

Q1. If + means -, - means ×, × means ÷, and ÷ means +, what will be the value of the following expression?

$$65 \div 35 + 72 \times 8 - 5$$

- (a) 195
- (b) 45
- (c) 455
- (d) 55

Q2. In a certain code language, 'CHART' is written as 'GDASS' and 'EMPTY' is written as 'LFPXU'. How will 'INDEX' be written in that language?

- (a) MIDWF
- (b) MJDWF
- (c) MDJWF
- (d) MWDJF

Q3. Two statements are given, followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

All phones are gadgets.

All gadgets are machines.

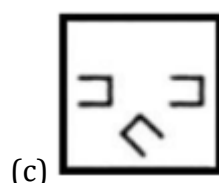
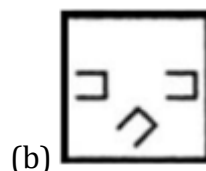
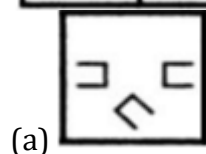
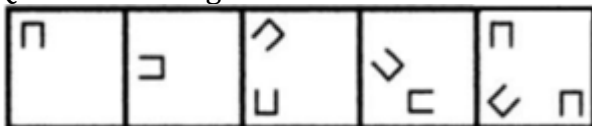
Conclusions:

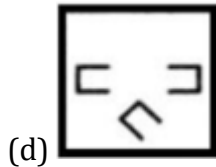
I. All phones are machines.

II. All machines are gadgets.

- (a) Both conclusions I and II follow
- (b) Only conclusion II follows
- (c) Neither conclusion I nor II follows
- (d) Only conclusion I follows

Q4. Select the figure that will come next in the following figure series.





Q5. Based on the position in the English alphabetical order, three of the following letter-clusters are alike in some manner and one is different. Select the odd letter-cluster.

- (a) QUXZ
- (b) GKOQ
- (c) AEIK
- (d) KOSU

Q6. In a code language, 'you are tall' is coded as 'la da ma', 'you workout daily' is coded as 'la pa ka', and 'daily workout makes you tall' is coded as 'ka pa ja la ma'. What is the code for the word 'makes'?

- (a) ma
- (b) ja
- (c) la
- (d) pa

Q7. Which of the following letter-clusters will replace the question mark (?) in the given series to make it logically complete?

AZX, CBZ, EDB, GFD, ?

- (a) IHF
- (b) IFH
- (c) FHI
- (d) JHF

Q8. Two statements are given, followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

Some classes are theories.

Some theories are lessons.

Conclusions:

I. All classes can never be lessons.

II. All theories being classes is a possibility.

- (a) Only conclusion I follows
- (b) Both conclusions I and II follow
- (c) Only conclusion II follows
- (d) Neither conclusion I nor II follows

Q9. Which letter-cluster will replace the question mark (?) to complete the given series?

PYWB, MVYD, ?, GPCH, DMEJ

- (a) JSBF
- (b) JTBF
- (c) JTBG
- (d) JSAF

Q10. Six students are sitting around a circular table facing the centre. Salman is an immediate neighbour of both Kiran and Shwetha. Bala is sitting second right to Salman. Shwetha is sitting third to the left of Bala. Akshay is an immediate neighbour of both Bala and Nishitha. Who is the immediate neighbour of Nishitha and Salman?

- (a) Bala
- (b) Kiran
- (c) Shwetha
- (d) Akshay

Q11. Select the option that represents the letters that, when sequentially placed from left to right in the blanks below, will complete the letter series.

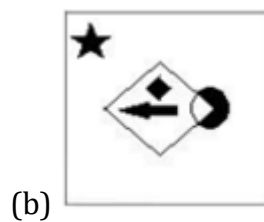
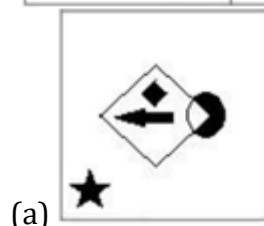
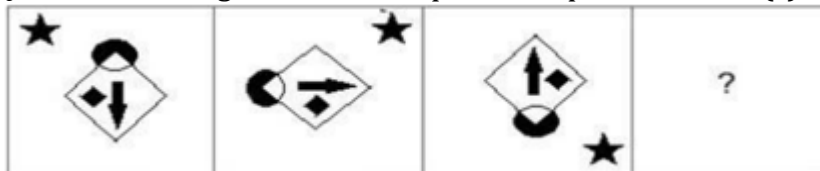
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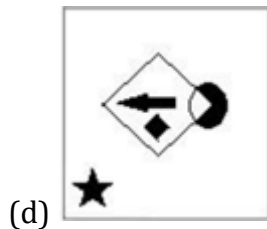
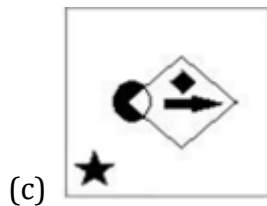
- (a) FOFLOLW
- (b) FFLLOOW
- (c) FFOLLLOL
- (d) FOWLLFW

Q12. On a certain day John decided to go school using his newly purchased skates. So, he left his house and skated 15 km northwards, then turned left and skated 7 km, then he took another left turn and skated 15 km, and then finally turned right and skated 13 km. How far exactly is his school from his house?

- (a) 20 km
- (b) 6 km
- (c) 2 km
- (d) 28 km

Q13. Select the figure that will replace the question mark (?) in the following figure series.





Q14. Select the option that indicates the correct arrangement of the given words in a logical and meaningful order.

1. Universe
 2. Country
 3. Sun
 4. Earth
 5. Milky Way
- (a) 1,4,2,5,3
 (b) 1,5,3,4,2
 (c) 1,2,3,4,5
 (d) 5,4,3,2,1

Q15. In a code language, 'trek to the mountain' is written as 'tes mel fern lor', 'the mountain is high' is written as 'lor max fern ani', 'high to the sky' is written as 'tes ani sav fern'. What is the code for the word 'trek' in this language?

- (a) fern
 (b) max
 (c) mel
 (d) tes

Q16. Select the set in which the numbers are related in the same way as are the numbers of the following sets. (NOTE : Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13- Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

- (27, 21, 16)
 (24, 33, 19
 (a) (25, 21, 13)
 (b) (36, 15, 17)
 (c) (42, 18, 21)
 (d) (32, 14, 7)

Q17. Select the correct option to indicate the arrangement of the following words in a logical and meaningful order.

1. Tissue

2. Population

3. Organ

4. Cell

5. Organism

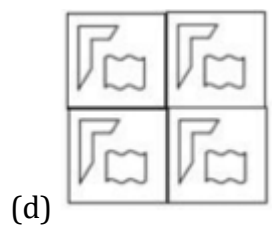
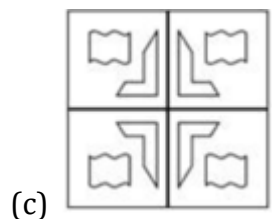
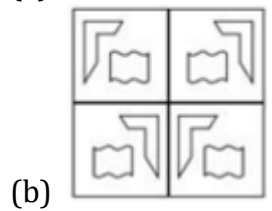
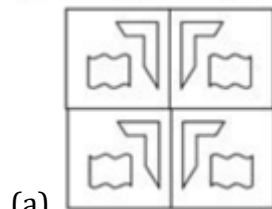
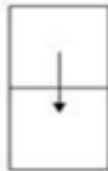
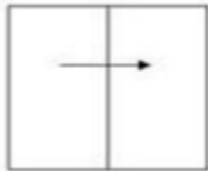
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(b) 14325

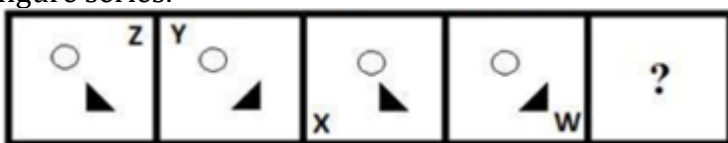
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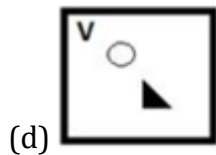
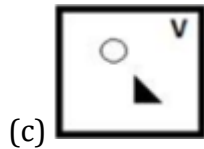
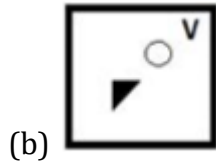
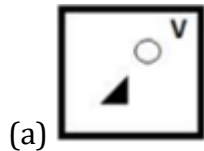
(d) 14253

Q18. A paper is folded and cut as shown below. How will it appear when unfolded?



Q19. Select the figure that will come in place of the question mark (?) in the following figure series.





Q20. If \div means $-$, $-$ means \times , \times means $+$, $+$ means \div , what will come in place of the question mark (?)?

$$132 + 6 - 9 \times 13 \div 31 = ?$$

- (a) 180
- (b) 206
- (c) 216
- (d) 208

Q21. In a code language, VACCINE is written as $132/7$ and MASKS is written as $72/5$. How will SANITIZE be written in that language?

- (a) $113/8$
- (b) $89/7$
- (c) $113/7$
- (d) $89/8$

Q22.

'P # Q' means 'P is the husband of Q'.

'P \$ Q' means 'P is the son of Q'.

'P @ Q' means 'P is the brother of Q'.

'P % Q' means 'P is the father of Q'.

'P & Q' means 'P is the mother of Q'.

'P \times Q' means 'P is the wife of Q'.

Which of the following statements is correct regarding the given expression?

$$M \times O \$ N @ Q \% R \# S$$

- (a) M is the brother of R.
- (b) M is the daughter-in-law of R.
- (c) O is the daughter of Q.

(d) N is the brother of R's father.

Q23. If I denotes '÷', J denotes '×', K denotes '-', and L denotes '+', then what will come in place of '?' in the following equation?

$$29 J 7 K 168 I 4 L 71 K 39 L 14 J 2 = ?$$

- (a) 221
- (b) 228
- (c) 216
- (d) 235

Q24. Select the option that is related to the fifth term in the same way as the second term is related to the first term and the fourth term is related to the third term.

$$FAN2 : ICO8 :: NAP5 : QCQ125 :: GUN8 : ?$$

- (a) JWO64
- (b) JWO512
- (c) JWO484
- (d) JVO512

Q25. Select the correct combination of mathematical signs to sequentially replace the * signs and balance the given equation.

$$467 * 231 * 123 * 789 * 345 * 131$$

- (a) +, -, +, +, =
- (b) +, -, -, +, =
- (c) +, -, ×, +, =
- (d) ×, -, -, +, =

Q26. If A denotes '+', B denotes '×', C denotes '-', and D denotes '÷', then what will come in place of '?' in the following equation?

$$124 D 4 C 86 D 2 A 61 A 17 B 3 = ?$$

- (a) 100
- (b) 98
- (c) 92
- (d) 110

Q27. Select the set in which the numbers are related in the same way as are the numbers of the given sets.

(NOTE : Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is NOT allowed)

- (2, 3, 35)
- (11, 6, 1547)
- (a) (4, 15, 3439)
- (b) (10, 9, 1730)
- (c) (7, 8, 2565)
- (d) (3, 12, 1296)

Q28. Three of the following four letter-clusters are alike in a certain way and one is different. Pick the odd one out.

- (a) XCY
- (b) OLP
- (c) TGU
- (d) BXC

Q29. Two statements are given followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

All dogs are cats.
No cat is a rat.

Conclusions:

- I. Some rats are cats.
- II. Some dogs are rats.
- (a) Neither conclusion I nor II follows
- (b) Only conclusion I follows.
- (c) Both conclusions I and II follow.
- (d) Only conclusion II follows.

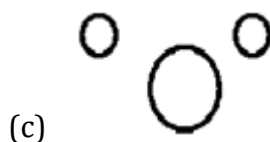
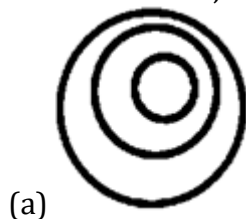
Q30. Select the number from among the given options that can replace the question mark (?) in the following series.

159, 146, ?, 120, 107, 94, 81

- (a) 136
- (b) 131
- (c) 133
- (d) 140

Q31. Select the Venn diagram that best illustrates the relationship between the following classes.

Prime minister, Finance minister, Union Government





Q32. Select the option that is related to the third term in the same way as the second term is related to the first term and the sixth term is related to the fifth term.

$$9 : 36 :: 12 : ? :: 18 : 126$$

- (a) 65
- (b) 60
- (c) 70
- (d) 58

Q33. Three different positions of the same dice are shown. Find the number on the face opposite the face showing '6'.

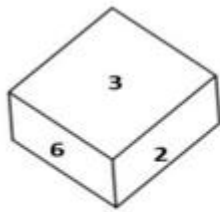


Figure 1

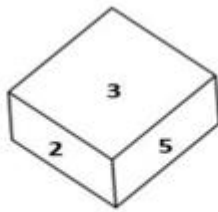


Figure 2

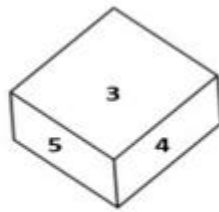


Figure 3

- (a) 3
- (b) 1
- (c) 2
- (d) 5

Q34. Select the set in which the numbers are related in the same way as are the numbers of the given sets.

(NOTE : Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

- (19, 64, 11)
- (27, 169, 14)
- (a) (23, 110, 12)
- (b) (20, 200, 8)
- (c) (24, 99, 15)
- (d) (22, 121, 11)

Q35. Karan drives 6 km towards north from point A. He takes a left turn and drives 3 km. Again he takes a left turn and drives 3 km. He takes a left turn and drives 6 km. He takes a right turn and drives 3 km to reach point B. How far and towards which direction should he drive in order to reach point A again?

- (a) 5 km towards east
- (b) 3 km towards west

- (c) 4 km towards north
- (d) 2 km towards south

Q36. Which of the following numbers will replace the question mark (?) in the given series?

90, 211, 67, 236, ?

- (a) 143
- (b) 45
- (c) 40
- (d) 38

Q37. In a code language, 'day of rest' is written as 'per din ces', 'rest after work' is written as 'per fin tds', 'all day work' is written as 'din fin mls'. What is the code for the word 'after' in this language?

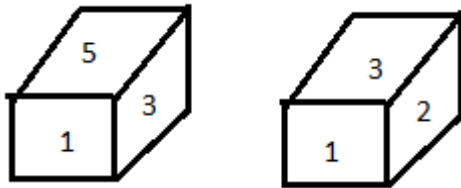
- (a) din
- (b) per
- (c) tds
- (d) ces

Q38. If + means \times , \times means \div , and \div means +, what will be the value of the following expression?

$$2 \div 5 + 2 - 5 \times 5 = ?$$

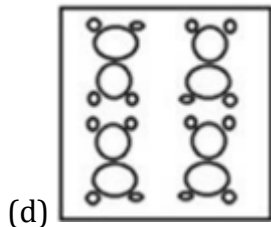
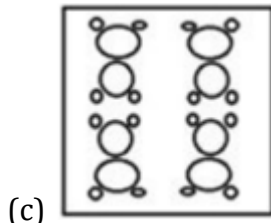
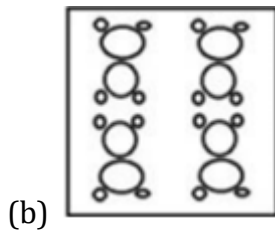
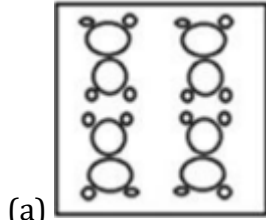
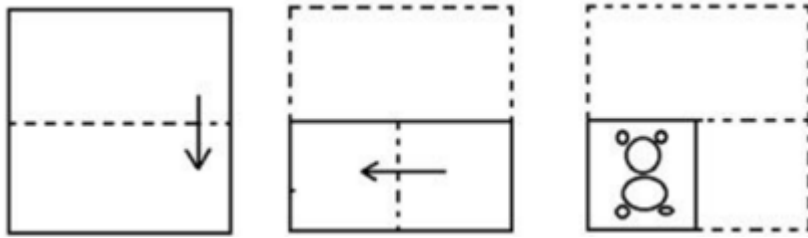
- (a) 5
- (b) 10
- (c) 8
- (d) 6

Q39. Two different positions of the same dice are shown, the six faces of which are numbered from 1 to 6. Select the number that will be on the face opposite to the one showing '5'.



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

Q40. The sequence of folding a piece of paper and the manner in which the folded paper has been cut is shown below. Choose the figure that would most closely resemble the unfolded form of the paper.



Q41. Which of the following numbers will replace the question mark (?) in the given series ?

10, 21, 35, 56, 90, 145, 231, 360, ?

- (a) 436
- (b) 546
- (c) 463
- (d) 564

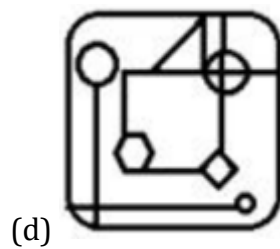
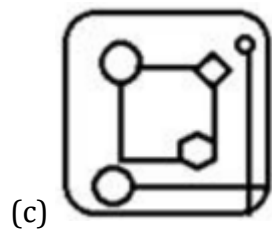
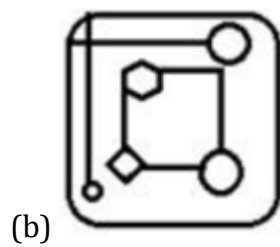
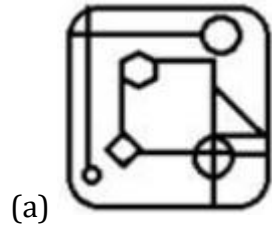
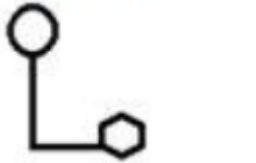
Q42. Select the correct combination of mathematical signs to sequentially replace the * signs and balance the given equation.

$121 * 11 * 99 * 11 * 77 * 79$

- (a) $\times, -, \div, +, =$
- (b) $\div, -, \div, \times, =$
- (c) $\div, -, \times, +, =$

(d) $\div, -, \div, +, =$

Q43. Select the option in which the given figure is embedded (rotation is NOT allowed).



Q44. Three different positions of the same dice are shown. Find the number on the face opposite the face showing '5'.

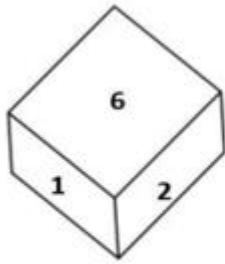


Figure 1

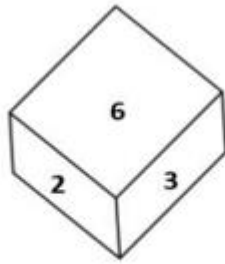


Figure 2

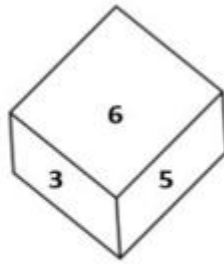
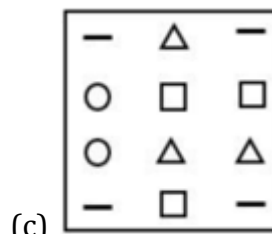
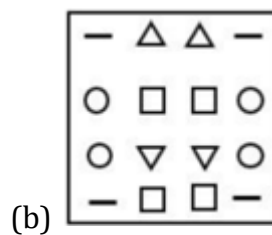
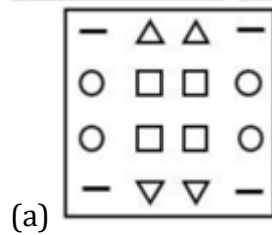
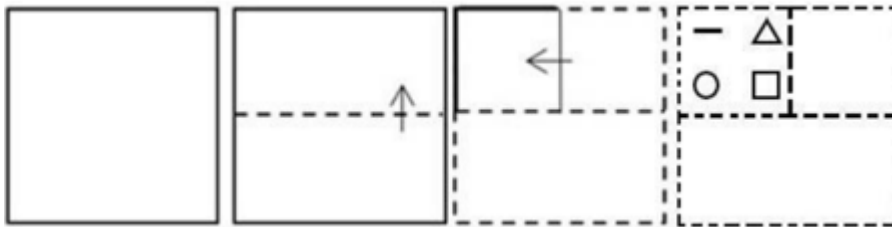
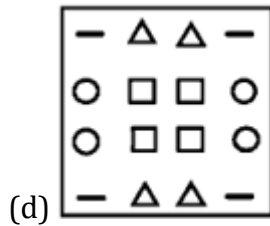


Figure 3

- (a) 3
- (b) 2
- (c) 6
- (d) 1

Q45. A paper is folded and cut as shown below. How will it appear when unfolded?





Q46. Which of the following numbers will replace the question mark (?) in the given series?

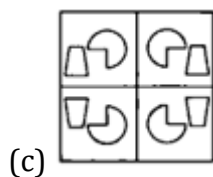
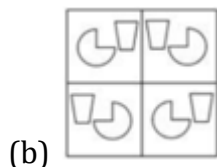
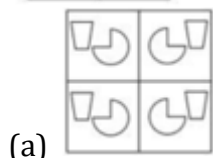
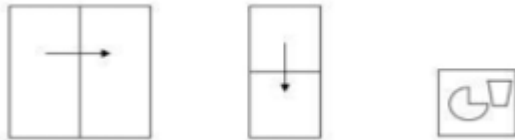
42, 67, 96, 129, 166, ?

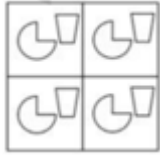
- (a) 207
- (b) 206
- (c) 205
- (d) 208

Q47. Seven people, A, B, C, D, E, F and G, are sitting in a straight row facing the north. Only two people sit to the left of C. Only two people sit between A and B. B sits to the left of A. E is an immediate neighbour of A to the right. Only one person sits to the right of D. F is not an immediate neighbour of B. Who sits to the extreme left?

- (a) B
- (b) D
- (c) E
- (d) F

Q48. A paper is folded and cut as shown below. How will it appear when unfolded?





(d)

Q49. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below.

(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)

Master : Disciple

(a) Coach : Player

(b) Cup : Plate

(c) Tea : Coffee

(d) Doctor : Medicine

Q50.

A # B means 'A is the brother of B'

A @ B means 'A is the sister of B'

A & B means 'A is the husband of B'

A % B means 'A is the daughter of B'

If W # Q @ T & Y @ M % K # L, then how is K related to T?

(a) Wife's father

(b) Wife's brother

(c) Father

(d) Brother

Q101. The following table shows the production of different types of two wheelers from 1993 to 1998.

(No. of two wheelers is in 1000s)

Year Type	1993	1994	1995	1996	1997	1998
A	36	34	40	35	37.5	40
B	20	22	25	23	19.5	18
C	14	22	16	25	29	35
D	60	62	67.5	75	76	80
E	40	45	48	50	80	105
F	45	52	55	60	57.5	56
Total	215	237	251.5	268	299.5	334

What is the approximate percentage increase in the total production of all types of two wheelers in 1998 in comparison to 1994?

(a) 42

- (b) 45
- (c) 40
- (d) 41

Q102. The price of a car is first increased by 35% and after that the price is decreased by 25% due to reduction in sales. What is the net percentage change in final price of the car?

- (a) Decreases by $2\frac{1}{5}\%$
- (b) Increases by $2\frac{1}{3}\%$
- (c) Decreases by $1\frac{3}{5}\%$
- (d) Increases by $1\frac{1}{4}\%$

Q103. The average age of 10 students and their class teacher is 17 years. If the age of the class teacher is excluded, the average age of the 10 students is reduced by 2 years. What is the age of the class teacher?

- (a) 38 years
- (b) 36 years
- (c) 37 years
- (d) 35 years

Q104. A largest six-digit number is divisible by 198. If the digits are rearranged, even then the number will be divisible by:

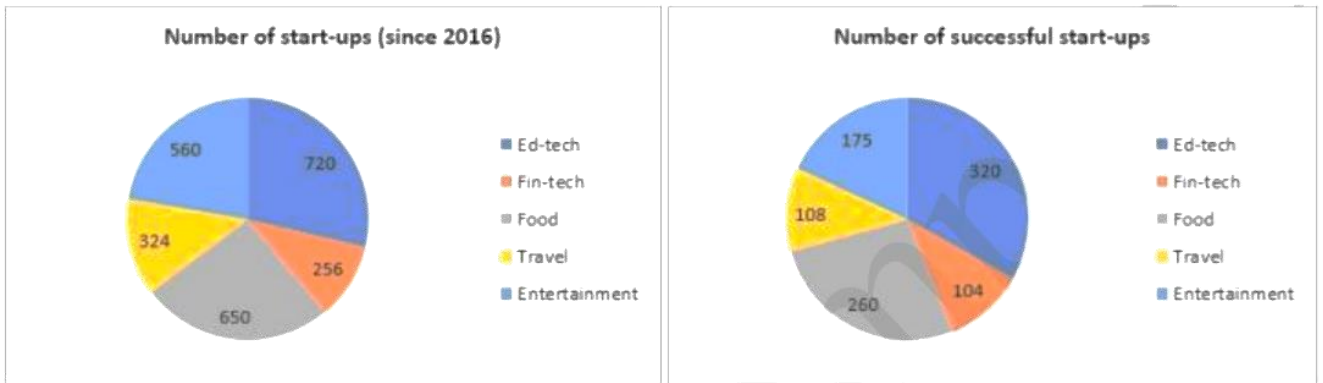
- (a) 3
- (b) 6
- (c) 2
- (d) 66

Q105. Simplify :

$$\left[\frac{2.31 \times 2.31 + 2 \times 2.31 \times 1.69 + 1.69 \times 1.69}{2.31 + 1.69} \right]^3$$

- (a) 64
- (b) 69
- (c) 42
- (d) 52

Q106. The following pie charts shows the number of start-ups started in various sectors since 2016 and the number of successful start-ups in those sectors respectively.



Find the ratio of the number of successful start-ups in entertainment sector to the total number of start-ups in entertainment since 2016.

- (a) 5 : 16
- (b) 5 : 17
- (c) 7 : 16
- (d) 25 : 81

Q107. Find the greatest number that exactly divides 15, 30 and 40.

- (a) 3
- (b) 40
- (c) 5
- (d) 15

Q108. The weight of a person was entered incorrectly as 83 kg instead of 63 kg. As a result, the average weight of a group of people increased by 500 gm. What is the total number of people in the group?

- (a) 44
- (b) 48
- (c) 40
- (d) 50

Q109. A dress has a marked price of Rs. 800. It is sold at a price of Rs. 612 after two successive discounts of 15% and x%. Find the value of x.

- (a) 8%
- (b) 10%
- (c) 12%
- (d) 14%

Q110. If $a + \frac{1}{a} = P^2$, then find $a^2 + \frac{1}{a^2}$.

- (a) $P^2 - 2$
- (b) $P^2 + 2$
- (c) $P^4 - 2$

(d) $P^4 + 2$

Q111.

Simplify.

$$\frac{\cos^4\theta - \sin^4\theta}{\sin^2\theta}$$

(a) $1 - \tan^2\theta$

(b) $\tan^2\theta - 1$

(c) $\cot^2\theta - 1$

(d) $1 - \cot^2\theta$

Q112. The marked price of a chair was ₹1,000 but it was sold for ₹1,200. What is the percentage increase on the product?

(a) 10%

(b) 15%

(c) 35%

(d) 20%

Q113. If $a = 9.6$, $b = 4.44$ and $c = 5.16$, then the value of $a^3 - b^3 - c^3 - 3abc$ is:

(a) 0

(b) -1

(c) 2

(d) 1

Q114. A gives B a head-start of 10 seconds in a 1500 m race and both finish the race at the same time. What is the time taken by A (in minutes) to finish the race if speed of B is 6 m/s?

(a) 3

(b) 4

(c) 8

(d) 5

Q115. $1.6^3 - 0.8^3 - 0.4^3$

(a) 3.25

(b) 3.52

(c) 5.61

(d) 2.65

Q116. In an assembly election, a candidate got 60% of the total valid votes. 2% of the total votes were declared invalid. If the total number of voters is 1,50,000, then find the number of valid votes polled in favour of that candidate.

(a) 90,000

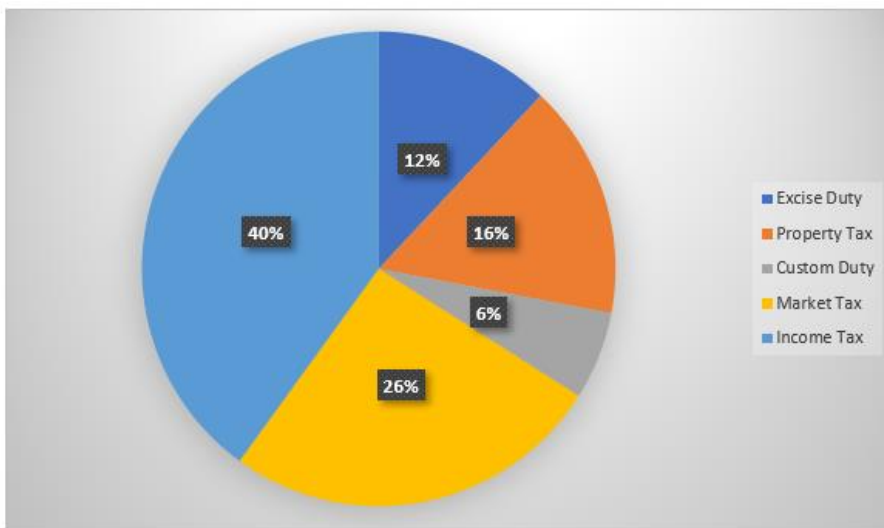
(b) 78,000

- (c) 86,400
 (d) 88,200

Q117. A cuboid has a length of 16 m, a breadth of 25 m, and a volume of 4000 m^3 . A cube has a volume that is two times the volume of this cuboid. Find the ratio of total surface area of the cuboid to the cube.

- (a) 25: 41
 (b) 27:40
 (c) 29: 43
 (d) 31: 43

Q118. The following pie chart shows the distribution of income from different taxes. Study the chart and answer the question.



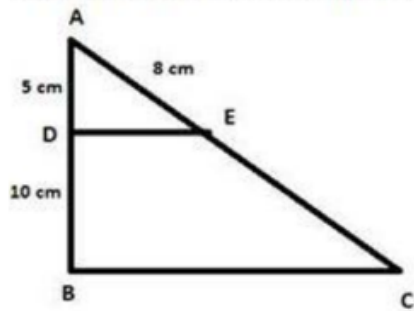
If the income from the market tax in a year is Rs. 260 crore, then the total income from other sources is: (in Rs. crore)

- (a) 540
 (b) 560
 (c) 740
 (d) 760

Q119. The value of $6\frac{8}{15} \div \frac{7}{9}$ of $(1\frac{1}{10} + 5\frac{1}{5}) + \frac{2}{5} \div 7\frac{1}{5}$ is:

- (a) 25/16
 (b) 5/14
 (c) 25/18
 (d) 5/18

Q120. In the given figure, DE is parallel to BC. If AD = 5 cm, DB = 10 cm, and AE = 8 cm, then AC is:



- (a) 24 cm
- (b) 32 cm
- (c) 8 cm
- (d) 16 cm

Q121. Find the total surface area of hemisphere having a diameter of 4.2 cm.

- (a) 45.58 cm^2
- (b) 41.58 cm^2
- (c) 43.58 cm^2
- (d) 31.58 cm^2

Q122. A wire is drawn from a sphere with a radius of 15 cm. If the length of the wire is 20 cm, find the radius of the wire in meters.

- (a) 150
- (b) 15
- (c) 1.5
- (d) 0.15

Q123. A retailer offers the following discount schemes for buyers on an item.

- i) Two successive discount of 15%
- ii) A discount of 20% followed by a discount of 10%
- iii) A discount of 30%

Under which scheme the selling price will be maximum?

- (a) ii
- (b) ii and iii
- (c) i and ii
- (d) i

Q124. The total number of teachers in different subjects and the respective percentage of females among them in a school are given in the following table. Study the table and answer the following question.

Subject	Total number of teachers	Percentage of females
Hindi	50	80
English	40	90
Mathematics	60	35
Science	55	40
Commerce	30	50
Social Science	40	75

In which subject are the maximum number of teachers males?

- (a) Mathematics
- (b) Hindi
- (c) Commerce
- (d) English

Q125. A computer is priced at Rs. 39,000 if paid in full payment. Alternatively, it can be purchased by making an initial payment of Rs. 19,000, followed by five monthly installments of Rs. 4,200 each. Calculate the annual interest rate for this instalment plan.

- (a) $20\frac{21}{29}\%$
- (b) $21\frac{20}{29}\%$
- (c) $20\frac{20}{29}\%$
- (d) $25\frac{20}{29}\%$

Q126. Find the value of 'a' in the following equation. (Given $a < 10$.)

$$\frac{(187 \div 17 \times a - 3 \times 3)}{(8^2 - 9 \times 7 + a^2)} = 1$$

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

Q127. Find the area of triangle whose sides are 10 cm, 12 cm, and 18 cm.

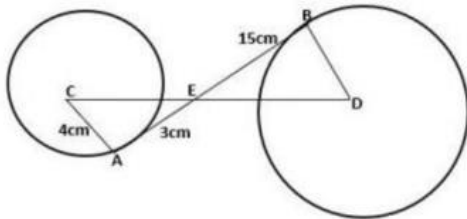
- (a) $22\sqrt{2} \text{ cm}^2$
- (b) $30\sqrt{2} \text{ cm}^2$
- (c) $28\sqrt{2} \text{ cm}^2$
- (d) $40\sqrt{2} \text{ cm}^2$

Q128. The ratio of the third proportional to 16 & 40 and the mean proportional between 10 & 40 is:

- (a) 5 : 1
- (b) 1 : 5
- (c) 4 : 1

(d) 1 : 4

Q129. AB is the common tangent to both circles as shown in the given figure. What is the distance between the centres of the circles?

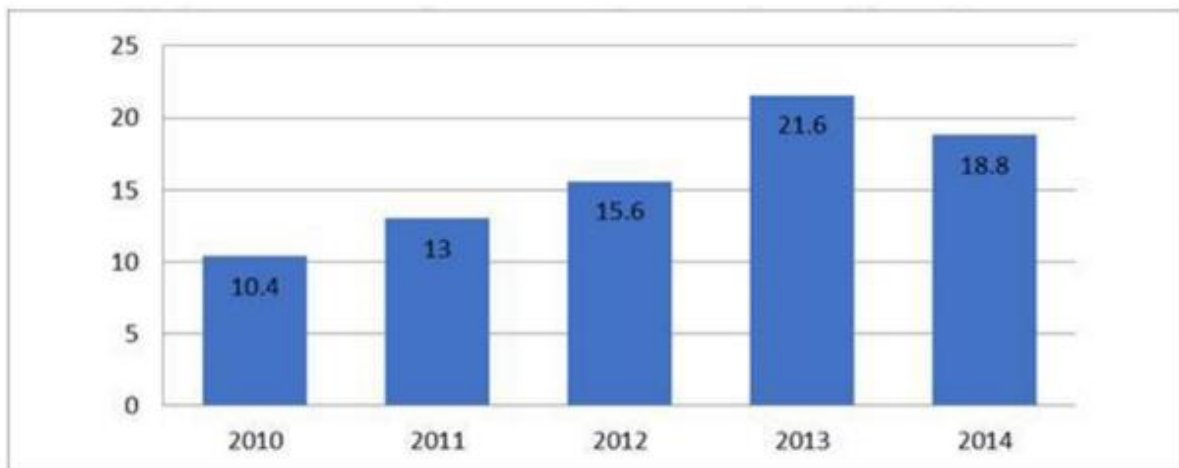


- (a) 20 cm
- (b) 15 cm
- (c) 10 cm
- (d) 30 cm

Q130. 24 men can complete a work in 15 days. How many men are needed to complete the same work in 10 days?

- (a) 16
- (b) 20
- (c) 36
- (d) 25

Q131. Study the given bar-graph and answer the question that follows. The bar-graph shows the export of rice (in Rs. lakh) during five years.



In how many years was the export of rice less than the average export for the five-year period?

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

Q132. The speed of a boat in still water is thrice the speed of the stream. If the boat takes 15.5 sec to go to a certain place downstream, then find the additional time required to cover the same distance travelling upstream.

- (a) 15.5 sec
- (b) 29 sec
- (c) 31 sec
- (d) 35 sec

Q133. 8 men and 12 women finish a job in 4 days. While 6 men and 14 women in 5 days. In how many days will 20 women finish the job?

- (a) 10
- (b) 20
- (c) 30
- (d) 15

Q134. Ishaan completed a journey by car. He traveled 30% of the distance at a speed of 90 km/h, 45% of the distance at 135 km/h, and the remaining distance at 75 km/h. What was his average speed (in km/h) for the entire journey?

- (a) 100 km/hr
- (b) 80 km/hr
- (c) 70km/hr
- (d) 60 km/hr

Q135. One side of the triangle is 15 cm and the corresponding height is 6 cm, then area of the triangle is:

- (a) 46 sq.cm
- (b) 45 sq.cm
- (c) 47 sq.cm
- (d) 48 sq.cm

Q136. By selling 24 items, a shopkeeper gains the selling price of 4 items. His gain percentage is:

- (a) $16\frac{1}{3}\%$
- (b) 20%
- (c) $33\frac{1}{3}\%$
- (d) $16\frac{2}{3}\%$

If $\sqrt{1 + \frac{x}{529}} = \frac{24}{23}$, then the value of x is:

- Q137.
- (a) 15
 - (b) 27
 - (c) 47
 - (d) 30

Q138. The area of the base of a cone is 616 cm^2 . If its slant height is 20 cm, then what is the total surface area of the cone? [Use $\pi = 22/7$]

- (a) 1352 cm^2
- (b) 1296 cm^2
- (c) 1496 cm^2
- (d) 1524 cm^2

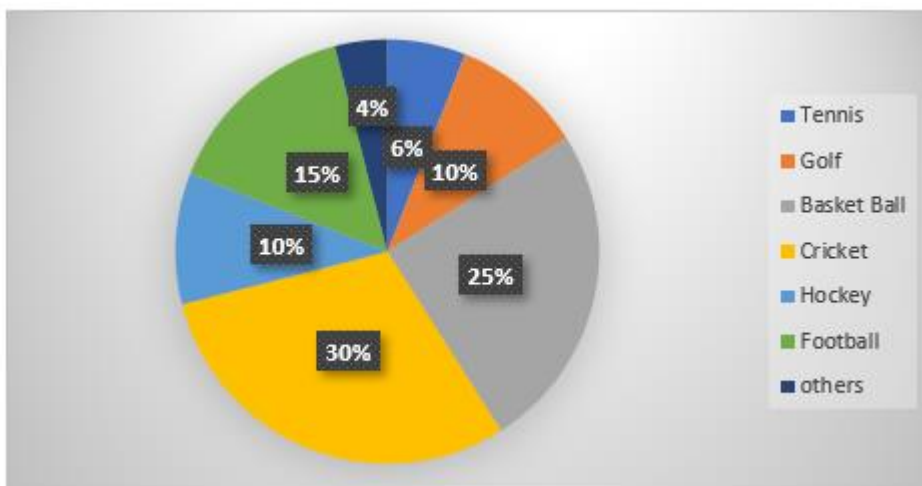
The value of $\frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} - 1$ is:

Q139.

- (a) $\frac{1}{2}$
- (b) 1
- (c) 0
- (d) 2

Q140. The circle graph given here shows the spending of a country on various sports during a year. Study the graph carefully to answer the question.

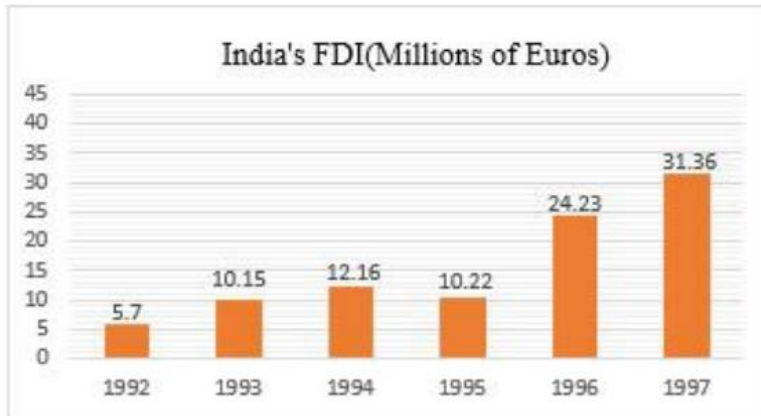
Percentage of money spent on various sports for one year.



If the total amount spent during the year was Rs. 1,20,00,000, then how much was spent on Basket Ball?

- (a) Rs. 25,00,000
- (b) Rs. 10,00,000
- (c) Rs. 40,00,000
- (d) Rs. 30,00,000

Q141. The following bar chart shows the trends of foreign direct investment (FDI) into India from all over the world.



For which year is the per cent increase in FDI over the previous year the highest?

- (a) 1997
- (b) 1994
- (c) 1996
- (d) 1993

Q142. Two trains A and B starts from station X and Y towards each other at the same time They meets each other on the way and from there A reached the station in 81 min & B in 100 min. respectively. If speed of A is 60 km/hr. then find the speed of B.

- (a) 40 km/hr
- (b) 45 km/hr
- (c) 50 km/hr
- (d) 54 km/hr

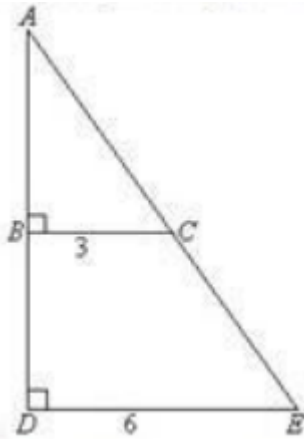
Q143. A shopkeeper sells his good at a discount of 12.5 % on MRP & earns a profit of 20%. If the CP of article is 1400. Find MRP of article.

- (a) Rs. 1900
- (b) Rs. 1920
- (c) Rs. 1950
- (d) Rs. 1970

If $\sin^2\theta = \cos^3\theta$, then the value of $(\cot^2\theta - \cot^6\theta)$ is:

- Q144.
- (a) -1
 - (b) 0
 - (c) 2
 - (d) 1

Q145. Study the given figure and answer the question that follows.



Find the length of AB in the given triangle, if it is given that the length of BD is 4 unit.

- (a) 3
- (b) 3.5
- (c) 2.5
- (d) 4

Q146. What is the value of $12 - 8 \div 2 - \{16 \text{ of } (-2) + (3 \times 5 - 4)\}$?

- (a) 29
- (b) 45
- (c) 1
- (d) 0

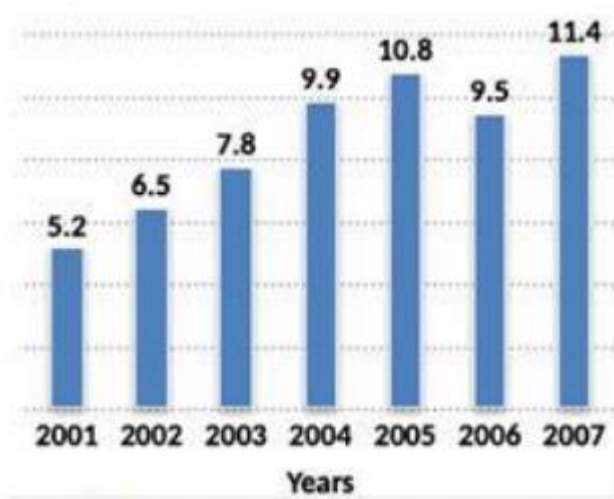
Q147.

What is the positive value of the following expression?

$$\sqrt{36 \div 15 \text{ of } 2 \text{ of } [25 \times 4 \div 4 \text{ of } \{29 - (8 - 11) \div (9 \times 5 \div 5 \text{ of } 3)\}]}$$

- (a) $1\frac{5}{6}$
- (b) $1\frac{1}{5}$
- (c) $2\frac{4}{5}$
- (d) $2\frac{3}{5}$

Q148. The following bar graph describes the population of a town (in lakhs) from 2001 to 2007.



Find the percentage increase in population from 2006 to 2007.

- (a) 15%
- (b) 20%
- (c) 16%
- (d) 18%

Q149. On a certain sum of money lent out at 16% per annum, the difference between the compound interest for 1 year, payable half-yearly, and the simple interest for 1 year is Rs. 60. The sum is:

- (a) Rs. 937.5
- (b) Rs. 9,000
- (c) Rs. 9,365
- (d) Rs. 9,375

Q150. If $\sin A = \frac{1}{2}$, then the value of $(\tan A + \cos A)$ is:

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

Solutions

S1. Ans. (d)

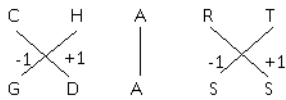
Sol.

A.T.Q,

$$\begin{aligned} &= 65 + 35 - 72 \div 8 \times 5 \\ &= 65 + 35 - 45 \\ &= 20 + 35 \\ &= 55 \end{aligned}$$

S2. Ans. (b)

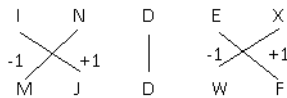
Sol.



and,

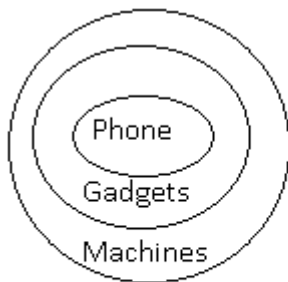


Similarly,



S3. Ans. (d)

Sol.



1. Right

2. Wrong

S4. Ans. (c)

S5. Ans. (a)

Sol.

$$\begin{aligned} Q &\rightarrow +4 \rightarrow U \rightarrow +3 \rightarrow X \rightarrow +2 \rightarrow Z \\ G &\rightarrow +4 \rightarrow K \rightarrow +4 \rightarrow O \rightarrow +2 \rightarrow Q \\ A &\rightarrow +4 \rightarrow E \rightarrow +4 \rightarrow I \rightarrow +2 \rightarrow K \\ K &\rightarrow +4 \rightarrow O \rightarrow +4 \rightarrow S \rightarrow +2 \rightarrow U \end{aligned}$$

S6. Ans. (b)

Sol.

Code are as follows.

you - la
 tall - ma
 daily workout - ka pa
 makes - ja`

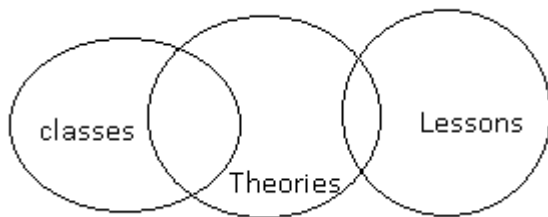
S7. Ans. (a)

Sol.

A → +2 → C → +2 → E → +2 → G → +2 → I
 Z → +2 → B → +2 → D → +2 → F → +2 → H
 X → +2 → Z → +2 → B → +2 → D → +2 → F

S8. Ans. (c)

Sol.



Statement I does not follow - There is no information and relation between classes and lessons given so we cannot assume anything with incomplete information and thus the conclusion does not follow.

Statement II follows - If the amount of 'some classes' is equal to 'all theories' then there is a possibility that all theories are classes and therefore the conclusion follows.

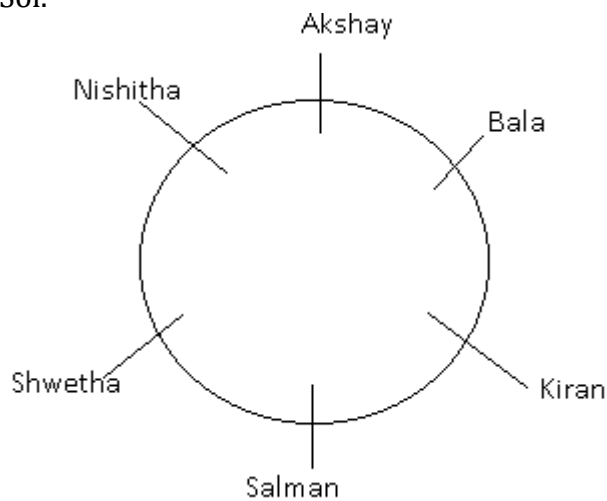
S9. Ans. (d)

Sol.

P → -3 → M → -3 → J → -3 → G → -3 → D
 Y → -3 → V → -3 → S → -3 → P → -3 → M
 W → +2 → Y → +2 → A → +2 → C → +2 → E
 B → +2 → D → +2 → F → +2 → H → +2 → J

S10. Ans. (c)

Sol.



From the arrangement, we can see that Shwetha is the immediate neighbour of Nishitha and Salman.

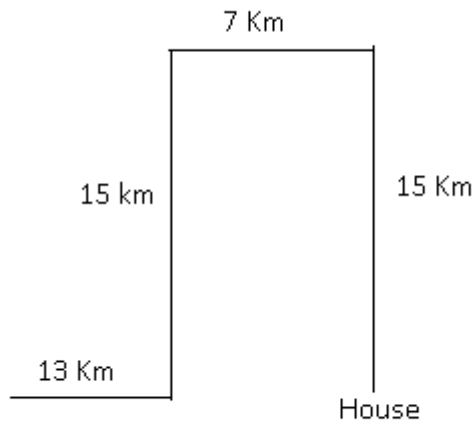
S11. Ans. (a)

Sol.

FFOOLLW/ FFOOLLW/ FFOOLLW

S12. Ans. (a)

Sol.



Total distance = 13 Km + 7 Km = 20 Km

S13. Ans. (a)

S14. Ans. (b)

Sol.

1,5,3,4,2 is the correct order.

S15. Ans. (c)

Sol.

Code are as follow.

to - tes

the - fern

mountain - lor

trek - mel

S16. Ans. (b)

Sol.

$$27 + 21 = 16 \times 3 = 48$$

$$24 + 33 = 19 \times 3 = 57$$

Similarly,

$$36 + 15 = 17 \times 3 = 51$$

S17. Ans. (c)

Sol.

41352 is the correct order.

S18. Ans. (c)

S19. Ans. (c)

S20. Ans. (a)

Sol.

$$132 \div 6 \times 9 + 13 - 31$$

$$22 \times 9 + 13 - 31$$

$$198 - 18$$

$$180$$

S21. Ans. (a)

Sol.

The logic is

Sum of opposite positional value of all the alphabets \div Number of alphabets = Code

So,

SANITIZE is coded as,

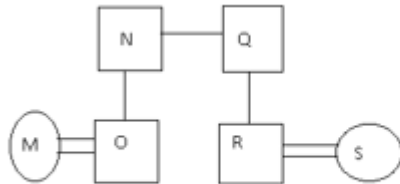
$$8 + 26 + 13 + 18 + 7 + 18 + 1 + 22 = 113,$$

$$\frac{113}{8}$$

$$8$$

S22. Ans. (d)

Sol.



We can see that N is the brother of R's Father.

S23. Ans. (a)

Sol.

$$29 \times 7 - 168 \div 4 + 71 - 39 + 14 \times 2$$

$$203 - 42 + 71 - 39 + 28$$

$$221$$

S24. Ans. (b)

Sol.

F \rightarrow +3 \rightarrow I
A \rightarrow +2 \rightarrow C
N \rightarrow +1 \rightarrow O
2 \rightarrow *cube* \rightarrow 8

and
N \rightarrow +3 \rightarrow Q
A \rightarrow +2 \rightarrow C
P \rightarrow +1 \rightarrow Q
5 \rightarrow *cube* \rightarrow 125

Similarly,
G \rightarrow +3 \rightarrow J
U \rightarrow +2 \rightarrow W
N \rightarrow +1 \rightarrow O
8 \rightarrow *cube* \rightarrow 512

S25. Ans. (b)

Sol.

$$467 + 231 - 123 - 789 + 345 = 131$$

$$1043 - 123 - 789 = 131$$

$$131 = 131$$

S26. Ans. (a)

Sol.

$$124 \div 4 - 86 \div 2 + 61 + 17 \times 3$$

$$31 - 43 + 61 + 51$$

$$143 - 43 = 100$$

S27. Ans. (a)

Sol.

$$2^3 + 3^3 = 8 + 27 = 35$$

and

$$11^3 + 6^3 = 1331 + 216 = 1547$$

Similarly,

$$4^3 + 15^3 = 64 + 3375 = 3439$$

S28. Ans. (d)

Sol.

$$X \rightarrow \textit{opposite} \rightarrow C \rightarrow \textit{opposite} + 1 \rightarrow Y$$

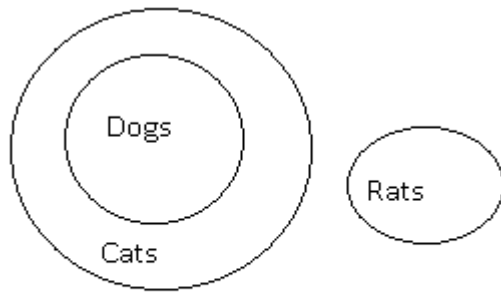
$$O \rightarrow \textit{opposite} \rightarrow L \rightarrow \textit{opposite} + 1 \rightarrow P$$

$$T \rightarrow \textit{opposite} \rightarrow G \rightarrow \textit{opposite} + 1 \rightarrow U$$

$$B \rightarrow \textit{opposite} - 1 \rightarrow X \rightarrow \textit{opposite} \rightarrow C$$

S29. Ans. (a)

Sol.



1. Wrong

2. Wrong

S30. Ans. (c)

Sol.

$$159 - 13 = 146$$

$$146 - 13 = 133$$

$$133 - 13 = 120$$

$$120 - 13 = 107$$

$$107 - 13 = 94$$

$$94 - 13 = 81$$

S31. Ans. (b)

S32. Ans. (b)

Sol.

The logic followed: First number \times (First number \div 3 + 1)

$$9 : 36$$

$$9 \times (9 \div 3 + 1)$$

$$= 36$$

and

$$18 : 126$$

$$18 \times (18 \div 3 + 1)$$

$$= 126$$

Similarly,

$$12 : ?$$

$$12 \times (12 \div 3 + 1)$$

$$= 60$$

S33. Ans. (d)

Sol.

From figure 1 and 2

We know that

In this type of dices uncommon number are opposite to each other.

So,

6 is opposite to 5

S34. Ans. (d)

Sol.

$$(\text{First term} - \text{Third Term})^2 = \text{Second Term}$$

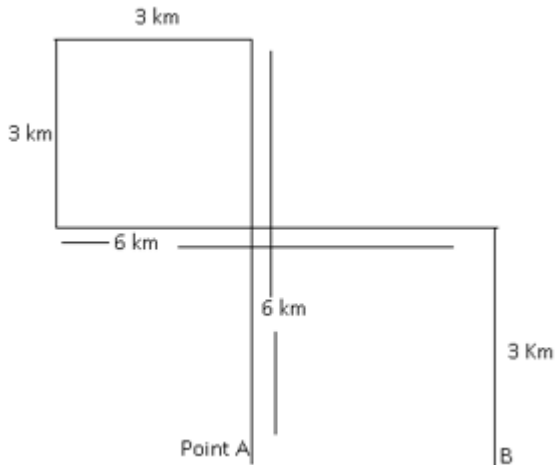
So,

$$(22, 121, 11)$$

$$(22 - 11)^2 = 11 \times 11 = 121$$

S35. Ans. (b)

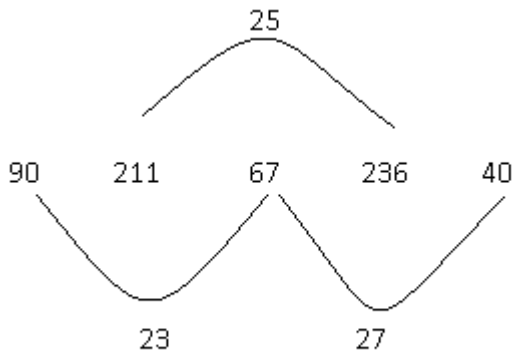
Sol.



We can see that Karan should drive 3 km towards west to reach point A.

S36. Ans. (c)

Sol.



S37. Ans. (c)

Sol.

The code are as follow:

day - din

rest - per

Work - fin

So,

'after' is coded as 'tds'

S38. Ans. (a)

Sol.

$$2 + 5 - 2 \times 5 \div 5$$

$$2 + 5 - 2$$

$$= 5$$

S39. Ans. (d)

Sol.

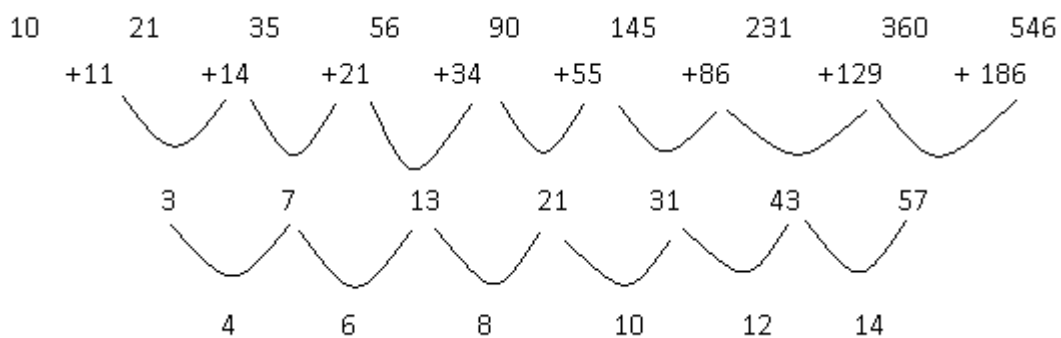
In this type of dices uncommon numbers are opposite to each other.

5 is opposite to 2

S40. Ans. (c)

S41. Ans. (b)

Sol.



S42. Ans. (d)

Sol.

$$121 \div 11 - 99 \div 11 + 77 = 79$$

$$11 - 9 + 77 = 79$$

$$79 = 79$$

S43. Ans. (c)

S44. Ans. (b)

Sol.

From figure 2 and 3

In this type of dices uncommon numbers are opposite to each other.

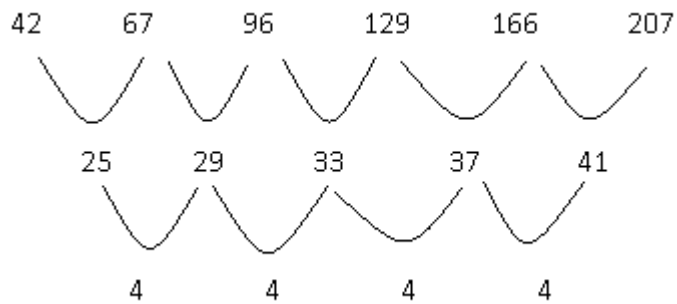
So,

5 is opposite to 2

S45. Ans. (a)

S46. Ans. (a)

Sol.



S47. Ans. (a)

Sol.



From the above figure, we can see that B is at the extreme left.

S48. Ans. (c)

S49. Ans. (a)

Sol.

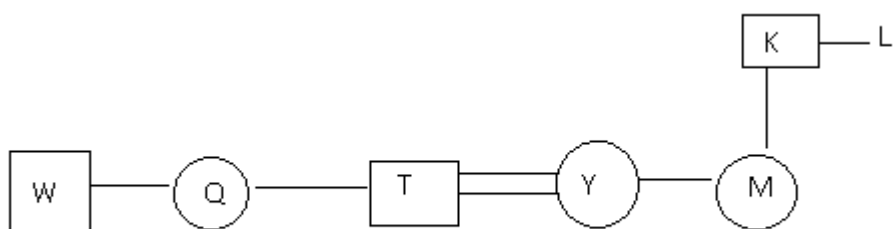
Disciple is the follower of Master.

Similarly,

Player is the follower of Coach.

S50. Ans. (a)

Sol.



From the above family tree we can see that K is the T's wife's father.

S101. Ans. (d)

Sol.

Total Production of two-wheelers in year 1998 = $40 + 18 + 35 + 80 + 105 + 56 = 334$

Total Production of two-wheelers in year 1994 = $34 + 22 + 22 + 62 + 45 + 52 = 237$

Increase in Production = $334 - 237 = 97$

Percentage increase in two-wheelers in 1998 in comparison to 1994

$$= \frac{97}{237} \times 100\% = 40.9\%$$

S102. Ans. (d)

Sol.

$$\text{Percentage change} = 35\% - 25\% - \left(35 \times \frac{25}{100}\right)$$

$$= 10\% - \left(\frac{35}{4}\right)\%$$

$$= \text{Increased by } 1\frac{1}{4}\%$$

S103. Ans. (c)

Sol.

The sum of the age of 10 students and their teacher is = $11 \times 17 = 187$ years

The sum of the age of 10 students = $10 \times (17 - 2) = 150$ years

Now,

The age of teacher = $187 - 150 = 37$ years

S104. Ans. (a)

Sol.

Largest six-digit number = 999999

Dividing by 198, we get

Quotient = 5050, Remainder = 99

Six-digit number divisible by 198 = $999999 - 99 = 999900$

If the digits are rearranged, then the number is only divisible by 3.

Now, another six-digits number which is divisible by 198 = $999900 - 198 = 999,702$

If the digits are rearranged, then the number is divisible by 3.

S105. Ans. (a)

Sol.

$$\left[\frac{2.31 \times 2.31 + 2 \times 2.31 \times 1.69 + 1.69 \times 1.69}{2.31 + 1.69} \right]^3$$

Let $a = 2.31$ and $b = 1.69$

$$\left[\frac{a^2 + 2ab + b^2}{a + b} \right]^3 = \left[\frac{(a + b)^2}{a + b} \right]^3 = (a + b)^3 = (2.31 + 1.69)^3 = 4^3 = 64$$

S106. Ans. (a)

Sol.

Number of successful start-ups in entertainment sector = 175

Total number of start-ups in entertainment since 2016 = 560

The ratio of the number of successful start-ups in the entertainment

sector to the total number of start-ups in entertainment since 2016 = $\frac{175}{560} = \frac{5}{16}$

S107. Ans. (c)

Sol.

$$15 = 3 \times 5$$

$$30 = 2 \times 3 \times 5$$

$$40 = 2 \times 2 \times 2 \times 5$$

Therefore, the greatest number that exactly divides 15, 30, and 40 is 5.

S108. Ans. (c)

Sol.

Let the total number of people = x

A.T.Q,

The total increase in average weight of people = 83 - 63

$$\frac{x}{2} = 83 - 63$$

$$x = 40$$

S109. Ans. (b)

Sol.

After 15% discount on the marked price = $800 - 15\%$ of $800 = 680$

Now it is sold at Rs. 612

$$\text{Now Discount \%} = \frac{680 - 612}{680} \times 100 = 10\%$$

S110. Ans. (c)

Sol.

Squaring both sides of the given value, we get

$$a^2 + \frac{1}{a^2} + 2 \times a \times \frac{1}{a} = p^4$$

$$a^2 + \frac{1}{a^2} + 2 = p^4$$

$$a^2 + \frac{1}{a^2} = p^4 - 2$$

S111. Ans. (c)

Sol.

A.T.Q,

$$\frac{\cos^4\theta - \sin^4\theta}{\sin^2\theta} = \frac{(\cos^2\theta + \sin^2\theta)(\cos^2\theta - \sin^2\theta)}{\sin^2\theta}$$

$$\frac{(1)(\cos^2\theta - \sin^2\theta)}{\sin^2\theta} = \frac{\cos^2\theta}{\sin^2\theta} - 1 = \cot^2\theta - 1$$

S112. Ans. (d)

Sol.

It is given that CP of the chair = 1000

SP of the chair = 1200

SP = Profit + CP

$$\text{Profit} = \text{SP} - \text{CP} = 1200 - 1000 = 200$$

$$\text{Percentage increase} = \frac{200}{1000} \times 100 = 20\%$$

S113. Ans. (a)

Sol.

We know,

When

$$a + (-b) + (-c) = 0$$

then,

$$a^3 - b^3 - c^3 - 3abc = 0$$

S114. Ans. (b)

Sol.

$$\text{Time taken by B to finish the race} = \frac{1500}{6} = 250 \text{ s}$$

Given A gives a head start of 10 seconds to B

$$\text{Time taken by A to finish the race} = 250 - 10 = 240 \text{ s}$$

$$1 \text{ minute} = 60 \text{ seconds}$$

So,

$$240 \text{ s} = \frac{240}{60} = 4 \text{ minutes.}$$

S115. Ans. (b)

Sol.

$$1.6^3 - 0.8^3 - 0.4^3 = 4.096 - 0.512 - 0.064 = 3.52$$

S116. Ans. (d)

Sol.

$$\text{Total votes} = 150000$$

$$\text{Total valid votes} = 150000 \times \left(\frac{100-2}{100}\right) = 147000$$

$$\text{Votes polled in favour of the candidate} = 147000 \times 60\% = 88200$$

S117. Ans. (b)

Sol.

$$\text{Volume of cuboid} = 4000 \text{ m}^3$$

$$LBH = 4000$$

$$16 \times 25 \times H = 4000$$

$$H = 10 \text{ m}$$

$$\text{Volume of cube} = 8000 \text{ m}^3$$

$$a^3 = 8000$$

$$a = 20 \text{ m}$$

$$\text{Total Surface Area of Cube} = 6a^2 = 2400 \text{ m}^2$$

$$\text{Total Surface Area of Cuboid} = 2(lb+bh+hl) = 1620 \text{ m}^2$$

$$\text{Required Ratio} = \frac{1620}{2400} = \frac{27}{40}$$

S118. Ans. (c)

Sol.

Let the total income from all the sources be x crores

A.T.Q,

$$\frac{26}{100} \times x = 260$$

$$X = 260 \times \frac{100}{26} = 1000 \text{ crores}$$

Total income from all the sources = 1000

Income from other sources other than market tax = $1000 - 260 = 740$

S119. Ans. (c)

Sol.

$$\begin{aligned} & 6\frac{8}{15} \div \frac{7}{9} \text{ of } (1\frac{1}{10} + 5\frac{1}{5}) + \frac{2}{5} \div 7\frac{1}{5} \\ & \frac{98}{15} \div \frac{49}{10} + \frac{2}{5} \div \frac{36}{5} \\ & \frac{98}{15} \times \frac{10}{49} + \frac{2}{5} \times \frac{5}{36} \\ & \frac{4}{3} + \frac{1}{18} = \frac{25}{18} \end{aligned}$$

S120. Ans. (a)

Sol.

DE is parallel to BC (Given)

So,

$$\frac{AD}{AB} = \frac{AE}{AC}$$

$$\frac{5}{15} = \frac{8}{AC}$$

$$AC = \frac{8 \times 15}{5} = 24 \text{ cm}$$

S121. Ans. (b)

Sol.

$$\text{Radius} = 4.2/2 = 2.1 \text{ cm}$$

$$\text{Total Surface Area of hemisphere} = 3\pi r^2 = 3 \times \frac{22}{7} \times (2.1)^2 = 41.58 \text{ cm}^2$$

S122. Ans. (d)

Sol.

Volume of wire = Volume of Sphere

$$\pi r^2 h = \frac{4}{3} \pi R^3$$

$$r^2 \times 20 = \frac{4}{3} (15)^3$$

$$r^2 = 225 \text{ cm}$$

$$r = 15 \text{ cm}$$

$$r = 0.15 \text{ m}$$

S123. Ans. (d)

Sol.

$$\text{(i) effective discount} = 15 + 15 - \frac{15 \times 15}{100} = 27.75\%$$

$$\text{(ii) effective discount} = 20 + 10 - \frac{20 \times 10}{100} = 28\%$$

$$\text{(iii) effective discount} = 30\%$$

So,

in (i) scheme selling price will be maximum.

S124. Ans. (a)

Sol.

The maximum numbers of male teachers are in mathematics i.e., 65

S125. Ans. (c)

Sol.

According to the question

$$\text{Interest of five month } 4200 \times 5 - 20000 = 1000$$

$$\left[\frac{20000 \times R}{12 \times 100} + \frac{15800R}{12 \times 100} + \frac{11600R}{12 \times 100} + \frac{7400 \times R}{12 \times 100} + \frac{3200 \times R}{100} \right] = 1000$$

$$\frac{580R}{12} = 1000$$

$$R = \frac{600}{29}\% = 20\frac{20}{29}\%$$

S126. Ans. (b)

Sol.

$$\frac{(187 \div 17 \times a - 3 \times 3)}{(8^2 - 9 \times 7 + a^2)} = 1$$

$$11a - 9 = a^2 + 64 - 63$$

$$a^2 - 11a + 10 = 0$$

$$(a-1)(a-10) = 0$$

$$a = 1 \text{ or } 10$$

As given,

$$a < 10,$$

so

$$a = 1$$

S127. Ans. (d)

Sol.

A.T.Q,

$$\text{Semi perimeter} = \frac{10+12+18}{2} = 20$$

$$\text{Area of the triangle} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{Area of the triangle} = \sqrt{20(20-10)(20-12)(20-18)}$$

$$= 40\sqrt{2}$$

S128. Ans. (a)

Sol.

A.T.Q,

$$\text{Mean proportion of 10 and 40} = \sqrt{400} = 20$$

$$\text{Third proportion of 16 and 40} = \frac{40 \times 40}{16} = 100$$

$$\text{Ratio} - 100 : 20 = 5 : 1$$

S129. Ans. (d)

Sol.

In triangle CAE

$$CE^2 = AC^2 + AE^2$$

$$CE^2 = 4^2 + 3^2$$

$$CE = 5$$

ΔACE and ΔBDE are similar

$$\frac{AC}{AE} = \frac{BD}{BE}$$

$$\frac{4}{3} = \frac{BD}{15}$$

$$BD = 20$$

In triangle DBE

$$DE^2 = DB^2 + BE^2$$

$$DE^2 = 20^2 + 15^2$$

$$DE = 25$$

$$\text{Distance between two circles} = CE + DE = 5 + 25 = 30 \text{ cm}$$

S130. Ans. (c)

Sol.

$$(M_1 \times D_1) = (M_2 \times D_2)$$

$$24 \times 15 = M_2 \times 10$$

$$M_2 = 36$$

S131. Ans. (c)

Sol.

A.T.Q,

$$\text{Average export of rice for 5 years} = \frac{10.4+13+15.6+21.6+18.8}{5} = 15.88$$

So,

The average export of rice for the years 2010, 2011, and 2012 < average export of rice for 5 years.

S132. Ans. (a)

Sol.

A.T.Q,

$$\text{Downstream speed} = 4x \text{ m/s}$$

So,

$$\text{Distance} = 15.5 \times 4x = 62x$$

$$\text{Upstream speed} = 2x \text{ m/s}$$

So,

$$62x = t \times 2x$$

$$t = 31 \text{ sec}$$

$$\text{Additional time required to travel upstream} = 31 - 15.5 = 15.5 \text{ sec}$$

S133. Ans. (b)

Sol.

$$(8M + 12W) \times 4 = (6M + 14W) \times 5$$

$$32M + 48W = 30M + 70W$$

$$2M = 22W$$

$$M : W = 11 : 1$$

So,

The total work done is,

$$[(8 \times 11) + (12 \times 1)] \times 4$$

$$[88 + 12] \times 4 = 400$$

So,

20 women do this work in $\frac{400}{20} = 20$ days

S134. Ans. (a)

Sol.

Let total distance = 100 unit

According to the question

$$\frac{100 \text{ unit}}{\frac{30 \text{ unit}}{90} + \frac{45 \text{ unit}}{135} + \frac{25 \text{ unit}}{75}} = \frac{100}{\frac{1}{3} + \frac{1}{3} + \frac{1}{3}} = 100 \text{ km/h}$$

S135. Ans. (b)

Sol.

$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2} \times 6 \times 15 \\ &= 45 \text{ cm}^2 \end{aligned}$$

S136. Ans. (b)

Sol.

Let the SP of an item be Rs. 100.

Total SP of 24 items = $24 \times 100 = \text{Rs. } 2400$

Gain = $4 \times 100 = \text{Rs. } 400$

Cost Price of 24 items = $2400 - 400 = \text{Rs. } 2000$

Gain percentage = $\frac{400}{2000} \times 100 = 20\%$

S137. Ans. (c)

Sol.

Squaring both the sides, we get

$$1 + \frac{x}{529} = \frac{24 \times 24}{23 \times 23}$$

$$529 + x = 576$$

$$x = 576 - 529 = 47$$

S138. Ans. (c)

Sol.

Area of base of cone = πr^2

$$\frac{22}{7} \times r^2 = 616$$

$$r = \sqrt{196} = 14 \text{ cm}$$

TSA of cone = $616 + \frac{22}{7} \times 14 \times 20$

$$\text{TSA of cone} = 616 + 44 \times 20 = 616 + 880 = 1496 \text{ cm}^2$$

S139. Ans. (b)

Sol.

$$\frac{\sin A(\cot A - \operatorname{cosec} A) - \sin A(\cot A + \operatorname{cosec} A) - (\cot A + \operatorname{cosec} A)(\cot A - \operatorname{cosec} A)}{(\cot A + \operatorname{cosec} A)(\cot A - \operatorname{cosec} A)}$$

$$\frac{\sin A \cot A - \sin A \operatorname{cosec} A - \sin A \cot A - \sin A \operatorname{cosec} A - \cot^2 A + \operatorname{cosec}^2 A}{\cot^2 A - \operatorname{cosec}^2 A}$$

$$\frac{-2 \sin A \operatorname{cosec} A - \cot^2 A + \operatorname{cosec}^2 A}{-(\operatorname{cosec}^2 A - \cot^2 A)}$$

using the identity,

$$1 + \cot^2 A = \operatorname{cosec}^2 A$$

we get,

$$\cot^2 A - \operatorname{cosec}^2 A + 2 \sin A \operatorname{cosec} A$$

$$2 \sin A \times \frac{1}{\sin A} - 1 = 2 - 1 = 1$$

S140. Ans. (d)

Sol.

Percentage of money spent on Basket Ball = 25%

$$\text{Money spent on Basket ball} = \frac{25}{100} \times 12000000 = \text{Rs. } 30,00,000$$

S141. Ans. (c)

Sol.

Increase in year 1996 is maximum i.e.,

$$= 24.23 - 10.22 = 14.01$$

$$= \text{percentage increase} = \frac{14.01}{10.22} \times 100 = 137.08\%$$

S142. Ans. (d)

Sol.

$$\frac{\text{Speed of A}}{\text{Speed of B}} = \frac{\text{time taken by B}}{\text{Time taken by A}}$$

$$\frac{60}{\text{Speed of B}} = \frac{100}{81}$$

$$\frac{\text{Speed of B}}{60} = \frac{10}{9}$$

$$\text{Speed of B} = 54 \text{ km/hr}$$

S143. Ans. (b)

Sol.

$$\frac{\text{Cost Price}}{\text{Marked Price}} = \frac{(100 - \text{discount})}{100 + \text{profit}}$$

$$\frac{1400}{\text{Marked Price}} = \frac{87.5}{120}$$

$$\text{Marked Price} = 1920$$

S144. Ans. (a)

Sol.

A.T.Q we have,

$$\sin^2\theta = \cos^3\theta$$

by squaring both sides,

$$\sin^4\theta = \cos^6\theta \dots\dots\dots (1)$$

Now,

$$\cot^2\theta - \cot^6\theta = \cot^2\theta - \frac{\cos^6\theta}{\sin^6\theta}$$

from equation 1

$$\cot^2\theta - \frac{\sin^4\theta}{\sin^6\theta} = \cot^2\theta - \operatorname{cosec}^2\theta = -1$$

S145. Ans. (d)

Sol.

In the given triangle,

Triangle ABC is similar to triangle ADE

So,

$$\frac{AD}{AB} = \frac{DE}{BC}$$

Let the length of AB = x units

$$\frac{AB+BD}{AB} = \frac{DE}{BC}$$

$$\frac{x+4}{x} = \frac{6}{3}$$

$$x = 4$$

S146. Ans. (a)

Sol.

$$12 - 8 \div 2 - \{16 \text{ of } (-2) + (3 \times 5 - 4)\}$$

$$12 - 4 - \{-32 + 11\}$$

$$12 - 4 + 21 = 29$$

S147. Ans. (b)

Sol.

$$= \sqrt{36 \div 15 \text{ of } 2 \text{ of } [25 \times 4 \div 4 \text{ of } \{29 - (8 - 11) \div (9 \times 5 \div 5 \text{ of } 3)\}]}$$

$$= \sqrt{36 \div 15 \text{ of } 2 \text{ of } [25 \times 4 \div 4 \text{ of } \{29 - (-3) \div (9 \times 5 \div 15)\}]}$$

$$= \sqrt{36 \div 15 \text{ of } 2 \text{ of } [25 \times 4 \div 4 \text{ of } \{29 + 3 \div (3)\}]}$$

$$= \sqrt{36 \div 15 \text{ of } 2 \text{ of } [25 \times 4 \div 4 \text{ of } 30]}$$

$$= \sqrt{36 \div 15 \text{ of } 2 \text{ of } [25 \times 4 \div 120]}$$

$$= \sqrt{36 \div 15 \text{ of } 2 \text{ of } \frac{5}{6}}$$

$$= \sqrt{36 \div 15 \text{ of } \times \frac{5}{3}}$$

$$= \sqrt{36 \div 25}$$

$$= \frac{6}{5}$$

$$= 1\frac{1}{5}$$

S148. Ans. (b)

Sol.

Population in 2006 = 9.5 lakhs

Population in 2007 = 11.4 lakhs

Increase in population from 2006 to 2007 = $11.4 - 9.5 = 1.9$

Percentage increase in population from 2006 to 2007 = $\frac{1.9}{9.5} \times 100 = 20\%$

S149. Ans. (d)

Sol.

Let the principal amount be Rs x.

$$SI = \frac{x \times 16 \times 1}{100} = \frac{4x}{25}$$

$$CI = x\left(1 + \frac{16}{2 \times 100}\right)^2 - x$$

$$= 0.1664x$$

$$= 0.1664x - 0.16x = 60$$

$$x = \frac{60}{0.0064} = \text{Rs. } 9375$$

S150. Ans. (c)

Sol.

A.T.Q

Perpendicular = 1

Hypotenuse = 2

Base = $\sqrt{3}$

$$\tan A + \cos A = \frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{2} = \frac{5}{2\sqrt{3}}$$