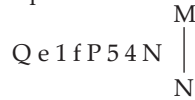


21. Select the option that is related to the third number in the same way as the second number is related to the first number.
 16 : 144 :: 28 : ?
 1. 263 2. 544 3. 420 4. 364
22. Four words have been given, out of which three are alike in some manner and one is different. Select the word that is different.
 1. Jealousy 2. Empathy 3. Hatred 4. Envy
23. Select the correct mirror image of the given combination when the mirror is placed at MN as shown.



1. N ƒ ɔ ƒ ƒ 1 9 0 2. N ƒ ɔ ƒ ƒ 1 9 0
 3. N ƒ ɔ ƒ ƒ 1 9 0 4. N ƒ ɔ ƒ ƒ 1 9 0
24. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.
Statements:
 No bank is an office.
 All offices are stalls.
Conclusions:
 I. No bank is a stall. II. No stall is a bank.
 III. Some stalls are offices. IV. All the stalls are offices.
1. Only conclusion I follows.
 2. Both conclusions I and IV follow.
 3. Only conclusion III follows.
 4. Both conclusions I and II follow.
25. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.
 THME, WKJB, ZNGY, CQDV, ?
 1. FTAS 2. FUAS 3. FTAR 4. FTBS

General Awareness

26. Which part of the body is associated with the rickets disorder?
 1. Heart 2. Bones 3. Eyes 4. Skin
27. How many trains were flagged off by Prime Minister Narendra Modi in January 2021 connecting the location of the Statue of Unity to different parts of India?
 1. Eight 2. Six 3. Five 4. Seven
28. Who among the following was the first Indian to unfurl the tricolour on foreign land?
 1. Annie Besant 2. Bhikaiji Cama
 3. Begum Hazrat Mahal 4. Lakshmi Sehgal
29. Which of the following diseases is caused by a parasite?
 1. Plague 2. Goitre 3. Malaria 4. Pneumonia
30. Which of the following is a work on statecraft written by Krishnadevaraya?
 1. Kadambari 2. Amuktamalyada
 3. Karpuramanjari 4. Tolkappiyam
31. With which of the following sports is the term 'Chinaman' associated?
 1. Cricket 2. Polo
 3. Table tennis 4. Swimming
32. Which of the following is NOT a feature of food security?
 1. Availability 2. Accessibility
 3. Acceptability 4. Affordability
33. _____ is created by the collision of convergent plate boundaries.
 1. Mid-ocean ridge 2. Oceanic trench
 3. Mountain building 4. Land erosion

34. India and _____ were declared joint winners of the 2020 Online FIDE Chess Olympiad.
 1. Russia 2. USA 3. Serbia 4. Estonia
35. When is National Girl Child Day observed annually in India?
 1. 24th January 2. 12th May 3. 5 June 4. 9 September
36. Who among the following never became the Vice President of India?
 1. V.V. Giri 2. B.D. Jatti
 3. Gulzarilal Nanda 4. Zakir Husain
37. Tapovan Vishnugad Hydroelectric Project is located in:
 1. Himachal Pradesh 2. Ladakh
 3. Uttarakhand 4. Jammu and Kashmir
38. According to the Puranas, Lord Vishnu took the shape of _____ in order to rescue the earth, which had sunk into water.
 1. a boar 2. a lion 3. an elephant 4. a tiger
39. Who among the following was the Nizam of Hyderabad in 1947?
 1. Osman Ali 2. Nasir Jung
 3. Mir Mahbub Ali Khan 4. Akbar Ali Khan
40. Which of the following locations has the highest altitude?
 1. Moradabad 2. Ranikhet 3. Kolkata 4. Patna
41. Which of the following Articles of the Constitution of India provides for the creation of a GST Council?
 1. Article 269A 2. Article 279A
 3. Article 323A 4. Article 246A
42. What is the objective of the 'Doughnut Model' of development?
 1. It envisions rapid development at environmental cost, then makes up for it later.
 2. It envisions a world in which people and planets can thrive in balance.
 3. It envisions the food processing industry as the centre of development.
 4. It envisions total abandonment of technology to live at peace with environment.
43. Which of the following is the meaning of 'Pishtaq' in the context of medieval Indo-Islamic architecture?
 1. Tall gateway 2. Dome
 3. Water tank 4. True arch
44. Which of the following states' former Governor, Mata Prasad, died in January 2021?
 1. Goa 2. Uttarakhand
 3. Arunachal Pradesh 4. Uttar Pradesh
45. Who among the following was appointed as the Chairman and Managing Director of Telecommunications Consultants India Limited in January 2021?
 1. Jitendra Singh 2. Rajeev Kumar
 3. Sanjeev Kumar 4. Sarabjit Singh Sandhu
46. 'Bolak-aat' is a _____ from the state of Karnataka.
 1. music form 2. sculpting form
 3. dance form 4. painting form
47. Halogens have _____ electrons in their outermost shells.
 1. seven 2. six 3. eight 4. five
48. Who among the following is credited with postulating three laws of planetary motion?
 1. Galileo Galilei 2. Isaac Newton
 3. Johannes Kepler 4. Tycho Brahe
49. Who among the following is the author of the book 'Democrats and Dissenters'?
 1. Arun Shourie 2. Nalini Singh
 3. Gurucharan Das 4. Ramchandra Guha
50. Which of the following is a water-soluble vitamin?
 1. Vitamin A 2. Vitamin K 3. Vitamin D 4. Vitamin C

Quantitative Aptitude

51. If $\left(2x - \frac{3}{x}\right) = 2$, then what is the value of $\left(16x^4 + \frac{81}{x^4}\right)$?
1. 220 2. 180 3. 328 4. 184

52. The table shows the number of trees planted in 4 cities from 2016 to 2020.

Years	Chandigarh	Ahmedabad	Pune	Kolkata
2016	1,800	2,500	1,800	2,000
2017	2,500	2,300	1,850	1,800
2018	2,300	2,400	1,840	1,760
2019	2,440	1,950	1,900	1,600
2020	2,250	2,100	2,000	1,750

From 2016 to 2020, how many more trees were planted in Ahmedabad as compared to trees planted in Pune?

1. 2,340 2. 2,000 3. 1,850 4. 1,860
53. The table shows income (in ₹) received by 4 employees of a company during the month of December 2020 and all their income sources.

Source	Amit	Suresh	Nitin	Varun
Salary	35,000	38,500	29,000	42,000
Arrears	6,000	6,300	5,000	7,500
Bonus	1,000	1,100	1,000	1,240
Overtime	1,800	1,950	1,400	1,500

By what per cent are the Arrears of Amit and Suresh taken together less than the Arrears of Nitin and Varun taken together?

1. 1.6 2. 1.2 3. 1.4 4. 1.5
54. Study the following table and answer the question:
Number of students enrolled for Vocational Courses (VC) in five institutes - A, B, C, D and E.

Year \ Institute	2013	2014	2015	2016	2017	2018
A	120	135	130	135	128	140
B	125	132	138	132	135	142
C	125	120	125	138	140	135
D	100	125	122	140	128	138
E	105	110	115	147	130	145

The ratio of the total number of students enrolled for VC in institutes A, C and E in 2016 to the total number of students enrolled in institutes B and D in 2018 is:

1. 14 : 9 2. 8 : 7 3. 3 : 2 4. 21 : 19
55. $x + y + z = 2$ and $xy + yz + zx = -11$, then the value of $x^3 + y^3 + z^3 - 3xyz$ is:
1. 74 2. 78 3. 69 4. 71
56. The ratio of the present age of a mother to that of her daughter is 7 : 1. After 5 years, the ratio will become 4 : 1. What is the difference (in years) in their present ages?
1. 28 2. 31 3. 30 4. 29
57. On selling an article for ₹246.80, the gain is 20% more than the amount of loss incurred on selling it for ₹216. If the article is sold for ₹220.75, then what is the gain/loss per cent (correct to the nearest integer)?
1. Profit 7% 2. Loss 4% 3. Profit 3% 4. Loss 5%
58. In ΔABC , $\angle A = 90^\circ$, $AD \perp BC$ at D. If $AB = 12$ cm and $AC = 16$ cm, then what is the length (in cm) of BD?
1. 8.4 2. 6.4 3. 7.8 4. 7.2
59. A can do a certain work in 15 days. B is 25% more efficient than A. Both worked together for 4 days. C alone completed

the remaining work in 8 days. A, B and C together will complete the same work in:

1. $4\frac{1}{2}$ days 2. $6\frac{1}{2}$ days 3. 5 days 4. 4 days
60. A sum of ₹7,500 amounts to ₹9,075 at 10% p.a. interest being compounded yearly in a certain time. The simple interest (in ₹) on the same sum for the same time and the same rate is:
1. 1,480 2. 1,500 3. 1,530 4. 1,520
61. The angle between the internal bisectors of two angles $\angle B$ and $\angle C$ of a ΔABC is 132° , then the value of $\angle A$ is:
1. 62° 2. 84° 3. 72° 4. 48°
62. The selling price of an article marked for ₹10,000 after giving three discounts, 20%, 10% and $k\%$ is ₹6,120. What will be the selling price (in ₹) of the same article if a single discount of $(k + 20)\%$ is allowed?
1. 8,500 2. 6,800 3. 8,000 4. 6,500
63. $1 + 2 \tan^2 \theta + 2 \sin \theta \sec^2 \theta$, $0^\circ < \theta < 90^\circ$, is equal to:
1. $\frac{1 + \sin \theta}{1 - \sin \theta}$ 2. $\frac{1 + \cos \theta}{1 - \cos \theta}$ 3. $\frac{1 - \sin \theta}{1 + \sin \theta}$ 4. $\frac{1 - \cos \theta}{1 + \cos \theta}$
64. In a circle with centre O and radius 5 cm, AB and CD are two parallel chords of lengths 6 cm and x cm, respectively and the chords are on the opposite side of the centre O. The distance between the chords is 7 cm. What is the value of x ?
1. 8 2. 9 3. 10 4. 12
65. In a circle with centre O, AB is a diameter and CD is a chord such that $\angle ABC = 34^\circ$ and $CD = BD$. What is the measure of $\angle DBC$?
1. 30° 2. 28° 3. 32° 4. 24°
66. The average of 22 numbers is 37.5. The average of the first 12 numbers is 40.6 and that of the last 12 numbers is 35.4. If 11th and 12th numbers are excluded, then what is the average of the remaining numbers?
1. 36.9 2. 37.4 3. 37.8 4. 36.4
67. If $\frac{\operatorname{cosec} \theta + \cot \theta}{\operatorname{cosec} \theta - \cos \theta} = 7$, then the value of $\frac{4 \sin^2 \theta - 1}{4 \sin^2 \theta + 5}$ is:
1. $-\frac{1}{9}$ 2. $\frac{1}{3}$ 3. $\frac{1}{9}$ 4. $-\frac{1}{3}$
68. If the 6-digit number $5x423y$ is divisible by 88, then what is the value of $(5x - 8y)$?
1. 24 2. 16 3. 14 4. 28
69. A train runs first 75 km at a certain uniform speed and next 90 km at an average speed of 10 km/h more than the normal speed. If it takes 3 hours to complete the journey, then how much time will the train take to cover 300 km with normal speed?
1. 5 hours 25 minutes 2. 6 hours
3. 5 hours 4. 5 hours 15 minutes
70. The value of $\frac{52 - 1,170 - 26 + 13 \times 2}{2 + 1\frac{1}{8} \text{ of } 2 - 1\frac{1}{4}}$ is.
1. 12 2. 11 3. 27 4. 41
71. If $3 \cos^2 \theta - 4 \sin \theta + 1 = 0$, $0^\circ < \theta < 90^\circ$, then $\tan \theta + \sec \theta$ is:
1. $2\sqrt{3}$ 2. $2\sqrt{5}$ 3. $3\sqrt{3}$ 4. $\sqrt{5}$
72. The income of A is 30% less than the income of B and the income of B is 137.5% more than that of C. If the income of A is ₹28,500 less than that of B, then the income (in ₹) of C is:
1. 36,000 2. 50,000 3. 40,000 4. 48,000

73. Study the following table and answer the question:
Number of students enrolled for Vocational Courses (VC) in five institutes - A, B, C, D and E.

Year \ Institute	2013	2014	2015	2016	2017	2018
A	120	135	130	135	128	140
B	125	132	138	132	135	142
C	125	120	125	138	140	135
D	100	125	122	140	128	138
E	105	110	115	147	130	145

The total number of students enrolled for VC in Institute C in 2013, 2014 and 2017 is what per cent of the total number of students enrolled in all the five institutes in 2018?

1. 62 2. 53 3. 58 4. 55
74. If $a^3 + b^3 = 405$ and $a + b = 9$, then the value of ab is:
1. 10 2. 15 3. 12 4. 8
75. What is the area (in cm^2) of a circle inscribed in a square of area 784 cm^2 ? (Take $\pi = \frac{22}{7}$)
1. 660 2. 924 3. 462 4. 616

English Comprehension

76. Select the most appropriate option to fill in the blank.
A _____ souvenir will be released on the occasion of the World Meet.
1. generous 2. considerable 3. bountiful 4. voluminous
77. Select the option that will improve the underlined part of the sentence. In case no improvement is needed, select 'No improvement required'.
I wish I have come an hour sooner.
1. will 2. has
3. had 4. No improvement required
78. Select the most appropriate ANTONYM of the given word. Invade
1. Attack 2. Assault 3. Seize 4. Surrender
79. Select the most appropriate option to substitute the underlined segment in the given sentence. If no substitution is required, select 'No substitution'.
The place is too much noisy.
1. No substitution 2. too noisy
3. much too much noisy 4. much noisy
80. Select the most appropriate meaning of the given idiom.
To cut a long story short
1. Like to tell short stories 2. Like to tell long stories
3. Tell something in a roundabout way
4. Tell something briefly
81. Select the most appropriate synonym of the given word.
Transmit
1. Convey 2. Accept 3. Catch 4. Receive
82. Select the option that expresses the given sentence in reported speech.
"Whom did you see at the shopping mall today?" I asked my daughter.
1. I asked my daughter whom she had seen at the shopping mall that day.
2. I asked my daughter that whom she saw at the shopping mall on that day.
3. I asked my daughter who she has seen at the shopping mall today.
4. I asked my daughter that whom did she saw at the shopping mall that day.
83. The following sentence has been divided into parts. One part contains an error. Select the part that contains the error from the given options.
It have been only / through writing / that men have been able / to spread their ideas to mankind.
1. through writing
2. It have been only
3. that men have been able
4. to spread their ideas to mankind
84. Select the most appropriate synonym of the given word.
Numerous
1. Several 2. Numbered 3. Totalled 4. Few
85. Select the most appropriate ANTONYM of the given word. (Toxic)
1. Healthy 2. Lethal 3. Harmful 4. Venomous
86. Select the INCORRECTLY spelt word.
1. Anxious 2. Vishious 3. Mimic 4. Moisture
87. Select the most appropriate option to fill in the blank.
You need not _____ so much fuss about wearing a mask when you go out.
1. do 2. generate 3. cause 4. make
88. Select the most appropriate meaning of the given idiom.
Full of beans
1. A storeroom full of vegetables
2. A dish made of French beans
3. Full of energy 4. Full of cowardice
89. Select the option that can be used as a one-word substitute for the given group of words.
A person who listens to someone's private conversation without them knowing
1. Infiltrator 2. Spy
3. Eavesdropper 4. Secret agent
90. Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the right order to form a meaningful and coherent paragraph.
A. Then, I took him by the hand and led him across the street.
B. I was going to the market when I saw a blind man trying to cross the street.
C. He expressed his gratitude with folded hands.
D. I walked across to the blind man.
1. CBDA 2. BDAC 3. ABCD 4. DABC
91. The following sentence has been divided into parts. One part contains an error. Select the part that contains the error from the given options.
The Principal requested / the teachers / to monitor / and take care of the small children.
1. the teachers
2. and take care of the small children
3. The Principal requested
4. to monitor
92. Select the option that can be used as a one-word substitute for the given group of words.
A large building with an extensive floor area, typically for housing aircrafts
1. Shed 2. Airport 3. Barn 4. Hangar
93. Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the right order to form a meaningful and coherent paragraph.
A. This invention has helped us to heal wounds caused by bacteria.
B. Penicillin is one of the most useful drugs man has invented.
C. In the beginning however, very few people knew of this discovery and its use.
D. Its use has saved the lives of hundreds of thousands of soldiers.
1. BADC 2. DCBA 3. CABD 4. ABCD
94. Select the option that expresses the given sentence in passive voice.

Someone stole his traveller's cheques when he was travelling in Europe.

1. His traveller's cheques was stole when he was travelling in Europe.
 2. His traveller's cheques were stolen when he was travelling in Europe.
 3. His traveller's cheques are stole when he was travelling in Europe.
 4. Someone had been stole his traveller's cheques when he was travelling in Europe.
95. Select the INCORRECTLY spelt word.

1. Arbitrary 2. Scrutinise 3. Cerebral 4. Withdrawl

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.

It is true that the more you study, the more you (1)_____ your horizon and hence your point of view undergoes a (2)_____. A person with higher education certainly has a better (3)_____ and ideas to help in community

and societal (4)_____. Ideas that are gathered from such people provide a global (5)_____ for the nation as a whole.

96. Select the most appropriate option to fill in blank number 1.
 1. exchange 2. narrow 3. expand 4. convert
97. Select the most appropriate option to fill in blank number 2.
 1. backwardness 2. transformation
 3. succession 4. enlargement
98. Select the most appropriate option to fill in blank number 3.
 1. luck 2. outlook 3. scope 4. routine
99. Select the most appropriate option to fill in blank number 4.
 1. elaboration 2. ripening
 3. development 4. maturity
100. Select the most appropriate option to fill in blank number 5.
 1. posture 2. perspective 3. prejudice 4. proportion

Answer Key

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

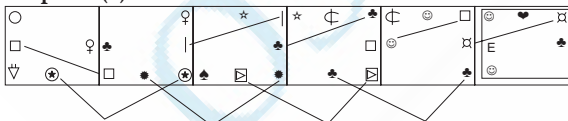
Answers with Explanations

General Intelligence and Reasoning

1. Option (3) is correct.

The pattern is:
 The given series is 10, 22, 35, 40, 72, 40.
 The second term $\Rightarrow 22 = 10 + 12$
 The third term $\Rightarrow 35 = 22 + 12 + 1^3$
 the fourth term $\Rightarrow 40 = 35 + 12 + 1^3 - 2^3$
 the fifth term $\Rightarrow 72 = 40 + 12 + 1^3 - 2^3 + 3^3$
 the sixth term $\Rightarrow 40 = 72 + 12 + 1^3 - 2^3 + 3^3 - 4^3$
 Similarly,
 The seventh term of the series can also found,
 $\Rightarrow 7\text{th term} = 40 + 12 + 13 - 2^3 + 3^3 - 4^3 + 5^3$
 $\Rightarrow 7\text{th term} = 40 + 12 + 1 - 8 + 27 - 64 + 125$
 $\Rightarrow 7\text{th term} = 205 - 72$
 $\Rightarrow 7\text{th term} = 133$.

2. Option (4) is correct.



3. Option (1) is correct.

According to the alphabetical positions of the letters, (1) 1st, 3rd and 5th letters are reversed their position with the addition of 5.
 (2) 2nd and 4th letters are coded as their equivalent opposite letter.
 The first, third and fifth letters are moved 5 steps forward as well as the second and fourth letters are coded according to the equivalent opposite letter of a particular letter of the word.

$P + 5 = U$

$R = I$ (Reverse position of I is 18 which is equal to I).

$I + 5 = N$
 $N = M$
 $T + 5 = Y$
 $M + 5 = R$
 $A = Z$
 $G + 5 = L$
 $I = R$
 $C + 5 = H$

Similarly,

Hence, HRLZR is the correct answer.

4. Option (1) is correct.

UACBDT UACBDT UACBDT UACBDT
 Count the total number of letters which is 24. Now we write 24 as 6×4 . It means we divide these letters either into 4 groups of each group having 6 letters or into 6 groups with 4 letters in each group. Now count the total number of letters in UACBDT, so 6 letters are used in the following series.

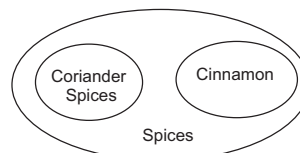
Hence, we can form 4 groups of 6 letters each.

5. Option (4) is correct.

$(1\text{st number} + \text{second number}) \times (1\text{st number} - \text{second number}) = \text{third number}$
 $(6, 9, 45) \rightarrow (6 + 9) \times (9 - 6) = 15 \times 3 = 45$
 Similarly, $(8, 10, 36) \rightarrow (8 + 10) \times (10 - 8) = 18 \times 2 = 36$

6. Option (2) is correct.

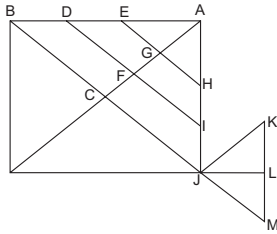
Coriander and cinnamon are both spices, so they will both be included in the spices.



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

When a rectangle is having 2 diagonals then number of triangles is equal to $2 \times 4 = 8$.

Then start counting randomly which is shown below in the figure.



ADF, AFI, ADI, AEG, AGH, AEH (Note: If triangle has one perpendicular to it then it has 3 triangles so there are two such triangles so there will be total of 6 triangles.)

Now, total = $8 + 6 + KJL + JLM + KJM$.

Hence, there are total 17 triangles.

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

When we fold the given figure along the lines then 6,3,4 will be together which is option , and 1,2 and 3 will be also together which is option (C).

Option B: Since 4, and 2 faces opposite to each other and those are together in option B.

Option D: As 5 and 3 face opposite each other but they are together in option D.

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

Leaves: Rustle — Soft, muffled crackling sound caused by the movement of dry leaves or paper is called rustle.

Similarly, Owl: ? — Hoot is a low, wavering musical sound which is the typical call of many kinds of owl.

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

As both 1st and 2nd letter of the every word is same. So now we will start arranging from 3rd word, the 3rd word is r, l, l, p, l. After arranging these letters we know l comes before p and r. So l is in 2, 3, 5 and the first word must be 2, 3 or 5. Now arrange 4th letters are i, u, v so i comes before u and v, etc. on arranging we get 2, 3, 5, 4, 1.

Hence, 2, 3, 5, 4, 1 is the correct answer.

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

LNJI → L - 2 = J

N - 5 = I

RTPO → R - 2 = P

T - 5 = O

DFBA → D - 2 = B

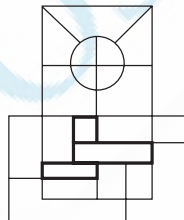
F - 5 = A

FHDB → F - 4 = B

H - 4 = D

Hence, FHDB is the correct answer.

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



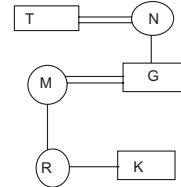
The embedded figure is shown in the above diagram.

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

Anger is one of the basic human emotions, as elemental as happiness, sadness, anxiety, or disgust.

In the same way, Pomegranate is the type of fruit.

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



From the above blood relation tree, T is the father-in-law of M not paternal grandfather.

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

$[2\text{nd number} - (1\text{st number} \div 2)] + (\text{multiply of digits of } 1\text{st number}) = 3\text{rd number}$

Row 1 : 14, 16, 13

$$=[16 - (14 \div 2)] + (1 \times 4)$$

$$=[16 - 7] + 4$$

$$=9 + 4 = 13$$

Row 3: 12, 21, 17

$$=[21 - (12 \div 2)] + (1 \times 2)$$

$$=[21 - 6] + 2 = 15 + 2 = 17$$

Similarly, Row 2: 18, 6, ?

$$=[6 - (18 \div 2)] + (1 \times 8)$$

$$=[6 - 9] + 8 = -3 + 8 = 5$$

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

1st number x

$7 - 8 =$ second number.

1. 21: 139 → $21 \times 7 - 8 = 147 - 8 = 139$

2. 25: 167 → $25 \times 7 - 8 = 175 - 8 = 167$

3. 15: 197 → $15 \times 7 - 8 = 105 - 8 = 97$

(it must be equal to 197)

4. 27: 181 → $27 \times 7 - 8 = 189 - 8 = 181$

Except for option (3), all options are following the given logic. Thus option (3) is an odd one. Hence, 15 : 197 is the correct answer.

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

Month	Code
Jan	0
Feb	3
Mar	3
Apr	6
May	1
June	4
July	6
Aug	2
Sept	5
Oct	0
Nov	3
Dec	5

Code for Days:

Month	Code
Sunday	0 or 7
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6

Code for Centuries:

1600 → 6
 1700 → 4
 1800 → 2
 1900 → 0
 2000 → 6
 2100 → 4
 2200 → 2
 2300 → 0

For, 17th April 2014

Date = 17

Code for Month = 6

Code for Century = 6

2014 = 2000 + 14

For, 2000 it is 6

For, 14 it is 14

And, $14 \div 4 = 3$

Adding all = $17 + 6 + 6 + 14 + 3 = 46$

$46 \div 7 = 4$ (here we consider the remainder).

4 is the code for Thursday.

17th April 2014 is Thursday.

18. Option (3) is correct.

The pattern is: Initially, letters of the word are coded according to the equivalent opposite letter of the word.

Then, the letters obtained are coded according to their positional alphabetical series.

Code = Sum of positional values of opposite letter + Number of letters in each word.

F opposite letter is U and $U = 21$

R opposite letter is I and $I = 9$

E opposite letter is V and $V = 22$

N opposite letter is M and $M = 13$

C opposite letter is X and $X = 24$

H opposite letter is S and $S = 19$

then $21 + 9 + 22 + 13 + 24 + 19 + 6 = 114$

Similarly,

C opposite letter is X and $X = 24$

O opposite letter is L and $L = 12$

U opposite letter is F and $F = 6$

R opposite letter is I and $I = 9$

S opposite letter is H and $H = 8$

E opposite letter is V and $V = 22$

$24 + 12 + 6 + 9 + 8 + 22 + 6 = 87$

19. Option (2) is correct.

Using option (2), we get

$$14 \times 81 \div 9 - (88 \div 4) + 36 + (22 + 7)$$

$$= 14 \times 9 - 22 + 36 + 29$$

$$= 126 - 22 + 36 + 29 = 169$$

Therefore, LHS = RHS.

20. Option (2) is correct.



21. Option (3) is correct.

The pattern is:

$$16 : 144 \rightarrow 16 \times (16 \div 2) + 16$$

$$= 16 \times 8 + 16 = 128 + 16 = 144$$

Similarly,

$$28 : 28 \times (28 \div 2) + 28$$

$$= 28 \times 14 + 28$$

$$= 392 + 28 = 420$$

22. Option (2) is correct.

Envy: The feeling of discontented.

Hatred: Intense dislike, hate.

Empathy: The ability to understand and share the feelings of another.

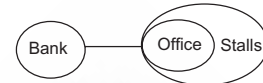
Jealousy: Envy, the state or feeling of being jealous.

Therefore, Empathy is odd one out.

23. Option (4) is correct.

When the mirror is placed on the line MN, then letters in the right positions will appear on the left and letters in the left positions will appear on the right.

24. Option (3) is correct.



From the given Venn diagram, only III follows.

25. Option (1) is correct.

T +3 W +3 Z +3 C +3 F

H +3 K +3 N +3 Q +3 T

M -3 J -3 G -3 D -3 A

E -3 B -3 Y -3 V -3 S

Hence, FTAS is the correct answer.

General Awareness

26. Option (2) is correct.

Infants and early children are susceptible to avoidable bone disease rickets, which results in weak and brittle bones. A deficiency in calcium, phosphorus, or vitamin D can result in rickets. Dark skin, inadequate Sun exposure, nutritional inadequacies, and diseases of the liver, kidney, or small intestine can all contribute to vitamin D deficiency. Improved Sun exposure, diet, vitamin D, and mineral supplements are all possible treatments. Most children with rickets are between the ages of 6 and 36 months. Children typically experience tremendous growth during this time.

27. Option (1) is correct.

Prime Minister Narendra Modi has flagged off of eight trains through video conferencing to connect the Statue of Unity in Kevadiya, Gujarat, with various parts of the nation. It was the first time in history, according to PM Modi, that so many trains from various locales were flagged off for a single destination.

28. Option (2) is correct.

One of the early leaders in India's fight for independence was Bhikaji Cama. In the German city of Stuttgart on August 21, 1907, an international socialist conference was taking place. Bhikaji Rustam Cama raised the Indian National Flag for the first time on this occasion. She was a member of the tiny team that worked on creating the flag, which featured many aspects of the Indian nation and its identity. She is credited for creating India's first tricolour flag, which had red, saffron, and green stripes with the words "Vande Mataram" inscribed on it. Madam Cama, also known as Bhikaiji Rustam Cama, was born in Bombay on September 24, 1861.

29. Option (3) is correct.

A parasite that often infects a particular species of mosquito that feeds on people can cause malaria. The female Anopheles mosquito, which transmits the parasites, deposits sporozoites in the skin of the human host. The World Health Organisation (WHO) will commemorate World Malaria Day 2020 on April 25 under the banner "Zero Malaria Start with Me." A medication called chloroquine is used to treat and prevent malaria, mainly in regions where the disease is susceptible to its effects.

30. Option (2) is correct.

The Amuktamalyada, a Telugu work on statecraft written by Krishnadevaraya, the most well-known monarch of Vijayanagara, is a work on statecraft. Regarding traders, he said: A king should develop his nation's harbours and promote trade to the point where horses, elephants, rare stones, sandalwood, pearls, and other goods can be freely imported. The Vijayanagara Empire was ruled by Krishnadevaraya between 1509 and 1530. He oversaw the Vijayanagara empire at its height as the third king of the Tuluva Dynasty.

31. Option (1) is correct.

Chinaman is regarded as a left-arm bowler's leg-spin delivery. A Chinaman delivery, also known as left-arm unorthodox spin, typically spins sharply because of the spin created by the wrist.

32. Option (3) is correct.

From the given options, only "acceptability" is not a feature of food security in India. Food security has three components, viz., availability, access, and absorption. The three are interconnected. Food security means availability, accessibility, and affordability of food to all people at all times. The attainment of food security involves eliminating current hunger and reducing the risk of future hunger.

33. Option (3) is correct.

The collision of convergent plate boundaries results in the formation of mountains. When two landmasses collide, orogeny, or mountain building, occurs. This may occur when the continental and oceanic crust clash or when the continental and oceanic crust collide (continent-continent collision).

34. Option (1) is correct.

The FIDE online Chess Olympiad has been jointly won by India and Russia. After at least two games in the second match were impacted by internet connectivity problems, the world chess governing organisation FIDE declared both finalists as joint winners. After the 2020 Online FIDE Chess Olympiad final was disrupted by internet outages, India and Russia were crowned joint champions. Nihal Sarin and Divya Deshmukh of India lost out on time in the final due to a server disconnect, and Russia had initially crowned the winner. India had filed an appeal in opposition to the contentious choice.

35. Option (1) is correct.

Every year on January 24, India observes National Girl Child Day. The Ministry of Women and Child Development originally established National Girl Child Day in 2008 with the goals of Raising public awareness of all the injustices that girls experience in the nation. Raising awareness of a girl child's rights raises awareness of the value of nutrition, health and education for females.

36. Option (3) is correct.

Vice President of India Gulzarilal Nanda never held that position. He held the positions of head of the Bombay Housing Board and secretary of the Indian Labor Welfare Organisation. The National Planning Committee included him among its members. He played a significant role in the development of the Indian National Trade Union Congress and later served as its president. Following the passing of Jawaharlal Nehru in 1964 and Lal Bahadur Shastri in 1966, he served as India's former prime minister for two brief stints. Nanda received the Bharat Ratna Award from the Indian government in 1997.

37. Option (3) is correct.

Tapovan Vishnugarh Power Plant is a 520 MW run-of-river project being built by NTPC on the Dhauliganga River in Uttarakhand's Chamoli district. The Tapovan Vishnugarh Hydroelectric Project will include four 130 MW Pelton turbines and a Dhauliganga River barrage. The barrage will be 200 metres long and 22 metres high, with four 12 metres high and 14 metres wide gates.

38. Option (1) is correct.

Lord Vishnu, according to the Puranas, took the form of a boar to save the earth, which had drowned in water. Vishnu in the form of Varaha – a Madhya Pradesh image. This magnificent statue depicts a particular form of Vishnu, Varaha or the Boar. The concept of Bhakti is present in the Bhagavad Gita, a Hindu sacred text included in the Mahabharata. In this, Krishna, the Lord, requests that Arjuna, His devotee and friend, abandon all religions and seek refuge in him because only he can deliver Arjuna from all evil. This form of worship gradually spread throughout the country.

39. Option (1) is correct.

The city of Hyderabad was ruled by seven Nizams, also known as Asaf Jahis; the seventh, Asaf Jah Nawab Mir Osman Ali Khan Bahadur, reigned until 1948. From 1724 to 1948, Hyderabad experienced tremendous cultural and economic growth. After India gained independence in August 1947, Nizam chose not to join the Indian Union. However, his reign came to an end in September 1948, when the Indian Army launched Operation Polo under the command of Sardar Vallabhbhai Patel, India's then-Home Minister and Deputy Prime Minister.

40. Option (2) is correct.

Ranikhet is located at an elevation of 1,869 metres above sea level, with views of the western Himalayan peaks. Ranikhet is a hill station and cantonment town in the Indian state of Uttarakhand's Almora district. The revered temples near Ranikhet include Mankameshwar, Haidakhan Temple, Jhula Devi, and Ram Mandir.

41. Option (2) is correct.

The GST Council is a constitutional body established by Article 279A. It was established by the Constitution (One Hundred and First Amendment) Act of 2016 and makes recommendations to the Union and State Governments on Goods and Services Tax issues. The GST Council is chaired by the Union Finance Minister, and other members include the Union State Ministers of Revenue or Finance, as well as State Ministers in charge of Finance or Taxation.

42. Option (2) is correct.

The Doughnut, also known as Doughnut Economics, is a visual framework for sustainable development that is shaped like a doughnut or lifebelt and combines the concept of planetary boundaries with the complementary concept of social boundaries. It envisions a world in which people and the environment can coexist in harmony. The name comes from the shape of the diagram, which is a disc with a hole in the centre.

43. Option (1) is correct.

The formal entrance to the Iwan is known as Pishtaq, a Persian term for a portal projecting from a building's facade and typically decorated with calligraphy bands, glazed tilework, and geometric designs. Iwans are commonly associated with Islamic architecture; however, the form is Iranian in origin and was invented and fully developed in Mesopotamia around the 3rd century CE, during Persia's Parthian period.

44. Option (3) is correct.

Mata Prasad, the former governor of Arunachal Pradesh, died at the age of 95. In 1988–89, he was a minister in the Congress government of Uttar Pradesh, and in 1993, he was appointed governor of Arunachal Pradesh. He is a retired officer from the Indian Administrative Service. In 2012, the Government of India awarded him the third highest civilian honour, the Padma Bhushan, for his contributions to civil service.

45. Option (3) is correct.

Telecommunications Consultants India Limited has appointed Shri Sanjeev Kumar, Director (Technical), MTNL, as Chairman-cum-Managing Director. Sanjeev Kumar's appointment has been approved by the Cabinet

Appointments Committee (ACC). He has been appointed to the post for five years from the date of joining the post or until the age of superannuation or until further orders, whichever is earlier, according to an order of the Department of Personnel and Training (DoPT). He is currently employed as the Director (Technical) of Mahanagar Telephone Nigam Limited (MTNL).

46. Option (3) is correct.

Bolak-aat is a Karnataka folk dance form. Lord Vishnu is said to have performed 30 different dance forms on his mission to kill the evil spirit 'Bhasmasura,' and 'Bolkat' is one of them. The dancers are dressed in traditional Kodava attire and are performed in an open field by Kodava men in the back of an oil lamp. On one hand, the performers hold 'chavari,' Yak-animal fur and on the other, 'Kodava,' (Sickle). The dance is known as 'kattiyata' when only the sickle is used. The 'Dudi' is the musical instrument used in this dance. The dance's theme is based on the heroic exploits of the Kodava gods and goddesses.

47. Option (1) is correct.

The halogens are a group of five or six chemically related elements in the periodic table: fluorine, chlorine, bromine, iodine (I), and astatine. In their outermost shell, halogens have 7 electrons. The boiling points of halogens tend to move down the group as the strength of van der Waals forces increases with atom size and relative atomic mass. At standard temperature and pressure, halogens are the only periodic table group that contains elements in all three familiar states of matter (solid, liquid, and gas). Halogens are highly reactive elements that, in sufficient quantities, can be harmful or even fatal to biological organisms. The high electronegativity and effective nuclear charge cause this reactivity.

48. Option (3) is correct.

Kepler's laws of planetary motion, published between 1609 and 1619 by Johannes Kepler, describe the orbits of planets around the Sun. The laws altered Nicolaus Copernicus' heliocentric theory, replacing circular orbits and epicycles with elliptical trajectories, and explained how planet velocities varied. According to the three laws, a planet's orbit is an ellipse with the Sun at one of the two centres. A line segment connecting a planet and the Sun crosses equal areas at equal times. The square of a planet's orbital period is proportional to the cube of its semi-major axis length.

49. Option (4) is correct.

Ramachandra Guha's book "Democrats and Dissenters" was written. The book contains 16 essays on a variety of topics, including India's relations with its neighbours, freedom of expression, and tribal discrimination. Ramachandra is an Indian historian, writer, and public intellectual who studies social, political, contemporary, environmental, and cricket history, as well as economics.

50. Option (4) is correct.

Among the above-mentioned vitamins, vitamin C is a water-soluble vitamin. Vitamins A, D, E and K are fat-soluble vitamins. Ascorbic acid is another name for vitamin C. Vitamin C protects cells from free radical damage. Oranges, lemons and tomatoes are high in vitamin C. Fat-soluble vitamins are abbreviated as KEDA.

Quantitative Aptitude

51. Option (4) is correct.

$$\text{We have, } 2x - \frac{3}{x} = 2$$

$$\text{Squaring both the sides, } \left(2x - \frac{3}{x}\right)^2 = 2^2$$

$$\Rightarrow 4x^2 + \frac{9}{x^2} - 2 \times 2x \times \frac{3}{x} = 4$$

$$\Rightarrow 4x^2 + \frac{9}{x^2} = 4 + 12$$

$$\Rightarrow 4x^2 + \frac{9}{x^2} = 16$$

Squaring both the sides,

$$\Rightarrow \left(4x^2 + \frac{9}{x^2}\right)^2 = 16^2$$

$$\Rightarrow 16x^4 + \frac{81}{x^4} + 2 \times 4x^2 \times \frac{9}{x^2} = 16^2$$

$$\Rightarrow 16x^4 + \frac{81}{x^4} = 256 - 72 = 184$$

52. Option (4) is correct.

Number of trees planted in Ahmedabad from 2016 to 2020 = 2,500 + 2,300 + 2,400 + 1,950 + 2,100 = 11,250

Number of trees planted in Pune from 2016 to 2020 = 1,800 + 1,850 + 1,840 + 1,900 + 2,000 = 9,390

Required difference = 11,250 - 9,390 = 1,860

53. Option (1) is correct.

Arrears taken by Amit and Suresh together = 6,000 + 6,300 = 12,300

Arrears taken by Nitin and Varun together = 5,000 + 7,500 = 12,500

Required percentage

$$= \frac{12,500 - 12,300}{12,500} \times 100 = 1.6\%$$

54. Option (3) is correct.

Total number of students enrolled in institutes A, C and E in 2016 = 135 + 138 + 147 = 420

Total number of students enrolled in institutes B and D in 2018 = 142 + 138 = 280

Required ratio = 420 : 280 = 3 : 2

55. Option (1) is correct.

We have, $x + y + z = 2$

$$xy + yz + zx = -11$$

we know, $x^3 + y^3 + z^3 - 3xyz$

$$= (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$$

$$= (x + y + z)(x^2 + y^2 + z^2 + 2xy + 2yz + 2zx - 3xy - 3yz - 3zx)$$

$$= (x + y + z)((x + y + z)^2 - 3(xy + yz + zx))$$

$$= (2)(2^2 - 3(-11)) = 2(4 + 33) = 74$$

56. Option (3) is correct.

Let the age of mother = $7x$

The age of daughter = x

As per the question,

$$\Rightarrow \frac{7x + 5}{x + 5} = \frac{4}{1}$$

$$\Rightarrow 7x + 5 = 4x + 20$$

$$\Rightarrow 3x = 15$$

$$\Rightarrow x = 5$$

Required difference = $7x - x = 6x = 6 \times 5 = 30$

57. Option (2) is correct.

Let the cost price = ₹ x

It gets a loss when selling price is ₹ 216.

$$\text{Loss} = x - 216$$

It gains when selling price is ₹ 246.80.

$$\text{Gain} = 246.80 - x$$

According to the question,

$$246.80 - x = (x - 216) \times \frac{120}{100}$$

$$\Rightarrow 2,468 - 10x = 12x - 2,592$$

$$\Rightarrow 22x = 5,060$$

$$\Rightarrow x = 230$$

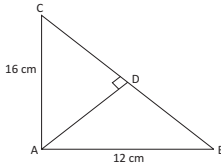
So, the cost price = ₹ 230
 Loss percentage = $\frac{230 - 220.75}{230} \times 100 = 4\%$

58. Option (4) is correct.

We have,
 AB = 12 cm and AC = 16 cm

By Pythagoras theorem in $\triangle ABC$,

$$\begin{aligned} BC^2 &= AB^2 + AC^2 \\ \Rightarrow BC^2 &= 12^2 + 16^2 \\ \Rightarrow BC^2 &= 144 + 256 \\ \Rightarrow BC &= \sqrt{400} = 20 \end{aligned}$$



As shown in figure, $\triangle ABC$ and $\triangle DBA$ are similar triangle as all the angles are same.

$$\begin{aligned} \text{So, } \frac{AB}{DB} &= \frac{BC}{AB} = \frac{AC}{DA} \\ \Rightarrow \frac{12}{DB} &= \frac{20}{12} \\ \Rightarrow DB &= \frac{144}{20} = 7.2 \text{ cm} \end{aligned}$$

59. Option (4) is correct.

Let the efficiency of A = $4x$
 Then, efficiency of B = $5x$
 A can complete the work in 15 days.
 So, total work = $15 \times 4x = 60x$
 4 days work by both of them = $4(4x + 5x) = 36x$
 Remaining work = $60x - 36x = 24x$
 C can complete the remaining work in 8 days.

So, efficiency of C = $\frac{24x}{8} = 3x$

\therefore Time taken by A, B and C together to finish the work
 = $\frac{60x}{5x + 4x + 3x} = 5$ days

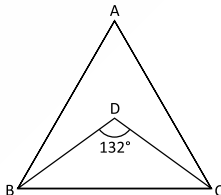
60. Option (2) is correct.

We have,
 Principal amount (P) = ₹ 7,500
 Total amount (A) = ₹ 9,075
 Rate of interest (r) = 10% p.a.
 Let the sum invested for n years.
 As we know,

$$\begin{aligned} A &= P \left(1 + \frac{r}{100}\right)^n \\ \Rightarrow 9,075 &= 7,500 \left(1 + \frac{10}{100}\right)^n \\ \Rightarrow \frac{9,075}{7,500} &= \left(\frac{11}{10}\right)^n \\ \Rightarrow \left(\frac{121}{100}\right) &= \left(\frac{11}{10}\right)^n \\ \Rightarrow \left(\frac{11}{10}\right)^2 &= \left(\frac{11}{10}\right)^n \\ \text{So, } n &= 2 \\ \text{Simple interest} &= \frac{P \times R \times T}{100} \\ &= \frac{7,500 \times 10 \times 2}{100} = ₹ 1,500 \end{aligned}$$

61. Option (2) is correct.

We have,
 $\angle BDC = 132^\circ$
 By using bisector property,
 $\angle BDC = 90^\circ + \frac{1}{2} \angle A$



$$\Rightarrow \frac{1}{2} \angle A = 132^\circ - 90^\circ$$

$$\Rightarrow \frac{1}{2} \angle A = 42^\circ$$

$$\Rightarrow \angle A = 84^\circ$$

62. Option (4) is correct.

MRP of the article = ₹ 10,000

As per the question,

$$10,000 \times \frac{80}{100} \times \frac{90}{100} \times \frac{(100 - k)}{100} = 6120$$

$$\Rightarrow 100 - k = \frac{6,120}{72}$$

$$\Rightarrow 100 - k = 85$$

$$\Rightarrow k = 100 - 85 = 15$$

So, selling price after allowing 35% discount

$$= 10,000 \times \frac{65}{100} = ₹ 6,500$$

63. Option (1) is correct.

We have,

$$\begin{aligned} 1 + 2\tan^2 \theta + 2\sin \theta \sec^2 \theta &= 1 + 2 \frac{\sin^2 \theta}{\cos^2 \theta} + 2 \frac{\sin \theta}{\cos^2 \theta} \\ &= 1 + 2 \frac{\sin^2 \theta}{\cos^2 \theta} + 2 \frac{\sin \theta}{\cos^2 \theta} \\ &= \frac{\cos^2 \theta + 2\sin^2 \theta + 2\sin \theta}{\cos^2 \theta} \\ &= \frac{1 - \sin^2 \theta + 2\sin^2 \theta + 2\sin \theta}{1 - \sin^2 \theta} \\ &= \frac{1 + \sin^2 \theta + 2\sin \theta}{(1 - \sin \theta)(1 + \sin \theta)} \\ &= \frac{(1 + \sin \theta)^2}{(1 - \sin \theta)(1 + \sin \theta)} \\ &= \frac{(1 + \sin \theta)}{(1 - \sin \theta)} \end{aligned}$$

64. Option (1) is correct.

We have,
 AB = 6 cm
 CD = x cm
 PQ = 7 cm

Radius of circle AO = CO = 5 cm

Perpendicular from centre on chord bisects them.

So, AP = BP = 3 cm

And CQ = DQ = $\frac{x}{2}$ cm

In $\triangle AOP$ by Pythagoras,

$$\Rightarrow AO^2 = OP^2 + AP^2$$

$$\Rightarrow 25 = OP^2 + 9$$

$$\Rightarrow OP^2 = 16$$

$$\Rightarrow OP = 4$$

From the above figure, OQ = PQ - OP = 7 - 4 = 3 cm

In $\triangle OQC$ by Pythagoras,

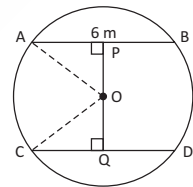
$$\Rightarrow OC^2 = CQ^2 + OQ^2$$

$$\Rightarrow 25 = CQ^2 + 9$$

$$\Rightarrow CQ^2 = 16$$

$$\Rightarrow CQ = 4$$

So $x = 4 \times 2 = 8$



65. Option (2) is correct.

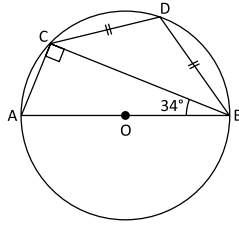
In above figure,

$$\angle ABC = 34^\circ$$

$$\angle ACB = 90^\circ$$

Let $\angle DBC = x^\circ$

So, $CD = DB$
 $\angle DBC = \angle BCD = x^\circ$
 In cyclic quadrilateral ABCD,
 $\angle ACD + \angle DBA = 180^\circ$
 $\Rightarrow 90^\circ + x + x + 34^\circ = 180^\circ$
 $\Rightarrow 2x + 124^\circ = 180^\circ$
 $\Rightarrow x = \frac{56^\circ}{2} = 28^\circ$

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

Sum of 22 numbers = $37.5 \times 22 = 825$
 Sum of first 12 numbers = $40.6 \times 12 = 487.2$
 Sum of last 12 numbers = $35.4 \times 12 = 424.8$
 Let the 11th and 12th numbers be x and y .

From the above 3 equations,
 $(x + y) = 487.2 + 424.8 - 825$
 $\Rightarrow (x + y) = 87$

Required average = $\frac{825 - 87}{20} = 36.9$

67. Option (3) is correct.

We have,

$$\Rightarrow \frac{\operatorname{cosec} \theta + \cot \theta}{\operatorname{cosec} \theta - \cot \theta} = 7$$

$$\Rightarrow \frac{\frac{1}{\sin \theta} + \frac{\cos \theta}{\sin \theta}}{\frac{1}{\sin \theta} - \frac{\cos \theta}{\sin \theta}} = 7$$

$$\Rightarrow \frac{\frac{1 + \cos \theta}{\sin \theta}}{\frac{1 - \cos \theta}{\sin \theta}} = 7$$

$$\Rightarrow 1 + \cos \theta = 7 - 7 \cos \theta$$

$$\Rightarrow 8 \cos \theta = 6$$

$$\Rightarrow \cos \theta = \frac{3}{4}$$

we know that, $\sin^2 \theta = 1 - \cos^2 \theta$

$$= 1 - \left(\frac{3}{4}\right)^2 = \frac{7}{16}$$

$$\text{Now, } \frac{4 \sin^2 \theta - 1}{4 \sin^2 \theta + 5} = \frac{4 \times \frac{7}{16} - 1}{4 \times \frac{7}{16} + 5} = \frac{\frac{7}{4} - 1}{\frac{7}{4} + 5} = \frac{3}{27} = \frac{1}{9}$$

68. Option (1) is correct.

If given number $5x423y$ is divisible by 88, then it must be divisible by 11 and 8 both.

By divisibility rule of 11,

$$\Rightarrow 5 + 4 + 3 = x + 2 + y$$

$$\Rightarrow x + y = 10 \quad \dots(1)$$

By divisibility rule of 8,

Last 3 digits $23y$ must be divisible by 8

$$\text{So, } y = 2$$

And from equation (1),

$$x = 8$$

The value of $(5x - 8y) = (5 \times 8 - 2 \times 8) = 24$

69. Option (2) is correct.

Let the speed at which it covers first 75 km be x km/hr.

As per the question,

$$\Rightarrow \frac{75}{x} + \frac{90}{x+10} = 3$$

$$\Rightarrow \frac{75x + 750 + 90x}{x^2 + 10x} = 3$$

$$\Rightarrow 165x + 750 = 3x^2 + 30x$$

$$\Rightarrow 3x^2 - 135x - 750 = 0$$

$$\Rightarrow x^2 - 45x - 250 = 0$$

$$\Rightarrow (x - 50)(x + 5) = 0$$

$$x = 50 \text{ (+ve value of } x)$$

$$\text{Required time} = \frac{300}{50} = 6 \text{ hrs}$$

70. Option (2) is correct.

We have,

$$\Rightarrow \frac{52 - 1170 \div 26 + 13 \times 2}{2 + 1 \frac{1}{8} \text{ of } 2 - 1 \frac{1}{4}}$$

$$= \frac{52 - 45 + 13 \times 2}{2 + \frac{9}{4} - \frac{5}{4}} = \frac{52 - 45 + 26}{2 + 1}$$

$$= \frac{52 - 45 + 26}{3} = \frac{33}{3} = 11$$

71. Option (4) is correct.

We have,

$$3 \cos^2 \theta - 4 \sin \theta + 1 = 0$$

$$\Rightarrow 3(1 - \sin^2 \theta) - 4 \sin \theta + 1 = 0$$

$$\Rightarrow 3 - 3 \sin^2 \theta - 4 \sin \theta + 1 = 0$$

$$\Rightarrow 3 \sin^2 \theta + 4 \sin \theta - 4 = 0$$

$$\Rightarrow 3 \sin^2 \theta + 6 \sin \theta - 2 \sin \theta - 4 = 0$$

$$\Rightarrow (3 \sin \theta - 2)(\sin \theta + 2) = 0$$

$$\text{So, } \sin \theta = \frac{2}{3} \quad (0 < \theta < 90^\circ)$$

$$\cos \theta = \sqrt{1 - \sin^2 \theta} = \sqrt{1 - \left(\frac{2}{3}\right)^2} = \frac{\sqrt{5}}{3}$$

$$\text{Now, } \tan \theta + \sec \theta = \frac{\sin \theta}{\cos \theta} + \frac{1}{\cos \theta}$$

$$= \frac{1 + \sin \theta}{\cos \theta}$$

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

72. Option (3) is correct.

Let the income of A be ₹ A, B be ₹ B and C be ₹ C, respectively

Income of B is 137.5% more than that of C

$$\Rightarrow B = C \times \frac{(100 + 137.5)}{100}$$

$$\Rightarrow B = C \times \left(\frac{2,375}{1,000}\right)$$

$$\Rightarrow B = \frac{19}{8} C \quad \dots(1)$$

Income of A is 30% less than the income of B

$$\Rightarrow A = B \times \frac{(100 - 30)}{100}$$

$$\Rightarrow A = B \times \frac{70}{100}$$

Substituting the value of B from Eq. (1)

$$\Rightarrow A = \left(\frac{19C}{8}\right) \times \frac{7}{10}$$

$$\Rightarrow A = \frac{133C}{80} \quad \dots(2)$$

Difference between B's income and A's income = ₹ 28,500

$$\begin{aligned} \Rightarrow B - A &= 28,500 \\ \text{Substituting the values of A and B from equation (1) and (2)} \\ \Rightarrow \frac{19C}{8} - \frac{133C}{80} &= 28,500 \\ \Rightarrow \frac{(190C - 133C)}{80} &= 28,500 \\ \Rightarrow \frac{57C}{80} &= 28,500 \\ \Rightarrow C &= \frac{(28,500 \times 80)}{57} \\ \Rightarrow C &= 500 \times 80 \\ \Rightarrow C &= ₹ 40,000 \end{aligned}$$

73. Option (4) is correct.

Total students enrolled in institute C in 2013, 2014 and 2017 = 125 + 120 + 140 = 385

Total students enrolled in all 5 institutes in 2018 = 140 + 142 + 135 + 138 + 145 = 700

$$\text{Required percentage} = \frac{385}{700} \times 100 = 55\%$$

74. Option (3) is correct.

We have,

$$\begin{aligned} a^3 + b^3 &= 405 \\ a + b &= 9 \end{aligned}$$

we know that,

$$\begin{aligned} a^3 + b^3 &= (a + b)(a^2 + b^2 - ab) \\ \Rightarrow 405 &= (9)(a^2 + b^2 - ab) \\ \Rightarrow 45 &= (a + b)^2 - 3ab \\ \Rightarrow 45 &= (9)^2 - 3ab \\ \Rightarrow 45 &= 81 - 3ab \\ \Rightarrow 3ab &= 81 - 45 \\ \Rightarrow ab &= 12 \end{aligned}$$

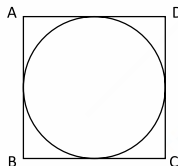
75. Option (4) is correct.

We have, Area of square = 784 cm²

$$\text{Side} = \sqrt{\text{area}} = \sqrt{784} = 28$$

$$\text{Radius of circle} = 28/2 = 14 \text{ cm}$$

$$\text{Area of circle} = \pi r^2 = \frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$$



English Comprehension

76. Option (4) is correct.

The blank will be filled with an adjective describing a souvenir.

- (1) 'Generous' means showing a readiness to give more of something, especially money, than is strictly necessary or expected.
- (2) 'Considerable' means notably large in size, amount, or extent. A souvenir isn't expected to be very large.
- (3) 'Bountiful' means abundant. A souvenir cannot be abundant.
- (4) 'Voluminous' refers to something that is very lengthy and detailed.

77. Option (3) is correct.

- (1) 'Will' shows certainty and not a wish. Also, it is used in future tense.
- (2) 'Has' is used with a third person pronoun. It is present simple tense. Also, it is not used to express a wish.
- (3) 'I wish I had' is used to express present wishes.
- (4) 'Have' shows possession and is not used with the verb 'wish'. Also, it is used in present simple tense.

78. Option (4) is correct.

'Invade' is to enter a country by force with large numbers of soldiers in order to take possession of it.

- (1) 'Attack' is to try to hurt or defeat using violence.
- (2) 'Assault' is a violent attack.
- (3) 'Seize' is to take something quickly and keep or hold it.
- (4) 'Surrender' is to accept defeat. Of the given options, this is the closest antonym of the given word.

79. Option (4) is correct.

'Much' is an adverb, meaning a great amount or quantity of something. 'Too' is also an adverb, meaning excessively.

- (1) 'Too much' means intolerable. So, 'noisy' cannot be intolerable.
- (2) 'Too noisy' means excessively noisy. So, option (2) is the correct answer.
- (3) 'Much too much' is not a correct phrase.
- (4) 'Much' is used for a great amount or quantity of something. 'Noisy' is a quality and hence, cannot be used with 'much'.

80. Option (4) is correct.

'To cut a long story short' is to explain what happened in a few words, without giving all the details.

81. Option (1) is correct.

'Transmit' is to transfer or pass on something from one person or place to another.

- (1) 'Convey' is to transport or carry to a place. It is a synonym of the given word.
- (2) 'Accept' is to consent to receive or undertake something offered.
- (3) 'Catch' is intercept and hold something which has been thrown or dropped.
- (4) 'Receive' is to be given, presented with, or paid something.

82. Option (1) is correct.

This is an interrogative sentence. Hence, no conjunction is used, and the 'question-word' acts as a joining clause.

- (1) Past simple tense changes into past perfect tense.
- (2) As the 'question-word' is acting as a joining clause, no other conjunction is used.
- (3) The relative pronoun 'whom' should stay just as it is. Also, the sentence is in present perfect tense, instead of past perfect tense.
- (4) This is past simple tense.

83. Option (2) is correct.

The subject of the sentence is 'it', which is singular. So, the verb should also be singular, while the verb used in the sentence is plural 'have'. So, the error is in option (2). The correct phrase will be 'It has been only'.

84. Option (1) is correct.

Numerous' means great in number.

- (1) 'Several' means more than two but not many.
- (2) 'Numbered' is to give something a number in a series and usually to write this number on it.
- (3) 'Totalled' is to amount to something or to add up.
- (4) 'Few' means a small number of.

85. Option (1) is correct.

'Toxic' means poisonous.

- (1) 'Healthy' means having, showing, or encouraging good health. It is the antonym of the given word.
- (2) 'Lethal' means sufficient to cause death.
- (3) 'Harmful' means causing or likely to cause harm.
- (4) 'Venomous' describes something that secretes venom, or is capable of injecting venom by means of a bite or sting.

86. Option (2) is correct.

- (1) 'Anxious' is feeling or showing worry, nervousness, or unease about something with an uncertain outcome.
- (2) The correct spelling is 'vicious', which means deliberately cruel or violent.
- (3) 'Mimic' is to imitate someone or their actions or words, especially in order to entertain or ridicule.
- (4) 'Moisture' is water or other liquid diffused in a small quantity as vapour, within a solid, or condensed on a surface.

87. Option (4) is correct.

The sentence is looking for the verb used with 'fuss'.

- (1) 'Do' is to carry out. It cannot be used with the word 'fuss'.
- (2) 'Generate' is to produce or create. One cannot generate fuss.
- (3) 'Cause' is to make something happen. It is usually used in a negative manner.

(4) 'To make fuss' is to become angry and complain about something.

88. Option (3) is correct.

'Full of beans' is to be lively or to be in high spirits.

89. Option (3) is correct.

(1) 'Infiltrator' is a person who secretly becomes part of a group in order to get information or to influence the way the group thinks or behaves.

(2) 'Spy' is a person employed by a government or other organization to secretly obtain information on an enemy or competitor.

(3) 'Eavesdropper' is a person who listens secretly to what other people are saying.

(4) 'Secret Agent' is a spy acting for a country.

90. Option (2) is correct.

Sentence B introduces the blind man, who is referred to as 'he' in the remaining sentences. So, sentence B should begin the sequence. So, the correct sequence is BDAC.

91. Option (1) is correct.

Apostrophe is used either to show possession or contraction. Neither use is present over here. So, there is error in option

(1). The correct phrase will be 'the teachers'.

92. Option (4) is correct.

(1) 'Shed' is a larger structure for storing or maintaining vehicles or other machinery.

(2) 'Airport' is a complex of runways and buildings for the take-off, landing, and maintenance of civil aircraft, with facilities for passengers.

(3) 'Barn' is a large farm building used for storing grain, hay, or straw or for housing livestock.

(4) 'Hangar' is a large building in which aircraft are kept.

93. Option (1) is correct.

Sentence B introduces the subject of the paragraph, Penicillin. So, sentence B should begin the sequence.

94. Option (2) is correct.

The subject and the object of the active voice are interchanged in passive voice. The passive form of simple past tense active voice sentences is 'Subject + was/were + past participle + by Object'. The object, performing the action, can be skipped if it is not considered important for the meaning of the sentence.

(1) The subject is plural and hence, there is a subject-verb disagreement. Also, the verb is of past simple tense rather than past participle.

(2) This sentence is correct according to the mentioned form.

(3) The sentence is grammatically incorrect as after 'are', we cannot use the base form of the verb.

(4) This sentence is grammatically incorrect. Also, the subject of the passive sentence should be 'traveller's cheques' and not 'someone'.

95. Option (4) is correct.

(1) 'Arbitrary' means based on random choice or personal whim, rather than any reason or system.

(2) 'Scrutinise' is to examine or inspect closely and thoroughly.

(3) 'Cerebral' means intellectual rather than emotional or physical.

(4) The correct spelling of the word is 'withdrawal', which means the action of withdrawing something.

96. Option (3) is correct.

The sentence talks of a benefit of studying in terms of one's knowledge.

(1) Studying doesn't result in 'exchange' of knowledge.

(2) 'Narrow' means limited in extent or scope. This is a negative tone word while we are looking for a positive word.

(3) 'Expand' is to become or make larger or more extensive. This fits in the context.

(4) Knowledge is not converted or doesn't change its form because of studying.

97. Option (2) is correct.

This blank refers to another benefit of studying in terms of one's point of view.

(1) 'Backwardness' is the state of having made less progress than is normal or expected. This word has a negative tone while we need a positive tone word.

(2) 'Transformation' is a marked change in form, nature, or appearance. The sentence suggests that one's entire point of view changes tremendously when one studies.

(3) 'Succession' is a number of people or things of a similar kind following one after the other. It doesn't fit the context.

(4) One's point of view cannot be expanded. It can only be modified or changed.

98. Option (2) is correct.

The blank talks of something getting better because of higher education. Also, it should be in line with ideas as both are mentioned to improve with higher education.

(1) 'Luck' cannot be related with education.

(2) 'Outlook' refers to one's point of view, which is improved with higher education.

(3) 'Scope' means extent. It is very ambiguous and hence, incorrect.

(4) 'Routine' is a sequence of actions regularly followed. It doesn't fit the context.

99. Option (3) is correct.

The entire paragraph has a positive tone. The blank mentions something that is related to society.

(1) 'Elaboration' means the process of developing or presenting a theory, policy, or system in further detail. Society isn't elaborated.

(2) 'Ripening' is to become or make ripe or mature. Society will not ripen.

(3) 'Development' is a specified state of growth or advancement. This fits the context as the society will develop due to better outlook and ideas of people.

(4) 'Maturity' is the state, fact, or period of being mature. It is the same as option (2).

100. Option (2) is correct.

The sentence talks of an improved outlook and societal development. So, the blank should be in line with these two.

(1) 'Posture' is the position in which someone holds their body when standing or sitting. It is irrelevant to the context.

(2) 'Perspective' means a point of view.

(3) 'Prejudice' is preconceived opinion that is not based on reason or actual experience. Also, it is negative tone, misaligned with the positive tone of the paragraph.

(4) 'Proportion' is the relationship of one thing to another in terms of quantity, size, or number; ratio. It is irrelevant to the context.