63 : 41 (E) 63 : 42

18. A tank with dimensions 50 cm × 60 cm × 100 cm has 2,40,000 cm^3 of water in it. Bricks measuring
4 cm × 15 cm × 10 cm are placed into it (one brick per second) for 10 seconds. In the 11th second
1000 cm^3 of water is leaked through a pipe. Then again the bricks are placed at the same rate for
10 seconds and 1000 cm^3 water is leaked out in the 11th second. This process continues unless the tank is filled upto the brim. After how many seconds from the start would the tank get filled for the first time?

(A) 120 seconds (B) 132 seconds (C) 130 seconds (D) 119 seconds (E) 105 seconds

19. All possible 6-digit numbers are formed using 1, 1, 2, 3, 4, 5 exactly once. All these digits are arranged in ascending order in a row to form a single number. What will be the 1730th digit from the right of this number?

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

Answer questions nos. 20 to 22 based on the following information.

Guru bhai wants to open a coaching centre in Palampur for the preparation of RAT-2011. The number of students taking admission in the coaching centre would depend on the employment of Gyanidas, a high profile instructor in the field. Gyanidas, in case he is employed, charges a very high fee for his services.

A student can enroll by giving the full fee in lump sum or by giving 20% of the amount as registration fee at the time of enrollment and the rest after one month of enrollment. However, some students do not turn up after one month after paying the registration fee.

The total cost (including study material, class rooms and the local instructors) incurred by the coaching centre is Rs. 30,000 per student. The cost in case of dropout students is Rs.10,000 per student. The students are divided into three catogories: `A', `B' and `C'. The percentage of dropouts is 20%, 30% and 50% for `A', `B' and `C' respectively.

Guru bhai decides to charge Rs. 50,000 per student as the fee. The enrollment numbers that would happen with and without employing Gyanidas are given below.

	With Gyanidas	Without Gyanidas
A	8000	5000
B	6000	4000
C	2000	1000

20. The maximum amount that Guru bhai would be able to pay Gyanidas while keeping a profit of Rs. 15 crore for himself is

(A) Rs. 47.4 crore (B) Rs. 23.2 crore (C) Rs. 8.2 crore (D) Rs. 2 crore (E) Cannot be determined

21. Gyanidas agrees to join Guru bhai for a fixed amount of Rs. 5.2 crore. If Guru bhai wants to keep a profit of Rs. 6.4 crore for himself, then what is the maximum discount that can be offered to students who pay the full fee in lump sum?

(A) Rs. 10,000 (B) Rs. 15,000 (C) Rs. 20,000 (D) Rs. 25,000 (E) Cannot be determined

22. If Gyanidas agrees to join for a fixed amount of Rs. 1.3 crore, the profit made by the coaching centre will increase by

(A) Rs. 3 crore (B) Rs. 4.3 crore (C) Rs. 7.3 crore (D) Rs. 8.6 crore (E) Cannot be determined

23. In an exam, each question has five options out of which exactly one is correct. Puneet randomly marks an answer option for each question. What should be the minimum number of questions in the test such that Puneet's probability of getting exactly two answers correct is at least 0.2?

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

Answer questions nos. 24 to 26 based on the following information.

Cost price and selling price data for product A and product B by Saral Industries for four consecutive years are given in the following table:

	Product A				Product B			
	Total Cost (in Rs.)	Variable cost (as % of total cost)	Variable cost per unit (in Rs.)	Selling Price per unit (in Rs.)	Total Cost (in Rs.)	Variable cost (as % of total cost)	Variable cost per unit (in Rs.)	Selling Price per unit (in Rs.)
2006	24000	15	4.5	39	43800	15	7.3	56
2007	22000	17	4.4	41	45600	15	7.2	57
2008	23000	18	4.6	43	47500	16	7.6	59
2009	25500	15	4.5	42	37500	18	7.5	58

Total cost = Fixed cost + Variable cost

Profit = Total sale - Total cost

Profit rate = Profit/Number of units

24. Sum of the fixed costs of product A and product B is maximum for the year

(A) 2009 (B) 2008 (C) 2007 (D) 2006 (E) Cannot be determined

25. What is the average number of units sold per year of product A in the given 4 years?

(A) 895 (B) 925 (C) 800 (D) 900 (E) 850

26. Profit rate of A in 2006 is less than profit rate of B in

(A) 2006 (B) 2007 and 2008 (C) 2008 and 2009

(D) 2009 (E) 2007, 2008 and 2009

27. Professor Sharma and Professor Shetty have been assigned to prepare the admission test for their institute, the institute - I. After having worked on the assignment for two days, they felt the need to consult a few expert Professors from other institutes. Hence, they invited professor Verma and Professor Shastri both from institute - J. They also invited Professor Albert, Professor Robert and Professor Alvin, all from institute - K. All the professors assembled in a hall in institute - I. Before they could start working on the admission test, every Professor made a hand shake with Professors from the other institutes. What could be the maximum possible number of hand shakes made in the hall?

(A) 16 (B) 10 (C) 14 (D) 12 (E) 10

28. Given, three events A, B and C, no two of which are mutually exclusive. If the probabilities $P(A \cap B \cap \overline{C}) = \frac{1}{2}$, $P(A \cap \overline{B} \cap C) = \frac{1}{3}$ and $P(\overline{A} \cap B \cap C) = \frac{1}{4}$, then the probability $P(A \cap B \cap C)$ can never be

(A) 0.15 (B) 0.16 (C) 0.17 (D) 0.14 (E) 0.13

Answers

Test 1 - CAT

1	d	**2**	c	**3**	b	**4**	c	**5**	a	**6**	c	**7**	d	**8**	d	**9**	a	**10**	d
11	a	**12**	c	**13**	a	**14**	a	**15**	b	**16**	d	**17**	b	**18**	c	**19**	d	**20**	b
21	b	**22**	c	**23**	c	**24**	b	**25**	a	**26**	d	**27**	c	**28**	d	**29**	c	**30**	d

Test 2 - CAT

1	d	2	a	3	c	4	d	5	b	6	d	7	a	8	d	9	a	10	d
11	c	12	a	13	a	14	b	15	b	16	b	17	d	18	b	19	d	20	a
21	b	22	b	23	b	24	a	25	d	26	d	27	c	28	b	29	c	30	c

Test 3 - CAT

1	b	**2**	b	**3**	c	**4**	d	**5**	c	**6**	d	**7**	b	**8**	a	**9**	b	**10**	b
11	b	**12**	d	**13**	d	**14**	b	**15**	c	**16**	b	**17**	c	**18**	a	**19**	d	**20**	a
21	c	**22**	a	**23**	c	**24**	c	**25**	a	**26**	c	**27**	c	**28**	b	**29**	d	**30**	c

Test 4 - CAT

1	a	**2**	d	**3**	b	**4**	a	**5**	d	**6**	a	**7**	c	**8**	b	**9**	a	**10**	a
11	a	**12**	a	**13**	c	**14**	b	**15**	a	**16**	c	**17**	d	**18**	a	**19**	b	**20**	b
21	b	**22**	b	**23**	a	**24**	a	**25**	d	**26**	b	**27**	c	**28**	d	**29**	a	**30**	d

Test 5 - SNAP

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

Test 6 - SNAP

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

Test 7 - IIFT

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

Test 8 - IIFT

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

Test 9 - XAT

1	D	**2**	E	**3**	A	**4**	E	**5**	B	**6**	E	**7**	A	**8**	B	**9**	E	**10**	C
11	D	**12**	B	**13**	B	**14**	B	**15**	A	**16**	E	**17**	D	**18**	D	**19**	C	**20**	D
21	E	**22**	D	**23**	C	**24**	C	**25**	A	**26**	E	**27**	B	**28**	A				

Test 10 - XAT

1	D	**2**	B	**3**	D	**4**	A	**5**	B	**6**	C	**7**	A	**8**	C	**9**	B	**10**	E
11	A	**12**	E	**13**	D	**14**	B	**15**	B	**16**	B	**17**	B	**18**	C	**19**	B	**20**	C
21	A	**22**	C	**23**	D	**24**	B	**25**	E	**26**	C	**27**	A	**28**	C				

Explanations

Test 1 - CAT

1. d Let A be `10a + b' where `a' and `b' are single digit numbers.

$\Rightarrow 10a + b + 10b + a + ab = 145 \Rightarrow a = \frac{145 - 11b}{11 - b}$

The possible values of `a' and `b' that satisfies the above equation are 3 and 8 or 8 and 3 respectively.

Sum of the digits of A = 11.

2. c f(1) = 1; f(2) = 4f(1) + 6 = 10

f(3) = f(1 + 2) = f(1) + 12(1) + 12 = 25

f(5) = f(3 + 2) = f(3) + 12(3) + 12 = 73

f(10) = 4f(5) + 6 = 298

f(20) = 4^2f(5) + 24 + 6 = 1198.

3. b Total hours between Thursday 6:00 a.m. and Saturday, 9:00 p.m. = 63

Total time gap = 28 min

Required time gap = 12 min

Watch showed the correct time after $63 \times \frac{12}{28} = 27$ hours i.e. at 9:00 a.m. on Friday.

For questions 4 and 5:

Let Anu, Banu, Cara, Dia and Emily be represented as A, B, C, D and E respectively.

Total number of blue pebbles is 11, so total number of pebbles with A, C, D and E is 8. As number of blue pebbles with each of them is prime so each of A, C, D and E has 2 blue pebbles with them.

So E has 2 pebbles each of red, blue and green colour. In total E has 6 pebbles. Hence C has 2 × 6 = 12 pebbles.

Total number of pebbles with B and D

= (15 + 11 + 22) - (10 + 12 + 6) = 48 - 28 = 20

Let the number of pebbles with D be x.

$\Rightarrow x + 1.5x = 20$

$\Rightarrow x = 8$, total number of pebbles with D = 8 and with B = 12

Ratio of number of red pebbles to number of green pebbles is 1 : 2 for each of B and D, hence we determine that number of red and green pebbles with B is 3 and 6 respectively and with D is 2 and 4 respectively.

	Red	Blue	Green	Total
A	4	2	4	10
B	3	3	6	12
C	4	2	6	12
D	2	2	4	8
E	2	2	2	6

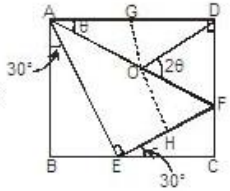
4. c For A, B and D the ratio number of blue pebbles to green pebbles is 1 : 2.

5. a Total number of pebbles with A = 10

Total number of pebbles with D = 8

Ratio = 10 : 8 = 5 : 4

6. c



Clearly AEFD is a cyclic quadrilateral. Also, AF has to be the diameter $(\text{since } \angle ADF = \angle AEF = 90^\circ)$ and it passes through O (since perpendicular bisectors of any two chords of a circle passes through the center).

Hence, $\angle DOF = 2\angle DAF$

Taking $AB = CD = \sqrt{3}x, BC = AD = 2x$

In ΔABE, $BE = AB \tan 30^\circ = x \Rightarrow EC = x$

In ΔECF, $FC = EC \tan 30^\circ = \frac{x}{\sqrt{3}} \Rightarrow DF = \frac{2x}{\sqrt{3}}$

$\Rightarrow \tan\theta = \frac{DF}{AD} = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30^\circ$

Hence, $\angle DOF = 60^\circ$

7. d Let the price at which the shopkeeper bought each note book be Rs. c.

$\left(\frac{14-c}{c}\right)\times 100 = p$ and $\left(\frac{300-25c}{25c}\right)\times 100 = q$

As per the information given in the question $\frac{14-c}{12-c} = \frac{p}{q} = 2 \Rightarrow c = 10$

The shopkeeper will make a profit of $\left(\frac{130-100}{100}\right)\times 100 = 30\%$ in his transaction with Vijay.

8. d First place can be filled in 4 ways. The subsequent places can be filled in 3 ways each.

Hence, the number of ways = $4 \times 3 \times 3 \times 3 \times 3 \times 3 = 4 \times 3^5$.

9. a Statement I suggests that the number can be either 6 or 7. So, X is not a perfect square.

Statement II concludes that X cannot be a perfect square. 7X is a perfect square, so X must be of the form 7m, where `m' is a perfect square. So, X is not a perfect square.

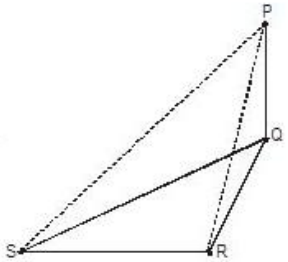
10. d $S_n = 1^2 - 2^2 + 3^2 - 4^2 + ... + (2n - 1)^2 - (2n)^2 + (2n + 1)^2$

$= (1 - 2)(1 + 2) + (3 - 4)(3 + 4) + ... (2n - 1 - 2n)(2n - 1 + 2n) + (2n + 1)^2$

$= -\left[\frac{2n(2n+1)}{2}\right] + (2n+1)^2 = -n(2n + 1) + (2n + 1)^2 = 2n^2 + 3n + 1$

Therefore, $S_{100} = 20301$; $S_{25} = 1326$; $S_{50} = 5151$ and $S_{10} = 231$.

11. a



Let PQ be the tower with its base at Q.

In ΔPQR, $\frac{PQ}{QR} = \tan 60^\circ \Rightarrow QR = \frac{PQ}{\tan 60^\circ}$

$\Rightarrow QR = \frac{10}{\sqrt{3}}$ m

In ΔPQS, $\frac{PQ}{QS} = \tan 30^\circ \Rightarrow QS = 10\sqrt{3}$ m

ΔQRS is a right-angled triangle with right angle at R.

$\Rightarrow SR^2 + QR^2 = QS^2 \Rightarrow SR = 10\sqrt{\left(3 - \frac{1}{3}\right)}$ m $= 10\sqrt{\frac{8}{3}}$ m

12. c Export price per bicycle = $\frac{\text{Export value (Rs. crores)}}{\text{Export ('000 units)}}$

Export price per bicycle is the highest in 1999-2000 and is equal to $\frac{141 \times 10^7}{1009 \times 10^3} \approx$ Rs. 1397.

13. a Percentage increase in domestic consumption in 1998-99 over 1997-98 is the highest and is equal to $\frac{7814.8 - 6517}{6517} \times 100 \approx 20\%$.

14. a If initial capacity = $C_{initial} = C$,

final capacity = $1.4 \times C_{initial} = 1.4C$

Initial capacity utilisation = $\frac{7721}{C_{intal}} = \frac{7721}{C}$

Final capacity utilisation = $\frac{9813}{C_{intal} \times 1.4} = \frac{9813}{1.4C} \Rightarrow \frac{9813}{1.4C} \times \frac{C}{7721} = 0.91$

Capacity utilisation decreased by 1 - 0.91= 0.09 = 9%.

15. b Any multiple of 18 can be written as 18k.

Therefore, $18k = n^2 + 2$

First four values of `n' that satisfy the above equation are 4, 14, 22 and 32.

We can observe the following pattern in which these values come:

Difference between 14 and 4 is 10. Difference between 22 and 14 is 8. Difference between 22 and 32 is again 10.

So the next value of `n' that satisfies will be

32 + 8 = 40 and so on.

For `n' = 50, k = 139.

$\therefore 18k = 2502 < 3500$

For `n' = 58, k = 187.

$\therefore 18k = 3366 < 3500$

So there are 7 multiples of 18 that are less than 3500 and are 2 more than the square of a natural number.

16. d $a^{3-x}b^{5x} = a^{x+5}b^{3x}$

Taking log on both the sides

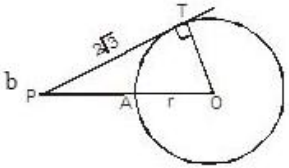
(3 - x) loga + 5x logb = (x + 5) loga + 3x logb.

2x logb = (2x + 2) loga

x logb = (x + 1) loga

$x\left(\frac{\log b}{\log a}\right) = x + 1$

17. b



In triangle OPT, $PT^2 + OT^2 = (PO)^2$

$\Rightarrow (2\sqrt{3})^2 + (2)^2 = (PA + 2)^2 = 12 + 4 = PA^2 + 4PA + 4$

$= PA^2 + 4PA - 12 = 0 = PA = 2$ cm or PA = - 6 cm

Since, the length cannot be negative, PA = 2 cm.

18. c Take one extreme case where Anil takes 15 days and Mukesh takes 20 days to complete the assignment. Let us assume there are 60 units of work to be done.

So Anil does 4 units/day and Mukesh does 3 units/day. Since they are working on alternate days, they will finish 7 units in 2 days. Both of them are not working on 3rd day. So, after 3 days only 7 units will be finished. So in 24 days 56 units will be completed.

Now, if Anil starts the assignment, he will work on 25th day and he will complete the remaining 4 units. So in this case exactly 25 days will be required. Otherwise, if Mukesh starts, it will take more than 25 days. So option (a) and (d) are ruled out.

In another extreme case, if we assume that Anil takes 10 days and Mukesh takes 15 days to complete the assignment, by approaching similarly, we get that it will take 17 days to complete the assignment.

So correct answer choice should be (c)

19. d Let the number of unbroken pencils with Amit, Bosco and Chris be m, n and p respectively.

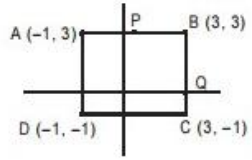
$\Rightarrow \frac{p}{m} = \frac{8}{5}$ and $\frac{p}{n} = \frac{7}{4} \Rightarrow \frac{p}{m} = \frac{56}{35}$ and $\frac{p}{n} = \frac{56}{32}$

As m, n and p are integers, p = 56, m = 35 and n = 32.

The number of broken pencils with Amit, Bosco and Chris are 21, 24 and 0 respectively.

Since there are 64 broken pencils, the number of broken pencils with Deepak = 64 - (21 + 24) = 19.

20. b



Since, AP : PB = 2 : 3, co-ordinates of point P are $\left[-1+(3-(-1))\times\frac{2}{5}, 3\right] = \left(\frac{3}{5}, 3\right)$

Since, BQ : QC = 3 : 1, co-ordinates of point Q are (3, 0).

Equation of line AQ is $y - 0 = \frac{3-0}{-1-3}(x-3)$

$\Rightarrow 4y + 3x = 9$ ...(i)

Equation of line PD is $y + 1 = \left(\frac{3+1}{\frac{3}{5}+1}\right)(x+1)$

$\Rightarrow 2y - 5x = 3$ ...(ii)

Co-ordinates of point S can be found by solving Eq. (i) and Eq. (ii) and are $\left(\frac{3}{13}, \frac{27}{13}\right)$

Slope of line $CS = \frac{\left(\frac{27}{13}+1\right)}{\left(\frac{3}{13}-3\right)} = \frac{-40}{36} = \frac{-10}{9}$

21. b The equation is:

$f(x) = x^3 + px^2 + x + p = 0$

If $f(x) = 0$ has no real roots or exactly two real roots between $x = 1$ and $x = -1$ then we must have:

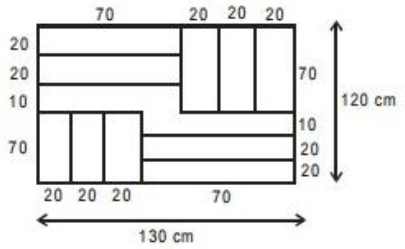
$f(-1) \times f(1) > 0$

$= (2p - 2) \times (2p + 2) > 0$

$= p^2 - 1 > 0$

$\Rightarrow -\infty < p < -1$ or $1 < p < \infty$.

22. c The following figure can be drawn.



So the maximum number of tiles is 10.

For questions 23 to 25:

Year	1995	1996	1997	1998
Men	2	3	4	5
Women	1.3	Increases at 10% p.a.		
Boys	Increases at 5% p.a.			1.2
Girls	Increases at 25% p.a.			1

(Numbers in lakh)

23. c Rather than doing the complete calculations, we can say that since the number of men was significantly greater than the other three, the maximum number of literates will be in the year which has the highest literacy rate for men. Thus, the answer should be 1997.

24. b In 1996, population of women = 1.3×1.1 lakh and that of boys $= \frac{1.2}{(1.05)^2} = \frac{1.2}{1.1025}$

Literacy rate of women and boys in 1996 was 20% and 50% respectively. Thus, the ratio of literate women to literate boys in 1996

$$= \frac{(20\% \text{ of } 1.3 \times 1.1)}{(50\% \text{ of } \frac{1.2}{1.1025})} \approx 0.52.$$

25. a Number of literates = Population × Literacy rate. Thus, if the percentage change in the population is a% and that in the literacy rate is b%, then the percentage change in the

number of literates = $\left(a + b + \frac{ab}{100}\right)\%$

From 1997-98, the population of girls has increased by 25% and literacy rate has increased by 350%. Thus, the percentage change in the number of literate girls $= 25 + 350 + \left(25 \times \frac{350}{100}\right) = 462.5\%$

26. d $\frac{8^{643}}{132} = \frac{2^{1927}}{33}$

$\frac{2^7.2^{1920}}{33} = \frac{2^7.(2^{10})^{192}}{33} = \frac{2^7.(1024)^{192}}{33}$

$= \frac{2^7.(1023+1)^{192}}{33}$

Since 1023 is a multiple of 33, the remainder will be 2^7. When 2^7 is divided by 33 the remainder is 29.

Since we have cancelled a common factor of 4 from the numerator and the denominator, the actual remainder will be $29 \times 4 = 116$.

27. c We have

$\frac{x}{y} + \frac{y}{x} = 3a$ ...(i)

$\frac{y}{z} + \frac{z}{y} = 4b$ ...(ii)

$\frac{z}{x} + \frac{x}{z} = 5c$ ...(iii)

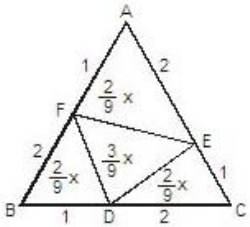
Multiplying (i), (ii) and (iii), we get

$2 + \frac{x^2}{y^2} + \frac{y^2}{x^2} + \frac{y^2}{z^2} + \frac{z^2}{y^2} + \frac{z^2}{x^2} + \frac{x^2}{z^2} = 60\ abc$

$= 2 + (9a^2 - 2) + (16b^2 - 2) + (25c^2 - 2) = 60abc$

$= 9a^2 + 16b^2 + 25c^2 - 60abc - 4 = 0$

28. d Let area of ΔABC be x sq. units.



Area of $\Delta AFE = \frac{1}{2} \times AF \times AE \times \sin A = \frac{1}{2} \times \frac{AB}{3} \times \frac{2AC}{3} \times \sin A = \frac{2}{9}\left(\frac{1}{2} AB \times AC \sin A\right) = \frac{2}{9}x$

Same is true for other triangles as well.

Alternative: Take an equilateral triangle and try out from the given options.

$\frac{z}{x} + \frac{x}{z} = 5c$ ...(iii)

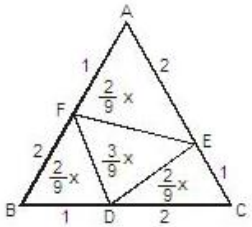
Multiplying (i), (ii) and (iii), we get

$2 + \frac{x^2}{y^2} + \frac{y^2}{x^2} + \frac{y^2}{z^2} + \frac{z^2}{y^2} + \frac{z^2}{x^2} + \frac{x^2}{z^2} = 60\ abc$

$\Rightarrow 2 + (9a^2 - 2) + (16b^2 - 2) + (25c^2 - 2) = 60abc$

$\Rightarrow 9a^2 + 16b^2 + 25c^2 - 60abc - 4 = 0$

28. d Let area of ΔABC be x sq. units.

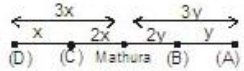


Area of $\Delta AFE = \frac{1}{2} \times AF \times AE \times \sin A = \frac{1}{2} \times \frac{AB}{3} \times \frac{2AC}{3} \times \sin A = \frac{2}{9}\left(\frac{1}{2} AB \times AC \sin A\right) = \frac{2}{9} x$

Same is true for other triangles as well.

Alternative: Take an equilateral triangle and try out from the given options.

29. c



Let Mrs Tarak asked the first and second question at point C and B respectively.

Therefore, distance between Delhi and Agra

= DA = DC + CB + BA = 3x + 3y = 450 km

(Since, 2x + 2y = 300 km)

30. d We have 7x + 3y = 123 or $y = \frac{123 - 7x}{3} = 41 - \frac{7x}{3}$

For integer value of y, x has to be a multiple of 3.

Every increase of 3 in the value of x would be compensated by the decrease of 7 in the value of y. Hence, the positive integer solutions of (x, y) are (3, 34), (6, 27), (9, 20), (12, 13) and (15, 6)

Since `x' is always less than `y' there are only 4 possible solutions of the equation.

Test 2 - CAT

1. d S = 871 × 873 × 875 × 878 × 881 × 883

When the number S is divided by 1000, the remainder will be the last 3 digits of the product.

$$\Rightarrow \frac{S}{1000} = \frac{871\times873\times875\times878\times881\times883}{1000} \Rightarrow \frac{S}{1000} = \frac{871\times873\times125\times7\times2\times439\times881\times883}{1000}$$

$$\Rightarrow \frac{S}{1000} = \frac{871\times873\times7\times439\times881\times883}{4}$$

$$\Rightarrow \frac{S}{1000} = \frac{(217\times4+3)\times(218\times4+1)\times(109\times4+3)\times(4+3)\times(220\times4+1)\times(220\times4+3)}{4} \Rightarrow \frac{S}{1000} \text{ is of the form } \left(\frac{4k+1}{4}\right).$$

∴ `S' is of the form 250 (4k + 1).

The remainder when S is divided by 1000 is 250.

Required sum = 2 + 5 + 0 = 7.

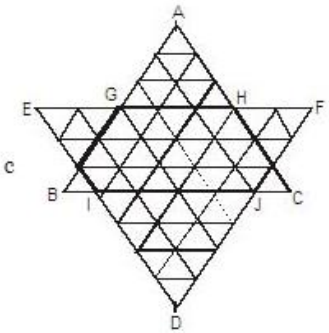
2. a We can observe that

$f_1(1) = \frac{1}{2},\ f_2(1) = \frac{2}{3},\ f_3(1) = \frac{3}{5},\ f_4(1) = \frac{5}{8},\ f_5(1) = \frac{8}{13}$ and so on.

We can see that $f_n(1)$ is actually the ratio of subsequent terms of a Fibonacci series (1,1,2,3,5,8,13,21...) where every term beyond 2nd term is sum of previous two terms.

We know that the ratio of subsequent terms of Fibonacci series is the golden ratio equal to 0.618.

3. c



Divide the figure into small triangles of area `a' sq. units.

Number of smaller triangles inside the shaded area = 25

Number of small triangles in the entire figure = 60

Fraction of area under the shaded region $= \frac{25}{60} = \frac{5}{12}$

4. d Let the cost (in Rs.) of 1 desk, 1 chair and 1 table be `d', `c' and `t' respectively.

6d = 6c + t ...(i)

12c = 6d + 3t ...(ii)

Solving equations (i) and (ii), we get that $t = \frac{6}{5} \times d$

$\Rightarrow t = \frac{3}{2} \times c \Rightarrow c : t : d = 4 : 6 : 5$

Let c, t and d be 4x, 6x and 5x respectively.

All the options except option (d) are correct.

5. b **Case I:** Five `6' and one `0': $\frac{6!}{5!} = 6$

Case II: Four `6' and One `2' and One `4': $\frac{6!}{4!} = 30$

Case III: Three `6' and Three `4': $\frac{6!}{3!\,3!} = 20$

Case IV: Four `6' and Two `3': $\frac{6!}{4!\,2!} = 15$

Total number of different sequences = 71.

6. d Let G be the centroid of the triangle ABC.

The co-ordinates of the point G will be

$\left(\frac{2-3-2}{3}, \frac{5+0+4}{3}\right) = (-1, 3)$

Equation of the Line `L' will be

$y - 1 = \left(\frac{3-1}{-1-1}\right)(x-1) \Rightarrow y + x = 2$

Distance of the line `L' from the origin = $\frac{2}{\sqrt{1+1}} = \sqrt{2}$ units

For questions 7 and 8:

Let us assume that the total number of runs scored by Sachin against New Zealand be 'x'.

Given that 72 = 18% of x $\Rightarrow$ x = 400

Number of runs scored by Sachin in 2007 is $400 \times \frac{100}{10} = 4000$

Number of runs scored by Sachin against England, Pakistan, Australia, South Africa and Bangladesh will be 800, 600, 720, 1000 and 480 respectively.

7. a Required Percentage $= \frac{280}{800} \times 100 = 35\%$

8. d Number of runs that are not scored in 4's or 6's by Sachin against England, Pakistan, Australia, South Africa, Bangladesh and New Zealand is 464, 320, 296, 728, 180 and 0 respectively.

9. a N consists of even natural numbers only. If 17 numbers are divisible by 9, they must be divisible by 18 as well. That means, the maximum number is between 17 × 18 = 306 and 18 × 18 - 2 = 322.

N = { 2, 4, 6, 8, ..., k }; where `k' is any even number from 306 to 322. The number of numbers is between 153 and 161 (inclusive).

In option 1, numbers divisible by 15 in N are {30, 60, 90, ..., 300}. They are exactly 10 in number.

10. d Given that

$\Rightarrow (x-3)^3 = (3^{\frac{1}{3}} + 3^{\frac{5}{3}})^3$

$= x^3 - 9x^2 + 27x - 27 = 3 + 3^5 + 3^3.(3^{\frac{1}{3}} + 3^{\frac{5}{3}})$

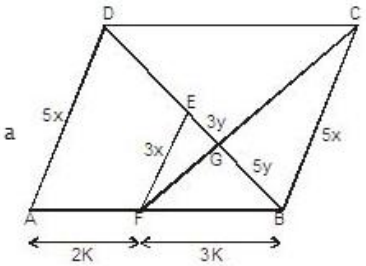
$= x^3 - 9x^2 + 27x - 27 = 3 + 3^5 + 27(x - 3)$

$\left[\because (x-3) = 3^{\frac{1}{3}} + 3^{\frac{5}{3}}\right]$

$= x^3 - 9x^2 = 192$

11. c Both the statements are required. If the second statement is not given, we cannot find the water displaced by the immersed part of the cylinder, which leads to the rise in the water level.

12. a



EF || AD so that $\Delta BFE \sim \Delta BAD$

$\Rightarrow \frac{EF}{AD} = \frac{BF}{AB} = \frac{3}{5}$

Let EF be 3x, then AD = 5x = BC

Similarly, $\Delta EGF \sim \Delta BGC$

$\Rightarrow \frac{BG}{EG} = \frac{BC}{EF} = \frac{5}{3}$

Let BG = 5y, then EG = 3y

In ΔBFE and ΔBAD,

$\frac{BE}{BD} = \frac{3}{5}$ or $\frac{5y+3y}{BD} = \frac{3}{5}$ or $\frac{8y}{BD} = \frac{3}{5}$

$\Rightarrow BD = \frac{40}{3}y \Rightarrow GD = BD - BG$

$\Rightarrow GD = \left(\frac{40}{3}y - 5y\right) = \frac{25}{3}y \Rightarrow \frac{BG}{GD} = \frac{5y}{\frac{25}{3}y} = \frac{3}{5}$

13. a Train X traveling at 120 km/hr $= \left(\frac{100}{3}\right)$ m/s

Length of train X $= \left(\frac{100}{3}\right) \times 4 = \left(\frac{400}{3}\right)$ m

Since, train Y and train X take 36 sec and 31 sec to completely cross the line PQ.

So, total distance traveled by train X

$= \left(\frac{100}{3}\right) \times 31 = \frac{3100}{3}$ m

Therefore, length of the line PQ

$= \left(\frac{3100}{3}\right) - \left(\frac{400}{3}\right) = 900$ m $= 0.9$ km

Train Y traveling at 110 km/hr $= 110\left(\frac{5}{18}\right) = \left(\frac{275}{9}\right)$ m/s

Now, total distance traveled by train Y $= \left(\frac{275}{9}\right) \times 36 = 1100$ m

So the length of train Y = 1100 - 900 = 200 m

14. b $\frac{1}{(2^2+0)} + \frac{1}{(5^2+3)} + \frac{1}{(8^2+6)} + \frac{1}{(11^2+9)} + \ldots\ldots\ldots + \frac{1}{(29^2+27)}$

$= \frac{1}{3} \times \left[\frac{3}{(2^2+0)} + \frac{3}{(5^2+3)} + \frac{3}{(8^2+6)} + \ldots + \frac{3}{(29^2+27)}\right]$

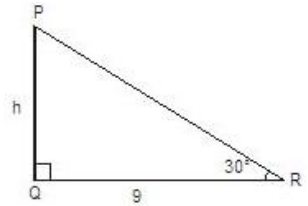
$= \frac{1}{3} \times \left[\frac{3}{4} + \frac{3}{28} + \frac{3}{70} + \frac{3}{130} + \ldots + \frac{3}{868}\right]$

$= \frac{1}{3} \times \left[\left(1 - \frac{1}{4}\right) + \left(\frac{1}{4} - \frac{1}{7}\right) + \left(\frac{1}{7} - \frac{1}{10}\right) + \ldots + \left(\frac{1}{28} - \frac{1}{31}\right)\right]$

$= \frac{1}{3} \times \left[1 - \frac{1}{31}\right] = \frac{10}{31}$

15. b Let the height of the central stick be `h' m.

At 8.00 am, in triangle PQR,



$\tan 30^\circ = \frac{h}{9} = \frac{1}{\sqrt{3}}$ or $h = 3\sqrt{3}$ m

When the length of the shadow is $3\sqrt{3}$ m, the angle of elevation of the sun must be 45°.

16. b Alaska's land area $=\left(\frac{60}{12}\right) \times 68{,}181 = 340900$ sq. miles

Arizona's population = 17.3 × 68,181= 11,79,531

Alaska's population $=\left(\frac{1}{11}\right) \times 11{,}79{,}531 = 107{,}230$

Population Density $=\frac{107{,}230}{340{,}900} \approx 0.3$.

17. d Let the sum of "Population" and the "Area of the Land" of the five states be P and A respectively. The "Population Density" values of the five states are given below:

$$\text{Alaska} = \frac{0.01}{0.60}\left(\frac{P}{A}\right) = \frac{1}{60}\left(\frac{P}{A}\right),$$

$$\text{Arizona} = \left(\frac{11}{12}\right)\left(\frac{P}{A}\right) = 0.92\left(\frac{P}{A}\right),$$

$$\text{Arkansas} = \frac{0.06}{0.06}\left(\frac{P}{A}\right) = 1\left(\frac{P}{A}\right),$$

$$\text{Arizona} = \frac{0.10}{0.05}\left(\frac{P}{A}\right) = 2\left(\frac{P}{A}\right)$$

$$\text{California} = \frac{0.72}{0.17}\left(\frac{P}{A}\right) = 4.23\left(\frac{P}{A}\right).$$

California has the maximum value of "Population Density".

18. b "Area of the Land" of Alaska = 0.6×(Sum of the "Area of the Land" of the five states)

Sum of "Area of the Land" of Arizona, Arkansas and California

= 0.35×(Sum of the "Area of the Land" of the five

states) $=\frac{0.35}{0.60} \times 98282$ = 57331 sq. miles.

"Area under water" of Arizona, Arkansas and

California = $\frac{9}{100} \times 102201$ = 9198 sq. miles

Total area of the three states

= (Sum of "Area of the Land") + (Sum of "Area under Water")

= (57331 + 9198) sq. miles = 66529 sq. miles

19. d If $N = a^p \times b^q$

Sets of factors which are coprime to each other can be directly calculated by

$[(p + 1)(q + 1) - 1] + p \times q$

Here `a' and `b' are prime factors; `p' and `q' are power of prime factors.

Total 17 possibilities are:

(1, 2), (1, 3), (1, 4), (1, 6), (1, 8), (1, 9), (1, 12), (1, 18), (1, 24), (1, 36), (1, 72) (2, 3), (2, 9), (4, 3), (4, 9), (8, 3) and (8, 9).

20. a Since they cover 20 and 24 km in equal time, their speeds will be in the same ratio as their distance covered.

$$\text{speed} = \frac{R}{S} = \frac{20}{24} = \frac{5}{6}$$

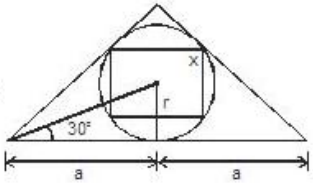
Hence,

$$\frac{20}{6x} + \frac{8}{60} = \frac{24}{5x}$$

$\therefore x = 11$

Sohan's speed = 66 km/hr

21. b



From the figure, $\frac{r}{a} = \tan 30^\circ \Rightarrow r = \frac{a}{\sqrt{3}}$

Diagonal of square = 2r

$x^2 + x^2 = 4r^2 \Rightarrow 2x^2 = 4 \times \frac{a^2}{3}$

$x^2 = \frac{2a^2}{3}$ = Area of square

Area of triangle = $\frac{\sqrt{3}}{4}(2a)^2 = \sqrt{3}a^2$

Required ratio = $\frac{\sqrt{3}a^2 \times 3}{2a^2} = \frac{3\sqrt{3}}{2}$

Ratio is $3\sqrt{3} : 2 = 9 : 2\sqrt{3}$

22. b Since there are 3 positive and 3 negative terms, -1 has to be the 3rd term of A.P.

If it's 1st or 2nd term, then the third term would become positive.

Since it's an increasing A.P., d cannot take any negative value and the first 3 terms should be negative.

If d = 1, them 4th term would be 0, which is not acceptable.

That means d = 2, 3, 4.

Three cases are possible:

Common Difference							Mean
2	−5	−3	−1	1	3	5	0
3	−7	−4	−1	2	5	8	$\frac{1}{2}$
4	−9	−5	−1	3	7	11	1

Difference between maximum and minimum mean

= 1 - 0 = 1

23. b The product of any number of integers will be even if and only if at least one of the integers involved is even. Let x denote the event that the product of the three integers is even. Then x' denotes the event that the product of the three integers is odd. The total number of ways of choosing three odd integers out of 1, 2, ..., 20 is ${}^{10}C_3$.

$$\therefore P(x') = \frac{{}^{10}C_3}{{}^{20}C_3} = \frac{10 \times 9 \times 8}{20 \times 19 \times 18} = \frac{2}{19}$$

$$\therefore P(x) = 1 - P(x') = 1 - \frac{2}{19} = \frac{17}{19}$$

24. a Equation of line OA 2y - 3x = 0

for the shaded region, 2y - 3x ≤ 0 ...(i)

Equation of line OB 5y - x = 0

for the shaded region, 5y - x ≥ 0 ...(ii)

Equation of line AB 2x + 3y - 13 = 0

for the shaded region 2x + 3y - 13 ≤ 0 ...(iii)

The solution set that represents the shaded region is given by 2y - 3x ≤ 0, 5y - x ≥ 0, 2x + 3y - 13 ≤ 0.

25. d Yield (in tons/hectare) of wheat in:

1965 = $\frac{182000}{2600}$ = 70. 1966 = $\frac{194750}{2700}$ = 72.13.

1967 = $\frac{224000}{2800}$ = 80. 1968 = $\frac{261000}{2900}$ = 90.

1969 = $\frac{302500}{3025}$ = 100. 1970 = $\frac{321600}{3200}$ = 100.5.

Increase in yield compared to previous year is the lowest for 1969-70.

26. d Yield (in tons/hectare) for paddy in 1967 = 60

Yield (in tons/hectare) for wheat in 1967 = 80

Collective average yield (in tons/hectare)

$$= \frac{138000 + 224000}{5100} = 71$$

In order to make their yields same (at the collective average yield of 71), some area under paddy has to be transferred to area under wheat cultivation.

New area under paddy = $\frac{138000}{71}$ = 1943.7 hectares

Hence, (2300 - 1943.7) = 356.3 hectares are to be put as area under wheat.

27. c Land area for paddy increases by 5% in 1970-71 and production of paddy increases to 1,75,000 tons.

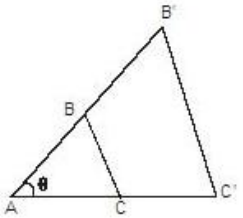
Increased land area = 2835 hectares

Yield (in tons/hectare) for 1971 will be $\frac{175000}{2835} = 61.73$

Yield (in tons/hectare) for 1970 = 62.5

Percentage decrease = $\frac{0.77}{62.5} \times 100 = 1.2\%$

28. b



From statement I:

Statement I gives data about triangle ABC only and no information is given about triangle $AB'C'$. Statement 1 alone is not sufficient.

From statement II:

$\Delta ABC = \frac{1}{2} AB \times AC \times \sin\theta$

$\Delta AB'C' = \frac{1}{2} AB' \times AC' \times \sin\theta$

$\therefore$ percentage increase in the area of $\Delta ABC = 20 + 30 + \frac{20 \times 30}{100} = 56$

Statement II alone is sufficient.

29. c Given $625^{\log_{36} 6} + 12^{\log_7 49} = 11^{\log_x 169}$

$\Rightarrow 625^{\frac{1}{2}\log_6 6} + 12^{2\log_7 7} = 11^{\log_x 169} \Rightarrow 25 + 144 = 11^{\log_x 169}$

$\Rightarrow 169 = 11^{\log_x 169} \Rightarrow \log_{11} 169 = \log_x 169 \times \log_{11} 11 \Rightarrow x = 11$

30. c Let the initial number of Rs. 1 notes and 20 paise coins be x and y respectively.

According to question,

$\frac{1}{3}\left(x + \frac{y}{5}\right) = y + \frac{x}{5}$ or $x : y = 7 : 1$

As, the total amount lies between Rs. 10 and Rs.

20, x = 14 and y = 2

Total amount = Rs. 14.40

Amount spent $= \frac{2}{3} \times 14.40 =$ Rs. 9.60.

Test 3 - CAT

1. b Using cyclicity,

$22^{33^{44}} = 22^{(32+1)^{44}} = 22^{4k+1}$.

Unit's digit = 2.

2. b Let us say the roots are a, b, g and d. Given that sum of the roots a + b + g + d = 4 and product of roots
abgd = 1. Since a, b, g and d are positive, the only possible values of a, b, g and d is a = b = g = d = 1, because the product of these four roots is maximum.

So, a = b = g = d = 1

a = ab + bg + gd + ad + bd + ag = 6

-b = abg + dbg + agd + abd or b = - 4.

3. c nth term of a GP = ar^{n-1}, where `a' is the first term and `r' is the common ratio.

According to question,

ar = 6 and $ar^4 = 48$

Hence, r = 2 and a = 3

10th term = $3 \times 2^9 = 1536$.

4. d Three successive decreases of 20% in the solution would mean that 51.2% of original amount of the contents is left. Therefore ratio is 512 : 488.

5. c Here, we will go through all the 4! combinations of the words starting with the alphabet C and all the 4! combinations of the words starting with the alphabet I. That make it 24 + 24 = 48 till now.

Hence, the first alphabet of the 60th word is O.

Likewise, for the remaining four alphabets C, I, W and T, we will go through all the combinations starting with C and then I. That give 3! + 3! = 6 + 6 = 12 more words. Consequently, the 60th word will be the last combination starting with the alphabet I, that is IWTC. So, the 60th word will be OIWTC.

6. d The four vertices of a square are equidistant from the point of intersection of its diagonals. Let P be the point of intersection of its diagonals.

Then P = (1,2)

Length of the diagonal = $2\sqrt{(3-1)^2+(4-2)^2} = 4\sqrt{2}$

Length of the square = 4

Area of the square = 4^2 = 16 sq. unit

7. b BE : $0.38 \times 6 = 2.28$

L & T : 0.35 × 471 = 164.85

IDBI : 0.45 × 259 = 116.55

M & M : 0.55 × 229 = 125.95

8. a Percentage increase

$$= \frac{251-229}{229}\times 100 = \frac{22}{229}\times 100 > \frac{22}{230}\times 100 = \left(1-\frac{1}{23}\right)\times 10 = 10 - 0.435 \approx 9.56\%$$

So answer should be slightly more than 9.56 = 9.6%

9. b L & T percentage increase = $\frac{531-471}{471}\times 100 = 12.7\%$

IDBI percentage increase = $\frac{501-259}{259}\times 100 = 93.4\%$

Apollo Tyres percentage increase = $\frac{41-31}{31}\times 100 = 32\%$

Hoechst Marion percentage increase = $\frac{37.5-20}{20}\times 100 = 87.5\%$

Hence, percentage increase is the second highest for Hoechst Marion.

10. b $x_n = 4^n - 3n - 1$

$\Rightarrow$ X = {0, 9, 54, 243, 1008, ...}

Except for zero, each element of the set X, is a multiple of 9. But all multiples of 9, are not included in this set.

$y_n = 9(n - 1)$

$\Rightarrow$ Y = {0, 9, 18, 27, 36, 45, 54, 63, ...}

The set Y, includes all multiples of 9 and it also includes zero, as its element.

Hence, X is a proper subset of Y. It is denoted by $x \subset y$.

11. b $a_1 = 2^5 \times 3^4 \times 5^2$

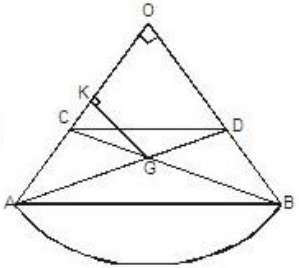
$$a_2 = \frac{a_1}{30} = \frac{2^5\times 3^4\times 5^2}{2\times 3\times 5} = 2^4\times 3^3\times 5$$

$$a_3 = \frac{a_1}{a_2} = \frac{2^5\times 3^4\times 5^2}{2^4\times 3^3\times 5} = 2\times 3\times 5$$

$$a_4 = \frac{a_2}{a_3} = \frac{2^4\times 3^3\times 5}{2\times 3\times 5} = 2^3\times 3^2$$

As none of the options (a), (c) and (d) are perfect squares, answer options is (b).

12. d



As CD is parallel to AB, therefore $\Delta AGB \sim \Delta DGC$

$AB = \sqrt{OA^2 + OB^2} = 4\sqrt{2}$ units

$CD = \sqrt{OC^2 + OD^2} = 3\sqrt{2}$ units

$\Rightarrow \frac{AG}{GD} = \frac{AB}{CD} = \frac{4}{3}$

From point G, drop a perpendicular GK, on OA.

Now, as KG is parallel to OD, therefore $\Delta AKG \sim \Delta AOD$

$\Rightarrow \frac{AG}{AD} = \frac{KG}{OD}$

$\Rightarrow KG = \left(\frac{AG}{AD}\right) \times OD = \left(\frac{4}{7} \times \frac{3}{4}\right) \times 4 = \frac{12}{7}$ units

$\Rightarrow \Delta AGC = \frac{1}{2} \times AC \times KG = \frac{1}{2} \times 1 \times \frac{12}{7} = \frac{6}{7}$ square units

13. d Actual price of each shirt = Rs.850

Profit earned during non-festive season- (1020 - 850) × 50 = Rs. 8,500

Profit earned during festival season- (920 - 850) × 50 = Rs. 3,500

Total profit = Rs.12,000

Cost of a shirt during festival season = Rs.920

Now, $\frac{12000}{920} = 13.044$

Maximum number of shirts that can be bought = 13

14. b Let the fixed amount be Rs. x

Amount at the end of 2002 = Rs. 1000 × 1.1 - x

Amount at the end of 2003 = Rs. [(1000 × 1.1 - x) × 1.1 - x], because interest would be calculated upon the remaining amount.

Amount at the end of 2004 = Rs. [(1000 × 1.1 - x) × 1.1 - x] × 1.1 - x

But amount at the end of 2004 was zero.

Thus, [(1000 × 1.1 - x) × 1.1 - x] × 1.1 - x = 0

$\Rightarrow 1000 = \frac{x}{1.1^3} + \frac{x}{1.1^2} + \frac{x}{1.1}$

$\Rightarrow 1331 = 3.31x$

$\Rightarrow x =$ Rs. 402.11

15. c Age of eldest member = 15 yrs. Hence, all adults are 15 yrs of age. (less than 15 means child)

$\Rightarrow$ average age per member

$= \frac{15 \times 5 + 12.3 \times 20}{25} = \frac{321}{25} = 12.84$ yrs.

16. b Let there be n children in Rathi family. Youngest child = 4 yrs. Maximum age that a child can have = 14 years.

To minimize the number of people, we assume that there is only one adult having the age of 19 years and all the children except the youngest one are 14 yrs old.

Total age of all the children = $11.5n = 4 + 14(n - 1)$

$\Rightarrow n = 4$

Total members = 5

17. c Average age of all members = 14 yrs.

Age of youngest member = 8 yrs.

Age of eldest member = 50 yrs.

Since average age of all members is 14 years, we must make sure there is only one adult in Datta family to minimize the number of members.

For n children in Datta family, $50 + 10.4n = 14(n + 1)$

$\Rightarrow n = 10$. Least number of members = 10 + 1 = 11.

18. a The HCF of the two given numbers is 10^{11}.

Hence, all the factors of 10^{11} would be common to both the numbers 30^{11} and 20^{13}.

$10^{11} = 2^{11} \times 5^{11}$

Total number of common factors

= Number of factors of $2^{11} \times 5^{11} = (11 + 1)(11 + 1)$

$= 12 \times 12 = 144$

19. d Since, $15x + 20y = 375 \Rightarrow 3x + 4y = 75$

Possible values of x and y are as follows in that order.

(1, 18); (5, 15); (9, 12); (13, 9); (17, 6); (21, 3)

in order to minimise the value of $\sqrt{x^2 + y^2}$, we need to take the ordered pair of x and y where difference between them is least possible.

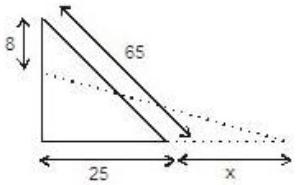
Minimum possible value of $\sqrt{x^2+y^2}$ is when

x = 9 and y = 12 and is equal to 15.

20. a Statement I indicates that n = 3. Since ${}^3C_2 = 3$ is the only such case.

Statement II indicates that n = 4, since ${}^4C_1 + {}^4C_2 + {}^4C_3 + {}^4C_4 = 2^4 - 1$ is the total number of ways of choosing at least one ball from the box.

21. c One of the ways of doing this is by Pythagoras' theorem.



Initially, we have a right-angled triangle with hypotenuse 65 ft and one of the sides 25 ft.

Hence, the third side $= \sqrt{65^2 - 25^2} = 60$ ft.

If the upper end moves down by 8 ft, its new side will be 52 ft. Hence, now we have a right-angled triangle with hypotenuse 65 ft and one of the sides of 52 ft. Hence, the third side = $\sqrt{65^2 - 52^2}$ = 39 ft.

Hence, the bottom end moves towards right by 14 ft.

The other way of doing this is by the use of Pythagorean triplet and its property that `any multiple of the basic triplets also forms a triplet'. Thus, in our case, we have an initial triangle of sides 25 ft and 65 ft. We can write this as 5 × (5) and 5 × (13).

Since 5-12-13 form a triplet, the third side has to be

5 × (12) = 60 ft. Now we have a triangle of sides 52 ft and 65 ft. This can be written 13 × (4) and 13 × (5).

Since 3-4-5 forms a triplet, the third side of this triangle has to be 13 × (3) = 39 ft.

22. a Dexter started at 4:00 am and his bike broke down for 2 hours. Deedee started at 6:00 am. It is equivalent to 4 hours of journey for both of them.

Deedee's initial speed = 28 kmph.

Distance travelled by Deedee = 28t + 14(4 - t) = 14(t + 4) km, where t is the number of hours post 6:00 am at which her bike slowed down. Hence, `t' could be 1, 2 or 3.

So, Dexter's speed (in kmph) could be 35.5, 39 or 42.5.

23. c Equation of circle is given by

$$x^2 + y^2 - 2x + 4y + \lambda(x^2 + y^2 - 2x + 3) = 0$$

where 'λ' is an arbitrary constant.

The circle also passes through (1, 2).

$\Rightarrow 1^2 + 2^2 - 2 + 8 + \lambda(1^2 + 2^2 - 2 + 3) = 0$

$\Rightarrow 6\lambda = -11 \Rightarrow \lambda = -\frac{11}{6}$

Equation of circle: $5x^2 + 5y^2 - 10x - 24y + 33 = 0$.

24. c The required number should be either

HCF of (3309 - 1385) and (7151 - 3309) or its factors.

HCF = 1921

As the number is three digit number, so we have to check the factors of 1921 which are three digit numbers.

Among the three digits factors of 1921, only 113 satisfies the given conditions.

25. a Since $f(x) = a\sqrt{x}$, we have

$f(x) = a\sqrt{x}$, $f(y) = a\sqrt{y}$ and $f(x+y) = a\sqrt{(x+y)}$

$\Rightarrow [f(x)]^2 + [f(y)]^2 = [f(x+y)]^2$

$\Rightarrow a^2x + a^2y = a^2(x+y)$

This means the triangle is a right triangle.

So, area of the triangle = $\frac{1}{2} \times f(x) \times f(y)$

$= \frac{1}{2} \times a\sqrt{x} \times a\sqrt{y} = \frac{1}{2} \times a \times a\sqrt{xy} = \frac{1}{2} \times a \times f(xy)$

26. c The total surface area of the cone is $(\pi rL + \pi r^2)$

After cutting, total surface area of each of the identical pieces is $\frac{\pi rL + \pi r^2}{2}$ + surface area of new exposed triangular cross-section with base 2r and height h.

The ratio is $\frac{\frac{(\pi rL + \pi r^2)}{2} + rh}{(\pi r^2 + \pi rL)} = \frac{1}{2} + \frac{h}{\pi r + \pi L}$

27. c The highest difference is in 2002, the second highest in 2001. The third highest is a choice between 1999 and 2000.

From observation it is 1999.

28. b We do not need to calculate the value of the average but only check the level of the value.

For example, for year 2002, average price is

$\frac{63.4}{21.56} \approx$ Rs. 3/kg .

Hence average price for the period would be Rs. 4/kg.

29. d Let the number of questions solved correctly, solved wrongly and left unattempted be x, y and z respectively.

$= \frac{1}{2} \times a\sqrt{x} \times a\sqrt{y} = \frac{1}{2} \times a \times a\sqrt{xy} = \frac{1}{2} \times a \times f(xy)$

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For example, for year 2002, average price is

$\frac{63.4}{21.56} \approx$ Rs. 3/kg .

Hence average price for the period would be Rs. 4/kg.

29. d Let the number of questions solved correctly, solved wrongly and left unattempted be x, y and z respectively.

$\Rightarrow x + y + z = 100$ ...(i)

$\Rightarrow 4x - 2y - z = 64$ ...(ii)

Adding eq. (i) and (ii), we get

$\therefore x = \frac{164 + y}{5}$

Only, y = 56, will give an integer value of `x', therefore option (d) is the correct choice.

30. c Both the circular paths have the maximum possible radius hence, both have a radius of 3 cm each. Irrespective of the angle between the planes of their circular paths, the two ants will meet again, at point Y only, which is at the diametrically opposite end of X. "Chinti" will take 9 seconds to reach point Y, completing half a revolution. On the other hand, "Pinti" would have completed $1\frac{1}{2}$ of her revolutions and it will also reach, point Y simultaneously.

Test 4 - CAT

1. a $V_1 = 2$, $V_2 = 1$, $V_3 = \frac{3(1)-2}{2} = \frac{1}{2}$ $V_4 = \frac{3\left(\frac{1}{2}\right)-1}{2} = \frac{1}{4}$, $V_5 = \frac{3\left(\frac{1}{4}\right)-\frac{1}{2}}{2} = \frac{1}{8}$

Thus we observe that $V_n = \frac{1}{2^{n-2}}$ $V_9 = \frac{1}{2^{9-2}} = \frac{1}{2^7} = \frac{1}{128}$

2. d For log to be defined, $x^2 - 5x + 7 > 0$ which is true for every value of `n'.

$\Rightarrow \log(x^2 - 5x + 7) < 0 \Rightarrow \log(x^2 - 5x + 7) < \log 1$

$\Rightarrow x^2 - 5x + 7 < 1 \Rightarrow x^2 - 5x + 6 < 0$

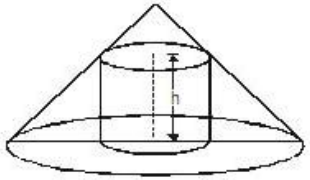
$\Rightarrow (x - 2)(x - 3) < 0 \Rightarrow 2 < x < 3$

3. b For maximum number of students learning all three dances, x has to be maximum.

So, $18 - x = 0 \Rightarrow x = 18$.

Hence, maximum of 18 students could be learning all three dances.

4. a



Let the height of the cylinder = h

$\Rightarrow$ height of the small cone just above the top circular surface of the cylinder = (21 - h)

Since that small cone and the original complete cone are similar,

Height of small cone = Radius of small cone = (21 - h)

But, radius of small cone = radius of the cylinder

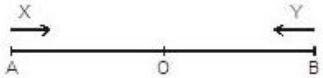
Thus, volume of the cylinder = (p) × $(21 - h)^2 \times h \Rightarrow V = \frac{(\pi)}{2} \times (21 - h) \times (21 - h) \times (2h)$

Sum of all the variable terms in the above expression = (21 - h) + (21 - h) + 2h = 42

Thus, product of these three terms would be maximum when all the variable terms are equal, since their sum is constant.

$\Rightarrow V = \left(\frac{\pi}{2}\right) \times \frac{42}{3} \times \frac{42}{3} \times \frac{42}{3} = 4312\ cm^3$

5. d



OA will be minimum possible when the point O lies on the line joining the points from where boat X and boat Y started.

$OA = AB \times \left(\frac{\text{Speed of boat X}}{\text{Speed of boat X} + \text{Speed of boat Y}}\right)$

Case 1: The flow of the stream is from A to B.

Speed of the boat (X) = 60 + 10 = 70 m/s (downstream)

Speed of the boat (Y) = 30 - 10 = 20 m/s (upstream)

Therefore OA = 77.78 m

Case 2: The flow of the stream is from B to A.

Speed of the boat (X) = 50 m/s

Speed of the boat (Y) = 40 m/s

Therefore OA = 55.56 m

6. a Since the tables are placed side by side, the arrangement would be treated exactly like linear arrangements.

Hence, the answer is ${}^{5}C_{4} \times 4! \times 4!$.

7. c The people belonging to the Republic party were the presidents of the United States of America for not less than 2 years and not more than 5 years are Abraham Lincoln, Andrew Johnson, Rutherford B. Hayes, Chester A. Arthur, Benjamin Harrison, William McKinley and William Howard Taft.

Therefore, there are seven such people.

8. b The number of people who belong to the state Virginia, Tennessee, Louisiana, New York, New Hampshire, Pennsylvania, Illinois, Ohio, Indiana and New Jersey are 1, 2, 1, 5, 1, 1, 2, 5, 1 and 1 respectively.

The two people who belong to the state Tennessee belong to different parties.

Out of the five people who belong to the state New York, the number of people who belong to the Republic and the Democrat party are 2 and 2 respectively.

The two people who belong to the state Illinois belong to the same party.

All the five people from the state Ohio belong to the Republic party.

Therefore, maximum possible number of people in the group is (2 + 2) (New York) + 2(Illinois) + 5(Ohio) = 11

9. a If we assume that any digit is in fixed position, then the remaining four digits can be arranged in 4! = 24 ways. So each of the five digit will appear in each of the five places 24 times. So the sum of the digits in each position is 24(1 + 3 + 5 + 7 + 9) = 600 and hence the sum of all such numbers will be

600(1 + 10 + 100 + 1000 + 10000) = 6666600.

10. a $2f\left(\frac{x}{1-x}\right) - f\left(\frac{1}{x-1}\right) = \frac{3}{x-1}$ ...(i)

Replacing x by $\frac{1}{x}$ we get

$$\Rightarrow 2f\left(\frac{\frac{1}{x}}{1-\frac{1}{x}}\right)+f\left(\frac{1}{\frac{1}{x}-1}\right)=\frac{3}{\frac{1}{x}-1}$$

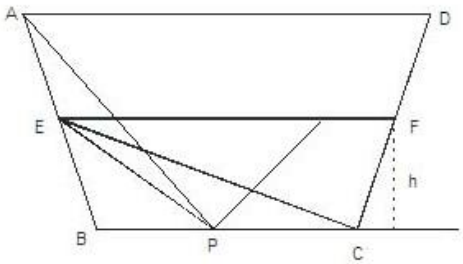
$$\Rightarrow 2f\left(\frac{1}{x-1}\right)+f\left(\frac{x}{1-x}\right)=\frac{3x}{1-x} \quad ...(ii)$$

Multiplying (ii) by 2 and subtracting (i) we get

$$3f\left(\frac{1}{x-1}\right)=\frac{6x}{1-x}-\frac{3}{x-1}=\frac{6x+3}{1-x}$$

$$\therefore f\left(\frac{1}{x-1}\right)=\frac{1}{3}\frac{(6x+3)}{(1-x)}=\frac{2x+1}{1-x} \quad \therefore f(-1)=1$$

11. a



Area of $\Delta ECP=\frac{1}{2}PC\times h=\frac{1}{2}BP\times h=$ Area of ΔBEP

(Since P is the mid-point of BC, PC = BP)

$\Delta BEP=\frac{1}{2}\ \Delta ABP$,

($\therefore$ PE is the median, which divides the ΔABP into two equal triangles)

Also, area of $\Delta ABP = 4$ sq. unit

$\therefore$ Area of $\Delta ECP=\frac{1}{2}\times$ Area of $\Delta ABP=\frac{4}{2}=2$ sq. units

12. a Initial quantity of milk and water in the beakers:

Beaker A: Milk = 25 ml and Water = 75 ml

Beaker B: Milk = 20 ml and Water = 80 ml

Beaker C: Milk = 40 ml and Water = 60 ml

After 40 ml is transferred from beaker A to beaker C:

Beaker A: Milk = 25 - 10 = 15 ml

Beaker B: Milk = 20 ml

Beaker C: Milk = 40 + 10 = 50 ml

Water = 60 + 30 = 90 ml

Now, Milk : Water in Beaker C = 5 : 9

After 28 ml is transferred from beaker C to beaker B:

Beaker A: Milk = 15 ml

Beaker B: Milk = 20 + 10 = 30 ml

Beaker C: Milk = 50 - 10 = 40 ml.

Required ratio = 15 : 30 : 40 = 3 : 6 : 8

13. c Fraction of work completed by 'A' in one day $= \frac{1}{25}$ Fraction of work completed by 'B' in one day $= \frac{1}{30}$

Fraction of work completed by 'B' in first two days $= 2\left(\frac{1}{30}\right) = \frac{1}{15}$

Fraction of work left after day 2 $= 1 - 2\left(\frac{1}{30}\right) = \frac{14}{15}$

Fraction of work completed on each day after day 2 $= \frac{1}{25} + \frac{1}{30} = \frac{11}{150}$

Number of days after day 2 to complete work $= \frac{\left(\frac{14}{15}\right)}{\left(\frac{11}{150}\right)} = \frac{14 \times 150}{15 \times 11} = 12.72$ days

So work will be completed after 15 days.

14. b $b^2 + 2ab - 48a^2 = (b - 6a)(b + 8a)$

Using Statement I:

As $ax^2 + bx + 4a > 0$ for all values of x, we must have $a > 0$ and discriminant < 0.

$\Rightarrow a > 0$ and $b^2 - 16a^2 < 0 \Rightarrow a > 0$ and $(b - 4a)(b + 4a) < 0$

$\Rightarrow (b - 4a) < 0$ and $(b + 4a) > 0 \Rightarrow (b - 6a) < 0$ and $(b + 8a) > 0$

$\Rightarrow b^2 + 2ab - 48a^2 < 0$

Hence (I) alone is sufficient to answer the question.

Using Statement II:

As $2ax^2 + (\sqrt{4b})x + 3 = 0$ for only one real x, discriminant = 0.

$\Rightarrow (\sqrt{4b})^2 - 4(2a)(3) = 0 \Rightarrow (b - 6a) = 0 \Rightarrow b^2 + 2ab - 48a^2 = (b - 6a)(b + 8a) = 0$

Hence (II) alone is also sufficient to answer the question.

15. a Total Revenue = (517 × 14) + (799 × 12) + (1128 × 8) = 7238 + 9588 + 9024 = Rs. 25,850

To get maximum average, the number of trains should be minimum and equal to the HCF (517, 799, 1128) = 47

Number of trains $= \frac{517}{47} + \frac{799}{47} + \frac{1128}{47} = 11 + 17 + 24 = 52$

So the maximum average revenue per train $= \frac{25850}{52} =$ Rs 497.10.

16. c The number of factors = 36 i.e. $3 \times 3 \times 2 \times 2$.

So both the numbers are in the form $a^2 \times b^2 \times c \times d$ or $a^2 \times b^2 \times c^3$, where a,b,c,d are prime numbers.

HCF = 36 = $2^2 \times 3^2$. For the minimum possible LCM of two numbers, the numbers should be minimum.

So the numbers will be $2^3 \times 3^2 \times 5^2$ and $2^2 \times 3^3 \times 7^2$ and their LCM will be $\mathbf{2^3 \times 3^3 \times 5^2 \times 7^2}$.

17. d Given that $2ax^2 + y^2 = 1$

$\Rightarrow 2ax^2 + (2 - 3ax)^2 = 1$ (since $y = 2 - 3ax$) $\Rightarrow 2ax^2 + 4 - 12ax + 9a^2x^2 = 1$

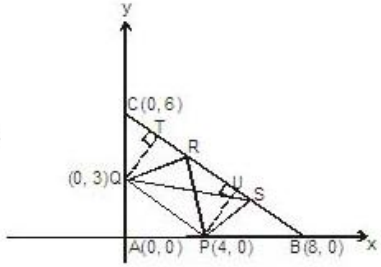
This equation has real solutions, therefore, discriminant ≥ 0

$\Rightarrow x^2(2a + 9a^2) - 12ax + 3 = 0 \Rightarrow (12a)^2 - 4 \times 3 \times (2a + 9a^2) \geq 0$

$\Rightarrow 144a^2 - 24a - 108a^2 \geq 0 \Rightarrow 36a^2 - 24a \geq 0$

$\Rightarrow 12a(3a - 2) \geq 0 \Rightarrow a \leq 0$ and $a \geq \frac{2}{3}$ therefore, minimum possible value of `a' is $\frac{2}{3}$.

18. a



In triangle ABC, PQ || BC

$PQ = \frac{BC}{2} = \frac{10}{2} = 5$ units

$\Rightarrow RS = PQ = 5$ units.

$\Rightarrow CR + BS = 10 - RS = 5$ units

Let $CR = a \Rightarrow BS = 5 - a$

QT = PU (Distance between two parallel lines)

$$\frac{\text{area}(\Delta PBR)}{\text{area}(\Delta CSQ)} = \frac{\frac{1}{2} \times BR \times PU}{\frac{1}{2} \times CS \times QT} = \frac{BR}{CS} = \frac{10 - a}{5 + a}$$

As the length (in units) of CR and BS are integer, the value of `a' can be 1, 2, 3 or 4 only.

Accordingly, $\frac{10-a}{5+a}$ can be $\frac{9}{6}, \frac{8}{7}, \frac{7}{8}$ or $\frac{6}{9}$ only.

19. b Percentage contribution of south region in 1995 = $\frac{3567}{3567+3213+4466}$ = 31.71%.

20. b Percentage change for south region is maximum in 1995 and is equal to 45.59%.

21. b Total production in south region = 17,034 tons.

Total production in north region = 20,746 tons

Thus, ratio of production of south region to north region = 1 : 1.2

22. b Let's consider $\frac{a}{2}, \frac{a}{2}, \frac{b}{3}, \frac{b}{3}, \frac{b}{3}$ and c as 6 variables.

As all variables are positive, A.M. ≥ G.M.

$$\frac{\frac{a}{2}+\frac{a}{2}+\frac{b}{3}+\frac{b}{3}+\frac{b}{3}+c}{6} \geq \left(\frac{a^2b^3c}{2^2\times 3^3}\right)^{\frac{1}{6}}$$

Putting the value of $a^2 b^3 c$ in the above inequality

$\frac{a+b+c}{6} \geq \left(\frac{2}{3}\right)$ or $a+b+c \geq 4$

Hence minimum value of (a + b + c) = 4.

23. a The side of $S_1 = x$

The side of $S_2 = \frac{x}{\sqrt{2}}$

The side of $S_3 = \frac{x}{\sqrt{2}\times\sqrt{2}}$

.....

The side of $S_{35} = \frac{x}{2^{17}}$.

24. a $\left[\left(m(1.1)^2-5,000\right)\times 1.1-6,000\right]\times 1.1 = 10,000$ or m = Rs. 15,470.

25. d $t_4(1) = t_3(1) + \frac{1}{4\times 5}$ $t_4(1) = t_2(1) + \frac{1}{3\times 4} + \frac{1}{4\times 5}$

$\therefore t_4(1) - t_2(1) = \frac{1}{12} + \frac{1}{20} = \frac{2}{15}$

26. b Distance covered

= Area under the speed time curve on horizontal Axis

Between the time interval t_C to t_D

Distance covered by A: $\frac{1}{2}\times\left(\frac{15\text{ min}}{60\text{ min}}\right)\times[60+20] = \frac{1}{2}\times\frac{1}{4}[80]$ = 10 km.

Distance covered by B: $\frac{1}{2}\times\frac{1}{4}\times[50+30] = 10$ km

Required difference = 0 km.

27. c Average speed = $\frac{\text{Total distance travelled}}{\text{Total time taken}}$

$= \frac{\frac{1}{2}\times\frac{1}{4}\times[50+30]+50\times\frac{1}{4}}{\frac{1}{2}}$

$= \frac{1}{4}\times\frac{2}{1}[40+50] = \frac{1}{2}\times[90] = 45$ km/hr.

28. d At t_x, common speed of A & B (approximately)

= 26 km/hr.

And at t_y, the common speed (approx.) = 42 km/hr.

The average speed of B in the interval t_0 to t_D

$= \frac{\text{Total distance travelled}}{\text{Total time taken}} = \frac{\frac{1}{2}\times\frac{1}{4}\times(20+30)+\frac{1}{2}\times\frac{1}{4}\times(30+50)+\frac{1}{4}\times 50+\frac{1}{2}\times\frac{1}{4}\times(50+30)}{4\times\left(\frac{15\text{ min}}{60\text{ min}}\right)} = 38.75$ km/hr

Required percentages are

$\frac{26}{38.75}\times 100 \approx 67\%$ and $\frac{42}{38.75} \approx 108\%$

29. a Given that $\left(1+\frac{1}{a}\right)x+\left(1-\frac{1}{a}\right)y = a$

or, $(a + 1)x + (a - 1)y = a^2$

Also given that $2 < a \le 100$

Considering, a is even,

Let a = 2N; (N = 1, 2, 3, ... 50) the equation is

$(2N + 1)x + (2N - 1)y = 4N^2$

$\Rightarrow x = \frac{4N^2-(2N-1)y}{2N+1}$

for **N = 1**, $x = \frac{4-y}{3}$, only one positive integral solution

is x = 1, y = 1

for **N = 2**, $x = \frac{16-3y}{5}$; only one positive integral solution is x = 2, y = 2

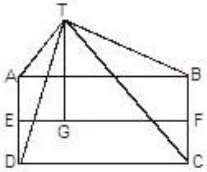
for **N = 3**, $x = \frac{36-5y}{7}$; only one positive integral solution is x = 3, y = 3 .... and so on

.....

for **N = 50**, $x = \frac{10000-99y}{101}$; only one positive integral solution is x = 50, y = 50

For every even number a; there exists only one positive integral solution. Hence, between 2 to 100 (both included); there are 50 such values of a.

30. d



Let, EG = x m, $\therefore$ GF = (20 − x)m

Since, E and F are the mid-points of sides AD and BC respectively, AT = TD and BT = TC.

Since, $\angle ATD = 90^\circ$, therefore, ΔATD is an isoceles right angeled triangle and $AT = TD = 4\sqrt{2}$ m

and since, $\angle BTC = 60^\circ$, ΔBTC is equilateral triangle and BT = TC = BC = 8m.

Let the height of the tower be `h'

$h^2 = TD^2 - DG^2 = 32 - (ED^2 + EG^2) = 16 - x^2$

Similarly, $h^2 = TC^2 - GC^2 = 64 - (GF^2 + FC^2)$

$= 48 - (20 - x)^2$

$\Rightarrow 16 - x^2 = 48 - (20 - x)^2 \Rightarrow 40x = 16 + 352$

$\Rightarrow x = \frac{368}{40} = \frac{46}{5} \therefore 20 - x = \frac{54}{5}$

Required Ratio $= \frac{EG}{FG} = \frac{23}{27}$

Test 5 - SNAP

1. a If P_1 and P_2 are twin-primes, then P_1 will be of the form 6K - 1.

and P_2 will be of the form 6k + 1 (K is a natural number.)

$P_1 = 6K - 1$ and $P_2 = 6K + 1$.

$P_1 + P_2 = 6K - 1 + 6K + 1 = 12K$

∴ 12 would always divide $P_1 + P_2$.

Note: Any prime number greater than 3 has to be of the form 6K + 1 or 6K - 1.

2. b Let the number of swans be x.

∴ We get $7\left\{\frac{1}{2}\sqrt{x}\right\} + 2 = x$

Taking x = 16, we get $7\left\{\frac{1}{2}\sqrt{16}\right\} + 2 = 16$ or 16 = 16 which is correct. Hence, the number of swans is 16.

3. b Every next term in the series is the result of the addition of sum of digits of previous number to the term itself. Hence the missing number will be 38 + 8 + 3 = 49.

Option (b) is the correct choice.

4. a Let a = 2.22, b = 3.33, c = 4.44

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ac)$

$S = (2.22)^2 + (3.33)^2 + (4.44)^2 + 2 \times (1.11)^2 (2 \times 3 + 2 \times 4 + 3 \times 4)$

$S = (2.22 + 3.33 + 4.44)^2$

The value of the expression S = 100.

5. a Factorize 399

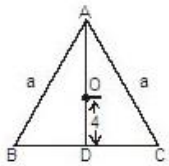
$399 = 3 \times 7 \times 19$

The possible pairs of (x, y) are:

(57, 7) (21, 19) (399, 1) (133, 3)

The least possible sum is given when x = 21 & y = 19. And the sum is 2 + 1 = 3.

6. b Let `a' be the side of the equilateral ΔABC



We can write here,

$\frac{1}{3} \times \left(\frac{\sqrt{3}}{2}\right) \times a = 4 \Rightarrow a = \frac{24}{\sqrt{3}}$

Now area of triangle ABC $= \left(\frac{\sqrt{3}}{4}\right) \times a^2$

$= \left(\frac{\sqrt{3}}{4}\right) \times \left(\frac{24}{\sqrt{3}}\right)^2 = 48\sqrt{3}\ cm^2$

7. c You know that

A + B + C = 180° (i.e. angles of a triangle)

Given A = 4B

$\Rightarrow 5B + C = 180° \Rightarrow B = \frac{180° - C}{5} = 36° - \frac{C}{5}$ ∴ B has to be less than 36°.

8. b Given that volume(V) = 1000 m^3

Length(l) = 5 m

Height(h) = 20 m

$\Rightarrow \text{Breadth(b)} = \frac{V}{(lh)} = \frac{1000}{100} = 10\ m$

The volume of water taken out

= length × breadth × drop in the level of water

Let `d' metres be the drop in level of water.

$\Rightarrow 200 = 5 \times 10 \times d$

$\Rightarrow d = 4\ m$

9. d Required probability $= \frac{1}{5}$.

10. d The important thing to understand here is that if we need to focus on the concentration of vodka, it does not matter that the replaced fluid is water or lime cordial or any other fluid as that does not affect the concentration of vodka. What matters is the quantity of mixture replaced only.

Initial concentration of vodka $= \frac{32}{50} = \frac{16}{25}$

After the first operation, it becomes

$\left(\frac{16}{25}\right) \times \left\{\frac{(50-10)}{50}\right\} = \left(\frac{16}{25}\right) \times \left(\frac{4}{5}\right) = \frac{64}{125}$

After the second operation, it becomes

$\left(\frac{64}{125}\right) \times \left\{\frac{(50-20)}{50}\right\} = \left(\frac{64}{125}\right) \times \left(\frac{3}{5}\right) = \frac{192}{625} = 30.72\%$

11. c Let volume of can be V litres.

$$\frac{\text{Amount of Paint left}}{\text{Amount of Paint originally}} = \left(\frac{\text{Volume of can} - \text{Volume replaced}}{\text{Volume of can}}\right)^2$$

or $\frac{\frac{49}{64} \times V}{V} = \left(\frac{V-5}{V}\right)^2 \Rightarrow \frac{49}{64} = \left(\frac{V-5}{V}\right)^2 \Rightarrow \frac{7}{8} = \frac{V-5}{V} \Rightarrow V = 40 \text{ litres}$.

12. a We know that profit percentage = 20%.

So SP = 1.2 CP. This profit is made after the loss that he has incurred by selling 16 articles at the price of 12. This loss would be $\frac{(16-12)}{16}$ = 25%.

So his actual SP × 0.75 = 1.2 CP.

So his actual SP = 1.6 CP.

Also his actual SP = 0.8 MP.

Therefore, 0.8 MP = 1.6 CP or MP = 2 CP.

This means that he had marked his goods 100% above his CP.

13. b Let the cost price of 1 apple be `x', therefore the cost price of 1 orange and 1 mango would be `x' and `2x' respectively.

Selling price of 1 apple $= \left(\frac{16x}{10}\right) = 1.6x$

Selling price of 1 orange $= \left(\frac{12x}{16}\right) = 0.75x$

Selling price of 1 mango $= \left(\frac{12x}{4}\right) = 3x$

Total cost price of 1 apple, 2 oranges and 2 mangoes = x + 2x + 4x = 7x.

Total selling price of 1 apple, 2 oranges and 2 mangoes = 1.6x + 1.5x + 6x = 9.1x

Net Profit = 9.1x - 7x = 2.1x

Net Profit percent $= \left(\frac{2.1x}{7x}\right)100 = 30\%$

14. d Let work (in units) done by A in one day be 4w.

Work (in units) done by A's assistants in one day will be 3w.

Total work (in units) done by all three of them in one day

= 4w + 3w + 3w = 10w

Let the total work (in units) be 20w

Required fraction $= \frac{2}{5}$.

15. b Assume there are 360 units of work (LCM of 90, 40 and 12). Hence, A, B and C can do 4, 9 and 30 units per day or together 43 units for every 3 days. So in 24 days, 43 × 8 = 344 units of work is completed. In the next 2 days, 13 units are completed and on the 27th day, C takes $\left(\frac{1}{10}\right)$ of a day to finish the rest. So A and B have worked for 9 days each and

have hence put in 36 and 81 units respectively, and the rest of the 243 units is put in by C.

The wages shall also be distributed in the same ratio as Rs. 36, Rs. 81 and Rs. 243.

16. b Now here, Rs. 200 gets added every year to the initial amount of Rs. 400

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

$$18000 = \frac{n}{2}[800 + (n-1)200] \Rightarrow 18000 = \frac{n}{2}[600 + 200n] = 300n + 100n^2$$

We have $n^2 + 3n - 180 = 0 \Rightarrow n = 12$.

17. b The amount becomes 4 times in 4 yrs.

$\Rightarrow$ interest = 3 times the principal

$P(r + 2r + 4r + 8r) = 3P$

$\Rightarrow r = 20\%$

Here, 52 times means interest = 51P

$$\Rightarrow 51P = \frac{P}{100}(20 + 40 + 80 + 160 + \ldots 2^{n-1} \times 20)$$

$\Rightarrow n = 8$ yrs.

18. d Let r = running time of the train

s = stoppage time of the train

D = total distance travelled by train

We have:

$$\frac{D}{r} = 60 \text{ and } \frac{D}{r+s} = 40$$

$$\Rightarrow \frac{r+s}{r} = \frac{3}{2} \Rightarrow \frac{s}{r} = \frac{1}{2}$$

As D = 300 kms

$$\frac{300}{r} = 60 \Rightarrow r = 5 \text{ hr.} \Rightarrow s = \frac{5}{2} = 2.5 \text{ hr.}$$

Alternate Method:

Running time (t) = $\frac{300}{60} = 5$ km/hr

Running time + Stoppage time(s) = t + s = $\frac{300}{60} = 5$ km/hr

Stoppage time = 2.5 hours

19. d Arrangements possible are (3, 4, 5, 6, 7, 8), (7, 10, 13, 16, 19, 22) and (4, 7, 10, 13, 16, 19).

Hence answer cannot be determined.

20. c The ratios of the share of

students : teachers : benefactor = 1 : 1.5 : 4.5

So the proportion of teacher's share is $\frac{1.5}{7}$.

Hence, the teachers would donate: $\frac{(1.5 \times 4200)}{7}$ = Rs. 900.

21. a If CP is initially X, then the values after the increases are 1.1 X, 1.21 X and 1.331 X.

Since 0.121 X = Rs. 121, then X = Rs. 1000

So 0.1 X is equivalent to Rs. 100.

22. a $x^2 - 7x + 12 \le 0 \Rightarrow (x-4)(x-3) \le 0 \Rightarrow 3 \le x \le 4$.

23. a Let, (x - y + z) = 2k and (y - z + 2w) = 3k and (2x + z - w) = 5k.

Or, (x - y + z) + (y - z + 2w) = 2k + 3k = 5k = 2x + z - w. Or, x + z = 3w. S = (3x + 3z - 2w) : w = 7 : 1.

24. b As every son should get at least one chocolate.

The number of ways 8 distinct chocolates can be selected is

$^9c_8 = {}^9c_1 = 9$ ways

The number of ways each son gets one chocolate each out of these 8 selected chocolates 8!.

Total number of ways 8 chocolates can be distributed is = 9 × 8!.

Now the last one chocolate can be given to any of the 8 sons hence total number of ways of distributing $= \frac{9 \times 8! \times 8}{2} = (36 \times 8!)$ ways.

Hence option (b) is the correct choice.

Note: Why it is divided by 2; take an example of 3 chocolates and 2 sons ($B_1 \times B_2$). Two chocolates can be selected out of (a, b, c) and distributed to too sons in $^3C_2 \times 2! = 6$ ways and the third chocolate can be distributed in 2 ways hence final answer should be 6 × 2 = 12 ways. But

a. If (a, b) is selected, one of the ways of distributing chocolates (a, b) will be a [a][b]

After c is distributed it will be one of the following

[a, c] [b] ...(i)

or

[a] [b, c] ...(ii)

b. If (b, c) are selected then one of the ways of distributing chocolates (b, c)

[b] [c]

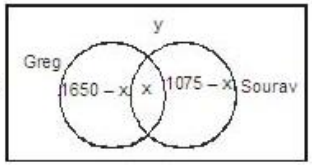
After a is distributed

[a, b] [c] ...(iii)
or [b] [a, c] ...(iv)

We can check (i) and (iv) are same.

⇒ Every distribution will repeat once hence divided by 2.

25. b



From the above venn diagram we have

x = both Greg and Sourav

y = neither Greg nor Sourav (1650 + 1075 - x) + y = 2000

⇒ x - y = 2725 - 2000 = 725 x = 725 + y

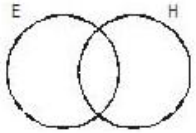
⇒ x_{min} = 725; when y = 0 ⇒ A minimum of 725 people, preferred both Greg and Sourav.

26. a Since the year of birth is also known, the birthday being on Saturday can have a zero probability.

Also since between 6th and 10th, there are three days, i.e., 7th, 8th and 9th.

Therefore, probability of birthday falling an Saturday can be $\frac{1}{3}$.

27. c



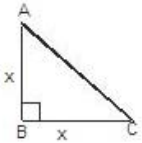
I: Gives no information about n(E) or n(E∩H) II: Gives n(E∪H) but we can't count n(E)

From both I & II; we get n(E∪H) = n(E) + [n(H) - n(E∩H)]

or 300 = n(E) + 100 ⇒ n(E) = 200.

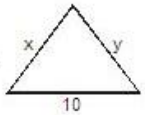
28. c Using statement I, let AB = BC = x units

I.



Now, area = $\frac{1}{2}x^2$, but we do not know the length of x.

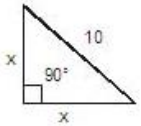
So area cannot be found out by statement I alone

II. 

We have only one length = 10 cm.

So we cannot find the area from statement II alone

Combining I and II:



Area = $\frac{1}{2}x^2$ and $2x^2 = 10^2 \Rightarrow x^2 = 50$

$\Rightarrow$ Area = 25 sq. units

So, statement I & statement II, then combined can solve this problem.

29. c By combining both the statements, we get $x + y \geq 1$.

30. c It is obvious that the question cannot be answered by using the statements alone. Combining both the statements together:

60y = 80(y - 50)

20y = 4000

$\therefore$ y = 2000, where `y' is the amount paid by a student of Vasant Valley school.

31. a Statement I alone is not sufficient to find the area of ABCD. It only tells that

Area of ABCD = $\sqrt{(s-a)(s-b)(s-c)(s-d)}$.

Statement II gives the length of all the sides of ABCD.

Once the length of all the sides of the quadrilateral are known, its area can be determined. Hence, statement II alone is sufficient to answer the question.

32. d It is obvious that the question cannot be solved by using the two statements alone.

The number of people living in the ground, first and second floors could be 3, 8 and 4 or 9, 4 and 2 respectively. So, it cannot be determined.

33. c The costliest brand is one whose ratio of market share percentage by value to market share percentage by volume is the highest. Among the options given, Kitkat is the costliest.

34. c Let total value be Rs. 100x and total volume be 100y units.

Average market price (in Rs./unit) = $\frac{x}{y}$.

Therefore, among given choices Perk is priced above average market price with price of $\frac{9.2x}{8.3y}$.

35. d Ratio of market share by value to market share by volume for Nestle is $\left(\frac{25.1}{243.7}\right) = 1.01$.

Thus, we can say that price of Nestle is 1.01 times or 1% more than the average market price. Since we do not have the actual average market price, the amount by which Nestle is higher cannot be determined.

36. b Volume sales of Bar-one = 28% of 3.3% of 10000 tons = 92,400 kg

37. b Market value of C in May = 70

Market value of C in Feb. = 50

Required percentage = $\frac{70}{50} \times 100 = 140\%$

38. a Lowest market value of A = 20

Highest market value of A = 70

Maximum percentage increase = $\frac{70-20}{20} \times 200\ \%$

39. c Market value of B in May = 100

And market value of B in Feb. = 70

Percentage increase = $\frac{100-70}{70} \times 100 = 43\%$.

40. b Average value of product

$= \frac{50+50+30+50+70+70}{6} = 53.33$

Number of months showing above average market value is 2, i.e. May and June.

For questions 41 and 42:

Cases which are not possible: (X_1, X_2), (X_1, X_3), (X_1, X_5), (X_1, X_6), (X_2, X_3), (X_2, X_4), (X_2, X_5), (X_3, X_4), (X_3, X_6), (X_4, X_5), (X_4, X_6) and (X_5, X_6).

Cases which can be possible: (X_1, X_4), (X_2, X_6) or (X_3, X_5)

41. d

42. c

43. d The grid will be

A(4)	B(9)	C(2)
D(3)	E(5)	F(7)
G(8)	H(1)	I(6)

or

A(4)	B(3)	C(8)
D(9)	E(5)	F(1)
G(2)	H(7)	I(6)

Hence option (d) is the correct choice.

For questions 44 to 46:

Let Keshto, Omprakash, Sanjiv Kumar, Tuntun, Vijayendra and Wahida be represented by K, O, S, T, V and W respectively.

I. Either O or V must be selected but neither V or S can be selected with O, i.e. VO and SO is not possible.

II. Either S or K or both SK must be selected.

44. d If V is not selected, then O must be selected.

Now using condition II, S cannot be selected with O. Therefore, K has to be there with O.

Hence, Omprakash and Keshto must be selected.

45. b According to the given conditions, if S is selected, then V must be selected but not O.

46. d Another interpretation of the given conditions is that any pair without S, V, O and K cannot be among the selected ones. Therefore, out of the given options pair of Tuntun and Wahida cannot be among the selected ones.

47. b The numbers inside the circles are the square roots of the sum of the numbers outside the circle.

48. d The numbers inside the circles are obtained by multiplying the numbers outside the circle.

49. c The code for a word is obtained by replacing each alphabet of the word by its immediate predecessor in the alphabet series. Hence in the word ENJOYMENT,

E is replaced by D N is replaced by M J is replaced by I

O is replaced by N Y is replaced by X M is replaced by L

E is replaced by D N is replaced by M T is replaced by S

50. a First term is 101×1, second term is 101×11 , third term is 101×111. Similarly the fifth term will be $101 \times 11111 = 1122211$.

For questions 51 to 53: First seven values of P will be

$0^2 - 2 \times 0 = 0$

$1^2 - 2 \times 1 = -1$

$2^2 - 2 \times 2 = 0$

$3^2 - 2 \times 3 = 3$

$4^2 - 2 \times 4 = 8$

$5^2 - 2 \times 5 = 15$

$6^2 - 2 \times 6 = 24$

51. d p = 24

52. d $(6^2 - 2 \times 6) - (3^2 - 2 \times 3) = 21$

53. c $0 - 1 + 0 + 3 + 8 + 15 + 24 = 49$

54. d The given word is broken into two parts, each having equal number of alphabets. Letters in each of these two groups are interchanged as below:

PHILANTHROPY is broken in two groups

PHILAN + THROPY

In each of the two groups, the first letter is exchange by the last letter, the second letter by the second last letter and so on. Thus we get:

PHILAN ⇒ NALIHP

THROPY ⇒ YPORHT

Similarly, code for the word PLEBISCITE is obtained as:

PLEBISCITE ⇒ PLEBI + SCITE

PLEBI ⇒ IBELP and SCITE ⇒ ETICS

Thus the code is IBELPETICS.

55. b The codes for different words are obtained by summing up the individual letters' corresponding place in the alphabet series.

TABLE is $20 + 1 + 2 + 12 + 5 = 40$

CHAIR is $3 + 8 + 1 + 9 + 18 = 39$

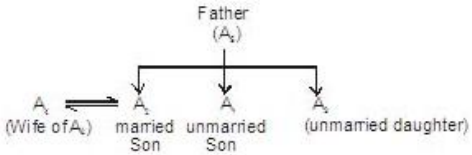
Hence DESK will be coded as $4 + 5 + 19 + 11 = 39$.

56. d Triangle holds the square, hexagon holds the triangle and circle holds the triangle and pentagon holds the hexagon. So square is the innermost figure.

57. c Sushma finished her graduation 5 years back from today. Geeta started teaching from the year Sushma entered college, i.e. 3 years before Sushma finished her graduation. So Geeta started teaching 8 years back from today.

58. b As `A' stays at Goa, `A' did not go to Goa during the holidays. As `C' loves visiting foreign countries, `C' also did not go to Goa. `D' and `E' went to a place away from the sea. So `D' also did not go to Goa. Therefore, `B' went to Goa.

For questions 59 and 60: The given information can be shown with the help of family tree as below:



Note: Statements (II) & (vii) are redundant.

59. c

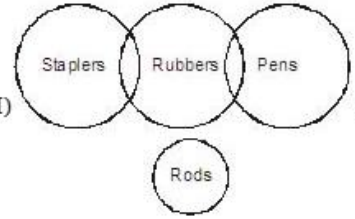
60. a

61. d Father of my father's daughter means my father.

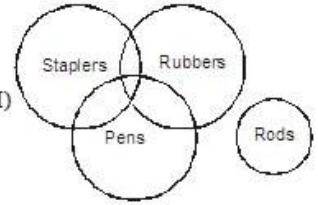
Brother of my father means my uncle.

Hence, Ashu is the uncle of Aru.

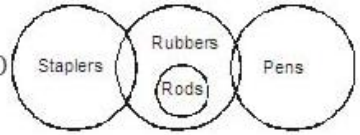
62. b (I)



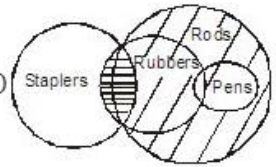
(II)



(III)



(IV)



The four possibilities depicted above clearly demonstrate that (b) is the correct option.

63. a I is implicit that is why `have done more harm the good', phrase is there. II is more of an conclusion and is not implicit.

64. c Choice (c) follows from the passage that says, chess is a popular " pastime" in Turkey and is played at an "amateur" level.

65. b (b) echoes the positive and optimistic tone of the passage while all the other choices walk on the sceptic side.

66. b The author mentions a fictional place and its characteristics. This is best stated in choice (b).

67. a The author mentions in the para about a person who has evaluated scientists according to different benchmarks which derive from the nature of the profession. This makes choice a correct.

68. c The author talks about the present context with special reference to children and their predicament. This is best stated in choice (c).

69. c The author mentions various Universities and the state of the students. This is highlighted through some examples but the author does not provide the reasons for this. This makes choice (c) correct.

70. d An army with weapons can defeat the enemy. Similarly, firemen can put out fire with water.

Test 6 - SNAP

1. a Let the amount (in dollars) spent by a writer, doctor, dentist and banker be a, b, c and d respectively.

According to question,

$5a = 4b = 3c = 4d$

Let $5a = 4b = 3c = 4d = k$

Therefore, $a = \frac{k}{5}; b = \frac{k}{4}; c = \frac{k}{3}$ and $d = \frac{k}{4}$

As, $25a + 20b + 18c + 12d = 1330$

$\Rightarrow 5k + 5k + 6k + 3k = 1330$ or $k = 70$

Amount spent by doctors = \$ 350.

2. d 14 can be achieved by (5,5,4) or (5,4,5) or (4,5,5). Probability of getting 5 is 2/6, and that of getting 4 is 1/6. Required probability (P) = $3 \times (2/6) \times (2/6) \times (1/6) = 1/18 = 5.55\%$.

3. b The series is moving as:

$1 \times 1.5 = 1.5$

$1.5 \times 2 = 3$

$3 \times 2.5 = \mathbf{(7.5)}$

$7.5 \times 3 = 22.5$

$22.5 \times 3.5 = 78.75$

$78.75 \times 4 = 315$

4. c Edge-length of the smaller cube = 1 mm

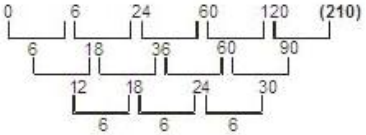
Edge-length of the bigger cube = 1 m = 1000 mm

So number of smaller cubes =

$$\frac{\text{Volume of the bigger cube}}{\text{Volume of a smaller cube}} = \frac{1000 \times 1000 \times 1000}{1 \times 1 \times 1} = 10^9$$

Since each smaller cube is having a side of 1 mm, while combining these smaller cubes end-to-end, total length of this cube - rope will be 1×10^9 mm = 1,000 km.

5. a



6. b Quantity of water admitted in one minute

$= \frac{7}{3 \times 6.5} - \frac{15}{60} = \frac{8.5}{78}$ tons

Therefore, 68 tons of water will be admitted in

$68 \times \frac{78}{8.5}$ i.e. 624 minutes or $\frac{624}{60}$ hrs.

Required speed $= \frac{156}{624} \times 60 = 15$ km/hr

7. d Going by options, average price per item in option (d)

$= \frac{50 + 40 + 25 \times 2 + 10}{5} =$ Rs. 30.

8. a Simple interest on principal amount for 1 year = 690 - 645 = Rs. 45

Simple interest for 4 years = 45 × 4 = Rs. 180

Principal amount = 645 -180 = Rs. 465

9. c Amount invested = Rs. 4,60,000

Profit earned = Rs. 1,84,000

Ratio of shares of profit for A, B and C = 15 : 16 : 15

So B receives 16 × 4,000 = Rs. 64,000

10. a Let the two numbers be 37x and 37y, where x and y are co-prime to each other.

Now 37x + 37y = 518

37(x + y) = 518

x + y = 14

As the difference between numbers is minimum possible, so x - y is minimum possible.

So x = 9 and y = 5.

Hence difference between the numbers = 37 × 4

= 148.

11. c The number of coins will be minimum when three of the boxes contain 1 coin each and the remaining boxes contain 2, 3, 4 and 5 coins respectively.

Required number of coins = 17.

12. b Let the initial number of workers be `n' and each worker completes `w' units of work in a day.

According to question,

$\frac{n}{w} + \frac{n-1}{w} + \ldots + \frac{1}{w} = n \times \frac{n}{w} \times \frac{2}{3}$ $\frac{n(n+1)}{2w} = \frac{2n^2}{3w}$ or n = 3.

13. c Let the fixed cost be Rs. c and variable cost be Rs. x.

According to question,

$c + 200x = 200 \times 9$ ...(i)

$c + 300x = 300 \times 8$ ...(ii)

From equations (i) and (ii),

$c = 600$ and $x = 6$

Cost per student for 600 students = Rs. 7.

14. b He takes 40 minutes less to cycle than to walk. Thus, on the whole he takes 40 more.

Required time = 3 hours 20 minutes or 3.33 hours.

15. d Total value of shares bought $= 225 \times \frac{100}{15} =$ Rs. 1500

Purchase price of one share by PQR ltd. = 125 + 115 = Rs. 240

Total investment made by PQR ltd. $= \frac{240}{125} \times 1500 =$ Rs. 2,880

16. d Let the number of men be `n'

Number of matches among men $= {}^{n}C_2 \times 2 = \frac{n(n-1)}{2} \times 2 = n(n-1)$

Number of matches between men and women $= n \times 2 \times 2 = 4n$

According to question,

$4n + 66 = n(n - 1)$ or $n = 11$

Total number of players = 11 + 2 = 13.

17. c Speed of train = 20 m/s

Length of train = 20 × 3 = 60 m

Now length of train + length of tunnel = 20 × 33 = 660 m

Length of tunnel = 600 m

18. c Let Rs. `a' be the total cost price of sweets.

$\frac{3}{5} \times a \times \frac{10}{100} - \frac{2}{5} \times a \times \frac{5}{100} = 1500$ or a = 37,500

19. b Put $x = 1$, $p - q + q - r + r - p = 0$

Hence, x = 1 is one of the roots. Now product of roots

$= \frac{c}{a} = \frac{r-p}{p-q} \Rightarrow 1 \times \text{second root} = \frac{r-p}{p-q}$ so second root $= \frac{r-p}{p-q}$.

Alternative method:

$(p-q)x^2+(q-r)x+(r-p)=0$

$x^2+\frac{(q-r)}{(p-q)}x+\frac{(r-p)}{(p-q)}=0$

$x^2-\frac{(r-q)}{(p-q)}x+\frac{(r-p)}{(p-q)}=0$

$x^2-\left(1+\frac{(r-p)}{(p-q)}\right)x+\frac{(r-p)}{(p-q)}=0$

This is of the form:

x^2-Sx+P, where S is the sum of the roots and P is the product of the roots.

Therefore, the roots are 1 and $\frac{r-p}{p-q}$.

20. a We have, $\frac{1}{a\alpha+b}+\frac{1}{a\beta+b}$

$=\frac{a(\alpha+\beta)+2b}{a^2\alpha\beta+ab(\alpha+\beta)+b^2}$

$=\frac{a\left(\frac{-b}{a}\right)+2b}{a^2\times\frac{c}{a}+ab\left(\frac{-b}{a}\right)+b^2}=\frac{b}{ac-b^2+b^2}=\frac{b}{ac}$

21. a **Note:** All the dimensions are in units.

If length = x and breadth = y,

then area = xy

New length = $x\left(\frac{125}{100}\right)=1.25x$

As area remains the same, new breadth

$=\frac{xy}{1.25x}=\frac{4y}{5}$

$\frac{4y}{5}\times 100=80\%$ of y (old breadth)

Therefore, breadth of the plot should be decreased by 20%.

22. a B alone can produce 3,00,00 meters of cloth in 15 hrs.

$\therefore\frac{3,00,000}{15}=20,000$ meters of cloth in 1 hr

B alone can produce 2,00,000 meters of cloth in 10 hrs.

Remaining 3,00,000 - 2,00,000 = 1,00,000 meters of cloth is produced by A in 10 hrs.

23. b If the area of the garden is `a' sq. ft, then the difference between $\frac{3}{4}$ and $\frac{2}{3}$ of the area is 60 sq. ft,

i.e. $\left(\frac{3}{4}-\frac{2}{3}\right) \times a = 60 \Rightarrow a = 720$ sq. ft

$\text{Length} = \frac{\text{Area}}{\text{Width}} = \frac{720}{10} = 72$ ft.

24. c Since exponents are even, we can apply the property that if `x' is even, then $a^x - b^x$ is divisible by a + b.

$= 7^{256} - 3^{256}$ is divisible by 7 + 3 i.e. 10.

Now, any number when multiplied by 10 gives the last digit as `zero'.

25. b C.P. of first article $= 624 \times \frac{100}{120} = \text{Rs. } 520$

C.P. of second article $= 1024 \times \frac{100}{133.33} = \text{Rs. } 768$

C.P. of both the articles = Rs. 1,288

S.P. of both the articles $= 1288 \times \frac{125}{100} = \text{Rs. } 1,610$

26. a Let $\frac{a}{7} = \frac{b}{5} = \frac{c}{9} = k$

Hence, $\frac{(ab+bc+ca)}{b^2} = \frac{(35+45+63)}{25} = \frac{143}{25}$

27. d Let the original rate of interest be r%

$\therefore 6000 - 5000 = \frac{5000 \times 4 \times r}{100}$ or r = 5

New rate of interest = 2r = 10%

New Principal = Rs. 6,000

Final Amount = Rs. 10,000

Time $= \frac{(10000-6000)}{6000 \times 10} \times 100 = \frac{20}{3}$ years = 80 months.

28. b If one group is selected then each of the other three groups has one student in common from the first group. So in first group there are only three students. Similarly for the other three groups. If student numbers are 1, 2, 3, 4, 5 and 6 then groups can be made as (1, 2, 3), (3, 4, 5), (5, 6, 1) and (2, 4, 6). Hence there are six students in the class.

29. a Average of consecutive natural numbers from a_n to a_m is $= \frac{a_n + a_m}{2}$ ...(i)

Average of consecutive natural numbers from a_1 to a_{2m} is $\frac{a_1 + a_{2m}}{2}$ ...(ii)

Required difference (i) - (ii)

$= \frac{(a_n + a_m) - (a_1 + a_{2m})}{2} = \frac{(a_n - a_1) + (a_m - a_{2m})}{2}$

30. b **Way 1 :** All white pawns on white squares and all black pawns on black squares.

Way 2 : All white pawns on black squares and all black pawns on white squares.

31. c $a \times b \times c \times d$ will always be negative. Therefore, magnitude of $a \times b \times c \times d$ should be least for maximum value.

For least magnitude, a = 15, b = 1, c = 1, d = -1

Hence, $a \times b \times c \times d = -15$.

32. b Cost of a horse = Rs. 48

Cost of 2 horses = Rs. 96 = Cost of 16 Goats

Therefore, cost of 10 goats $= \frac{96}{16} \times 10 = \text{Rs. } 60$

Cost of 5 cats = Rs. 60 = Cost of 3 dogs

Therefore, cost of 5 dogs $= \frac{60}{3} \times 5 = \text{Rs. } 100$

33. b

Production rate	Profit per unit
1000	90
2000	95
3000	57
4000	50
5000	35
6000	25

Therefore, profit percentage will be maximum at production of 2000 units lot.

34. c Profit per unit is minimum at production level of 6000.

SP/unit = 120

CP/unit = 95

Profit/unit = 25

35. b The cost of 7000 units will be $135 \times 1000 + 95 \times 6000$ = Rs. 7,05,000.

So, the cost of 1 unit is approximately Rs. 100.

So, the profit is about 74%.

36. a $\frac{[106 \times 3 - 39]}{190 \times 3} \times 100 \approx 49\%$.

37. b To get a 70% = 399 points, we need 120 more points. 45 questions were unattempted. Let `x' be the number of accurate answers among these 45. Hence, $3x - 1(45 - x) = 120$. Hence, x = 41.25 which we take as 42 right answers.

Hence, accuracy rate $= \frac{42}{45} \times 100 = 93.33\%$.

38. d For DI, marks = $(23 \times 3) - 9 = 60$.

39. d Nothing can be said using statement I alone.

Nothing can be said using statement II alone.

Using both statements I and II again nothing can be said.

40. b Let the C.P. of article A be Rs. 4x

And C.P. of article B be Rs. 5x

Let the S.P. of article A be Rs. 7y

And S.P. of article B be Rs. 6y

$\frac{7y-4x}{4x} \times 100 = 40$ or $y = \frac{4x}{5}$

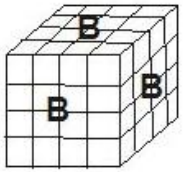
Profit/Loss percent on selling article B

$\frac{6y-5x}{5x} \times 100 = 4\%$ loss.

41. b In first step, middle element moves to opposite side, one element moves one step in ACW direction and other element is replaced by a new element.

In next step, middle element moves to opposite side, one element moves one step in CW direction and other element is
replaced by a new element. This process is repeated for further steps.

For questions 42 to 44: This figure represents the three adjacent sides of black colour. Rest sides contain red colour.



42. c Number of cubes with exactly 1 side painted red = 9 × 3 = 27

Number of cubes with exactly 2 side painted red = 3 × 3 = 9

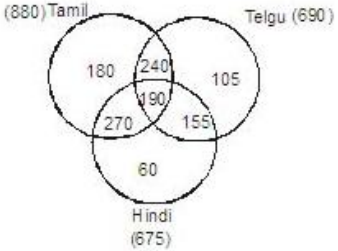
Number of cubes with exactly 3 side painted red = 1

Number of cubes with at least one side painted red = 27 + 9 + 1 = 37.

43. c Number of cubes which are painted with both red and black paint is 4 + 3 + 3 + 3 + 3 + 2 = 18.

44. a Only one cube.

For questions 45 to 47: On the basis of given information Venn diagram can be drawn as.



45. c 46. c 47. d

For questions 48 to 50: The given information can be shown as:

Rank no.	Jockey	Given number	Horse
1	Ganesh	–	Old-Boy
2	Jon	–	Lucky
3	Farokh	–	Power
4	Ismail	405	Magic
5	Hariprasad	404	Naughty

48. b

49. d

50. a

51. d Let the number of boxes of almond chunky bars, chewy chocolate chips bars and raisins nut bars be x, y and z respectively.

$8x + 10y + 12z = 88$ ...(i)

$x + y + z = 9$ ...(ii)

From above equations, we get $x = 4$, $y = 2$ and $z = 3$.

Alternative method:

We can go by options, number of box of almond chunky is more than number of box of raisins nut. So, only option (b) and (d) is true, but total number of bar in raisins nut is more than number of bar of almond chunky. Hence option (d) is true.

52. a Sarah's child Anne is 1 year old.

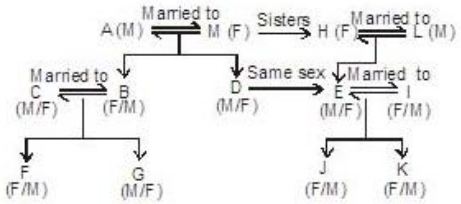
Laura's child Brian is 2 years old.

Jane's child Charlie is 3 years old.

Teresa's child Daniel is 4 years old.

For questions 53 to 55:

The relationship diagram would be like this.



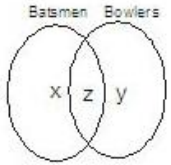
53. d Gender of F is not clear.

54. d According to the rules and given set of choices, D can marry F, J, or K.

55. d If F is male then both D and G must be female. If F is female then both D and G must be male. Hence, F could marry F or one of the `D or G', but not both.

56. c D is of the same sex as G.

57. c



Let x be the only batsmen, y be the only bowlers and z be the all-rounders i.e. both batsmen and bowler.

According to the given condition

$\frac{z+x}{3} = y$, $\frac{y+z}{2} = x$ and $x+y+z=16$

Solving this equations, we get

$z = 4$

Hence, number of all-rounders = 4.

58. c Eer's as well as Beer's first statement is true where as Phatte's second statement is true. Therefore, we can conclude that Terophobiaca is Tinkalaka's daughter.

For questions 59 to 61:

Let the marks scored by six students be a, 3a, 5a, 7a, 9a and 11a, in no particular order.

Marks	a	3a	5a	7a	9a	11a
Students	F	D	–	–	B	–

59. b 60. d 61. a

62. a (c) will facilitate implementation of the corporate resolution for governance code. (b) and (c) are vague responses. (a) links the failure to frame policies and systems to the question of implementation of the corporate resolution for governance code.

63. d A child is an animate thing, and cannot be divided between the parents.

64. b (b) will not be true as overall NPAs will show a downward trend once the companies settle down.

$\frac{z+x}{3} = y$; $\frac{y+z}{2} = x$ and $x+y+z=16$

Solving this equations, we get

$z = 4$

Hence, number of all-rounders = 4.

58. c Eer's as well as Beer's first statement is true where as Phatte's second statement is true. Therefore, we can conclude that Terophobiaca is Tinkalaka's daughter.

For questions 59 to 61:

Let the marks scored by six students be a, 3a, 5a, 7a, 9a and 11a, in no particular order.

Marks	a	3a	5a	7a	9a	11a
Students	F	D	–	–	B	–

59. b 60. d 61. a

62. a (c) will facilitate implementation of the corporate resolution for governance code. (b) and (c) are vague responses. (a) links the failure to frame policies and systems to the question of implementation of the corporate resolution for governance code.

63. d A child is an animate thing, and cannot be divided between the parents.

64. b (b) will not be true as overall NPAs will show a downward trend once the companies settle down.

65. d Bharati's statement does imply that Pizza Hut would go the McDonald's way.

66. d The author mentions two aspects of rhetoric and dialectic which are commonly used because of their function. This makes choice (d) correct.

67. b The author begins by mentioning the questioning of the fundamentals of the American constitution and the revelation of various biases. This makes choice (b) correct.

68. d The para states the rationale and the intention of the Romans with reference to fighting wars and the control of the Britishers.

69. d The author mentions a person called Lady Betty and the qualities that made her talked about. The para then delves into aspects of her life which was different from others.

70. d A gladiator is someone who practices his craft in an arena. Similarly, a lawyer practices his craft in a courtroom.

Test 7 - IIFT

1. A Only 0, 1, 2, 3, 4, 5 and 6 can be the digits (as base is 7)

$(abc)_7 = (cba)_9$

$7^2 \times a + 7^1 \times b + 7^0 \times c = 9^2 \times c + 9^1 \times b + 9^0 \times a$

$\Rightarrow 24a = 40c + b$

The number is $(503)_7 = (305)_9$

= 248 (in the decimal system)

2. B We have $x = \left(\frac{6y}{7}\right)$ and $z = \left(\frac{6y}{21}\right) \Rightarrow \frac{x}{z} = 3$

So, $\frac{(3z - 4x)}{(z + x)} = \frac{(3 - 4 \times 3)}{(1 + 3)} = \frac{-9}{4}$

3. C $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} + \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}} = \frac{(\sqrt{3}+\sqrt{2})^2}{(3-2)} + \frac{(\sqrt{3}-\sqrt{2})^2}{(3-2)} = (3+2+2\sqrt{6}) + (3+2-2\sqrt{6}) = 2(3 + 2) = 10$

4. B Since the volume remains constant, we can say

Volume = $\pi r^2 l$

$\Rightarrow (8 \times 11 \times 2) = l \times \pi \times 4^2$, i.e. l = 3.5 inches

5. D Length and breadth of the garden = 50 m and 40 m. Area of rectangular garden is 2,000 m^2.

Let `x' meters be the width of the road. Then, the area of the road = $2 \times [50x + (40 - 2x)x] = 344$

or, x = 2.0 meters.

6. A We can write that $AB \times d_1 = A$ and $AD \times d_2 = A$

$\Rightarrow AB = \frac{A}{d_1}$ and $AD = \frac{A}{d_2}$

The perimeter of the parallelogram

$= 2(AB + AD) = 2\left(\frac{A}{d_1} + \frac{A}{d_2}\right) = 2A\left(\frac{d_1 + d_2}{d_1 d_2}\right)$

7. C Suppose initially there was `x' units of HH stain and `y' units of CC stain.

In 3 hours there will be 6 blocks of 30 minutes.

So units of HH stain after 3 hours will be

$x(1.1)^6$ and units of CC stain will be $y(1.05)^3$

Therefore, $x(1.1)^6 = y(1.05)^3$

or, $\left(\frac{x}{y}\right) = \frac{1.15}{1.77}$ = 65% approx.

Now checking the options, only option C is closest.

8. B If `x' liters of water was present initially then

$$\left[4x-15\left(\frac{4}{5}\right)\right]:\left[x-15\left(\frac{1}{5}\right)+15\right]=1:4$$

$\Rightarrow x = 4$

Hence, volume of alcohol present initially in the beaker = 4x = 16 liters.

9. C Let the cost price of an article be Rs. x.

Marked price (in Rs.) of the article $=x\left(1+\frac{z}{100}\right)$

Selling price (in Rs.) $=x\left(1+\frac{z}{100}\right)\left(1-\frac{12}{100}\right)$

Profit percentage = k%

$$\Rightarrow x\left(1+\frac{k}{100}\right)=x\left(1+\frac{z}{100}\right)\left(1-\frac{12}{100}\right)$$

$$\Rightarrow z=\frac{25}{22}(12+k)$$

As `z' is an integer, `k' must be a multiple of 22. All the possible values of k, less than 100 are:

k = 10, 32, 54, 76 and 98.

Except option C, all the options are possible.

10. C $\frac{1}{R_1}=\frac{1}{10}$

$$\frac{1}{R_2}+\frac{1}{R_3}=\frac{1}{4}$$

$$\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}=\frac{1}{4}+\frac{1}{10}=\frac{7}{20}$$

$\therefore$ In 20 hrs working together the three robotic arms will complete 7 products and in 40 hrs, they will complete (7 × 2) = 14 products.

11. C Assume m_1 be the actual speed (in kmph).

Then, $\frac{d}{m_1}=t$ and $\frac{d}{m}=t+2$

So $m_1\times t=m\times(t+2)$ or $m_1=\frac{m\times(t+2)}{t}$

12. D α and β are roots of $x^2 + ax + b = 0$

$\Rightarrow \alpha + \beta = -a$ and $\alpha \times \beta = b$

$\Rightarrow (\alpha-\beta)^2 = (\alpha+\beta)^2 - 4\alpha\beta = a^2 - 4b$ ...(i)

Similarly, γ and δ are roots of $x^2 + bx + a = 0$

$\Rightarrow (\gamma-\delta)^2 = b^2 - 4a$ ...(ii)

From (i) and (ii),

$(\alpha-\beta)^2 - (\gamma-\delta)^2 = (a^2 - 4b) - (b^2 - 4a)$

$= (a^2 - b^2) + (4a - 4b)$

$= (a - b)(a + b) + 4(a - b)$

or $(\alpha-\beta-\gamma-\delta)(\alpha-\beta+\gamma-\delta)$

$= (a - b)(a + b + 4)$

$\Rightarrow (a - b)(a + b + 4) = 0$

as $a \neq b$, $(a + b + 4) = 0$

$\Rightarrow (a + b) = -4$

13. C $\log_7(x^4 - x^2) - \log_{49}(x^4 + 1 - 2x^2) = 6$

$\Rightarrow \log_7\{x^2(x^2 - 1)\} - \log_{49}\{(x^2 - 1)^2\} = 6$

$\Rightarrow \log_7 x = 3$

$\Rightarrow x = 343$

14. A $2^x + 4^x - 6 < 0$

Put $2^x = t$

$\Rightarrow t + t^2 - 6 < 0$

$\Rightarrow (t+3)(t-2) < 0$

$\Rightarrow -3 < t < 2$

i.e. $-3 < 2^x < 2$

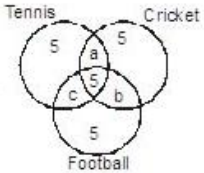
$2^x < 2^1 \Rightarrow x < 1$

And $2^x > -3$ which is true for any real value of x,

$\therefore$ Solution set is $(-\infty, 1)$

Note: As long as $x < 1$, the given inequality holds since when $x = 1$, L.H.S becomes equal to R.H.S. and when $x > 1$, L.H.S becomes greater than R.H.S. Also, option (2) can be discarded since $x = 0$ is not included in the range.

15. B



Given, $(5 + b + c + 5) = 10 + (b + c) = 13$.

$\Rightarrow b + c = 3$

Total number of students = 25

$\Rightarrow (5 + a + 5 + c + 5 + b + 5) = 25 \Rightarrow a = 2$

16. B Jack and Jill will contradict each other when one speaks the truth and the other lies.

Probability that Jack speaks truth and Jill lies = $\frac{3}{4} \times \frac{1}{5} = \frac{3}{20}$

Probability that Jill speaks truth and Jack lies = $\frac{4}{5} \times \frac{1}{4} = \frac{1}{5}$

The two probabilities are mutually exclusive. Hence, probability that Jack and Jill contradict each other

$= \frac{3}{20} + \frac{1}{5} = \frac{7}{20} = 35\%$.

17. B Second tap can fill the tank in 1.8 × 10 i.e. 18 hours.

Fraction of tank filled after 5 hours $= \frac{5}{10} + \frac{3}{18} - \frac{5}{30} = \frac{1}{2}$

Let the first tank remains open for next `n' hours

According to question, $\frac{n}{10} + \frac{n+2}{18} = \frac{1}{2}$ or $n = 2.5$

Total time taken to fill the tank = 9.5 hours or 9 hours 30 minutes

18. C Let a man in one day can do `w' units of work.

Therefore, total work = (36 × 12) × w units

Work done by a woman in one day $= \frac{36 \times 12 \times w}{48 \times 18} = \frac{w}{2}$ units

Amount of work done in 10 days $= 10 \times \left(16w + \frac{16w}{2}\right) = 240w$ units

Remaining work = 192w units

Let `n' additional men are required.

According to question, $= 3 \times (24w + nw) = 192w$ or $n = 40$.

19. C Expected increase in sales (in Rs. lakh)

$= 0.08 \times 156.6 + 0.125 \times 80 + 0.062 \times 54.8 = 12.528 + 10 + 3.39 \approx 26$

Expected sales growth $= \frac{26}{291.4} \times 100 \approx 8.9\%$.

20. A Side of square $= \frac{4000}{20} = 200$ cm

Length of wire = 18 × 4 i.e. 72 cm

After cutting:

Length of bigger piece $= \frac{2}{3} \times 72 = 48$ cm

Length of smaller piece = 24 cm

Area of equilateral triangle $= \frac{\sqrt{3}}{4} \times \left(\frac{48}{3}\right)^2 = 64\sqrt{3}$ cm^2

Area of square $= \left(\frac{24}{4}\right)^2 = 36$ cm^2

Required difference $= 4\sqrt{3}\left(16 + 3\sqrt{3}\right)$ cm^2

21. C Let the share of the younger son be Rs. x and that of the elder son be Rs. 26,840 - x.

The younger and the elder son turn 20 years of age after 14 and 12 years respectively.

According to question,

$$x\left(1+\frac{20}{100}\right)^{14} = (26,840 - x)\left(1+\frac{20}{100}\right)^{12}$$

$$x(1.2)^2 = (26,840 - x)$$

$$2.44x = 26,840 \text{ or } x = 11,000$$

Therefore, share of elder child is Rs. 15,840.

22. D After completion of 5th round by Saurabh, both Arvind and Saurabh will be at the starting position.

Saurabh completes first round in 2 minutes, second round in 4 minutes, third round in 8 minutes and so on.

Therefore, we can conclude that, Saurabh will complete 6th round in 2^6 minutes and 7th round in 2^7 minutes.

Since Arvind maintained his speed, they meet for $\left(\frac{64}{2} - 1 + \frac{128}{2} - 1\right)$ i.e. 94 times.

(One is subtracted because meeting at the start of each round is excluded)

23. D Let he start borrowing after `n' months.

Let total expenditure of Harshad for `n' months be E.

According to question,

E = 1,800 + 2,400 + 3,000 + ...

$$E = \frac{n}{2}(3,600 + (n-1)600)$$

For n = 12, E = 62,000

Therefore, he will start borrowing from 13th month onwards.

24. A In 2008, Hemant Dubey was given bonus of 8:17, thereby increasing his shares to 1000. In 2009, Hemant Dubey was again given a bonus of 3:5, thereby increasing his shares to 1600.

Dividend received $= \frac{1}{6} \times 15 \times 1600 =$ Rs. 4,000

25. D Purchase pattern and the preference of PC buyers are not known.

26. C PCs purchased by Business Houses in 2004 = 0.4 × 55000 = 22000.

In 2003 it would be $\frac{22000}{1.07} \approx 20560$.

Total number of PCs sold in 2003 = (20000 + 22000) = 42000

Hence, the required percentage is $\frac{20560}{42000} \times 100 \approx 49\%$.

27. B In 2005, sales of Dell and HP is 34,000 and 38,000 respectively. If sales of Dell and HP PCs increase by 12% and 10% respectively, then in 2006 sales would be 38,080 and 41,800 for Dell and HP, i.e. total PCs sold will be 79,880 and price becomes Rs. 31,500 after 5% increase.

Sales is 31500 × 79,880 = Rs. 2,516220,000

Also, Sales in 2005 was Rs. 2,160,000,000

The percentage increase is

$\frac{2516.22 - 2160}{2160} \times 100 \approx 16.5\%$

Alternate Method:

Since the number of units sold by both are comparable, we can safely assume that overall increase in the sales is approximately 11%.

$\because \left(\frac{10+12}{2} = 11\right)$

Again, prices have increased by 5%

∴ New sales = 1.11 × 1.05 × sales in 2005 = 1.1655 × sales in 2005

i.e. little more than 16% is the increase.

28. A Interest earned on Rs. 100.

= 7201 - (12 × 5 × 100) = Rs. 1,201.

29. D $\frac{\text{Interest on 10 years}}{\text{Interest on 5 years}} = \frac{17409 - 12000}{7201 - 6000} = \frac{5409}{1201} \approx 9:2$

≈ 4.5 : 1.

30. B Interest on 250 monthly investment for 20 years = 130991 - (12 × 20 × 250 = 60,000) = Rs. 70,991.

Interest on 500 monthly investment for 10 years = Rs. 87047 - 60000 = Rs. 27,047.

∴ (70991 - 27047) = Rs. 43,944 less would be earned.

31. D Interest on 10-year-period with monthly investment of Rs. 100 = 17409 - (12 × 100 × 10) = Rs. 5,409

32. B Interest on Rs. 50 monthly investment for 10 year = 8705 - 50 × 10 × 12 = Rs. 2,705

Interest on Rs. 100 monthly investment for 5 year = 7201 - 100 × 5 × 12 = 1201

Difference = 2705 - 1201 = Rs. 1,504

For questions 33 to 35:

33. B

	Manipulated Revenue	Manipulated Expenditure	Actual Revenue	Actual Expenditure
A	725	531	580	708
B	1024	376	768	564
C	1296	472	1080	590
D	1428	420	1224	504

Note: All the figures above are in thousands dollars.

$$\frac{ARP_A}{AEP_A} = \frac{580-531}{725-708} = \frac{49}{17} = 2.8$$

$$\frac{ARP_B}{AEP_B} = \frac{768-376}{1024-564} = \frac{392}{460} = 0.85$$

$$\frac{ARP_C}{AEP_C} = \frac{1080-472}{1296-590} = \frac{608}{706} = 0.86$$

$$\frac{ARP_D}{AEP_D} = \frac{1224-420}{1428-504} = \frac{804}{924} = 0.87$$

34. C Manipulated Revenue = $1224 \times \frac{5}{6} = 1020$ thousand dollars

Manipulated Expenditure = $504 \times \frac{7}{6} = 588$ thousand dollars

Manipulated Profit now = 1020 - 588 = 432 thousand dollars

Manipulated Profit earlier = 1428 - 420 = 1008 thousand dollars

$$\therefore \text{Percentage change} = \frac{1008-432}{1008} = \frac{576}{1008} = 57.14\%.$$

35. D

	A	B	C	D
Manipulated Profit	194	648	824	1008
Actual Profit	–128	204	490	720

A will be fined $\frac{1}{2} \times 194 = 97$ thousand dollars. B will be fined $\frac{1}{2} \times 648 = 324$ thousand dollars.

C will be fined $\frac{1}{2} \times 824 = 412$ thousand dollars. D will be fined $\frac{1}{2} \times 1008 = 504$.

Final Profit of

A = -128 - 97 < 0.

B = 204 - 324 < 0

C = 490 - 412 > 0

D = 720 - 504 > 0

Hence C and D earned profit.

For questions 36 to 40:

	2006	2010
Delhi	61432	98495
Chandigarh	67307	82846
Mumbai	48954	109668
Bangalooru	28634	86454
Others	14489	21258
India	**24380**	**42460**

Note: All figures above are in rupees.

Per Capita Income of a city = GDP of the city / population of the city.

For two or more cities, combined GDP = aggregate of the individual GDPs of those cities. Similarly, combined population = aggregate of the individual populations of those cities. This way, per capita income (combined) will be equal to Total GDP divided by Total Population.

36. D Compounded annual growth rate $= \left[\left(\frac{42460}{24380}\right)^{1/4} - 1\right] \times 100 = 14.9\%$

Expected per capita income of India in 2008 = 24380 (1.149) (1.149) = Rs. 32,174

Option (D) is the correct answer.

37. C Arithmetic mean of per capita incomes of Mumbai and Bangalooru in 2006 = Rs. 38794. The given combined per capita income, i.e. Rs. 38804, is more than it. This means, population is more in the city having higher per capita income (Mumbai). In 2010, the arithmetic mean = Rs.98060 and the given combined per capita income = Rs. 98049 is lesser than it. This means, the population is more in the city having lower per capita income (Bangalooru). So, Bangalooru's population has increased at a faster rate.

38. D As it is not clear that given per capita income of India is of `only cities' or it consisted of rural part of India also. So answer cannot be determined.

39. C CAGR of Delhi = 12.5%

CAGR of Chandigarh = 5.33%

Per capita income of Delhi in 2007 = 61432 (1.125) = Rs. 69,127

Per capita income of Chandigarh in 2009 = Rs.67,307 Required ratio = $\frac{69127}{78653} \approx 0.88$.

40. B Required Ratio (R) for each of the given cities is given below.

Delhi = 1.60331

Chandigarh = 1.23086

Mumbai = 2.24022

Bangalooru = 3.0192

For questions 41 to 44:

From statements B, E, H and F, we get

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
First Name			Dheeraj	Jyoti	Rohit	
Surname			Thapa			Tyagi
Suggested activities	Painting		Dancing		Gardening	

Now from statements C, A, D and G, we get

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
First Name	Sameer	Karan	Dheeraj	Jyoti	Rohit	Ranjeet
Surname	Malhotra	Verma	Thapa	Roy	Sharma	Tyagi
Suggested activities	Painting	Singing	Dancing	Acting	Gardening	Drawing
Years (in school)	less than 3	less than 3			More than 3	More than 3

41. C Karan

42. A Friday - Gardening

43. A Malhotra

44. A Gardening

45. C From the given information, if F is disqualified, then rank of A and D is `fair' and rank of C is lower than A. So rank of C is `poor'.

46. D At least one sweet is ranked very good or at least one sweet is ranked good.

47. D If rank C is higher than F, then ranks of all sweets can be determined.

48. A Let Z = Starting amount of Dibyanshu.

Then for the first vendor:

Z + Z - 10 = 2Z - 10 was left.

For the second vendor:

(2Z - 10) + (2Z - 10) - 10 = 4Z - 30 was left

For the third vendor:

(4Z - 30) + (4Z - 30) - 10 = 8Z - 70 was left

So, as per the question he had no money left and hence

$$8Z - 70 = 0 \Rightarrow Z = \frac{70}{8}$$

Dibyanshu had Rs. 8.75 at starting.

49. C If Dipan's statement is true then Jugal's statement is false but Sarmistha's statement is true. Hence, two statements is true but it is given only one statement is true. If Dipan cheated then only Jugal's statement is true and statements of other three are false.

50. A In this code every letter of the word is replaced by (27 - n)th letter, where `n' is the numerical position of the alphabet in the word to be coded. For example `A' will be replaced by `Z', `B' by X and so on...

Therefore, MUST will be coded as by NFHG.

51. D B + 2 = D; A - 2 = Y; C + 2 = E; K - 2 = I

Similarly, F + 2 = H; R - 2 = P; O + 2 = Q; N - 2 = L; T + 2 = V

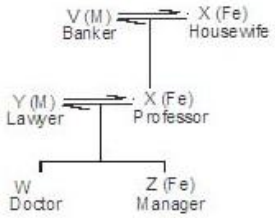
∴ R + 2 = T; I - 2 = G; G + 2 = I; H - 2 = F; T + 2 = V

Therefore RIGHT = TGIFV

Note: B + 2 means the second alphabet after B. Same meaning is implied in all such denotions.

For questions 52 to 54:

Using the statements (ii), (i) and (iv) then (iii) and (v) in the this order, we get



52. B

53. C

54. D

55. D Original Message: come as you are

Step I: cpmf bs ypv brf

Step II: cPmF Bs yPV BRF

Step III: FmPc sB VPy FRB

Hence (D) is the correct answer.

56. B Original Message: "swim across to moon"

Step I: Swjm bcrpss tp mppn

Step II: swJm BcRPss TP mPPN

Step III: mJws ssPRcB PT NPPm

Hence (B) is the correct answer.

57. B Every next term is obtained by adding the greater digit of the previous number. Therefore the missing term will be 35 + 5 = 40.

Hence option (B) is the correct option.

For questions 58 and 59:

58. C 59. D

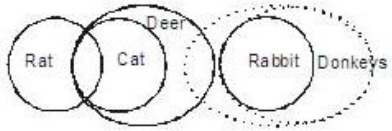
	Food	Game
Amit	Gujarati	Football
Betty	Italian/ Mughlai	Badminton / Carrom
Cathy	South Indian	Table Tennis
Danny	Italian/ Mughlai	Badminton / Carrom
Earl	Chinese	SoftBall

60. B If at least one philosopher told the truth, then it must have been the first philosopher.

If he was telling the truth (about there being only one lie) then all of the 11 other philosophers must have lied so that (11 lies) + (the one told in the beginning) = 12 lies.

If the first philosopher is lying, and more lies were told in the beginning, then none of the philosophers would have told the truth.

Hence, option (b) is the correct choice.

61. C 

Either I or II or IV follow.

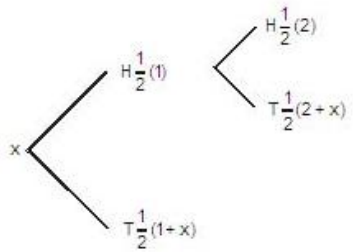
62. D

All follow.

63. B Assumption I talks about the need of married couples, with respect to children, being more intense than unmarried people. This is not implicit in the given statement. II talks about the assumption of the government with respect to parenting abilities of married people and is implicit in the statement as it is the basis on which the government is planning to change the adoption laws.

64. D Assumption I is not implicit because it is mentioned in the statement that George is a very dull actor and his previous five films were flops. Assumption II is not implicit as it talks about the looks of George and nothing can be assumed in this regard.

65. D Let the expected number of tosses to get 2 consecutive heads be x.



At end of 1st toss, if it is tail, then number of tosses required is again x, but already 1 toss has been held, so 1+x. If 1st toss ends in Head, then it is tossed again. At end of 2 tosses, if we get 2 consecutive heads, the probability is ¼ and if its tail, then number of tosses required is again x, but already 2 tosses has been taken, so 2+x is multiplied by its probability.

$$x = \frac{1}{2}\left(\frac{1}{2}(2) + \frac{1}{2}(2+x)\right) + \frac{1}{2}(1+x) \Rightarrow x = 6$$

66. D In first knock out round, out of 16 teams, only 8 teams will move to next round.

A team has to win 3 rounds to reach final match, hence, the probability that a team reaches final is

$$= \frac{1}{2^3} = \frac{1}{8}.$$

Team ranked 1 cannot play with team rank 2 in any round except final match.

Hence, the probability that both team ranked 1 and team ranked 2, reach final is $\frac{1}{8} \times \frac{1}{8} = \frac{1}{64} = 0.015625$.

Test 8 - IIFT

1. D In the campaign 1.33:1 or 4:3 is the ratio in which villagers are made literate now, out of 10% villagers who were illiterate, can now speak only one language.

now, $\frac{4}{7}$ of the 10% villagers know Hindi also = 5.7% of the total and before the campaign 10% of the villagers can speak Hindi only.

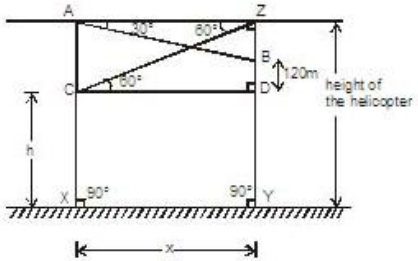
⇒ Total numbers who can speak only hindi after the campaign = 15.7% 16%.

2. D $T_n = \left\{\frac{(n+5)}{(n+1)(n+2)(n+3)}\right\} \times \frac{1}{2^n} = \left\{\frac{2}{(n+1)(n+2)} - \frac{1}{(n+2)(n+3)}\right\} \times \frac{1}{2^n} = \frac{1}{(n+1)(n+2)} \times \frac{1}{2^{n-1}} - \frac{1}{2^n \times (n+2)(n+3)}$

$T_1 = \frac{1}{2\times3} \times \frac{1}{2^0} - \frac{1}{(3)\times(4)} \times \frac{1}{2^1}$ $T_2 = \frac{1}{3\times4} \times \frac{1}{2^1} - \frac{1}{4\times5} \times \frac{1}{2^2}$ $T_3 = \frac{1}{4\times5} \times \frac{1}{2^2} - \frac{1}{5\times6} \times \frac{1}{2^3}$

$\therefore S_\infty = T_1 + T_2 + T_3 + \ldots = \frac{1}{6}$ $\therefore$ 36S = 6

3. A



CX ≡ "Corporate Tower": BY ≡"Business Tower". AX = ZY = height of the helicopter, above the ground, let XY = x m, be the distance between the two buildings.

In right ΔAZB, $\frac{BZ}{AZ} = \tan 30° = \frac{1}{\sqrt{3}} \Rightarrow BZ = \frac{x}{\sqrt{3}}$ m

In right ΔCDZ, $\frac{ZD}{CD} = \tan 60°$

$\Rightarrow \left(\frac{x}{\sqrt{3}} - 120\right) m = \sqrt{3}\, x \Rightarrow x = 60\sqrt{3}\ m \Rightarrow BZ = 60$ m

$\Rightarrow AC = 120 \text{ m} + \frac{60\sqrt{3}}{\sqrt{3}} = 180$ m

4. C Let the defect be fixed in `d' days.

Then, $\frac{d}{m} + \frac{(d-1)}{2m} + \frac{(d-2)}{3m} = 1$

$\Rightarrow 6d + 3d - 3 + 2d - 4 = 6m \Rightarrow 11d = 6m + 7$

Hence, m = 11k + 8, where k is a non negative integer.

So Salil alone can complete the defect in 2m = 22k + 16 days.

5. B In container 1, water $= \frac{2}{5}$ parts.

In container 2, water $= \frac{1}{5}$ parts.

In container 1, milk $= \frac{3}{5}$ parts

In container 2, milk $= \frac{4}{5}$ parts

Therefore, in the resulting mixture, the water to milk ratio $= \left(\frac{2}{5} \times \frac{3}{7} + \frac{1}{5} \times \frac{4}{7}\right) : \frac{3}{5} \times \frac{3}{7} + \frac{4}{5} \times \frac{4}{7}$

$= \frac{10}{25} = \frac{2}{5}$

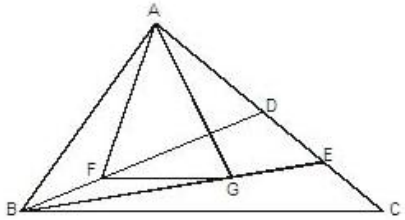
6. A Rupee devalued by 4% means, if you had Rs. 100 on 1st April 2005, it is equivalent to having Rs. 104 on

1st April 2006. In other words, amount of goods you could have bought by Rs. 100 on 1st April 2005, will cost Rs. 104 on 1st April 2006.
Therefore if 100 on 1st April 2005 is equivalent to 104 on 1st April 2006.

$\therefore$ 355 will be equivalent to $\left(\frac{104}{100} \times 355\right) = 369.20$

Therefore the percentage profit = $\frac{(978 - 369.20) \times 100}{369.20} = 165\%$

7. B



Let us assume that the area of triangle ABC is 48x sq. units.

Then the area of triangles ABD, DBE and EBC will be 24x, 12x and 12x sq. units respectively. Consider triangle ABD (24x sq. units). F divides the base BD in the ratio 1 : 2. So, area of triangle ABF will be 8x sq. units.

Consider the triangle ABE (36x sq. units). G divides the base BE in the ratio 2:1. So, area of triangle AGE will be 12x sq. units.

Area of $(\Delta AFG + \Delta BFG)$

$= \Delta ABE - \Delta ABF - \Delta AGE$ = 36x - 8x - 12x

= 16x sq. units

Required ratio = 1:3

8. B If Anuj has missed two numbers then sum should be definitely more than 2024.

Sum of n consecutive number $= \frac{n(n+1)}{2}$

$2024 < \frac{n(n+1)}{2}$

Least value of `n' satisfying is 64 as $\frac{64 \times 65}{2} = 2080$.

2024 + a + a + 2 = 2080

2a = 54

a = 27 and 2nd number will be 29.

9. B Had the Dhoni scored 16 runs in that particular inning, his average would have remain the same i.e. 16. But he scored 6 runs more than 16, which increases his average by 1.

So, this particular inning must have been his 6th inning. To increase his average by 4, he needs to score = 6 × 6 = 24 runs more than his previous average. So his score is 40.

10. A Let the total number of managers be 100x,

G managers → 75x

F manager → 25x

Level G managers entitled to lunch = $\frac{75x}{1} \times \frac{80}{100} = 60x$

Level F managers entitled to lunch = $25x \times \frac{20}{100} = 5x$

Managers not entitled to free lunch = 35x

∴ 35x = 63

Number of managers = $\frac{63}{35} \times 100 = 180$

11. C As per the information given in the question, we get the following cases.

Case I: a = 3: b = 2

Case II: a = 4: b = 3 or 2.

Case III: a = 5: b = 4 or 3 or 2.

Case IV: a = 6: b = 5 or 4 or 3 or 2.

Case V: a = 7: b = 6 or 5 or 4 or 3 or 2.

Case VI: a = 8: b = 7 or 6 or 5 or 4 or 3 or 2.

Therefore, the total number of such four-digit numbers are 1+ 2 + 3 + 4 + 5 + 6 = 21

Hence, option (c) is the correct choice.

12. C Let a = 0.625, b = 0.576

$K = \frac{(a+b)^2 - (a-b)^2}{ab}$

$K = \frac{(a^2 + b^2 + 2ab) - (a^2 + b^2 - 2ab)}{ab}$

$K = \frac{4ab}{ab}$

$\therefore K = 4$

13. B Let the tap completely fill the bucket (with no hole in it) in "t" minutes.

$= \frac{1}{t} - \frac{1}{4} = \frac{1}{t+2}$

$= t^2 + 2t - 8 = 0$

$= (t - 2)(t + 4) = 0$

$= t = 2$ minutes.

14. A Let, Earlier CP = Rs.100

$\therefore$ Earlier SP = Rs.110

Current SP = 110 × 1.2 = Rs.132

$\therefore$ Current CP = $\left(\frac{100}{115}\right) \times 132 \approx 114.78$

Hence, the percentage increase = 114.78 - 100 = 14.78%

15. A Himanshu's total cost = Rs. 2,57,000 + 1,20,000 = Rs. 27,00,000

Selling Price of Himanshu = 1.18 × 2,70,000 = Rs. 31,86,000

Selling Price of Pawan = Rs. 31,86,000 - 1,86,000 = Rs. 30,00,000

Required loss percentage $= \frac{1,86,000}{30,00,000} \times 100 = 6.2\%$.

16. D Speed of the faster train $= \frac{240}{4} = 60\,km/hr$

Speed of the slower train = $\frac{240}{6}$ i.e. $40\,km/hr$

Speed of faster train with respect to the slower train is (60 - 40) km/hr.

Let the length of the slower and the faster train be L_1 and L_2 respectively.

According to question, $L_2 = 18 \times \frac{5}{18} \times 20 = 100\ m$

$L_1 + L_2 = 54 \times \frac{5}{18} \times 20 = 300\ m$

Difference between the lengths of the trains = 200 - 100 = 100 meters.

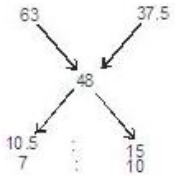
17. B LCM of (8, 15, 20 and 27) = 1080

1080 minutes = 18 hours

Required time = 10 o'clock in the morning.

18. C Cost Price per kilogram of mixture $= \text{Rs. } \frac{60}{1.25} = \text{Rs. } 48$

Applying alligation,



Required quantity $= 28 \times \frac{10}{7} = 40 \text{ kg}$

19. D Let the two trains meet after `t' hours.

According to question, $(25 - 15) \times \frac{18}{5} \times t = 72 \text{ or } t = 2$

Required distance $= (25 + 15) \times \frac{18}{5} \times 2 = 288 \text{ km}$

20. A Let the original number of 25 paise and 1 Rupee coins with Ananya be y and z respectively.

After transaction with **Disha:** Number of 1 Rupee coins left $= \frac{3z}{4}$

New count of 25 paise coins $= y + \frac{z}{4}$

After transaction with **Maitri:** New count of 1 Rupee coins $= \frac{3z}{4} + 36$

According to question, $y + \frac{z}{4} = 33 \text{ or } y = 30$ and z = 12.

21. B Let in `t' hours the tank is filled by P1 and P2

$\Rightarrow \frac{t}{6} + \frac{t}{9} = 1 \text{ or } t = 3.6 \text{ hours}$

Therefore, timer is to start after 0.8 hours or 48 minutes.

(Since, 22.22% is equal to $\frac{2}{9}$)

When P3 was opened, let the tank get filled in t' hours

$\frac{t'}{6} + \frac{t'}{9} - \frac{t'}{12} = \frac{7}{9} \text{ or } t' = 4 \text{ hours}$

Therefore, the caretaker was supposed to come back after 4.8 hours.

Required time = 1.2 hours or 1 hour 12 minutes.

22. C Probability that a child will contract polio when neither of the two vaccines is given is 60%.

Probability of a child contracting polio, when vaccine-A is given is (1 - 0.2)×0.6 = 0.48

Probability of a child contracting polio, when vaccine-B is given is (1 - 0.3)×0.6 = 0.42

Probability of a child contracting polio, when both vaccines are given is (1 - 0.3 - 0.2)×0.6 = 0.30

Required Probability $= \frac{150 \times 0.48}{150 \times 0.48 + 150 \times 0.42 + 200 \times 0.30} = \frac{72}{195} \approx 0.37.$

23. B Number of ways two boys can be selected $= {}^{5}C_{2} = 28$

Number of ways two girls can be selected $= {}^{6}C_{2} = 15$

Also, among 2 boys and 2 girls, two teams can be formed in two different ways.

Required number of ways $= 28 \times 15 \times 2 = 840.$

24. C The given condition results in formation of two GPs.

I. First term `a' = 60 and common ratio `r' = $\frac{5}{6}$.

II. First term `a' = 50 and common ratio `r' = $\frac{5}{6}$.

Distance traversed by ball $= \frac{60}{1-\frac{5}{6}} + \frac{50}{1-\frac{5}{6}} = 660$ m.

For questions 25 and 26:

25. B Let C be the total consumption, then total wastage = 1560 - C

But, as per the question, $1560 - C = \frac{1}{4} \times C \Rightarrow C = 1248$

Approximate wastage is Philadelphia $= 600 - \frac{35}{100} \times 1248 = 163$

Hence, percentage required $= \frac{163 \times 100}{(1560 - 1248)} = 52.3$ (approx)

26. B The new consumption percentage for Philadelphia $= 35 - \frac{35 \times 30}{100} = 24.5\%$

The new consumption percentage for Oklahoma $= 20\left(1 - \frac{30}{100}\right) = 14\%$

The new consumption percentage for New York and Miami = 100 - (24.5 + 14) = 61.5%

So, the wastage in Philadelphia $= 600 - \frac{24.5}{100} \times 800 = 404$

The total wastage = 1560 - 800 = 760

Hence, the wastage percentage in Philadelphia $= \frac{404}{760} \times 100 = 53.15\%$ (approx.)

27. A Total numbers of flowers that were damaged = 216 + 219 + 191 + 245 + 257 = 1128

So, number of new flowers of variety B that were generated by the magician is $\frac{1128}{6} = 188.$

Therefore, total number of flowers of variety B available on day 4 is 183 + 188 = 371.

28. B Aggregate number of flowers of varieties D and I on day 1, 2, and 3 = 241 + 214 + 204 + 254 + 208 + 233

= 1354.
Therefore, T = 0.5 × 1354 = 677

Aggregate number of flowers of varieties D and I on day 4 and 5 = 191 + 186 + 191 + 182 = 750

Therefore, W = 0.8 × 750 = 600

Also, M = 0.2 × 750 = 150

So, T - M + 2W = 677 - 150 + 2 × 600 = 1727

29. B Aggregate number of flowers of varieties A, B, C and K in the given five days is 1131, 1059, 1123 and 1076 respectively.

Aggregate number of flowers of these four given varieties = 4389.

Aggregate number of flowers of all the varieties across all the five days = 11810

Required percentage $= \frac{4389}{11810} \times 100 = 37.16\%$

For questions 30 to 33:

30. D A. Incorrect: South was actually the highest (year 2004).

B. Incorrect: South and North saw fall in 2004-2005, others had fall in 2003-2004.

C. Incorrect: 84 days for South in 2005 crossed North's 79 in 2003.

D. Correct: Change was 5.51 in 2004 over 2003 and 1.63 in 2006 over 2005.

31. C A. Incorrect: North and South both suffered loss in respective terms in 2006 over 2005.

B. Incorrect: West and East had a fall in number of days as topmost voter.

C. Correct: In 2003 East had 17 days which was more than what it had in any other year.

D. Incorrect: Ratio of change was 12 : 1.

32. B A. Incorrect: It was in 2003

B. Correct: Central's maximum = 49 in 2005, West's minimum = 50 in 2005

C. Incorrect: Percentage change in SMS vote share for South in 2006 over 2003 $\frac{22.88 - 20.28}{22.88} \times 100 = 11.36\%$

Percentage change in SMS vote share for Central in 2005 over 2004 $\frac{13.71 - 11.35}{11.35} \times 100 = 20.80\%$

D. Incorrect: 4 zones had a decrease in 2004 over 2003.

33. C A. Incorrect: Number of days as topmost voter for Central and East combined = 208

Number of days as topmost voter for West = 232

B. Incorrect: West never had the same rank in both categories in any year.

C. Correct: The year was 2004

D. Incorrect:

Percentage = $\frac{315}{1054} \times 100 = 29.89\%$

For question 34 and 35:

Note: All the temperatures in degrees celsius.

34. C The maximum fluctuation in temperature is the difference between the maximum temperature and the least temperature in the given period from among the given cities the following are the maximum fluctuations.

Atlanta = 12.2 + 8.5 = 20.7

New York = 11.7 + 7 = 18.7

Moscow = 10.9 + 9.3 = 20.2

Vienna = 12 + 7.5 = 19.5

Melbourne = 12 + 3.5 = 15.5

London = 11 + 1.7 = 12.7

Clearly the highest fluctuation is for Atlanta.

So, statement (A) is false.

The least maximum fluctuation in the period 2001-2007 is for London.

Hence, statement (B) is also false.

For statement (C) we have to consider the net change in the temperature from 2004 to 2005 and then rank the cities.

Atlanta = 11 + 5.1 = 16.1

New York = 9.2 - 11.7 = -2.5

Moscow = 8.6 + 4 = 12.6

Vienna = 9 - 12 = -3

Melbourne = 8 + 3.5 = 11.5

London = -1.7 - 9.7 = -11.4

Clearly Moscow has the second highest increase and hence is ranked second.

So, statement (C) is true.

For statement (D) we need to find the average temperature for each city.

$$\text{Atlanta} = \frac{35.6}{7} = 5.086\ ;\ \text{NewYork} = \frac{35.9}{7} = 5.128$$

$$\text{Moscow} = \frac{9.4}{7} = 1.34\ ;\ \text{Vienna} = \frac{33.5}{7} = 4.78$$

$$\text{Melborne} = \frac{41.5}{7} = 5.93\ ;\ \text{London} = \frac{41.4}{7} = 5.91$$

Clearly the average is second least for Vienna and hence statement (D) is not true.

So, option (C) is correct.

35. D Let us see the percentage increase in 2005 over 2002 for all the cities

$$\text{Atlanta} = \left(\frac{2}{9}\right) \times 100 = 22.22\%$$

$$\text{NewYork} = \left(\frac{16.2}{7}\right) \times 100 = 231.43\%$$

$$\text{Moscow} = \left(\frac{17.9}{9.3}\right) \times 100 = 192.47\%$$

$$\text{Vienna} = \left(\frac{16.5}{7.5}\right) \times 100 = 220\%$$

$$\text{Melborne} = \left(\frac{1}{7}\right) \times 100 = 14.29\%$$

$$\text{London} = \left(\frac{-6.8}{5.1}\right) \times 100 = -133.33\%$$

Clearly, the minimum percentage increase is for London and the maximum is for New York.

Hence statement (A) and (C) both are false.

Now, consider the percentage increase in 2007 over 2001.

$$\text{Atlanta} = \left(\frac{3}{7}\right) \times 100 = 42.86\%$$

$$\text{NewYork} = \left(\frac{2.2}{6.5}\right) \times 100 = 33.85\%$$

$$\text{Moscow} = \left(\frac{1.2}{4}\right) \times 100 = 30\%$$

$$\text{Vienna} = \left(\frac{-1}{10}\right) \times 100 = -10\%$$

$$\text{Melborne} = \left(\frac{6.7}{4.3}\right) \times 100 = 155.8\%$$

$$\text{London} = \left(\frac{6.7}{4.3}\right) \times 100 = 155.8\%$$

Clearly the lowest increase is for Vienna, hence option (B) is false.

The third highest percentage is in Atlanta.

Hence, option (D) is correct.

For questions 36 to 40:

36. C Price of a 10 cigarette pack of Wills Classic $= \frac{(\text{revenue})}{(\text{number of cigarette sold})} \times 10$

$\frac{(27 \text{ million})}{(14 \text{ million})} \times 10 \approx \$19$

37. B Cost of a Marlboro cigarette $= \frac{40}{21} \sim \$1.9$

Cost of a Triple 5 cigarette $= \frac{25}{11} \sim \$2.3$

Percentage difference $= \frac{(2.3 - 1.9)}{2.3} = 17 = 17\%$ cheaper

38. D Maximum number of packs (sold by Marlboro) $= \frac{21}{20} = 1.05$ million.

Minimum number of packs (sold by Seven) $= \frac{10}{20} = 0.5$ million.

Difference = 1.05 - 0.5 = 0.55 million.

39. A Cost of single cigarette of Camel = $1

Cost of single cigarette of Seven = $1.7

Difference = 1.7 - 1 = 0.7

Percentage increase in the revenue of Camel will be $= \frac{0.7}{1} \times 100 = 70\%$

40. D No parameter regarding the favourability of the Brand in the market is mentioned and nothing is mentioned about brands other than these five.

For questions 41 to 45:

Name	Specialization	University
Sharad	HR	Delhi
Ujjawal	Operations	Kolkata/ Madras/ Rajasthan
Brijesh	Finance	Kolkata/ Madras
Jeetu	IT	Punjab
Bharti	System	Mumbai
Abhi	Marketing	Madras/ Rajasthan

41. A 42. D 43. D 44. C 45. D

For questions 46 to 48:

46. C Reports of the female can be arranged in the following four cases.

Case I:

Shekhar Amar M W M W M W

Case II:

ShekharAmarWMWMWM

Case III:

ShekharAmarWMWMMW

Case IV:

Shekhar Amar WMMWMW

Each of the above arrangements can be done in 3! × 3! = 36 ways

Hence, total number of ways = 4 × 36 = 144

47. D Check the options. Two women scientists should not be together in the arrangement. Hence, (D) is the right answer.

48. B Check the options, with the help of the following table

1	2	3	4	5	6	7	8
Shekhar	Amar	F	M	Sen	M	F	Ravinder

where M = male and F = female

The two other female scientists should be at the position number 3 and position number 7 in the arrangement.

Hence (B) is the answer.

For questions 49 and 50: The given information can be tabulated as shown below.

Team / Against	India	Pakistan	Srilanka	Bangladesh
India	X	D	L	L
Pakistan	D	X	L	L
Sri Lanka	W	W	X	D
Bangladesh	W	W	D	X
Points	7	7	1	1

49. A Only one way.

50. C Statements II and III are true.

51. D Cannot be determined

52. D It has not been mentioned what Neeta's first brother does. Hence, we the answer cannot be determined.

53. B Since he is a lecturer, he teaches.

For questions 54 to 57:

Total number of motorbikes = 36.

Suppose number of Standard motorbikes = x.

Therefore number of Touring motorbikes = 2x

= number of Cruiser motorbikes

Suppose number of Sport Touring motorbikes = y

Therefore number of Sport motorbikes = 3y = number of Motocross motorbikes.

$5x + 7y = 36$, both x, y and positive integers.

$\therefore$ Only solution possible is $x = y = 3$.

Number of motorbikes from Argentina = Number of motorbikes from Mexico = b (suppose).

Number of motorbikes from Germany = a + 2 (suppose)

Number of motorbikes from France = 2a.

Number of motorbikes from Brazil = a

As given $(a + 2) + 2a + a + 2b = 36 \Rightarrow 4a + 2b = 34$ where $5 < b < 7$. So only $b = 5$ satisfy the constraint.

Therefore $a = 6$ and $b = 5$

At least one motor bike of each category from every country apart from the exceptions mentioned in (2) and (3). We get

	Germany	France	Brazil	Argentina	Mexico	**Total**
Touring	3	2	×	1	×	6
Sport Touring	×	1	1	×	1	3
Cruiser	1	2	1	1	1	6
Standard	×	1	1	×	1	3
Sport		3			1	9
Motocross		3			1	9
Total	8	12	6	5	5	**36**

Now for Sport and Motocross motorbikes from Germany, Brazil and Argentina, the exact distribution cannot be determined.

The four possible combinations are:

	Germany	Brazil	Argentina
Sport	3	1	1
Motocross	1	2	2

	Germany	Brazil	Argentina
Sport	2	2	1
Motocross	2	1	2

	Germany	Brazil	Argentina
Sport	1	2	2
Motocross	3	1	1

	Germany	Brazil	Argentina
Sport	2	1	2
Motocross	2	2	1

54. B Three (Germany, Brazil and Argentina)

55. B Required Ratio is 3 : 1

56. D (1 : 2) or (2 : 1)

57. D Statements A and C can be true.

58. B As candidate has secured less than 60% marks in Personal Interview.

59. D As candidate is not graduate in Mechanical / Electronics but has more than 8 years of experience after graduation. Therefore he will be referred to Managing director of the organization.

60. C As candidate does not satisfy criteria (i) but has more than 75% marks in post-graduation.

61. C Assumption I and II are implicit otherwise Tanu wouldn't have asked her servant to go the market to get vegetables in the first place.

62. A Assumption I is implicit otherwise there would be no reason for the activists to press for the bill. Assumption II is not implicit as there seems to be no co-relation between women's reservation bill and crimes against women.

63. C I is strong because it directly attacks the reason for privatization. II is strong because it highlights the purpose of railways. The purpose is not only making profits but also fulfilling social responsibilities.

64. C If the current rates are much below the real property values, it is justified to raise the circle rates. Reduction in black money component is always desirable. Thus, argument II is strong.

65. D The probability of choosing a box is ½. So, if 1 box contains only blue balls, then the probability of getting blue ball from that box is 1. No matter if it contains 1 ball or all of blue ball, the probability of getting blue ball out of that box will be 1. The probability of getting a blue ball from other box will be maximum if it has maximum number of blue balls, which can be 8.

So the required probability $=\frac{1}{2}(1)+\frac{1}{2}\left(\frac{8}{8+12}\right)=\frac{1}{2}+\frac{1}{5}=\frac{7}{10}$.

60. C As candidate does not satisfy criteria (i) but has more than 75% marks in post-graduation.

61. C Assumption I and II are implicit otherwise Tanu wouldn't have asked her servant to go the market to get vegetables in the first place.

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So the required probability $=\frac{1}{2}(1)+\frac{1}{2}\left(\frac{8}{8+12}\right)=\frac{1}{2}+\frac{1}{5}=\frac{7}{10}$.

66. C Let the total units of work be 12.

A man does $\frac{12}{4}=3$ units in a day, and his wife does $\frac{12}{6}=2$ units a day.

Let man works for x days, and woman works for y day to complete the work. Woman can work from 0 to 6 days and to complete the work, man will have to work for rest of days.

x	y	3x + 2y	No. of days (D)	Cases	Comments
4	0	12	4	1	
4	1	14	4 < D < 5	${}^4C_1 = 4$	Woman cannot work on last day, else it will be completed in 4 days itself
3	2	13	4 < D < 5	${}^5C_2 = 10$	
2	3	12	5	${}^5C_2 = 10$	
2	4	14	5 < D < 6	${}^5C_1 = 5$	Woman cannot work on last day, else it will be completed in 5 days itself
1	5	13	5 < D < 6	${}^6C_1 = 6$	
0	6	12	6	1	

Probability that work can be completed within 5 days $=\frac{1+4+10+10}{1+4+10+10+5+6+1}=\frac{25}{37}$.

Test 9 - XAT

For questions 1 and 2:

The number can be expressed as- $2^p 3^q 5^r 7^s$ .....(where p, q, r, s.....are positive integers.)

Number of factors =(p + 1)(q + 1)(r + 1)(s + 1)...

Further analysis will give M = 12

M will be 12 when,

(i) p = 5, q = 1 or N = 96

(ii) p = 3, q = 2 or N = 72

(iii) p = 2, q = 1, r = 1 or N = 60

(iv) p = 2, q = 1, s = 1 or N = 84

(v) p = 1, q = 2, s = 1 or N = 90

1. D

2. E

3. A For the minimum possible sum of all the prime factors, the number will be 2^9. So it's composite factors will be 2^2, 2^3, 2^4. 2^5, 2^6, 2^7 and 2^8.

Hence the minimum possible sum of prime factors = 2.

4. E The first such number is 35 and the first number in the desired range is 35 + 1320 = 1355.

(LCM of 11, 8 and 6 is 264 and the required type of numbers will be repeated after multiples of 264, i.e.

(35 + 264x)

1355; 1619; 1883; 2145; 2411

Hence, 5 such numbers are there.

5. B Let R_n = 1111...1(n digits),

$\therefore R_5 = 11111 =$

$$1+10+10^2+10^3+10^4=\frac{10^5-1}{10-1}=\frac{10^5-1}{9}$$

$$\therefore f(11111)=90\times\left(\frac{10^5-1}{9}\right)^2+20\left(\frac{10^5-1}{9}\right)+1$$

$$=\frac{10\left(10^5-1\right)^2}{9}+20\frac{10^5-1}{9}+1$$

$$=\frac{10}{9}\left(10^5-1\right)\left(10^5-1+2\right)+1=\frac{10}{9}\left(10^5-1\right)\left(10^5+1\right)+1=\frac{10\left(10^{10}-1\right)}{9}+1$$

$$=\frac{10^{11}-10+9}{9}=\frac{10^{11}-1}{9}=11111111111=R_{11}$$

$\therefore$ Sum of digits of the number f(11111) = 11 × 1 = 11

Alternative method:

$f(11111) = 90(11111)^2 + 20(11111) + 1$ gives a remainder of 2 when divided by 9. Option (B) is only option which gives the digit sum of 2. Hence, the correct choice.

6. E Let the three roots be a, a, b.

$x^3 - px^2 + qx - 100 = (x - a)^2 (x - b)$

or, $x^3 - px^2 + qx - 100 = x^3 - (2a + b)x^2$

$+ (a^2 + 2ab)x - a^2b$

comparing the coefficients, $a^2b = 100$

$2a + b = p$, $a^2 + 2ab = q$

Now, $a^2b = 100 = 2^2 \times 5^2$

(a, b) can be (1, 100), (2, 25), (5, 4), (10, 1)

$\Rightarrow$ (p, q) can be (102, 201), (29, 104),(14, 65) or (21, 120)

$\Rightarrow$ p + q = 303 for (p, q) = (102, 201)

q - p = 75 for (p, q) = (29, 104)

2p + q = 162 for (p, q) = (29, 104)

2q - p = 116 for (p, q) = (14, 65)

7. A Let $f(x)=\frac{(5+x)(7+x)}{1+x}$

Now $1 + x = y \Rightarrow x = y - 1$

$$f(x)=\frac{(4+y)(6+y)}{y}=\frac{24+10y+y^2}{y}=y+10+\frac{24}{y} \quad ...(i)$$

Equation (i) can be written as

$$y+10+\frac{24}{y}=\left(\sqrt{y}-2\sqrt{\frac{6}{y}}\right)^2+10+4\sqrt{6}$$

Now $f(x)=\left(\sqrt{y}-2\sqrt{\frac{6}{y}}\right)^2+4\sqrt{6}+10$ will be minimum only when Ist term of the expression is zero.

Hence minimum possible value of $f(x)=4\sqrt{6}+10$

8. B AD = CD

$\Rightarrow$ ED = FD = 1 unit. $\Rightarrow$ ΔFED is equilateral.

$\Rightarrow$ $\angle AEB = 60^\circ \Rightarrow \Delta AEB$ is equilateral.

$\Rightarrow$ AB = 1 unit.

In quadrilateral ABFD, AB = FD & the diagonals AF and BD intersect each other at E. Point A, B, F and D lie on the same circle.

$\Rightarrow \angle BFD = \angle BAD = 90^\circ$

$\Rightarrow$ ABFD is a rectangle.

$\Rightarrow$ area $(\Delta BEF) = \frac{1}{4} \times (\text{area of rectangle } ABFD)$

$= \frac{1}{4} \times 1 \times \sqrt{2^2 - 1^2} = \frac{\sqrt{3}}{4}$ sq. units.

area $(\Delta ABD) = 2 \times \text{area}(\Delta BEF) = 2 \times \frac{\sqrt{3}}{4}$ sq. units. $= \frac{\sqrt{3}}{2}$ sq. units.

area $(\Delta BCD) = 4 \times (\text{area } \Delta BEF) = \sqrt{3}$ sq. units.

$\Rightarrow$ area (ABCD) = $\left(\frac{\sqrt{3}}{2} + \sqrt{3}\right) = \frac{3\sqrt{3}}{2}$ sq. units. & area (circumcircle of ΔBFD) = $\pi(1)^2 = \pi$ sq. units.

$\Rightarrow$ ratio = $\frac{\pi}{\frac{3\sqrt{3}}{2}} = \frac{2\pi}{3\sqrt{3}}$ i.e. $2\pi : 3\sqrt{3}$

9. E Work done by Arkava and Bimal in a day $\frac{1}{14} + \frac{1}{35} = \frac{1}{10}$

Effective work done in a day $\frac{2}{3} \times \frac{1}{10} = \frac{1}{15}$

Thus, work will be completed in 15 days.

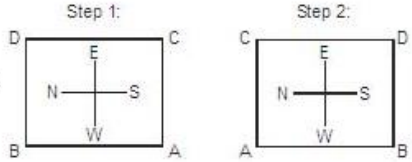
10. C Let number of chocolates with A, B, C, D and E be 6x, 7x, 8x, 9x and 10x respectively.

Total number of chocolates = 40x

20% of the total chocolates = 0.2 × 40x = 8x

Thus, only D and E have more than 20% of the total chocolates.

11. d



For questions 12 and 13:

Let the distance (in km) traveled by Pinky after 10 hours be `10x+y'.

Distance (in km) traveled by Pinky after 12 hours = 10y +x.

Distance traveled by Pinky in two hours

$$= \frac{10x+y}{5} \text{ km} \Rightarrow 10y + x - 10x - y = \frac{10x+y}{5} \Rightarrow 44y - 55x = 0 \Rightarrow \frac{x}{y} = \frac{4}{5}$$

As both `x' and `y' are single digits, only possible values are 4 and 5 respectively.

Hence distance traveled by Pinky after 10 hours will be 45 km and that after 12 hours will be 54 km.

12. B Hence, as the second milestone, Pinky has covered 54 miles.

13. B Pinky's speed $= \frac{45}{10} = \frac{54}{12} = 4.5 \text{ miles/hr}$

14. B $S_m = \frac{m}{2}\{2b_1 + (m-1)d\}$,

d = Common difference

$S_n = \frac{n}{2}\{2b_1 + (n-1)d\}$

Since $\frac{S_m}{S_n} = \left(\frac{m}{n}\right)^2$, replacing the values of S_m and S_n in the above equation we get

$(m - n)(2b_1 - d) = 0$

Since $m = n \Rightarrow d = 2b_1 \Rightarrow b_1 = \frac{d}{2}$

$$\therefore \frac{b_m}{b_n} = \frac{b_1 + (m-1)d}{b_1 + (n-1)d} = \frac{\frac{1}{2}d + (m-1)d}{\frac{1}{2}d + (n-1)d} = \frac{d\left(m - \frac{1}{2}\right)}{d\left(n - \frac{1}{2}\right)} = \frac{2m-1}{2n-1}$$

15. A Let the numbers written on the shirts of A, B, C and D be a - d, a, a + d and $\frac{(a+d)^2}{a}$ respectively.

Also, $\frac{(a+d)^2}{a} - (a-d) = 48 \Rightarrow 3ad + d^2 = 48a$

$$\therefore a = \frac{d^2}{3(16-d)}$$

`d' should be a multiple of 3 and less than 16

Only possible value of d is 15.

d cannot be 12 because then a = 12 and a - d = 0

$\therefore d = 15$ and $a = 75$

Sum of the numbers = 60 + 75 + 90 + 108 = 333.

16. E **Case 1**: There is only one 9, one 8 and one 7 in the number. Hence, there has to be one digit from {1, 2, 3, 4, 5, 6} repeated thrice. Total number of ways in which such a number can exist-

$^{6}C_1 \times \frac{5!}{3!2!} = 60$

Case 2: One of the three digits {9, 8, 7} is repeated thrice. Hence there will be one digit from {1, 2, 3, 4, 5, 6}. Total number of ways in which such a number can exist-

$^{3}C_1 \times {}^{6}C_1 \times \frac{5!}{2!2!} = 540$

Total possible telephone numbers = 60 + 540 = 600

Probability = $\frac{1}{10}$

17. D Using the first statement we have $\frac{27n - x}{n - 1} = n + 1$

$\Rightarrow x = 27n - n^2 + 1 = n(27 - n) + 1$

For n = 1, x = 27 which is possible.

For n = 27, x = 1 which is NOT possible as the age of any member cannot be less than 4 years.

So, the maximum value of n is 26 for which x = 27

We can always chose two values a and b for n such that a + b = 27 to yield the same value of x.

So the unordered pair (a, b) varies from (1, 26) to (13, 14). Hence 13 different ages are possible.

From the second statement we have

$\frac{27n - x}{n - 1} = 2x \Rightarrow x = \frac{27n}{2n - 1}$

For n = 1, 2, 5 and 14, x holds different values.

Hence the question can be answered by using either of the statements alone.

18. D Using statement I we have two real and distinct roots and with a < 0. So that for any value of x between the two roots the value of $ax^2 + bx + c$ is positive.

Using statement II we have

Two real and distinct roots and with a > 0.

So that for any value of x between the two roots the value of $ax^2 + bx + c$ is negative.

Hence the question can be answered by using either of the statements alone.

19. C The quantity of Mica produced as a percentage of the total quantity of mineral ores produced in Argentina, France, Bolivia, India and Russia is 22.09%, 21.15%, 22.75%, 20.3% and 18% respectively.

20. D For six countries Syria, Pakistan, Sri Lanka, South Africa, Nigeria and Australia the ratio of the quantity of Iron to the quantity of Mica produced is greater than the ratio of the quantity of Tin to the quantity of Sulphur produced.

21. E Required percentage is 18.56%.

22. D

Countries	Required Ratio
Syria	2.481684982
Pakistan	5.019685039
Sri Lanka	17.01183432
India	0.701780415
South Africa	1.881154499
Nigeria	6.16036036
Australia	6.57480315
Russia	0.347876005
Argentina	1.919330289
France	0.972627737
Bolivia	16.41414141

Hence option (D) is the correct choice.

For questions 23 to 26:

23. C Let the cost price of PHUSPHUS (P) be x Rs/bottle:-

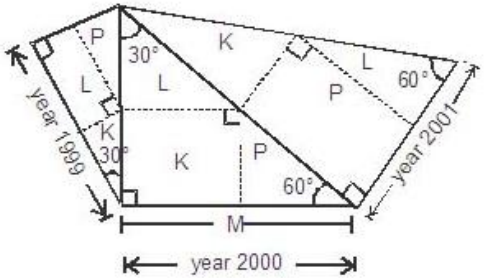
	K	L	P
Cost Prices	1.08x	0.9x	x
Selling Prices	80 Rs (= 1.188x)	0.99x	1.1x

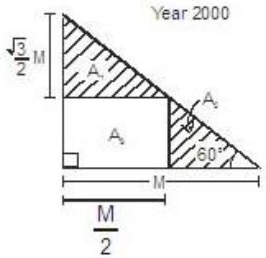
The selling prices are such that the sale of bottles gives a profit of 10%, accordingly the sales prices are written, in terms of x. But we will give the price of one bottle of KHUSPHUS as Rs. 80/bottle

⇒ x = Rs. 67.34

⇒ A pack of 3 bottles of K, L & P (one each) comes at a price of = Rs. 2.98x × 1.1 = Rs. 220.75/-

24. C





Area A_1 = Area A_2 = $\frac{1}{2}$ Area A_3 = $\frac{1}{4}$ Area (triangle)

Fig. 1999

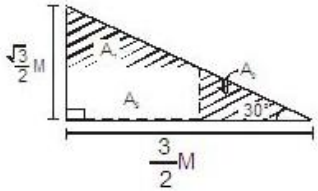
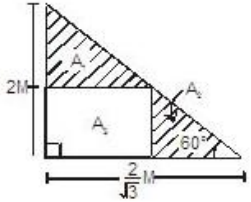


Fig: - 2001



In 1999: - PHUSPHUS corresponds to A_1 = it's 25% of the total production in 1999.

In 2001: - PHUSPHUS corresponds to A_3 = it's 50% of the total production in 2001.

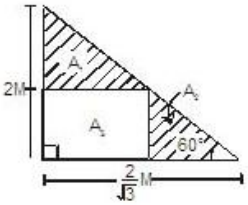
Change from 25% to 50% = 100% increase.

25. A Total production of Khusphus (K) from 1999 to 2001 is given by:- sum of areas occupied by Khusphus in the Annual triangles 1999, 2000 & 2001: Similarly for LUSPHUS

(i) Production of KHUSPHUS = $\frac{49\sqrt{3}}{96}M^2$

(ii) Production of LUSPHUS = $\frac{46\sqrt{3}}{96}M^2$ ratio = $\frac{49}{46}$ = 1.065

26. E The total number of hours for which Kumar studied on days except Tuesday and Friday in weeks I, II, III, IV, V, VI, VII, VIII, IX and X is 12, 29, 11, 25, 11, 11, 28, 6, 4 and 10 respectively.



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26. E The total number of hours for which Kumar studied on days except Tuesday and Friday in weeks I, II, III, IV, V, VI, VII, VIII, IX and X is 12, 29, 11, 25, 11, 11, 28, 6, 4 and 10 respectively.

27. B In week IV, the number of hours for which Kumar studied on Tuesday witnessed the maximum percentage increase.

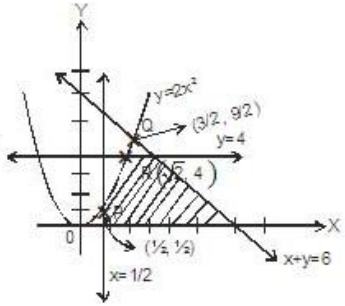
28. A Average number of hours per week for which Kumar studied $= \frac{363}{10} = 36.3$ hrs.

Average number of hours per remaining 5 days for which Kumar studied $= \frac{147}{10} = 14.7$ hrs.

Required difference = 36.3 - 14.7 = 21.6 hrs.

Test 10 - XAT

1. D



It is clear from the graph that the y - coordinate on the curve y = 2x² will vary from $y=\frac{1}{2}$ to y = 4 corresponding to the values of y between the y - coordinates of the points p and R respectively.

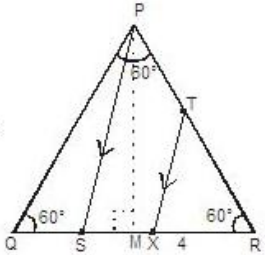
Alternative solution:

The region inside the area bounded by the given curves will correspond to the following inequalities:-

$x>\frac{1}{2}$, x + y < 6, y < 4 and y > o solving these inequalities by putting y = 2x², we will get $\frac{1}{2}<x<\sqrt{2}$,

$\therefore \frac{1}{2}<y<4 \left[\because y=2x^2\right]$

2. B



Construction: Draw $PM \perp QR$.

SM = QM - QS = 1cm.

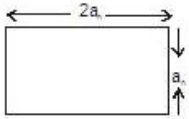
In right triangle PSM:

$PS=\sqrt{PM^2+SM^2}=\sqrt{(3\sqrt{3})^2+1^2}=2\sqrt{7}$ cm.

Since PS is parallel to TX, triangle PSR and triangle TXR are similar.

Hence, $TX=PS\frac{TR}{PR}=(2\sqrt{7})\frac{2}{3}=\frac{4\sqrt{7}}{3}$ cm.

3. D R_n is



According to question: $a_{n+1} = \sqrt{5}a_n$

where a_n = breadth of the rectangle.

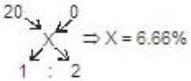
As $a_1 = 1$, $a_2 = \sqrt{5}$ and $a_3 = 5$ $\therefore a_n = 5^{\frac{n-1}{2}}$

Hence length of rectangle R_n will be

$2 \times a_n = 2 \times 5^{\frac{n-1}{2}}$ i.e. $10^{\frac{n-1}{2}} \times 2^{\frac{3-n}{2}}$

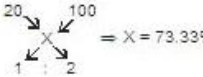
4. A The concentration of milk in the 200 litres solution has to be greater than or equal to 0% and less than or equal to 100% respectively.

If the concentration is 0 percent, X will be calculated by alligation method as:



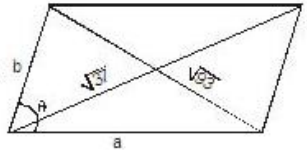
$\Rightarrow X = 6.66\%$

Similarly, if concentration of milk is 100 percent



$\Rightarrow X = 73.33\%$

5. B



$\cos\theta = \frac{a^2 + b^2 - 37}{2ab}$ ...(i)

$\cos(180 - \theta) = \frac{a^2 + b^2 - 93}{2ab}$ ...(ii)

On dividing equation (i) by (ii), we get $-1 = \frac{a^2 + b^2 - 37}{a^2 + b^2 - 93} \Rightarrow a^2 + b^2 = \frac{130}{2} = 65$

Product of sides is ab = 28.

$\therefore$ Area is ab $\sin\theta = 28\sin\theta$.

from equation (i) $\cos\theta = \frac{65 - 37}{2 \times 28} = \frac{28}{2 \times 28} = \frac{1}{2} \Rightarrow \theta = 60^\circ$

$\therefore \sin\theta = \sin 60^\circ = \frac{\sqrt{3}}{2}$

$\therefore$ Required Area $= 28 \times \frac{\sqrt{3}}{2} = 14\sqrt{3}$ sq. units

6. C Total odd products are $5 \times 5 \times 5 \times 5 = 625$.

Odd products with less than 3 factors are

$4 \times (3,1,1,1)$, $4 \times (5,1,1,1)$, $4 \times (7,1,1,1)$ and $(1,1,1,1) = 13$ ways

So the required number of trials is 625 - 13 = 612

7. A Radius of outer Circle =12

Radius of middle circle = 6

Radius of innermost circle = 3 cm

Three Paths A to F are

I. ABCDEF

II. ADEF

III. ABHCGF

Distance travelled along First Path

$$= 3 + \frac{1}{4} \times 2\pi \times 3 + 3 + \frac{45}{360} \times 2\pi \times 6 + 6 = 12 + 3\pi$$

Distance travelled along Second Path

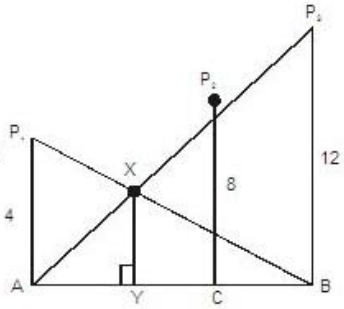
$$= \frac{135}{360} \times 2\pi \times 6 + 6 = \frac{9}{2}\pi + 6$$

Distance travelled along Third Path

$$= 3 + \frac{3}{4} \times 2\pi \times 3 + 9 + \frac{45}{360} \times 2\pi \times 12 = \frac{15}{2}\pi + 12$$

Increasing order arrangement is given by II, I, III i.e. Second path, First path, Third path.

8. C



$$XY = \frac{4 \times 12}{4 + 12} = 3 \text{ metres}$$

In ΔP_1AB and ΔXYB

$$\frac{P_1A}{XY} = \frac{AB}{YB} \Rightarrow \frac{4}{3} = \frac{24}{YB}$$

So YB = 18 metres

Hence YC = 18 - 14 = 4 metres

So $XC = \sqrt{3^2 + 4^2} = 5$ metres.

9. B

	A	B	Hrs available
X	5 hrs	4 hrs	230 hrs
Y	3 hrs	4 hrs	170 hrs

Let the manufacturer produces `x' units of A and `y' units of B.

So according to the question:

$5x + 4y \le 230$; $3x + 4y \le 170$

So when we draw the graph, the values of x and y will lie in the area common to the lines represented by these equations and the x-axis and the y-axis.

Solving the equations we get:

$x = 30, y = 20$

So the profit is $7 \times 30 + 4 \times 20$ = Rs.290

But if he produces only A, he can make $\frac{230}{5} = 46$ units of item A.

So profit = 46×7 = Rs.322

10. E Let there be 100 students in the B-School.

$\therefore$ the number of males = 60

Hence, the number of females = 40

Minimum number of non-engineer males = 24

$\therefore$ Maximum number of engineer males = 36

Minimum number of female engineers = 24

Maximum number of female non-engineers = 16

Hence, required percentage

$$= \frac{\text{Maximum female non engineers}}{\text{Minimum male non engineers}} \times 100 = \frac{16}{24} \times 100 = 66.67\%$$

11. A Every number has 1 as its smallest factor. Starting with 1, four terms in A.P. can be

(1, 2, 3, 4), (1, 3, 5, 7), (1, 4, 7, 10), (1, 5, 9, 13)

(1, 6, 11, 16), (1, 7, 13, 19)

(1, 4, 7, 10) can be rejected as if 4 is the factor of N, 2 should also be one of the factors. Similarly, other cases can be

rejected except first, second and sixth case.

Case I: If first four factors are (1, 2, 3, 4) then the number is a multiple of 12.

Hence, 166 values.

Case II: If (1, 3, 5, 7) are first four factors then number can be an odd multiple of 105.

Hence, 10 values.

Case III: (1, 7, 13, 19) = Only one value i.e. 1729

Hence, the answer = 177

12. E $a^2 + 5b^2 + 4ab - 6b + 3 = a^2 + 4b^2 + b^2 + 2 \times 2b \times a - 6b + 3$

$= (a + 2b)^2 + b^2 - 2 \times 3 \times b + 9 - 9 + 3 = (a + 2b)^2 + (b - 3)^2 - 6$

Value of this expression can be -6 only if $a + 2b = 0$ and $b - 3 = 0$ i.e. $b = 3$.

Hence, $a = -2b = -2 \times 3 = -6$

So $a + b = -6 + 3 = -3$

13. D Total sale from Lupsar in January = Rs.1,67,28,000

Total sale from Lupsar in April = Rs.2,28,80,000

$$\text{Percentage increase in sale} = \frac{6152000}{16728000} \times 100$$

= 36.78%

14. B Average price for January = Rs.28,365

Average price for February = Rs.30,120

Average price for March = Rs.21,462.50

Average price for April = Rs.24,993.75

15. B Percentage contribution in February $= \frac{420 \times 44100}{55440000} \times 100 = 33.41\%$

Percentage contribution in March $= \frac{450 \times 43800}{70380000} \times 100 = 28.01\%$

Decrease in percentage contribution $= \frac{33.41 - 28.01}{33.41} \times 100 = 16.16\%$

For questions 16 and 17:

The complete table looks like:

	Sales	Profit
CDMA	50%	40%
GSM	30%	30%
Edge	20%	

Let s be the total sales of Caretel.

Hence, cost of CDMA connections $= \frac{0.5s}{1.4} = \frac{25s}{70} = \frac{5}{14}s$

Similarly, cost of GSM connections $= \frac{0.3s}{1.3} = \frac{30}{130}s = \frac{3}{13}s$

16. B Edge accounts for 26.5% of the total cost.

Hence, $\frac{5s}{14} + \frac{3s}{13} = 73.5\%$ of cost

$\Rightarrow$ Total cost = 0.8s

Hence Profit percentage $= \frac{0.2s}{0.8s} = 25\%$

17. B Ratio of the two costs $= \frac{5}{14}s : \frac{3}{13}s = 65 : 42$

18. C Volume of each brick = 600 cm^3.

In 10 seconds, water level will rise by 6000 cm^3. Next second, it will decrease by 1000 cm^3. So after 11 seconds the water level will rise by 5000 cm^3.

In 121 seconds it will rise by 55000 cm^3.

In the next 9 seconds the water level will rise by another 5400 cm^3 and so it will be filled upto the brim in 130 seconds.

19. B The total number of numbers that can be formed using these digits are $\frac{\lfloor 6}{\lfloor 2} = 360$. So total digits in the number are 360 × 6 = 2160.

1730th digit from the right is same as (2160 - 1729) = 431st digit from left.

Numbers starting with 11 = $\lfloor 4$ = 24

Number of digits = 24 × 6 = 144

Numbers starting with 12 = $\lfloor 4$ = 24

Number of digits = 24 × 6 = 144

Numbers starting with 13 = $\lfloor 4$ = 24

Number of digits = 24 × 6 = 144

$\Rightarrow$ 432 digits till the unit digit of the last number i.e. 135421.

Hence, the answer is 2.

20. C A dropout student will pay 20% of Rs.50,000 = Rs.10,000 as registration fee. Since the cost in case of a dropout student is also Rs.10,000, there will be no profit no loss in case of a dropout student. For other students there will be a profit of Rs.20,000.

The maximum that Guru bhai can afford to pay Gyanidas = Total profit - Profit for Gurubhai

Total profit = 20,000[8000 × 0.8 + 6000 × 0.7 + 2000 × 0.5]

$= 20{,}000[6400 + 4200 + 1000] = 20{,}000 \times 11600$ = Rs. 23.2 crore

So maximum amount that can be paid to Gyanidas is

$(23.2 - 15) \rightarrow$ Rs 8.2 crore

21. A If Gyanidas joins the profit would be

20,000 [8000 + 0.8 + 6000 × 0.7 + 2000 × 0.5]

= Rs.23.2 crore

Guru bhai wants a profit of Rs. 6.4 Cr and Gyanidas wants Rs. 5.2 crore.

So the remaining amount = 23.2 - [6.2 + 5.2] = 11.6 crore

$$\text{Maximum discount} = \frac{\text{Total Amount (Remaining)}}{\text{Total number of students}}$$

$$= \frac{11,60,00,000}{11600} = \text{Rs. } 10,000$$

22. C If Gyanidas joins, the additional profit would be

= 20,000[3000 × 0.8 + 2000 × 0.7 + 1000 × 0.5]

= 20,000[2400 + 1400 + 500] = 20,000 × 4300 = Rs. 8.6 crore

Gyanidas will charge only Rs. 1.3 crore

So the profit will increase by Rs. 7.3 crore.

23. D Probability of getting exactly 2 questions correct = ${}^{n}C_{2}\left(\frac{1}{5}\right)^{2}\left(\frac{4}{5}\right)^{n-2}$

At n = 5, the probability becomes greater than 0.2.

24. b Fixed cost for 2006 = 20400 + 37230 = Rs. 57630

Fixed cost for 2007 = 18260 + 38760 = Rs. 57020

Fixed cost for 2008 = 18860 + 39900 = Rs. 58760

Fixed cost for 2009 = 21675 + 30750 = Rs. 52425

25. e Total number of units sold for product A = 800 + 850 + 900 + 850

$$\text{Average} = \frac{3400}{4} = 850$$

26. c Profit rate of A in 2006 = 9

Profit rate of B in 2006 = 7.33

Profit rate of B in 2007 = 9

Profit rate of B in 2008 = 11.5

Profit rate of B in 2009 = 16.33

27. A

Institutes	Number of Professors
I	2
J	2
K	3

Total number of handshakes are = 2 × (1 × 2 + 1 × 3) + (1 × 3) × 2 = 16

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I	2
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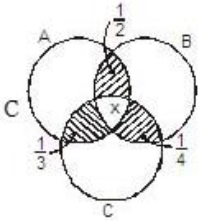
28. C



As no two of the three events A, B and C are mutually exclusive hence $P(A \cap B) > 0$, $P(B \cap C) > 0$ and $P(A \cap C) > 0$

Also, as $0 < P(A), P(B), P(C) < 1$ we must have:

$0 < \frac{1}{2} + \frac{1}{3} + x < 1$ ...(i)

$0 < \frac{1}{2} + \frac{1}{4} + x < 1$ ...(ii)

$0 < \frac{1}{3} + \frac{1}{4} + x < 1$ ...(iii)

From (i), (ii) and (iii)

$x < \frac{1}{6}$ or $x < 0.1\dot{6}$

So, x can never be equal to 0.17.