SSC CHSL Tier-1 2023: Official Paper (Held On: 14 Aug, 2023 Shift 3) (Previous Year Paper)

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

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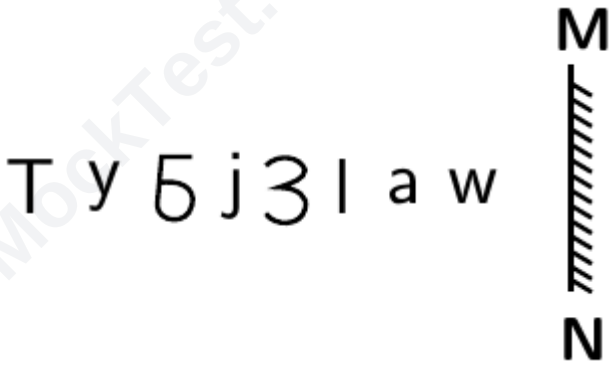
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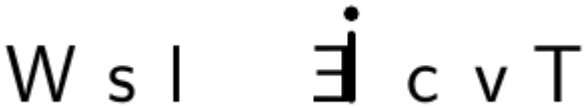
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ENGLISH LANGUAGE

Q1. select the correct mirror image of the given figure when the mirror is placed at MN as shown below.



(a)



(b)



(c)



(d)



Q2. If 19 June 2001 is Tuesday, then what will be the day of the week on 21 August 2009?

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

Q3. Select the term from among the given options that can replace the question mark (?) in the following series based on the English alphabetical order.

GAF, GEF, GIF, GOF, ?

(a) GUF
(b) GTF
(c) GRF
(d) GSF

Q4. In a certain code language, ‘MINER' is coded as '56342' and ‘ANIME’ is coded as '63457'. What is the code for ‘R' in the given code language?

(a) 6
(b) 3
(c) 5
(d) 2

Q5. In a month of 29 days, the second Thursday falls on the 13th day of the month. What day of the week will be the second last day of the month?

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

Q6. What will come in the place of the question mark (?) in the following equation, if ‘+' and ‘×’ are interchanged and ‘-' and '÷’ are interchanged?

105 - 15 ÷ 13 + 3 × 27 = ?

(a) 58
(b) -5
(c) 16
(d) 23

Q7. What should come in place of X in the given series?

5 10 20 37 63 X

(a) 100
(b) 105
(c) 95
(d) 90

Q8. 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.

146 : 438 :: 316 : 948 :: 556 : ?

(a) 2400
(b) 1822
(c) 1668
(d) 2016

Q9. CHMZ is related to WRMZ in a certain way based on the English alphabetical order. In the same way, NPWY is related to LJCA. Which of the given options is DGNO related to following the same logic?

(a) ONGD
(b) VSLK

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(c) KECF
(d) CFMN

Q10. What should come in place of the question mark (?) in the given series?

9 14 ? 24 29 34

(a) 18
(b) 19
(c) 21
(d) 20

Q11. In a certain code language,

A + B means A is the daughter of B,

A - B means A is the wife of B'

A × B means 'A is the brother of B,

A ÷ B means 'A is the father of B'

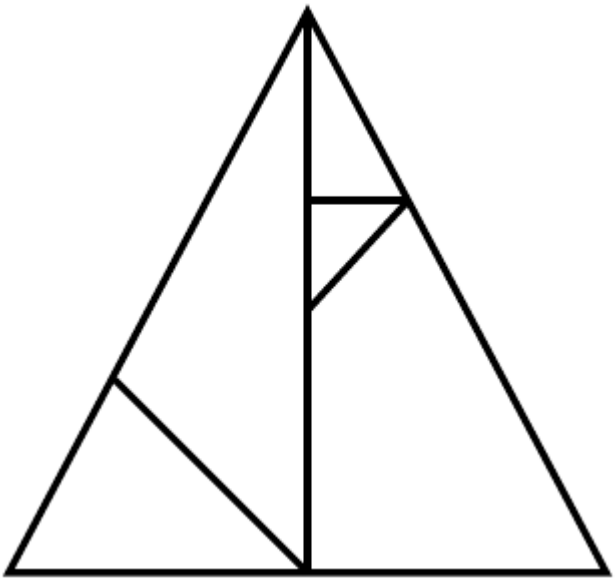
Based on the above, how is P related to T if P + Q - R ÷ S × T'?

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

Q12. 11 is related to 1210 following a certain logic. Following the same logic, 13 is related to 1690. To which of the following is 17 related to, following the same logic?

(a) 2690
(b) 2990
(c) 2790
(d) 2890

Q13. How many triangles are there in the given figure?



(a) 5
(b) 4
(c) 6
(d) 8

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Q14. What should come in place of ? in the given series based on the English alphabetical order?

JYB LVD NSF PPH ?

(a) SMK
(b) TMK
(c) RMJ
(d) SNJ

Q15. In a certain code language ‘HOUSE’ is coded as ‘23617' and ‘MOUSE’ is coded as ‘61235' What is the code for 'H' in the given code language?

(a) 6
(b) 5
(c) 7
(d) 2

Q16. In a certain code language,

'A × B' means 'A is the sister of B',

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

'A $ B' means 'A is the father of B'.

Based on the above, how is X related to R if X # P $ Q × R?

(a) Father
(b) Father's mother
(c) Father's father
(d) Son's son

Q17. What will come in the place of the question mark (?) in the following equation if '+' and '-' are interchanged and ‘×’ and '÷' are interchanged?

11 ÷ 42 × 3 - 41 + 27 = ?

(a) 168
(b) 171
(c) 155
(d) 159

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 tables are green.

All green is lawn.

All lawn is soft.

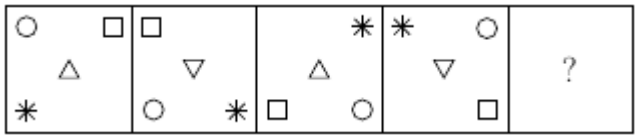
Conclusions:

(1): All tables are green.

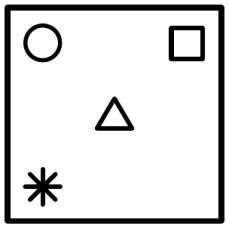
(II): Some green is lawn.

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

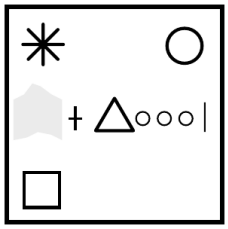
Q19. Identify the figure given in the options which when put in place of the question mark (?) will logically complete the series.



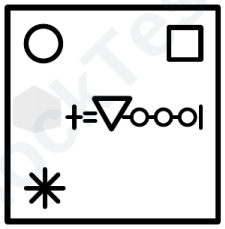
(a)



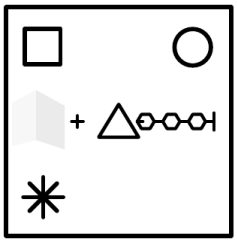
(b)



(c)



(d)



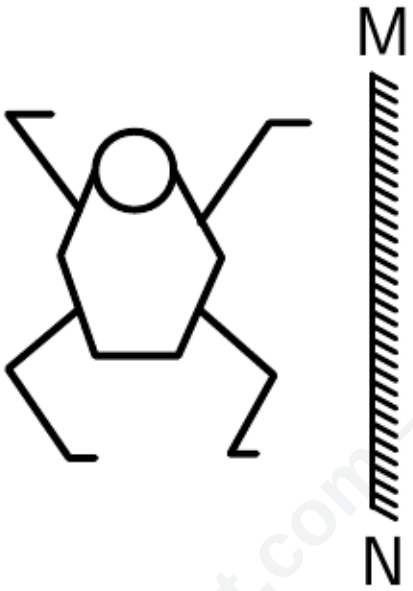
Q20. Which of the following letter-clusters will replace the question mark (?) in the given series to make it logically complete?

MF 99, OD 109, ?, SZ 129, UX 139

(a) PC 120
(b) PB 109
(c) QC 105
(d) QB 119

Q21. Select the correct mirror image of the given figure when the mirror is placed at MN as shown.

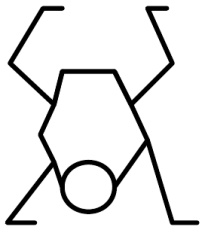
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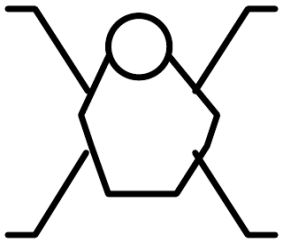
(a)



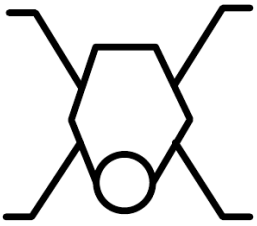
(b)



(c)



(d)



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Q22. If ‘A’ stands for '÷', 'B’ stands for '×’, 'C’ stands for '+' and 'D’ stands for '-', what will come in place of the question mark ‘?' in the following equation?

1024 A 32 B 11 D 57 C 121 = ?

(a) 107
(b) 421
(c) 436
(d) 416

Q23. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

PWMA, UBRF, ZGWK, ?

(a) ELBP
(b) DFQR
(c) DKAO
(d) FMDQ

Q24. 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 conclusions logically follow/s from the given statements.

Statements:

All rubbers are folders.

Some folders are computers.

All computers are envelopes.

Conclusions:

(1): All folders are rubbers.

(II): Some computers are folders.

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

Q25. Which number will replace the question mark (?) to complete the given series?

3, 7, 15, 31, 63, 127, ?

(a) 245
(b) 250
(c) 260
(d) 255

GENERAL INTELLIGENCE

Q26. Who among the following Indian women shuttlers is the runner-up in the Madrid Spain Masters-2023 tournament?

(a) Saina Nehwal
(b) Jwala Gutta
(c) PV Sindhu
(d) Neha Gurudutt

Q27. Which of the following sentences is INCORRECT with regard to government budget?

(a) Government budget is a constitutional requirement in India.
(b) It is a statement of estimated receipts and expenditures of the government for the financial year.
(c) It comprises two accounts.
(d) It is a statement of receipts and expenditures incurred by the government.

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Q28. Which of the following teams won the 15th edition of the Indian Premier League cricket tournament in the year 2022?

(a) Chennai Super Kings
(b) Gujarat Titans
(c) Delhi Capitals
(d) Mumbai Indians

Q29. Which law was developed in the 1600s to describe that any force applied to a confined fluid is transmitted equally in all directions, regardless of the shape of the container?

(a) Magnus's Law
(b) Graham's Law
(c) Pascal's Law
(d) Torricelli's Law

Q30. Which of the following Articles of the Indian Constitution enshrines that if we are observing any religious procession, then we need to remember communal harmony?

(a) Article 51A (d)
(b) Article 51A (c)
(c) Article 51A (b)
(d) Article 51A (e)

Q31. Which state in India has the highest literacy rate as per Census of 2011?

(a) Bihar
(b) Maharashtra
(c) Kerala
(d) Tamil Nadu

Q32. Safeguarding India's Intangible Cultural Heritage and Diverse Cultural Traditions of India' is a scheme of which Ministry of the Government of India?

(a) Ministry of Culture
(b) Ministry of Tourism
(c) Ministry of Education
(d) Ministry of Urban Development

Q33. In which of the following states did NABARD launch the e-Shakti project for the first time?

(a) West Bengal and Assam
(b) Jharkhand and Maharashtra
(c) Uttar Pradesh and Punjab
(d) Karnataka and Andhra Pradesh

Q34. Alha and Udal, who gave stiff resistance to the enemy, belonged to which of the following Rajput States?

(a) Parmar
(b) Kalchuri
(c) Chandella
(d) Gahadavala

Q35. In 1996, Dr. Indira PP Bora, an exponent of Sattriya, was honoured with the

(a) Filmfare Award
(b) Bharat Ratna
(c) Sangeet Natak Akademi Award
(d) Saraswati Samman

Q36. Bokajan is a cement plant located in which of the following states?

(a) Bihar
(b) Assam
(c) Madhya Pradesh

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(d) Andhra Pradesh

Q37. Which of the following aggregates best describes the National Income?

(a) GDP at MP
(b) NNP at FC
(c) NDP at MP
(d) GNP at FC

Q38. Subha Mudgal is famous for which of the following music forms?

(a) Carnatic music
(b) Reggae music
(c) Hip hop music
(d) Hindustani music

Q39. In 1851, who discovered the phenomenon of Eddy currents which flow in closed loops within conductors in planes perpendicular to the magnetic field?

(a) David Hughes
(b) Charles Townes
(c) Nicola Tesla
(d) Leon Foucault

Q40. What is the name of a type of waterfall with an enormous volume of water?

(a) Cascade
(b) Rapid
(c) Cataract
(d) Chute

Q41. Indian Councils Act of _____ also called Morley-Minto Reforms, series of reform measures enacted in the British Parliament

(a) 1909
(b) 1919
(c) 1862
(d) 1935

Q42. Hornbill festival is celebrated in which of the following states?

(a) Nagaland
(b) Manipur
(c) Sikkim
(d) Assam

Q43. Which country came out with the first 'official' compilation of volleyball rules and was published by the YMCA?

(a) Germany
(b) The US
(c) The UK
(d) Australia

Q44. Velocity of circulation of money is _____

(a) k times the value of transactions
(b) the number of times a unit of money changes hands during the unit period
(c) the number of times the same transactions can be repeated by a given volume of money supply
(d) the ratio of money balance to the value of transactions

Q45. Which of these is NOT true about green revolution?

(a) It was funded by international agencies.
(b) It was a private-sector programme for agricultural modernization.
(c) It was targeted mainly in the wheat and rice-growing areas.

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(d) It was introduced only in areas that had assured irrigation.

Q46. The traditional 'Cheraw' dance, in which bamboo is used, is famous in _____.

(a) Mizoram
(b) Goa
(c) Odisha
(d) Bihar

Q47. Which of the following posts of Defence Research Development Organisation (DRDO) is in the Level I (top level) of its organisational chart?

(a) Director General Technical Cluster
(b) Secretary DD and R & D
(c) Director General Corporate
(d) Director of Laboratory

Q48. The first-ever terrestrial plants to possess vascular tissues were:

(a) pteridophyta
(b) lichens
(c) bryophyta
(d) algae

Q49. Bailadila range of hills are famous for which of the following minerals?

(a) Iron ore
(b) Zinc
(c) Bauxite
(d) Manganese

Q50. The Battle of Karnal is known for the invasion of which of the following aggressors against India?

(a) Nadir Shah
(b) Nasir Khan
(c) Ahmad Shah Abdali
(d) Shah Shuja

QUANTITATIVE APTITUDE

Q51. If $p + q = 12$ and $pq = 14$, then find the value of $p^2 - pq + q^2$.

(a) 192
(b) 181
(c) 102
(d) 144

Q52. Rajat. Pooja and Abha participate in the election. If the total votes polled are 40,000 and 10% of votes are invalid, Rajat got 36% of valid votes and Pooja got 40% of valid votes, then find the number of votes Abha got.

(a) 9245
(b) 1024
(c) 8640
(d) 5760

Q53. A transverse common tangent is drawn to two circles of radius 8.5 cm and 5.5 cm. The centres of the two circles are 18 cm apart. What is the length (in cm) of the tangent?

(a) $10\sqrt{3}$
(b) $10\sqrt{2}$
(c) $8\sqrt{2}$
(d) $8\sqrt{3}$

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Q54. If an article is sold for Rs. 402, there is a loss of 33%. At what price should it be sold to get 37% profit?

(a) Rs. 911
(b) Rs. 618
(c) Rs. 822
(d) Rs. 781

Q55. What is the mean proportional of 8.41 and 16.81?

(a) 13.69
(b) 9.88
(c) 11.89
(d) 12.79

Q56. If a 10-digit number 620x976y52 is divisible by 88, then the least value of $(x^2 + y^2)$ will be:

(a) 8
(b) 7
(c) 11
(d) 10

Q57. If Rs. 2000 is invested at a simple interest rate of 5% per annum and the interest is added to the principal after 10 years, then in how many years will it amount to Rs. 4000 at the same rate of interest?

(a) 182/3 years
(b) 161/3 years
(c) 162/3 years
(d) 181/3 years

Q58. The marked price of a shirt is Rs. 2,000. It is sold at a discount of 15%. The shopkeeper has allowed a further discount of 5% due to off season. Find the selling price of the shirt.

(a) Rs. 1,710
(b) Rs. 1,615
(c) Rs. 1,650
(d) Rs. 1,700

Q59. If $\cos 5\alpha = \sin \alpha$ and $5\alpha < 90°$, then the value of $\tan 2\alpha$ is :

(a) $\sqrt{2}$
(b) $1/\sqrt{2}$
(c) $1/\sqrt{3}$
(d) $\sqrt{3}$

Q60. A 10-litre solution of milk and water contains 8 litres of milk, 2 litres of the solution is replaced by pure milk and mixed. The process is repeated two more times. How much milk (in litres) is present in the mixture so obtained?

(a) 8.976
(b) 8.597
(c) 8.796
(d) 8.679

Q61. In a 120 metre race, P beats S by 6 metres. If S starts with a head start of 7.5 metres and it is a 100 metre race, then who wins the race and how many metres? (Correct to 2 decimal places)

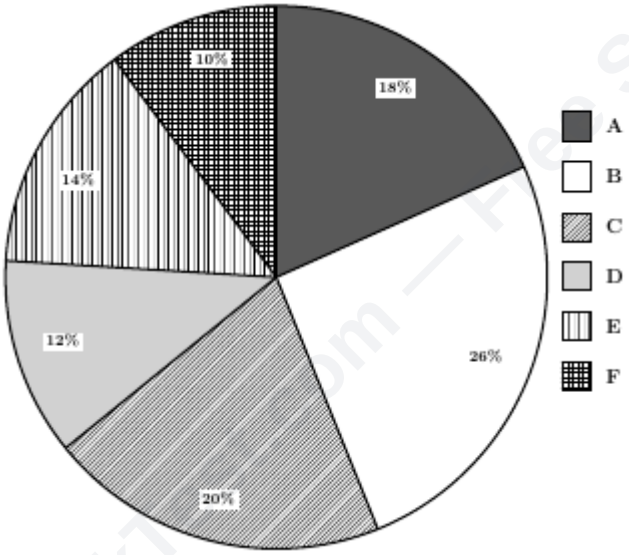
(a) S, 2.63
(b) P, 3.63
(c) S, 3.63
(d) P, 2.63

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Q62. The Pie chart shows the percentage distributions of total number of laptops (both Dell and HP) sold by six stores in March.

Refer to the pie chart and table carefully and answer the given questions,

Total number = 11200



Ratio of the number of Dell and HP sold

Stores	Ratio
A	5 : 4
B	7 : 6
C	1 : 4
D	11 : 10
E	4 : 3
F	3 : 1

What is the central angle corresponding to the total number of laptops (both Dell and HP) sold by store E? [correct to one decimal place)

(a) 43.2°
(b) 64.8°
(c) 50.4°
(d) 63.2°

Q63. The value of (1+sin A)/(cos A)+(cos A)/(1+sin A) is

(a) 2 sec A
(b) 2 cosec A
(c) sec A
(d) cosec A

Q64. CT is a tangent to a circle at the point T on the circle. Chord AB of the circle is extended to meet the tangent CT at the point C. If m (AB) = 3 cm and m (BC) = 2.4 cm, find the length (in cm) of the tangent CT.

(a) 4.2
(b) 3.6
(c) 3.2
(d) 4.0

Q65. If $(y^2+1/(y^2))=167$ and $y > 0$, find the value of $(y+1/y)$.

(a) 13
(b) $-\sqrt{165}$
(c) $\sqrt{165}$
(d) -13

Q66. Find the surface area of a sphere whose radius is 3.5 cm (Use $\pi = 22/7$)

(a) 154 cm^2
(b) 152 cm^2
(c) 146 cm^2
(d) 160 cm^2

Q67. Simplify the given expression. $((x+3)^3+(x-3)^3)/(x^2+27)$

(a) 3x
(b) x
(c) 4x
(d) 2x

Q68. In a triangle Δ PQR. the bisectors of angle P and angle R meet at a point M inside the triangle. If the measurement of angle PMR = 127°, then the measurement of angle Q is:

(a) 90°
(b) 74°
(c) 180°
(d) 106°

Q69. Jason can do a piece of work alone In 23.4 days. while Rafique can do the same piece of work alone in 39 days. In how many days can the duo complete the same work if they work together?

(a) 14.750
(b) 14.625
(c) 14.875
(d) 14.375

Q70. The table given below shows the number of aerated drinks A, B, C, D, manufactured (in thousands) by a company over the years.

YEAR	Aerated Drinks			
A	B	C	D	
2019	250	200	140	115
2020	200	230	170	120
2021	260	210	195	135
2022	275	175	190	155

In which year was the cumulative manufacturing of aerated drinks by B and C is highest?

(a) 2021
(b) 2019
(c) 2020
(d) 2022

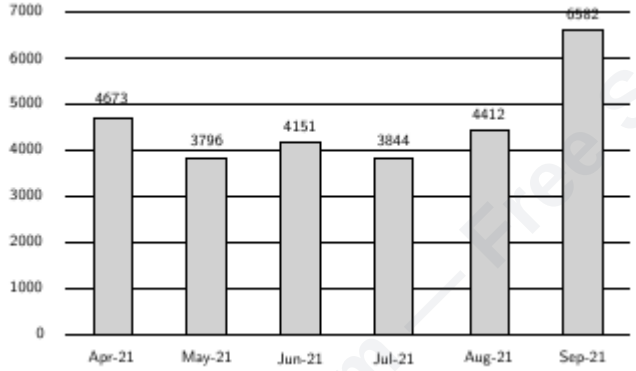
Q71. Simplify the given equation (1 + tan2 A)(1 + cot2 A) =?

(a) $1/(\cos^2A(1+\sin^2A))$
(b) $1/(\sin^2A(1-\sin^2A))$
(c) $1/(\sin^2A+\text{cosec}^2A)$
(d) $1/(\sin^2A(1+\cos^2A))$

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Q72. The following bar graph shows the number of thesis submitted in six months.

The total submission of thesis in April 21, May 21, and June 21 is what percentage of the total submission of thesis in July 21, August 21, and Sept 21? (Rounded off to two decimal places).



(a) 85.05%
(b) 79.12%
(c) 70.21%
(d) 102.34%

Q73. Triangle ABC is similar to Δ PQR and PQ = 10 cm, If the area of Δ ABC is 32 cm² and the area of Δ PQR is 50 cm². then the length of AB (in cm) is equal to:

(a) 10
(b) 4
(c) 6
(d) 8

Q74. The fourth proportion of number 8, 20 and 15 is:

(a) 37.5
(b) 10
(c) 10.6
(d) 200

Q75. A discount of 20% is given on the marked price of a cycle, and still there is a profit of 20%. If the profit is Rs. 800, find the marked price of the cycle.

(a) Rs. 4,000
(b) Rs. 5,800
(c) Rs. 4,800
(d) Rs. 6,000

GENERAL AWARENESS

Q76. Select the option that can be used as a one-word substitute for the underlined segment.

The new technology was much more productive and achieved maximum output with minimum wasted effort or expense.

(a) efficient
(b) elaborate
(c) rapid
(d) magnificent

Q77. Select the most appropriate ANTONYM to substitute the underlined word in the following sentence.

There was an interminable struggle from his part in his fight against cancer.

(a) overwhelming
(b) inappropriate
(c) unsustainable

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(d) intermittent

Q78. The following sentence has been split into four segments. Identify the segment that contains a spelling error.

Majority of the people / do not comprehend / the vissicitudes / of regular life.

(a) Majority of the people
(b) the vissicitudes
(c) of regular life
(d) do not comprehend

Q79. Select the option that expresses the given sentence in active voice.

The victim was found innocent as well as honest by the police.

(a) The police find the victim innocent as well as honest.
(b) The police has found the victim innocent and honest.
(c) The police found the victim innocent as well as honest.
(d) The police finds the victim innocent and honest.

Q80. Select the most appropriate synonym of the bracketed word in the following sentence to fill in the blank.

She looked _____ (amazed) when she heard the news.

(a) inspired
(b) afflicted
(c) induced
(d) astonished

Q81. 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.

This boy / is cleverest / of all / in the class.

(a) in the class
(b) This boy
(c) is cleverest
(d) of all

Q82. Select the most appropriate ANTONYM of the given word.

Dominate

(a) Protect
(b) Cover
(c) Open
(d) Liberate

Q83. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.

A. featuring the fool, or jester, who represented the weaknesses,

B. fool's literature is the allegorical satires

C. popular throughout Europe from the 15th to the 17th century,

D. vices, and grotesqueries of contemporary society

(a) BCAD
(b) DABC
(c) CABD
(d) ACDB

Q84. Select the option that can be used as a one-word substitute for the given group of words.

Free time; time at one’s own disposal

(a) Leisure
(b) Legible
(c) Lethal

(d) Legion

Q85. Select the most appropriate option that can substitute the underlined words in the given sentence.

Despite facing numerous obstacles and setbacks, the determined entrepreneur refused to give up on her dream of creating a successful startup that would transform the sector.

(a) that will improvise the sector
(b) that shall redesign the industry
(c) that could socialise the sector
(d) that would revolutionise the industry

Q86. Select the most appropriate synonym of the given word.

Fraudulent

(a) Genuine
(b) Counterfeit
(c) Unimaginative
(d) Dissimilar

Q87. Select the appropriate ANTONYM of the underlined word to fill in the blank.

We should try to pacify the situation and not _____ it further.

(a) mitigate
(b) standardise
(c) illustrate
(d) aggravate

Q88. Select the most appropriate ANTONYM of the given underline word.

We sell magazines, groceries and sundry articles.

(a) Diverse
(b) Uniform
(c) Various
(d) Several

Q89. Select the option that expresses the given sentence in active voice.

The entrance of the museum was opened by the official.

(a) The official opened the entrance of the museum.
(b) The official had opened the entrance of the museum.
(c) The official open the entrance of the museum.
(d) The officials opening the entrance of the museum.

Q90. Select the most appropriate meaning of the given idiom.

Cry for the moon

(a) To start performing better
(b) To have patience
(c) To desire the unattainable
(d) To be extremely happy

Q91. Select the option with the correct spelling that can replace the underlined word in the given sentence.

Employees were lay of from work due to the recession.

(a) laid off
(b) laid of
(c) lay off
(d) layed off

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Q92. Identify the error in the use of preposition in the given sentence and select the correct option.

Her family lost their way on Daman.

(a) over
(b) in
(c) upon
(d) of

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

Amal brightened of when they said he could go with them.

(a) brightened in when they
(b) brightened on when they
(c) brightened upon when they
(d) brightened up when they

Q94. Select the most appropriate option that can substitute the underlined words in the given sentence.

Instead of taking the time to do the job properly, they decided to cut corners and save time by using cheap materials.

(a) avoid someone or something intentionally
(b) physically cut a corner off of something
(c) take a shortcut for easy way out in order to save efforts
(d) break a promise or commitment

Q95. Select the option that can be used as a one-word substitute for the underlined group of words.

Henny Penny is a story that is passed down from generation to generation through spoken word.

(a) folktale
(b) fable
(c) epic
(d) parable

Directions

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

Five centuries after Leonardo da Vinci painted the Mona Lisa (1503–19), the portrait hangs behind bulletproof glass (1)_____ the Louvre Museum and draws thousands of jostling spectators each day. It is the most famous painting in the world, and yet, when viewers manage to see the artwork up close, they are likely to be (2)____ by the small subdued portrait of an ordinary woman. She's dressed modestly in a translucent veil, dark robes, and no jewellery. Much has been said about her smile and gaze, but viewers still might wonder what all the (3)_ is about. Along with the mysteries of the sitter's identity and her (4)____ look, the reason for the work's popularity is one of its many conundrums. Although many theories have attempted to pinpoint one reason for the art piece's celebrity, the most compelling arguments insist that there is no one explanation. The Mona Lisa's fame is the result of many chance circumstances combined with the painting's (5)_____ appeal.

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

(a) within
(b) beside
(c) toward
(d) outside

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

(a) composed
(b) unfazed
(c) baffled
(d) fine

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

(a) fuss
(b) unease
(c) cavil
(d) censure

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

(a) dark
(b) occult
(c) enigmatic
(d) murky

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

(a) inherent
(b) focal
(c) limited
(d) logical

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) [figure]

The correct mirror image of the given figure is:
Hence, the correct answer is "Option 1".

Q2. Answer: (b) Friday

Given: 19 June 2001 is Tuesday.
Now,
2001 to 2009 = 8 Years (6 Ordinary Year and 2 Leap Year).
And, In 8 Years = 2 Leap years and 6 Ordinary Year.
So, 2 Leap Year has 4 odd days,
And, 6 Ordinary Year has 6 odd days.
Total odd days = 4 + 6 = 10.
10 odd days → 10/7 = 1 week and 3 odd days.
then, 19 June 2009 will be Tuesday + 3 = Friday.
Now, the number of days between 19 June 2009 to 21 August 2009
= 11(June) + 31(July) + 21(August) = 63 days.
= 63 days → 63/7 = 9 week and 0 odd day.

So, 21 August 2009 will be Friday + 0 = Friday.
Hence, the correct answer is "Option 2".

Q3. Answer: (a) GUF

The logic followed here is:
So, 'GUF' will replace the question mark in the given series.
Hence, the correct answer is "Option 1".

Q4. Answer: (d) 2

The logic followed here is:
'MINER' is coded as '56342'
'ANIME' is coded as '63457',
Here, 'MINE' is common in both the statement, so the remaining number is the code for the remaining letter.
So, 'R' will be coded as '2'.
Hence, the correct answer is "Option 4".

Q5. Answer: (a) Friday

Given: 13th February of the month = Thursday. (As, 29 days month is February)
So, second last day of the month means 28th February,
And, days between 13th February to 28th February - 15 days.
And, 15 days = 15/7 = 2 week and 1 odd day.
Then, the second last day of the month will be: Thursday + 1 = Friday.
Hence, the correct answer is "Option 1".

Q6. Answer: (b) -5

BODMAS Table:
Given equation: 105 - 15 ÷ 13 + 3 × 27 = ?
Now, if '+' and '×' and '-' and '÷' are interchanged, then:
=> 105 ÷ 15 - 13 × 3 + 27 = ?
=> 7 - 13 × 3 + 27 = ?
=> 7 - 39 + 27 = ?
=> 34 - 39 = -5.
Hence, the correct answer is "Option 2".

Q7. Answer: (a) 100

The logic followed here is:

So, '100' will replace the X sign in the given series.
Hence, the correct answer is "Option 1".

Q8. Answer: (c) 1668

The logic followed here is:
Logic: (1st number × 3) = 2nd number.
Now,
For, 146 : 438
=> 146 × 3 = 438.
For, 316 : 948
=> 316 × 3 = 948.
Similarly, for 556 : ?
=> 556 × 3 = 1668.
Hence, the correct answer is "Option 3".

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Q9. Answer: (b) VSLK

The logic followed here is:
CHMZ is related to WRMZ,
NPWY is related to LJCA,
Similarly, for DGNO
So, DGNO will be related to VSLK.
Hence, the correct answer is "Option 2".

Q10. Answer: (b) 19

The logic followed here is:

So, '19' will replace the question mark in the given series.
Hence, the correct answer is "Option 2".

Q11. Answer: (a) Sister

Family Chart:
Decoding the Symbols:

Symbol	•	•	×	÷
Meaning	Daughter	Wife	Brother	Father

Given: P + Q - R ÷ S × T
It means: P is the Daughter of Q, Q is the Wife of R, R is the Father of S, S is the Brother of T.
So, P is the 'Sister' of T.
Hence, the correct answer is "Option 1".

Q12. Answer: (d) 2890

The logic followed here is:
Logic: (1st number)2 × 10 = 2nd number.
Now,
For, 11 is related to 1210
=> (11)2 × 10
=> 121 × 10 = 1210.
For, 13 is related to 1690
=> (13)2 × 10
=> 169 × 10 = 1690.
Similarly, for 17 related to
=> (17)2 × 10
=> 289 × 10 = 2890.
So, 17 related to 2890.
Hence, the correct answer is "Option 4".

Q13. Answer: (d) 8

The triangles are:
So, there are '8' triangles in the given figure.
Hence, the correct answer is "Option 4".

Q14. Answer: (c) RMJ

The logic followed here is:
So, 'RMJ' will replace the question mark in the given series.
Hence, the correct answer is "Option 3".

Q15. Answer: (c) 7

The logic followed here is:
‘HOUSE’ is coded as ‘23617'

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'MOUSE' is coded as '61235',

Here, 'OUSE' is common in both the statement, so the remaining number is the code for the remaining letter.

So, 'H' will be coded as '7'.

Hence, the correct answer is "Option 3".

Q16. Answer: (b) Father's mother

Family Chart:

Decoding the Symbols:

Symbol	×	#	$
Meaning	Sister	Mother	Father

Given: X # P $ Q × R

It means: X is the Mother of P, P is the Father of Q, Q is the Sister of R.

So, X is the 'Father's mother' of R.

Hence, the correct answer is "Option 2".

Q17. Answer: (a) 168

BODMAS Table:

Given equation: 11 ÷ 42 × 3 - 41 + 27 = ?

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

=> 11 × 42 ÷ 3 + 41 - 27 = ?

=> 11 × 14 + 41 - 27 = ?

=> 154 + 41 - 27 = ?

=> 195 - 27 = 168.

Hence, the correct answer is "Option 1".

Q18. Answer: (b) Only conclusion (II) follows

Given Statements:

Some tables are green.

All green is lawn.

All lawn is soft.

The least possible Venn diagram for the given statement is:

Conclusions:

I. All tables are green - False (Because, Some tables are green).

II. Some green is lawn - True (Because, All green is lawn also implies that Some green is lawn).

So, Only conclusion II follows.

Hence, the correct answer is "Option 2".

Q19. Answer: (a) [figure]

The logic followed here is:

Logic:

Step I: The corners images are getting rotated by one place in anticlockwise direction to each next images.

Step II: The center triangle are getting flipped to each next images.

So, 'Option 1' will replace the question mark.

Hence, the correct answer is "Option 1".

Q20. Answer: (d) QB 119

The logic followed here is:

So, 'QB 119' will replace the question mark in the given series.

Hence, the correct answer is "Option 4".

Q21. Answer: (a) [figure]

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 1".

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Q22. Answer: (d) 416

Given Equation: 1024 A 32 B 11 D 57 C 121 = ?

BODMAS Rule:

Decoding the given information:

Alphabet	A	B	C	D
Meaning	÷	×	•	•

Now replacing the sign from left to right using BODMAS Rule, we get:

=> 1024 ÷ 32 × 11 - 57 + 121 = ?

=> 32 × 11 - 57 + 121 = ?

=> 352 - 57 + 121 = ?

=> 473 - 57 = 416.

Hence, the correct option is "Option 4".

Q23. Answer: (a) ELBP

The logic followed here is:

So, 'ELBP' will replace the question mark in the given series.

Hence, the correct answer is "Option 1".

Q24. Answer: (b) Only conclusion (II) follows

Given Statements:

All rubbers are folders.

Some folders are computers.

All computers are envelopes.

The least possible Venn diagram for the given statement is:

Conclusions:

I. All folders are rubbers - False (Because, All rubbers are folders implies that some folders are rubbers, So, All folders are rubbers can be possible only).

II. Some computers are folders - True (Because, Some folders are computers).

So, Only conclusion (II) follows.

Hence, the correct answer is "Option 2".

Q25. Answer: (d) 255

The logic followed here is:

So, '255' will replace the question mark in the given series.

Hence, the correct answer is "Option 4".

Q26. Answer: (c) PV Sindhu

The correct answer is PV Sindhu

Key Points

• Gregoria Mariska Tunjung, an Indonesian badminton player, emerged victorious in the Women's singles category at the Madrid Spain Masters 2023 finals. She defeated PV Sindhu from India, marking her first BWF World Tour title and her first win over PV Sindhu in eight matches.

Q27. Answer: (d) It is a statement of receipts and expenditures incurred by the government.

The correct answer is It is a statement of receipts and expenditures incurred by the government.

Key Points

• Government budget is a constitutional requirement in India : Article 112 of the Indian Constitution mandates the government to present an annual budget to the Parliament.

• It is a statement of estimated receipts and expenditures of the government for the financial year: The budget outlines the government's expected revenue from various sources like taxes and its planned spending across different sectors for the upcoming financial year.

• It comprises two accounts: The Indian government budget consists of two main accounts: the Consolidated Fund of India (CFI) and the Contingency Fund of India.

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• The CFI deals with regular government receipts and expenditures, while the Contingency Fund caters to unforeseen expenses.

Additional Information

• Union Budget:

• Article 112 of the Indian Constitution mandates the presentation of the Union Budget, also known as the Annual Financial Statement (AFS), in the Parliament every year.

• The Union Budget is a statement of the government's revenue and expenditure for the upcoming financial year, which runs from April 1 to March 31.

• The Union Budget comprises three parts:

• The Consolidated Fund of India includes the government's revenue receipts, capital receipts, and expenditure dealt under Article 266.

• The Contingency Fund of India is used to meet unforeseen expenses dealt under Article 267.

• The Public Account of India includes transactions of the government relating to debt, deposits, and other transactions dealt under Article 266.

• The Union Budget is a crucial document that reflects the government's economic policies, priorities, and vision for the country's growth and development.

• A government that is in its final year in office, going through a transition period, or facing general elections presents an interim budget.

Q28. Answer: (b) Gujarat Titans

The correct answer is Gujarat Titans.

Key Points

• The 15th edition of the IPL in 2022 was won by the Gujarat Titans, led by captain Hardik Pandya.

• They defeated the Rajasthan Royals in the final by 7 wickets.

• This was the Gujarat Titans' maiden IPL season.

Additional Information

• Indian Premier League (IPL):

• It is a men's Twenty20 (T20) cricket league considered one of the most popular and exciting cricket tournaments annually held in India.

• It was established by the BCCI (Board of Control for Cricket in India) in 2007.

• As of the 2024 season, the league has ten teams based in cities across India.

• The IPL's headquarters are situated inside the Cricket Centre next to the Wankhede Stadium in Churchgate, Mumbai.

• In the 16th edition of the IPL in 2023, Chennai Super Kings defeated Gujarat Titans, by five wickets (DLS method) to win their fifth league title.

• The 2024 Indian Premier League will be the 17th season.

Q29. Answer: (c) Pascal's Law

The correct answer is Pascal's Law.

Key Points

• Pascal's Law states that when an external pressure is applied to an enclosed fluid, the pressure is transmitted equally throughout the fluid and to the walls of the container, regardless of the shape of the container or the amount of fluid.

• Blaise Pascal, a French scientist and mathematician, formulated the principle around 1647.

• Pascal's Law remains a fundamental principle in fluid mechanics and has countless applications in various fields, such as hydraulics, engineering, and even everyday tools like syringes and brakes.

• The sphygmomanometer, the device used to measure your blood pressure, relies on Pascal's Law to transmit the pressure fluctuations in your arteries to the mercury column or digital display.

• Scuba diving gear: The pressure experienced by divers increases with depth, and Pascal's Law ensures equal pressure distribution on all parts of the diver's body and equipment, maintaining comfort and safety.

• Hydraulic lifts: Cars are lifted at service stations, heavy machinery is raised in construction, and even dump trucks rely on Pascal's Law to transmit force through fluids, amplifying small forces into significant lifting power.

• Hydraulic brakes: The force you apply to your car's brake pedal is multiplied through a hydraulic system, transmitting pressure evenly to the brake pads on each wheel, creating powerful stopping force.

• Hydraulic presses: Compressing objects like bales of hay, forging metals, and shaping car parts utilizes hydraulic presses that harness the pressure multiplication principle.

Additional Information

• Magnus's Law deals with lift generation by a spinning object in a moving fluid.

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• Graham's Law explains the diffusion of gases at different rates based on their molecular weight.

• Torricelli's Law relates the speed of an effluxing liquid to the square root of its height.

Q30. Answer: (d) Article 51A (e)

The correct answer is Article 51A (e).

Key Points

• Article 51A(e) of Indian Constitution: To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic, and regional or sectional diversities; to renounce practices derogatory to the dignity of women.

• It enshrines the obligation to foster unity and a spirit of fraternity among all Indians, irrespective of their religious, linguistic, regional, or sectional differences.

• This speaks directly to the obligation to take into account social peace even when taking part in religious processions.

Additional Information

• Fundamental Duties:

• Part IV A of the Indian Constitution contains Article 51A, which deals with the Fundamental Duties.

• The Soviet Constitution (USSR) is where the idea of fundamental duties originated.

• Fundamental Duties were recommended in 1976 by the Swaran Singh Committee.

• Ten Fundamental Duties were added to the Indian Constitution by the 42nd Amendment Act of 1976.

• Fundamental duties are not subject to legal action unless specifically stated in a provision, in contrast to fundamental rights, which are justiciable.

• The 11 fundamental duties under Article 51A are:

• (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

• (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

• (c) to uphold and protect the sovereignty, unity and integrity of India;

• (d) to defend the country and render national service when called upon to do so;

• (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

• (f) to value and preserve the rich heritage of our composite culture;

• (g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;

• (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

• (i) to safeguard public property and to abjure violence;

• (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement and

• (k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

Q31. Answer: (c) Kerala

The correct answer is Kerala.

Key Points

• The highest literacy rate, as per the 2011 Census, is in Kerala with 94%.

• The least literate state is Bihar, with 61.80% literacy, Maharashtra has 82.34% and Tamil Nadu has 80.09% literacy.

• The overall literacy rate in India is 74%.

• Census of India 2011:

• It started on April 1, 2010.

• "Our Census, Our Future" was the 2011 census's slogan.

• India's population, according to the 2011 Census, is estimated to be 1.21 billion.

• The population density was 382 persons per square kilometer in 2011.

• India's sex ratio, as per the 2011 census, is 940.

• India's child sex ratio is 918, the lowest since the country's independence, as per Census 2011.

• This marked the commencement of the 15th Census of India and the 7th Census of Independent India (2011).

• The Indian Census Commissioner for 2011 was C. Chandramouli.

• The 2011 India Census was carried out in two phases:

• House listing and Housing Census (April to September 2010).

• Population Enumeration (9th to 28 February 2011).

Additional Information

• The 1948 Census Act governs how the census is carried out.

• The Indian Home Minister at the time, Sardar Vallabhbhai Patel, spearheaded the bill for this Act.

• The Indian Constitution's Article 246 declares the population census to be a Union subject.

• It is mentioned in the Seventh Schedule of the Constitution under serial number 69.

• The Ministry of Home Affairs' Office of the Registrar General and Census Commissioner oversees the decennial census.

• The first census of India was conducted by Lord Mayo in 1872.

• The first official census was started by Lord Ripon in 1881.

Q32. Answer: (a) Ministry of Culture

The correct answer is Ministry of Culture.

Key Points

• The scheme "Safeguarding India's Intangible Cultural Heritage and Diverse Cultural Traditions of India" falls under the purview of the Ministry of Culture of the Government of India.

• This scheme actively works towards:

• Strengthening and protecting the rich intangible cultural heritage of India.

• Preserving and promoting various diverse cultural traditions present in the country.

• Supporting institutions, groups, individuals, and NGOs involved in safeguarding and promoting intangible cultural heritage.

• The Ministry of Culture is responsible for various initiatives related to:

• Recognizing and promoting various art forms, languages, and cultural practices.

• Setting up and maintaining cultural institutions like museums, archives, and libraries.

• Providing financial assistance to cultural organizations and artists.

• Participating in international cultural exchange programs.

Additional Information

• The Ministry of Tourism, is the nodal agency for the formulation of national policies and programs and for the co-ordination of activities of various Central government Agencies, State Governments/UTs and the Private Sector for the development and promotion of tourism in the country.

• The main objectives of the Ministry of Education are :

• Formulating the National Policy on Education and ensuring that it is implemented in letter and spirit

• Planned development, including expanding access and improving quality of the educational institutions throughout the country, including in the regions where people do not have easy access to education.

• Provide financial help in the form of scholarships, loan subsidy, etc to deserving students from deprived sections of the society.

• Encouraging international cooperation in the field of education, including working closely with the UNESCO and foreign governments as well as Universities, to enhance the educational opportunities in the country.

• The Ministry of Housing and Urban Affairs is the apex authority of Government of India at the national level to formulate policies, sponsor and support programme, coordinate the activities of various Central Ministries, State Governments and other nodal authorities and monitor the programmes concerning all the issues of urban employment, poverty and housing in the country.

• Ministry aims for an equitable, inclusive and sustainable civic sensitive growth of towns and cities free from slums, which provides adequate affordable housing, means of productive employment, dignity and a decent quality of life to all inhabitants, including the poor.

Q33. Answer: (b) Jharkhand and Maharashtra

The correct answer is Jharkhand and Maharashtra.

Key Points

• In July 2016, the National Bank for Agricultural and Rural Development (NABARD) launched the ‘e-Shakti Project' for digitisation of all Self-help Groups (SHGs) in the district.

• In the pilot phase, Nabard had taken up two districts: Dhule in Maharashtra and Ramgarh in Jharkhand.

• e-Shakti project:

• It is a project initiated by the National Bank for Agriculture and Rural Development (NABARD) in India. It aims to digitize the accounts of Self Help Groups (SHGs) across the country, leading to their financial inclusion and access to wider financial services.

• Objectives:

• Digitize SHG accounts: This involves capturing demographic and financial data of SHG members and making it accessible through a Management Information System (MIS).

• Bring SHGs under financial inclusion: By digitizing their accounts, SHGs can access various financial services offered by banks like loans, savings accounts, and insurance.

• Improve quality of data: The MIS provides transparent and accurate data on SHGs, making it easier for banks to assess their creditworthiness and offer services accordingly.

• Increase outreach: e-Shakti aims to cover all SHGs in the country, bringing them into the formal financial system.

Additional Information

• NABARD is the acronym used for National Bank for Agriculture and Rural Development.

• India's top development bank, NABARD, aims to support fair and sustainable rural and agricultural development.

• As per the National Bank for Agriculture and Rural Development Act, 1981, it is a statutory body that was founded in 1982 by Parliament.

• Its headquarter is located in Mumbai, India.

• It supervises Regional Rural Banks (RRBs) and Cooperative Banks, assisting them in establishing safe banking procedures and integrating them with the CBS (Core Banking Solution) system.

• It offers financing assistance for the construction of rural infrastructure.

• It creates credit strategies at the district level to direct and inspire the banking sector to meet these goals.

• Current (as on Jan 2024) Chairman of NABARD is Shri. Shaji K V

Q34. Answer: (c) Chandella

The correct answer is Chandella.

Key Points

• Alha and Udal were legendary generals in the service of King Parmardi-deva (also known as Parmal), who belonged to the Chandela dynasty.

• Their bravery and resistance against enemies are celebrated in the epic ballad Alha-Khand.

• They were born to Chandravanshiya Kshatriya family. Udal was 12 years younger than Alha.

• They learned the art of war and religious knowledge from their guru, Gorakhnath.

• Alha and Udal were the learned scholars who shared a long-lasting bond between them. They were known for their bravery, serving their religion and love for their motherland.

Additional Information

• Chandela dynasty:

• They dominated Madhya Pradesh's eastern region (Area of Bundelkhand) with capital city is Mohoba, Khajuraho.

• They were one among the 36 Rajput clans.

• Under the early monarchs like Jayashakti Dhanga, who was a renowned leader of this dynasty, the Chandella kingdom gradually grew.

• He adopted the name Maharajadhiraja.

• His battles against Mahmud of Ghazni are widely recognized.

• During his rule, a number of the Khajuraho temples were constructed.

• Paramara dynasty:

• In west-central India, the Paramara dynasty dominated Malwa and the surrounding areas from the ninth to the fourteenth centuries.

• Upendra, also known as Krishnaraja, was the Malwa region's founder of the Parmar dynasty.

• It was situated in the early ninth century, north of the Narmada River.

• Kalachuri dynasty:

• It was a strong dynasty that governed Central India.

• It had two branches that governed in distinct locations for various ages.

• The Kalachuri Dynasty of Mahismati was the name given to the previous government.

• Between the sixth and seventh centuries AD, they ruled across west-central India.

• The Kalachuri Dynasty of Tripuri, who ruled from the 7th to the 13th century AD.

• Gahadavala dynasty:

• The Gahadavala dynasty emerged as a Rajput state in the eleventh and twelfth centuries.

• It ruled over parts of what are now the states of Uttar Pradesh and Bihar in modern India.

• Another name for it was the Gahadavalas of Kannauj.

• It expanded upto Delhi.

• In the east, it reached Patna and the Munger districts of Bihar.

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• The reign of Govinchandra was the pinnacle of the dynasty's power.

• In the latter part of the 12th century A.D., they were overthrown by Muhammad of Ghur's assaults.

Q35. Answer: (c) Sangeet Natak Akademi Award

The correct answer is Sangeet Natak Akademi Award.

Key Points

• Indian Satriya dancer Dr. Indira P. P. Bora is from Assam.

• She received 13 years of training in Bharatnatyam from Guru Rukmini Devi Arundale and Kuchipudi from Guru Vempati Chinna Satyam.

• Bora has performed and promoted Satriya in Vietnam, the United States, and New Zealand.

• She was awarded various awards including the Sangeet Natak Akademi Award in 1996 and Padma Shri in 2020.

Additional Information

• Sattriya Dance has its origin in the ‘Sattras’ established by Mahapurush Srimanta Sankardev in the 15th and 16th centuries.

• The Sattras were established for the propagation of Vaishnavism and later became the religious, cultural and social hub of Assam.

• The Sattriya dance can be classified into two styles, namely ‘Paurashik Bhangi’ i.e. Tandava or Masculine style and ‘Stri Bhangi’ i.e. Lashya or feminine style.

• On November 15 in the year 2000, the Sangeet Natak Akademi of India recognized Sattriya as one of the eight classical dances of India.

• Sangeet Natak Akademi:

• It is the apex body in the field of performing arts in the country and was set up in 1953 for the preservation and promotion of the vast intangible heritage of India’s diverse culture expressed in forms of music, dance and drama.

• The Chairman of the Akademi is appointed by the President of India for a term of five years.

• Sangeet Natak Akademi is an autonomous body of the Ministry of Culture, Government of India.

• The registered office of the Akademi is at Rabindra Bhavan, New Delhi.

• The Sangeet Natak Akademi Awards are the highest national recognition conferred on practicing artists.

• It is India's National Academy of Music, Dance & Drama, also called the Akademi Puraskar.

• It is the greatest honor bestowed upon those involved in the performing arts in India.

• 1952 marked its initial award.

Q36. Answer: (b) Assam

The correct answer is Assam.

Key Points

• Bokajan is a cement plant located in the Karbi Anglong district of Assam, situated approximately 21 kilometers from Dimapur Airport and 350 kilometers from Guwahati.

• It is operated by the Cement Corporation of India Limited (CCI).

• It is one of the 3 functional cement factory in India, out of its 10 cement factories of CCI, which are fully owned by the Central Govt. of India.

• Annually, the plant produces around 198,000 MT by using the dry process.

Additional Information

• Cement:

• It is a binding material that hardens when mixed with water, sand, and gravel to form concrete.

• It plays a crucial role in construction due to its strength, durability, and versatility.

• Based on how they set and harden, cement materials can be divided into two categories: hydraulic cements and non-hydraulic cements respectively.

• Hydraulic cements: The dry materials and water in hydraulic cements, such as Portland cement, react chemically to set and become adhesive.

• Non-hydraulic cement: Less often used non-hydraulic cement does not harden in damp environments or underwater.

• Instead, it solidifies when it dries and interacts with atmospheric carbon dioxide.

Q37. Answer: (b) NNP at FC

The correct answer is NNP at FC.

Key Points

• NNP at FC (Net National Product at factor cost) best describes the National Income.

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• It's calculated by deducting depreciation from GDP at MP, giving a more accurate picture of the net value of production.

• Net National Product at Factor Cost or NNP_(FC) : It is the net value of all the final goods and services that are produced by the residents of a nation within a period of one year.

• It can be shown as

• NNP_(FC) = GNP_(MP) - Net Indirect Taxes - Depreciation.

• National income of a country means the sum total of incomes earned by the citizens of that country during a given period, over a year.

Additional Information

• Gross Domestic Product (GDP) at Market Price or GDP_(MP):It is the gross market value of all final goods and services that is produced within the domestic territory of a nation within an accounting year.

• It is shown as: GDP_(MP) = Net domestic product at FC (NDP_(FC)) + Depreciation + Net Indirect tax.

• Net Domestic Product (NDP) at Market Price or NDP_(MP) :It is the net market value of all the final goods and services produced within the domestic territory of the nation within a year excluding depreciation

• Gross National Product (GNP) at Factor Cost or GNP_(FC) :It is referred to as the gross money value of all the final goods and services that are produced by the residents living within the boundaries of a nation during one accounting year excluding the net indirect taxes.

• It is shown as: GNP_(FC) = GNP_(MP) - Net Indirect Taxes.

• National income is calculated using various methods, such as the output method, income method, and expenditure method.

• The output method measures national income by adding up the value of all goods and services produced in the country, while the income method measures it by adding up all the income earned by individuals and businesses in the country.

• The expenditure method measures national income by adding up all the spending on goods and services by households, businesses, and the government.

• The income method measures all the income earned by all the factors of production in an economy.

Q38. Answer: (d) Hindustani music

The correct answer is Hindustani music.

Key Points

• Indian musician, composer, vocalist, and multi-instrumentalist Shubha Mudgal was born in 1959 and is well-known for her contributions to Tamil film, Indian pop music, and Hindustani classical music.

• She is skilled in the khyal, thumri, and dadra genres.

• In 2000, she was awarded the Padma Shri.

• Hindustani classical music:

• The classical music of the northern parts of the Indian subcontinent is known as Hindustani classical music. It is also known as shastriya sangeet in Hindustani or North Indian classical music.

• In addition to referring to Indian classical music generally, the term "shastriya sangeet" literally means "classical music."

• Instruments like the veena, sitar, and sarod are used to play it.

• It began in the 12th century CE, when it separated from the South Indian classical style known as Carnatic music.

• Hindustani music mostly employs works written in Urdu, Punjabi, Rajasthani, and occasionally Hindi, whereas Carnatic music mostly uses tunes written in Kannada, Telugu, Tamil, Malayalam, and occasionally Sanskrit.

Additional Information

• Carnatic music: This is a separate classical music tradition originating in south India.

• While both Hindustani and Carnatic music share some similarities, they have distinct styles and melodic structures.

• Reggae music: This is a genre of popular music originated in Jamaica, known for its offbeat rhythm and use of basslines.

• Hip hop music: This is a genre of popular music developed in the United States, characterized by rapping, DJing, and breakdancing.

Q39. Answer: (d) Leon Foucault

The correct answer is Leon Foucault.

Key Points

• In 1851, Leon Foucault, a French physicist, discovered the phenomenon of Eddy currents.

• He demonstrated that when a conductor moves through a magnetic field or vice versa, an electric current is induced within the conductor, forming closed loops perpendicular to the magnetic field.

• These currents are known as Eddy currents and can have various effects, including:

• Generating heat: The flow of Eddy currents within conductors results in energy loss as heat. This can be detrimental in some applications like transformers and motors.

• Damping motion: Eddy currents can induce a drag force on moving conductors in a magnetic field, slowing down their motion. This effect is used in magnetic brakes and damping mechanisms.

• Creating repulsion forces: Repulsive forces arise between a magnet and a conductor experiencing Eddy currents due to the interaction of their magnetic fields.

Additional Information

• British-American inventor, practical experimenter, and music professor David Edward Hughes is well-known for his contributions to the development of the printing telegraph and the microphone.

• American physicist Charles Hard Townes worked on quantum electronics related to both maser and laser devices, as well as the theory and implementation of the maser, for which he was granted the foundational patent.

• Nikola Tesla was a Serbian-American inventor, futurist, and mechanical and electrical engineer.

• His contributions to the present alternating current (AC) energy delivery system's design are what made him most famous.

Q40. Answer: (c) Cataract

The correct answer is Cataract.

Key Points

• Cataract:

• This term specifically refers to a large, powerful waterfall with an enormous volume of water flowing over a steep drop.

• Examples include Niagara Falls, Victoria Falls, and Iguazu Falls.

• The waterfall is known for having one of the highest flow rates of any in the world.

• In 2014, Iguaçu Falls recorded an all-time high in its flow rate, carrying 46,300 cubic meters per second - 33 times the usual water flow rate—after torrential rains.

Additional Information

• Cascade:

• While distinct from other types, cascade waterfalls are similar to multi-step waterfalls. This waterfall cascades over a set of rock stairs, but unlike multi-step waterfalls, it lacks plunge pools at each step.

• This type is one of the more common along seasonal creeks in hilly or mountainous areas.

• Roaring Fork Falls in the Pisgah National Forest of western North Carolina is a perfect example of a cascade waterfall.

• Rapid:

• This term typically refers to fast-flowing sections of a river with turbulence and whitewater, not necessarily large waterfalls.

• Chute:

• This refers to a steep incline over which water flows quickly, often associated with artificial structures like hydroelectric dams.

Q41. Answer: (a) 1909

The correct answer is 1909.

Key Points

• Indian Councils Act of 1909 also called Morley-Minto Reforms.

• Important reform measures enacted under it are:

• The legislative councils at the Centre and the provinces increased in size.

• Central Legislative Council – from 16 to 60 members.

• Legislative Councils of Bengal, Madras, Bombay, and United Provinces – 50 members each.

• Legislative Councils of Punjab, Burma, and Assam – 30 members each.

• The legislative councils at the Centre and the provinces were to have four categories of members as follows:

• Ex officio members: Governor-General and members of the executive council.

• Nominated official members: Government officials who were nominated by the Governor-General.

• Nominated non-official members: nominated by the Governor-General but were not government officials.

• Elected members: elected by different categories of Indians.

Additional Information

• Government of India Act 1935

• There was a growing demand for constitutional reforms in India by Indian leaders.

• India’s support to Britain in the First World War also aided in British acknowledgment of the need for the inclusion of more Indians in the administration of their own country.

• The Act was based on

• Simon Commission Report

• The recommendations of the Round Table Conferences

• The White Paper published by the British government in 1933 (based on the Third Round Table Conference)

• Report of the Joint Select Committees.

• Government of India Act, 1919

• The matters, which were of National importance or related to more than one province were governed at the central level, such as Foreign Affairs, Defence, Political Relations, Communication, Public Debt, Civil and Criminal Laws, Wire services, etc.

• The Central Legislature was made more powerful and more representative by this Act.

• The Act introduced a bicameral legislature; the Lower House or Central Legislative Assembly and the Upper House or Council of State.

• The legislators, under the new reforms, could now ask questions and supplementary, pass adjournment motions, and vote a part of the budget, but 75% of the budget was still not votable.

• The legislature had virtually no control over the Governor-General and his Executive Council.

Q42. Answer: (a) Nagaland

The correct answer is Nagaland.

Key Points

• Hornbill festival is celebrated Nagaland.

• This vibrant and colorful festival takes place every year from December 1st to 10th, showcasing the rich cultural heritage and traditions of the various Naga tribes.

• It's considered a "Festival of Festivals" as it incorporates various smaller festivals celebrated by different Naga communities.

• The festival is named after the hornbill, the large and colourful forest bird which is displayed in the folklore of most of the state's ethnic groups.

Additional Information

• Some other important festivals:

State	Festival
Assam	Bohag Bihu (Rangali Bihu), Magh Bihu (Bhogali Bihu), Kangali Bihu (Kati Bihu)
Arunachal Pradesh	Torgia (a Buddhist festival), Nyokam, Mopin, Tamladu, Reh, Ojiyale, Boori-Boot, Losar
Sikkim	Tse-chhu Chham, Tashiding Bhumchu, Shad Suk Mynsiem, Saga Dawa, Pang Lhabsol, Guthor Chaam
Nagaland	Sukrunyi, Hornbill festival, Moatsii Mong, Sekrenyi, Naknyulem, Bushu Jiba, Aoleang Monyu
Manipur	Gang-Ngai, Yaosang, Cheiraoba: The Manipuri New Year, Kang: The Ratha Yatra of Manipur, Heikru Hitongba, Ningol Chak-kouba: A social festival of the Manipuris, Kut: Festival of Kuki- Chin- Mizo.
Mizoram	Chapchar Kut, Lyuva Khutla, Pawl Kut
Tripura	Kharchi Puja, Garia Puja, Ker Puja, Bizu Festival, Tirtha Mukh Festival, Ashokastami, Ganga Puja, Lampra Puja, Wah festival

Q43. Answer: (b) The US

The correct answer is The US.

Key Points

• The first 'official' compilation of volleyball rules, published by the YMCA, originated in the United States.

• First Rules:

• Morgan wrote down the original set of rules himself, containing basic elements like a 6-foot 6-inch net, the ability to use any number of players, and points scored from serving.

• YMCA and Official Rules:

• Recognizing the potential of the game, the Young Men's Christian Association (YMCA) formalized the rules and published them in the "Handbook of the Athletic League of the Young Men's Christian Associations of North America" in 1897.

• This marked the first official compilation of volleyball rules.

Additional Information

• History of Volleyball:

• In 1895, William G. Morgan, a physical education director at the YMCA in Holyoke, Massachusetts, invented volleyball as an indoor sport for businessmen seeking a less vigorous alternative to basketball.

• He initially called it "mintonette," but a professor later suggested the name "volleyball" due to the volleying nature of the game.

• Young Men's Christian Association (YMCA):

• The YMCA, often known as the Y in some regions, is a global youth organization with over 64 million members across 120 countries.

• Its headquarters are in Geneva, Switzerland.

• George Williams established the organization as the Young Men's Christian Association on June 6, 1844, in London.

• The group strives to develop a healthy body, mind, and spirit in order to live out Christian principles.

Q44. Answer: (b) the number of times a unit of money changes hands during the unit period

The correct answer is the number of times a unit of money changes hands during the unit period.

Key Points

• Velocity of circulation of money is defined as the number of times a unit of money changes hands during the unit period.

• It is the frequency with which the total money supply in the economy turns over in a given period of time.

• It is measured by dividing GDP by the country's total money supply. A high velocity of circulation in a country indicates a high degree of inflation.

• It helps in determining how vigorous a country's economy is.

Additional Information

• The desire to hold financial assets in the form of money, such as cash or bank deposits rather than investments, is known as the demand for money.

• It refers to the amount of money people want to hold at a given point.

• Hot money signifies currency that quickly and regularly moves between financial markets, that ensures investors lock in the highest available short-term interest rates.

• It continuously shifts from countries with low-interest rates to those with higher rates.

• FPI (Foreign portfolio investment - investments made in securities and other financial assets issued in another country) is often referred to as “hot money” because of its tendency to flee at the first signs of trouble in an economy.

Q45. Answer: (b) It was a private-sector programme for agricultural modernization.

The correct answer is It was a private-sector programme for agricultural modernization.

Key Points

• The Green Revolution in India:

• The Green Revolution, which refers to the large-scale introduction of high-yielding varieties of seeds, fertilizers, and pesticides in agriculture, has been criticized for its negative impact on small farmers.

• The Government of India launched the Green Revolution in 1965 under the Third Five-Year Plan(1961-66).

• MS Swaminathan is considered the father of the Green Revolution in India.

• Norman Borlaug is known as the 'Father of Green Revolution' in the world.

• In India, the aim of this revolution was to increase the productivity of agricultural crops, particularly wheat and rice.

• The main focused crops were Wheat, Rice, Jowar, Bajra and Maize.

• In the first phase of the Green Revolution, the use of HYV seeds was limited to the more prosperous states of Haryana, Punjab, Andhra Pradesh, Tamil Nadu and Western Uttar Pradesh.

• HYV seeds refer to high-yielding varieties of seeds that were developed during the Green Revolution to increase crop yields.

• These are resistant to insects and diseases and have a high yield capacity.

Additional Information

• The Green Revolution was a period of agricultural transformation that took place in the 1960s and 1970s in India.

• The goal of the Green Revolution was to increase agricultural productivity and food security by introducing high-yielding crop varieties (HYV seeds), modern irrigation systems, and chemical fertilizers and pesticides.

• It was a significant success in India, as it helped to increase agricultural output (especially wheat and rice) and reduce food shortages.

• However, it also had some negative impacts, such as environmental degradation, soil erosion, and the loss of traditional farming practices.

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Q46. Answer: (a) Mizoram

The correct answer is Mizoram.

Key Points

• The "Cheraw" dance, also known as the "Bamboo dance," is a captivating performance showcasing the cultural heritage of the Mizo people of Mizoram.

• It typically involves six to eight male dancers rhythmically clapping bamboo staves on the ground while a group of female dancers gracefully perform intricate steps in between the beating bamboo.

• The dance is often performed during festive occasions and holds cultural significance for the Mizo community.

Additional Information

• The Indian States and Folk Dances:

• | Indian States | Folk Dances |

Sikkim	**Chu Faat Dance, Sikmari, Singhi Chaam or the Snow Lion Dance, Yak Chaam, Denzong Gnenha, Tashi Yangku Dance, Khukuri Naach, Chutkey Naach, Maruni Dance**
Bihar	Jata-Jatin, Bakho-Bakhain, Panwariya, Sama Chakwa, Bidesia.
Goa	Tarangamel, Koli, Dekhni, Fugdi, Shigmo, Ghode, Modni, Samayi nrutya, Jagar, Ranmale, Gonph, Tonnya mell.
Mizoram	Cheraw Dance, Khuallam, Chailam, Sawlakin, Chawnglaizawn, Zangtalam, Par Lam, Sarlamkai/Solakia, Tlanglam, Bamboo Dance.
Assam	Bihu, Bichhua, Natpuja, Maharas, Kaligopal, Bagurumba, Naga dance, Khel Gopal, Tabal Chongli, Canoe, Jhumura Hobjanai
Odisha	Odissi (Classical), Savari, Ghumara, Painka, Munari, Chhau.
Jammu and Kashmir	Rauf, Hikat, Mandjas, Kud Dandi Nach, Damali.
Manipur	Dol Cholam, Thang Ta, Lai Haraoba, Pung Cholom, Khamba Thaibi, Nupa Dance, Raslila, Khubak Ishei, Lhou Sha.

Q47. Answer: (b) Secretary DD and R & D

The solution is in Hindi. Read it online.

Q48. Answer: (a) pteridophyta

The correct answer is pteridophyta.

Key Points

• Pteridophyta:

• These are the first group of terrestrial plants with vascular tissues.

• They have specialized xylem and phloem tissues that enable efficient water and nutrient transport throughout their bodies, allowing them to grow larger and colonize drier habitats compared to bryophytes.

• Examples of pteridophytes include ferns, horsetails, and club mosses.

Additional Information

• Algae: These are aquatic organisms and haven't adapted to a terrestrial environment. They do not have vascular tissues.

• Lichens: These are symbiotic organisms, not true plants.

• They form complex partnerships between fungi and photosynthetic organisms like algae or cyanobacteria.

• While some lichens are terrestrial, they lack any vascular system.

• Bryophyta: These are the first land plants, but they lack vascular tissues.

• They rely on diffusion for water and nutrient transport, limiting their size and restricting them to moist environments.

• Vascular tissues are complex, specialized tissues found in vascular plants like ferns, gymnosperms (e.g., conifers), and angiosperms (flowering plants).

• They act as the internal plumbing system, transporting water, nutrients, and dissolved substances throughout the plant body.

• Their presence is crucial for the survival and growth of these plants, especially in terrestrial environments.

• Components of vascular tissues:

• Xylem: Responsible for transporting water and dissolved minerals from the roots to the rest of the plant.

• Xylem cells are elongated and dead, with hollow interiors that facilitate water flow.

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• Phloem: Responsible for transporting sugars and other organic nutrients synthesized in the leaves to other parts of the plant.
• Phloem cells are living and arranged in tubes with specialized sieve plates for efficient transport.

Q49. Answer: (a) Iron ore

The correct answer is Iron ore.

Key Points

• The Bailadila Range is a mountain range located in the Dantewada district of Chhattisgarh, India.
• It is known for its rich deposits of iron ore, which are among the highest grade in the world.
• The range is also home to a variety of plant and animal life, including tigers, elephants, and sal trees.

Additional Information

• Iron ore:
• The Ballary-Chitradurga-Chikmagalur-Tumkur belt located in Karnataka is renowned for its vast reserves of iron ore.
• It is considered one of the major iron ore belts in India, contributing significantly to the country's iron and steel industry.
• The Kudremukh mines, located in the Western Ghats of Karnataka, are entirely focused on exports.
• A pipeline carries the ore in a slurry form to a port close to Mangalore.
• One of the three main iron ore belts is the one that runs through Odisha and Jharkhand.
• The other two are the Bellary-Chitradurga-Chikmagalur-Tumkur belt and the Durg-Bastar Chandrapur belt.
• The Odisha-Jharkhand belt's Badampahar mines produce high-grade hematite ore.
• Manganese ore can be found in the districts of Balaghat, Chhindwara, and Jhabua in Madhya Pradesh, in Nagpur and Bhandara in Maharashtra and Sundargarh, Koraput, and Ganjam in Odisha.
• The five largest zinc mines in India are Rampura Agucha Mine, Sindesar Khurd Mine, Zawar Mine, Kayad Mine, and Rajpura Dariba Mine.
• In terms of states, Odisha alone is responsible for 51% of the nation's bauxite resources, with Andhra Pradesh (16%), Gujarat (9%), Jharkhand (6%), Maharashtra (5%) and Madhya Pradesh & Chhattisgarh (4% each) following.
• The East Coast bauxite deposits in Odisha and Andhra Pradesh contain the majority of the world's bauxite resources.

Q50. Answer: (a) Nadir Shah

The correct answer is Nadir Shah.

Key Points

• The Battle of Karnal occurred in 1739, when Nadir Shah, the ruler of the Afsharid dynasty of Persia, invaded India.
• He defeated the Mughal army led by Muhammad Shah at Karnal and subsequently sacked Delhi, the Mughal capital.
• This decisive victory marked the beginning of the decline of the Mughal Empire.
• Afsharid Dynasty:
• The Turkoman Afshar tribe in Iran's northeastern area of Khorasan gave rise to the Afsharid dynasty, which controlled Iran (Persia) in the middle of the eighteenth century.
• Nadir Shah (Nader Shah Afshar), a brilliant military tactician who deposed the final Safavid dynasty member and crowned himself Shah of Iran, founded the dynasty in 1736.
• Under Nader's leadership, Iran reached its widest point since the Sasanian Empire.
• At its height, it controlled portions of Iraq, Turkey, the United Arab Emirates, and Oman in addition to modern-day Iran, Armenia, Georgia, the Azerbaijan Republic, Afghanistan, Bahrain, Turkmenistan, Uzbekistan, and Pakistan, as well as portions of the North Caucasus (Dagestan).

Additional Information

• Ahmed Shah Abdali:
• The founder of the Durrani Empire and the modern state of Afghanistan was Ahmad Shah Abdali, sometimes referred to as Ahmad Khan Abdali or Ahmad Shah Durrani.
• After Nadir Shah passed away in 1747, Abdali was selected to take over and attacked India on several occasions between 1748 and 1767.
• During this period, he launched eight invasions of India, conquered Punjab, and defeated the Marathas in the Third Battle of Panipat in 1761.
• Shah Shuja:
• The second child of Mughal Emperor Shah Jahan and Empress Mumtaz Mahal was Mirza Shah Shuja.
• He served as governor of both Bengal and Odisha; his capital was Dhaka.
• Following Shah Jahan's sickness in September of 1657, the brothers had a power struggle.
• Shah Shuja declared himself to be the Emperor, but Aurangzeb took the Dehli throne and dispatched Mir Jumla to bring Shuja

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under control.

• On January 5, 1659, Shuja lost the Battle of Khajwa.

• Nasir Khan:

• While Nasir Khan participated in rebellions against the Mughal Empire, he wasn't involved in the Battle of Karnal.

Q51. Answer: (c) 102

GIVEN:

$p + q = 12$

$pq = 14$

FORMULA USED:

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

CALCULATION:

$\Rightarrow p + q = 12$

square on both side

$\Rightarrow (p + q)^2 = 12^2$

$\Rightarrow p^2 + 2pq + q^2 = 144$

$\Rightarrow p^2 + 2\times 14 + q^2 = 144$ (put, $pq = 14$)

$\Rightarrow p^2 + q^2 = 144 - 28 = 116$

Now,

$\Rightarrow p2 - pq + q^2 = 116 - 14 = 102$.

Option 3 is the correct.

Q52. Answer: (c) 8640

Given:

The total votes polled = 40,000

Invalid vote = 10%

Rajat got of valid votes = 36%

Pooja got of valid votes = 40%

Calculation:

$\Rightarrow$ Total valid votes = 40,000 × 90% = 36,000

$\Rightarrow$ Rajat got of valid votes = 36000 × 36% = 12960

$\Rightarrow$ Pooja got of valid votes = 36000 × 40% = 14400

$\Rightarrow$ Abha got votes of valid votes = (100-36-40)% = 24%

$\Rightarrow$ Abha got of valid votes = 36000 × 24% = 8640.

Therefore The correct answer is 8640.

Q53. Answer: (c) 8√2

Given:

Radius of two circles are = 8.5 cm and 5.5 cm

Distance between the centre of the two circles = 18 cm

Formula Used:

The length of a transverse common tangent = $\sqrt{(d^2 - (r1 + r2)^2)}$

Where, d = distance between the centre of two circles

r1and r2 = radius of the circles

Calculation:

$\Rightarrow$ Length of the tangent = $\sqrt{(18^2 - (8.5 + 5.5)^2)}$

$\Rightarrow$ Length of the tangent = $\sqrt{(324 - 196)} = \sqrt{128}$

$\Rightarrow$ Length of the tangent = $8\sqrt{2}$ cm

Therefore The correct answer is $8\sqrt{2}$ cm. Option 3).

Q54. Answer: (c) Rs. 822

Given:

That the article is sold for Rs. 402 at a loss of 33%

Formula used:
Cost Price - Loss = Selling Price
Selling Price = Cost Price + Profit
calculations:
Let the cost price of the article be Rs. X
=> X - (33/100)X = 402
=> 0.67X = 402
=> X = 402 / 0.67
=> X = 600
So, the cost price of the article is Rs. 600.
Now, we need to calculate the selling price at a profit of 37%.
S.P = 600 + 0.37 × 600
S.P = 600 + 222
S.P = 822
Therefore The article should be sold for Rs. 822 to get a profit of 37%.

Q55. Answer: (c) 11.89

Formula Used:
$b^2 = ac$
Calculation:
Mean Proportional = √(8.41 ×16.81)
= √(8.41 ×16.81)
= √141.37 = 11.89
Hence, mean proportional is 11.89.
Correct Answer: 3) 11.89

Q56. Answer: (d) 10

Given:
620x976y52 is divisible by 88
Concept Used:
Divisibility Rule for 8 = The last three digits should be divisible by 8.
For 11, The difference between the sum of odd place digits and even place digits should be a multiple of 11
Calculation:
The given number is divisible by 88 = 8 × 11
So, the number should be divisible by 8 and 11 both.
For the number 620x976y52 to be divisible by 8, possible values of y = 1, 3, 5, 7, 9
For the number 620x976y52 to be divisible by 11, (6 + 0 + 9 + 6 + 5) - (2 + x + 7 + y + 2)
=> 26 - (11 + x + y) = 15 - (x + y) it should be divisible by 11.
For that (x + y) = 4
we can say that y = 1 or 3 and x = 3 or 1
$x^2 + y^2 = (1^2 + 3^2) = 10$
Therefore The correct answer is 10.

Q57. Answer: (c) 162/3 years

Given:
If Rs. 2000 is invested at a simple interest rate of 5% per annum and the interest is added to the principal after 10 years
Concept Used:
Simple Interest (SI) = (P × R × t) / 100
Where, P = Principal, R = rate of interest, and t = time of investment
Calculation:
Here, P = Rs. 2000, R = 5% and t = 10 years
Interest earned after 10 years = (2000 × 5 × 10) / 100 = 1000
Now the interest earned is added to the principal, so current P = (2000 + 1000) = Rs. 3000

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Required interest = (4000 - 3000) = Rs. 1000

The time required to earn Rs. 1000 is = (1000× 100)/(3000× 5) = 20/3 years

Total time required to gain the amount of Rs. 4000 is = (10 + 20/3) = 162/3 years

Therefore The correct answer is option 1

Q58. Answer: (b) Rs. 1,615

Shortcut Trick15%= 3/20

5% = 1/20

MP	SP
20	17
20	19
400	323

=> 400 unit = 2000

=> 1 unit = 5

=> 323 unit = 5 × 323 = 1615

Selling price of the shirt = Rs. 1615

Alternate Method Given :

Marked Price of shirt = Rs 2000

First discount = 15%

Second discount = 5%

Formula Used :

Selling Price = Marked Price × (100 - Discount%)/100

Calculation :

Selling price

=> 2000 × ((100-15)/100)((100-5)/100)

=> 2000 × 85/100 × 95/100

=> 1615 Rs.

Therefore The correct answer is Rs. 1615.

Q59. Answer: (c) 1/√3

Given:

cos 5α = sin α

5α < 90°

Formula used:

sin θ = cos (90° − θ)

tan 2α = tan (2α)

Calculations:

cos 5α = sin α

=> cos 5α = cos (90° − α)

=> 5α = 90° − α (acute angles)

=> 6α = 90°

=> α = 15°

=> 2α = 30°

=> tan 2α = tan 30°

=> tan 2α = 1/√3

Therefore The correct answer is 1/√3.

Q60. Answer: (a) 8.976

Given:

Initially quantity of the solution = 10 litres

Milk in the initial solution = 8 litres

2 litres of pure milk is added replacing 2 litres of the mixture.
Above process is repeated two more times.
Calculation:
First Replacement:
Volume removed contains = 8/10 milk and 2/10 water.
Milk removed = 2(8/10) = 1.6 litres
Water removed = 2(2/10) = 0.4 litres
Milk left = (8 - 1.6 = 6.4) litres
Water left = (2 - 0.4 = 1.6) litres
Then, 2 litres of milk is added,
New Milk Quantity = (6.4 + 2 = 8.4) litres
Water remains the same at 1.6 litres.
Second Replacement:
Milk removed = 2(8.4/10) = 1.68 litres
Water removed = 2(1.6/10) = 0.32 litres
Milk left = (8.4 - 1.68 = 6.72) litres
Water left = (1.6 - 0.32 = 1.28) litres
Then, 2 litres of milk is added,
New Milk Quantity = (6.72 + 2 = 8.72) litres
Water remains the same at 1.28 litres.
Third Replacement
Milk removed = 2(8.72/10) = 1.744 litres
Water removed = 2(1.28/10) = 0.256 litres
Milk left = (8.72 - 1.744 = 6.976) litres
Water left = (1.28 - 0.256 = 1.024) litres
Then, 2 litres of milk is added,
New Milk Quantity = (6.976 + 2 = 8.976) litres
Therefore 8.976 litres of milk is present in the mixture.
Shortcut Trick
Initially ratio of milk and water = 8 : 2 = 4 : 1
In 2 litres of mixture,
Quantity of water = 2 × 1/5 = 0.4 litre
Water after 1st replacement/Initial water = 0.4/2 = 1/5

	Initial water quantity (unit)	Final water quantity (unit)
1st Replacement	5	(5 - 1) = 4
2nd Replacement	5	(5 - 1) = 4
3rd Replacement	5	(5 - 1) = 4
Total	5 × 5 × 5 = 125	4 × 4 × 4 = 64

=> 125 units = 2 litres
=> 1 unit = 2/125 litres
=> 64 units = 2/125 × 64 = 1.024 litres
So, Final milk quantity = 10 - 1.024 = 8.976 litres
Therefore 8.976 litres of milk is present in the mixture.

Q61. Answer: (a) S, 2.63

Given :
In a race of 120 m, P beats S by 6m
In the race of 100 m, S has a head start of 7.5 m
Formula Used :
Speed = Distance / Time

Calculation :

Let the speed of P and Q be a and b respectively.

If P beats S by 6 m, it means in the same time P runs 120 m while Q runs 114 m.

Then, 120 / a = 114 / b

=> a / b = 120 / 114 = 60 / 57 --------(1)

Now in the race of 100 m, S starts with a head start of 7.5 m which means S runs 92.5 m.

Let in same time P runs y m.

Then, y / a = 92.5 / b

=> y = a/b × 92.5

=> y = 60/57 × 92.5 = 97.37

Thus, P will run only 97.37 m.

Therefore P loses the race by (100 - 97.37) m = 2.63 m

Therefore S wins the race by 2.63 m.

Q62. Answer: (c) 50.4°

Given:

Total number of laptop sold (100%) = 11200

Concept used:

Angle made at the center of circle will be 360°

Calculation:

=> % of laptop sold by store E = 14%

Now,

=> (360° / 100%) × 14% = 50.4°

Therefore The correct answer is 50.4°.

Q63. Answer: (a) 2 sec A

Formula Used:

$\sin^2\theta + \cos^2\theta = 1$

Calculation:

=> (1+sin A)/(cos A) + cosA/(1+sinA)

=> $((1+\sin A)^2)/(\cos A\times (1+\sin A)) + (\cos^2 A)/((1+\sin A)\times \cos A)$

=> $(1+2\sin A+\sin^2 A+\cos^2 A)/(\cos A\times (1+\sin A))$

=> $(2(1+\sin A))/(\cos A\times (1+\sin A))$

=> 2 / cos A = 2 sec A

Therefore The correct answer is option 1

Q64. Answer: (b) 3.6

Given:

CB = 2.4 cm, CA = 5.4 cm

Formula Used:

$TC^2 = CB \times CA$

Calculation:

Let the value of CT be x cm.

=> TC2 = CB × CA

=> $x^2 = 2.4 \times 5.4 = 3.6 \times 3.6$

=> x = 3.6

Therefore The length of the tangent CT is 3.6 cm.

Q65. Answer: (a) 13

Given:

$y^2 + 1/(y^2) = 167$

Formula Used:

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

Calculation:
Adding and subtracting 2 on the LHS we get,
=> y2 + 1/(y²) + 2 - 2 = 167
=> (y + 1/y)² - 2 = 167
=> (y + 1/y)² = 169
Taking square root on both sides we get
=> (y + 1/y) = 13
Therefore The correct answer is 13. Option 1).

Q66. Answer: (a) 154 cm²

Given :
Radius = 3.5 cm
Formula used :
Surface area of a sphere = 4πr²
Where, Radius = r
Calculation :
Surface area of a sphere
=> 4 × 22/7 × 3.5 × 3.5
=> 154 cm²
Therefore The correct answer is 154 cm2.

Q67. Answer: (d) 2x

Given:
((x+3)³+(x-3)³)/(x²+27)
Concept used:
(a + b)³ = a³ + b³ + 3ab (a + b)
(a - b)3 = a3 - b3 - 3ab (a - b)
Calculation:
According to the question,
The expression is = ((x+3)³+(x-3)³)/(x²+27)
We know,
(x + 3)³ = x³ + 3³ + 3 × (x) × 3 (x + 3)
=> (x + 3)³ = x³ + 27 + 9x(x + 3)
=>(x + 3)³= x3 + 27 + 9x² + 27x
=>(x + 3)3 = x3 + 9x2 + 27x + 27 ---------(1)
Similarly,
(x - 3)3 = x3 - 33 - 3 × (x) × 3 (x - 3)
=> (x - 3)³ = x3 - 27 - 9x(x - 3)
=>(x - 3)3 = x3 - 27 - 9x2 + 27x
=>(x - 3)³ = x3 - 9x2 + 27x - 27 ---------(2)
Put the value of eq. (1) and eq. (2) in given expression
=> ((x+3)³+(x-3)³)/(x²+27) = (x³ + 9x² + 27x + 27) + (x³ - 9x² + 27x - 27)/(x² + 27)
=> ((x+3)³+(x-3)³)/(x²+27) = (2x³ +54x)/(x² + 27)
=> ((x+3)³+(x-3)³)/(x²+27) = (2x(x²+27))/(x²+27)
=> ((x+3)³+(x-3)³)/(x²+27) = 2x
Therefore The value of ((x+3)³+(x-3)³)/(x²+27) is 2x.

Q68. Answer: (b) 74°

Given:
angle PMR = 127°
The bisector of angle P and angle R meet at a point M inside the Triangle.
Concept Used:
In the ΔABC, if BO and CO are the angle bisectors, then angle BOC = 90 + 1/2angle A

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Calculation:
According to given concept,
=> angle PMR = 90° + angle Q/2
=> angle Q/2 = 127° - 90°
=> angle Q = 37° × 2 = 74°
Therefore The value of angle Q is 74°.

Q69. Answer: (b) 14.625

Given :
Jason can do a piece of work alone = 23.4 days.
Rafique can do the same piece of work alone = 39
Concept used :
Number of days to complete work = Total work /Efficiency
Formula used :
Efficiency = Total work / no. of days
Calculation :
Let as the total work = 23.4× 39 = 912.6
Efficiency of Jason = 912.6 / 23.4 = 39
Efficiency of Rafique = 912.6 / 39 = 23.4
Efficiency of Jason and Rafique = 39 + 23.4 = 62.4
=> Number of days to complete work = Total work /Efficiency
=> Number of days to complete work = 912.6 / 62.4
=> 14.625
Hence, the correct option (2).

Q70. Answer: (a) 2021

Calculation:
Aerated drinks manufactured together by company B and C in 2019 = 200 + 140 = 340
Aerated drinks manufactured together by company B and C in 2020 = 230 + 170 = 400
Aerated drinks manufactured together by company B and C in 2021 = 210 + 195 = 405
Aerated drinks manufactured together by company B and C in 2022 = 175 + 190 = 365
Clearly shows that, most of the aerated drinks manufactured together by company B and C is in 2021
Therefore The correct option is 1.

Q71. Answer: (b) 1/(sin²A(1-sin²A))

Given:
(1 + tan2 A)(1 + cot2 A)
Formula used:
$sec^2A - tan^2A = 1$
$cosec^2A - cot^2A = 1$
$sin^2A + cos^2A = 1$
Calculation:
(1 + tan2 A)(1 + cot2 A)
=> $sec^2A \times cosec^2A$
=> $(1/cos^2A) \times (1/sin^2A)$
=> $1/(sin^2A(1-sin^2A))$
Therefore The correct answer is 2.

Q72. Answer: (a) 85.05%

Calculations:
The total submission of the thesis on April 21, May 21, and June 21
=> 4673 + 3796 + 4151 = 12620
The total submission of the thesis on July 21, August 21, and Sept 21

=> 3844 +4412 + 6582 = 14838

=> Total percentage = (12620 / 14838)× 100 = 85.05%

Therefore The correct answer is A.

Q73. Answer: (d) 8

Shortcut Trick

Ratio of areas of similar triangles = (Ratio of corresponding sides)²

Area(ΔABC) : Area(ΔPQR) = 32 : 50 = 16 : 25

Ratio of sides AB : PQ = √16 : √25 = 4 : 5

Given PQ = 10 cm (which corresponds to 5 units), so 1 unit = 2 cm

AB = 4 units = 4 × 2 = 8 cm

Therefore The correct answer is 8 cm.

Alternate Method

Given:

Area of ΔABC = 32 cm²

Area of ΔPQR = 50 cm²

Length of PQ = 10 cm

Formula Used:

Area(ΔABC) / Area(ΔPQR) = (AB / PQ)²

A

B

C

P

Q

R

AB = ?

PQ = 10 cm

Area = 32

Q74. Answer: (a) 37.5

Given:

Numbers are 8, 20 and 15

Concept used:

If numbers a, b, c and d are in fourth proportion then a × d = b × c

Calculation:

Let fourth number is Y

Now,

=> 8 × Y = 20 × 15

=> Y = 300/8 = 37.5

Therefore The correct answer is 37.5.

Q75. Answer: (d) Rs. 6,000

Given:

Discount (D) % = 20

Profit (P) % = 20

Profit = Rs. 800

Formula used:

Cost price (CP) / Marked price (MP) = (100 - D%) / (100 + P%)

Selling Price (SP) = MP × (100 - D%) / 100

Profit (P) = SP - CP

Calculation:

=> CP / MP = 80 / 120 ratio

=> SP = (120 × 80) / 100 = 96 ratio

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=> P = 96 - 80

=> 800 = 16 ratio

=> 50 = 1 ratio

Now,

=> MP = 120 ratio = 120 × 50 = 6000

Therefore The correct answer is 6000.

Q76. Answer: (a) efficient

The solution is in Hindi. Read it online.

Q77. Answer: (d) intermittent

The solution is in Hindi. Read it online.

Q78. Answer: (b) the vissicitudes

The solution is in Hindi. Read it online.

Q79. Answer: (c) The police found the victim innocent as well as honest.

The correct answer is Option(3).

Key Points

• The sentence given is in the passive voice, and the task is to convert it into active voice.

• In the original passive sentence, "The victim was found innocent as well as honest by the police," the police are the doers of the action.

• In this passive voice: The subject is "the victim" and the object is "the police".

• To convert to active voice, the subject performing the action (the police) should come at the beginning of the sentence.

• Among the options, "The police found the victim innocent as well as honest," correctly shifts the sentence to active voice while maintaining the original meaning.

Therefore, the correct answer is- The police found the victim innocent as well as honest.

Additional Information

• Option 1 ("The police find the victim innocent as well as honest") uses present tense, which does not reflect the past action correctly.

• Option 2 ("The police has found the victim innocent and honest") is grammatically incorrect because "has found" should be "have found" when referring to "the police," which is considered a plural noun in this context.

• Option 4 ("The police finds the victim innocent and honest") is incorrect because "finds" is not the correct form of the verb to use with the plural subject "the police"; it should be "find."

Q80. Answer: (d) astonished

The solution is in Hindi. Read it online.

Q81. Answer: (c) is cleverest

The correct answer is: is cleverest

Key Points

• The error lies in the omission of the definite article "the" before "cleverest."

• When using the superlative form to indicate that someone or something has the highest degree of quality within a group, it's necessary to include the definite article "the."

• This helps specify that the individual being referred to is the most outstanding or best in comparison to all others in the group.

• The corrected sentence becomes: This boy is the cleverest of all in the class.

Therefore, the correct answer is option 3.

Q82. Answer: (d) Liberate

The solution is in Hindi. Read it online.

Q83. Answer: (a) BCAD

The correct answer is: BCAD

Key Points

• Part B: It introduces the topic of fool's literature, stating that it consists of allegorical satires.

• Part C: It provides information about the time frame during which fool's literature was popular.

• Part A: Introduces the central figure in fool's literature, explaining that it typically features a fool or jester who symbolizes the

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weaknesses of society.

• Part D: Concludes the sentence by explaining what the fool or jester represents - the vices and grotesqueries of contemporary society.

Arranged Sentence: Fool's literature is the allegorical satires, popular throughout Europe from the 15th to the 17th century, featuring the fool, or jester, who represented the weaknesses, vices, and grotesqueries of contemporary society.

Therefore, the correct answer is option 1.

Q84. Answer: (a) Leisure

The solution is in Hindi. Read it online.

Q85. Answer: (d) that would revolutionise the industry

The correct answer is "that would revolutionise the industry"

Key Points

• The phrase "that would revolutionise the industry" implies a significant and transformative change, which aligns with the entrepreneur's ambitious dream.

• "Revolutionise" suggests a profound impact, indicating a major shift or transformation in the industry, which is the intended meaning.

• The use of "would" correctly implies a future possibility, fitting the context of a dream or ambition the entrepreneur is working towards.

• The term "industry" is more appropriate than "sector" in this context, as it suggests a broader scope of impact, which is likely the entrepreneur's goal.

Hence, the correct answer is option 4.

Correct sentence: Despite facing numerous obstacles and setbacks, the determined entrepreneur refused to give up on her dream of creating a successful startup that would revolutionise the industry.

Additional Information

• "Improvising the sector" (Option 1) suggests making unplanned or spontaneous changes, which does not align with the planned ambition of revolutionizing the industry.

• "Redesigning the industry" (Option 2) could imply changes but lacks the emphasis on transformative impact that "revolutionise" carries.

• "Socialising the sector" (Option 3) is unclear and does not accurately convey the intended meaning of industry-wide transformation.

Q86. Answer: (b) Counterfeit

The solution is in Hindi. Read it online.

Q87. Answer: (d) aggravate

The solution is in Hindi. Read it online.

Q88. Answer: (b) Uniform

The solution is in Hindi. Read it online.

Q89. Answer: (a) The official opened the entrance of the museum.

The correct answer is "The official opened the entrance of the museum."

Key Points

• The given sentence is in the passive voice, indicating that the action (opening the entrance of the museum) was performed by the official.

• To convert it into active voice, we identify the doer of the action (the official) and make it the subject of the sentence.

• The verb in the active voice sentence should directly reflect the action performed by the subject without the use of 'was' or 'by' which are indicators of passive voice.

• The correct active voice construction is "The official opened the entrance of the museum," which clearly states that the official is the one performing the action of opening.

Hence, the correct answer is option 1.

Correct sentence: The official opened the entrance of the museum.

Additional Information

• Option 2 "The official had opened the entrance of the museum." uses past perfect tense, which isn't necessary as there is no mention of another action happening after the opening.

• Option 3 "The official open the entrance of the museum." is grammatically incorrect due to the incorrect tense (present tense

instead of past tense).

• Option 4 "The officials opening the entrance of the museum." is a fragment and not a complete sentence; it lacks a main verb in the past tense to indicate the completed action.

Q90. Answer: (c) To desire the unattainable

The solution is in Hindi. Read it online.

Q91. Answer: (a) laid off

The solution is in Hindi. Read it online.

Q92. Answer: (b) in

The correct answer is 'Option 2' i.e. 'in'

Key Points

• The preposition 'on' is incorrectly used in the context of geographical locations when referring to being in a place or city.

• The correct preposition for entering or being in a city or country is 'in'.

• Prepositions are important markers to indicate the relationship between the subject and the rest of the sentence, particularly indicating location or movement.

• Using the correct preposition 'in' indicates that the family lost their way within the boundaries or confines of Daman.

Therefore, the correct answer is- 'in'

Correct sentence: Her family lost their way in Daman.

Additional Information

• 'Over' is used to indicate movement or position at a higher level than something else but not touching it.

• 'Upon' is similar to 'on' but is more formal or literary.

• 'Of' indicates belonging to, relating to, or connected with someone or something.

Q93. Answer: (d) brightened up when they

The correct answer is "brightened up when they"

Key Points

• The phrase "brightened of when they" is incorrect in the context of the sentence.

• The CORRECT expression is "brightened up when they," which means to become happier or more cheerful.

• "Brighten up" is a phrasal verb that is commonly used in English to describe someone becoming happier or something becoming more pleasant or attractive.

• The use of "brightened up" correctly conveys the change in Amal's mood upon hearing the news.

Hence, the correct answer is option 4.

Correct sentence: Amal brightened up when they said he could go with them.

Additional Information

• "Brightened in when they" (Option 1) does not form a recognized or meaningful phrasal verb in English.

• "Brightened on when they" (Option 2) is also incorrect as "on" does not pair with "brightened" to form a correct phrasal verb in this context.

• "Brightened upon when they" (Option 3) is grammatically incorrect and does not convey the intended meaning of someone's mood improving.

Q94. Answer: (c) take a shortcut for easy way out in order to save efforts

The solution is in Hindi. Read it online.

Q95. Answer: (a) folktale

The solution is in Hindi. Read it online.

Q96. Answer: (a) within

The correct answer is Option 1.

Key Points

• The correct answer choice needs to fit seamlessly into the sentence to describe the placement of the Mona Lisa within the context given.

• "Within" suggests that the Mona Lisa is located inside or enclosed by something, which in this case, is the Louvre Museum. This preposition accurately describes the painting's location, reinforcing the idea that it's protected and displayed inside the museum.

Therefore, the correct answer is- within.

Additional Information

• "Beside" (Option 2) would imply that the Mona Lisa is next to the Louvre Museum, not inside it, which misrepresents the factual display location of the painting.

• "Toward" (Option 3) suggests direction or movement towards the museum, not a static location of the Mona Lisa within it, making it contextually inappropriate for the intended description.

• "Outside" (Option 4) directly contradicts the factual information, as the Mona Lisa is not displayed outdoors but inside the Louvre Museum, protected by security measures.

Q97. Answer: (c) baffled

The correct answer is Option 3.

Key Points

• The context of the passage describes an initial reaction from viewers who, after enduring the crowd to see the Mona Lisa up close.

• "Baffled" means to be perplexed or confused, which logically fits the reaction described. Given the painting's immense fame, viewers might expect something grander or more immediately striking.

• The use of "baffled" aligns with the passage's exploration of why the Mona Lisa's fame persists despite the potential for such an unexpected reaction, setting the stage for the discussion of its many conundrums and the complexity behind its popularity.

Therefore, the correct answer is- "Baffled".

Additional Information

• "Composed" (Option 1) would imply a state of being calm and in control, which does not fit the reaction indicated by the context where viewers are likely surprised by the painting's modest appearance.

• "Unfazed" (Option 2) suggests a lack of surprise or disturbance, which contradicts the intended meaning of viewers experiencing a disconnect between their expectations and the reality of the painting.

• "Fine" (Option 4) could imply a positive but mild appreciation, which does not capture the sense of confusion or astonishment implied by the context.

Q98. Answer: (a) fuss

The correct answer is Option 1.

Key Points

• The purpose of this part of the passage is to express the perplexity or surprise of the viewers upon seeing the painting up close, leading them to question the source of its fame.

• "Fuss" refers to excessive excitement, interest, or activity, typically about something considered to be of little importance.

• In this context, "fuss" aptly describes the viewers' bewilderment over the intense popularity and attention the Mona Lisa receives in contrast to its subdued presentation.

Therefore, the correct answer is- "Fuss"

Additional Information

• "Unease" (Option 2) suggests a feeling of discomfort or worry, which, while potentially relevant, doesn't as accurately capture the specific nature of the public's reaction.

• "Cavil" (Option 3) means to make petty or unnecessary objections, which could seem relevant but doesn't as directly relate to the general sentiment of questioning the painting's fame.

• "Censure" (Option 4) implies harsh criticism or disapproval, which is stronger and more negative than the intended nuance of questioning or wondering that the passage conveys about the Mona Lisa's renown.

Q99. Answer: (c) enigmatic

The correct answer is Option 3.

Key Points

• The passage discusses the "mysteries" surrounding the sitter, which include her identity and her "_____ look."

• "Enigmatic" means mysterious, puzzling, or difficult to understand.

• Using "enigmatic" makes the painting sound more mysterious and interesting, adding to why the Mona Lisa is so famous.

Therefore, the correct answer is- "Enigmatic".

Additional Information

• "Dark" (Option 1) generally refers to limited light or conveys a negative, ominous implication, which doesn’t specifically fit the context.

• "Occult" (Option 2) is associated with supernatural, magical, or mystical phenomena, which is not appropriate in describing the subtle naturalism and psychological complexity of the Mona Lisa's expression.

• "Murky" (Option 4) implies something that is cloudy, unclear, or difficult to see through physically, which misses the abstract and

psychological nuance of the Mona Lisa's intriguing expression.

Q100. Answer: (a) inherent

The solution is in Hindi. Read it online.

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