STAFF SELECTION COMMISSION

COMBINED HIGHER SECONDARY LEVEL (TIER-I)

SOLVED PAPER

(18th October 2020: Shift-1)

Time Allotted- 1 hour **Max marks-** 200

Important Instructions:-

⇨ This paper contains 100 questions which are divided into 4 sections and each section contains 25 questions.
- ✓ English Language (Basic Knowledge)
- ✓ General Intelligence
- ✓ Quantitative Aptitude (Basic Arithmetic Skill)
- ✓ General Awareness

⇨ There will be 2 marks for each correct answer and also there will be negative marking of 0.50 marks for each wrong answer.
⇨ Each question is compulsory to attempt and there will be no negative marking for unattempted questions.

English Language

1. Select the most appropriate meaning of the given idiom.
Vanish into the air
1. Perpetually postpone **2.** Totally dilute
3. Permanently mix **4.** Completely disappear

2. Select the wrongly spelt word.
1. Selection **2.** Conviction
3. Defenition **4.** Valediction

3. Select the correct passive form of the given sentence.
The students have performed a new version of Shakespeare's 'Macbeth'.
1. A new version of Shakespeare's 'Macbeth' has been performed by the students.
2. Shakespeare's 'Macbeth' have been performed by the new version of the students.
3. Shakespeare's 'Macbeth' has been performed by the new version of the students.
4. A new version of Shakespeare's 'Macbeth' have been performed by the students.

4. Select the correct indirect form of the given sentence.
Shanti asked me, "Why did you keep this smartphone in the bin?"
1. Shanti asked me why I had kept that smartphone in the bin.
2. Shanti asked me why I was keeping that smartphone in the bin.
3. Shanti asked me why I had been keeping that smartphone in the bin.
4. Shanti asked me why I kept that smartphone in the bin.

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.
The internet is fast becoming trusted by (1)_____ children and adults as reliable and accurate (2)_____ of information. Through the internet children now have (3)_____ to an almost endless supply of information and opportunity for (4)_____. However, there can be real risks and dangers for an (5)_____ child.

5. Select the most appropriate option for blank No. 1.
1. often **2.** not only **3.** both **4.** neither

6. Select the most appropriate option for blank No. 2.
1. piece **2.** deposit **3.** source **4.** collection

7. Select the most appropriate option for blank No. 3.
1. gathering **2.** access **3.** ability **4.** easiness

8. Select the most appropriate option for blank No. 4.
1. deliberation **2.** intimation
3. consultation **4.** interaction

9. Select the most appropriate option for blank No. 5.
1. unsupervised **2.** undeveloped
3. unauthorised **4.** unparalleled

10. Select the most appropriate meaning of the given idiom.
Take one's hat off to someone
1. Express anger **2.** Display humility
3. Indicate disapproval **4.** Show admiration

11. Select the word which means the same as the group of words given.
A person who is neither well experienced nor professional
1. Amateur **2.** Proficient **3.** Veteran **4.** Expert

12. Select the most appropriate word to fill in the blank.
I had a broken bone in the hand which the doctor called a _____ and suggested immediate surgery.
1. wound **2.** infection
3. contamination **4.** fracture

13. Select the word which means the same as the group of words given.
Something which is considered to be very important
1. Meagre **2.** Cardinal
3. Scanty **4.** Supplementary

14. Select the most appropriate synonym of the given word.
JOVIAL
1. Judgmental **2.** Joyous **3.** Jealous **4.** Jeering

15. Select the most appropriate option to substitute the underlined segment in the given sentence. If there is no need to substitute it, select 'No improvement'.
<u>As of</u> you are here with me, who cares about the outcome of the issue.
1. So long **2.** No improvement
3. As long to **4.** As long as

16. Select the most appropriate ANTONYM of the given word.
EARTHLY
1. Temperamental **2.** Peripheral
3. Celestial **4.** Temporal

17. Given below are four jumbled sentences. Out of the given options select the one that gives their correct order.
A. One day, a strange crow from the west, landed on one of the branches.
B. There was a large mango tree deep inside a thick forest.
C. The branches were full of leaves, which crackled when the storm blew.
D. Its branches spread in all directions, lobbing a large shadow on the ground.
1. BDCA **2.** BCAD **3.** CDBA **4.** ACDB

18. Given below are four jumbled sentences. Out of the given options select the one that gives their correct order.
A. In the evening, Tejaswini would sing songs praising the Lord.

B. She would go to the Lord's temple twice a day.
C. Tejaswini was known in the village for her devotion to the Lord.
D. In the morning, she would take with her a pot of milk and a bunch of flowers as offering.
1. CADB **2.** DCAB **3.** CBDA **4.** ACDB

19. In the sentence identify the segment which contains the grammatical error.
Thomas is a man of word who have been paying back the borrowed money in instalments.
1. the borrowed money **2.** in instalments
3. Thomas is a man of word **4.** who have been paying back

20. Select the wrongly spelt word.
1. Collaborate **2.** Comemorate
3. Corporate **4.** Conjugate

21. Select the most appropriate word to fill in the blank.
She has shown a great interest towards space science, since her early childhood and a passion to _____ the outer space.
1. elicit **2.** entertain **3.** enlighten **4.** explore

22. In the sentence identify the segment which contains the grammatical error.
Though she was able to finish the work on time, she couldn't do that out in fear.
1. finish the work on time, **2.** she couldn't do that
3. Though she was able to **4.** out in fear

23. Select the most appropriate synonym of the given word.
CHOOSY
1. Productive **2.** Frank **3.** Selective **4.** Tricky

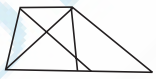
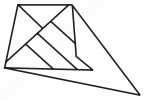
24. Select the most appropriate ANTONYM of the given word.
OBSCURE
1. Ambiguous **2.** Clear **3.** Uncertain **4.** Vague

25. Select the most appropriate option to substitute the underlined segment in the given sentence. If there is no need to substitute it, select 'No improvement'.
Before it was modified, the Law provided with the owner could take possession of the goods at any time.
1. provided that **2.** provided on
3. No improvement **4.** provided as

General Intelligence

26. Rishabh is a 10 year old boy. If his mother is 20 years older than him and 6 years younger than his father, then what is his father's age?
1. 34 years **2.** 26 years **3.** 30 years **4.** 36 years

27. Select the option in which the given figure is embedded. (Rotation is not allowed)

1.  **2.** 
3.  **4.** 

28. In a certain code language, PAGER is written as MIDOO. How will ANGEL be written as in that language?
1. IKDOI **2.** AOIDK **3.** ILVDN **4.** AVIDI

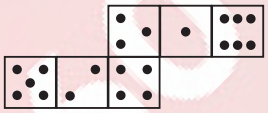
29. In a code certain code language, MUSIC is coded as 60 and TUNE is coded as 56. How will LYRIC be coded as in that language?
1. 62 **2.** 65 **3.** 63 **4.** 67

30. Read the given statements and conclusions carefully. Assuming that the information given in the statement 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 :
1. All doors are teachers.
2. All teachers are cups.
Conclusions :
I. All cups are doors.
II. All doors are cups.
III. All teachers are doors.
IV. Some cups are teachers.
1. Only conclusions I and II follow.
2. Only conclusion I follows.
3. Only conclusions II and IV follows.
4. Only conclusions I and III follows.

31. Select the option that is related to the third number in the same way as the second number is related to the first number.
9 : 121 :: 7 : ?
1. 81 **2.** 102 **3.** 105 **4.** 79

32. Arrange the following words in a logical and meaningful order.
1. Letter **2.** Satellite
3. Telephone **4.** Smartphone
1. 3, 2, 1, 4 **2.** 4, 3, 1, 2 **3.** 1, 3, 4, 2 **4.** 3, 1, 2, 4

33. If the following figure is folded to form a cube, then how many dots will be on the face opposite to the face having 2 dots?



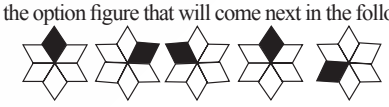
1. 1 **2.** 6 **3.** 4 **4.** 3

34. Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster.
INTEX : EINTX :: SMALL : ?
1. ALMLV **2.** AJKLM **3.** ALLMS **4.** LLAMV

35. Select the combination of letters that when sequentially placed in the blanks of the given letter series will complete the series.
ab _ _ _ cba _ _ _ dd _ _ _ abcd _ _ baa _ _ _ _ cba
1. abeaacdecdeecdd **2.** acbdecdeaacecdd
3. cddabccbadcbcdd **4.** abbaacdeecdecdd

36. Select the combination of letters that when sequentially placed in the blanks of the given letter series will complete the series.
e _ geef _ gg _ ee _ f _ ggg
1. g, f, e, f, f **2.** f, f, f, f, f **3.** f, g, f, g, g **4.** f, f, e, f, f

37. Select the option figure that will come next in the following series.



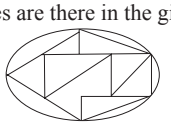
1.  **2.**  **3.**  **4.** 

38. Four letter-pairs have been given, out of which three are alike in some manner and one is different. Select the odd letter pair.
1. BE **2.** AY **3.** US **4.** OM

39. A and B can do a piece of work in 30 days and 18 days respectively. A started the work alone and then after 6 days B joined him till the completion of the work. In how many days has the whole work completed?
1. 17 **2.** 15 **3.** 9 **4.** 12

40. Select the option in which the word share the same relationship as that shared by the given pair of words.
Chair : Furniture
1. Letter paper : Stationary **2.** Pencil : Wood
3. Bicycle : Travel **4.** Seat : Cover

41. How many triangles are there in the given figure?



1. 12 **2.** 10 **3.** 8 **4.** 13

42. Which two signs should be interchanged to make the following equation correct ?

$4 \div 6 + 9 - 48 \times 8 = 27$

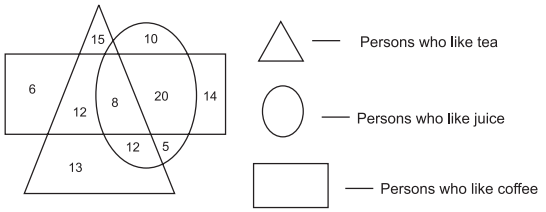
1. + and × **2.** + and – **3.** ÷ and + **4.** ÷ and ×

43. Select the number that can replace the question mark (?) in the following series.

2, 8, 15, 24, 36, 52, ?

1. 83 **2.** 73 **3.** 78 **4.** 63

44. Study the following diagram and answer the given question.



How many people like both tea and coffee, but do NOT like juice?

1. 22 **2.** 12 **3.** 8 **4.** 20

45. Which two signs and numbers should be interchanged to make the following equation correct ?

$16 \times 18 + 2 - 14 \div 3 = 38$

1. 14 and 18, + and – **2.** 16 and 14, – and –

3. 14 and 18, + and × **4.** 16 and 3, – and ÷

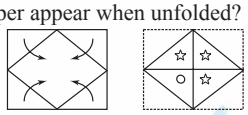
46. Which of the option is the exact mirror image of the given alpha-numeric figure when the mirror is held at the right side?

AHTOITG46Q34

1. ÞƐQ∂ÞƆTIOTHA **2.** ƐÞQ∂ÞƆTIOTHA

3. ÞƐQ∂ÞƆTIOHTA **4.** ÞƐQ∂ÞGTIOTHA

47. A paper is folded and cut as shown in the following figure. How will this paper appear when unfolded?



1.  **2.**  **3.**  **4.** 

48. Sheela introduced Rahul saying,"His sister is the single daughter of my mother". How are Rahul and Sheela related to each other?

1. Uncle-Niece **2.** Cousins

3. Brother-Sister **4.** Son-Mother

49. Select the set in which the number are related in the same way as are the numbers of the set. (2, 6, 32)

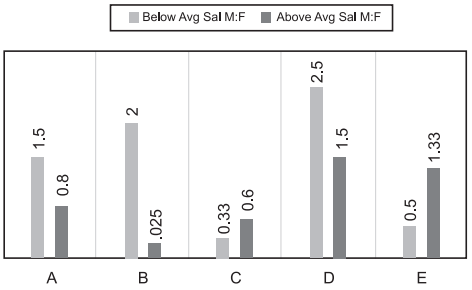
1. (9, 13, 43) **2.** (4, 12, 36) **3.** (8, 18, 80) **4.** (4, 8, 34)

50. In a certain code language, 'APRICOT' is written as 'GLXRIKZ' then how will 'ORANGE' be written in the same code language?

1. LIZMTV **2.** VTNZHM **3.** VTMZIL **4.** LHZMSV

Quantitative Aptitude

51. The following graph shows the data of five companies A, B, C, D, E with the respect to the male and female ratio of employees above, or below the average salary.



If in the company D, the percentage of employees above the average salary is 16% which is equal to 80, then the number of employees below salary are:

1. 520 **2.** 300 **3.** 420 **4.** 470

52. 25 men can complete a task in 16 days. Four days after they started working, 5 more men, with equal workmanship, joined them. How many days will be needed by all to complete the remaining task?

1. 10 days **2.** 12 days **3.** 15 days **4.** 18 days

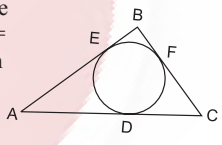
53. If $\frac{4}{1+\sqrt{2}+\sqrt{3}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$, where a, b, c, d are natural numbers, then the value of a + b + c + d is:

1. 1 **2.** 0 **3.** 2 **4.** 4

54. A person purchased 40 items at some price. He sold some items at a profit of 30% by selling them at a price equal to the cost price of 26 items. The remaining items are sold at 18% profit. The total profit percentage is :

1. 27% **2.** 28% **3.** 24% **4.** 25%

55. A circle is inscribed in the triangle ABC whose sides are given as $AB = 10$, $BC = 8$, $CA = 12$ units as shown in the figure. The value of $AD \times BF$ is :



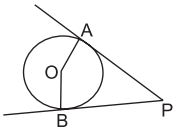
1. 21 units **2.** 15 units

3. 18 units **4.** 16 units

56. If $\left[\left\{\left(\frac{2}{3}\right)^3\right\}^{(2x+3)}\right]^{\frac{-3}{4}} = \left[\left\{\left(\frac{2}{3}\right)^{\frac{2}{3}}\right\}^{(3x+7)}\right]^{\frac{-6}{5}}$ then the value $\sqrt{2-42x}$ is :

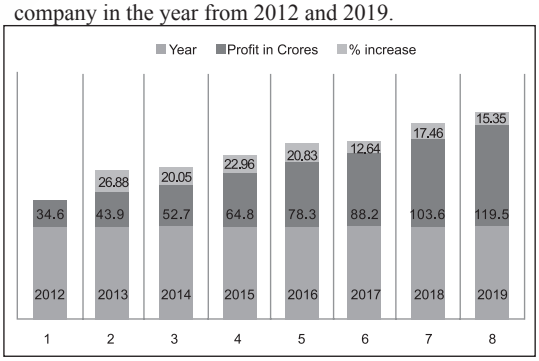
1. 6 **2.** 5 **3.** 3 **4.** 4

57. PA and PB are tangents to the circle and O is the centre of the circle. The radius is 5 cm PO is 13 cm. If the area of the triangle PAB is M, then the value of $\sqrt{\frac{M}{15}}$ is :



1. $\frac{12}{13}$ **2.** $\frac{24}{13}$ **3.** $\sqrt{\frac{12}{13}}$ **4.** $\sqrt{\frac{24}{13}}$

58. The following graph shows the profit (in crore ₹) earned by a company in the year from 2012 and 2019.

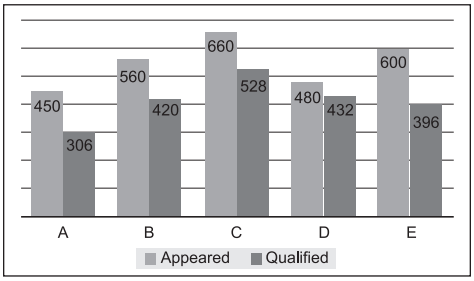


The percentage increase in the profit from the previous year, is greatest in the year :
1. 2017 **2.** 2015 **3.** 2018 **4.** 2013

59. If a sinA + b cosA = c, then a cosA – b sinA is equal to :
1. $\sqrt{a^2+b^2-c^2}$ **2.** $\sqrt{a^2+b^2+c^2}$
3. $\sqrt{a^2-b^2+c^2}$ **4.** $\sqrt{a^2-b^2-c^2}$

60. If the length of a rectangle is increased by 12% and the breadth is decreased by 8%, the net effect on the area is :
1. decrease by 2.6% **2.** increase by 3.04%
3. increase by 2.6 % **4.** decrease by 3.04%

61. The following graph shows the data of the number of candidates that appeared and qualified for a competitive exam from the colleges A, B, C, D, E.



Based on the information, the difference between the percentage of students that qualified, from the colleges B and D is :
1. 18 **2.** 15 **3.** 12 **4.** 20

62. In a 56 liters mixture of milk and water, the ratio of milk to water 7 : 2, some quantity of milk is to be added to the mixture. The quantity of the milk present in the new mixture will be :
1. 16 liters **2.** 40 liters **3.** 48 liters **4.** 56 liters

63. If the value of $\frac{3x\sqrt{y}+2y\sqrt{x}}{3x\sqrt{y}-2y\sqrt{x}}-\frac{3x\sqrt{y}-2y\sqrt{x}}{3x\sqrt{y}+2y\sqrt{x}}$ is same as that of $\sqrt{x}\sqrt{y}$, then which of the following relations between x and y is correct?
1. $9x + 4y = 36$ **2.** $9x + 4y = 24$
3. $9x – 4y = 36$ **4.** $9x – 4y = 24$

64. A man has ₹10,000. He lent a part of it at 15% simple interest and the remaining at 10% simple interest. The total interest he received after 5 years amounted to ₹6,500. The difference between the part of the amounts he lent is :
1. ₹1,750 **2.** ₹2,500 **3.** ₹2,000 **4.** ₹1,500

65. If one side of a triangle is 7 with its perimeter equal to 18, and area equal to $\sqrt{108}$, then the other two sides are :
1. 3.5 and 7.5 **2.** 6 and 5 **3.** 7 and 4 **4.** 3 and 8

66. $\frac{1-\tan A}{1+\tan A}=\frac{\tan 3^\circ\tan 15^\circ\tan 30^\circ\tan 75^\circ\tan 87^\circ}{\tan 27^\circ\tan 39^\circ\tan 51^\circ\tan 60^\circ\tan 63^\circ}$, then the value of cot A is :
1. 2 **2.** 1 **3.** 4 **4.** 3

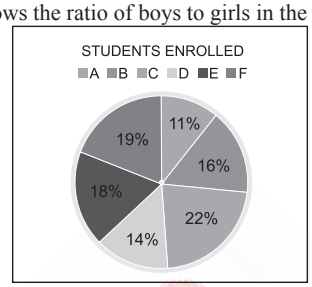
67. If x is the square of the number when $\left(\frac{2}{5}\ of\ 6\frac{1}{4}\div\frac{3}{7}\right)\ of\ 1\frac{2}{7}$ is divided by $11\frac{1}{4}$, then the value of 81 x is :
1. 16 **2.** 4 **3.** 36 **4.** 9

68. Ravi starts for his school from his house on his cycle at 8:20 a.m. If he runs his cycle at a speed of 10 km/h, he reaches his school 8 minutes late, and if he drives the cycle at a speed of 16 km/h, he reaches his school 10 minutes early. The school starts at:
1. 9:40 a.m **2.** 8:40 a.m. **3.** 8:50 a.m. **4.** 9:00 a.m.

69. If a% of 240 is c and c% of a is 117.6, then the value of $a + c$ is :
1. 144 **2.** 260 **3.** 196 **4.** 238

70. A secant is drawn form a point P to a circle so that it meets the circle first at A, then goes through the centre , and leaves the circle at B. If the length of the tangent from P to the circle is 12 cm, and the radius of the circle is 5 cm, then the distance from P to A is:
1. 10 cm **2.** 8 cm **3.** 12 cm **4.** 18 cm

71. The given pie chart shows the percentage of students enrolled into the colleges A, B, C, D, E and F in a city, and the table shows the ratio of boys to girls in the college.



A	9 : 4
B	5 : 9
C	3 : 4
D	7 : 2
E	1 : 4
F	3 : 2

Based on this information, if the total number of students is 9800, then the number of girls in the college B is :
1. 504 **2.** 560 **3.** 280 **4.** 1008

72. A shopkeeper pays 12% of the cost price as tax while purchasing an item whose cost is ₹ 500. He wants to earn a profit of 20% after giving a discount of 16% on the marked price. So,the marked price should be :
1. ₹800 **2.** ₹780 **3.** ₹960 **4.** ₹840

73. If $\tan a = \frac{2}{\sqrt{13}}$, then the value of $\frac{\text{cosec}^2 a+2\sec^2 a}{\text{cosec}^2 a-3\sec^2 a}$ is:
1. 16 **2.** 32 **3.** 14 **4.** 21

74. Which of the following numbers is divisible by 2, 5 and 10 ?
1. 7,20,345 **2.** 149 **3.** 19,400 **4.** 1,25,375

75. Several students have taken an exam. There was an error in the answer key which affected the marks of 48 students, and their average marks reduced from 78 to 66. The average of remaining students increased by 3.5 marks. This resulted the reduction of the average of all students by 4.5 marks. The number of students that attended the exam is :
1. 96 **2.** 84 **3.** 100 **4.** 93

General Awareness

76. Which of the following cities hosted the third edition of the Khelo India Youth Games?
1. Panaji **2.** Cuttack **3.** Guwahati **4.** Patna

77. Who among the following was conferred with the 'Dadasaheb Phalke Award 2019'?
1. Kabir Bedi **2.** Anupam Kher
3. Amitabh Bachchan **4.** Dilip Kumar

78. Who among the following won ICC's '2019 Sir Garfield Sobers Trophy'?
1. Virat Kohli **2.** Ben Stokes
3. Rohit Sharma **4.** Ken Williamson

79. In the context of memory size in computer data storage, one gigabyte is equal to how many megabytes?
1. 1012 MB **2.** 32 MB **3.** 64 MB **4.** 1024 MB

80. Who was the Chairman of the Drafting Committee of the Constituent Assembly of India?
1. BR Ambedkar **2.** Jawaharlal Nehru
3. Dr. Sardar Vallabhbhai Patel **4.** Rajendra Prasad

81. A hard disk is an example of which type of data storage device?
1. Secondary Storage **2.** Tertiary Storage
3. Primary Storage **4.** Offline Storage

82. Who among the following was appointed as the Deputy Governor of Reserve Bank of India (RBI) in January 2020?
1. NS Vishwanathan **2.** BP Kanungo
3. Michael Debabrata Patra **4.** Viral Acharya

83. What was India's overall rank in the medals tally in the 23rd edition of the Asian Athletics Championship?
1. Fourth **2.** Fifth **3.** First **4.** Third

84. The rhythmic rise and fall of ocean water twice in a day is called _____.
1. Wave **2.** Current **3.** Tsunami **4.** Tide

85. Who among the following won the 'Women's World Rapid Chess Championship 2019'?
1. Lei Tingjie **2.** Dronavalli Harika
3. Sopiko Khukhashvili **4.** Koneru Humpy

86. Which of the following articles of the Constitution of India has a provision for financial emergency?
1. Article 365 **2.** Article 330
3. Article 356 **4.** Article 360

87. Which of the following is NOT a credit rating agency in India?
1. RBI **2.** CRISIL **3.** CARE **4.** ICRA

88. Who among the following took charge as India's first Chief of Defence Staff (CDS) on 1 January 2020?
1. Navy Chief Admiral Karambir Singh
2. General Manoj Mukund Naravane
3. General Bipin Rawat
4. Air Chief Marshal Rakesh Kumar Singh Bhadauria

89. The 'Kathakali' dance is a harmonious combination of _____ forms of fine art.
1. five **2.** seven **3.** four **4.** six

90. Which of the following teams won the 129th edition of Durand Cup in August 2019?
1. East Bengal **2.** Mohammedan Sporting Club
3. Mohun Bagan **4.** Gokulam Kerala

91. Under which of the following schemes has the Government of India set up a new institution for development and refinancing activities related to micro units?
1. Pradhan Mantri MUDRA Yojana
2. Pradhan Mantri Sadak Yojana
3. Pradhan Mantri Yojna
4. Pradhan Mantri MNREGA Yojana

92. Tummalapalle, believed to have one of the largest uranium reserves in the world, is situated in which of the following states?
1. Tamil Nadu **2.** Karnataka
3. Telangana **4.** Andhra Pradesh

93. In which of the following years did India come under the direct rule of the British crown?
1. 1888 **2.** 1878 **3.** 1858 **4.** 1868

94. _____ is the term used for breeding of fish in specially constructed tanks and ponds.
1. Horticulture **2.** Agriculture
3. Pisciculture **4.** Viticulture

95. Who among the following scientists invented dynamite?
1. Rudolf Diesel **2.** Benjamin Franklin
3. Alfred Nobel **4.** Thomas Alva Edison

96. Which of the following is a disease caused by protozoa?
1. Small Pox **2.** AIDS **3.** Kala azar **4.** Rabies

97. Which is the largest uranium producing country in the world?
1. Uzbekistan **2.** USA
3. India **4.** Kazakhstan

98. 'Gurpurab' is the most important and sacred festival of the Sikh community. In which of the following months of the Hindu calendar is it celebrated?
1. Jyaistha **2.** Kartik **3.** Shravana **4.** Vaisakha

99. Which of the following statements is correct?
1. The Governor has no power to grant pardon in respect of punishment or sentence inflicted by Court Martial.
2. The President has no power to grant pardon in respect of punishment or sentence inflicted by Court Martial.
3. The Governor has no power to suspend, remit or commute a sentence of death.
4. The Governor has power to grant pardon in case of a death sentence.

100. Which of the following scientists was awarded a Nobel Prize for his services to Theoretical Physics, and especially for his discovery of the Law of the Photoelectric Effect?
1. Ernest Rutherford **2.** Thomas Edison
3. Nikola Tesla **4.** Albert Einstein

Answer Key

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

Answers with Explanations

1. Option (4) is correct.
The meaning of the idiom 'vanish into the air' is to disappear completely in a way that is mysterious. Options 1, 2, and 3, are not the meaning.

2. Option (3) is correct.
Defenition is the wrongly spelled word. The right spelling is definition, which means a description or explanation about something.

3. Option (1) is correct.
The given sentence for conversion is: The students have performed a new version of Shakespeare's 'Macbeth'. Here, the tense in the sentence is present perfect. The verb is 'have performed'.When we convert an active sentence into passive, the subject of the active will become the object in the passive and the object will become the subject. 'A new version of Shakespeare's Macbeth' is the object of the active sentence which is singular in nature. It is turned to be the subject and since the verb is in the present form, we use 'has' and we add the be verb 'been'. Already, the 'verb' is in the participle form. We add the connector 'by' and add the object of the passive sentence. Hence, the answer is: A new version of Shakespeare's 'Macbeth' has been performed by the students.

4. Option (1) is correct.
The given exercise for conversion is: Shanti asked me, "Why did you keep this smartphone in the bin?"
The reporting verb as well as the verb to be reported is the past form. The part to be reported is an interrogative sentence

or a question. When both verbs are in the past form, the verb to be reported ought to be converted to past participle form. 'You' refers to me. So, it must be changed to 'I'. Hence, the answer is: Shanti asked me why I had kept that smartphone in the bin.

5. **Option (3) is correct.**
The object of the sentence is 'children and adults' referring to two groups. Hence, 'both' is the right answer. Often is an adverb of frequency. The option 'not only' is a correlative conjunction that will take 'but also' and it is used to refer to two related pieces of information. So, it cannot be the answer. Neither is used to indicate negation. So, the right answer is both.

6. **Option (3) is correct.**
A source is a place, where something comes or starts from or where something is obtained. We gather information from some place or thing. We are talking about internet that is being used by children as well as adults. Internet cannot be a piece of information; it is a source from which we gather information. It cannot be a deposit or collection. So, the answer is 'source'.

7. **Option (2) is correct.**
The meaning of the word 'access' is 'to be able to use or obtain something.' So, here the writer speaks about the gathering of information using the internet. 'Gathering' is collecting information. Access is using the internet to gather information. 'Ability' and 'easiness' can be eliminated as they do not fit in this place and the right option is 'access'.

8. **Option (4) is correct.**
The meaning of interaction is a situation where two or more people or things communicate with each other or react to each another. Internet provides the situation to students to meet new people, communicate with them, and discuss with them. Deliberation is just a discussion but no collaboration takes place there. Intimation and consultation do not fit in this place. Hence, the right answer is interaction.

9. **Option (1) is correct.**
Internet can mislead children if they are not being observed or watched. Option 2, 3, and 4 will not fit in this place. The right answer is unsupervised in this context. So, the answer is 'unsupervised'.

10. **Option (4) is correct.**
If you say that you take your hat off to someone, you mean that you admire them for an achievement. Options 1, 2, and 3 do not explain the meaning of the idiom 'take one's hat off to someone'.

11. **Option (1) is correct.**
An amateur is a person inexperienced or unskilled in a particular activity. A proficient is a capable, experienced, and talented person. A veteran is an expert. So, a person who is neither well experienced nor professional is called an amateur.

12. **Option (4) is correct.**
A wound is an injury to part of our body, especially a cut.An infection occurs when a microorganism enters a person's body and causes harm.Contamination is the unwanted pollution of something by another substance. A fracture is a break, usually in a bone.

13. **Option (2) is correct.**
Meagre means inadequate and scanty. Scanty means inadequate and meagre. Supplementary means something that is additional. Cardinal means something that is of great importance. So, the one-word substitute of 'Something which is considered to be very important' is cardinal.

14. **Option (2) is correct.**
The synonym of judgemental is subjective. The synonym of joyous is cheerful. The synonym of jealous is envious and the synonym of jeering is scornful. So, joyous is the right synonym for jovial.

15. **Option (4) is correct.**
As long as is a phrase that is used to talk about something continuing for an amount of time. Options 1, and 3 do not fit in this space as they do not convey the relevant meaning in this context. The sentence requires improvement and hence option 2 is eliminated. As long as is the right answer.

16. **Option (3) is correct.**
The antonym of temperamental is calm. The antonym of peripheral is central. The antonym of celestial is earthly. The antonym of temporal is immaterial.

17. **Option (1) is correct.**
B introduces the setting of the plot, the big mango tree. So, it must be the first one. D describes the mango tree and hence, it must be the second one. Further description is given by option C and becomes the third one. D gives information about the arrival of the crow to the thick branches of the tree and so D becomes the final part of the story.

18. **Option (3) is correct.**
C introduces the subject of the passage 'Tejaswini'. So, it must be the first sentence. Option B speaks about her daily routine of going to the temple 'twice a day'. D speaks about her morning routine; option A speaks about her evening routine.

19. **Option (4) is correct.**
The error lies in the second part of the sentence 'who have been paying back.'
The subject of the sentence is Thomas and the tense is in the present form. As Thomas is a third-person singular subject, the auxiliary verb must be 'has' instead of 'have'. So, it must be 'has been paying back.

20. **Option (2) is correct.**
The wrongly spelt word is 'comemorate'. The right spelling is commemorate, meaning celebrate or honor. The others words are rightly spelt.

21. **Option (4) is correct.**
The meaning of elicit is to provoke or cause. The meaning of 'entertain' is to amuse others. The meaning of enlighten is to educate someone. The meaning of exploring is to discover something.

22. **Option (4) is correct.**
The error lies in the later part of the sentence. The phrase 'out of fear' means to be worried or frightened that something bad might happen or might have happened. 'Out in fear' is a wrong usage.

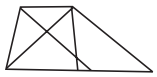
23. **Option (3) is correct.**
The synonym of productive is creative. The synonym of frank is forthright. The synonym of selective is choosy. The synonym of tricky is complicated.

24. **Option (2) is correct.**
The antonym of 'ambiguous' is certain. The antonym of 'clear' is obscure. The antonym of uncertain is certain. The antonym of vague is apparent.

25. **Option (1) is correct.**
The meaning of the phrase 'provided that' is on the condition or understanding. Provided with is a wrong usage. So, the sentence requires improvement. So, option 3 is eliminated. Option 2 and option 4 are meaningless and cannot be considered.

26. **Option (4) is correct.**
Rishabh's age = 10
Mother's age = 10 + 20 = 30
If his mother is 6 years younger to his father then Father's age = 30 + 6 = 36
Hence, the age of father is 36.

27. Option (2) is correct.



The given figure is shown embedded in the above figure.

28. Option (1) is correct.

Here, consonents are decreasing by 3 positional values and vowels are increasing by 8 & 10

P	–3	M
A	+8	I
G	–3	D
E	+10	O
R	–3	O

Similarly,

A	+8	I
N	–3	K
G	–3	D
E	+10	O
L	–3	I

Hence, IKDOI is correct answer.

29. Option (1) is correct.

The pattern is sum of position of alphabet – number of letters.

M + U + S + I + C – 5 = 13 + 21 + 19 + 9 + 3 – 5 = 65 – 5 = 60

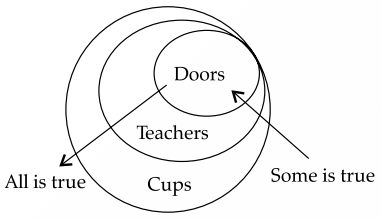
T + U + N + E – 4 = 20 + 21 + 14 + 5 – 4 = 60 – 4 = 56.

Similarly,

L + Y + R + I + C – 5 = 12 + 25 + 18 + 9 + 3 – 5 = 67 – 5 = 62

Hence, 62 is the correct answer.

30. Option (3) is correct.



From the above Venn diagram II and IV conclusion follows.

31. Option (1) is correct.

The pattern is $(9 + 2)^2 = 11^2 = 121$

Similarly, $(7 + 2)^2 = 9^2 = 81$

Hence, 81 is the correct answer.

32. Option (3) is correct.

These things can be arranged according to their inventions. Letter, telephone, smartphone, satellite.

So, the correct inventions are 1, 3, 4, 2.

33. Option (1) is correct.

When the given figure is folded to form a cube then 6 dots will be opposite to 3 dots, 5 dots will be opposite to 4 dots and 2 dots will be opposite to 1.

34. Option (3) is correct.

The pattern is that all letters are arranged in the alphabetical order.

Hence, SMALL will be coded as ALLMS.

35. Option (3) is correct.

Start counting them all we get 32 and 32 can be written as 4 × 8. Either we form 4 group having 8 letters or we make 8 groups of having 4 letters in each group.

Upon inserting alphabets sequentially from option 3, we get

abcd dcba abcd dcba abcd dcba abcd dcba

Hence, it forms a logical sequence.

36. Option (4) is correct.

The total number of letters are 18.

Upon inserting alphabets sequentially from option 4, we get

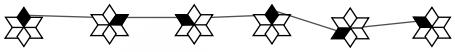
efg eeffgg eeefffggg

Which forms a logical series.

Hence, f,f,e,f,f is the correct answer.

37. Option (4) is correct.

The pattern is that 1st is related to 2nd in a way that it is moving clockwise by one similarly 3rd is related to 4th and moving in clockwise direction in the same way 5th will be related to 6th in the clockwise direction.



38. Option (1) is correct.

The pattern is

	B	+3	E
	A	-2	Y
	U	-2	S
	O	-2	M

Therefore, BE does not follow the same pattern as the other three follows. Hence, BE is the correct answer.

39. Option (2) is correct.

$A \rightarrow 30$

$B \rightarrow 18$

Total work = 90 (LCM of 30, 18 = 90).

So, the efficiency of A = $\frac{90}{30} = 3$.

The efficiency of B = $\frac{90}{18} = 5$.

A's 6 days work = 6 × 3 = 18.

Remaining work is 90 – 18 = 72.

So total efficiency of A and B is 3 + 5 = 8

Therefore, remaining work will be completed in $\frac{72}{8} = 9$.

Total number of days is 9 + 6 = 15.

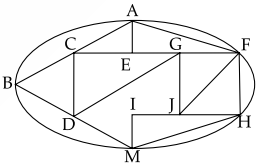
Hence, work will be completed in 15 days.

40. Option (1) is correct.

Chair is the category of furniture similarly; Letter Paper is the category of Stationary.

Hence, Letter Paper: Stationary is the correct answer.

41. Option (3) is correct.



ACE, AEF, ACF, BCD, CDG, IMH, FJH, GJF.

Hence, there are 8 triangles.

42. Option (4) is correct.

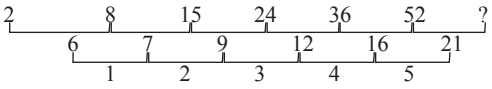
Upon checking option 4 and Using BODMAS Rule

4 × 6 + 9 – 48 ÷ 8 = 24 + 9 – 6 = 33 – 6 = 27

Therefore LHS = RHS.

43. Option (2) is correct.

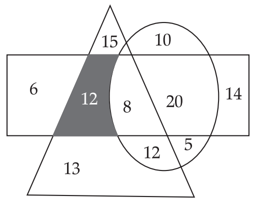
The pattern is



Therefore, the missing number is 52 + 21 = 73.

Hence, 73 is the correct answer.

44. Option (2) is correct.



We need to find persons which are in rectangle and triangle but in not in circle which is highlighted in the above diagram.

Hence, 12 is the correct answer.

45. Option (3) is correct.

Upon checking option 3,

Using BODMAS

16 + 14 × 2 – 18 ÷ 3 (Hint: As 14 cannot be divided by 3 so we have to exchange 14 with 18 so that to make 18 divided by 3).

= 16 + 28 – 6

= 16 + 22 = 38

Therefore LHS = RHS.

46. Option (1) is correct.

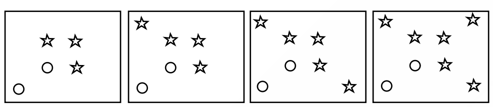
When the mirror is placed at the right place then objects which appear on the right will appear on the left and the objects which appear on the left side will appear on the right side.

Hence, the mirror image is as below.

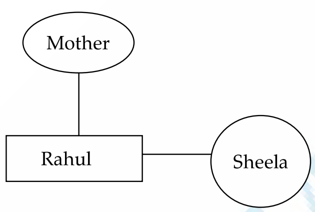
4ƐϘ∂4GTIOTHA

47. Option (1) is correct.

The process of unfolding is shown below.



48. Option (3) is correct.



Therefore, Rahul and Sheela are brother and sister.

49. Option (3) is correct.

The pattern is:

(2^{nd} number-1^{st} number) × 8 = 3^{rd} number

(6 – 2) × 8 = 32

similarly upon checking option , we get

(18 – 8) × 8 = 10 × 8 = 80

Hence, (8, 18, 80) is correct.

50. Option (3) is correct.

The pattern followed here is to reverse position of alphabets and then reverse the word.

A	P	R	I	C	O	T
Z	K	I	R	X	L	G

Now the whole word is reversed as GLXRIKZ.

Similarly,

O	R	A	N	G	E
L	I	Z	M	T	V

Now, the value will be reversed as VTMZIL.

Hence, VTMZIL is the correct answer.

51. Option (3) is correct.

Let the total number of employees in company D = x

As given in the question,

$$\Rightarrow \quad \frac{16}{100} \times x = 80$$

$$\Rightarrow \quad x = \frac{80 \times 100}{16} = 500$$

So, the number of employees below average salary

$$= \frac{84}{100} \times 500 = 420$$

52. Option (1) is correct.

Given:

25 men can complete a task in 16 days after 4 days 5 more men joined them.

Now all 30 men is going to finish the task which was suppose to done by 25 men in next 12 days.

We have, $\quad M_1 \times D_1 = M_2 \times D_2$

$$\Rightarrow \quad 25 \times 12 = 30 \times D_2$$

$$\Rightarrow \quad D_2 = \frac{25 \times 12}{30} = 10 \text{ days}$$

So, the time taken by 30 men to complete the remaining task = 10 days

53. Option (4) is correct.

Given:

$$\Rightarrow \frac{4}{1+\sqrt{2}+\sqrt{3}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow \frac{4}{1+\sqrt{2}+\sqrt{3}} \times \frac{(1+\sqrt{2})-\sqrt{3}}{(1+\sqrt{2})-\sqrt{3}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow \frac{4\left(1+\sqrt{2}-\sqrt{3}\right)}{(1+\sqrt{2})^2-(\sqrt{3})^2} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow \frac{4\left(1+\sqrt{2}-\sqrt{3}\right)}{1+2+2\sqrt{2}-3} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow \frac{4\left(1+\sqrt{2}-\sqrt{3}\right)}{2\sqrt{2}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow \frac{4\left(1+\sqrt{2}-\sqrt{3}\right)}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow \frac{4\left(\sqrt{2}+2-\sqrt{6}\right)}{4} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$$\Rightarrow 2+\sqrt{2} - \sqrt{6} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

By comparing both sides,

$a = 2, b = 1, c = 0, d = 1$

Then $a + b + c + d = 2 + 1 + 0 + 1 = 4$

54. Option (3) is correct.

Let the cost price of 40 items = ₹ 40

Let he sold x items at a profit of 30%.

As given in the question,

$$x \times \frac{130}{100} = 26 \Rightarrow x = 20$$

So, remaining 20 items selling price

$$= 20 \times \frac{118}{100} = \text{Rs. } 23.6$$

So, total selling price of all 40 articles

$= 26 + 23.6 = ₹\ 49.6$

Total profit percentage

$$= \frac{49.6-40}{40}\times 100 = \frac{9.6}{40}\times 100 = 24\%$$

55. Option (1) is correct.

We have,

AB = 10 cm, BC = 8 cm and CA = 12 cm

We know that the length of tangents drawn from an external point to a circle are equal.

Let BE = BF = x unit

And CF = CD = y unit

And AD = AE = z unit

Now $AB = AE + BE = z + x = 10$ …(1)

$BC = BF + CF = x + y = 8$ …(2)

$AC = AD + CD = z + y = 12$ …(3)

By adding equation (1), (2) and (3),

$2(x + y + z) = 30$

$\Rightarrow x + y + z = 15$ …(4)

By equation (4) – equation (2), Z = 7

By equation (4) – equation (3), X = 3

So, AD × BF = $z \times x = 7 \times 3 = 21$

56. Option (2) is correct.

We have,

$$\Rightarrow \left[\left\{\left(\frac{2}{3}\right)^3\right\}^{2x+3}\right]^{-\frac{3}{4}} = \left[\left\{\left(\frac{2}{3}\right)^{\frac{2}{3}}\right\}^{3x+7}\right]^{-\frac{6}{5}}$$

$$\Rightarrow \left[\frac{2}{3}\right]^{3(2x+3)\left(-\frac{3}{4}\right)} = \left[\frac{2}{3}\right]^{\frac{2}{3}(3x+7)\left(-\frac{6}{5}\right)}$$

Comparing both sides,

$$\Rightarrow 3\times(2x+3)\left(-\frac{3}{4}\right) = \frac{2}{3}\times(3x+7)\left(-\frac{6}{5}\right)$$

$$\Rightarrow \frac{9}{4}\times(2x+3) = \frac{12}{15}\times(3x+7)$$

$$\Rightarrow 90x + 135 = 48x + 112$$

$$\Rightarrow 42x = 23$$

$$\Rightarrow x = -23/42$$

So, $\sqrt{2-42x} = \sqrt{2-42\times\left(-\frac{23}{42}\right)} = \sqrt{2+23} = 5$

57. Option (2) is correct.

We have,

Radius OA = OB = 5 cm and PO = 13 cm

$\angle OAP = \angle OBP = 90°$

[the tangent makes an angle of 90° with the radius of circle]

In ΔAOP, by Pythagoras theorem,

$OP^2 = OA^2 + AP^2$

$\Rightarrow 13^2 = 5^2 + AP^2$

$\Rightarrow AP^2 = 169 - 25 = 144 \Rightarrow AP = 12$ cm

And AP = BP = 12 cm

[tangents drawn from common point to a circle are equal in length]

Now area of quadrilateral PAOB = area of ΔPAO+ area of

$$\Delta PBO = \frac{1}{2}\times 5\times 12 + \frac{1}{2}\times 5\times 12 = 60 \text{ cm}^2$$

Let AB intersect PO at N.

Then ON = x cm and NP = $(13 - x)$ cm

area of quadrilateral PAOB = area of ΔOAB + area of ΔPAB

$$\Rightarrow 60 = \frac{1}{2}\times AB\times x + \frac{1}{2}\times AB\times(13-x)$$

$$\Rightarrow 60 = \frac{1}{2}\times AB(x+13-x)$$

$$\Rightarrow AB = \frac{120}{13}$$

Since ON is perpendicular to AB and O is the centre. Then On will bisect AB. AN = AB/2

or $AN = \frac{60}{13}$ cm

In ΔANO,

$AO^2 = AN^2 + ON^2$

$$\Rightarrow 52 = \left(\frac{60}{13}\right)^2 + ON^2$$

$$\Rightarrow ON^2 = \frac{625}{169} \Rightarrow ON = \frac{25}{13}$$

$$\text{Area of } \Delta AOB = \frac{1}{2}\times AB\times ON = \frac{1}{2}\times\frac{120}{13}\times\frac{25}{13} = \frac{1500}{169} \text{ cm}^2$$

$$\text{Area of } \Delta APB\ (M) = 60 - \frac{1500}{169} = \frac{8640}{169}$$

So, value of $\sqrt{\frac{M}{15}} = \sqrt{\frac{8640}{169\times 15}} = \sqrt{\frac{576}{169}} = \frac{24}{13}$

58. Option (4) is correct.

As shown in graph, the percentage increase in profit from the previous year is greatest in year of 2013 which is 26.88%.

59. Option (1) is correct.

Given: $a \sin A + b \cos A = c$

Squaring both the sides,

$(a \sin A + b \cos A)^2 = c^2$

$\Rightarrow a^2 \sin^2 A + b^2 \cos^2 A + 2ab \cos A \sin A = c^2$

$\Rightarrow a^2 (1 - \cos^2 A) + b^2 (1 - \sin^2 A) + 2ab \cos A \sin A = c^2$ [as $\sin^2\theta + \cos^2\theta = 1$]

$\Rightarrow a^2 - a^2 \cos^2 A + b^2 - b^2 \sin^2 A + 2ab \sin A \cos A = c^2$

$\Rightarrow -a^2 \cos^2 A - b^2 \sin^2 A + 2ab \sin A \cos A = c^2 - a^2 - b^2$

$\Rightarrow a^2 \cos^2 A + b^2 \sin^2 A - 2ab \sin A \cos A = a^2 + b^2 - c^2$

$\Rightarrow (a \cos A - b \sin A)^2 = a^2 + b^2 - c^2$

$\Rightarrow a \cos A - b \sin A = \sqrt{(a^2 + b^2 - c^2)}$

60. Option (2) is correct.

Given:

Percentage increase in length of a rectangle = 12%

Percentage decrease in breadth of a rectangle = 8%

We have, successive percentage change $= x + y + \frac{xy}{100}$

So, net percentage change in the area

$$= 12 - 8 - \frac{12\times 8}{100} = 4 - .96 = 3.04\%$$

Here, net change is positive. So, there is an increase of 3.04% in the area of rectangle.

61. Option (2) is correct.

Percentage of students qualified from college B

$$= \frac{420}{560} \times 100 = 75\%$$

Percentage of students qualified from college D

$$= \frac{432}{480} \times 100 = 90\%$$

Required difference = 90% – 75% = 15%

62. Option (4) is correct.

Given: Total quantity of milk and water in mixture = 56 *l*

Ratio of milk and water in mixture = 5 : 2

So, quantity of milk in mixture = $56 \times \frac{5}{7} = 40\ l$

quantity of water in mixture = $56 \times \frac{2}{7} = 16\ l$

Let x litre milk is added to make the mixture of required ratio.

As given in the question,

$$\Rightarrow \quad \frac{40+x}{16} = \frac{7}{2}$$

$$\Rightarrow \quad 80 + 2x = 112$$

$$\Rightarrow \quad 2x = 32$$

$$\Rightarrow \quad x = 16$$

So, quantity of milk in the new mixture = 40 + 16 = 56 l

63. Option (4) is correct.

We have,

$$\Rightarrow \frac{3x\sqrt{y}+2y\sqrt{x}}{3x\sqrt{y}-2y\sqrt{x}} - \frac{3x\sqrt{y}-2y\sqrt{x}}{3x\sqrt{y}+2y\sqrt{x}} = \sqrt{x}\sqrt{y}$$

$$\Rightarrow \frac{(3x\sqrt{y}+2y\sqrt{x})^2-(3x\sqrt{y}-2y\sqrt{x})^2}{(3x\sqrt{y})^2-(2y\sqrt{x})^2} = \sqrt{x}\sqrt{y}$$

$$\Rightarrow \frac{9x^2y+4y^2x+12xy\sqrt{xy}-9x^2y-4y^2x+12xy\sqrt{xy}}{9x^2y-4y^2x}$$

$$= \sqrt{x}\sqrt{y}$$

$$\Rightarrow \frac{24xy\sqrt{xy}}{xy(9x-4y)} = \sqrt{x}\sqrt{y} \Rightarrow 9x - 4y = 24$$

64. Option (3) is correct.

Given: Principal amount = ₹ 10000

Time = 5 years

Let the man lent ₹ x at the rate of 15% and ₹ $(10000 - x)$ at the rate of 10%.

We have, $\text{SI} = \frac{P \times R \times T}{100}$

So, as given in the question,

$$6500 = \frac{x \times 15 \times 5}{100} + \frac{(10000-x) \times 10 \times 5}{100}$$

$$\Rightarrow \quad 650000 = 75x + 500000 - 50x$$

$$\Rightarrow \quad 25x = 150000$$

$$\Rightarrow \quad x = 6000$$

Required difference

$$= 6000 - (10000 - 6000) = ₹\ 2000$$

65. Option (4) is correct.

Given: One side of triangle a = 7 cm

Perimeter of triangle = 18 cm

And area of triangle = $\sqrt{108}\ \text{cm}^2$

Let other two sides of triangle be b and c cm.

We have, Perimeter of triangle = $a + b + c$ = 18 cm

So, $7 + b + c = 18$

$$b + c = 11 \qquad \ldots(1)$$

area of triangle = $\sqrt{s(s-a)(s-b)(s-c)} = \sqrt{108}$

[s = semi perimeter of triangle]

$$\Rightarrow \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{108}$$

$$\Rightarrow 18(81 - 9b - 9c + bc) = 108$$

$$\Rightarrow \quad 9(b + c) - bc = 75$$

$$\Rightarrow \quad 9 \times 11 - bc = 75 \qquad [\text{as } b + c = 11]$$

$$\Rightarrow \quad b(11 - b) = 99 - 75 \qquad [\text{as } b + c = 11]$$

$$\Rightarrow \quad b^2 - 11b + 24 = 0$$

So, $b = 8, 3$

If we take $b = 8$

The $c = 11 - 8 = 3$

So, the other two sides of the triangle are 8 cm and 3 cm.

66. Option (1) is correct.

Given:

$$\Rightarrow \frac{1-\tan A}{1+\tan A} = \frac{\tan 3^\circ \tan 15^\circ \tan 30^\circ \tan 75^\circ \tan 87^\circ}{\tan 27^\circ \tan 39^\circ \tan 51^\circ \tan 60^\circ \tan 63^\circ}$$

$$\tan(90-87)^\circ \tan(90-75)^\circ \tan 30^\circ$$

$$\Rightarrow \frac{1-\tan A}{1+\tan A} = \frac{\tan 75^\circ \tan 87^\circ}{\tan(90-63)^\circ \tan(90-51)^\circ \tan 51^\circ}$$

$$\tan 60^\circ \tan 63^\circ$$

$$\Rightarrow \frac{1-\tan A}{1+\tan A} = \frac{\cot 87^\circ \cot 75^\circ \tan 30^\circ \tan 75^\circ \tan 87^\circ}{\cot 63^\circ \cot 51^\circ \tan 51^\circ \tan 60^\circ \tan 63^\circ}$$

$$\Rightarrow \frac{1-\tan A}{1+\tan A} = \frac{\cot 87^\circ \cot 75^\circ \tan 30^\circ \tan 75^\circ \tan 87^\circ}{\cot 63^\circ \cot 51^\circ \tan 51^\circ \tan 60^\circ \tan 63^\circ}$$

[as tan A . cot A = 1]

$$\Rightarrow \frac{1-\tan A}{1+\tan A} = \frac{\tan 30^\circ}{\tan 60^\circ}$$

$$\Rightarrow \frac{1-\tan A}{1+\tan A} = \frac{1}{\sqrt{3} \times \sqrt{3}} = \frac{1}{3}$$

$$\Rightarrow 3 - 3\tan A = 1 + \tan A$$

$$\Rightarrow \tan A = \frac{1}{2} \text{ So, } \cot A = 2$$

67. Option (3) is correct.

Given:

$$\Rightarrow x = \left[\frac{\left(\frac{2}{5} \text{ of } 6\frac{1}{4} \div \frac{3}{7}\right) \text{ of } 1\frac{2}{7}}{11\frac{1}{4}}\right]^2$$

$$\Rightarrow x = \left[\frac{\left(\frac{2}{5} \text{ of } 6\frac{1}{4} \div \frac{3}{7}\right) \text{ of } 1\frac{2}{7}}{11\frac{1}{4}}\right]^2$$

$$\Rightarrow x = \left[\frac{\left(\frac{2}{5}\times\frac{25}{4}\times\frac{7}{3}\right)\times\frac{9}{7}}{\frac{45}{4}}\right]^2$$

$$\Rightarrow x = \left[\left(\frac{2}{5}\times\frac{25}{4}\times\frac{7}{3}\right)\times\frac{9}{7}\times\frac{4}{45}\right]^2 \Rightarrow x = \frac{4}{9}$$

So, value of $81x = 81 \times \frac{4}{9} = 36$

68. Option (4) is correct.

Ravi starts for his school from his house at 8 : 20 a.m.

Let the distance between house and school is d km.

We have, $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$

Case 1: When Ravi goes to school at a speed of 10 km/hr.

$$t_1 = \frac{d}{10}$$

Case 2: When Ravi goes to school at a speed of 16 km/hr.

$$t_1 = \frac{d}{16}$$

as given in the question,

$$\Rightarrow \frac{d}{10} - \frac{d}{16} = \frac{18}{60}$$

$$\Rightarrow \frac{16d - 10d}{160} = \frac{18}{60}$$

$$\Rightarrow 6d = 48$$

$$\Rightarrow d = 8$$

So, time taken to reach his school at a speed of 10 km/hr $= \frac{8}{10}\text{hr} = \frac{8}{10}\times 60 \text{ min} = 48$ min

School starts at = 8 : 20 am + 40 min

[he is 8 min late at speed of 10 km/hr]

= 9:00 am

69. Option (4) is correct.

Given:

$$\Rightarrow \frac{a}{100}\times 240 = c$$

$$\Rightarrow 12a = 5c \quad \ldots(1)$$

And $\frac{c}{100}\times a = 117.6$

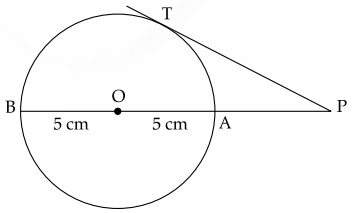
$$\Rightarrow ac = 11760$$

$$\Rightarrow \frac{12}{5}a^2 = 11760 \Rightarrow a = 70 \quad [\text{as } c = \frac{12}{5}a]$$

By equation (1),

$C = \frac{12}{5}\times 70 = 168$ So, $a + c = 168 + 70 = 238$

70. Option (2) is correct.



Given: Radius of circle = 5 cm

Length of the tangent drawn from point P to circle PT = 12 cm

Let PA = x

We have, $PA \times PB = PQ^2$

$$\Rightarrow x \times (x+10) = 12^2$$

$$\Rightarrow x^2 + 10x - 144 = 0$$

$$\Rightarrow (x+18)(x-8) = 0$$

$$x = 8, -18$$

Distance from P to A = x = 8 cm

71. Option (4) is correct.

Given: Total number of students = 9800

The ratio of boys and girls in college B = 5 : 9

From pie chart, 16% of total students enrolled in college B.

So, number of girls in college B = $9800 \times \frac{16}{100}\times\frac{9}{14} = 1008$

72. Option (1) is correct.

Given: Shopkeeper pays 12% of CP as a tax for a product worth ₹ 500.

So total cost price for shopkeeper = $500 \times \frac{112}{100} = \text{Rs. } 560$

Shopkeeper wants to earn a profit of 20%. So, S.P of product $= 560 \times \frac{120}{100} = \text{Rs. } 672$

Let MRP of product = ₹ x

So, $x \times \frac{84}{100} = 672 \Rightarrow x = 800$

So, MRP of product = ₹ 800

73. Option (4) is correct.

Given: $\tan a = \frac{2}{\sqrt{13}}$

so, $\frac{\text{cosec}^2 a + 2\sec^2 a}{\text{cosec}^2 a - 3\sec^2 a} = \frac{\frac{1}{\sin^2 a} + \frac{2}{\cos^2 a}}{\frac{1}{\sin^2 a} - \frac{3}{\cos^2 a}}$

$$\Rightarrow \frac{\cos^2 a + 2\sin^2 a}{\cos^2 a - 3\sin^2 a} = \frac{1 + 2\tan^2 a}{1 - 3\tan^2 a}$$ [both numerator and denominator divided by $\cos^2 a$]

$$\Rightarrow \frac{1 + 2\times\frac{4}{13}}{1 - 3\times\frac{4}{13}} = 21$$

74. Option (3) is correct.

Given that the number must be divisible by 2, 5 and 10.

From given option only option (3) has unit digit 0. So, this is only option which is divisible by 10.

75. Option (4) is correct.

For 48 students, average reduced from 78 to 66.

The average of remaining students increased by 3.5 marks

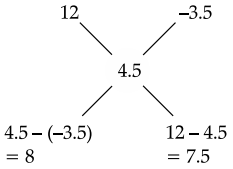
Total average reduced by 4.5 marks.

Let total number of students = x

So, number of students whose average is increased = $x - 48$

The marks of 48 students reduced by = 78 – 66 = 12

By mixture and allegation,



As given, $\frac{48}{x-48} = \frac{8}{7.5}$

$\Rightarrow \frac{48}{x-48} = \frac{16}{25}$

$\Rightarrow 16x - 768 = 720$

$\Rightarrow 16x = 720 + 768 \Rightarrow x = 93$

So, total number of students is 93.

76. Option (3) is correct.

The third edition of the Khelo India Youth Games was held in Guwahati, Assam, from January 10 to January 22, 2020. Khelo India Youth Games (KIYG), formerly Khelo India School Games (KISG), are the national level multidisciplinary grassroots games in India held for two categories, namely under-17 years school students and under-21 college students. They are held annually in January or February. Every year, the top 1000 children will receive a 5 lakh scholarship for the next eight years to help them prepare for international sporting events. On January 31, 2018, Prime Minister Narendra Modi inaugurated the Khelo India School Games at the Indira Gandhi Arena in a ceremony based on the Guru-shishya tradition. Kiren Rijiju, Minister of Sports, has launched the third Khelo India Youth Games.

77. Option (3) is correct.

In 2019, Amitabh Bachchan received the 'Dada Saheb Phalke award'. The Dadasaheb Phalke Awards are India's highest film honours. This award is presented at the National Film Awards each year. Devika Rani was the first recipient of this award, which she received at the 17th National Film Awards in 1969. Dadasaheb Phalke is regarded as the 'Father of Indian Cinema'. In 1913, he directed India's first full-length feature film, Raja Harishchandra. As a result, the government of India established the Dadasaheb Phalke Award in 1969 to commemorate Dadasaheb Phalke. The awardees are recognised for their exceptional contributions to the growth and development of Indian cinema. The prize includes a Swarna Kamal (Golden Lotus) medallion, a shawl, and a ₹ 10 lakh cash prize.

78. Option (2) is correct.

The Sir Garfield Sobers Trophy is awarded annually by the International Cricket Council to the world player of the year. It is one of the ICC's most prestigious awards. England all-rounder Ben Stokes won this prestigious award in 2019. Sir Garfield Sobers, a former West Indies captain, is honoured with this award. The winner of this prize is chosen by a committee of 56 people. It first began in 2004, with Rahul Dravid being selected as the winner.

79. Option (4) is correct.

In data storage memory, one gigabyte equals 1024 MB (megabyte) or 1 million bytes. In modern times, this is the most commonly used storage unit. Unit Conversion Table: 4 bit = 1 Nibble 8 bit = 1 byte, 1 KB (kilobyte) = 1024 byte, 1 MB (megabyte) = 1024 KB, 1 GB (gigabyte) = 1024 MB, 1 TB (terabyte) = 1024 GB, 1 PB (petabyte) = 1024 TB, 1 XB (Exabyte) = 1024 PB, 1 ZB (zettabyte) = 1024 XB, 1 YB (yottabyte) = 1024 ZB

80. Option (1) is correct.

We know that the elected constituent assembly, which served as independent India's first parliament, is credited with framing and drafting the world's longest constitution. Every member was involved in this challenging task face to face, and the first draught was presented on November 29th, while the assembly began on December 9th, 1946. Dr B.R. Ambedkar chaired the Constitution Drafting Committee because, as we all know, he was a wise constitutional expert who had studied the constitutions of around 60 countries.

81. Option (1) is correct.

Secondary storage, also known as auxiliary storage, is non-volatile and is used to store data and programmes for later retrieval. There are various types of secondary storage, each with advantages and disadvantages. Most storage systems employ either magnetic or optical storage media. A hard disc is an example of secondary storage and magnetic media that is used to store large amounts of data and programmes. In the case of computers, they are typically built-in and thus not portable. Some hard drives are reversible, allowing for easy portable storage between machines. They are generally efficient and stable, with easy access to stored data.

82. Option (3) is correct.

Michael Patra is an Indian economist and central banker. He is now a retired Reserve Bank of India officer serving as one of the bank's four deputy governors. Patra is a career central bank officer who joined the Reserve Bank of India (RBI) in 1985. Prior to his appointment as deputy governor, Patra was the executive director of the RBI's Monetary Policy Department, where he relocated in 2006, and an internal member of the influential Monetary Policy Committee.

83. Option (1) is correct.

In 2019, the Asian Athletics Championship was held in Doha, Qatar, with 595 athletes from 43 countries competing. It was a four-day event. India finished fourth in the medal count (3 gold, 7 silver, and 7 bronze), trailing only Bahrain, China, and Japan. Gold medals won by Indians – Tejinder Pal Singh Toor (Shot Put) Gomathi Marimuthu (800 m) PU Chitra (1500 m)

84. Option (4) is correct.

A tide is the rhythmic rise and fall of the ocean twice a day. The intense gravitational force exerted by the sun and moon on the earth's surface causes tides. Further Information High tide occurs when water covers the majority of the shore and rises to its maximum level. It is low tide when the waterfall reaches its lowest point and recedes from the sea. The water on Earth closer to the moon is drawn in by the moon's gravitational force, resulting in a high tide. During full moon and new moon days, the sun, moon, and earth are all in the same line, and the tides are at their highest. These tides are known as spring tides. However, when the moon is in its first and last quarters, the ocean waters are drawn in diagonally opposite directions by the sun and earth's gravitational forces, resulting in low tides. These are known as neap tides.

85. Option (4) is correct.

Koneru Humpy, India's young female Grandmaster, won the 2019 World Rapid Championship. She won the Women's World Rapid Chess Championship in the tiebreaker series (Armageddon game) after defeating China's Lei Tingjie. In January 2010, her FIDE score was 2614, placing her second (after Judget Polgar) in the world ranking of female chess players. In 2003, she received the Arjuna Award, and in 2007, she received the Padma Shri Award. In 2015, she took bronze in the Women's World Team Chess Championship. Koneru Humpy finished second in the FIDE Women's Grand Prix series in 2009-2011, 2011-12, 2013-14, and 2015-16.

86. Option (4) is correct.

Article 360 of the Indian Constitution empowers the president to declare a financial emergency if the president is satisfied that a situation has arisen that threatens or jeopardises India's financial stability or credibility. The 38th Constitutional Amendment Act of 1975 made the president's satisfaction with declaring a financial emergency final and conclusive. The president's satisfaction is challenged in any court on any grounds. The 44th Constitutional Amendment Act of 1978, however, repealed this provision. This means that the president's satisfaction is being reviewed by the courts. The President may issue directives reducing the salaries and allowances of Supreme Court and High Court judges, as well as all or any class of persons serving the Union. In India, the Financial Emergency has never been declared. Article 356 of the Constitution grants the President the authority to act only when he believes that the government of a state cannot be carried out in accordance with the provisions of the Constitution. Article 352: The President may declare an emergency only on the basis of a written request from the Prime Minister's Cabinet. Many Fundamental Rights of Indian citizens can be suspended during a national emergency.

87. Option (1) is correct.

The Reserve Bank of India (RBI) is India's central bank, in charge of issuing and distributing the Indian rupee as well as overseeing the Indian banking system. It also manages the country's key payment networks and works to promote economic growth. In accordance with the Reserve Bank of India Act, of 1934, the RBI began operations on April 1, 1935. Following India's independence on August 15, 1947, the RBI was nationalised on January 1, 1949. A credit rating agency is an organisation that evaluates and assesses a debtor's ability to repay the debt by making timely principal and interest payments. CRISIL, CARE, ICRA Limited, India Ratings and Research Pvt. Ltd., SMERA Ratings Limited, and others are credit rating agencies in India.

88. Option (3) is correct.

General Bipin Rawat is a four-star general in the Indian Army. He is India's first and current Chief of Defence Staff (CDS). On December 30, 2019, he was named India's first CDS, and he took office on January 1, 2020. Prior to becoming the CDS, he was the Chairman of the Chiefs of Staff Committee and the Indian Army's 27th Chief of Army Staff. On December 17, 2016, the Government of India appointed him as the 27th Chief of the Army Staff, succeeding two other senior Lieutenant Generals, Praveen Bakshi and P. M. Hariz. He became the 27th Chief of Army Staff on December 31, 2016, following the retirement of General Dalbir Singh Suhag. He is the third Gorkha Brigade officer to become Chief of the Army Staff, following Field Marshal Sam Manekshaw and General Dalbir Singh Suhag. During his over a 40-year career, he has received the Param Vishisht Seva Medal, Uttam Yudh Seva Medal, Ati Vishisht Seva Medal, Yudh Seva Medal, Sena Medal, Vishisht Seva Medal, COAS Commendation on two occasions, and the Army Commander's Commendation for gallantry and exemplary service. Lieutenant General Manoj Pande has been named the 29th Chief of Army Staff (2022).

89. Option (1) is correct.

Kathakali is a classical Indian dance form that is a story-play genre of art. It is Kerala's folk dance form. It is a synthesis of five types of fine art: Natyam (expressions) Nritham (dance) Nrithyam (enactment) Sangeetam (music) Vadya (instruments) Kathakali costumes include Sathwika (hero), Katti (villain), and Minukku (females) Thathi (other characters) (other characters) Maddalam, Chenda, and Idakka are the three types of drums used in Kathakali. Kathakali is the most difficult style of the traditional dance form in which actors use sign language to dictate word parts of the character and facial and eye movements express emotions and mood. Kathakali is based on the Ramayana and Mahabharata epics.

90. Option (4) is correct.

Gokulam Kerala Football Club, based in Kozhikode, Kerala, is an Indian professional football club. The team was founded in 2017 and plays in Indian football's second division, the I-League. They won the Durand Cup tournament, which was founded in 1888. The 2019 Durand Cup was the 129th edition of Asia's oldest football tournament. The tournament featured 16 teams. Gokulam Kerala won their first trophy after defeating Mohun Bagan 2-1 in the 2019 Durand Cup Final at the Salt Lake Stadium in Kolkata on August 24, 2019. With this victory, Gokulam Kerala became the state's first club in 22 years to win the tournament.

91. Option (1) is correct.

In 2015, the Government of India launched the MUDRA Yojana to boost the micro sector by establishing institutions for development and refinancing. Non-corporate, micro-enterprises can apply for a loan of up to ₹ 10 lakhs under this scheme. This scheme includes three products: Shishu: A loan of up to ₹ 50,000 is available. Kishore: A loan ranging from ₹ 50,000 to ₹ 5 lakh. Tarun: A loan ranging from ₹ 5 lakh to ₹ 10 lakh. MUDRA loan's purpose: Commercial transportation vehicle financing Agriculture and food sector loans Micro-unit equipment financing loan Traders and shopkeepers can apply for business loans. Development and Promotional Assistance (Sectorial Development, Financial Literacy, Institution Development).

92. Option (4) is correct.

The Tummalapalle Mine is a uranium mine in the village of Tumalapalli in the Indian state of Andhra Pradesh. According to research conducted by India's Atomic Energy Commission in 2011, this mine may have one of the world's largest uranium reserves. On July 19, 2011, Dr S. Banerjee, Secretary of Atomic Energy and Chairman of the Indian Atomic Energy Commission, confirmed 49,000 tons of reserves and suggested that it could be three times larger, making Tummalapalle the world's largest uranium deposit mine. The estimates were later raised to 85,000 tonnes in 2014. According to recent discoveries, the reserves are as deep as 1,000 metres.

93. Option (3) is correct.

From 1858 to 1947, the British maintained 'Crown Rule' or 'Direct Rule' over the Indian subcontinent. British India was the name given to the area under British control, while indigenous rulers were known as Princely states. Following the Indian Rebellion of 1857, control of the British India Company was transferred to Queen Victoria's Crown. Lower Burma became a part of British India in 1858, while upper Burma joined in 1886.

94. Option (3) is correct.

Pisciculture is the practice of raising fish in tanks or ponds. Tilapia, salmon, carp, and catfish are the most important species raised worldwide. Pisciculture produces more than half of the world's seafood. It contributes to development by creating jobs in the fishing community. Catla, Rohu, Mrigal, Catfishes, Murrels, and Tilapia are examples of freshwater cultivable fish. Sea bass, grey mullet, and milkfish are all cultivable in marine water. Viticulture: A branch of horticulture concerned with grape cultivation and harvesting. Agriculture is the science of cultivating soil, growing crops, and raising livestock to produce plant and animal products. Horticulture is a type of agriculture that grows plants for food and decoration.

95. Option (3) is correct.

Dynamite was invented in 1867 by Alfred Bernhard Nobel, a Swedish scientist who also founded the Nobel Prize. Nitro-glycerine is used as an absorbent in dynamite, and sodium nitrate is added to increase the explosive's strength. Construction, mining, and demolition all make use of dynamite. Submarine Blasting Dynamite is typically sold as a cylindrical stick containing one Mega Joule of energy. Dynamite has a maximum shelf life of one year. Inventions by – Thomas Alva Edison: Bulb, Gramophone, Electric Pen, etc. Rudolf Diesel: Diesel Engine Benjamin Franklin: Lightning rod, Bifocals, Glass Harmonica.

96. Option (3) is correct.

A chronic and potentially fatal parasitic disease of the viscera (the internal organs, particularly the liver, spleen, bone marrow, and lymph nodes) caused by Leishmania donovani infection. This disease's Indian name is "black fever," which refers to the characteristic darkening of the skin seen in patients with this condition. Internal organs such as the liver and spleen are affected by visceral leishmaniasis (also known as VL or kala-azar). If not treated, it is fatal. Post-kala-azar dermal leishmaniasis (PKDL) can develop six months or more after an apparent VL cure.

97. Option (4) is correct.

Kazakhstan has been a major uranium producer for more than 50 years. Kazakhstan has 12% of the world's uranium deposits. Between 2001 and 2013, output increased from 2022 to approximately 22,550 U tonnes per year, making Kazakhstan the world's leading uranium producer. In 2009, it overtook Russia as the world's leading uranium producer, accounting for approximately 28% of the global supply. The annual volume is approximately 25,000 tU. In 2019, production was 22,808 tU, accounting for 43% of global uranium.

98. Option (2) is correct.

A Gur Purab is a festival commemorating the anniversary of the birth of a guru in the Sikh tradition. The term Gur Purab first appeared during the guru's reign. It is a combination of the words Purab (or Parva in Sanskrit) and Guru, both of which denote a festival or celebration. Guru Nanak was born on the Full Moon (Pooranmashi) of the Kartik Indian Lunar Month, according to the contentious Bhai Bala Janamsakhi. As a result, Sikhs celebrated Guru Nanak's Gurpurab in November, and it was incorporated into Sikh rituals. The festival is usually similar for all Sikhs; only the hymns differ. Prabhat Pheris is the traditional start to the festivities.

99. Option (4) is correct.

A Governor is an official with the authority to govern the executive branch of a sub-national level of government, such as a state or union territory. They have similar powers and functions to the President of the Union. In the event that a decision is granted/announced by the Court of a district/state, the Governor has the authority to pardon the accused. The Governor, like the President, has the authority to reverse the court's decision to grant a pardon, suspend, remit, or commute a death sentence. The Governor cannot commute a death sentence, which can only be commuted by the President. The Governor has the authority to suspend, remit, or commute a death sentence. For a pardon, the accused has to file a mercy petition to the Governor or President.

100. Option (4) is correct.

Albert Einstein was a theoretical physicist of German origin who developed the theory of relativity, one of the two pillars of scientific physics. His work has also had an impact on scientific theory. He also discovered the photoelectric effect law, for which he received the Nobel Prize in Physics in 1921. The photoelectric effect is a phenomenon in which electrons are released from the surface of a metal when a specific light frequency is present. Heinrich Hertz first described the photoelectric effect in 1887, and Lenard followed suit in 1902. Furthermore, Maxwell's electromagnetic wave theory of light could not account for both photoelectric effects. Einstein addressed this question using Planck's groundbreaking theory that light was a photon.

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