SSC CHSL Tier-1 2023: Official Paper (Held On: 03 Aug, 2023 Shift 1) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2023 • 100 questions • 60 minutes • Answer key and solutions

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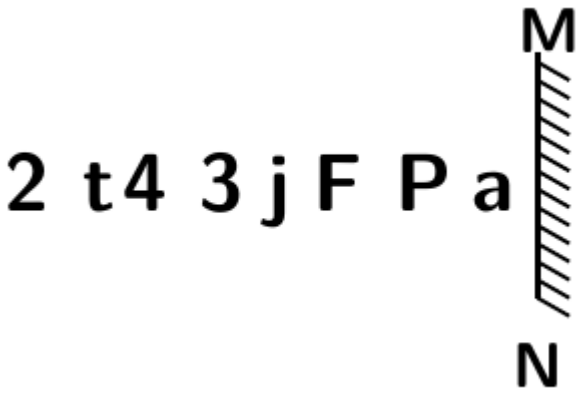
ENGLISH LANGUAGE

Q1. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below. (The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word.)

Begin - Start

(a) Bitter - Sweet
(b) Green - Leaf
(c) Ban - Forbid
(d) After - before

Q2. Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.



(a)



(b)



(c)



(d)

bdhh ictS

Q3. If 11 August 2004 is Wednesday, then what will be the day of the week on 11 February 2006?

(a) Friday
(b) Sunday
(c) Thursday
(d) Saturday

Q4. 24 is related to 75 in a certain way. Following the same logic, 36 is related to 111. To which of the following is 43 related following the same logic?

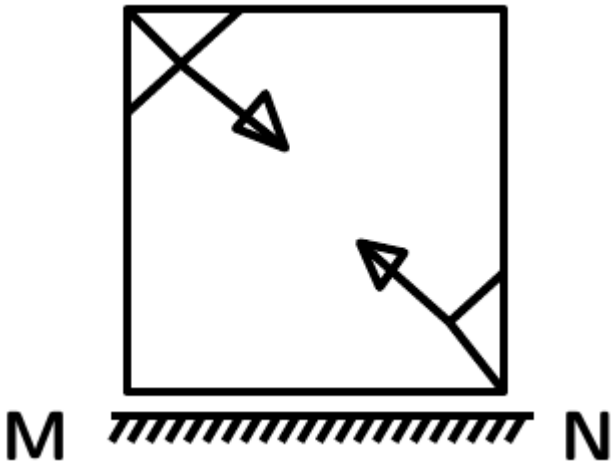
(a) 130
(b) 138
(c) 135
(d) 132

Q5. Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number.

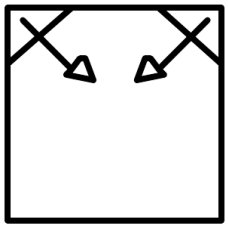
129 : 32 :: 109 : 27 :: 289 : ?

(a) 54
(b) 96
(c) 72
(d) 28

Q6. Select the correct mirror image of the given figure when the mirror is placed at MN as shown.

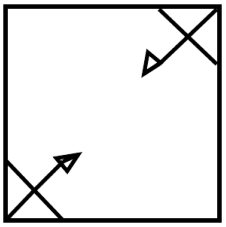


(a)

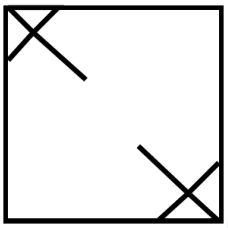


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(b)



(c)



(d)



Q7. In a certain code language, 'QUIRKY' is coded as 'TCLZNG' and 'MUZHIK' is coded as 'PCCPLS'. What is the code for 'FROWZY' in the given code language?

(a) IZKECG
(b) IZRECG
(c) IZREDG
(d) IZRECF

Q8. AFKQ is related to BELR in a certain way based on the English alphabetical order. In the same way, IQWY is related to JPXZ. To which of the following is CMSU related to following the same logic?

(a) XNHE
(b) BLRT
(c) DKTU
(d) DLTV

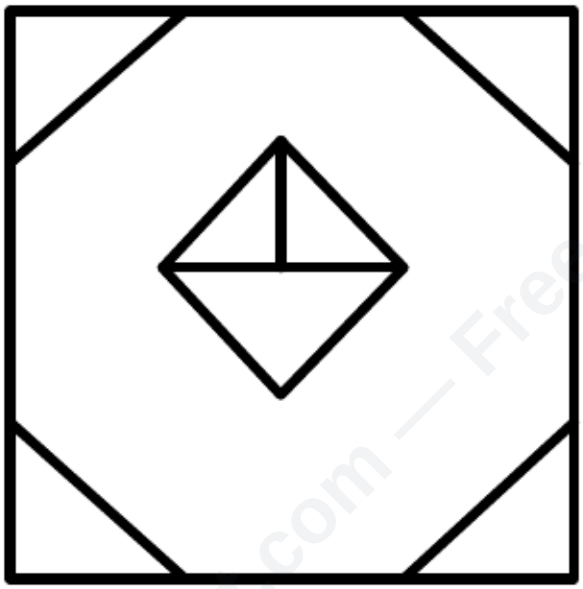
Q9. What will come in the place of the question mark (?) in the following equation if '+' and '-' are interchanged and '×' and '÷' are interchanged?

13 ÷ 182 × 14 - 45 + 24 = ?

(a) 194
(b) 183
(c) 190
(d) 187

Q10. How many triangles are there in the given figure?

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(a) 9
(b) 10
(c) 11
(d) 8

Q11. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

4 - 12 - 50 and 7 - 12 - 86

(a) 3 - 6 - 18
(b) 6 - 18 - 110
(c) 2 - 5 - 23
(d) 5 - 7 - 34

Q12. In a certain code language, 'TRIM' is coded as '6794' and 'MINT' is coded as '3679'. What is the code for 'R' in the given code language?

(a) 9
(b) 4
(c) 3
(d) 7

Q13. What should come in place of the question mark (?) in the given series?

254, 251, 245, 236, 224, ?

(a) 212
(b) 209
(c) 210
(d) 206

Q14. Three of the following four letter-clusters are alike in some manner and hence form a group. Which letter-clusters does not belong to that group?

(a) MKN
(b) QOR
(c) GEH
(d) TRV

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Q15. Select the combinations of letters that when sequentially placed in the blanks of the given series will complete the series.

Z __ WV USR _ NML KIG F __ CB

(a) YQOHD
(b) XQPHD
(c) XQOHD
(d) YQPHD

Q16. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below.

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

Blood : Red

(a) Stone : Hard
(b) Dry : Wet
(c) Music : Guitar
(d) Finger : Toe

Q17. Which number from among the given options can replace the question mark (?) in the following series?

8, 11, 22, ?, 50, 53

(a) 37
(b) 42
(c) 35
(d) 25

Q18. Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusion's logically follow/s from the given statements.

Statements :

Some apples are oranges.

All oranges are bananas.

All bananas are mangoes.

Conclusion (I) : Some mangoes are oranges.

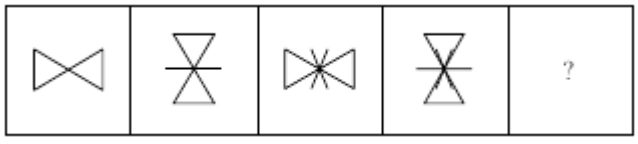
Conclusion (II) : Some bananas are apples.

(a) Only conclusion (I) is true.
(b) Both conclusions (I) and (II) are true.
(c) Neither conclusion (I) nor (II) is true.
(d) Only conclusion (II) is true.

Q19. The position of how many letters will remain unchanged if each of the letter in the word 'VAPORIZE' is arranged in alphabetical order?

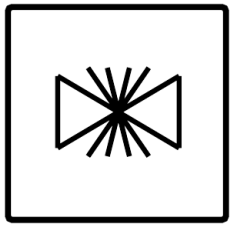
(a) Two
(b) Three
(c) Four
(d) One

Q20. Identify the figure given in the options which when put in place of the question mark (?) will logically complete the series.

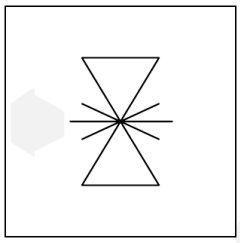


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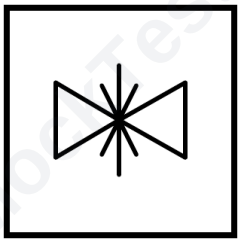
(a)



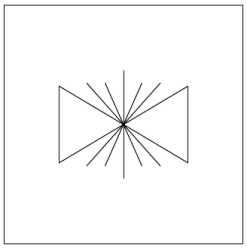
(b)



(c)



(d)



Q21. The second number in the given number pairs is obtained by performing certain mathematical operations(s) on the first number. The same operation(s) are followed in all the number pairs except one. Find that odd number pair.

(a) 5 : 23
(b) 4 : 19
(c) 2 : 11
(d) 7 : 32

Q22. Select the combination of letters that when sequentially placed in the blanks of the given series will make the series logically complete.

AEI __ JL QS _ SS ___ ZXU

(a) BLSN
(b) SSUU
(c) SDMA
(d) ONSB

Q23. In a certain code language,

A + B means 'A is the mother of B',

A - B means 'A is the brother of B',

A × B means 'A is the wife of B',

A ÷ B means 'A is the father of B'.

Based on the above, how is M related to P if 'M + N ÷ O × P - Q'?

(a) Wife's Father's Mother
(b) Mother's husband
(c) Brother's wife
(d) Daughter

Q24. Pointing towards a photo, Mahesh said, "She is the daughter of the only son of my grandfather." How is the girl in the photo related to Mahesh?

(a) Sister
(b) Daughter
(c) Mother's sister
(d) Mother

Q25. What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged?

26 ÷ 6 + 24 × 3 - 6 = ?

(a) 124
(b) 154
(c) 134
(d) 144

GENERAL INTELLIGENCE

Q26. Who gave the concept of 'money illusion' for the first time?

(a) Robertson
(b) Adam Smith
(c) Irving Fisher
(d) JM Keynes

Q27. Which Spanish football team play their home games at the Bernabeu?

(a) Real Madrid
(b) Elche
(c) Barcelona
(d) Athletic Madrid

Q28. What is the rationale behind why one is ready to hold a ten rupee coin?

(a) It is finely and artistically minted.
(b) It can be melted to extract metal worth Rs. 10 out of it.
(c) Its value is backed by the issuing authority.
(d) Its intrinsic value is greater than Rs. 10.

Q29. Which of the following cities was built by Humayun at Delhi?

(a) Akbarabad
(b) Dinpanah
(c) Muhammadabad
(d) Siri

Q30. According to Census of India 2011, which state in India has the highest female literacy rate?

(a) Himachal Pradesh
(b) Kerala
(c) Tamil Nadu
(d) Maharashtra

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Q31. 2^(nd) October is observed as _____.

(a) International Non-Violence Day
(b) World Social Justice Day
(c) World Wildlife Day
(d) International Education Day

Q32. The political Part of the Indian Constitution has been largely drawn from which Constitution?

(a) British Constitution
(b) Irish Constitution
(c) Australian Constitution
(d) US Constitution

Q33. The government of india launched a new programme called the New India Literacy Programme (NILP) for five years, from FY's _____ to _____ with a budget of Rs. 1,037.90 crores.

(a) 2023-24 to 2026-27
(b) 2022-23 to 2026-27
(c) 2022-23 to 2024-25
(d) 2021-22 to 2025-26

Q34. Which of these is true about the second phase of the green revolution?

(a) It covered the period of the 1980s.
(b) It was introduced in areas with irrigation facilities.
(c) It covered the period of the 1960s and 1970s.
(d) It was introduced in Punjab and Uttar Pradesh regions.

Q35. What is the name of the chemical compound having the molecular formula C3H4O which is mostly used for the production of acrylic acid and acrylate ester?

(a) Naphthaldehyde
(b) Vanillin
(c) Acrolein
(d) Muscone

Q36. The Monetary Policy Committee maintained a hawkish stand on the interest rates. In this context, 'hawkish' stand means _____.

(a) interest rates were decreased
(b) interest rates were increased
(c) interest rates were kept unchanged
(d) money supply was increased

Q37. Gurunaidu Sanapathi, who became India's first weightlifter to win a gold medal at the IWF in 2022, is from which state?

(a) Kerala
(b) Tamil Nadu
(c) Andhra Pradesh
(d) Odisha

Q38. Which are the four quantum numbers for an electron present in 4f orbital?

(a) n = 4, l = 3, m = +1, s = +1/2
(b) n = 3, l = 2, m = -2, s = +1/2
(c) n = 4, l = 4, m =-4, s = -1/2
(d) n = 4, l = 3, m = +4, s = +1/2

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Q39. Which institution had launched the project E-Shakti for the digitization of all members of self-help groups in India?

(a) SIDBI
(b) SEBI
(c) IFCI
(d) NABARD

Q40. What is the product of the reaction when anhydrite undergoes hydration?

(a) Limonite
(b) Magnesite
(c) Kaolin
(d) Gypsum

Q41. Which of the following diseases is transmitted by the bite of an infected phlebotomine sandfly, characterised by irregular fever, weight loss and enlargement of the spleen and liver?

(a) Japanese encephalitis
(b) Visceral leishmaniasis
(c) Diarrhoea
(d) Anaplasmosis

Q42. The name of the Brahmin priest who later came to be known as Ramakrishna Paramahansa is :

(a) Gadadhar Chattopadhyaya
(b) Dayanand Saraswati
(c) Shree Narayana Guru
(d) Narendra Nath Datta

Q43. Ravi Shankar is famous for which of the following musical instruments?

(a) Veena
(b) Sitar
(c) Algoza
(d) Flute

Q44. Chali, Jhumura, and Nadu Bhangi are associated with which Indian classical dance form?

(a) Kathakali
(b) Sattriya
(c) Manipuri
(d) Kuchipudi

Q45. In which year was the Indian National Congress established?

(a) 1891
(b) 1885
(c) 1876
(d) 1882

Q46. India topped the medal tally in 2023 Taoyuan Archery Asia Cup Stage-I World ranking tournament, with _____ medals.

(a) 9
(b) 7
(c) 8
(d) 10

Q47. Sutapa Talukdar is associated with which Indian Classical dance form?

(a) Kuchipudi
(b) Odissi
(c) Bharatanatyam
(d) Mohiniyattam

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Q48. According to the Indian Minerals Yearbook 2020, which state has the highest production of manganese in India?

(a) Karnataka
(b) Madhya Pradesh
(c) Odisha
(d) Maharashtra

Q49. Article 22 of the Indian Constitution is related to which of the following?

(a) Right to education
(b) Protection of Personal liberty
(c) Preventive detention
(d) Protection of life

Q50. Which of the following industries is its own major consumer in India?

(a) Iron and steel
(b) Aviation
(c) Automobile
(d) Chemical

QUANTITATIVE APTITUDE

Q51. Mohan purchased trousers for Rs. 765, after a discount of 15% was offered on its marked price. What is the marked price (in Rs.) of the trousers?

(a) 885
(b) 855
(c) 900
(d) 870

Q52. In April 2019, Dinesh purchased a new car for Rs. 7,00,000 and sold it in April 2022 at its depreciated cost. If the rate of depreciation in the first year is 20%, 15% in the second year and 10% every year thereafter, what amount of money will Dinesh get as the selling price?

(a) Rs. 4,28,400
(b) Rs. 4,28,600
(c) Rs. 4,68,400
(d) Rs. 5,28,400

Q53. In a village election between three candidates, 80% of the voters cast their votes, out of which 3% votes were declared invalid. The winning candidate got 42,680 votes which were 55% of the total valid votes. Find the number of valid votes received by the candidate who stood third, given that he received only 10% of the total valid votes.

(a) 7760
(b) 7700
(c) 7670
(d) 7680

Q54. If $\sqrt{a/b} = 8/3 + \sqrt{(b/a)}$ and $(a + b) = 30$, then what is the value of ab?

(a) 64
(b) 28
(c) 81
(d) 36

Q55. A train starts from a station P for another station Q at 6 p.m. at an average speed of 75 km per hour. Another train starts from station Q for station P at 8 p.m. at an average speed of 105 km per hour. If the distance between these two stations is 690 km, then at what time will the two trains meet?

(a) 10:30 p.m.
(b) 10 p.m.
(c) 11 p.m.

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(d) 11:30 p.m.

Q56. The data given in the following table shows the number of boys and girls enrolled for different games in an academy over 5 years.

Years	Basketball	Football	Cricket			
Boys	Girls	Boys	Girls	Boys	Girls	
2018	46	34	42	37	45	35
2019	40	41	44	34	42	32
2020	43	40	40	32	38	36
2021	37	44	43	25	34	28
2022	34	41	41	32	41	39

In which year did the academy have the highest enrolment?

(a) 2019
(b) 2022
(c) 2020
(d) 2018

Q57. The perimeter of a parallelogram is 48 cm. If the height of the parallelogram is 6 cm and the length of the adjacent side is 8 cm, find its area.

(a) 90 cm^2
(b) 80 cm^2
(c) 84 cm^2
(d) 96 cm^2

Q58. Ali, Avtar Singh and Ashok working together can finish a work in 8 days. Ali alone can do it in 20 days and Avtar Singh alone can do it in 24 days. In how many days can Ashok alone do the same work?

(a) 30
(b) 28
(c) 26
(d) 25

Q59. If $\cos\theta/(1+\sin\theta)+\cos\theta/(1-\sin\theta) = 4$ and θ is acute, then the value of θ is :

(a) 60°
(b) 15°
(c) 45°
(d) 30°

Q60. Solve $(1+5/6+7/8+11/12) \div (3/4-5/8)$.

(a) 29
(b) 39
(c) 19
(d) 49

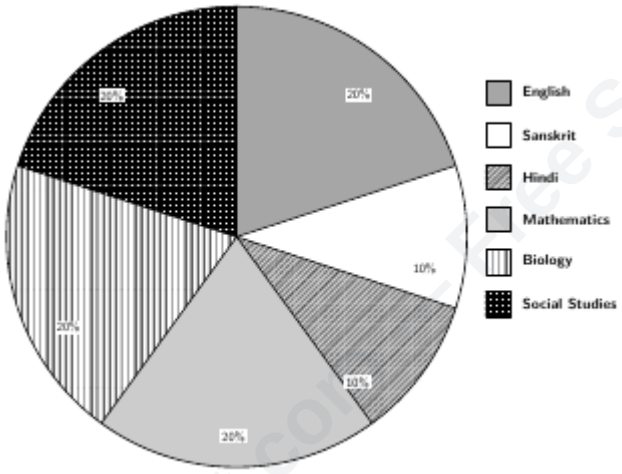
Q61. Catch Cola 300 ML with MRP Rs. 20 is displayed in a Hyper Market with an Offer 'BUY 2 GET 1 FREE'. With this offer, the Hyper Market is giving what per cent discount?

(a) 50%
(b) 33.33%
(c) 20%
(d) 40%

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Q62. Study the given pie-chart and answer the question that follows.

Percentage-wise distribution of teachers in six different subjects in a school is given in the pie-chart. The total number of teachers is 600. The ratio of male to female teachers is 3 : 1.



What is the total number of male teachers in the school?

(a) 500
(b) 420
(c) 450
(d) 400

Q63. If sin α + cos α = 2/√3, then what is (tan α + cot α) equal to?

(a) 1
(b) 2
(c) 6
(d) 0

Q64. A circle of radius 5 cm and the length of tangent drawn from a point X outside the circle is 12 cm. The distance of the point x from the centre of the circle is :

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

Q65. O is the center of a circle and A is a point on a major arc BC of the circle. angle BOC and angle BAC are the angles made by the minor BC on the center and circumference, respectively. If angle ABO = 40° and angle ACO = 30°, then find angle BOC.

(a) 130°
(b) 140°
(c) 120°
(d) 150°

Q66. If a craftsman were to sell a table at Rs. 1,300, he would lose 35%. To gain 30%, he would sell it for :

(a) Rs. 2,600
(b) Rs. 2,500
(c) Rs. 2,300
(d) Rs. 2,400

Q67. The simple interest on a certain sum for 3 years at 8% per annum is Rs. 9120 less than the simple interest on the same sum for 7 years at 8% per annum. Find the sum.

(a) Rs. 28500
(b) Rs. 28250
(c) Rs. 28750

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(d) Rs. 28000

Q68. If $2x + 3y = 9$, and $xy = 3$, what is $8x^3 + 27y^3$?

(a) 235
(b) 244
(c) 243
(d) 234

Q69. Find the value of cos 0° + cos 30° - tan 45° + cosec 60° + cot 90°.

(a) 7/6√3
(b) √3/6
(c) 7/6
(d) 7/2√3

Q70. In an isosceles triangle, if the unequal side is 8 cm and equal side is 5 cm, then the area of the triangle is :

(a) 12 cm^2
(b) 25 cm2
(c) 6 cm2
(d) 11 cm2

Q71. The average monthly salary of workers in a factory is Rs. 6,000. The average monthly salary of 100 technicians is Rs. 12,000, and the average monthly salary of non-technicians is Rs. 4,000. Find the total number of workers in the factory

(a) 400
(b) 300
(c) 250
(d) 450

Q72. The data of production (in million) on three types of medicines by three different companies is given below :

Medicine →	**P**	**Q**	**R**
Company ↓			
A	1.125	2.220	2.100
B	2.225	1.175	2.500
C	1.550	1.750	1.950

Which of the following gives the minimum production of a medicine by any company?

(a) Medicine P, Company A
(b) Medicine Q, Company C
(c) Medicine P, Company C
(d) Medicine Q, Company B

Q73. ΔPQR and ΔSQR are both isosceles triangles on a common base QR such that P and S lie on the same side of QR. If angle QSR = 60° and angle QPR = 100°, then find angle SRP.

(a) 80°
(b) 60°
(c) 100°
(d) 20°

Q74. A sum of money is divided among A, B, C in the ratio 3 : 2 : 5, respectively. If the share of C is Rs. 300 more than B, then how much more money will A get than B?

(a) Rs. 150
(b) Rs. 75
(c) Rs. 100
(d) Rs. 125

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Q75. Simplify the following expression.

0.01 + 0.68 × 0.68 + 0.22 × 0.22 + 0.044 + 0.136 + 0.44 × 0.68

(a) 0.69
(b) 1
(c) 0.8
(d) 0.9

GENERAL AWARENESS

Q76. Select the most appropriate ANTONYM of the given word.

Sumptuous

(a) Unremitting
(b) Lucrative
(c) Inexpensive
(d) Delectable

Q77. Select the meaningful and correctly spelt word from the given options to fill in the blank.

The chief guest is _____ to arrive at the venue within half an hour.

(a) accepted
(b) expieted
(c) expected
(d) espected

Q78. Select the most appropriate option that can substitute the underlined segment in the given sentence.

Peter was brought in the penalty area.

(a) was brought down of the
(b) was brought of the
(c) was brought on the
(d) was brought down in the

Q79. Identify the error in the use of preposition in the given sentence and select the correct option.

Radhika is not capable on participating in a national level competition.

(a) about
(b) of
(c) on
(d) at

Q80. Select the option that expresses the given sentence in passive voice.

They cancelled the meeting due to bad weather.

(a) The meeting is cancelled by them because of bad weather.
(b) The meeting was cancelled due to bad weather.
(c) They cancelled the meeting and bad weather was the cause.
(d) The bad weather is the reason they cancelled the meeting.

Q81. Select the option that expresses the given sentence in active voice.

The work will be finished by the mason within a short time.

(a) The mason will be finishing the work within a short time.
(b) The mason would have finish the work within a short time.
(c) The mason would finish the work within a short time.
(d) The mason will finish the work within a short time.

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Q82. Directions: Choose the option that best describes the meaning of the given idiom/phrase.

Memory like sieve

(a) Being healthy
(b) Poor memory
(c) Feeling ill
(d) Remembering everything

Q83. Select the most appropriate option that can substitute the underlined words in the following sentence.

He will be looking as if he has not slept.

(a) He looks
(b) He has look
(c) He was looking
(d) He will be look

Q84. Identify the correct spelling of the underlined word.

Medical termnalogy is difficult to understand.

(a) tarmnalogy
(b) tarminology
(c) terminology
(d) terminiology

Q85. Select the most appropriate ANTONYM of the given word.

Amateur

(a) Hobbyist
(b) Devotee
(c) Layman
(d) Professional

Q86. Select the option that can be used as a one-word substitute for the given group of words.

A person who loves and collects books

(a) Bibliophile
(b) Philanthropist
(c) Geologist
(d) Sommelier

Q87. Select the most appropriate idiom for the underlined words in the given sentence.

The candidate blamed the persistent traffic jam as reason of his being late and the interviewer believed him though he was not convinced.

(a) gave the benefit of doubt
(b) changed his tune
(c) thought err is human and to forgive is divine
(d) did not judge the book by its cover

Q88. Select the most appropriate synonym of the underlined word.

Caves like Ajanta lie in perpetual darkness.

(a) Permanent
(b) Extreme
(c) Brief
(d) Huge

Q89. Select the most appropriate ANTONYM of the given word.

Comply

(a) Deny
(b) Engage

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(c) Assist
(d) Expect

Q90. The following sentence has been divided into four parts. One of them contains an error. Select the part that contains the error from the given options.

The sun / revolves / around / a earth.

(a) The sun
(b) revolves
(c) a earth
(d) around

Q91. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.

(A) between the two countries
(B) will inevitably count
(C) the recent political incident
(D) against the peace process

(a) CDBA
(b) CDAB
(c) CBAD
(d) CABD

Q92. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.

A. or brave man to make
B. money the chief object of his thoughts
C. for a well-educated, intellectual
D. it is physically impossible

(a) ABCD
(b) DCAB
(c) CDAB
(d) CABD

Q93. Select the most appropriate option that can substitute the underlined segment in the given sentence.

Mahesh's attitude annoyed me and I blew into.

(a) annoyed me and I blew over
(b) annoyed me and I blew off
(c) annoyed me and I blew down of
(d) annoyed me and I blew up

Q94. Select the most appropriate synonym of the word 'Pervasive' from the given sentence.

The scientist's hypothesis was substantiated by extensive research and experimentation.

(a) Extensive
(b) Substantiated
(c) Experimentation
(d) Hypothesis

Q95. Select the most appropriate homophone to fill in the blank.

The dog took a _____ during his walk and lifted his _____ to indicate that he was tired.

(a) pause, pours
(b) pours; pores
(c) paws; pause
(d) pause; paws

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Directions

Direction : In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

I have few deliberations for you. Don't leave your hard work to _____ 1 _____. If you have gone to the effort to complete a dialogue, _____ 2 _____ fritter away all the meaning you created by trusting your memories. Write down the _____ 3 ____ of conclusions, decisions and assignments. Remember to record ____ 4 ____ does what by when. Revisit your notes at key times and _____ 5 _____ assignments.

Q96. Select the most appropriate option to fill in blank 1.

(a) diary
(b) notes
(c) memory
(d) someone

Q97. Select the most appropriate option to fill in blank 2.

(a) does not
(b) did not
(c) do not
(d) had not

Q98. Select the most appropriate option to fill in blank 3.

(a) titles
(b) failures
(c) details
(d) short cuts

Q99. Select the most appropriate option to fill in blank 4.

(a) which
(b) who
(c) that
(d) whom

Q100. Select the most appropriate option to fill in blank 5.

(a) obliterate
(b) introspect
(c) speculate
(d) review

ANSWER KEY

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

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SOLUTIONS

Q1. Answer: (c) Ban - Forbid

The logic followed here is:
Logic: The second word is the Synonym of the first word.
Here,
Begin - Start → Begin is the Synonym of Start.
Similarly,
Ban - Forbid → Ban is the Synonym of Forbid.
Hence, the correct answer is "Option 3".

Q2. Answer: (b) [figure]

The correct mirror image of the given figure is:
Hence, the correct answer is "Option 2".

Q3. Answer: (d) Saturday

Given: 11 August 2004 was Wednesday.
Then, 11 August 2005 was Wednesday + 1 = Thursday.
Now, from 11 August 2005 to 11 February 2006
= 20(Aug) + 30(Sept) + 31(Oct) + 30(Nov) + 31(Dec) + 31(Jan) + 11(Feb)
= 184 days.
And, Total odd days in 184 days = 184/7 = 26 weeks and 2 odd days.
So, 11 February 2006 will be → Thursday + 2 = Saturday.
Hence, the correct answer is "Option 4".

Q4. Answer: (d) 132

The logic followed here is:
Logic: (1st number × 3) + 3 = 2nd number.
Now,
For, 24 is related to 75
→ (24 × 3) + 3
→ 72 + 3 = 75.
For, 36 is related to 111
→ (36 × 3) + 3
→ 108 + 3 = 111.
Similarly, for 43 is related to
→ (43 × 3) + 3
→ 129 + 3 = 132.
Hence, the correct answer is "Option 4".

Q5. Answer: (c) 72

The logic followed here is:
Logic: (1st number - 1) ÷ 4 = 2nd number.
Now,
For 129 : 32
→ (129 - 1) ÷ 4
→ 128 ÷ 4 = 32.
For 109 : 27
→ (109 - 1) ÷ 4
→ 108 ÷ 4 = 27.
Similarly, for 289 : ?
→ (289 - 1) ÷ 4
→ 288 ÷ 4 = 72.

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Hence, the correct answer is "Option 3".

Q6. Answer: (b) [figure]

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 2".

Q7. Answer: (b) IZRECG

The logic followed here is:

For, 'QUIRKY' is coded as 'TCLZNG',

For, 'MUZHIK' is coded as 'PCCPLS',

Similarly, for 'FROWZY'

So, 'FROWZY' will be coded as 'IZRECG'.

Hence, the correct answer is "Option 2".

Q8. Answer: (d) DLTV

The logic followed here is:

For, 'AFKQ' is related to 'BELR'

For, 'IQWY' is related to 'JPXZ'

Similarly, for 'CMSU'

So, 'CMSU' will be related to 'DLTV'

Hence, the correct answer is "Option 4".

Q9. Answer: (c) 190

BODMAS Table:

Given equation: 13 ÷ 182 × 14 - 45 + 24 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 13 × 182 ÷ 14 + 45 - 24 = ?

=> 13 × 13 + 45 - 24 = ?

=> 169 + 45 - 24 = ?

=> 214 - 24 = 190.

Hence, the correct answer is "Option 3".

Q10. Answer: (d) 8

The triangles are:

So, there are total '8' triangles in the given figure.

Hence, the correct answer is "Option 4".

Q11. Answer: (b) 6 - 18 - 110

The logic followed here is:

Logic: (1st number × 2nd number) + 2 = 3rd number.

Now,

For 4 - 12 - 50

→ (4 × 12) + 2

→ 48 + 2 = 50.

For 7 - 12 - 86

→ (7 × 12) + 2

→ 84 + 2 = 86.

Similarly, for 6 - 18 - 110

→ (6 × 18) + 2

→ 108 + 2 = 110.

Hence, the correct answer is "Option 2".

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Q12. Answer: (b) 4

Given:

'TRIM' is coded as '6794'

'MINT' is coded as '3679'.

So, 'R' will be coded as '4'.

Hence, the correct answer is "Option 2".

Q13. Answer: (b) 209

The logic followed here is:

So, '209' will complete the series.

Hence, the correct answer is "Option 2".

Q14. Answer: (d) TRV

The logic followed here is:

Option 1) MKN

Option 2) QOR

Option 3) GEH

Option 4) TRV

Here, 'TRV' is odd among the given options.

Hence, the correct answer is "Option 4".

Q15. Answer: (b) XQPHD

The logic followed here is:

So, 'XQPHD' will be the correct combination of letters that filled in the blanks in the same sequence will make the series logically complete.

Hence, the correct answer is "Option 2".

Q16. Answer: (a) Stone : Hard

The logic followed here is:

Logic: The second word shows the properties of the first word.

Here,

Blood : Red → Blood naturally has the color Red.

Similarly,

Stone : Hard → Stones naturally have the property of being Hard.

Hence, the correct answer is "Option 1".

Q17. Answer: (d) 25

The logic followed here is:

So, '25' will complete the series.

Hence, the correct answer is "Option 4".

Q18. Answer: (b) Both conclusions (I) and (II) are true.

Given Statements:

Some apples are oranges.

All oranges are bananas.

All bananas are mangoes.

The least possible Venn diagram for the given statement is:

Conclusions:

I. Some mangoes are oranges - True (Because, All oranges are bananas and all bananas are mangoes, so some part of mangoes is also oranges).

II. Some bananas are apples - True (Because, Those part of mangoes which is oranges will also apples).

So, Both conclusions (I) and (II) are true.

Hence, the correct answer is "Option 2".

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Q19. Answer: (d) One

Given word: VAPORIZE

Now, each letter of the word 'VAPORIZE' is arranged in English alphabetical order:

Letter	V	A	P	O	R	I	Z	E
Alphabetical order	A	E	I	O	P	R	V	Z

Here, only 'One' letter(O) will remain unchanged after arrange the words in Alphabetical order.

Hence, the correct answer is "Option 4".

Q20. Answer: (a) [figure]

The logic followed here is:

Step I: The symbols are getting rotated by 90 degree to the next diagram.

Step II: One lines added in the each next images.

Hence, the correct answer is "Option 1".

Q21. Answer: (d) 7 : 32

The logic followed here is:

Logic: (1st number × 4) + 3 = 2nd number.

Now, checking the options:

Option 1) 5 : 23 → (5 × 4) + 3 → 20 + 3 = 23.

Option 2) 4 : 19 → (4 × 4) + 3 → 16 + 3 = 19.

Option 3) 2 : 11 → (2 × 4) + 3 → 8 + 3 = 11.

Option 4) 7 : 32 → (7 × 4) + 3 → 28 + 3 = 31 ≠ 32.

So, '7 : 32' odd among the given options.

Hence, the correct answer is "Option 4".

Q22. Answer: (d) ONSB

The logic followed here is:

So, 'ONSB' will be the correct combination of letters that filled in the blanks in the same sequence will make the series logically complete.

Hence, the correct answer is "Option 4".

Q23. Answer: (a) Wife's Father's Mother

Family Chart:

Decoding the Symbols:

Symbol	•	•	×	÷
Meaning	Mother	Brother	Wife	Father

Given: M + N ÷ O × P - Q

It means: M is the Mother of N, N is the Father of O, O is the Wife of P, P is the Brother of Q.

So, M is the 'Wife's Father's Mother' of P.

Hence, the correct answer is "Option 1".

Q24. Answer: (a) Sister

Family Chart:

Given: Pointing towards a photo, Mahesh said, "She is the daughter of the only son of my grandfather."

So, the girl is the 'Sister' of Mahesh.

Hence, the correct answer is "Option 1".

Q25. Answer: (b) 154

BODMAS Table:

Given equation: 26 ÷ 6 + 24 × 3 - 6 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

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=> 26 × 6 - 24 ÷ 3 + 6 = ?

=> 26 × 6 - 8 + 6 = ?

=> 156 - 8 + 6 = ?

=> 162 - 8 = 154.

Hence, the correct answer is "Option 2".

Q26. Answer: (c) Irving Fisher

The correct answer is Irving Fisher.

Key Points

• Irving Fisher gave the concept of 'money illusion' for the first time.

• Money illusion refers to the tendency of people to think in nominal terms rather than real terms.

• For example, if a person's salary increases by 3% but inflation is also 3%, they may think they have received a raise when in reality their purchasing power has not changed.

Additional Information

• Adam Smith is known for his work on economics.

• He is often referred to as the father of modern economics.

• JM Keynes was a renowned economist.

• He is known for his theories on macroeconomics and the role of government in managing the economy.

• Robertson was an economist who contributed to the development of monetary theory.

Q27. Answer: (a) Real Madrid

The correct answer is Real Madrid.

Key Points

• Real Madrid is one of the most successful football clubs in the world, with a record 13 European Cup/UEFA Champions League titles.

• The Bernabeu stadium is the home ground of Real Madrid.

• It has a capacity of over 81,000 spectators and is located in the city center of Madrid.

• The stadium has been the venue for several high-profile football matches, including the finals of the European Cup/UEFA Champions League and the World Cup.

• Real Madrid has a fierce rivalry with Barcelona, who play their home games at the Camp Nou stadium.

• The two teams compete in the El Clasico derby, which is one of the most watched football matches in the world

Additional Information

• Elche is a Spanish football club that currently plays in the second division of the Spanish league system.

• Their home ground is the Estadio Manuel Martinez Valero, which is located in the city of Elche.

• Barcelona is another top Spanish football club, with a record 5 European Cup/UEFA Champions League titles.

• They play their home games at the Camp Nou stadium, which has a capacity of over 99,000 spectators.

• Athletic Madrid (also known as Atletico Madrid) is a Spanish football club that has won the Spanish league title 11 times.

• They play their home games at the Wanda Metropolitano stadium, which has a capacity of over 68,000 spectators.

Q28. Answer: (c) Its value is backed by the issuing authority.

The correct answer is its value is backed by the issuing authority.

Key Points

• The issuing authority, which is the government in this case, guarantees the value of the coin.

• This means that the coin can be used as a medium of exchange, as people trust that it is worth the value printed on it.

• The ten rupee coin is not finely or artistically minted, nor does it have an intrinsic value greater than Rs. 10.

• Its value is purely symbolic and based on the trust that people have in the issuing authority.

Additional Information

• The term "issuing authority" refers to the entity that is responsible for creating and distributing currency.

• In India, this is the Reserve Bank of India (RBI), which is the central bank of the country.

• Finely and artistically minted coins may have aesthetic value, but this does not necessarily make them more valuable as currency.

• The value of a coin is determined by its purchasing power, which is based on the trust that people have in the currency and the stability of the economy.

• The intrinsic value of a coin is the value of the metal or materials used to make it.

• For example, a gold coin may have an intrinsic value based on the current market price of gold.

• However, most modern currency is not based on intrinsic value, but on the trust and confidence that people have in the issuing authority.

Q29. Answer: (b) Dinpanah

The correct answer is Dinpanah.

Key Points

• Humayun built the city of Dinpanah in Delhi during his reign as the Mughal emperor.

• The city was built as a refuge for his family and court during times of war and unrest.

• Dinpanah was located near the older city of Purana Qila and was connected to it by a bridge over the Yamuna River.

• Today, the remains of Dinpanah can be seen in the form of ruins and archaeological sites in the area.

Additional Information

• Akbarabad was built by Humayun's son Akbar after he became the Mughal emperor.

• During his lifetime, Akbar had renamed Agra as Akbarabad.

• But following the demise of Akbar, the name was once more changed to Agra.

• Muhammadabad is not a historically significant city and is not related to Humayun or the Mughal Empire.

• Siri was an ancient city in Delhi that was destroyed by Timur in the 14th century and was not rebuilt by Humayun.

• Delhi gave rise to Siri as its second city, but it was never taken.

Q30. Answer: (b) Kerala

The correct answer is Kerala.

Key Points

• Kerala has the highest female literacy rate in India according to the Census of India 2011, with a rate of 96.2%.

• Himachal Pradesh has the second-highest female literacy rate with 83.8%.

• Tamil Nadu has a female literacy rate of 80.3%, while Maharashtra has a rate of 77.4%.

• Female literacy rates are an important indicator of a state's development and progress towards gender equality.

• Kerala's high female literacy rate is due in part to its strong focus on education and high levels of social development.

Additional Information

• Himachal Pradesh has made significant progress in female literacy rates over the years, with the rate increasing from 76.5% in 2001 to 83.8% in 2011.

• Tamil Nadu has also made progress in female literacy rates, increasing from 68.5% in 2001 to 80.3% in 2011.

• Maharashtra has a relatively lower female literacy rate compared to other states in India, but has made progress in recent years with the rate increasing from 67.5% in 2001 to 77.4% in 2011.

Q31. Answer: (a) International Non-Violence Day

The correct answer is International Non-Violence Day.

Key Points

• October 2^(nd)is celebrated as the birth anniversary of Mahatma Gandhi, who was a leader of the Indian independence movement and a pioneer of the philosophy and strategy of non-violence.

• The United Nations General Assembly declared October 2^(nd)as the International Day of Non-Violence in 2007 to disseminate the message of non-violence, including through education and public awareness.

Additional Information

• World Social Justice Day is observed on February 20^(th) to promote social justice and eradicate poverty, inequality, and discrimination.

• World Wildlife Day is celebrated on March 3rd to raise awareness of the importance of wildlife and to promote conservation and sustainable use of wildlife.

• International Education Day is observed on January 24th to highlight the role of education in building a peaceful and sustainable world.

Q32. Answer: (a) British Constitution

The correct answer is the British Constitution.

Key Points

• The political part of the Indian Constitution has been largely drawn from the British Constitution.

• The Indian Constitution has borrowed the parliamentary form of government, the rule of law, the bicameral legislature, and the office of the governor from the British Constitution.

• However, the Indian Constitution has also made several modifications to the British model to suit the Indian context.

• For instance, India has a federal system of government with a strong center, while the UK has a unitary system.

Additional Information

• The Irish Constitution has influenced the Indian Constitution in terms of the Directive Principles of State Policy.

• The Indian Constitution has borrowed the idea of social and economic justice from the Irish Constitution.

• The Australian Constitution has influenced the Indian Constitution in terms of the concurrent list, which allows both the center and the states to make laws on certain subjects.

• The US Constitution has influenced the Indian Constitution in terms of fundamental rights, which are similar to the Bill of Rights in the US Constitution.

• However, the Indian Constitution has also made several modifications to the US model, such as the inclusion of socio-economic rights.

Q33. Answer: (b) 2022-23 to 2026-27

The correct answer is 2022-23 to 2026-27.

Key Points

• The New India Literacy Programme (NILP) will run from FY 2022-23 to 2026-27 with a budget of Rs. 1,037.90 crores.

• The NILP aims to provide functional literacy and numeracy to over 60 million non-literate and low-literate adults in the age group of 15-45 years.

• The programme will focus on digital and vocational literacy, and will use technology-enabled learning platforms to reach out to learners in remote and difficult-to-reach areas.

• The programme will also involve community participation and engagement and will be implemented through a decentralized and participatory approach.

Additional Information

• The ability to read, write, speak, and listen in a way that facilitates efficient communication and helps us make sense of the outside world is known as literacy.

• In India, 77.70% of people are literate overall (2021 and 2022).

• And it takes a very long time to achieve this weightage through policies and reforms.

• When India gained its independence in 1947, the country's literacy rate was extremely low.

• Merely 18% of the total populace possessed literacy skills.

Q34. Answer: (a) It covered the period of the 1980s.

The correct answer is It covered the period of the 1980s.

Key Points

• Period: The second phase of the Green Revolution was introduced in the 1980s.

• Second Phase: The second phase did involve the introduction of new technologies in areas with irrigation facilities.

• Technological Introduction: The Green Revolution was a period of increased agricultural productivity in the mid-20th century, largely due to the introduction of new technologies, such as high-yielding crop varieties, irrigation, and fertilizers.

Additional Information

• The first phase of the Green Revolution occurred in the 1960s and 1970s.

• During this period, only certain states such as Punjab, Haryana, Andhra Pradesh, Tamil Nadu, etc. were using HYV seeds.

• The second phase of the Green Revolution did involve the introduction of new technologies in areas with irrigation facilities.

• The Second Green Revolution refers to the shift in agricultural production that is generally accepted as being required to feed and support the planet's expanding population.

• These calls were prompted, among other things, by concerns about peak oil and rising food commodity prices.

• Punjab and Uttar Pradesh were two of the regions where the Green Revolution was first introduced in India.

Q35. Answer: (c) Acrolein

The correct answer is Acrolein.

Key Points

• The chemical compound having the molecular formula C_3H_4O is called Acrolein.

• Acrolein is mostly used for the production of acrylic acid and acrylate ester.

• Acrylic acid is used in the production of various products such as adhesives, coatings, and paints.

• Acrylate ester is used in the production of polymers and plastics.

Additional Information

• Naphthaldehyde is an organic compound that is used as a flavoring agent.
• It is also used in the production of dyes and pharmaceuticals.
• Vanillin is an organic compound that is used as a flavoring agent in food and beverages.
• It is the main ingredient in the vanilla bean extract.
• Muscone is an organic compound that is used in the production of perfumes and fragrances.

Q36. Answer: (b) interest rates were increased

The correct answer is interest rates were increased.

Key Points

• A hawkish stand on interest rates means that the central bank or monetary policy committee is inclined towards raising interest rates in order to control inflation.
• This is usually done to prevent the economy from overheating due to excessive borrowing and spending, which can lead to inflation.
• In contrast, a dovish stand on interest rates means that the central bank is more likely to lower interest rates to stimulate economic growth and borrowing.

Additional Information

• The term "hawkish" comes from the idea of a hawk, which is known for being aggressive and vigilant.
• A hawkish monetary policy is characterized by a more aggressive stance toward controlling inflation and maintaining price stability.
• In contrast, a "dovish" monetary policy is named after the image of a dove, which is associated with peace and tranquility.
• A dovish policy is more focused on stimulating economic growth and reducing unemployment, even if it means accepting a higher level of inflation.

Q37. Answer: (c) Andhra Pradesh

The correct answer is Andhra Pradesh.

Key Points

• Gurunaidu Sanapathi is from Andhra Pradesh.
• He became India's first weightlifter to win a gold medal at the IWF in 2022.
• He created history by achieving this feat.
• Gurunaidu Sanapathi has brought laurels to his state and the country as a whole.

Additional Information

• Kerala is a state in the southern part of India known for its scenic beauty and backwaters.
• It is also known for its traditional martial art form, Kalaripayattu.
• Tamil Nadu is a state in the southern part of India known for its rich culture and heritage.
• It is also known for its famous temple cities, such as Madurai and Thanjavur.
• Tamil Nadu's traditional stick-martial art is called silambam.
• Odisha is a state in the eastern part of India known for its rich history and culture.
• It is also known for its famous temples, such as the Jagannath Temple in Puri.
• Odisha has produced many renowned sports personalities, such as Dutee Chand and Anuradha Biswal.
• The Odia phrase "paika akhada" means "warrior gymnasium" or "warrior school" in general.

Q38. Answer: (a) n = 4, l = 3, m = +1, s = +1/2

The correct answer is n = 4, l = 3, m = +1, s = +1/2.

Key Points

• The four quantum numbers for an electron present in 4f orbital are n = 4, l = 3, m = +1, and s = +1/2.
• The principal quantum number (n) indicates the energy level of the electron, and for 4f orbital, it is 4.
• The azimuthal quantum number (l) determines the shape of the orbital, and for f orbital, it can have values from 0 to n-1, which gives l = 3.
• The magnetic quantum number (m) specifies the orientation of the orbital in space and can have values from -l to +l, which gives m = +1 for the 4f orbital.
• The spin quantum number (s) describes the intrinsic angular momentum of the electron and can have two values, +1/2 or -1/2, for the electron in 4f orbital, it is +1/2.

Additional Information

• Quantum Numbers are a set of numbers that describe the properties of an electron in an atom, including its energy level, orbital

shape, orientation, and spin.

• The characteristics of atomic orbitals and the electrons within them are described by quantum numbers.

• There are four quantum numbers that represent the states of an electron in an atom or an ion.

Q39. Answer: (d) NABARD

The correct answer is NABARD.

Key Points

• NABARD (National Bank for Agriculture and Rural Development) launched the project E-Shakti for the digitization of all members of self-help groups in India.

• The project aimed to digitize the data of around 3 crore members of Self Help Groups across the country.

• E-Shakti helped in creating a comprehensive database of all the members of SHGs which helped in tracking their financial transactions and also provided them with easy access to credit facilities.

• The project also aimed to improve the efficiency of the SHGs and make them more self-sustainable by providing them with necessary training and capacity building.

• Overall, E-Shakti played a crucial role in promoting financial inclusion and empowering women in rural areas through the SHG model.

Additional Information

• SIDBI (Small Industries Development Bank of India) is a financial institution that focuses on providing financial assistance and support to small-scale industries.

• Working Capital Assistance, Term Loan Assistance, Foreign Currency Loan, Receivables Support, Equity Support, Energy Saving Scheme, and other services are provided by SIDBI to the MSME sector.

• SEBI (Securities and Exchange Board of India) is a regulatory body that oversees the functioning of the securities market in India.

• It was created by the Indian government in 1992 to oversee the securities market and safeguard the interests of investors who buy securities.

• IFCI (Industrial Finance Corporation of India) is a financial institution that provides long-term financial assistance to medium and large-scale industries.

• The Government of India established The Industrial Finance Corporation of India (IFCI) on July 1, 1948 by enacting the IFC Act 1948.

Q40. Answer: (d) Gypsum

The correct answer is Gypsum.

Key Points

• Anhydrite is a mineral that has the chemical formula $CaSO_4$.

• It is an anhydrous form of gypsum.

• When anhydrite undergoes hydration, it reacts with water to form gypsum ($CaSO_4.2H_2O$).

• Therefore, the product of the reaction when anhydrite undergoes hydration is gypsum.

Additional Information

• Gypsum is a soft sulfate mineral that is widely used in construction as a building material.

• It is also used in agriculture, medicine, and other industries.

• Limonite is a type of iron ore that is brownish-yellow in color.

• It can precipitate from surface or groundwater that is rich in iron, and it forms from the weathering of other iron minerals.

• Magnesite is a mineral that has the chemical formula $MgCO_3$.

• The mineral was created either by the action of magnesium-containing solutions on calcite or as an alteration product from rocks rich in magnesium.

• Kaolin is a type of clay mineral that is used in ceramics, paper, and other industries.

• The fine particle size, plate-like or lamellar particle shape, and chemical inertness of hydrous kaolin are its distinguishing features.

Q41. Answer: (b) Visceral leishmaniasis

The correct answer is Visceral leishmaniasis.

Key Points

• Visceral leishmaniasis, also known as kala-azar, is a parasitic disease caused by the Leishmania donovani parasite, which is transmitted by the bite of an infected phlebotomine sandfly.

• The disease is characterized by irregular fever, weight loss, and enlargement of the spleen and liver, which can lead to serious

health complications if left untreated.

• Treatment for visceral leishmaniasis typically involves a combination of drugs such as liposomal amphotericin B, miltefosine, and paromomycin.

• Prevention measures for the disease include using insect repellent, wearing protective clothing, and sleeping under insecticide-treated bed nets.

Additional Information

• Japanese encephalitis is a viral disease transmitted by mosquitoes.

• It can cause inflammation of the brain and is endemic in parts of Asia.

• Diarrhea is a common condition characterized by loose or watery stools.

• It can be caused by a variety of factors such as infections, food intolerances, and medications.

• Anaplasmosis is a tick-borne disease caused by the Anaplasma phagocytophilum bacterium.

• It can cause fever, headache, and muscle aches.

Q42. Answer: (a) Gadadhar Chattopadhyaya

The correct answer is Gadadhar Chattopadhyaya.

Key Points

• Ramakrishna Paramahansa was originally named Gadadhar Chattopadhyaya.

• He was born in a village called Kamarpukur in the Hooghly district of West Bengal in 1836.

• Ramakrishna Paramahansa was a mystic and spiritual teacher who is considered to be one of the most influential figures in the spiritual history of India.

• He was a devotee of the Hindu goddess Kali and his teachings were based on the principles of Advaita Vedanta.

Additional Information

• Dayanand Saraswati was a Hindu reformer who founded the Arya Samaj.

• His greatest work is the book Satyarth Prakash, which continues to be a very influential work on the Vedic philosophy and explanations of many concepts and human responsibilities.

• Shree Narayana Guru was a social reformer and philosopher from Kerala.

• He spearheaded a reform movement to advance social equality and spiritual enlightenment by combating injustice in Kerala's caste-based society.

• "One caste, one religion, and one god for all men" is his well-known quotation.

• Narendra Nath Datta was a disciple of Ramakrishna Paramahansa who later became known as Swami Vivekananda.

• He was born on January 12, 1863, in Calcutta.

Q43. Answer: (b) Sitar

The correct answer is Sitar.

Key Points

• Ravi Shankar is famous for playing the sitar, which is a stringed musical instrument with a long neck and a rounded body.

• He is known for popularizing Indian classical music and the sitar in the Western world during the 1960s and 1970s.

Additional Information

• The veena is another stringed instrument that is popular in Indian classical music, but it is played differently from the sitar and has a different shape and sound.

• The algoza is a wind instrument that consists of two bamboo flutes played together.

• It is commonly used in Punjabi folk music.

• The flute is also a wind instrument, but it is played differently from the algoza and has a different sound.

• It is often used in classical music and jazz.

Q44. Answer: (b) Sattriya

The correct answer is Sattriya.

Key Points

• Chali, Jhumura and Nadu Bhangi are associated with Sattriya.

• It is a classical dance form from Assam.

• Sattriya is characterized by brisk footwork, graceful movements, and intricate hand gestures.

Additional Information

• Kathakali is a classical dance form from Kerala.

• It combines dance, music, and acting to tell stories from Hindu mythology.

• Manipuri is a classical dance form from Manipur.

• It is characterized by its gentle, fluid movements and use of vibrant costumes.

• Kuchipudi is a classical dance form from Andhra Pradesh.

• It combines storytelling, dance, and music to depict tales from Hindu mythology.

Q45. Answer: (b) 1885

The correct answer is 1885.

Key Points

• 1885 is the year in which a group of prominent Indian leaders, including Allan Octavian Hume and Dadabhai Naoroji, founded the Congress.

• It was founded with the goal of advocating for Indian independence from British rule and promoting Indian interests.

• Over the years, the Congress has played a significant role in India's struggle for independence and in shaping the country's political landscape.

Additional Information

• INC was the first contemporary nationalist movement to arise in Asia and Africa under the British Empire.

• Congress, which came into being as a secular, all-encompassing party following India's independence in 1947, dominated Indian politics for the next twenty years.

• Pandit Jawaharlal Nehru, the party's first prime minister, convinced the Congress to back socialist policies by instituting a mixed economy, forming a secular state, forming the Planning Commission, and introducing Five-Year Plans.

• Following the demise of Nehru and the brief administration of Lal Bahadur Shastri, Indira Gandhi assumed the role of party leader.

Q46. Answer: (d) 10

The correct answer is 10.

Key Points

• India has won a total of 10 medals in the 2023 Taoyuan Archery Asia Cup Stage-I World ranking tournament.

• This is the highest number of medals won by any country in the tournament.

• The tournament is a world ranking tournament for archery, held in Taoyuan, Taiwan.

Additional Information

• Archery is a sport where participants shoot arrows at a target from a specific distance.

• The Taoyuan Archery Asia Cup is a series of tournaments held across Asia, where archers from different countries compete for world ranking points.

• India has a strong history in archery, with Deepika Kumari being a notable archer who has won multiple medals in international competitions.

Q47. Answer: (b) Odissi

The correct answer is Odissi.

Key Points

• Sutapa Talukdar is associated with the Indian classical dance form of Odissi, which originated in the eastern state of Odisha.

• Odissi is known for its fluidity, grace, and intricate footwork, and is characterized by its use of sculpturesque poses and facial expressions to convey emotions and tell stories.

Additional Information

• Kuchipudi is another Indian classical dance form that originated in the state of Andhra Pradesh.

• It is known for its fast-paced footwork, intricate hand gestures, and dramatic storytelling.

• Bharatanatyam is a classical dance form from the southern state of Tamil Nadu.

• It is known for its precise footwork, complex rhythms, and elaborate costumes and makeup.

• Mohiniyattam is a classical dance form from the southwestern state of Kerala.

• It is known for its graceful, flowing movements and subtle expressions.

Q48. Answer: (b) Madhya Pradesh

The correct answer is Madhya Pradesh.

Key Points

• Madhya Pradesh has the highest production of manganese in India, with a production of 5,528 thousand tonnes in the year 2019-20, according to the Indian Minerals Yearbook 2020.

• Manganese is an important mineral used in the production of steel and other alloys.

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• India is the fifth-largest producer of manganese in the world.

• Madhya Pradesh has several manganese mines, including the Balaghat mine, which is one of the largest manganese mines in Asia.

Additional Information

• Karnataka is the second-highest producer of manganese in India with a production of 4,961 thousand tonnes in 2019-20.

• Odisha is the third highest producer of manganese in India with a production of 3,808 thousand tonnes in 2019-20.

• Maharashtra produced 1,271 thousand tonnes of manganese in 2019-20, which is lower than the top three manganese-producing states.

• Manganese is mainly used in the production of steel, aluminum, and batteries.

• It is also used in the production of fertilizers, animal feed, and water treatment chemicals.

Q49. Answer: (c) Preventive detention

The correct answer is Preventive detention.

Key Points

• Article 22 of the Indian Constitution deals with the right to protection against arrest and detention in certain cases.

• It lays down the guidelines for preventive detention, which means detaining a person without trial for a certain period, in order to prevent him/her from committing a crime.

• This article also ensures that a person who is arrested has the right to be informed about the grounds of arrest, and the right to consult and be defended by a legal practitioner of his/her choice.

Additional Information

• The right to education is covered under Article 21A of the Indian Constitution.

• Protection of personal liberty is covered under Article 21 of the Indian Constitution, while Article 22 deals with protection against arrest and detention in certain cases.

• Protection of life is covered under Article 21 of the Indian Constitution, while Article 22 deals with protection against arrest and detention in certain cases.

Q50. Answer: (d) Chemical

The correct answer is Chemical.

Key Points

• The chemical industry is its own major consumer in India as it produces a wide range of products that are used in various sectors such as agriculture, textiles, pharmaceuticals, and construction.

• The chemical industry is one of the oldest industries in India and is a significant contributor to the country's economy, accounting for around 2% of India's GDP.

• The key term mentioned in the question is "its own major consumer," which means the industry that produces products that are primarily used within the same industry.

Additional Information

• The iron and steel industry is one of the largest industries in India and is a major contributor to the country's economy.

• It is used in various sectors such as construction, infrastructure, and automobile.

• The aviation industry in India is growing rapidly, and it plays a crucial role in connecting various parts of the country and promoting tourism.

• The automobile industry is also one of the largest industries in India and is a significant contributor to the country's economy.

• It is used in various sectors such as transportation, logistics, and construction.

Q51. Answer: (c) 900

Shortcut Trick

Fraction value of 15% discount = −3/20, meaning Marked Price (MP) = 20 units and Selling Price (SP) = 17 units.

Given SP = 17 units = Rs. 765

1 unit = 765 ÷ 17 = Rs. 45

MP = 20 units = 45 × 20 = 900

Therefore The correct answer is Rs. 900.

Alternate Method

Given:

Selling Price (SP) of trousers = Rs. 765

Discount offered = 15%

Formula Used:

MP = SP × [100 ÷ (100 − Discount%)]

Marked Price

100%

Selling Price

85% = Rs. 765

− 15% Discount

Calculations:

=> Let the Marked Price (MP) be 100%.

=> Selling Price (SP) = 100% − 15% = 85%

=> According to the question, 85% of MP = Rs. 765

=> MP = 765 × (100 ÷ 85)

=> MP = 765 × (20 ÷ 17)

=> MP = 45 × 20 = 900

Therefore The correct answer is Rs. 900.

Additional Information

Marked Price vs Cost Price

Discount is always calculated on the Marked Price (MP) while Profit or Loss is always calculated on the Cost Price (CP) unless stated otherwise.

Relationship between MP and CP

If a profit of P% is made after allowing a discount of D%, then the ratio of MP to CP is determined by MP ÷ CP = (100 + P) ÷ (100 − D).

Successive Discounts

If two successive discounts of a% and b% are offered, the equivalent single discount given is (a + b − a×b ÷ 100)%.

Q52. Answer: (a) Rs. 4,28,400

Given:

Annual depreciation of car value = 20%, 15% and 10%

Cost = 7,00,000

Concept used:

If P is the initial price of the commodity, then after ‘n’ years the value of the commodity will become P × [1 – (n/100)]

Calculation:

Percentage fall in price after 3 years = 700000 × (100 - 20)/100 × (100 - 15)/100 × (100 - 10)/100

=> 700000 × 8/10 × 85/100 × 9/10

=> 70 × 8 × 85 × 9

=> 428400

The answer is 428400

Q53. Answer: (a) 7760

Shortcut Trick

The winning candidate got 55% of valid votes, which is 42,680.

The third candidate got 10% of valid votes.

Using the unitary method: 55% → 42,680

1% → 42,680 ÷ 55 = 776

10% → 776 × 10 = 7,760

Therefore The correct answer is 7760.

Alternate Method

Given:

Votes of the Winner = 42,680

Winner's share = 55% of Total Valid Votes

Third candidate's share = 10% of Total Valid Votes

Calculations:

Let the Total Valid Votes be V.

=> 55% of V = 42,680
=> (55 ÷ 100) × V = 42,680
=> V = (42,680 × 100) ÷ 55
=> V = 776 × 100
=> V = 77,600
The third candidate received 10% of these valid votes:
=> Votes = 10% of 77,600
=> Votes = (10 ÷ 100) × 77,600
=> Votes = 7,760
Therefore The correct answer is 7760.
Additional Information
Valid Votes vs Invalid Votes
Valid votes are those which are correctly marked and counted. Total Cast Votes = Valid Votes + Invalid Votes.
Winning Margin
The margin of victory is the difference in votes between the first-place candidate and the second-place candidate.
Voter Turnout
Voter turnout is the percentage of eligible voters who cast a ballot. Cast Votes = Total Voters × Turnout Percentage.

Q54. Answer: (c) 81

Given
√a/b =8/3 + √(b/a)
Calculation
√(a/b) - √(b/a) = 8/3
Squaring both sides:
(a/b) + (b/a) - 2 = 64/9
$(a^2 + b^2)/ab = 82/9$ ..(1)
As given,
(a + b) = 30
Squaring both sides:
a2 + b2 + 2ab = 900
a2 + b2 = 900 - 2ab ...(2)
Putitng 2 in 1.
(900 - 2ab)/ab = 82/9
8100 - 18ab = 82ab
100ab = 8100
ab = 81
The answer is 81.

Q55. Answer: (c) 11 p.m.

Shortcut Trick
Distance covered by the first train in 2 hours = 75 × 2 = 150 km.
Remaining distance at 8 p.m. = 690 − 150 = 540 km.
Relative speed (opposite direction) = 75 + 105 = 180 km/h.
Time to meet = 540 ÷ 180 = 3 hours.
Meeting time = 8:00 p.m. + 3 hours = 11:00 p.m.
Therefore The correct answer is 11 p.m.
Alternate Method
Given:
Total distance between stations P and Q = 690 km
Speed of the train starting from P at 6 p.m. = 75 km/h
Speed of the train starting from Q at 8 p.m. = 105 km/h
Total Distance = 690 km

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P
6 p.m.
75 km/h →
P' (8 p.m.)
Meeting Point
Q
8 p.m.
← 105 km/h
150 km
540 km (Remaining)
Calculations:
=> The first train travels alone for 2 hours (from 6 p.m. to 8 p.m.).
=> Distance covered by the first train = 75 × 2 = 150 km.
=> Remaining distance between the two trains at 8 p.m. = 690 − 150 = 540 km.
=> From 8 p.m. onwards, both trains move towards each other.
=> Relative speed = Speed of train P + Speed of train Q = 75 + 105 = 180 km/h.
=> Time taken to cover the remaining distance = Distance ÷ Relative speed
=> Time taken = 540 ÷ 180 = 3 hours.
=> The two trains will meet 3 hours after 8 p.m.
=> Meeting time = 8:00 p.m. + 3 hours = 11:00 p.m.
Therefore The correct answer is 11 p.m.
Additional Information
Relative Speed in Opposite Directions
When two objects travel towards each other, their relative speed is the sum of their individual speeds (S1 + S2).
Relative Speed in Same Direction
When two objects travel in the same direction, their relative speed is the difference between their speeds (|S1 − S2|).
Meeting Time Formula
Meeting Time = Total Initial Distance between them ÷ Relative Speed.

Q56. Answer: (d) 2018

Calculation
The academy enrolment in 2018 = 46 + 34 + 42 + 37 + 45 + 35 = 239
The academy enrolment in 2019 = 40 + 41 + 44 + 34 + 42 + 32 = 233
The academy enrolment in 2020 = 43 + 40 + 40 + 32 + 38 + 36 = 229
The academy enrolment in 2021 = 37 + 44 + 43 + 25 + 34 + 28 = 211
The academy enrolment in 2022 = 34 + 41 + 41 + 32 + 41 + 39 = 228
The highest enrolment is in 2018.

Q57. Answer: (d) 96 cm²

Shortcut Trick
Sum of adjacent sides = Perimeter ÷ 2 = 48 ÷ 2 = 24 cm.
Base of the parallelogram = 24 − 8 = 16 cm.
Area = Base × Height = 16 × 6 = 96 cm².
Therefore The correct answer is 96 cm².
Alternate Method
Given:
=> Perimeter of parallelogram = 48 cm
=> Length of one adjacent side (b) = 8 cm
=> Height (h) of the parallelogram = 6 cm
Formula used:
=> Perimeter = 2 × (Side1 + Side2)
=> Area = Base × Height

Calculations:

=> 48 = 2 × (Base + 8)

=> 24 = Base + 8

=> Base = 24 − 8 = 16 cm

=> Area = 16 × 6

=> Area = 96 cm²

Therefore The correct answer is 96 cm².

Additional Information

Area of Parallelogram

The area can be calculated as Area = a × b × sin(θ), where a and b are adjacent sides and θ is the angle between them.

Height and Side Relationship

In a parallelogram, the product of a side and its corresponding altitude is constant: Area = Base1 × Height1 = Base2 × Height2.

Properties of Parallelogram

Opposite sides are equal and parallel, and diagonals bisect each other.

Q58. Answer: (a) 30

Given

Concept used

Work = Time × Efficiency

Calculation

Total work = LCM of 8, 20 and 24 = 120 units

Total efficiency = 120/8 = 15 unit/day

Ali's efficiency = 120/20 = 6 unit/day

Avtar's efficiency = 120/24 = 5 unit/day

Ashok's efficiency = 15 - (6 + 5) = 4 unit/day

Time taken by Ashok = 120/4 = 30 days

The answer is 30 days

Q59. Answer: (a) 60°

Given

cos θ/(1+sin θ)+cos θ/(1-sin θ) = 4

Calculation

[cosθ(1 - sinθ) + cosθ(1 + sinθ)]/[(1 - sinθ).(1 + sinθ)] = 4

=> [cosθ - cosθsinθ + cosθ + cosθ sinθ]/(1 - sin²θ) = 4

=> 2cosθ/cos2θ = 4

=> cosθ= 1/2 = cos 60°

The answer is 60°

Q60. Answer: (a) 29

Calculation

(1+5/6+7/8+11/12) ÷ (3/4-5/8).

=> (24 + 20 + 21 + 22)/24 ÷ (6-5)/8

=> (87)/24 ÷ 1/8

=> (87)/24 × 8

=> 87/3 = 29

The answer is 29.

Q61. Answer: (b) 33.33%

Shortcut Trick

In Buy X Get Y Free offers, the discount is calculated on the total number of items.

Effective Discount % = (Free Items ÷ Total Items) × 100

Discount % = (1 ÷ (2 + 1)) × 100

Discount % = (1 ÷ 3) × 100 = 33.33%

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Therefore The correct answer is 33.33%.
Alternate Method
Given: Offer = Buy 2 Get 1 Free, MRP of 1 bottle of Catch Cola = Rs. 20.
Calculation of Discount Percentage:
=> Total items received = 2 + 1 = 3
=> Total Marked Price (MRP) = 3 × Rs. 20 = Rs. 60
=> Total Selling Price (SP) = 2 × Rs. 20 = Rs. 40
=> Total Discount = MRP − SP = 60 − 40 = Rs. 20
=> Discount % = (Discount ÷ MRP) × 100
=> Discount % = (20 ÷ 60) × 100 = 1/3 × 100 = 33.33%
Therefore The correct answer is 33.33%.
Additional Information
Discount Percentage Formula
The discount percentage is calculated using: (Discount ÷ Marked Price) × 100.
Marked Price vs Selling Price
Marked Price is the list price, while Selling Price is the final price after subtracting the discount from the Marked Price.
Successive Discounts
If two successive discounts x% and y% are given, the equivalent single discount = (x + y − (xy ÷ 100))%.

Q62. Answer: (c) 450

Calculation
Total male = 3/4 × 600 = 450
The answer is 450

Q63. Answer: (c) 6

Shortcut Trick
Direct identity: $(\sin\alpha + \cos\alpha)^2 = 1 + 2 / (\tan\alpha + \cot\alpha)$
Substitute the given value: $(2/\sqrt{3})^2 = 1 + 2 / (\tan\alpha + \cot\alpha)$
=> $4/3 = 1 + 2 / (\tan\alpha + \cot\alpha)$
=> $1/3 = 2 / (\tan\alpha + \cot\alpha)$
=> $\tan\alpha + \cot\alpha = 6$
Therefore The correct answer is 6.
Alternate Method
Given:
$\sin\alpha + \cos\alpha = 2/\sqrt{3}$
Formula Used:
$(a + b)^2 = a^2 + b^2 + 2 \times a \times b$
$\sin^2\alpha + \cos^2\alpha = 1$
$\tan\alpha = \sin\alpha / \cos\alpha$ and $\cot\alpha = \cos\alpha / \sin\alpha$
Calculations:
Squaring both sides of the given equation:
=> $(\sin\alpha + \cos\alpha)^2 = (2/\sqrt{3})^2$
=> $\sin^2\alpha + \cos^2\alpha + 2 \times \sin\alpha \times \cos\alpha = 4/3$
Substitute $\sin^2\alpha + \cos^2\alpha = 1$:
=> $1 + 2 \times \sin\alpha \times \cos\alpha = 4/3$
=> $2 \times \sin\alpha \times \cos\alpha = 4/3 - 1$
=> $2 \times \sin\alpha \times \cos\alpha = 1/3$
=> $\sin\alpha \times \cos\alpha = 1/6$
Now evaluate $(\tan\alpha + \cot\alpha)$:
=> $\tan\alpha + \cot\alpha = (\sin\alpha / \cos\alpha) + (\cos\alpha / \sin\alpha)$
=> $\tan\alpha + \cot\alpha = (\sin^2\alpha + \cos^2\alpha) / (\sin\alpha \times \cos\alpha)$
=> $\tan\alpha + \cot\alpha = 1 / (\sin\alpha \times \cos\alpha)$

Substitute the value of sin α × cos α:

=> tan α + cot α = 1 / (1/6)

=> tan α + cot α = 6

Therefore The correct answer is 6.

Additional Information

Basic Trigonometric Identities

$\sin^2 \alpha + \cos^2 \alpha = 1$, $\sec^2 \alpha - \tan^2 \alpha = 1$, and $\text{cosec}^2 \alpha - \cot^2 \alpha = 1$.

Reciprocal Relations

$\tan \alpha = 1 / \cot \alpha$, $\sin \alpha = 1 / \text{cosec}\ \alpha$, and $\cos \alpha = 1 / \sec \alpha$.

Key Shortcut Formula

The expression tan α + cot α frequently simplifies to 1 / (sin α × cos α), which is a direct and standard substitution for trigonometric simplifications.

Q64. Answer: (d) 13 cm

Shortcut Trick

A tangent forms a 90° angle with the circle's radius at the point of contact.

The distance from the centre acts as the hypotenuse of the right-angled triangle formed.

Distance from centre = $\sqrt{(\text{Radius}^2 + \text{Tangent}^2)}$

Distance = $\sqrt{(5^2 + 12^2)} = \sqrt{(25 + 144)} = 13$ cm.

(Note: 5, 12, 13 is a direct standard Pythagorean triplet, saving calculation time)

Therefore The correct answer is 13 cm.

Alternate Method

Given:

Radius of the circle (r) = 5 cm

Length of the tangent from external point X (t) = 12 cm

Formula Used:

Pythagoras Theorem: $\text{Hypotenuse}^2 = \text{Perpendicular}^2 + \text{Base}^2$

O

5 cm

12 cm

? cm

P

X

Calculations:

=> Let the centre of the circle be O and the point of tangency be P.

=> The radius of a circle is always perpendicular to the tangent at the point of contact.

=> Therefore angle OPX = 90°.

=> In the right-angled ΔOPX, the distance from the centre (OX) is the hypotenuse.

=> $OX^2 = OP^2 + PX^2$

=> $OX^2 = 5^2 + 12^2$

=> $OX^2 = 25 + 144 = 169$

=> $OX = \sqrt{169}$

=> OX = 13 cm

Therefore The correct answer is 13 cm.

Additional Information

Radius-Tangent Theorem

A tangent at any point of a circle is strictly perpendicular to the radius drawn through that point of contact.

Number of Tangents

From any point strictly outside a circle, exactly two tangents can be drawn, and their respective lengths are always equal.

Pythagorean Triplets

Sets of integers satisfying $a^2 + b^2 = c^2$. Commonly tested triplets include (3, 4, 5), (5, 12, 13), (8, 15, 17), and (7, 24, 25). Spotting them immediately saves calculation time.

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Q65. Answer: (b) 140°

Given

angle ABO = 40° and angle ACO = 30°

Concept used

The angle subtended by the arc on the centre of the circle is twice that of the angle subtended by the same arc on some point on the circumference.

Calculation

angle ABO = 40° and angle ACO = 30°

angle ABO = angle OAB = 40° (opposite angles of the equal sides are equal)

angle ACO = angle OAC = 30° (opposite angles of the equal sides are equal)

angle BAC = 40 + 30 = 70°

angle BOC = 2 × 70 = 140°

The answer is 140°.

Q66. Answer: (a) Rs. 2,600

Given,

Selling price of an article = 1300 and makes a loss = 35%

Calculation

Selling price of an article = 1300, loss = 35%

Loss = (cost price - 1300)/cost price × 100

=> 35/100 = 1 - 1300/cost price × 100

=> 35/100 = 1 - 1300/cost price

=> 1300/cost price = 1 - 7/20

=> 1300/cost price = 13/20

=> cost price = 1300 × 20 /13

=> cost price = 2000

profit gain = 30%

SP = 2000 ×130/100

= 2600

Therefore The selling price = Rs.2600

Shortcut TrickAccordiing to the question,

Selling Price = Amount × (100 + Profit)/(100 - Loss)

Selling price = 1300 × (100 + 30)/(100 - 35)

=> 2600

Therefore The selling price is Rs. 2600

Q67. Answer: (a) Rs. 28500

Given:

The simple interest on a certain sum for 3 years at 8% per annum is Rs. 9120 less than the simple interest on the same sum for 7 years at 8% per annum

Concept used:

Simple Interest, SI = (P × R × T)/100

Amount = P + SI

where

P = Principal amount

R = Rate of interest per year

T = Time in years

Calculation:

Let the principal amount be P.

According to the question,

(P × 7 × 8)/100 - (P × 3 × 8)/100 = 9120

=> (P × 4 × 8)/100 = 9120

=> P = 28500

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Therefore The sum is Rs. 28500.

Q68. Answer: (c) 243

Shortcut Trick

Given (2x + 3y) = 9 and xy = 3.

Use the direct cubic identity: $A^3 + B^3 = (A + B)^3 - 3AB(A + B)$.

Here, A = 2x and B = 3y, so AB = (2x)(3y) = 6xy = 6 × 3 = 18.

Substitute values: $9^3 - 3 \times 18 \times 9 \Rightarrow 729 - 486 = 243$.

Therefore The correct answer is 243.

Alternate Method

Given: 2x + 3y = 9 and xy = 3

Formula Used: $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

Cubing the equation 2x + 3y = 9 on both sides:

$\Rightarrow (2x + 3y)^3 = 9^3$

$\Rightarrow (2x)^3 + (3y)^3 + 3 \times (2x) \times (3y) \times (2x + 3y) = 729$

$\Rightarrow 8x^3 + 27y^3 + 18xy \times (2x + 3y) = 729$

Substitute xy = 3 and (2x + 3y) = 9 into the equation:

$\Rightarrow 8x^3 + 27y^3 + 18 \times 3 \times 9 = 729$

$\Rightarrow 8x^3 + 27y^3 + 486 = 729$

$\Rightarrow 8x^3 + 27y^3 = 729 - 486$

$\Rightarrow 8x^3 + 27y^3 = 243$

Therefore The correct answer is 243.

Additional Information

Sum of Cubes Identity

The expression $a^3 + b^3$ can also be factored as $(a + b)(a^2 - ab + b^2)$.

Cubic Binomial Expansion

$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$, which is commonly rewritten as $a^3 + b^3 + 3ab(a + b)$ for solving algebraic problems.

Difference of Cubes

Similar to the sum, the difference is given by $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$ or $(a - b)^3 + 3ab(a - b)$.

Q69. Answer: (d) 7/2√3

Given

cos 0° + cos 30° - tan 45° + cosec 60° + cot 90°

Calculation

cos 0° + cos 30° - tan 45° + cosec 60° + cot 90°

= 1 + √3/2 - 1 + 2/√3 + 0

=> (3 + 4)/2√3

=> 7/2√3

The answer is 7/2√3

Q70. Answer: (a) 12 cm²

Given:

Length of each equal sides of isosceles triangle = 5 cm

Length of base of isosceles triangle = 8 cm

Formula:

Area of isosceles triangle = [b/4] × √(4a² – b²)

b = base of isosceles triangle

a = each equal side

Calculation:

Area of isosceles triangle = [8/4] × √(4 × 5² – 8²)

=> 2 × √(100 – 64)

=> 2 × √36

=> 2 × 6

=> 12 cm²

Therefore Area of isosceles triangle is 12 sq. cm.

Q71. Answer: (a) 400

Shortcut Trick

Ratio of Technicians to Non-technicians by Alligation:

(6,000 − 4,000) : (12,000 − 6,000) = 2,000 : 6,000 = 1 : 3

Given: 1 unit (Technicians) = 100

Total workers = 1 + 3 = 4 units = 4 × 100 = 400

Therefore The correct answer is 400.

Alternate Method

Given:

=> Average salary of all workers = Rs. 6,000

=> Number of technicians = 100

=> Average salary of technicians = Rs. 12,000

=> Average salary of non-technicians = Rs. 4,000

Formula Used:

Total Salary = Average Salary × Number of Workers

Calculations:

=> Let the total number of workers be x.

=> Total salary = 6,000 × x

=> Total salary = (100 × 12,000) + (x − 100) × 4,000

=> 6,000x = 12,00,000 + 4,000x − 4,00,000

=> 6,000x − 4,000x = 8,00,000

=> 2,000x = 8,00,000

=> x = 8,00,000 ÷ 2,000 = 400

Therefore The correct answer is 400.

Additional Information

Weighted Average Formula

The average of a group is given by (n1A1 + n2A2) ÷ (n1 + n2), where A represents the average and n represents the quantity.

Alligation Rule

Quantity of cheaper ÷ Quantity of dearer = (Rate of dearer − Mean rate) ÷ (Mean rate − Rate of cheaper).

Mean Value Property

The mean value of a mixture always lies between the lowest and the highest individual values of its components.

Q72. Answer: (a) Medicine P, Company A

Calculation

The minimum production of medicine by any company = 1.125 mn

This production is done by Company A in Medicine P.

The answer is Medicine P, Company A.

Q73. Answer: (d) 20°

Given

angle QSR = 60° and angle QPR = 100°

Calculation

In ΔSQR, angle QSR = 60° and SQ = SR

=> angle SQR = angle SRQ

angle SQR = angle SRQ = (180 - 60)/2 = 60°

In ΔPQR, angle QPR = 100° and PQ = PR

=> angle PQR = angle PRQ

angle PQR = angle PRQ = (180 - 100)/2 = 40°

From the given diagram,

angle SRP = angle SRQ - angle PRQ

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=> angle SRP = 60° - 40°

=> angle SRP = 20°

Q74. Answer: (c) Rs. 100

Shortcut Trick

Ratio of A : B : C = 3 : 2 : 5.

Difference between C and B in units = 5 − 2 = 3 units.

Given 3 units = Rs. 300 → 1 unit = Rs. 100.

Difference between A and B in units = 3 − 2 = 1 unit.

Therefore, 1 unit = Rs. 100.

Therefore The correct answer is Rs. 100.

Alternate Method

Given:

Ratio of shares of A, B, and C = 3 : 2 : 5

Difference between C's share and B's share = Rs. 300

Formula Used:

Value of one ratio unit = (Actual Difference) ÷ (Difference in ratio parts)

Calculations:

=> Let the shares of A, B, and C be 3x, 2x, and 5x respectively.

=> Difference between C and B = 5x − 2x = 3x

=> According to the question: 3x = 300

=> x = 300 ÷ 3 = 100

=> Difference between A and B = 3x − 2x = x

=> Required difference = 100

Therefore The correct answer is Rs. 100.

Additional Information

Ratio and Proportion

A ratio is a comparison of two quantities by division. Proportion is an expression that states two ratios are equal.

Mean Proportional

The mean proportional between two numbers a and b is given by √(a × b).

Third Proportional

If a : b = b : c, then c is called the third proportional to a and b, calculated as c = b² ÷ a.

Duplicate Ratio

The duplicate ratio of a : b is a² : b², and the sub-duplicate ratio is √a : √b.

Q75. Answer: (b) 1

Formula used

$(a + b)^2 = a^2 + b^2 + 2ab$

Calculation

$0.01 + 0.68 \times 0.68 + 0.22 \times 0.22 + 0.044 + 0.136 + 0.44 \times 0.68$

let, a = 0.68 and b = 0.22

$0.01 + 0.682 + 0.222 + 2 \times 0.22 \times 0.68 + 0.044 + 0.136$

=> $0.01 + (0.90)^2 + 0.044 + 0.136$

=> 0.01 + 0.81 + 0.044 + 0.136

=> 0.864 + 0.136

The answer is 1.

Q76. Answer: (c) Inexpensive

The solution is in Hindi. Read it online.

Q77. Answer: (c) expected

The solution is in Hindi. Read it online.

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Q78. Answer: (d) was brought down in the

The correct answer is: was brought down in the

Key Points

• The original sentence uses the phrase "was brought in the," which doesn't convey a clear and commonly used expression related to sports events.

• The substitution "was brought down in the" provides a more accurate and common expression when describing a player's action in a soccer or football context.

• When a player is fouled or tackled by an opponent in the penalty area, it is often referred to as being "brought down."

• This usage is consistent with the terminology used in sports commentary and reporting.

• Substituted sentence: Peter was brought down in the penalty area.

• In this sentence, if Peter was brought down in the penalty area, it implies that an opposing player tackled or fouled him within the penalty area, and as a result, Peter fell to the ground.

Therefore, the correct answer is option 4.

Q79. Answer: (b) of

The correct answer is: Of

Key Points

• The error in the given sentence is the incorrect use of the preposition "on."

• The correct preposition to use in this context is "of."

• The word "capable" is followed by the preposition "of" when expressing the ability or capacity to do something.

• The correct construction is "capable of (verb-ing)" to convey someone's ability or capability in performing a particular action.

• The correct sentence should be: Radhika is not capable of participating in a national level competition.

Thus, option 2 is the correct answer.

Additional Information

• "About" is often used to indicate a general subject, topic, or the content of a discussion or conversation.

• "On" is used to indicate various relationships, such as time, location, or topics.

• "At" is often used to indicate a specific point in time, a location, or a particular moment.

Q80. Answer: (b) The meeting was cancelled due to bad weather.

The correct answer is: The meeting was cancelled due to bad weather.

Key Points

• In an active voice sentence, the subject performs the action.

• Active Voice Structure: Subject + Verb + Object

• Example: The chef prepared a delicious meal.

• In a passive voice sentence, the subject receives the action.

• Passive Voice Structure: Object + Be verb + V3 + Subject

• Example: A delicious meal was prepared by the chef.

• So, here in the passive voice, the subject "They" from the active voice can be included using "by them" in the passive voice.

• The passive construction shifts the focus from the doer (They) to the action (cancelling the meeting).

Therefore, the correct answer is option 2.

Q81. Answer: (d) The mason will finish the work within a short time.

The correct answer is: The mason will finish the work within a short time.

Key Points

• In a passive voice sentence, the subject receives the action.

• Passive Voice Structure: Object + Be verb + V3 + Subject

• Example: The book will be read by the students next week.

• In an active voice sentence, the subject performs the action.

• Active Voice Structure: Subject + Verb + Object

• Example: The students will read the book next week.

• So, here the active voice starts with the doer of the action (The mason), followed by the main verb in its active form (will finish), ends with the object (the work) and then maintains the time modifier.

• In the active voice transformation, the focus shifts from the work being the main subject to the mason as the doer of the action, providing a more direct and clear expression of the sentence.

Therefore, the correct answer is option 4.

Q82. Answer: (b) Poor memory

The solution is in Hindi. Read it online.

Q83. Answer: (a) He looks

The correct answer is: He looks

Key Points

• The original sentence is in the future continuous tense ("will be looking"). This tense suggests an ongoing action in the future.

• However, the key here is the use of "as if," which introduces a hypothetical or unreal condition.

• When expressing hypothetical or unreal conditions, English often uses the simple present tense to convey a general truth or a habitual action.

• In this context, the use of "He looks" suggests an ongoing state that is habitual or characteristic of the person, creating a more natural and idiomatic expression.

• Therefore, "He looks" is the most appropriate option, as it aligns with the sense of an ongoing condition suggested by the original sentence, considering the hypothetical nature introduced by "as if."

Thus, option 1 is the correct answer.

Corrected sentence: He looks as if he has not slept.

Q84. Answer: (c) terminology

The solution is in Hindi. Read it online.

Q85. Answer: (d) Professional

The solution is in Hindi. Read it online.

Q86. Answer: (a) Bibliophile

The solution is in Hindi. Read it online.

Q87. Answer: (a) gave the benefit of doubt

The solution is in Hindi. Read it online.

Q88. Answer: (a) Permanent

The solution is in Hindi. Read it online.

Q89. Answer: (a) Deny

The solution is in Hindi. Read it online.

Q90. Answer: (c) a earth

The correct answer is: a earth

Key Points

• The error is in the use of the article "a" before "earth."

• Indefinite article 'A' is used when referring to a non-specific item or an item for the first time.

• Example: I saw a cat in the backyard.

• Definite Article "the" is used when referring to a specific item that has already been mentioned or is known to both the speaker and the listener.

• Example: I saw the cat in the backyard again.

• When referring to our planet, "earth" should be preceded by the definite article "the" rather than the indefinite article "a."

• The definite article "the" is used to specify a particular item, in this case, the Earth around which the sun revolves.

Therefore, the correct answer is option 3.

Q91. Answer: (d) CABD

The correct answer is: CABD

Key Points

• Part C: This part introduces the main subject of the sentence, setting the stage for what will be discussed.

• Part A: Provides additional information about the incident, specifying the context and location of the political incident.

• Part B: Introduces the verb phrase, indicating that something (presumably negative) will inevitably have an impact.

• Part D: Completes the sentence by specifying the nature of the impact, stating that the incident will count against the peace process.

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• This order ensures a logical flow, providing a clear and meaningful sentence about a political incident and its impact on the peace process between two countries.

Therefore, the correct answer is option 4.

Q92. Answer: (b) DCAB

The correct answer is: DCAB

Key Points

• Part D: This phrase sets the stage for the sentence, establishing a condition or limitation.

• Part C: Introduces the type of person being discussed, providing additional information about their background or characteristics.

• Part A: Connects with the previous part and introduces a contrast or alternative, emphasizing the characteristics required.

• Part B: Completes the sentence by stating the consequence or result of the conditions and characteristics mentioned earlier.

• This sequence ensures a logical flow, providing a meaningful sentence that discusses the impossibility for a person with intellectual qualities to prioritize money as the chief object of their thoughts unless they are a brave individual willing to make an alternative choice.

Therefore, the correct answer is option 2.

Q93. Answer: (d) annoyed me and I blew up

The solution is in Hindi. Read it online.

Q94. Answer: (a) Extensive

The solution is in Hindi. Read it online.

Q95. Answer: (d) pause; paws

The solution is in Hindi. Read it online.

Q96. Answer: (c) memory

The solution is in Hindi. Read it online.

Q97. Answer: (c) do not

The correct answer is: do not

Key Points

• "Do not" is used to convey a negative imperative or prohibition. It is used in the simple present tense.

• It is often employed to give instructions or commands, advising someone not to do a particular action.

• Example: Do not touch the live wires; they are dangerous.

• **Here, "do not" completes the sentence with a negative imperative, conveying a cautionary instruction.

Therefore, the correct answer is option 3.

Additional Information

• Does not: This is used in the present tense to form negative statements for third-person singular subjects (he, she, it).

• Did not: This is used in the past tense to form negative statements for all subjects.

• Had not: This is used in the past perfect tense to form negative statements for actions completed before a specific point in the past.

Q98. Answer: (c) details

The solution is in Hindi. Read it online.

Q99. Answer: (b) who

The correct answer is: who

Key Points

• "Who" is used as a relative pronoun to introduce a clause that provides additional information about a person or people.

• Example: The woman who is wearing the red dress is my sister.

• In this given context, using "who" emphasizes the importance of documenting not only the tasks themselves but also the individuals responsible for them.

Therefore, the correct answer is option 2.

Additional Information

• Which: Used to introduce a relative clause that provides additional information about a thing or an animal.

• That: Used to introduce a restrictive (essential) relative clause that is necessary to the sentence's meaning.

• Whom: Used as an object pronoun, particularly when referring to a person, in a formal or more traditional context.

Q100. Answer: (d) review

The solution is in Hindi. Read it online.

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