

STAFF SELECTION COMMISSION
COMBINED GRADUATE LEVEL (TIER-I)

SOLVED PAPER

(4th June 2019: Shift-1)

Time Allotted: 1 hour

Max marks: 200

General Intelligence and Reasoning

1. In a code language, VICTORY is written as CIVSYSO. How will TRAITOR be written in that language?

1. RTAJORT 2. RATHORT
3. ARTJOTR 4. ARTHROT

2. Select the option in which the given figure is embedded. Rotation not allowed



1. 2. 3. 4.

3. Select the set in which the numbers are related in the same way as are the numbers of the following set. (9, 35, 16)

1. (16, 50, 64) 2. (36, 55, 25) 3. (81, 65, 36) 4. (25, 30, 4)

4. Two statements are given, followed by the conclusion numbered II and III. 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 rulers are machines.

Some machines are costly items.

Conclusions:

- I. Some rulers are costly items.
II. Some costly items are machines.
III. All costly items are machines.
1. Only conclusion I follows.
2. Both conclusions I and II follow.
3. Only conclusion II follows.
4. Both conclusions II and III follow.

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

1. GHIJ 2. CFIL 3. MOQS 4. PSUX

6. Select the number-pair in which the two numbers are related in the same way as are the two numbers of the following.

1. 21 : 51 2. 27 : 63 3. 45 : 95 4. 57 : 135

7. In a family of eight persons, there are two couples, each having two children. B and D are brothers and each has two children. E is the aunt of A, who is the cousin brother of C. C is the sister of H, who is the cousin brother of G. F is the wife of B. How is H related to F?

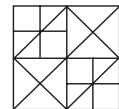
1. Son 2. Son-in-law 3. Nephew 4. Brother

8. Select the word-pair in which the two words are related in the same way as are the two words in the following word-pair:

Book : Thesaurus

1. Tennis : Ball 2. Reptile : Python
3. Furniture : Wood 4. Tree : Forest

- Q.9. How many squares are there in the following figure?



1. 14 2. 13
3. 12 4. 16

10. 'Lawyer' is related to 'Justice' in the same way as 'Arbitrator' is related to '_____'.
1. Judgment 2. Communication
3. Injustice 4. Settlement

11. Select the set in which the numbers are related in the same way as are the numbers of the following set. (3, 24, 4)

1. (2, 30, 8) 2. (12, 84, 4) 3. (4, 72, 9) 4. (6, 35, 11)

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



1. 2. 3. 4.

13. Select the Venn diagram that best illustrates the relationship between the following classes. Uncle, Relatives, Rich

1. 2. 3. 4.

14. Arrange the following words in a logical and meaningful order.

1. Buy 2. Dinner 3. Market 4. Vegetables
5. Cook

1. 4, 5, 3, 1, 2 2. 3, 5, 4, 1, 2 3. 1, 4, 5, 3, 2 4. 3, 4, 1, 5, 2

15. Select the combination of letter that, when sequentially placed in the gaps of the given letter series, will complete the series.

b _bab _bc _abbb _ba _b

1. cbabc 2. cbbcb 3. bcbab 4. cbbac

16. Select the option that is related to the third letter-cluster in the same way as the second letter is related to the first letter-cluster.

CEGI : AGEK : DFHJ : ?

1. BHFL 2. CHFI 3. BDJK 4. CGIK

17. ₹ 1,875 is divided among A, B and C in such a way that A's share is half of the combined share of B and C, and B's share is one-fourth of the combined share of A and C. By what amount is C's share more than that of A?

1. ₹ 200 2. ₹ 250 3. ₹ 225 4. ₹ 500

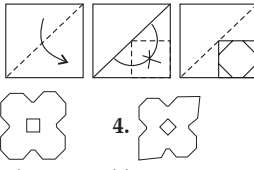




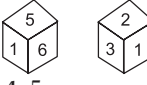
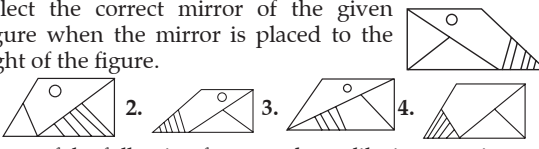
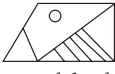
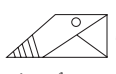
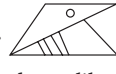

18. Which two signs should be interchanged in the following equation to make it correct?

$$12 - 8 + 12 \times 9 \div 3 = 9$$

1. + and - 2. + and ÷ 3. - and ÷ 4. + and ×

19. If DIG is coded as 25 and CUT is coded as 49, then how will KICK be coded as?

1. 43 2. 34 3. 39 4. 41

20. A paper is folded and cut as shown below. How will it appear when unfolded?
- 
1.  2.  3.  4. 
21. Three of the following four numbers are alike in a certain way and one is different. Pick the number that is different from the rest.
1. 126 2. 217 3. 189 4. 254
22. Two different positions of the same dice are shown. Which number will be at the top if 6 is at the bottom?
- 
1. 2 2. 4 3. 3 4. 5
23. Which number will replace the question mark (?) in the following series?
3, 7, 16, 35, ?, 153
1. 63 2. 78 3. 84 4. 74
24. Select the correct mirror of the given figure when the mirror is placed to the right of the figure.
- 
1.  2.  3.  4. 
25. Three of the following four word are alike in a certain way and one is different. Pick the odd word out.
1. Groundnut 2. Cumin 3. Fennel 4. Mustard

General Awareness

26. 'Thoda' a sport dance belongs to which of the following states?
1. Sikkim 2. Haryana
3. Himachal Pradesh 4. Andhra Pradesh
27. Which country was the first to implement Goods and Services Tax (GST)?
1. France 2. Germany 3. Canada 4. USA
28. According to The Economist Intelligence Unit report 'Worldwide Cost of Living Survey 2019', which of the following is NOT one of the three cheapest cities in India?
1. Mumbai 2. Bengaluru 3. New Delhi 4. Chennai
29. The Tata Iron and Steel company (TISCO) was established by Dorabji Tata in:
1. 1911 2. 1907 3. 1913 4. 1919
30. Who was the first female Director General of Police in Puducherry?
1. Kiran Bedi 2. Kanchan Choudhary
3. Sundari Nanda 4. Aswathy Tonge
31. Which gas in its solid state is also known as dry ice?
1. Carbon dioxide 2. Hydrogen
3. Nitrogen 4. Oxygen
32. The Malimath Committee Report deals with:
1. judicial delays 2. stock market reforms
3. textile sector reforms
4. criminal justice system reforms
33. The Indian National Association was established in 1876 by _____ in Calcutta.
1. V.K. Chiplunkar 2. Anand Mohan Bose
3. Sisir Kumar Ghosh 4. Badruddin Tyabji
34. Which of the following places was ruled by the Wadiyar dynasty?
1. Guwahati 2. Patna 3. Jabalpur 4. Mysore
35. Which of the following elements is a metalloid?
1. Silicon 2. Bismuth 3. Tin 4. Phosphorus
36. Methyl propane is an isomer of:
1. *n*-pentane 2. *n*-butane 3. *n*-propane 4. *n*-hexane
37. Name the first ever judge of the Supreme Court against whom the motion of impeachment was introduced into Parliament in Independent India.
1. Justice Mahajan 2. Justice Subba Rao
3. Justice Viraswami 4. Justice Ramaswami
38. Sundari, a well known species of trees, is found in:
1. tropical deciduous forests 2. mangrove forests
3. Himalayan mountains 4. tropical rainforests
39. Which of the following is mined in the Badampahar mines of Odisha?
1. Bauxite 2. Dolomite 3. Azurite 4. Hematite
40. Which queen died fighting Mughal armies while defending Garha Katanga in 1564?
1. Rani Durgavati 2. Rani Ahilyabai
3. Rani Rudrambara 4. Rani Avantibai
41. Who attacked and looted the famous Somnath temple in 1026 AD?
1. Mahmud of Ghazni 2. Muhammad Ghori
3. Nadir Shah 4. Genghis Khan
42. The property of catenation is predominant in _____.
1. silicon 2. nitrogen 3. sulphur 4. carbon
43. Which dance is performed by Buddhists to ward off evil spirits, is a dance form of Himachal Pradesh?
1. Chham 2. Natya 3. Dham 4. Gogra
44. The Musi and Bhima are tributaries of the river?
1. Mahanadi 2. Krishna 3. Kaveri 4. Brahmaputra
45. J. J. Thomson received the Nobel Prize in Physics for the discovery of?
1. protons 2. electrons 3. neutrons 4. positrons
46. _____ is the founder of Facebook.
1. Mark Zuckerberg 2. Brian Acton
3. Jimmy Wales 4. Larry Page
47. In March 2019, was sworn in as the new chief minister of Goa, following the demise of Manohar Parrikar?
1. VasundharaRaje 2. H.D. Kumaraswamy
3. Ashok Gehlot 4. PramodSawant
48. The Olympic Council of Asia (OCA) has decided to reintroduce in the 2022 Asian Games to be held at Hangzhou, China after it was dropped in 2018?
1. fencing 2. cricket 3. soccer 4. volleyball
49. The _____ edition of the India-Indonesia coordinated patrol (IND-INDO CORPAT) held from 19 March to 4th April 2019 was inaugurated at Port Blair, Andaman and Nicobar Islands.
1. 23rd 2. 45th 3. 33rd 4. 42nd
50. The lone gold medal for India was won by _____ at the 38th GeeBee Boxing Tournament held at Helsinki, Finland.
1. Naveen Kumar 2. Kavinder Singh Bisht
3. Shiva Thapa 4. Mohammed Hussamuddin

Quantitative Aptitude

51. A truck covers a distance of 384 km at a certain speed. If the speed is decreased by 16 km/h. it will take 2 hours more to cover the same distance. 75% of its original speed (in km/h) is:
1. 45 2. 54 3. 48 4. 42
52. If decreasing 120 by $x\%$ gives the same result as increasing 40 by $x\%$, then $x\%$ of 210 is what per cent less than $(x+20)\%$ of 180?
1. $16\frac{2}{3}$ 2. $33\frac{1}{3}$ 3. 20 4. 18
53. A solid cube of volume $13,824 \text{ cm}^3$ is cut into 8 cubes of equal volumes. The ratio of the surface area of the original cube to the sum of the surface areas of three of the smaller cubes is:
1. 2 : 1 2. 4 : 2 3. 2 : 3 4. 8 : 3
54. The ratio of the efficiencies of A, B and C is 2 : 5 : 3. Working together, they can complete a work in 27 days, B and C together can complete $\frac{4}{9}$ th part of that work in:
1. 15 days 2. $17\frac{1}{7}$ days 3. 27 days 4. 24 days

55. If $x^4 + x^{-4} = 194$, $x > 0$, then the value of $(x - 2)^2$ is:
 1. 1 2. 6 3. 2 4. 3
56. If $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ and $xz = y^2$, three the different between z and x is:
 1. 5 2. 3 3. 6 4. 4
57. The table shows the production of different types of cars (in thousands).

Cars \ Years	2012	2013	2014	2015	2016
A	30	35	48	45	56
B	42	48	40	38	56
C	48	36	38	35	44
D	51	24	30	46	54
E	20	42	40	35	43

What is the ratio of the total production of cars of type A in 2014 and type C in 2013 taken together to the total production of cars of type B in 2016 and type E in 2015 taken together?

1. 11 : 12 2. 12 : 13 3. 12 : 11 4. 10 : 11
58. In $\triangle ABC$, F and E are the points on sides AB and AC, respectively, such that $FE \parallel BC$ and FE divides the triangle in two parts of equal area. If $AD \perp BC$ and AD intersects FE at G, then $GD : AG = ?$
 1. $(\sqrt{2} + 1) : 1$ 2. $2\sqrt{2} : 1$ 3. $(\sqrt{2} - 1) : 1$ 4. $\sqrt{2} : 1$
59. If $(5\sqrt{5}x^3 - 81\sqrt{3}y^3) \div (\sqrt{5}x - 3\sqrt{3}y) = (Ax^2 + By^2 + Cxy)$, then the value of $(6A + B - \sqrt{15}C)$ is:
 1. 10 2. 9 3. 15 4. 12
60. If $4 - 2 \sin^2 \theta - 5 \cos \theta = 0$, $0^\circ < \theta < 90^\circ$, then the value of $\sin \theta + \tan \theta$ is:
 1. $3\sqrt{2}$ 2. $2\sqrt{3}$ 3. $\frac{3\sqrt{2}}{2}$ 4. $\frac{3\sqrt{3}}{2}$
61. The table shows the production of different types of cars (in thousands).

Cars \ Years	2012	2013	2014	2015	2016
A	30	35	48	45	56
B	42	48	40	38	56
C	48	36	38	35	44
D	51	24	30	46	54
E	20	42	40	35	43

The number of years, in which the production of cars of type B is less than the average production of type D cars over the years, is:

1. 4 2. 3 3. 2 4. 1
62. In a $\triangle ABC$, the bisectors of $\angle B$ and $\angle C$ meet at point O, inside the triangle. If $\angle BOC = 122^\circ$, then the measure of $\angle A$ is:
 1. 68° 2. 72° 3. 64° 4. 62°
63. The table shows the production of different types of cars (in thousands).

Cars \ Years	2012	2013	2014	2015	2016
A	30	35	48	45	56
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C	48	36	38	35	44
D	51	24	30	46	54
E	20	42	40	35	43

If the data related to the production of cars of type E is represented by a pie chart, then the central angle of the sector representing the date of production of cars in 2013 will be:

1. 80° 2. 70° 3. 102° 4. 84°
64. The ratio of the ages of A and B four years ago was 4 : 5. Eight years from now, the ratio of the ages of A and B will be 11 : 13. What is the sum of their present ages?
 1. 72 years 2. 80 years 3. 96 years 4. 76 years

65. The table shows the production of different types of cars (in thousands).

Cars \ Years	2012	2013	2014	2015	2016
A	30	35	48	45	56
B	42	48	40	38	56
C	48	36	38	35	44
D	51	24	30	46	54
E	20	42	40	35	43

The total production of type B cars in 2012, 2014 and 2015 taken together is approximately what per cent more than the total production of type A cars in 2013 and 2016 taken together?

1. 34.4 2. 33.2 3. 31.9 4. 36.3
66. In a circle of radius 10 cm, with centre O. PQ and PR are two chords each of length 12 cm PO intersects chord QR at the points S. The length of OS is:
 1. 2.8 cm 2. 2.5 cm 3. 3.2 cm 4. 3 cm

67. If $\sin \theta = \frac{p^2 - 1}{p^2 + 1}$, then $\cos \theta$ is equal to:
 1. $\frac{2p}{p^2 - 1}$ 2. $\frac{p}{p^2 - 1}$ 3. $\frac{p}{1 + p^2}$ 4. $\frac{2p}{1 + p^2}$

68. $\frac{2 + \tan^2 \theta + \cot^2 \theta}{\sec \theta \operatorname{cosec} \theta}$ is equal to:
 1. $\cos \theta \sin \theta$ 2. $\sec \theta \operatorname{cosec} \theta$
 3. $\cot \theta$ 4. $\tan \theta$

69. After giving two successive discounts, each of $x\%$, on the marked price of an article, total discount is ₹ 259.20. If the marked price of the article is ₹ 720, then the value of x is:
 1. 25 2. 24 3. 18 4. 20

70. A circle is inscribed in a triangle ABC. It touches the sides AB, BC and AC at the point R, P and Q, respectively. If $AQ = 4.5$ cm, $PC = 5.5$ cm and $BR = 6$ cm, then the perimeter of the triangle ABC is:
 1. 28 cm 2. 30.5 cm 3. 32 cm 4. 26.5 cm

71. The value of $2 \times 3 \div 2$ of $3 \times 2 \div (4 + 4 \times 4 \div 4$ of $4 - 4 \div 4 \times 4)$ is:
 1. 2 2. 1 3. 4 4. 8

72. A person sold an article at a loss of 15%. Had he sold it for ₹ 30.60 more, he would have gained 9%. To gain 10%, he should have sold it for:
 1. ₹ 132 2. ₹ 140.25 3. ₹ 128.4 4. ₹ 130

73. The average of twelve numbers is 42. The average of the last five numbers is 40, and that of the first four numbers is 44. The 6th number is 6 less than the fifth and 5 less than the 7th number. The average of the 5th and the 7th number is:
 1. 44 2. 43.5 3. 43 4. 44.5

74. If a nine-digit number $985x3678y$ is divisible by 72, then the value of $(4x - 3y)$ is:
 1. 6 2. 4 3. 3 4. 5

75. A sum amounts to ₹ 8,028 in 3 years and to ₹ 12,042 in 6 years at a certain rate per cent per annum, when the interest is compounded yearly. The sum is:
 1. ₹ 5,352 2. ₹ 5,253 3. ₹ 5,235 4. ₹ 5,325

English Comprehension

76. Select the synonym of the given word.
 Coerce
 1. cajole 2. pressurise 3. enchant 4. leave
77. Given below are four jumbled sentences. Select the option that gives their correct order.
 A. An environmental group performed a necropsy on the animal and found about 40 kilograms of plastic, including grocery bags and rice sacks.

- B. A 4.7-metre long whale died on Saturday in Phillipines where it was stranded a day earlier.
- C. "It's very disgusting and heartbreaking," he said. "We've done necropsies on 61 dolphins and whales in the last 10 years and this is one of the biggest amounts of plastic we've seen."
- D. "The animal died from starvation and was unable to eat because of the trash filling its stomach," said Darrell Blatchley, Director of D' Bone Collector Museum Inc.
1. BACD 2. ABCD 3. DABC 4. BADC
78. Select the most appropriate option to substitute the underlined segment in the given sentence. If no substitution is required, select No improvement.
If you park your car here, the traffic police has fined you.
1. fine you 2. will fine you
3. fined you 4. No improvement
79. Select the most appropriate meaning of the given idiom.
At daggers drawn
1. deceiving somebody 2. bitterly hostile
3. without hope 4. friendly with each other
80. Select the most appropriate word to fill in the blank.
Around sixty bands in colourful _____ took part in the Notting Hill Carnival.
1. clothings 2. apparels 3. costumes 4. dressing
81. Select the antonym of the given word.
Scarce
1. plentiful 2. few 3. seldom 4. scanty.
82. Select the correct active form of the given sentence.
Every passing vehicle was being thoroughly checked by the guards.
1. The guards have thoroughly checked every passing vehicle
2. Every passing vehicle were thoroughly checking the guards.
3. The guards were thoroughly checking every passing vehicle.
4. The guards have been thoroughly checking every passing vehicle.
83. In the sentence, identify the segment which contains the grammatical error.
We had to decline several orders in case that the production was held up due to labour strike.
1. the production was held up
2. due to labour strike
3. we had to decline
4. in case that
84. Select the word which means the same as the group of words given.
A student who idly or without excuse absents himself/herself from school
1. vagrant 2. truant 3. itinerant 4. migrant
85. Select the wrongly spelt word.
1. expire 2. explicit 3. explode 4. exploite
86. Select the wrongly spelt word.
1. career 2. callous 3. calander 4. carriage
87. Select the word which means the same as the group of words given.
A person, animal or plant much below the usual height
1. witch 2. dwarf 3. wizard 4. creature
88. Given below are four jumbled sentences. Select the option that gives their correct order.
- A. The cafe's owner says he's interested in conservation, and hopes customers will realise the animals are worth saving, even though they often have a bad reputation.
B. None of them are venomous, meaning customers can get up close and personal with the reptiles.
C. Here, you sip your drink in the company of 35 snakes.
D. This cafe, which has just opened in Tokyo, is not for the faint-hearted.
1. DCBA 2. ABDC 3. DBCA 4. ABCD
89. In the sentence, identify the segment which contains the grammatical error.
Cyclone Idai killed at least 157 people in Zimbabwe and Mozambique although it tore across Southern Africa.
1. although 2. at least 157 people
3. Cyclone Idai killed 4. it tore across
90. Select the most appropriate option to substitute the underlined segment in the given sentence. If no substitution is required, select No improvement.
The workers of this textile factory demand higher wages for a long time.
1. demanded higher wages
2. has demanded higher wages
3. No improvement
4. have been demanding higher wages
- ### Comprehension
- In the following passage, some words have been deleted. Fill in the blanks with the help of the alternatives given. Select the most appropriate option for each blank.
- Seoul's city government is asking people for help to correct poorly translated street signs with prizes on offer for (1) _____ who spot the most errors. It's running (2) _____ two-week campaign calling on Koreans and foreigners (3) _____ to keep their eyes peeled for (4) _____ in English, Japanese and Chinese text, the Korea Times reports. There's a (5) _____ focus on public transport signs, maps and information signs at historic sites, as part of a drive to improve the experience of foreign tourists in the South Korean capital.
91. Select the most appropriate option to fill in blank number 1.
1. that 2. these 3. this 4. those
92. Select the most appropriate option to fill in blank number 2.
1. the 2. one 3. an 4. a
93. Select the most appropriate option to fill in blank number 3.
1. likely 2. alike 3. similarly 4. same
94. Select the most appropriate option to fill in blank number 4.
1. mistakes 2. blunder 3. oversight 4. guffaws
95. Select the most appropriate option to fill in blank number 5.
1. signifying 2. particular 3. meticulous 4. important
96. Select the synonym of the given word.
Chronic
1. common 2. persistent 3. temporary 4. ordinary
97. Select the correct passive form of the given sentence.
Do not buy medicines without the doctor's prescription.
1. Medicines should not be bought without the doctor's prescription.
2. Medicines need not be bought without the doctor's prescription.
3. Medicines might not be bought without the doctor's prescription.
4. Medicines could not be bought without the doctor's prescription.
98. Select the most appropriate word to fill in the blank.
His company has the _____ of producing the best cricket balls in the country.
1. brand 2. position 3. reputation 4. opinion
99. Select the most appropriate meaning of the given idiom.
To play ducks and drakes
1. to use recklessly 2. to act cleverly
3. to change places 4. to be friendly
100. Select the antonym of the given word.
Expansion
1. augmentation 2. extension
3. compression 4. inflation

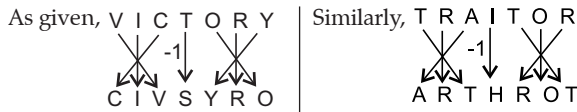
Answer Key

1. (4)	2. (4)	3. (2)	4. (3)	5. (4)	6. (2)	7. (3)	8. (2)	9. (2)	10. (4)	11. (3)	12. (4)	13. (2)	14. (4)	15. (2)
16. (1)	17. (2)	18. (2)	19. (3)	20. (1)	21. (4)	22. (2)	23. (4)	24. (2)	25. (1)	26. (3)	27. (1)	28. (2)	29. (2)	30. (3)
31. (1)	32. (4)	33. (2)	34. (4)	35. (1)	36. (2)	37. (4)	38. (2)	39. (4)	40. (1)	41. (1)	42. (4)	43. (1)	44. (4)	45. (2)
46. (1)	47. (4)	48. (2)	49. (3)	50. (2)	51. (1)	52. (1)	53. (2)	54. (1)	55. (4)	56. (1)	57. (2)	58. (3)	59. (4)	60. (4)
61. (3)	62. (3)	63. (4)	64. (2)	65. (3)	66. (3)	67. (4)	68. (2)	69. (4)	70. (3)	71. (1)	72. (2)	73. (4)	74. (2)	75. (1)
76. (2)	77. (4)	78. (2)	79. (2)	80. (3)	81. (1)	82. (3)	83. (4)	84. (2)	85. (4)	86. (3)	87. (2)	88. (1)	89. (1)	90. (4)
91. (4)	92. (4)	93. (2)	94. (1)	95. (2)	96. (2)	97. (1)	98. (3)	99. (3)	100. (2)					

Answers with Explanations

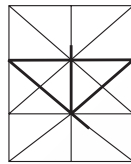
General Intelligence and Reasoning

1. **Option (4) is correct.**



2. **Option (4) is correct.**

It is clearly shown that the given figure is embedded in option (4).



3. **Option (2) is correct.**

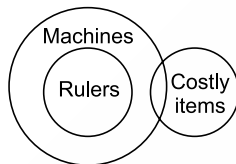
As, given set is 9, 35, 16

Here, 9 is the square of 3 and 16 is the square of 4, so $(3 + 4) \times 5 = 7 \times 5 = 35$ (middle term)

Similarly, in set of option (2) 36, 55, 25, 36 is a square of 6 and 25 is a square of 5, so $(6 + 5) \times 5 = 11 \times 5 = 55$ (middle term).

4. **Option (3) is correct.**

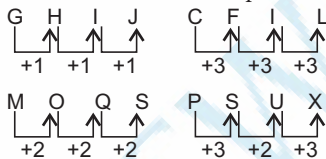
The Venn diagram is as follows:



So, only conclusion II follows that some costly items are machines.

5. **Option (4) is correct.**

Except, option (4) all other option follows similar pattern but PSUX doesn't follow the same pattern.

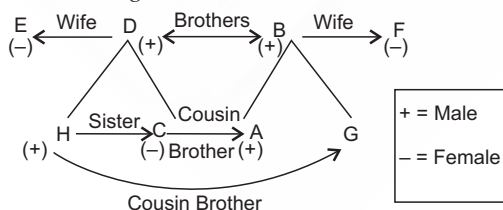


6. **Option (2) is correct.**

As, 36 : 84
 $12 \times 3 = 36, 12 \times 7 = 84$
 Similarly, 27 : 63
 $9 \times 3 = 27, 9 \times 7 = 63$

7. **Option (3) is correct.**

The blood diagram is as shown below:



From the above diagram, it is clearly shown that H is the nephew of F.

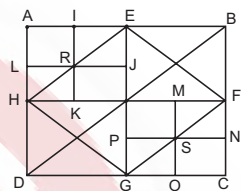
8. **Option (2) is correct.**

As we know that book can be of multiple types and thesaurus is one of them. So, thesaurus is a book. Similarly, reptile can be of multiple types and python is one of them. So, python is a reptile.

9. **Option (2) is correct.**

The given figure is labelled as:

- ABCD, EFGH, AEQH,
- AIRL, LRKH, KQJR, EJRI,
- QMSP, PSOG, SOCN,
- SNFM, MFNS, HQGD,
- EBFQ



So, there are 14 squares in the given figure.

10. **Option (4) is correct.**

As we know that a lawyer is a person who is appointed to get justice. Similarly, an arbitrator is a person who is appointed for settlement.

11. **Option (3) is correct.**

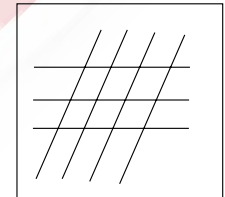
As the pattern in the given number set is that the middle number is obtained from the multiple of 1st and 3rd number and is multiplied by 2.

Given, 3, 24, 4, $3 \times 4 = 12 \times 2 = 24$

Similarly, 4, 9 = $36 \times 2 = 72$

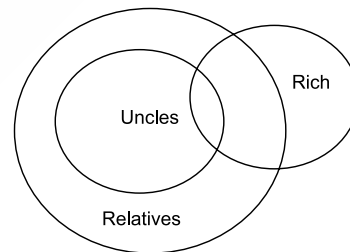
12. **Option (4) is correct.**

In the 1st figure, one horizontal line intersects two vertical lines and the 2nd figure shows its mirror image. Similarly, in the 3rd figure, two horizontal lines intersects three vertical lines and the 4th figure shows its mirror image. Therefore, according to the above pattern, the next figure is represented as:



13. **Option (2) is correct.**

According to the options, the Venn diagram of option (2) satisfies the given condition which is Uncle, Relatives, Rich.



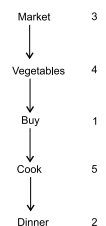
Here, we can see that some relatives are uncles, and all uncles are relatives and some of the relatives as well as uncles are rich.

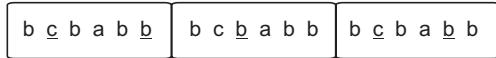
14. **Option (4) is correct.**

The logical and meaningful order of the given words would be:

15. **Option (2) is correct.**

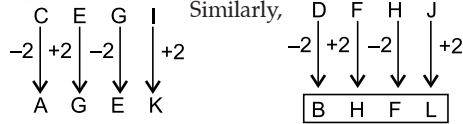
The pattern of the series is as follows:





So, option (2) fits in the series.

16. Option (1) is correct.



17. Option (2) is correct.

According to the question:

Share of A = Half of combined share of B and C

$$\text{i.e., } A = \frac{1}{2} (B+C)$$

$$2A = B+C$$

Now, add A on both the sides, $2A + A = A + B + C$

$$3A = A + B + C$$

$$3A = 1,875$$

$$A = 625$$

Share of B = $\frac{1}{4}$ th of combined share of A and C

$$\text{i.e., } B = \frac{1}{4} (A + C)$$

$$4B = A + C$$

Now, add B on both the sides,

$$4B + B = A + B + C$$

$$5B = A + B + C$$

$$5B = 1,875$$

$$B = 375$$

Now, $A + B + C = 1,875$

$$625 + 375 + C = 1,875$$

$$1,000 + C = 1,875$$

$$C = 1,875 - 1,000$$

$$C = 875$$

Therefore, $C - A = 875 - 625 = 250$

So, C's share is more than A's share by 250.

18. Option (2) is correct.

From option (2), $12 - 8 + 12 \times 9 \div 3 = 9$

We interchanged the signs + and \div ,

$$12 - 8 \div 12 \times 9 + 3 = 9$$

Now, from the BODMAS rule, we solve the equation,

$$12 - \frac{8}{12} \times 9 + 3 = 9$$

$$12 - 2 \times 3 + 3 = 9$$

$$12 - 6 + 3 = 9$$

$$15 - 6 = 9$$

$$9 = 9$$

19. Option (3) is correct.

As, $A \rightarrow 1, B \rightarrow 2, C \rightarrow 3, D \rightarrow 4$ so, on....

As,

D	I	G	
↓	↓	↓	
4	+ 9	+ 7	= 25

(According to the Alphabetical numbers)

and

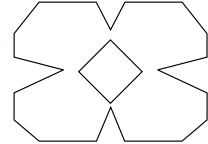
C	U	T	
↓	↓	↓	
3	+ 21	+ 20	= 49

Similarly,

K	I	C	K	
↓	↓	↓	↓	
11	+ 9	+ 3	+ 11	= 39

20. Option (1) is correct.

The paper is unfolded in two steps and after unfolding, it has to be symmetrical. Here, only option (1) satisfies this condition.



21. Option (4) is correct.

It is clearly shown that all options are divisible by 7 except option (4), i.e., 254. Hence, 254 is the different number.

22. Option (2) is correct.

As we know that dice/cube is moved in clockwise direction. So, after moving in clockwise direction dice/cube in figure 1 is 1-5-6 and dice/cube in figure 2 is 1-3-2. Therefore, it is clearly shown that number 2 will be at the top.

23. Option (4) is correct.

The series is 3, 7, 16, 35, ?, 153 and the pattern of the series is as follows:

$$3 \times 2 = 6, 6 + 1 = 7$$

$$7 \times 2 = 14, 14 + 2 = 16$$

$$16 \times 2 = 32, 32 + 3 = 35$$

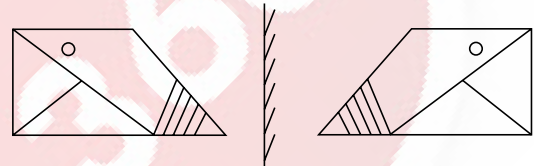
$$35 \times 2 = 70, 70 + 4 = 74$$

$$74 \times 2 = 148, 148 + 5 = 153$$

24. Option (2) is correct.

In the mirror image, left becomes right and right becomes left.

It is clearly shown that option (2) is the mirror image of the given image, and it is represented as follows:



25. Option (1) is correct.

According to the options, we know that mustard, cumin, and fennel are spices which are used in kitchen while making vegetables (cooking). So, groundnut is the different one.

General Awareness

26. Option (3) is correct.

Thoda is a mixture of martial art, sport and cultural fusion that have its roots in Himachal Pradesh. It happens each year during the Baisakhi festival in April. To enlist the assistance of the major deities, Goddesses Mashoo and Durga, certain prayers are given. The ability to shoot an arrow is the foundation of martial art. Thoda can be traced back to the Mahabharata when epic conflicts in the Kullu and Manali regions involved bows and arrows.

27. Option (1) is correct.

The Goods and Services Tax (GST) was first implemented globally in France. The GST has been introduced in more than 140 nations throughout the world. The majority of products and services sold for domestic consumption are subject to the Goods and Services Tax (GST), which is a value-added tax. Consumers pay the GST, but businesses that sell the products and services are responsible for remitting it to the government. The Constitution (122nd Amendment) Bill, India's equivalent of the GST Bill, was first introduced in 2014. This was approved in 2016 and given the new title of The Constitution (101st Amendment) Act, 2016, by the Rajya Sabha.

28. Option (2) is correct.

The Economist Intelligence Unit (EIU) is the world wide research and analysis division of the Economist Group

provides report of the Worldwide Cost of Living of different important cities of the world based on survey. According to EIU report 2019, Mumbai ranked at 127 on the global list of the most expensive cities in the world.

29. Option (2) is correct.

Jamsetji Nusserwanji Tata and Sir Dorabji Tata formed the Tata Iron & Steel Company (TISCO) on August 26, 1907. As a division of Jamsetji's Tata Group, TISCO began producing pig iron in 1911 and steel in 1912. On February 16th, 1912, a steel ingot was produced for the first time.

30. Option (3) is correct.

S. Sundari Nanda, an officer in the Indian Police Service from the 1988 AGMU cadre who holds the rank of ADGP, has been appointed as the Union Territory of Puducherry's first female Director General of Police (DGP). Instead of Ms. Nanda, DGP Sunil Kumar Gautam has been moved from Puducherry to the Government of the National Capital Territory of Delhi (NCTD). As the Lt. Governor of the Union Territory, Kiran Bedi is the first female IPS officer in the nation.

31. Option (1) is correct.

The solid form of carbon dioxide is called dry ice. Since CO₂ does not have a liquid state at normal atmospheric pressure and instead sublimates immediately from the solid state to the gas state, it is frequently used for short-term refrigeration. In addition to being utilised in fog machines in theatres for dramatic effects, it is largely used as a cooling agent. Its benefits include being colder than water ice and leaving no trace behind (other than incidental frost from moisture in the atmosphere). It is helpful for keeping frozen items (like ice cream) from spoiling in situations where mechanical chilling is not possible.

32. Option (4) is correct.

Justice V.S. Malimath, a former Chief Justice of the Karnataka and Kerala High Courts, served as the chairman of the Malimath Committee Report, which was established by the Ministry of Home Affairs. It was established to advise on whether confessions made to a police officer should be allowed to be used as evidence in a court of law. Reconsidering the foundational ideas of criminal law in order to regain public trust in the criminal justice system.

33. Option (2) is correct.

Surendranath Banerjee and Ananda Mohan Bose established the Indian Association, the first openly nationalist group, in British India in 1876. "Promoting by all lawful methods the political, intellectual, and material advancement of the people" was one of this association's stated goals. The Association attracted well-educated Indians and civic leaders from all over the nation and developed into a crucial forum for India's independence ambitions. With the Indian National Congress, it later merged.

34. Option (4) is correct.

The Wadiyar dynasty, commonly known as the Wadiyars of Mysore, was a late-medieval/early-modern South Indian Hindu royal line made up of past kings of Mysore from the Urs clan who were initially based in Mysore city. The name was formerly spelt Wodeyer or Odeyer. The Wadiyars ruled the Kingdom of Mysore as the Maharajas of Mysore from the late 1300s till 1950. Additionally, members of the Wadiyar and Urs clans had served as Diwans to their reigning cousins, nephews, or other distant relatives. Some members had served as the commander-in-chief (dalvoy) of army divisions under their ruling king.

35. Option (1) is correct.

A chemical element that forms a simple material with properties that fall somewhere between those of a conventional metal and a typical nonmetal is referred to as a metalloid in chemistry. The name is typically used to describe a collection of six to nine elements, located between the P-block and main block of the periodic table, including

boron, silicon, germanium, arsenic, antimony, tellurium, and potentially bismuth, polonium, and astatine.

36. Option (2) is correct.

Butane has an isomer called methyl propane. The two structural isomers of butane, also known as unbranched butane, or normal butane, and isobutane, or i-butane, have the chemical formula C₄H₁₀. The isomers of methyl propane are known as butane and 2-methyl propane in accordance with IUPAC nomenclature guidelines. Four carbon atoms make up the straight-chain alkane known as butane. It functions as a refrigerant and a food propellant. It is an alkane and a gas molecule.

37. Option (4) is correct.

The first Supreme Court judge in independent India to face removal proceedings was Veeraswami Ramaswami. Soumitra Sen of the Calcutta High Court is another judge facing removal procedures. On August 17, 2011, the Rajya Sabha began its investigation. A second such move was brought against Sikkim High Court Chief Justice Dinakaran, who subsequently tendered his resignation.

38. Option (2) is correct.

Mangroves are salt-tolerant plants that can be found in tropical and subtropical areas with tidal zones. The phrase "mangrove ecosystem" refers to the particular geographic areas where these plants grow. These are incredibly sensitive and fragile but also quite productive. The ecology also supports other trees including Hetal, Dhundal, and Sundari trees in addition to mangroves. The Sundari trees, which give the mangroves their name, are a distinguishing feature of Sunderban, the biggest estuarine forest and delta in the world covered in mangrove forests.

39. Option (4) is correct.

Hematite, an iron ore, is extracted in Odisha's Badampahar mines. The Badampahar mines in the Mayurbhanj and Kendujhar districts of the Odisha-Jharkhand belt are where you may find high-grade hematite ore. Hematite iron ore is mined in the Jharkhand district of Singhbhum, which is nearby, in the towns of Gua and Noamundi. In the renowned Bailadila range of hills in the Bastar district of Chhattisgarh, extremely high-grade hematites are also discovered. The hill range has 14 occurrences of extremely high-grade hematite iron ore. It possesses the ideal physical qualities required for manufacturing steel.

40. Option (1) is correct.

Queen Durgavati died fighting Mughal armies while defending Garha Katanga in 1564. She was the ruling Queen of Gondwana from 1550 until 1564. She killed herself in the battlefield on June 24, 1564 and the young prince Vir Narayan died in action during the Siege of Chouragarh.

41. Option (1) is correct.

The Somnath Mandir in Prabhas Patan, Saurashtra, on the western coast of Gujarat was attacked and robbed in 1025 AD by Mahmud of Ghazni. Prabhas Patan is close to Veraval. Afghanistan was ruled by Mahmud of Ghazni. Between 1026 and 1042 AD, the Paramara king Bhoja of Malwa and the Solanki king Bhimdev I of Anhilwara reconstructed the looted Somnath Mandir. Between 1000 and 1027 AD, the Turkish conqueror Mahmud of Ghazni launched 17 assaults on India. Mahmud of Ghazni's largest invasion took place in Gujarat's Somnath temple in 1027 AD. He conquered a lot of dynasties during the course of his 17 expeditions.

42. Option (4) is correct.

Carbon exhibits catenation most frequently. Catenation is the process through which atoms can join together to form a lengthy chain. Long chains are created by joining atoms of the same element together. For longer chains and more complex structures, the catenation process, which occurs mostly in carbon, generates covalent connections with additional carbon atoms.

43. Option (1) is correct.

The lively cham dance (Tibetan; Wylie: 'cham) is a masked and costumed dance that is connected to Buddhist festivals and some sects of Tibetan Buddhism. The music for the dance is performed by monks using traditional Tibetan instruments. The dances are believed to bestow merit on anybody who witnesses them and frequently provide moral guidance regarding karu (compassion) for sentient beings.

44. Option (4) is correct.

After the Ganges and the Godavari, the Krishna River is a river in the Deccan plateau and is the third-longest river in India. In terms of water inputs and river basin area, it ranks fourth in India, behind the Ganges, Indus, and Godavari. The river, also known as Krishnaveni, is 1,400 kilometres (870 mi) long, with 282 kilometres of that length located in Maharashtra. In the Indian states of Maharashtra, Karnataka, Telangana, and Andhra Pradesh, it is a significant source of irrigation.

Major distributaries of Krishna river are as given below:

- **Left:** Bhima, Dindi, Halia, Musi, Paleru, Peddavagu, Munnera
- **Right:** Venna, Koyna, Panchganga, Dudhganga, Ghataprabha, Malaprabha

45. Option (2) is correct.

The electron was the first subatomic particle to be identified. Sir Joseph John Thomson OM PRS was a British physicist and Nobel Laureate in Physics who lived from 18 December 1856 to 30 August 1940. Thomson demonstrated in 1897 that the hitherto unidentified negatively charged particles that made up cathode rays (now known as electrons) had bodies far smaller than atoms and a very high charge-to-mass ratio.

46. Option (1) is correct.

The American business Meta Platforms is the owner of the social networking and social media website Facebook. Facebook was founded in 2004 by Mark Zuckerberg and fellow Harvard College classmates and flatmates Eduardo Saverin, Andrew McCollum, Dustin Moskovitz, and Chris Hughes. The name of the company is derived from the face book directories that are frequently sent to students at American universities. Initially open only to Harvard students, membership has now grown to include students from other North American universities and, as of 2006, anybody over the age of 13. Facebook reported 2.93 billion monthly active users as of July 2022 and was the third-most popular website globally at the time. The 2010s' most popular mobile app was that one.

47. Option (4) is correct.

Pramod Sawant, an Indian politician and the 11th and current Chief Minister of Goa, was born on April 24, 1973. Sawant, a Bharatiya Janata Party member, represents the Sanquelim constituency in the Goa Legislative Assembly. He works as an ayurvedic physician full-time.

48. Option (2) is correct.

Following its removal from the Asian Games in 2018, the Olympic Council of Asia (OCA) has decided to reinstate cricket in the 2022 edition, which will be hosted in Hangzhou, China. Cricket has previously featured in the Asian Games of 2014 and 2010. When compared to Bangladesh and Pakistan in 2010, Sri Lanka and Pakistan won the gold medals in the same category at the Asian Games in 2014 for men and women, respectively. Both the 2014 and 2010 Asian Games were skipped by the Indian Team.

49. Option (3) is correct.

In 2019, Port Blair hosted the 33rd iteration of the India-Indonesia Coordinated Patrol (IND-INDO CORPAT). Both nations' ships and aircraft would police their respective sides of the International Maritime Boundary, which is 236 nautical miles long. The 33rd IND-INDO CORPAT coincides with 70 years of diplomatic relations between India and Indonesia.

50. Option (2) is correct.

Kavinder Singh Bisht won the lone gold medal for India at the 38th GeeBee Boxing Tournament held in Helsinki, Finland. He prevailed against Mohammed Hussamuddin in the 56 kg division of the summit clash. In the same competition, Indian boxer Mohammed Hussamuddin took home the bronze medal.

Quantitative Aptitude

51. Option (1) is correct.

Let the usual speed be x km/h

$$\text{Distance} = 384 \text{ km.}$$

$$\text{New speed} = (x - 16) \text{ km/h}$$

$$\text{ATQ } \frac{384}{x-16} - \frac{384}{x} = 2$$

$$\Rightarrow \frac{384(x-x+16)}{x^2-16x} = 2$$

$$\Rightarrow 192 \times 16 = x^2 - 16x$$

$$\Rightarrow x^2 - 16x - 3,072 = 0$$

$$\Rightarrow x^2 - 64x + 48x - 3,072 = 0$$

$$\Rightarrow (x-64)(x+48) = 0$$

$$\Rightarrow x = 64 \text{ or } x = -48 \text{ (not possible)}$$

$$\text{Now, required speed} = 64 \times \frac{75}{100} = 48 \text{ km/h}$$

52. Option (1) is correct.

ATQ

$$\Rightarrow 120 \left(1 - \frac{x}{100}\right) = 40 \left(1 + \frac{x}{100}\right)$$

$$\Rightarrow 3 \left(1 - \frac{x}{100}\right) = 1 + \frac{x}{100}$$

$$\Rightarrow 3 - 1 = \frac{x}{100} + \frac{3x}{100} \Rightarrow 2 = \frac{4x}{100}$$

$$\Rightarrow x = 50$$

$$\text{Now, } 210 \times \frac{50}{100} = 105$$

$$180 \times \frac{x+20}{100} = 180 \times \frac{70}{100} = 126$$

$$\text{Less number} = 126 - 105 = 21$$

$$\text{Less \%} = \frac{21}{126} \times 100 = \frac{50}{3} = 16 \frac{2}{3}$$

53. Option (2) is correct.

Given:

$$\text{Volume of original cube} = 13,824 \text{ cm}^3$$

$$\text{Let the side of cube} = a$$

$$\text{We have, volume of cube} = a^3$$

$$\text{A.T.Q. } a^3 = 13,424$$

$$\Rightarrow a = 24 \text{ cm}$$

$$\text{Now, surface area of original cube} = 6 \times a^2 \\ = 6 \times 24 \times 24 = 3,456 \text{ cm}^2$$

$$\text{Now, Volume of smaller cube} = \frac{13,824}{8} = 1,728 \text{ cm}^3$$

$$\text{A.T.Q. } a^3 = 1,728$$

$$\Rightarrow a = 12 \text{ cm}$$

$$\text{Now, surface area of smaller cube} = 6 \times a^2 \\ = 6 \times 12 \times 12 = 864 \text{ cm}^2$$

$$\text{So, sum of surface area of three smaller cubes} = 3 \times 864 \\ = 2,592$$

$$\text{Required ratio} = 3456 : 2,592 = 4 : 3$$

54. Option (1) is correct.

Work done by A, B and C together in 1 day is

$$2k + 5k + 3k = 10k$$

But A, B and C take a total of 27 days

$$\therefore \text{Total work} = 270k$$

Now, B and C per day work = $5k + 3k = 8k$

They do a $\frac{4}{9}$ th part of that work in

$$= \frac{4}{9} \times \frac{1}{8k} \times 270k = 15 \text{ days}$$

55. Option (4) is correct.

Given that $x^4 + \frac{1}{x^4} = 194$

$$\Rightarrow \left(x^2 + \frac{1}{x^2}\right)^2 - 2 = 194$$

$$\Rightarrow \left(x^2 + \frac{1}{x^2}\right)^2 = 196$$

$$\Rightarrow x^2 + \frac{1}{x^2} = 14$$

$$\Rightarrow \left(x + \frac{1}{x}\right)^2 - 2 = 14$$

$$\Rightarrow \left(x + \frac{1}{x}\right)^2 = 16$$

$$\Rightarrow x + \frac{1}{x} = 4$$

$$\Rightarrow x^2 - 4x + 1 = 0$$

$$\Rightarrow x = \frac{4 \pm \sqrt{16-4}}{2} = \frac{4 \pm 2\sqrt{3}}{2}$$

Take $x = \frac{4+2\sqrt{3}}{2}$

Now,

$$(x-2)^2 = \left(\frac{4+2\sqrt{3}}{2} - 2\right)^2 = \left(\frac{4+2\sqrt{3}-4}{2}\right)^2 = (\sqrt{3})^2 = 3$$

56. Option (1) is correct.

$$\Rightarrow (x + y + z)^2 = 19^2$$

$$\Rightarrow x^2 + y^2 + z^2 + 2(xy + yz + zx) = 361$$

$$\Rightarrow 133 + 2(xy + yz + y^2) = 361$$

$$\Rightarrow 2(xy + yz + y^2) = 361 - 133 = 228$$

$$\Rightarrow y(x + y + z) = 114$$

$$\Rightarrow y \times 19 = 114$$

$$\Rightarrow y = 6$$

so, $x + y + z = 19$

$$\Rightarrow x + z = 19 - 6 = 13$$

$$\Rightarrow xz = y^2 = (6)^2 = 36$$

$$\Rightarrow (z-x)^2 = (x+z)^2 - 4xz$$

$$= (13)^2 - 4 \times 36$$

$$= 169 - 144 = 25$$

$$\Rightarrow z-x = \sqrt{25} = 5$$

57. Option (2) is correct.

Total cars of type A in 2014 and type C in 2013 = $48 + 36 = 84$

Total cars of type B in 2016 and type E in 2015 = $56 + 35 = 91$

$$\text{Ratio} = \frac{84}{91} = \frac{12}{13} = 12 : 13$$

58. Option (3) is correct.

Given that Ar $\Delta AFE = \text{Ar } BCEF$

$$\therefore \text{Ar } \Delta ABC = 2\text{Ar } \Delta AFE \dots (i)$$

$\Delta AFE \sim \Delta ABC$

$$\frac{EF}{BC} = \frac{AG}{AD}$$

From (i)

$$\frac{1}{2} \times BC \times AD = 2 \times \frac{1}{2} \times EF \times AG$$

$$\frac{EF}{BC} \times \frac{AG}{AD} = \frac{1}{2}$$

$$\Rightarrow \left(\frac{AG}{AD}\right)^2 = \frac{1}{2}$$

$$\frac{AG}{AD} = \frac{1}{\sqrt{2}}$$

$$\Rightarrow \frac{AG}{AG + GD} = \frac{1}{\sqrt{2}}$$

$$\frac{GD}{AG} = \sqrt{2} - 1$$

$$\sqrt{2}AG = AG + GD$$

$$\Rightarrow (\sqrt{2} - 1)AG = GD$$

$$\Rightarrow GD : AG = (\sqrt{2} - 1) : 1$$

59. Option (4) is correct.

$$\frac{5\sqrt{5}x^3 - 81\sqrt{3}y^3}{\sqrt{5}x - 3\sqrt{3}y} = \frac{(\sqrt{5}x)^3 - (3\sqrt{3}y)^3}{\sqrt{5}x - 3\sqrt{3}y}$$

$$= \frac{(\sqrt{5}x - 3\sqrt{3}y) \left[(\sqrt{5}x)^2 + (3\sqrt{3}y)^2 + (\sqrt{5}x)(3\sqrt{3}y) \right]}{\sqrt{5}x - 3\sqrt{3}y}$$

$$5x^2 + 27y^2 + 3\sqrt{15}xy = Ax^2 + By^2 + Cxy$$

$$\therefore A = 5, B = 27, C = 3\sqrt{15}$$

Now, $6A + B - \sqrt{15}C = 6(5) + 27 - \sqrt{15}(3\sqrt{15})$

$$= 30 + 27 - 45 = 57 - 45 = 12$$

60. Option (4) is correct.

$$4 - 2\sin^2\theta - 5\cos\theta = 0$$

$$\Rightarrow 4 - 2(1 - \cos^2\theta) - 5\cos\theta = 0$$

$$\Rightarrow 4 - 2 + 2\cos^2\theta - 5\cos\theta = 0$$

$$\Rightarrow 2\cos^2\theta - 5\cos\theta + 2 = 0$$

$$\Rightarrow 2\cos^2\theta - 4\cos\theta - \cos\theta + 2 = 0$$

$$\Rightarrow (2\cos\theta - 1)(\cos\theta - 2) = 0$$

$$\Rightarrow \cos\theta = \frac{1}{2} \text{ or } \cos\theta = 2 \text{ (not possible)}$$

$$\Rightarrow \theta = 60^\circ$$

Now, $\sin\theta + \tan\theta = \sin 60^\circ + \tan 60^\circ$

$$= \frac{\sqrt{3}}{2} + \sqrt{3} = \frac{3\sqrt{3}}{2}$$

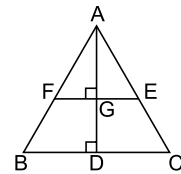
61. Option (3) is correct.

Average production of type D

$$= \frac{51 + 24 + 30 + 46 + 54}{5} = \frac{205}{5} = 41$$

Production of car B less than 41 in 2014 and 2015

\therefore Number of years where production of car B is less than 41 is 2



62. Option (3) is correct.

In ΔABC
because $\angle A + \angle B + \angle C = 180^\circ$

$$\frac{1}{2}\angle A + \frac{1}{2}\angle B + \frac{1}{2}\angle C = 90^\circ$$

$$\frac{1}{2}\angle B + \frac{1}{2}\angle C = 90^\circ - \frac{1}{2}\angle A$$

In ΔBOC

$$\frac{1}{2}\angle B + \frac{1}{2}\angle C + \angle BOC = 180^\circ$$

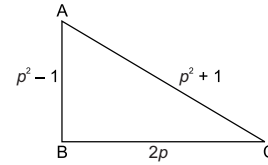
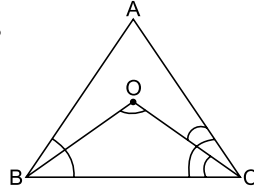
$$90^\circ - \frac{1}{2}\angle A + \angle BOC = 180^\circ$$

$$\angle BOC = 90^\circ + \frac{1}{2}\angle A$$

$$122^\circ = 90^\circ + \frac{1}{2}\angle A$$

$$\frac{1}{2}\angle A = 122^\circ - 90^\circ = 32^\circ$$

$$\angle A = 64^\circ$$



$$BC = \sqrt{(p^2 + 1)^2 - (p^2 - 1)^2}$$

$$BC = \sqrt{p^4 + 2p^2 + 1 - p^4 + 2p^2 - 1} = 2p$$

$$\therefore \cos \theta = \frac{2p}{p^2 + 1}$$

68. Option (2) is correct.

$$\frac{2 + \tan^2 \theta + \cot^2 \theta}{\sec \theta \cdot \operatorname{cosec} \theta} = \frac{1 + \tan^2 \theta + 1 + \cot^2 \theta}{\sec \theta \cdot \operatorname{cosec} \theta}$$

$$= \frac{\sec^2 \theta + \operatorname{cosec}^2 \theta}{\sec \theta \cdot \operatorname{cosec} \theta} = \frac{\sec^2 \theta}{\sec \theta \cdot \operatorname{cosec} \theta} + \frac{\operatorname{cosec}^2 \theta}{\sec \theta \cdot \operatorname{cosec} \theta}$$

$$= \frac{\sec \theta}{\operatorname{cosec} \theta} + \frac{\operatorname{cosec} \theta}{\sec \theta} = \frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{\sin \theta}$$

$$= \frac{\sin^2 \theta + \cos^2 \theta}{\sin \theta \cdot \cos \theta} = \frac{1}{\sin \theta \cdot \cos \theta}$$

$$= \sec \theta \cdot \operatorname{cosec} \theta$$

69. Option (4) is correct.

$$\text{Discount price} = 720 \left(1 - \frac{x}{100}\right) \left(1 - \frac{x}{100}\right)$$

$$\text{Discount} = 720 - 720 \left(1 - \frac{x}{100}\right)^2$$

$$259.20 = 720 - 720 \left(1 - \frac{x}{100}\right)^2$$

$$720 \left(1 - \frac{x}{100}\right)^2 = 720 - 259.20 = 460.8$$

$$\left(1 - \frac{x}{100}\right)^2 = \frac{460.8}{720} = \frac{64}{100}$$

$$\Rightarrow 1 - \frac{x}{100} = \frac{8}{10}$$

$$\Rightarrow 1 - \frac{8}{10} = \frac{x}{100}$$

$$\Rightarrow \frac{2}{10} \times 100 = x$$

$$\Rightarrow x = 20$$

70. Option (3) is correct.

$$AQ = AR = 4.5 \text{ cm}$$

$$QC = PC = 5.5 \text{ cm}$$

$$BP = BR = 6 \text{ cm}$$

$$\therefore AB = 4.5 + 6 = 10.5$$

$$BC = 6 + 5.5 = 11.5$$

$$AC = 4.5 + 5.5 = 10$$

$$\text{Perimeter of } \Delta ABC = 10.5 + 11.5 + 10 = 32 \text{ cm}$$

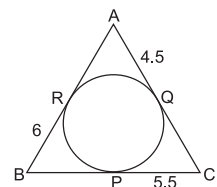
71. Option (1) is correct.

$$2 \times 3 \div 2 \text{ of } 3 \times 2 \div (4 + 4 \times 4 \div 4 \text{ of } 4 - 4 \div 4 \times 4)$$

$$= 2 \times 3 \div 6 \times 2 \div (4 + 4 \times 4 \div 16 - 1 \times 4)$$

$$= 2 \times \frac{1}{2} \times 2 \div \left(4 + 4 \times \frac{1}{4} - 4\right)$$

$$= 2 \div 1 = 2$$



63. Option (4) is correct.

Central angle of production of cars in 2013

$$= \frac{42}{20 + 42 + 40 + 35 + 43} \times 360^\circ$$

$$= \frac{42}{180} \times 360^\circ = 84^\circ$$

64. Option (2) is correct.

Let present ages of A and B are x and y years respectively

$$\therefore \text{Four year ago } \frac{x-4}{y-4} = \frac{4}{5}$$

$$\Rightarrow 5x - 20 = 4y - 16$$

$$5x - 4y = 4 \quad \dots(i)$$

$$\text{Eight year from now, } \frac{x+8}{y+8} = \frac{11}{13}$$

$$\Rightarrow 13x + 104 = 11y + 88$$

$$13x - 11y = -16 \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$x = 36 \text{ and } y = 44$$

$$\text{Sum of ages} = 36 + 44 = 80 \text{ years}$$

65. Option (3) is correct.

Total production of type B cars in 2012, 2014, 2015

$$= 42 + 40 + 38 = 120$$

Total production of type A cars in 2013 and 2016 = 35 + 56

$$= 91$$

$$\text{More cars} = 120 - 91 = 29$$

$$\% \text{ of more cars} = \frac{29}{91} \times 100 = 31.86\%$$

$$= 31.9\%$$

66. Option (3) is correct.

In rt. ΔOSQ

Let $SQ = y$ and $OS = x$

$$\therefore x^2 + y^2 = 100$$

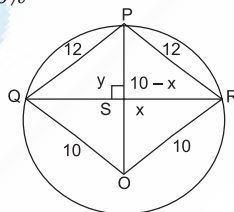
$$(10-x)^2 + y^2 = 144$$

$$100 - 20x + x^2 + y^2 = 144$$

$$100 - 20x + 100 = 144$$

$$20x = 56$$

$$x = 2.8 \text{ cm}$$



67. Option (4) is correct.

$$\sin \theta = \frac{p^2 - 1}{p^2 + 1}$$

72. Option (2) is correct.Let C.P. = x

$$S.P. = x \left(1 - \frac{15}{100} \right)$$

$$A.T.Q \quad x \left(1 - \frac{15}{100} \right) + 30.60 = x \left(1 + \frac{9}{100} \right)$$

$$\Rightarrow \frac{109x}{100} - \frac{85x}{100} = 30.60$$

$$\Rightarrow \frac{24x}{100} = 30.60$$

$$\Rightarrow x = \frac{30.60 \times 100}{24} = 127.5$$

$$\text{New S.P.} = 127.5 \left(1 + \frac{10}{100} \right) = 127.5 \times \frac{11}{10} = 140.25$$

73. Option (4) is correct.Let 5th number be x then 6th number is $x - 6$ and 7th number is $x - 1$

$$\therefore 12 \times 42 = 4 \times 44 + x + x - 6 + x - 1 + 5 \times 40$$

$$504 = 176 + 3x - 7 + 200$$

$$504 = 3x + 369$$

$$\Rightarrow 3x = 504 - 369 = 135$$

$$\Rightarrow x = 45$$

$$\text{Average of 5th and 7th} = \frac{2x-1}{2} = \frac{90-1}{2} = \frac{89}{2} = 44.5$$

74. Option (2) is correct.Since, $985x3678y$ is divisible by 72

i.e., it is divisible by 8 and 9

For divisible by 8

i.e., $78y$ is divisible by 8

$$\begin{array}{r} 8 \overline{) 78y \ 98} \\ \underline{72} \\ 6y \\ \underline{6y} \\ 0 \end{array}$$

$$\therefore y = 4$$

For divisible by 9

$$9 + 8 + 5 + x + 3 + 6 + 7 + 8 + 4 = 50 + x$$

$$= 9 \times 5 + 5 + x$$

$$\text{therefore } 5 + x = 9$$

$$\Rightarrow x = 4$$

$$\text{Now, } 4x - 3y = 4(4) - 3(4) = 16 - 12 = 4$$

75. Option (1) is correct.

$$\text{Because } 8,028 = P \left(1 + \frac{r}{100} \right)^3 \quad \dots(i)$$

$$12,042 = P \left(1 + \frac{r}{100} \right)^6 \quad \dots(ii)$$

From Eqs. (i) and (ii)

$$\frac{P \left(1 + \frac{r}{100} \right)^6}{P \left(1 + \frac{r}{100} \right)^3} = \frac{12,042}{8,028}$$

$$\left(1 + \frac{r}{100} \right)^3 = 1.5$$

$$\left(1 + \frac{r}{100} \right)^3 = 1.5$$

From Eq. (i)

$$8,028 = P \times 1.5$$

$$P = \frac{8,028}{1.5} = ₹ 5,352$$

English Comprehension**76. Option (2) is correct.**

The word "coerce" means "persuade (an unwilling person) to do something by using force or threats." Example: The court heard that the six defendants had been coerced into making a confession." Synonym of coerce is pressure. Hence, (2) is the answer. The meanings of the rest of the words are:

Cajole: "to persuade someone to do something they might not want to do, by pleasant talk and (sometimes false) promises." Example: He really knows how to cajole people into doing what he wants.

Enchant: "to attract or please someone very much." Example: The audience was clearly enchanted by her performance.

77. Option (4) is correct.

The paragraph is about the death of a whale, which died because of plastic pollution. Statement B introduces the topic. Hence, B is the opening statement. Option (1) and option (4) both start with statement B. In statement C, the pronoun "he" is mentioned, whereas the name is mentioned in statement "D". Hence, DC is a pair.

78. Option (2) is correct.

This is a simple statement of future speculation. Thus, the simple future tense is needed.

79. Option (2) is correct.

This question checks the students' understanding of idioms and phrases. The meaning of the idiom "at daggers drawn" is "in a state of extreme unfriendliness." Example: The two sides have been at daggers drawn for some months now with no sign of improvement in relations.

80. Option (3) is correct.

The blank needs a word which means a set of clothes particular to a group of people. Clothing represents a set of clothes and it cannot be written in plural form. Hence, option (1) is incorrect. Apparel means clothing. Hence, option (2) is also ruled out. Dressing means a piece of material used to cover and protect a wound, a sauce for salads. It does not fit in the sentence. The appropriate word for the blank is "costumes," which refers to "a set of clothes worn by an actor or performer for a particular role."

81. Option (1) is correct.

The word "scarce" means "not easy to find or get." Example: Food and clean water were becoming scarce. Students need to select antonym of "scarce", which means easy to find or abundance. Another word for abundance is plentiful. Scanty is the synonym of scare. Seldom means almost never. Example: Now that we have a baby, we seldom get the chance to go to the cinema.

82. Option (3) is correct.

In the active voice, the sentence's subject performs the action. It is used when you want the reader to focus on the subject of your sentence. In the passive voice, the action's target is the focus, and the verb acts upon the subject. To convert active voice into passive voice, students need to identify the (S + V + O) Subject, verb, and object. Passive sentences in the past continuous tense have the following structure: Object of the active sentence + was/were/ + being + past participle form of the verb + by + subject of the active sentence. To convert it to an active sentence in the past continuous tense, follow the structure: Subject + was/were + V1 -ing form of verb + object.

83. Option (4) is correct.

The error is in the phrase 'in case that'. It is a prepositional phrase that is used in sentences to indicate a condition or warning: please do not use the lift if there is a fire. It is a connecting fragment of reason in the given sentence that explains why the speaker had to decline the orders. It should be replaced by the conjunction "because" to provide the correct meaning to the sentence.

84. Option (2) is correct.

A student who absents himself/herself from school without permission is known as a truant. The meanings of the rest of the words are:

Vagrant: A person without a settled home or job, one who moves from place to place.

Itinerant: A person who travels from one location to another for a short period of time, usually to work.

Migrant: A person who attempts to permanently relocate to a new country, usually to get work.

85. Option (4) is correct.

The word, "exploit" is wrongly spelt.

86. Option (3) is correct.

The word, "calendar" is wrongly spelt in the question.

87. Option (2) is correct.

A person, animal, or plant much below the usual height is known as dwarf. The meanings of the rest of the words are:

Witch: a woman thought to have magic powers, especially evil ones. Example: In the story, a wicked witch put a curse on the princess for 100 years.

Wizard: a man who is believed to have magical powers and who uses them to harm or help other people. Example: He is a computer wizard.

88. Option (1) is correct.

The paragraph is about a café. The subject is introduced in the statement (d), which states that the café is not for the faint-hearted. Hence, D will start the paragraph, and D will be followed by C, because C describes the reason why the café is not for the faint-hearted. The statement C will be followed by the statement B, because "B" uses a pronoun that refers to the snakes mentioned in the statement C. Hence, the sequence is DCBA.

89. Option (1) is correct.

The word 'although' is used to mean 'in spite of or even though'. This doesn't make sense in the context of the statement because the cyclone's destruction of South Africa was a result of it, not in spite of, the deaths caused by it. The better rephrasing is: Cyclone Idai killed at least 157 people in Zimbabwe and Mozambique as it tore across Southern Africa.

90. Option (4) is correct.

The phrase "for a long time" is the key to determining the appropriate tense for this sentence. It suggests that we should choose a tense that describes how something began in the past and is still going on now. The tense that best represents it is the present perfect continuous tense. Hence, the best substitute for the underlined part is option (4).

91. Option (4) is correct.

The blank requires a word, which refers to the people who figure out the most errors. When it refers to identifying someone or something and assigning a distinguishing characteristic to it, the word "those" is the best fit.

92. Option (4) is correct.

The blank needs a determiner. An indefinite article 'a' is required because the campaign is talked about for the first

time and it precedes a word that begins with a consonant sound.

93. Option (2) is correct.

The blank requires an adverb. The word "same" would be incorrect because it is an adjective. Likely is out of scope since the sentence is talking about some possibilities. Alike means having a resemblance or similitude, whereas similar means having traits or characteristics in common. Between "alike" and "similarly," 'alike' is the correct choice. It means (of two or more people or things) similar to each other.

94. Option (1) is correct.

The meanings of the words are as follows:

Mistakes: something, especially a word, figure, or fact, that is not correct; an inaccuracy.

Blunder: a stupid or careless mistake.

Oversight: an unintentional failure to notice or do something.

Guffaws: a hearty and loud laugh. Example: "Both men guffawed at the remark."

A blunder is a clumsy or embarrassing mistake, while a mistake is an error. Here, the sentence is referring to errors. Therefore, 'mistakes' is the apt word to fill in the blank. 'Blunder' would be an extremely stronger word to use in the given context.

95. Option (2) is correct.

As part of a campaign to enhance the experience of foreign visitors in the South Korean capital, the sentence implies that there is a specific focus on public transportation signage, maps, and information signs at historic sites. The word "particular," which means "particularly great or intense," is a good fit for the blank.

96. Option (2) is correct.

The meaning of the word "chronic" is "persisting for a long time or constantly recurring." Example: "The school suffers from chronic overcrowding."

97. Option (1) is correct.

In the active voice, the subject of the sentence performs the action. It is used when you want the reader to focus on the subject of your sentence. In the passive voice, the action's target is the focus, and the verb acts upon the subject. To convert active voice into passive voice, students need to identify the (S+V+O) Subject, verb, and object in the active sentence so as to convert the sentence into passive form.

98. Option (3) is correct.

The sentence suggests that there is a belief that his company produces the best cricket balls in the country. Reputation means 'the beliefs or opinions that are generally held about someone or something'. It is the correct filler for the blank.

99. Option (3) is correct.

The idiom 'to play ducks and drakes' means 'to behave recklessly or misuse one's resources'. Example: Don't play ducks and drakes with this internship—it's a great opportunity, even if it doesn't pay!

100. Option (2) is correct.

The term "expansion" can refer to "augmentation, extension, or inflation." The antonym of expansion is compression.