SSC CHSL Tier-1 2022: Official Paper (Held On: 13 March, 2023 Shift 1) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2022 • 100 questions • 60 minutes • Answer key and solutions

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ENGLISH LANGUAGE

Q1. In the following question below are given some statements followed by some conclusions based on those statements. Taking the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusion logically follows the given statements.

Statements:

I. Some red are black.

II. No white is black.

Conclusion:

I. No black is white.

II. No white is red.

III. No black is red.

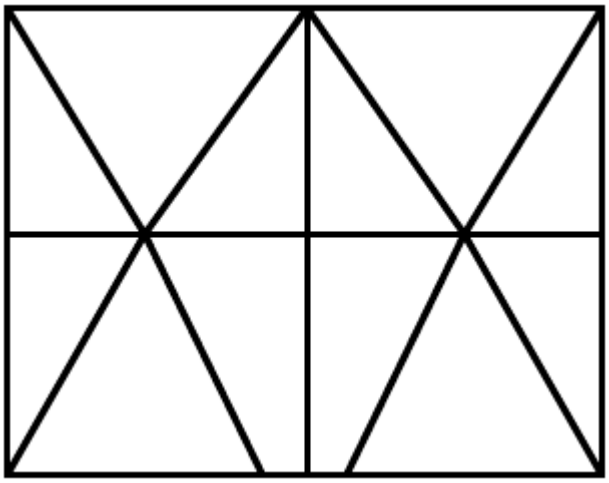
(a) Neither conclusion follows
(b) All conclusion follows
(c) Only conclusion I follows
(d) Both conclusions II and III follows

Q2. By interchanging which two numbers (not digits) the given equation will be correct?

13 + 9 ÷ 78 × 27 - 16 = 3

(a) 3 and 78
(b) 78 and 27
(c) 13 and 78
(d) 27 and 16

Q3. How many triangles are there in the given figure?



(a) 18
(b) 20
(c) 10
(d) 12

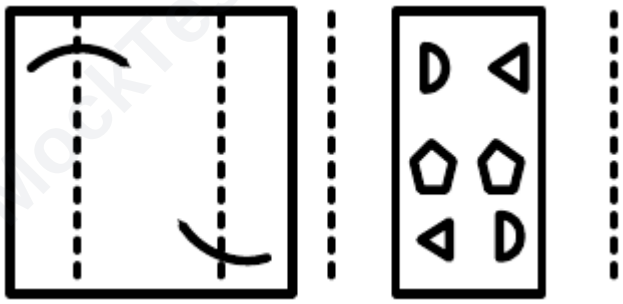
Q4. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g.13 - Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

(8, 9, 431)

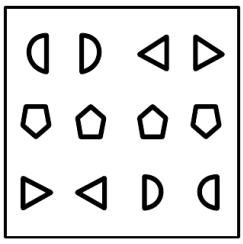
(11, 8, 1267)

(a) (9, 12, 595)
(b) (13, 14, 2011)
(c) (7, 5, 318)
(d) (12, 10, 1528)

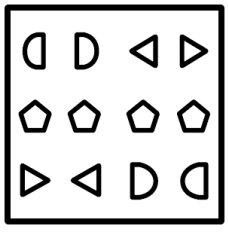
Q5. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?



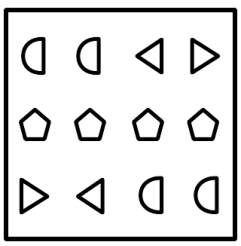
(a)



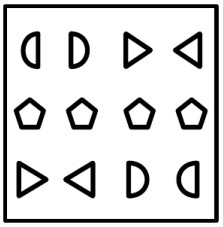
(b)



(c)



(d)

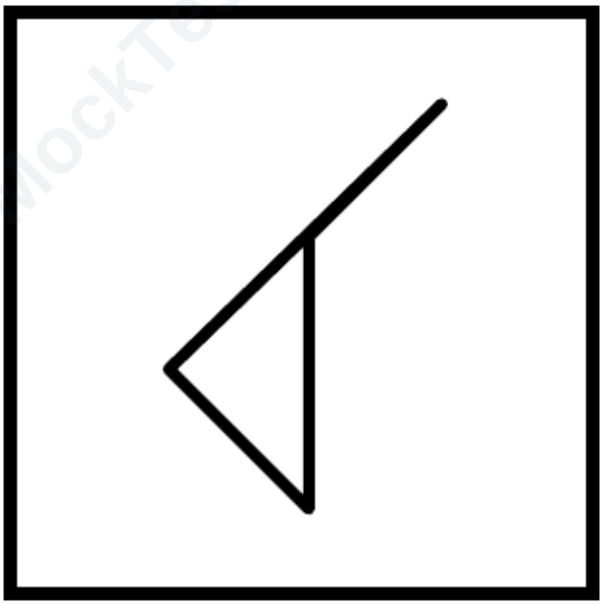


Q6. Words given on the left side of (::) are related with each other by some Logic/Rule /Relation. Select the missing word/word pair on the right side of (::) from the given alternatives based on the same Logic/Rule/Relation.

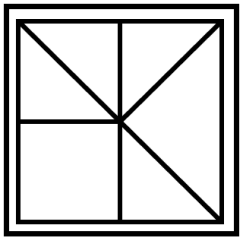
Chair : Table :: Eraser : ?

(a) Rub
(b) Stationery
(c) Pencil
(d) Student

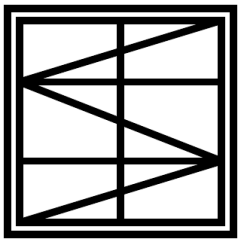
Q7. Select the option figure in which the given figure is embedded. (rotation is NOT allowed)



(a)

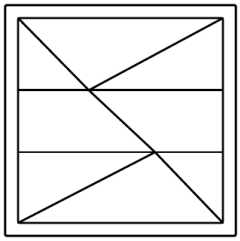


(b)

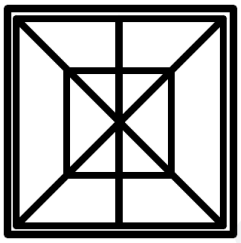


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(c)



(d)



Q8. In the following question, select the odd letter/letters from the given alternatives.

(a) AXU
(b) SPL
(c) URO
(d) ΝΚΗ

Q9. Select the option that is related to the fifth number in the same way as the first number is related to the second number and third number is related to fourth number.

19 : 359 :: 17 : 287 :: 21 : ?

(a) 449
(b) 439
(c) 441
(d) 433

Q10. Q is the sister of R. P is the father of Q. S is the son of T. R is the brother of S. How is T related to P?

(a) Daughter in law
(b) Daughter
(c) Niece
(d) Wife

Q11. In a certain code language, 'WEIGHS' is coded as 'QHEICW'. What is the code for 'ABUSES' in that code language?

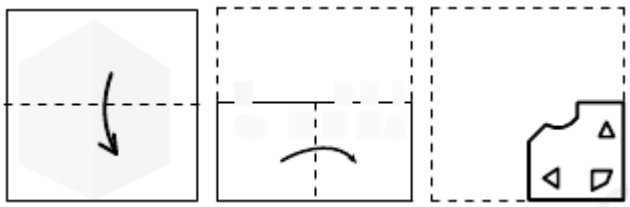
(a) QEQUZA
(b) QEQUAZ
(c) QEQZUA
(d) QEQUAA

Q12. Three of the following words are alike in a certain way and one is different. Pick the word that is different from the rest.

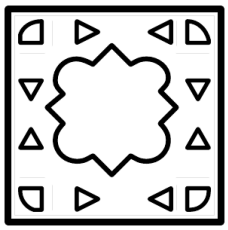
(a) Sarangi
(b) Telephone
(c) Saxophone
(d) Xylophone

Q13. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

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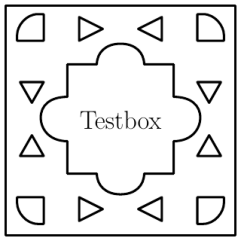
(a)



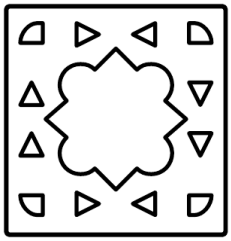
(b)



(c)



(d)



Q14. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g.13 - Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

(14, 112, 6)

(17, 204, 5)

(a) (21, 189, 12)

(b) (24, 145, 18)

(c) (9, 89, 3)

(d) (15, 135, 7)

Q15. In the following question, select the missing number from the given series.

59, 118, 354, 708, 2124, ?

(a) 4350
(b) 4248
(c) 4148
(d) 4250

Q16. Select the option that is related to the third word in the same way as the second word is related to the first word.

Computer : Mouse :: Television : ?

(a) Remote
(b) Flashlight
(c) Marker
(d) Pen

Q17. Select the correct option that indicates the arrangement of the given words in the order in which they appear in an English dictionary.

1. Machine
2. Macabre
3. Machinery
4. Macaroni
5. Machete

(a) 2, 4, 5, 1, 3
(b) 2, 5, 1, 3, 4
(c) 1, 2, 3, 4, 5
(d) 4, 1, 5, 2, 3

Q18. In the following question, select the related letters from the given alternatives.

AJN : DMQ :: PTW : ?

(a) ITE
(b) MZW
(c) SOH
(d) SWZ

Q19. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set. (NOTE : Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g.13 - Operations on 13 such as adding / subtracting / multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

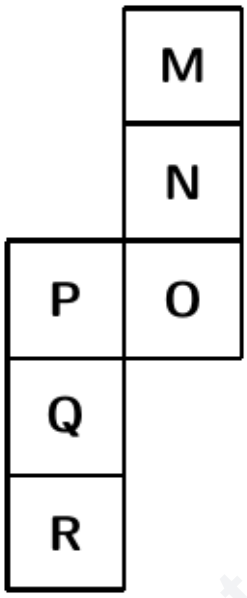
(32, 64, 256)

(18, 36, 144)

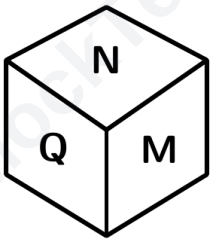
(a) (37, 74, 296)
(b) (26, 52, 313)
(c) (41, 82, 164)
(d) (24, 72, 287)

Q20. Which of the following figures can be formed on folding the given open cube in the question?

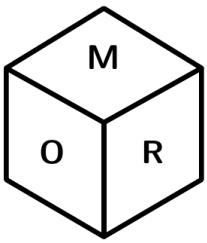
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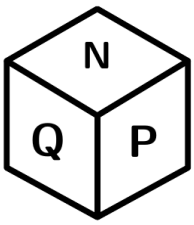
(a)



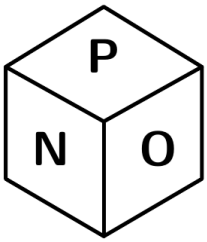
(b)



(c)



(d)



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Q21. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

ANM, GWZ, MFM, SOZ, ?

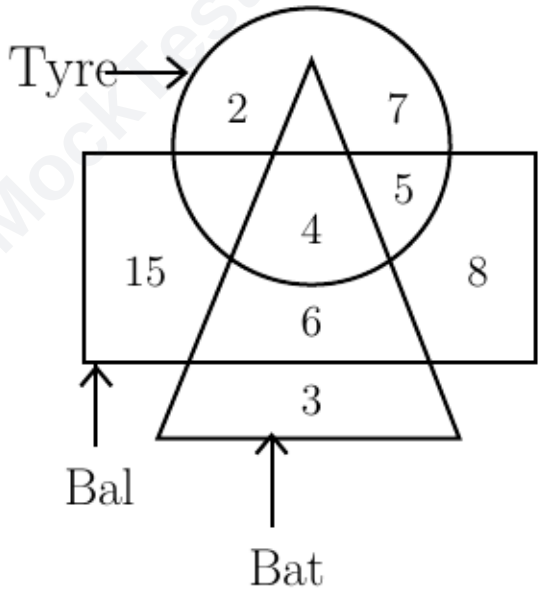
(a) YYM
(b) YXM
(c) NQR
(d) YXR

Q22. If 'A' means '×', 'B' means '÷', 'C' means '+' and 'D' means,'−', then what will come in the place of '?' in the given expression?

94 B 47 C 63 D 14 A 5 C ? = −2

(a) 7
(b) 3
(c) 4
(d) 6

Q23. How many balls are neither bat nor tyre?

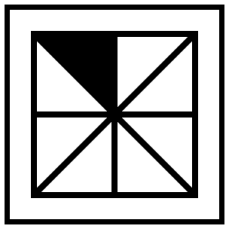


(a) 15
(b) 21
(c) 23
(d) 8

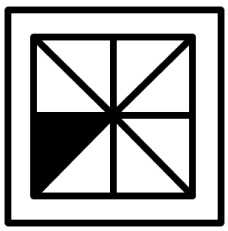
Q24. Select the figure from the given options that can replace the question mark (?) in the following series.



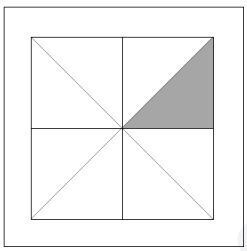
(a)



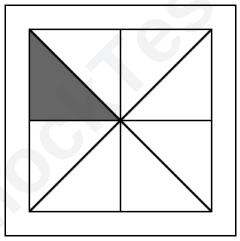
(b)



(c)



(d)



Q25. In a certain code language, 'GRATEFUL' is coded as '209267562112', 'INSTANCE' is coded as '18138711435'. What is the code for 'LIKEWISE' in that code language?

(a) 15181622239195
(b) 15181623339195
(c) 15161822238195
(d) 15811622239195

GENERAL INTELLIGENCE

Q26. Which article of the constitution of India is related to Comptroller and Auditor General of India Audit reports?

(a) 148
(b) 150
(c) 151
(d) 149

Q27. As on September 2021, which of the following is NOT a national political party in India?

(a) Indian National Congress
(b) Indian National Lok Dal
(c) Communist Party of India
(d) Bahujan Samaj Party

Q28. _____,also known as search unemployment, occurs when workers lose their current job and are in the process of finding another one.

(a) Voluntary unemployment
(b) Disguised unemployment
(c) Frictional unemployment
(d) Classical unemployment

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Q29. Which of the following is NOT application software?

(a) Entertainment software
(b) Education software
(c) Programming language translator software
(d) Personal assistance software

Q30. Which among the following lakes is known as the only "Floating Islands Lake" in India?

(a) Loktak
(b) Pulicat
(c) Chilka
(d) Kolleru

Q31. In India, what is the mean annual average temperature in subtropical vegetation zone?

(a) Above 24°C
(b) 7°C to 17° C
(c) Below 7°C
(d) 17°C to 24°C

Q32. Which famous sportsperson has received the Bharat Ratna award in 2014?

(a) Ravi Shastri
(b) Yogeshwar Dutt
(c) MS Dhoni
(d) Sachin Tendulkar

Q33. What is India's rank in reducing overall inequality according to the Commitment to Reducing Inequality Index (CRII) 2022?

(a) 118
(b) 123
(c) 129
(d) 132

Q34. What is the atomic mass of sodium?

(a) 32
(b) 40
(c) 23
(d) 12

Q35. Which Union Territory of India lies in the Bay of Bengal?

(a) Dadra & Nagar Haveli and Daman & Diu
(b) Chandigarh
(c) Lakshadweep Islands
(d) Andaman and Nicobar Islands

Q36. Which of the following shortcut key is used to display the font dialog box in MS-Word 365?

(a) Ctrl + F
(b) Ctrl + D
(c) Alt + D
(d) Alt+F

Q37. VSHORADS missile was successfully tested in September 2022 by_____.

(a) Defence Research and Development Organization (DRDO)
(b) Earth System Science Organization (ESSO)
(c) Hindustan Aeronautics Limited (HAL)
(d) Forest Survey of India (FSI)

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Q38. Humayun's Tomb situated in Delhi is built by_____.

(a) Gulbadan Begum
(b) Biga Begum
(c) Hamida Begum
(d) Maham Begum

Q39. Which of the following statements is correct?

(a) Living organisms can survive a wide range of pH change.
(b) When pH of rain water is less than 8.2, it is called acid rain.
(c) Our body works within the pH range of 7.0 to 7.8.
(d) Tooth decay starts when the pH of the mouth is lower than 1.5.

Q40. Where was the Commonwealth games held in the year 2022?

(a) Gold Coast
(b) New Delhi
(c) Birmingham
(d) Glasgow

Q41. Who among the following has been chosen as the male goalkeeper of the year by the International Hockey Federation (FIH) 2021-22?

(a) PR Sreejesh
(b) Mumtaz Khan
(c) Pirmin Blaak
(d) Arthur Thieffry

Q42. The shehnai is a reed instrument with how many holes along the tube?

(a) Five
(b) Seven
(c) Eleven
(d) Six

Q43. The Indian National Congress was established when_____ delegates from all over the country met at Bombay in December 1885.

(a) 34
(b) 72
(c) 108
(d) 156

Q44. _____is the change in total utility due to consumption of one additional unit of a commodity.

(a) Product Utility (PU)
(b) Revenue utility (RU)
(c) Demand utility (DU)
(d) Marginal utility (MU)

Q45. Which among the following pairs of 'animal - phylum of animal kingdom they belong' is incorrect?

(a) Liver fluke - Nematoda
(b) Sycon - Porifera
(c) Prawns - Arthropoda
(d) Starfish - Echinodermata

Q46. Kalinga is the ancient name of coastal_____.

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

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Q47. The Arctic Ocean is located within the Arctic Circle and surrounds the North Pole. It is connected with the Pacific Ocean by a narrow stretch of shallow water known as _____ strait.

(a) Berring
(b) Palk
(c) Hudson
(d) Bosphorus

Q48. Which among the following Ministries launched the app JALDOOT?

(a) Ministry of Finance
(b) Ministry of Culture
(c) Ministry of External Affairs
(d) Ministry of Rural Development

Q49. Which team won the Ranji trophy 2021 - 2022?

(a) Mumbai
(b) Madhya Pradesh
(c) Vidarbha
(d) Himachal Pradesh

Q50. Who among the following received the best actor in leading role (male) popular choice in the Filmfare Awards 2022?

(a) Vicky Kaushal
(b) Sidharth Malhotra
(c) Dhanush
(d) Ranveer Singh

QUANTITATIVE APTITUDE

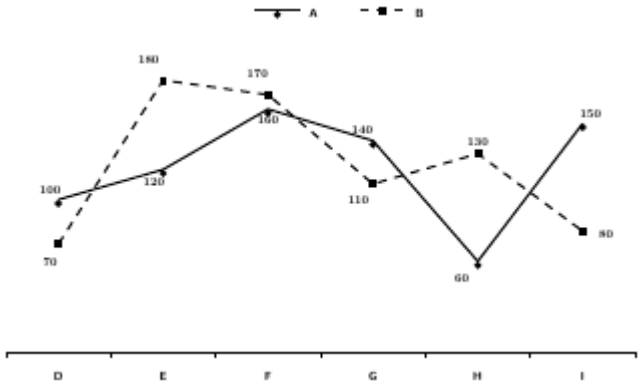
Q51. P. Q and R are partners and invest in a business. P invests 1/5th of total investments and Q invests 1/4th of the total investments. What is the ratio of investments of P, Q and R respectively?

(a) 4 : 8 : 11
(b) 4 : 5 : 11
(c) 4 : 7 : 11
(d) 4 : 5 : 9

Q52. What is the value of $(a + b + c) \{ (a - b)^2 + (b - c)^2 + (c - a)^2\}$?

(a) $2a^3 + 2b^3 + 2c^3$
(b) $2a^3 + 2b^3 + 2c^3 - 6abc$
(c) 3abc
(d) 6abc

Q53. The line chart given below shows the marks obtained by two students A and B in 6 subjects.



The marks obtained by A in all the subjects is what percent of the marks obtained by B in all the subjects?

(a) 82.16 percent

(b) 92.44 percent
(c) 98.64 percent
(d) 86.32 percent

Q54. What is the difference of the largest and smallest of the given fractions?
5/11, 5/7, 3/8, 6/13
(a) 17/56
(b) 19/56
(c) 1/7
(d) 23/56

Q55. Speed of stream is 4 km/hr and the speed of boat is 11 km/hr. In how much time will the boat cover a distance of 21 km upstream and 45 km downstream?
(a) 6 hours
(b) 3 hours
(c) 4 hours
(d) 7 hours

Q56. What is the value of √(cosec A+1)/(cosecA-1)+√(cosec A-1)/(cosec A+1) ?
(a) 2 cos A
(b) secA
(c) cos A
(d) 2 sec A

Q57. The average of 10 consecutive integers is 33/2. What is the average of first three integers?
(a) 12
(b) 13
(c) 15
(d) 11

Q58. In ΔSTU, SX is the median on TU. If SX = TX, then what is the value of angle TSU?
(a) 75 degree
(b) 45 degree
(c) 60 degree
(d) 90 degree

Q59. Median of an equilateral triangle is 15√3 cm. What is the side of this triangle?
(a) 24 cm
(b) 18 cm
(c) 30 cm
(d) 36 cm

Q60. The simple interest accrued on a certain principal is Rs. 1200 in 3 years at the rate of 8% per annum. What would be the compound interest (compounding annually) accrued on twice of that principal at the rate of 10% per annum in 2 years?
(a) Rs. 1,050
(b) Rs. 2,150
(c) Rs. 2,100
(d) Rs. 1,100

Q61. AD is the median of ΔABC. G is the centroid of ΔABC. If AG = 14 cm, then what is the length of AD?
(a) 42 cm
(b) 28 cm
(c) 35 cm
(d) 21 cm

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Q62. If tan A = 3, then what is the value of 3 sin A cos A?

(a) 8/9
(b) 9/10
(c) 7/9
(d) 9/11

Q63. The price of a commodity is decreased by 25 percent and therefore a household increased the consumption of that commodity by 20 kg to keep the expenditure same. What was the earlier consumption?

(a) 60 kg
(b) 55 kg
(c) 75 kg
(d) 45 kg

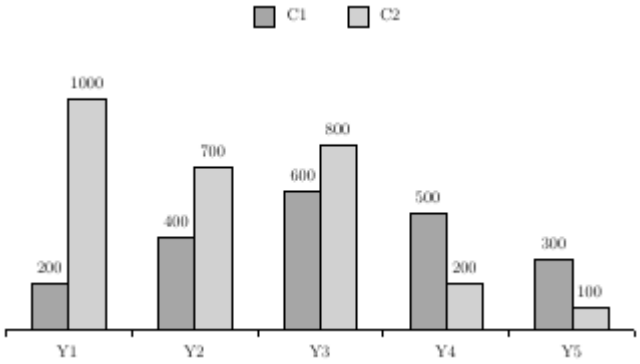
Q64. What is the value of $(a^2+ b^2+ 4c^2- ab - 2bc - 2ca)(a + b +2c)$?

(a) $a^3+ b^3 + 8c^3- 8abc$
(b) $a^3 + b^3 + 6c^3- 4abc$
(c) $4a^3 + b^3 + 8c^3- 9abc$
(d) $a^3 + b^3 + 8c^3- 6abc$

Q65. Radii of two circles are 11 cm and 3 cm. Distance between their centres is 17 cm. What is the length of the Direct common tangent?

(a) 12 cm
(b) 14 cm
(c) 16 cm
(d) 15 cm

Q66. The bar graph given below shows the sales of two companies C1 and C2 in 5 years.



JI - The average sale of company C1 in year Y1, Y2 and Y3.

J2 = The difference between total sale of company C1 and C2 in all the 5 yeas.

What is the value of (J2/J1)?

(a) 4
(b) 2
(c) 3
(d) 1

Q67. What is the value of $(1+\sin A)/(\cos^2 A)$?

(a) 1/(1-sin A)
(b) 1/(1+sin A)
(c) 1/(1+cos A)
(d) 1/(1-cos A)

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Q68. The table given below shows the salary of 6 employees of a company.

Employees	Salary
P	200
Q	650
R	350
S	250
T	450
U	300

What is the total salary of all the employees?

(a) 1800
(b) 2400
(c) 1600
(d) 2200

Q69. What is the value of 525 + 1235 ÷ 247 - 29 × 10?

(a) 210
(b) 240
(c) 220
(d) 250

Q70. If x+1/x=-2,, then what is the value of mathrm x^7+x^(-7)+x²+x^(-2) ?(x<0)

(a) 4
(b) 2
(c) 1
(d) 0

Q71. The ratio of time taken in completing a work by a man and woman is 2 : 3. The man and the woman can complete the work together in 24 days. In how many days can the woman complete the work alone?

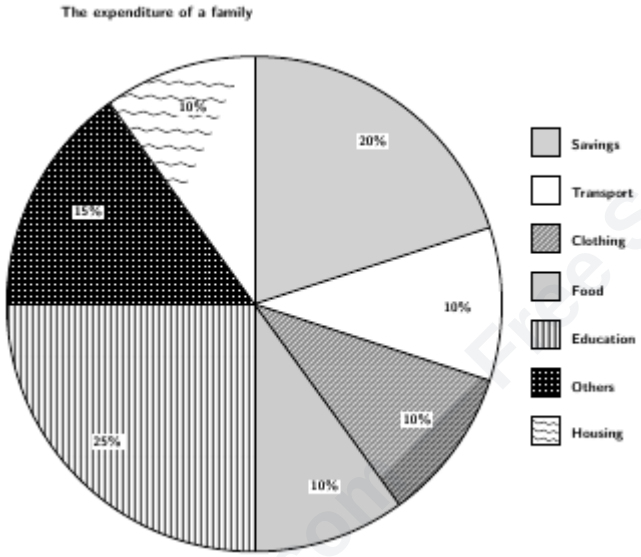
(a) 20 days
(b) 40 days
(c) 60 days
(d) 30 days

Q72. A dealer sells two machines at the rate of Rs. 15000 per machine. On one he earns a profit of 20 percent and on the other he loses 40 percent. What is his profit/loss percentage in the whole transaction?

(a) 20 percent loss
(b) 10 percent loss
(c) 10 percent profit
(d) 20 percent profit

Q73. The pie chart given below shows the expenditure of a family in percentage during a certain year. If the total amount spent during the year is Rs. 3,00,000. On which of the following items, amount spent together is equal to Rs. 1,50,000.

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(a) Education, Others, Savings
(b) Transport, Others, Education
(c) Savings, Housing, Education
(d) Savings, Clothing, Education

Q74. How many solid spherical balls of radius 6 cm can be made by melting a solid hemisphere of radius 12 cm?
(a) 4
(b) 2
(c) 10
(d) 8

Q75. A shopkeeper allows 20 percent discount on the marked price of an article and he suffers a loss of 5 percent. If the article is sold at marked price, then what will be the profit percentage?
(a) 8.33 percent
(b) 16.25 percent
(c) 18.75 percent
(d) 17.25 percent

GENERAL AWARENESS

Q76. Choose the word that can substitute the given group of words.
The animals of a particular region
(a) Phylum
(b) Blossom
(c) Fauna
(d) Flora

Q77. Select the correct indirect form of the given sentence.
The student said to her, "I don't remember your name."
(a) The student said to her that I did not remember her name.
(b) The student said to her that he/she cannot remember her name.
(c) The student told her that he/she did not remember her name.
(d) The student told her that he/she do not remember her name.

Q78. Improve the underlined part of the sentence. Choose 'No improvement' as an answer if the sentence is grammatically correct.
People who came into contact with the carrier are in danger of catching the disease.
(a) at dangerous of

(b) No improvement
(c) in danger off
(d) in dangers for

Q79. Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.

I will never judge you for yours impromptu performance.

(a) I will never
(b) yours impromptu performance.
(c) judge you for
(d) No error

Q80. Fill in the blank with an appropriate option.

I envy the way she_____ all tasks with such ease and speed.

(a) carries out
(b) dwindles out
(c) bring about
(d) account for

Q81. Fill in the blank with an appropriate option.

He could feel every _____ and artery in his body.

(a) liver
(b) vein
(c) beat
(d) place

Q82. Choose the incorrectly spelt word.

(a) Roast
(b) Ghost
(c) Malt
(d) Holitisc

Q83. Given below are four jumbled sentences. Pick the option that gives their correct order.

P. Rama, prince of Ayodhya, won the hand of the beautiful princess Sita (seen here), but was exiled with her and his brother Laksmana for 14 years through the plotting of his stepmother.

Q. The allies attacked Lanka, killed Ravana, and rescued Sita. In order to prove her chastity, Sita entered fire, but was vindicated by the gods and restored to her husband.

R. After the couple's triumphant return to Ayodhya, Rama's righteous rule (Ram-raj) inaugurated a golden age for all mankind.

S. In the forest Sita was abducted by Ravana, and Rama gathered an army of monkeys and bears to search for her.

(a) PQRS
(b) SQPR
(c) QRSP
(d) PSQR

Q84. Select the word that is opposite in meaning (ANTONYM) to the word given below.

Incredible

(a) Strained
(b) Far-fetched
(c) Implausible
(d) Believable

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Q85. Choose the word that is opposite in meaning to the given word.

Vain

(a) Productive
(b) Harmony
(c) Unpredictable
(d) Calculable

Q86. Choose the option that is the correct passive form of the sentence.

She ate the last slice of pizza.

(a) She had eaten the last slice of pizza.
(b) The last slice of pizza had been eaten by her.
(c) The last slice of pizza was eaten by her.
(d) The last slice was being eaten by her.

Q87. Rearrange the parts of the sentence in correct order.

P. my belief that UHC should be seen as the linchpin of the health development agenda

Q. rather than being seen as one target among many, it is

R. not only underpinning a more sustainable approach to the achievement of

S. the other health targets, but allowing for a balance between them

(a) QPRS
(b) PQRS
(c) PRSQ
(d) SPQR

Q88. Choose the word that is opposite in meaning to the given word.

Forthright

(a) Artless
(b) Uninhibited
(c) Uncandid
(d) Blunt

Q89. Choose the word that means the same as the given word.

Domicile

(a) Wild
(b) Dictator
(c) Home
(d) Evict

Q90. Improve the underlined part of the sentence. Choose 'No improvement' as an answer if the sentence is grammatically correct.

The students studied a diagrams of a plant cell.

(a) studied a diagram
(b) study a diagrams
(c) studying a diagram
(d) No improvement

Q91. Select the word segment that substitutes (replaces) the bracketed word segment correctly and completes the sentence meaningfully. Select the option 'no correction required' if the sentence is correct as given.

We (opened) on a new travel venture.

(a) No correction required
(b) Begun
(c) Initiated
(d) Embarked

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Q92. Select the most appropriate meaning of the given idiom.

Water under the bridge

(a) To be very sick.
(b) Anything from the past that isn't significant or important anymore.
(c) A paranormal sense that allows you to communicate with the dead.
(d) Someone else who takes the blame.

Q93. In the following question, out of the given four alternatives, select the alternative which best expresses the meaning of the Idiom/Phrase.

To keep an eye on

(a) To be able to understand everything
(b) To see someone in a bad light
(c) To watch over closely
(d) To keep distance from

Q94. Identify the segment in the sentence which contains a grammatical error. If there is no error, then select the option "No error".

If conventional arrangements and/ patterns are made more scarcer, other/ arrangements and patterns will spring up.

(a) arrangements and patterns will spring up.
(b) No error
(c) If conventional arrangements and
(d) patterns are made more scarcer, other

Q95. Choose the sentence with no spelling error.

(a) Many input devises perfrom specific functions.
(b) Many input devices perform specific functins.
(c) Many input devices perfrpm specfic functions.
(d) Many input devices perform specific functions.

Directions

In the following passage some of the words have been deleted. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.

Fresh pineapple, chilled watermelon, and an icy cold soft drink on a hot summer's day. What do these things have in (1) ___ ?They all taste so good because of the sweetness the sugar in them provides. When you think of sugar, you probably picture the white (2) _ you put in cookies, that your parents put in their coffee, or that you (3) _on your cereal. Actually, this is just one kind of sugar, called sucrose, which is (4) _ from sugar cane or sugar beets. Technically, sugar is a carbohydrate that occurs (5) ___ in every fruit and vegetable.

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

(a) tandem
(b) common
(c) collision
(d) balance

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

(a) rubbles
(b) capsules
(c) stones
(d) granules

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

(a) raise
(b) sprinkle
(c) send
(d) place

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

(a) extracted
(b) rugged
(c) shelved
(d) excavated

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

(a) fortunately
(b) mentally
(c) happily
(d) naturally

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) Only conclusion I follows

Given Statements:
I. Some red are black.
II. No white is black.
The least possible Venn diagram for the given statement is:
Conclusions:
I. No black is white - True (No white is black, so No black will be white).
II. No white is red - False (Because, there is no definite relation given between white and red, so it can be possible only).
III. No black is red - False (Because, some red is black)
So, Only conclusion I follows.
Hence, the correct answer is "Option 3".

Q2. Answer: (a) 3 and 78

Given equation: 13 + 9 ÷ 78 × 27 - 16 = 3.
BODMAS Table:
Let's check each option one by one.
Option 1) 3 and 78
Given: 13 + 9 ÷ 78 × 27 - 16 = 3
After interchanging the numbers we get;
=> 13 + 9 ÷ 3 × 27 - 16 = 78
=> 13 + 3 × 27 - 16 = 78
=> 13 + 81 - 16 = 78
=> 94 - 16 = 78

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=> 78 = 78
=> LHS = RHS
Option 2) 78 and 27
Given: 13 + 9 ÷ 78 × 27 - 16 = 3
After interchanging the numbers we get;
=> 13 + 9 ÷ 27 × 78 - 16 = 3
=> 13 + 0.333 × 78 - 16 = 3
=> 13 + 25.994 - 16 = 3
=> 38.994 - 16 = 3
=> 22.994 ≠ 3
=> LHS ≠ RHS
Option 3) 13 and 78
Given: 13 + 9 ÷ 78 × 27 - 16 = 3
After interchanging the numbers we get;
=> 78 + 9 ÷ 13 × 27 - 16 = 3
=> 78 + 0.692 × 27 - 16 = 3
=> 78 + 18.684 - 16 = 3
=> 96.684 - 16 = 3
=> 80.684 ≠ 3
=> LHS ≠ RHS
Option 4) 27 and 16
Given: 13 + 9 ÷ 78 × 27 - 16 = 3
After interchanging the numbers we get;
=> 13 + 9 ÷ 78 × 16 - 27 = 3
=> 13 + 0.115 × 16 - 27 = 3
=> 13 + 1.84 - 27 = 3
=> 14.84 - 27 = 3
=> -12.16 ≠ 3
=> LHS ≠ RHS
Hence, the correct answer is "Option 1".

Q3. Answer: (b) 20

The triangles are:
So, there are '20' triangles in the given figure.
Hence, the correct answer is "20".

Q4. Answer: (c) (7, 5, 318)

The logic followed here is:
Logic: (1st number)^3 - (2nd number)^2 = 3rd number.
Now,
For (8, 9, 431)
→ $(8)^3 - (9)^2$
→ 512 - 81 = 431.
For (11, 8, 1267)
→ (11)3 - (8)2
→ 1331 - 64 = 1267.
Similarly, for (7, 5, 318)
→ (7)3 - (5)2
→ 343 - 25 = 318.
Hence, the correct answer is "Option 3".

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Q5. Answer: (b) [figure]

When the paper is unfolded, the image we get is shown below:

Hence, the correct answer is " Option 2 ".

Q6. Answer: (c) Pencil

The logic followed here is:

Logic: The words are commonly associated items typically used together in the same context or setting.

Here,

Chair : Table → Chair and Table are commonly associated items, typically used together in a setting like a room or an office.

Similarly,

Eraser : ? → Pencil is commonly used with an eraser.

Chair	Table
Eraser	Pencil

Hence, the correct answer is " Pencil ".

Q7. Answer: (d) [figure]

The image embedded in given figure is as shown below:

Hence, "Option 4" is the correct answer.

Q8. Answer: (b) SPL

The logic followed here is:

=> 3 has been subtracted in each letter's positional value to get the next letter of the cluster.

Let's check each option as per the logic:

1) AXU:

2) SPL:

3) URO:

4) NKH:

Here, we can see that only Option 2 doesn't follow the logic.

Hence, the correct answer is " SPL ".

Q9. Answer: (b) 439

The logic followed here is:

=> (First Number)² - 2 = Second Number.

Let's check,

19 : 359

→ (19)² - 2 = 359

→ 361 - 2 = 359

→ 359 = 359

→ LHS = RHS.

17 : 287

→ (17)² - 2 = 287

→ 289 - 2 = 287

→ 287 = 287

→ LHS = RHS.

Similarly,

21 :?

→ (21)² - 2 =?

→ 441 - 2 = 439.

Hence, the correct answer is " 439 ".

Q10. Answer: (d) Wife

Family Chart:

Given:
Q is the sister of R.
P is the father of Q.
S is the son of T.
R is the brother of S.
So, T is wife of P.
Hence, the correct answer is "Option 4".

Q11. Answer: (a) QEQUZA

The logic followed here is:
'WEIGHS' is coded as 'QHEICW',
Similarly, for 'ABUSES'
So, 'ABUSES' is coded as 'QEQUZA'.
Hence, the correct answer is "Option 1".

Q12. Answer: (b) Telephone

The logic followed here is:
1. Sarangi: The sarangi is a stringed instrument used mainly in Indian classical music.
2. Telephone: This is a communication device used for transmitting and receiving voice messages.
3. Saxophone: The saxophone is a woodwind instrument, usually made of brass, played by use of a single-reed mouthpiece.
4. Xylophone: A musical instrument in the percussion family that consists of wooden bars struck by mallets.
Here, "Sarangi," "Saxophone," and "Xylophone" are all musical instruments but "Telephone" is not a musical instrument.
Hence, the correct answer is " Telephone ".

Q13. Answer: (a) [figure]

When the paper is unfolded, the image we get is shown below:
Hence, the correct answer is " Option 1 ".

Q14. Answer: (a) (21, 189, 12)

The logic followed here is:
Logic: 1st number × (1st number - 3rd number) = 2nd number.
Now,
For (14, 112, 6)
→ 14 × (14 - 6)
→ 14 × 8 = 112.
For (17, 204, 5)
→ 17 × (17 - 5)
→ 17 × 12 = 204.
Similarly, for (21, 189, 12)
→ 21 × (21 - 12)
→ 21 × 9 = 189.
Hence, the correct answer is "Option 1".

Q15. Answer: (b) 4248

The logic followed here is:
So, '4248' will complete the series.
Hence, the correct answer is "Option 2".

Q16. Answer: (a) Remote

The logic followed here is:
Logic: The second word is a device or accessory that is commonly used in conjunction with the first word.
Here,
Computer : Mouse → A mouse is a device that is commonly used with a computer.
Similarly,

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Television : ? → Remote is a device that is commonly used with a television.
Hence, the correct answer is "Remote".

Q17. Answer: (a) 2, 4, 5, 1, 3

The correct order as per the dictionary is:
2) Macabre
4) Macaroni
5) Machete
1) Machine
3) Machinery
Hence, the correct answer is " 2, 4, 5, 1, 3 ".

Q18. Answer: (d) SWZ

The logic followed here is:
AJN : DMQ
Similarly,
PTW :?
Hence, the correct answer is " SWZ ".

Q19. Answer: (a) (37, 74, 296)

The logic followed here is:
=> Second Number = First Number × 2
=> Third Number = Second Number × 4
(32, 64, 256):
→ 64 = 32 × 2
→ 256 = 64 × 4
(18, 36, 144):
→ 36 = 18 × 2
→ 144 = 36 × 4
Let's check each option as per the logic:
1) (37, 74, 296):
→ 74 = 37 × 2
→ 296 = 74 × 4
2) (26, 52, 313):
→ 52 = 26 × 2
→ 313 ≠ 52 × 4 => Doesn't satisfy the logic.
3) (41, 82, 164):
→ 82 = 41 × 2
→ 164 ≠ 82 × 4 => Doesn't satisfy the logic.
4) (24, 72, 287):
→ 72 ≠ 24 × 2
→ 287 ≠ 72 × 4 => Doesn't satisfy the logic.
Here, we can see that only Option 1 satisfy the logic.
Hence, the correct answer is " (37, 74, 296) ".

Q20. Answer: (d) [figure]

From the given open Dice:
M and O is the opposite sides.
P and R is the opposite sides.
N and Q is the opposite sides.
And, two opposite sides can not be the adjacent surfaces, so it can't be shows in a dice.
Now,
Option 1)

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→ Can not be made, because N and Q is the opposite sides.

Option 2)

→ Can not be made, because M and O is the opposite sides.

Option 3)

→ Can not be made, because N and Q is the opposite sides

Option 4)

→ Can be made, because all the surfaces are adjacent sides.

Hence, the correct answer is "Option 4".

Q21. Answer: (b) YXM

The logic followed here is:

Hence, the correct answer is "Option 2".

Q22. Answer: (b) 3

Bodmas Rule:

Given: 'A' means '×', 'B' means '÷', 'C' means '+' and 'D' means,'−'.

A	B	C	D
×	÷	•	•

Now, the equation is: 94 B 47 C 63 D 14 A 5 C ? = −2

After replacing, the equation we get:

→ 94 ÷ 47 + 63 - 14 × 5 + ? = - 2

→ 2 + 63 - 14 × 5 + ? = - 2

→ 2 + 63 - 70 + ? = - 2

→ 65 - 70 + ? = - 2

→ - 5 + ? = - 2

→ ? = - 2 + 5 = 3.

Hence, the correct answer is "3".

Q23. Answer: (c) 23

According to the given Venn diagram:

The shaded area shows the "total number of balls are neither bat nor tyre".

So, the total number of 'balls are neither bat nor tyre' = 15 + 8 = 23.

Hence, the correct answer is "23".

Q24. Answer: (d) [figure]

The logic followed here is:

Logic: The shaded area is increases by + 1 sides in next images.

Hence, the correct answer is "Option 4".

Q25. Answer: (a) 15181622239195

The logic followed here is:

'GRATEFUL' is coded as '209267562112',

'INSTANCE' is coded as '18138711435',

Similarly, for 'LIKEWISE'

So, 'LIKEWISE' is coded as '15181622239195'.

Hence, the correct answer is "Option 1".

Q26. Answer: (c) 151

The correct answer is Article 151.

Key Points

• Comptroller and Auditor General of India:

• The Constitution of India (Article 148) provides for an independent office of the Comptroller and Auditor General of India (CAG).

• He is the head of the Indian Audit and Accounts Department.

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• He is the guardian of the public purse and controls the entire financial system of the country at both the levels of the Centre and the state

• Article 149 deals with the powers and duties of the CAG.

• His duty is to uphold the Constitution of India and the laws of Parliament in the field of financial administration.

• This is the reason why Dr. B R Ambedkar said that the CAG shall be the most important Officer under the Constitution of India.

• He is one of the bulwarks of the democratic system of government in India; the others being the Supreme Court, the Election Commission, and the Union Public Service Commission.

• Article 151 says that the Comptroller and Auditor-General of India submit the reports in relation to the accounts of the Union to the President, who shall further lay it before each of the houses in the Parliament.

• The current CAG is K. Sanjay Murthy.

• Article related to CAG are 148,149,150,151,279

Additional Information

• Appointment and Term:

• The CAG is appointed by the president of India by a warrant under his hand and seal.

• The CAG, before taking over his office, makes and subscribes before the president an oath or affirmation:

• To bear true faith and allegiance to the Constitution of India;

• To uphold the sovereignty and integrity of India;

• To duly and faithfully and to the best of his ability, knowledge, and judgement perform the duties of his office without fear or favour, affection or ill-will; and

• To uphold the Constitution and the laws.

Q27. Answer: (b) Indian National Lok Dal

The correct answer is Indian National Lok Dal.

Key Points

• Indian National Lok Dal (INLD) is a regional political party in India primarily active in the state of Haryana.

• The party was founded in 1996 by Om Prakash Chautala, a prominent politician from Haryana.

• The INLD is considered a right-wing political party with a focus on promoting the interests of the Jat community, which is one of the dominant castes in Haryana.

• The party's main ideological stance is centered around rural and agrarian issues, with an emphasis on rural development, farmer welfare, and agricultural policies.

• The INLD has had a strong presence in Haryana politics and has been in power in the state multiple times.

Additional Information

• As of 2023, India has six national parties-

• Bharatiya Janata Party

• Indian National Congress

• Communist Party of India (Marxist)

• Aam Aadmi Party

• Bahujan Samaj Party

• National People's Party

Q28. Answer: (c) Frictional unemployment

The correct answer is Frictional unemployment.

Key Points

• Frictional unemployment is a type of unemployment that occurs when workers move from one job to another job.

• It is sometimes called search unemployment and can be based on the circumstances of the individual.

• Frictional unemployment is time spent between jobs when a worker is searching for a job or transitioning from one job to another.

Additional Information

• Seasonal unemployment occurs when people are unemployed at particular times of the year when demand for labor is lower than usual.

• Technological unemployment occurs when developments in technology and working practices cause some workers to lose their jobs. Technological unemployment is considered to be part of a wider concept known as structural unemployment.

• Cyclical unemployment is the component of overall unemployment that results directly from cycles of economic upturn and downturn. Cyclical unemployment is the impact of economic recession or expansion on the total unemployment rate.

Q29. Answer: (c) Programming language translator software

The correct answer is Programming language translator software.

Key Points Application software:

• Application software is a type of computer program that performs a specific personal, educational, or business function. Each program is intended to aid end-users in completing a range of activities relating to productivity, creativity, or communication.

• Examples of application software are Microsoft Word, spreadsheets, VLC media player, Firefox or Google Chrome, accounting applications, photo editors, and mobile apps such as video games, Whatsapp, Photoshop, OneNote, etc.

Additional Information

Programming language translator software

• Programming language translator software, also known as a compiler or interpreter, is used to convert human-readable source code written in one programming language into a form that can be executed by a computer.

• The software typically consists of various components, including a lexer, parser, intermediate code generator, optimizer, and code generator.

• The lexer, or tokenizer, breaks down the source code into individual tokens, such as keywords, identifiers, operators, and literals.

• The parser analyzes the tokens and builds a parse tree or an abstract syntax tree (AST) that represents the structure and semantics of the source code.

• The intermediate code generator translates the parse tree into an intermediate representation, which is a platform-independent representation of the program.

• The optimizer performs various optimizations on the intermediate code to improve the efficiency and performance of the resulting executable code.

• Finally, the code generator translates the optimized intermediate code into machine code specific to the target platform, such as x86 assembly or bytecode for a virtual machine.

• Programming language translator software can be categorized into two main types: compilers and interpreters. Compilers translate the entire source code into executable machine code upfront, while interpreters execute the source code line by line, translating and executing it on the fly.

• Some popular examples of programming language translation software include GCC (GNU Compiler Collection), Clang, Python's CPython interpreter, and Java's JVM (Java Virtual Machine).

Q30. Answer: (a) Loktak

The correct answer is Loktak Lake.

Key Points

• Loktak Lake is the largest freshwater lake in North-eastern region of the country.

• It is famous for Phumdis.

• It is located in Manipur.

• Keibul Lamjao is the only floating national park in the world floats over it.

• Area: 266 square kilometre.

• Two wetlands of India are in Montreux Record: Keoladeo National Park(Rajasthan) and Loktak Lake(Manipur).

• Montreux Record is also maintained as part of the Ramsar List.

• It is under the Ramsar Convention is a register of wetland sites on the List of Wetlands of International Importance.

Additional Information

Chilika Lake

• Chilika is Asia’s largest and world’s second-largest lagoon.

• It spreads over Puri, Khurda and Ganjam districts of Odisha on the east coast of India, at the mouth of the Daya River.

• It is the largest wintering ground for migratory birds on the Indian subcontinent.

• In 1981, it was designated the first Indian wetland of international importance under the Ramsar Convention.

• Nalbana Bird Sanctuary or Nalbana Island is the core area of the Chilika Lake.

Sambhar Lake

• Sambhar Salt Lake, an ephemeral salt lake, the largest lake in India, is situated in east-central Rajasthan state, west of Jaipur.

• It represents a depression of the Aravalli Range with 230 square km in area.

• It is also known as the salt lake of Rajasthan.

Pangong Lake

• Pangong Tso Lake located in Ladakh Union territory is an endorheic lake in the Himalayas situated at a height of about 4,350 m.

• It is geographically situated in a disputed territory, claimed both by India and China.

• This lake is about 5 km wide and about 134 km long with about 60% of the length extending into Tibet.

• Pangong Lake in Kashmir is the world's highest brackish lake at 4,350 m above sea level.

Q31. Answer: (d) 17°C to 24°C

The correct answer is 17°C to 24°C.

Key Points

• Climatic conditions:

• The mean annual rainfall is 75 cm to 125 cm.

• The average annual temperature is 17°-24°C.

• Humidity is 80 percent.

• Distribution:

• Eastern Himalayas to the east of 88°E longitude at altitudes varying from 1000 to 2000 m.

Additional Information

• Characteristics Forests of evergreen species.

• Commonly found species are evergreen oaks, chestnuts, ash, beech, sales and pines.

• Climbers and epiphytes [a plant that grows non-parasitically on a tree or other plant] are common.

• These forests are not so distinct in the southern parts of the country.

• They occur only in the Nilgiri and Palni hills at 1070-1525 metres above sea level.

• It is a “stunted rainforest” and is not so luxuriant as the true tropical evergreen.

• The higher parts of the Western Ghats such as Mahabaleshwar, the summits of the Satpura and the Maikal Range, the highlands of Bastar and Mt. Abu in the Aravali Range carry sub-types of these

Q32. Answer: (d) Sachin Tendulkar

The correct answer is Sachin Tendulkar.

Key Points

• In 2014, Sachin Tendulkar became the first and the only sportsperson to be conferred with the Bharat Ratna.

• Sachin Tendulkar debuted in 1989.

• He played 664 international cricket matches in a career spanning over two decades.

• He holds various cricket records including the only player to have scored one hundred international centuries, the first batsman to score a double century in a One Day International, and the only player to complete more than 34,000 runs in both ODI and Test cricket.

• Calls have been made over the years to award Major Dhyan Chand with Bharat Ratna, the country’s highest civilian award. But never happened.

Additional Information

• The Bharat Ratna is the highest civilian award of the Republic of India.

• The Bharat Ratna was introduced on 2 January 1954.

• It is awarded in recognition of exceptional service/performance of the highest order in any field of human endeavor.

• The number of annual awards is restricted to a maximum of three in a particular year.

• On conferment of the award, the recipient receives a Sanad (certificate) signed by the President and a medallion.

• The first recipients of the Bharat Ratna who were honored in 1954 are as follows:

• C. Rajagopalachari - The last Governor-General of the Dominion of India

• Sarvepalli Radhakrishnan - Second President and the First Vice President of India

• C. V. Raman - Nobel Prize Laureate, Physicist

Q33. Answer: (b) 123

The correct answer is 123rd.

Key Points

• India has moved up 6 places to rank 123 out of 161 countries for reducing inequality, according to the 2022 Commitment to Reducing Inequality Index (CRII).

• The 2022 CRII looks at govt policies & actions in 161 countries to fight inequality during the first 2 years of the COVID-19 pandemic.

• Norway leads the index followed by Germany & Australia.

• The Index is prepared by Oxfam International.

Additional Information

• Important Ranking and Index:

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• India climbed six notches to 40th position in the Global Innovation Index 2022, according to a report by the Geneva-based World Intellectual Property Organization.

• India with an index score of 0.663, stood at 4th in the 2022 Global Crypto Adoption Index.

• India ranked 132 out of 191 countries in the 2021 human development index (HDI), according to a report released by the United Nations Development Programme (UNDP).

• India ranks 135 among a total of 146 countries in the Global Gender Gap Index 2022.

• Austrian capital Vienna has been ranked as the world's most liveable city in the report 'Global Liveability Index 2022'.

• Vienna replaced New Zealand's Auckland city as the most liveable city.

• Kerala has been ranked first in Asia in Affordable Talent in Global Startup Ecosystem Report (GSER) 2022.

• India has jumped six positions to 37th rank on the annual World Competitiveness Index for the year 2022.

• Denmark has been ranked at the top while Switzerland has been ranked at second position.

Q34. Answer: (c) 23

The correct answer is 23.

Key Points

• The atomic mass of an element represents the average mass of an atom of that element, taking into account the different isotopes and their relative abundances.

• Sodium is a chemical element with the symbol Na and atomic number 11. It belongs to the alkali metal group on the periodic table.

• The atomic mass of sodium is approximately 22.99 atomic mass units (AMU).

• The atomic mass of an element is calculated by summing the masses of its isotopes, multiplied by their respective abundances, and expressed in atomic mass units.

• Sodium has two stable isotopes: sodium-23 (Na-23) and sodium-22 (Na-22).

• The most abundant isotope of sodium is sodium-23, which accounts for approximately 100% of natural sodium. It has an atomic mass of 22.98976928 amu.

• Sodium-22 is a less abundant isotope and has an atomic mass of 21.994437 amu.

• The atomic mass listed on the periodic table for sodium (22.99 amu) is a weighted average of the masses of its isotopes, considering their natural abundance.

• The atomic mass of an element may be slightly different from the mass number of its most abundant isotope due to the presence of other isotopes and their relative abundances.

• The atomic mass of sodium is important in various scientific fields, such as chemistry and physics, as it is used in stoichiometric calculations, determining molar mass, and understanding the behavior of sodium in chemical reactions.

Additional Information

Element	Atomic Symbol	Atomic Number	Atomic Mass (in amu)
Hydrogen	H	1	1.00784
Helium	He	2	4.002602
Carbon	C	6	12.011
Nitrogen	N	7	14.00674
Oxygen	O	8	15.999
Sodium	Na	11	22.98976928
Magnesium	Mg	12	24.305
Silicon	Si	14	28.085
Iron	Fe	26	55.845
Copper	Cu	29	63.546
Silver	Ag	47	107.8682
Gold	Au	79	196.966569
Mercury	Hg	80	200.592
Lead	Pb	82	207.2

Uranium	U	92	238.02891

Q35. Answer: (d) Andaman and Nicobar Islands

The correct answer is Andaman and Nicobar Islands.

Key Points

Andaman Nicobar Islands

• Least densely populated Union Territory in India.

• Barren Island is the largest active volcano in Andaman.

• Saddle Peak is the largest peak in Andaman.

• Andaman and Nicobar Islands come under the jurisdiction of the Kolkata High Court.

• Veer Sarvakar International Aiport is in Port Blair.

• Cellular Jail, also known as Kalapani was constructed by the British in 1906 in Port Blair.

• It is located in the Bay of Bengal.

Additional Information

Q36. Answer: (b) Ctrl + D

The correct answer is Ctrl + D.

Key Points

• Use the Ctrl+D keyboard shortcut to quickly summon the Font dialog box.

• The best benefit of the Font dialog box is its Preview window, at the bottom.

• This window shows you exactly how your choices affect text in your document.

• The Font names +Body and +Heading refer to the fonts selected by the current document theme.

Additional Information

• Important Shortcut keys:

• Cut the selected content to the Clipboard - Ctrl+X

• Copy the selected content to the Clipboard - Ctrl+C

• Paste the contents of the Clipboard -Ctrl+V

• Increase the font size by 1 point.- Ctrl+]

• Center the text - Ctrl+E.

• Align the text to the left - Ctrl+L

Q37. Answer: (a) Defence Research and Development Organization (DRDO)

The correct answer is Defence Research and Development Organization (DRDO).

Key Points

• DRDO on 27 Sept 2022 successfully flight tested the Very Short Range Air Defence System (VSHORADS) missile in Chandipur off the coast of Odisha.

• Maiden flight of the Autonomous Flying Wing Technology Demonstrator was carried out successfully by Defence Research and Development Organisation (DRDO) from the Aeronautical Test Range, Chitradurga, Karnataka on July 2022.

Additional Information

• DRDO is a military research and development wing of the Ministry of Defence, headquarters in New Delhi, India.

• It was founded in 1958.

• It has the vision to empower India with cutting-edge defence technologies and a mission to achieve self-reliance in critical defence technologies and systems.

• DRDO has developed an antibody detection-based kit called DIPCOVAN.

• Current Chief: Dr Samir V Kamat (from 2022)

Q38. Answer: (b) Biga Begum

The correct answer is Biga Begum.

Key Points

• Humayun's Tomb:

• The tomb of Humayun is located in Delhi.

• Humayun died in 1556, and his widow Biga Begum, also known as Haji Begam, commenced the construction of his tomb in 1569, fourteen years after his death. It is the first distinct example of proper Mughal style, which was inspired by Persian

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architecture. It is well known that Humayun picked up the principles of Persian architecture during his exile, and he himself is likely to have planned the tomb, although there is no record to that effect. The tomb was constructed at a cost of 15 lakh rupees (1.5 million).

• Mirak Mirza Ghiyath, a Persian, was the architect employed by Haji Begam for this tomb.

• It was also the first structure of its size to use red sandstone.

• In 1993, the tomb was designated as a UNESCO World Heritage Site.

Additional Information

• Humayun (1530-1540, 1555-1556):

• Humayun was the eldest son of Babar.

• In the Battle of Chausa, in 1539 and Battle of Bilgram, in 1540 (Battle of Kanauj), Humayun was defeated by Sher Khan.

• After losing his kingdom, Humayun became an exile for the next 15 years.

• In 1555, Humayun defeated the Afghans and recovered the Mughal Throne.

• He died in 1556 due to his fall from the staircase of his library.

• He loved painting and wrote poetry in the Persian language.

Important Points

• Tombs of important Mughal rulers:

Ruler	Location
Babur	Kabul, Afghanistan
Akbar	Sikandra, Agra
Jahangir	Lahore, Pakistan
Shah Jahan	Agra
Aurangzeb	Daulatabad (Khuldabad), Maharashtra
Bahadur Shah Zafar	Yangon, Myanmar

Q39. Answer: (c) Our body works within the pH range of 7.0 to 7.8.

The correct answer is Our body works within the pH range of 7.0 to 7.8.

Key Points

• pH

• pH means the potential of Hydrogen.

• The pH scale is the scale used to express the acidity or alkalinity of a substance based on the concentration of hydrogen ions in its solution.

• pH scale was discovered by Soren Sorensen.

• The range of pH scale 0 to 14.

• If pH < 7 then solution is acidic.

• If pH > 7 then solution is basic.

• If pH = 7 then solution is neutral

• The strength of acids and bases depends on the number of H+ ions and OH- ions produced, respectively.

• When the pH of rainwater is less than 5.6, it is called acid rain.

• The pH value of the Milk of Magnesia is 10.5.

Q40. Answer: (c) Birmingham

The correct answer is Birmingham.

Key Points

• The 2022 Commonwealth Games (officially known as the XXII Commonwealth Games) will be held in Birmingham, England.

• The 2022 Commonwealth Games is the third Commonwealth Games to be hosted in England following London 1934 and Manchester 2002.

• The motto of the 2022 Commonwealth Games is "Games for Everyone".

• Birmingham was announced as the host by the Commonwealth Games Federation in 2017.

• 72 Commonwealth nations are expected to participate in the 2022 Commonwealth Games.

Additional Information

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• Current monarch is King Charles III, who ascended the throne on 8 September 2022, upon the death of his mother, Queen Elizabeth II. is Head of the Commonwealth.

• The headquarters of GCF is located in London, England.

• 2026 Commonwealth Games:

• The 2026 Commonwealth Games, officially known as the XXIII Commonwealth Games.

• It is a multi-sport event for members of the Commonwealth to be organized in a city designated by the Commonwealth Games Federation.

• The host city was initially intended to be selected at the 2019 GCF General Assembly in Kigali, Rwanda.

• 2018 Commonwealth Games:

• The 2018 Commonwealth Games, officially known as the XXI Commonwealth Games and commonly known as Gold Coast 2018.

• It was held on the Gold Coast, Queensland, Australia, between 4 and 15 April 2018.

• It was India's 18th appearance at the Commonwealth Games. With 26 Gold medals and a total of 66 medals.

• India finished 3rd in the event.

• The first time a major multi-sport event achieved gender equality by having an equal number of events for male and female athletes.

Q41. Answer: (a) PR Sreejesh

• The correct answer is PR Sreejesh.

Key Points

• Veteran Indian Hockey goalkeeper P R Sreejesh has won the prestigious World Games Athlete of the Year for his 2021 performances.

• He has become only the 2nd Indian to receive the accolade.

• In 2020, Indian Women’s hockey captain Rani Rampal became the first Indian to win the honor for her 2019 performance.

• In the FIH Stars Awards in Oct'21, he was named the goalkeeper of the year for 2021.

Important Points

• Sreejesh beat competition from sports climber Alberto Gins Lopez of Spain and Italy’s wushu player Michele Giordano for the award.

• He received around one lakh twenty-seven thousand votes, whereas Lopez got around sixty-seven thousand votes and Giordano accumulated over fifty-two thousand votes.

Additional Information

• Sreejesh is a former captain of the Indian Men's Hockey Team and part of the Tokyo Olympics-bronze medal-winning side.

• The 33-year-old was the only Indian nominated and was recommended by the International Hockey Federation (FIH).

• Sreejesh has represented India in 244 senior international matches.

• At the 2016 Olympics in Rio, Sreejesh led the Indian hockey team to the quarterfinals of the tournament.

• He led the Indian team that won the silver medal at the 2016 Men’s Hockey Champions Trophy held in London.

Q42. Answer: (b) Seven

The correct answer is Seven.

Key Points

• Shehnai:

• It is a reed instrument in which there are seven holes along the tube which are used for playing the melody by opening and closing them with the fingers.

• It is known as a Mangal vadya and is usually played on all auspicious occasions in north India such as marriages, temple festivals, etc.

• The Shehnai is considered to have come to India from West Asia, there are other scholars who believe that this instrument travelled to China from India.

• It is now a popular instrument in concerts, the sound is very sweet and suited for playing Raga Sangeet.

• In the early fifties of this century, Ustad Bismillah Khan is credited for popularizing this instrument.

• Today, Pt. Anant Lal and Pt. Daya Shankar are also noted Shehnai players.

Q43. Answer: (b) 72

The correct answer is 72.

Key Points

• On 28 December 1885, the Indian National Congress was founded at Gokuldas Tejpal Sanskrit College in Bombay, with 72 delegates in attendance.

• The founder of the INC was Allan Octavian Hume. It was founded in Mumbai.

• It was formed when 72 delegates from all the presidencies and provinces of India met at Bombay from 28 to 30 December 1885.

• Allan Octavian Hume played a leading role in the formation of the Congress and acted as its General Secretary.

• It was set up to bring together a group of educated individuals on a common platform to influence policymaking.

• Some of the important leaders, who attended this first session of the congress which was held at the Gokuldas Tejpal Sanskrit College:

• Dadabhai Naoroji, Kashinath Trimbak Telang, Pherozeshah Mehta, S.Subramania Iyer, P. Ananda Charlu, Dinshaw Edalji Wacha.

• Gopal Ganesh Agarkar, G. Subramania Iyer, M. Veeraraghavarchariar, N.G. Chandavarkar, Rahmatullah M. Sayani and Womesh Chandra Bonnerjee.

• An important leader who was absent was Surendranath Banerjee. He had convened a national conference around the same time at Calcutta.

• The first president of the congress was Womesh Chandra Banerjee.

• Congress passed nine resolutions that demanded changes in British policy and reforms in administration.

Additional Information

• Aim and Objectives of the Congress :

• Promotion of friendship among the countrymen.

• Development and consolidation of a feeling of national unity irrespective of race, caste, religion, and provinces.

• Formation of popular demands and presentation before the Government through petitions.

• Training and organization of public opinion.

• Consolidation of sentiments of national unity.

• Recording of the opinions of educated classes on pressing problems.

• Laying down lines for the future course of action in the public interest.

Q44. Answer: (d) Marginal utility (MU)

The correct answer is Marginal utility (MU).

Key Points

• Marginal utility -

• It is the additional utility derived from the consumption of an additional unit of a commodity.

• Marginal utility is also known as Marginal Satiety.

• MU = Change in TU/Change in Quantity

• MU= TUn - TUn-1

• Also, Marginal Utility is the additional utility made to be TU by the additional consumption of one more unit of a commodity.

Additional Information

• Product Utility (PU)

• Product Utility (PU) refers to the perceived value or usefulness that a product provides to its users or customers.

• It is a concept commonly used in marketing and product development to assess and understand the benefits and satisfaction derived from a product

• Revenue Utility (RU)

• Revenue Utility (RU) refers to the economic benefit or value that a consumer derives from purchasing and consuming a particular good or service.

• It is a concept used in economics to measure the satisfaction or utility that individuals receive from the money they spend on goods and services.

• Demand utility (DU)

• Demand utility (DU) refers to the satisfaction or value that an individual or consumer derives from consuming or using a particular good or service.

• It is a concept commonly used in economics and consumer theory to measure the subjective benefit or enjoyment a consumer obtains from a product.

Q45. Answer: (a) Liver fluke - Nematoda

The correct answer is Liver fluke - Nematoda.

Key Points

• Liver Fluke -

• The scientific name of liver fluke is Fasciola hepatica.

• The life history of liver fluke involves two hosts (Digenetic parasitic).

• Primary host - Sheep and goat

• Secondary host - Garden snail (Planorbis, Lymnea)

• Liver fluke belongs to the phylum Platyhelminthes, not Nematoda.

• Liver fluke is a parasitic flatworm that infects the liver of its primary host, which is usually a sheep or goat.

Additional Information

• Sycon - Porifera

• Sycon is a sponge that belongs to the phylum Porifera.

• The common name of the Sycon is Crown Sponge.

• All sponges have a canal system that consists of the Ostia, spongocoel, and osculum.

• Canal system is one of the most important features of sponges.

• The canal system is a network of canals that connect the spongocoel to the outside via ostia.

• It helps in nutrition, respiration, and excretion processes.

• Prawns - Arthropoda

• Prawn is a common name for small aquatic crustaceans with an exoskeleton and ten legs (i.e. a member of the order decapoda), some of which can be eaten.

• They belong to the kingdom Animalia and order Arthropoda.

• Starfish - Echinodermata

• Starfish belongs to the phylum Echinodermata group.

• Echinodermata are so named owing to their spiny skin (from the Greek “echinos” meaning “spiny” and “dermos” meaning “skin”).

• Echinodermata are exclusively marine organisms. Sea stars, sea cucumbers, sea urchins, sand dollars, and brittle stars are all examples of echinoderms.

Q46. Answer: (b) Orissa

The correct answer is Option 2.

Key Points

• Kalinga is the ancient name of a region in eastern India that corresponds to the present-day states of Odisha and parts of northern Andhra Pradesh.

• It was a significant coastal region known for its rich cultural heritage and maritime trade.

• The history of Kalinga dates back to ancient times, with references to the region found in texts such as the Mahabharata and the Puranas.

• Kalinga was renowned for its seafaring abilities and flourishing trade connections with other parts of India and foreign lands.

• The region was known for its maritime trade in goods like textiles, spices, precious stones, and other commodities.

• Kalinga also had a rich political history. It was ruled by several dynasties and was often engaged in power struggles with neighboring kingdoms.

Additional Information

• One of the most notable events in the history of Kalinga was the Kalinga War in 261 BCE.

• This war was fought between the Mauryan Empire, led by Emperor Ashoka, and the Kalinga Kingdom.

• The war had a significant impact on Emperor Ashoka, who was deeply affected by the destruction and loss of life, leading him to embrace Buddhism and renounce violence.

• Over time, the name Kalinga fell out of use, and the region came to be known by different names during various historical periods.

• The present-day state of Odisha, which encompasses a significant portion of the ancient Kalinga, has a diverse cultural heritage and is known for its art, architecture, dance, and festivals. The coastal areas of Odisha have beautiful beaches and are popular tourist destinations.

Q47. Answer: (a) Berring

The correct answer is 'Bering'

Key Points

• Bering Strait:

• The Bering Strait is a narrow passage of water between Russia and Alaska.

• It connects the Arctic Ocean (via the Chukchi Sea) with the Pacific Ocean (via the Bering Sea).

• The strait is about 85 km wide at its narrowest point and is relatively shallow, with a depth of around 50 meters.

• It has been historically significant for human migration, as it is believed early humans crossed a land bridge here during the Ice Age.

Additional Information

• Palk Strait:

• This strait lies between India and Sri Lanka, connecting the Bay of Bengal and the Gulf of Mannar.

• It has no geographical relation to the Arctic Ocean.

• Hudson Strait:

• Located in northeastern Canada, it connects Hudson Bay with the Atlantic Ocean.

• Though in the northern latitudes, it does not connect the Arctic and Pacific Oceans.

• Bosphorus Strait:

• This important waterway in Turkey connects the Black Sea with the Sea of Marmara, and ultimately the Mediterranean Sea.

• It is far from the Arctic region and plays no role in linking the Arctic Ocean with the Pacific.

Q48. Answer: (d) Ministry of Rural Development

The correct answer is Option 4.

Key Points

• Ministry of Rural Development has developed “JALDOOT App” that will be used across the country to capture the water level of selected wells in a village.

• Union Minister of Rural Development and Panchayati Raj, Shri Giriraj Singh will launch the “JALDOOT App” at a function in New Delhi.

• The Jaldoot app will enable Gram Rojgar Sahayak (GRS) to measure the water level of selected wells twice a year (pre-monsoon and post-monsoon).

• In every village, adequate number of measurement locations (2-3) shall need to be selected.

• These will be representative of the ground water level in that village.

• The app will facilitate panchayats with robust data, which can be further used for better planning of works.

• The ground water data could be utilised as part of the Gram Panchayat Development Plan (GPDP) and Mahatma Gandhi NREGA planning exercises.

Additional Information

• The Ministry of Finance is a government department or ministry responsible for managing the financial affairs of a country or jurisdiction.

• Its primary role is to develop and implement fiscal policies, manage public finances, and oversee economic matters related to taxation, budgeting, and financial regulations.

• The Ministry of Culture is a government department or ministry that is responsible for overseeing and promoting cultural affairs within a country or jurisdiction.

• Its primary role is to preserve, develop, and promote the cultural heritage, arts, and creative industries of a nation.

• The Ministry of External Affairs, also known as the Foreign Ministry or the Ministry of Foreign Affairs, is a government department or ministry responsible for a country's foreign relations and diplomacy.

• Its primary role is to manage and conduct international relations on behalf of the country.

Q49. Answer: (b) Madhya Pradesh

The correct answer is Option 2.

Key Points

• Madhya Pradesh won their first Ranji Trophy.

• Group Stage: Madhya Pradesh, Karnataka, Mumbai, Bengal, Uttarakhand, Punjab, and Uttar Pradesh won their respective groups to qualify for the quarter-finals.

• Preliminary Quarter-Final: Jharkhand and Nagaland won their groups. Jharkhand scored 880 runs in their first innings, which is the fourth-highest team total in Ranji Trophy history. They extended their lead to 1008 runs, the biggest ever lead in first-class cricket, securing a place in the quarter-finals based on their first-innings lead.

• Quarter-Finals: Mumbai, Uttar Pradesh, and Madhya Pradesh emerged victorious in their quarter-final matches and advanced to the semi-finals.

• Semi-Finals: Bengal faced Jharkhand in a draw match, but Jharkhand progressed due to their first-innings lead. Madhya

Pradesh defeated Bengal by 174 runs to reach their first final since the 1999 edition of the Ranji Trophy. The second semi-final between Mumbai and Uttar Pradesh was also a draw, with Mumbai advancing to the final based on their first-innings lead.

• Final: Madhya Pradesh faced Mumbai in the final match and won by 6 wickets, securing their first-ever Ranji Trophy title.

• Overall, Madhya Pradesh's journey in the tournament was remarkable, with notable performances in the group stage, a strong victory in the quarter-finals, and a convincing win in the final against Mumbai.

Q50. Answer: (d) Ranveer Singh

The correct answer is Option 4.

Key Points

• Ranveer Singh received the best actor in leading role (male) popular choice in the Filmfare Awards 2022.

• The 67th Filmfare Awards were given out on 30 August 2022 at Jio World Centre, Mumbai.

• The 67th edition of the awards honoured the films released in 2021.

Additional Information

• The Other Winners are:

• Best Actress: Kriti Sanon for 'Mimi'

• Best Director: Vishnuvardhan for 'Shershaah'

• Best Film (Popular Category): 'Shershaah'

• Best Film (Critics' Choice): 'Sardar Udham'

Q51. Answer: (b) 4 : 5 : 11

Given:

P invests 1/5th of total investments

Q invests 1/4th of the total investments

Calculation:

Taking L.C.M = 5, 4

LCM = 20

Let the total investment be Rs. 20.

P invests 1/5th of total investments = 20/5 = Rs. 4

Q invests 1/4th of the total investments = 20/4 = Rs. 5

Thus R invests = Rs 20 - (Rs. 4 + Rs. 5)

=> 20 - 9

=> Rs. 11

Thus ratio of the profit of P, Q and R respectively is 4 : 5 : 11.

Therefore Option 2 is the correct answer.

Q52. Answer: (b) $2a^3 + 2b^3 + 2c^3 - 6abc$

Calculation:

Let's simplify the expression step by step:

$(a + b + c) [(a - b)^2 + (b - c)^2 + (c - a)^2]$

First, let's expand the squares inside the curly braces:

$(a + b + c) [(a^2 - 2ab + b^2) + (b^2 - 2bc + c^2) + (c^2 - 2ac + a^2)]$

Now, let's simplify the expression inside the curly braces:

$(a + b + c) [2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ac]$

$2(a + b + c) [a^2 + b^2 + c^2 - ab - bc - ac]$

$2(a^3 + b^3 + c^3 -3abc)$

$(2a^3 + 2b^3 + 2c^3 -6abc)$

Therefore Option 2 is the correct answer.

Q53. Answer: (c) 98.64 percent

Calculation:

Marks obtained by A in all subjects = 100 + 120 + 160 + 140 + 60 + 150 = 730

Marks obtained by B in all subjects = 70 + 180 + 170 + 110 + 130 + 80 = 740

Percentage of the marks obtained by A in all the subjects to the

marks obtained by B in all the subjects = 730/740 × 100 = 98.64 %

Therefore Option 3 is the correct answer.

Q54. Answer: (b) 19/56

Formula used:

Average = Sum of all the term/Number of term

Calculation:

L.C.M. of 11, 7, 8, 13 = 8008

=> (5/11, 5/7, 3/8, 6/13) × 8008

=> 11 × 120, 5 × 260, 7 × 195, 13 × 104

=> 3640, 5720, 3003, 3696

Least fraction = 3/8

Greatest fraction = 5/7

Difference = (5/7) - (3/8) = (40 - 21)/56 = 19/56

Therefore Option 2 is the correct answer.

Q55. Answer: (a) 6 hours

Given:

Speed of stream is 4 km/hr.

Speed of boat is 11 km/hr.

Concept Used:

Upstream Speed = Speed of boat - Speed of stream

Downstream Speed = Speed of boat + Speed of stream

Calculation:

Upstream Speed = Speed of boat - Speed of stream

=> 11 - 4 = 7 km/h

Upstream distance = 21 km

Time = 21/7 = 3 hrs

Downstream Speed = Speed of boat + Speed of stream

=> 11 + 4 = 15 km/h

Downstream distance = 45 km

Time = 45/15 = 3 hrs

Total time = 6 hrs

Therefore Option 1 is the correct answer.

Q56. Answer: (d) 2 sec A

Shortcut Trick

Use Substitution Method: Let A = 30°, so cosec A = 2.

Expression = $\sqrt{[(2 + 1) / (2 - 1)]} + \sqrt{[(2 - 1) / (2 + 1)]} = \sqrt{3} + 1/\sqrt{3}$

Expression = $(3 + 1) / \sqrt{3} = 4 / \sqrt{3}$

Checking options: 2 sec 30° = $2 \times (2 / \sqrt{3}) = 4 / \sqrt{3}$. This matches the result.

Therefore The correct answer is 2 sec A.

Alternate Method

Given Expression: $\sqrt{[(\text{cosec } A + 1) / (\text{cosec } A - 1)]} + \sqrt{[(\text{cosec } A - 1) / (\text{cosec } A + 1)]}$

Formula Used: $\sqrt{X} / \sqrt{Y} + \sqrt{Y} / \sqrt{X} = (X + Y) / \sqrt{(XY)}$ and $\text{cosec}^2 A - 1 = \cot^2 A$.

Calculations:

=> Expression = $[(\text{cosec } A + 1) + (\text{cosec } A - 1)] / \sqrt{[(\text{cosec } A - 1)(\text{cosec } A + 1)]}$

=> Expression = $(2 \text{ cosec } A) / \sqrt{(\text{cosec}^2 A - 1)}$

=> Expression = $(2 \text{ cosec } A) / \sqrt{(\cot^2 A)}$

=> Expression = $(2 \text{ cosec } A) / \cot A$

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

=> Expression = $2 / \cos A = 2 \sec A$

Therefore The correct answer is 2 sec A.

Additional Information

Trigonometric Identities

Fundamental identities include $\sin^2 A + \cos^2 A = 1$, $1 + \tan^2 A = \sec^2 A$, and $1 + \cot^2 A = \text{cosec}^2 A$.

Reciprocal Identities

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

Conjugate Multiplication

Multiplying terms like $\sqrt{(a+b)}$ and $\sqrt{(a-b)}$ helps in rationalizing denominators using the $(a+b)(a-b) = a^2 - b^2$ property.

Q57. Answer: (b) 13

Shortcut Trick

Average of 10 consecutive integers = 33 ÷ 2 = 16.5.

In a consecutive series, the average is the middle value; for 10 terms, it lies between the 5^(th) and 6^(th) terms.

Therefore 5^(th) term = 16 and 6^(th) term = 17.

1^(st) term = 5^(th) term − 4 = 16 − 4 = 12.

First three integers are 12, 13, 14; their average is the middle term, which is 13.

Therefore The correct answer is 13.

Alternate Method

Given:

Number of consecutive integers (n) = 10

Average of these 10 integers = 33/2 = 16.5

Formula Used:

Average of an Arithmetic Progression (AP) = (First term + Last term) ÷ 2

12

13

14

16

17

Avg = 16.5

First 3 Integers (Avg = 13)

Calculations:

=> Let the 10 consecutive integers be x, x+1, x+2, ..., x+9.

=> Average = (x + x + 9) ÷ 2

=> 16.5 = (2x + 9) ÷ 2

=> 33 = 2x + 9

=> 2x = 24

=> x = 12

=> The first three integers are 12, 13, and 14.

=> Average of first three = (12 + 13 + 14) ÷ 3 = 39 ÷ 3 = 13.

Therefore The correct answer is 13.

Additional Information

Arithmetic Progression Average

For any series in AP, the average is always the middle term (if n is odd) or the mean of the two middle terms (if n is even).

Sum of Consecutive Integers

The sum of n consecutive integers starting from a is given by $S = (n \div 2) \times [2a + (n - 1)]$.

Average of First n Natural Numbers

The average of the first n natural numbers is simply (n + 1) ÷ 2.

Q58. Answer: (d) 90 degree

Given:

In ΔSTU, SX is the median on TU.

SX = TX

Concept Used:

Median divided the line segment into two equal parts.

Calculation:

In ΔSTU, SX is the median. So,

TX = XU (median property)

SX = TX (given)

So, ΔSTX is isosceles triangle.

Let angle STX = angle TSX = θ

=> angle SXU = 2θ (exterior angle)

Similarly in ΔSXU.

SX = XU

ΔSXU is isosceles triangle.

Let angle SUX = angle USX = α

=> angle SXT = 2α (exterior angle)

Now,

2θ + 2α = 180° (Linear pair)

θ + α = 90°

So, angle TSU = θ + α = 90°

Therefore Option 4 is the correct answer.

Q59. Answer: (c) 30 cm

Given:

Median of an equilateral triangle is 15√3 cm.

Concept Used:

Length of median of the equilateral triangle = (√3/2) × side

Calculation:

Let the side of the equilateral triangle be a cm.

Length of median of the triangle = (√3/2) × a

=> (√3/2) × a = 15√3

=> a = 30 cm

Side = 30 cm

Therefore Option 3 is the correct answer.

Q60. Answer: (c) Rs. 2,100

Given:

Simple interest accrued on a certain principal is rupees 1200 in 3 years at a rate of 8% per annum.

Concept Used:

S.I. = (P × R × T)/100

where, P = principal, R = rate % per annum, T = time in years

Calculation:

Here, S.I. = 1200, R = 8%, T = 3 years

=> 1200 = (P × 8 × 3)/100

=> P = (1200 × 100)/(8 × 3) = 5000

Now let's find the compound interest on principal amount P = 2 × 5000 = Rs. 10000, R = 10%, T = 2 years

Compound interest = P(1 + r/100)^(n)- P

Compound interest

= P[(1 + r/100)^n - 1] = 10000[(1 + 10/100)^2 - 1]; = 10000[(1 + 1/10)^2 - 1] = 10000[(11/10)^2 - 1]; = 10000[121/100 - 1] = 10000[21/100] = 2100

Therefore Option 3 is the correct answer.

Q61. Answer: (d) 21 cm

Given:

AD is the median of ΔABC.

G is the centroid of ΔABC.

AG = 14 cm
Concept Used:
Centroid → intersection point of medians
Centroid divides median in ratio of 2:1
Calculation:
We know that G is centroid of ΔABC
AG = 14 cm
Also,
=> AG : GD = 2 : 1
=> AG/GD = 2/1
=> GD = AG/2
=> GD = 14/2 = 7 cm
=> AD = AG + GD
=> 14 + 7 = 21 cm
Therefore Option 4 is the correct answer.

Q62. Answer: (b) 9/10

Given:
tan A = 3
Concept Used:
tanθ = Perpendicular/Base
cosθ = Base/Hypotenuse
Pythagoras Theorem
Hypotenuse^2= Perpendicular^2 + Base^2
Calculation:
tan A = 3
=> Perpendicular/Base = 3/1
Perpendicular = 3 and Base = 1
Pythagoras Theorem
Hypotenuse2 = Perpendicular2 + Base2
=> Hypotenuse2 = $3^2 + 1^2$
=> Hypotenuse2 = 10
=> Hypotenuse = √10
=> Cos A = 1/√10
=> sin A = 3/√10
=> 3 sin A cos A = 3 × 3/√10 × 1/√10
=> 9/10
Therefore Option 2 is the correct answer.

Q63. Answer: (a) 60 kg

Given:
The price of a commodity is decreased by 25 percent.
Calculation:
Original price = 100/kg
Original consumption = x kg
New price = 75/kg After a decrease of 25%
New consumption = x + 20 kg
Original expenditure = 100x
New expenditure = 75(x + 20) = 75x + 1500
Since the expenditure is the same, we have 100x = 75x + 1500
=> 25x = 1500
=> x = 60 kg

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Therefore Option 1 is the correct answer.

Q64. Answer: (d) $a^3 + b^3 + 8c^3 - 6abc$

Given:

(a2 + b2 + 4c2 - ab - 2bc - 2ca)(a + b +2c)

Concept Used:

$a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

Calculation:

(a2 + b2 + 4c2 - ab - 2bc - 2ca)(a + b +2c)

$a^3 + b^3 + 8c^3 - 6abc$

Therefore Option 4 is the correct answer.

Q65. Answer: (d) 15 cm

Given:

Radii of two circles are 11 cm and 3 cm. Distance between their centres is 17 cm.

Formula used:

Length of the direct common tangent of two circles = $\sqrt{(D^2 - (r1 - r2)^2)}$ (D = Distance between their centres, r1 = radius of the bigger circle, and r2 = radius of the smaller

Calculation:

Let the centres be at P and Q.

ON = Radius of the bigger circle = 11 cm

PM = Radius of the smaller circle = 3 cm

Let MN be the direct common tangent.

According to the formula,

Length of MN

$\Rightarrow \sqrt{(17^2 - (11 - 3)^2)}$

$\Rightarrow \sqrt{(289 - 64)}$

$\Rightarrow$ 15 cm

Therefore The length of the direct common tangent is 15 cm.

Q66. Answer: (b) 2

Calculation:

J1 = The average sale of company C1 in year Y1, Y2 and Y3 = 200 + 400 + 600 = 1200/3 = 400

J2 = The difference between total sale of company C1 and C2 in all the 5 years = (1000 + 700 + 800 + 200 + 100) - (200 + 400 + 600 + 500 + 300)

$\Rightarrow$ 2800 - 2000 = 800

The value of (J2/J1) = 800/400 = 2

Therefore Option 2 is the correct answer.

Q67. Answer: (a) 1/(1-sin A)

Given:

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

Concept Used:

$\cos^2 A = 1 - \sin^2 A$

1 - Sin2 A = (1 - Sin A)(1 + Sin A)

Calculation:

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

$(1+\sin A)/(1 - \sin^2 A)$

(1+sin A)/(1 - sin A)(1 + sin A)

1/(1 - sin A)

Therefore Option 1 is the correct answer.

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Q68. Answer: (d) 2200

Calculation:

Total salary of all the employees = 200 + 650 + 350 + 250 + 450 + 300

=> 2200

Therefore Option 4 is the correct answer.

Q69. Answer: (b) 240

Given

525 + 1235 ÷ 247 - 29 × 10

Concept used:

Calculation:

525 + 1235 ÷ 247 - 29 × 10

=> 525 + 5 - 290

=> 530 - 290

=> 240

Therefore Option 2 is the correct answer.

Q70. Answer: (d) 0

Given:

x+1/x=-2,

Concept used:

a^7 + 1/a^7 = (a³ + 1/a³) × (a^4 + 1/a^4) - (a + 1/a)

(a3 + 1/a3) = (a+ 1/a)³ -3(a+ 1/a)

(a4 + 1/a4) = [(a + 1/a)² - 2]²

a²+1/a² = (a+1/a)² -2

Calculation:

If x + 1/x = -2

x³ + 1/x³ = (-2)³ - 3× (-2)

=> -8 + 6 = -2

x^4 + 1/x^4 = [(-2)² - 2]² - 2

=> 4 - 2

=> 2

So,

x^7 + 1/x^7 = (-2) × (2) - (-2)

=> -4 + 2

=> -2

Now,

x² + 1/x² = (-2)² - 2

=> 4 - 2 = 2

mathrm x^7+x^(-7)+x²+x^(-2) = -2 + 2 = 0

Therefore Option 4 is the correct answer.

Q71. Answer: (c) 60 days

Given:

The ratio of time taken in completing a work by a man and woman is 2 : 3.

The man and the woman can complete the work together in 24 days.

Concepts used:

Time = Work/Efficiency

Time is inversely proportional to efficiency.

Calculation:

Time Ratio = 2 : 3

Efficiency Ratio = 3 : 2

Total work = (3 + 2)24

Time take by women = (5 × 24)/2 = 60

Therefore A woman alone can complete the work in 60 days.

Q72. Answer: (a) 20 percent loss

Given:

A dealer sells two machines at the rate of Rs. 15000 per machine.

On one he earns a profit of 20 percent and on the other he loses 40 percent.

Calculation:

Let the cost price of one machine be Rs. y and other be Rs. z

CP of 1st machine,

=> y × (1 + 20/100) = 15000

=> y = 15000/1.2

=> y = Rs. 12500

CP of 2nd machine,

=> z × (1 – 40/100) = 15000

=> z = 15000/.6

=> z = 25000

=> Total cost price = 12500 + 25000 = Rs. 37500

=> Total selling price = 15000 + 15000 = Rs. 30000

=> Loss = 37500 – 30000 = Rs. 7500

=> Loss percent = loss × 100/CP = 7500 × 100/37500

=> Loss percent = 20%

Therefore Option 1 is the correct answer.

Alternate Method

Total Selling price = 15000 + 15000 = 30000

Total Cost price = 15000 (100/120 + 100/60)

=> Cost price = 37500

Loss = 37500 = 30000

=> 7500

Loss Percentage = (7500/37500)× 100

=> 20%

Therefore Option 1 is the correct answer.

Q73. Answer: (b) Transport, Others, Education

Given:

Total amount spent during the year is Rs. 3,00,000.

Amount spent together on some items is equal to Rs. 1,50,000.

Calculation:

150000/300000 × 100 = 50%

Now, take options

Option 1) Education, Others, Savings = 25% + 15% + 20% = 60% ≠ 50%

Option 2) Transport, Others, Education = 10% + 15% + 25% = 50%

Option 3) Savings, Housing, Education = 20% + 10% + 25% = 55% ≠ 50%

Option 4) Savings, Clothing, Education = 20% + 10% + 25% = 55% ≠ 50%

So, only Option 2) is correct.

Q74. Answer: (a) 4

Given:

Radius of spherical ball = 6 cm

Radius of solid hemisphere = 12 cm

Formula used:

Volume of a sphere = 4/3π r^3

Volume of a hemisphere = 2/3π r^3

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r = radius

Calculation:

Let n numbers of spherical balls be made

=> n × 4/3π × 6^3 = 2/3π × 12^3

=> n = 4

Therefore 4 Solid spherical balls can be made

Q75. Answer: (c) 18.75 percent

Given:

Discount = 20%

Loss = 5%

Concept Used:

MP/CP = (100 ± Profit%/Loss%)/(100 - Discount%)

Calculation:

Using the formula,

MP/CP = (100 - Loss%)/(100 - Discount%)

MP/CP = (100 - 5)/(100 - 20)

MP/CP = 95/80 = 19/16

If there is no discount, means discount = 0%, then profit%

MP/CP = (100 + Profit%)/(100 - Discount%)

19/16 = (100 + Profit%)/(100 - 0)

19/16 = (100 + Profit%)/100

19 × 100 = 16(100 + Profit%)

1900 = 1600 + 16 × Profit%

16 × Profit% = 1900 - 1600 = 300

Profit% = 18.75%

Therefore, if the article is sold at the marked price, the shopkeeper will make a profit of approximately 18.75%.

Therefore Option 3 is the correct answer.

Q76. Answer: (c) Fauna

The solution is in Hindi. Read it online.

Q77. Answer: (c) The student told her that he/she did not remember her name.

The correct answer is "Option 3'.

Key Points

• In indirect speech, we report what someone said without using their exact words. The key points to consider when converting direct speech to indirect speech are:

• Pronouns: The pronouns need to be changed to reflect the perspective of the speaker in the reporting clause.

• In this case, since the student is speaking, the pronouns "I" and "her" need to be changed accordingly.

• The options that use "he/she" are correct in this regard.

• Tense changes: The tense of the verb in the reported speech needs to be shifted back.

• The verb "do not remember" in the direct speech should be changed to "did not remember" in the past tense in the indirect speech.

Therefore, the correct sentence is: 'The student told her that he/she did not remember her name.'

Additional Information

• Now, let's examine why the other options are incorrect:

• Option 1 is incorrect because it uses "I" in the reported speech, which doesn't match the perspective of the student who is speaking.

• Option 2 is incorrect because it uses "cannot remember" in the reported speech, which doesn't match the tense of the original statement.

• Option 4 is incorrect because it uses "do not remember" in the reported speech, which doesn't match the tense of the original statement.

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Q78. Answer: (b) No improvement

The correct answer is 'Option 2' i.e. 'No improvement'.

Key Points

• The phrase "in danger of" is the correct and idiomatic way to express the idea of being at risk or susceptible to something harmful or dangerous.

• It is used appropriately in the given sentence to convey that people who came into contact with the carrier are at risk of catching the disease.

Therefore, the correct sentence is: 'People who came into contact with the carrier are in danger of catching the disease.'

Additional Information

• Now let's examine why the other options are incorrect:

• At dangerous of: This option is incorrect because "at dangerous of" is not a correct phrase.

• In danger off: This option is incorrect because it adds an unnecessary extra "f" at the end of "danger."

• In dangers for: "Dangers for" suggests that people are causing the dangers, whereas the original sentence implies that people are at risk of catching the disease. The original phrase "in danger of" should be retained.

Q79. Answer: (b) yours impromptu performance.

The correct answer is 'Option 2' i.e. 'Yours impromptu performance.'

Key Points

• The word "yours" is a possessive pronoun used to indicate ownership.

• However, in this sentence, the intention is to use the possessive form of the pronoun "you."

• The correct form should be "your" followed by the noun "impromptu performance."

Therefore, the correct sentence is: "I will never judge you for your impromptu performance."

Q80. Answer: (a) carries out

The correct answer is 'Option 1' i.e. 'Carries out'.

Key Points

• The phrase "carries out" means to perform or complete tasks.

• It is the most suitable option to convey the intended meaning in the given sentence.

• It implies that the subject (she) is able to accomplish tasks with ease and speed.

Therefore, the correct sentence is: I envy the way she carries out all tasks with such ease and speed.

Additional Information

• Now, let's examine why the other options are incorrect:

• Dwindles out: This option is incorrect because "dwindles out" means to gradually decrease or fade away, which does not match the context of the sentence.

• Bring about: This option is incorrect because "bring about" means to cause or make something happen. It does not fit the context of the sentence.

• Account for: This option is incorrect because "account for" means to explain or provide a reason for something.

Q81. Answer: (b) vein

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

Key Points

• He could feel every vein and artery in his body.

• The reason this is correct is because veins and arteries are the blood vessels that form the circulatory system in the body.

• It is through these vessels that blood flows, so it is plausible to say one can feel every "vein" and "artery."

Therefore, the correct answer is: 'He could feel every vein and artery in his body.

Additional Information

• As for the incorrect options:

• Liver: This option is incorrect because the liver is an organ, not something that can be felt all over the body.

• Beat: This option is incorrect because the term "beat" is generally associated with the heart, not something that can be felt all over the body.

• Place: This option is incorrect because "place" is too vague and not specifically related to the body or the circulatory system.

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Q82. Answer: (d) Holitisc

The correct answer is 'Option 4' i.e. 'Holitisc'.

Key Points

• The correct spelling and meaning for the word is "Holistic."

• Holistic (adjective): Referring to the approach or belief that emphasizes the whole picture, considering all aspects or parts of something in an interconnected and comprehensive manner.

Therefore, the correct answer is: 'Holitisc'.

Additional Information

• Explanation for the other options:

• Roast: A cooking method where food, typically meat, is cooked in an oven or over an open flame, usually at high temperatures.

• Ghost: The term "ghost" refers to the spirit or soul of a deceased person that is believed to appear or haunt a particular location.

• Malt: A substance made from germinated cereal grains, usually barley, that is dried and used in brewing and distilling processes.

Q83. Answer: (d) PSQR

The correct answer is 'Option 4' i.e. 'PSQR'.

Key Points

• The correct order (PSQR) maintains a logical and chronological flow of events.

• It starts with Rama winning Sita's hand, followed by her abduction, the rescue mission, and ends with their return and the establishment of Rama's righteous rule.

• Sentence P sets the initial context by introducing Rama, the prince of Ayodhya, winning the hand of princess Sita. However, they are exiled for 14 years due to the plotting of Rama's stepmother.

• Sentence S follows logically as it states that Sita was abducted by Ravana in the forest, and Rama gathers an army of monkeys and bears to search for her.

• Sentence Q comes next, as it describes the allies attacking Lanka, killing Ravana, and ultimately rescuing Sita. It also mentions Sita entering fire to prove her chastity, being vindicated by the gods, and being restored to her husband.

• Sentence R concludes the sequence by stating that after Rama and Sita's triumphant return to Ayodhya, Rama's righteous rule (Ram-raj) brings about a golden age for all mankind.

Therefore, the correct answer is: 'PSQR'.

Q84. Answer: (d) Believable

The solution is in Hindi. Read it online.

Q85. Answer: (a) Productive

The solution is in Hindi. Read it online.

Q86. Answer: (c) The last slice of pizza was eaten by her.

The correct answer is 'The last slice of pizza was eaten by her.'.

Key Points

• In the active sentence, "She ate the last slice of pizza," the subject "she" is performing the action of eating the pizza.

• To convert this sentence into the passive voice, we need to make the object of the active sentence ("the last slice of pizza") the subject of the passive sentence.

• The verb "ate" needs to be changed to its corresponding passive form.

• In option 3, "The last slice of pizza was eaten by her," the subject of the passive sentence is "The last slice of pizza," and the verb is "was eaten."

• The past participle form of the verb "eat" is "eaten," which is used in the passive voice.

• Grammatically, in the passive voice, the subject receives the action rather than performing it. The structure of the passive voice is "be + past participle (verb) + by + agent (optional)."

Therefore, the correct sentence is: 'The last slice of pizza was eaten by her.'

Q87. Answer: (a) QPRS

The correct answer is 'Option 1' i.e. "QPRS".

Key Points

• The correct order maintains a logical flow of ideas and creates a coherent sentence.

• First, we have Q, which introduces the contrast between UHC (Universal Health Coverage) and being seen as one target among many.

• Then, P follows, stating the belief that UHC should be seen as the linchpin of the health development agenda.

• R comes next, explaining that UHC not only underpins a more sustainable approach to achieving other health targets.

• Finally, S concludes the sentence, emphasizing that UHC allows for a balance between the other health targets.

Therefore, the correct sentence order is: 'QPRS.'

Q88. Answer: (c) Uncandid

The solution is in Hindi. Read it online.

Q89. Answer: (c) Home

The solution is in Hindi. Read it online.

Q90. Answer: (a) studied a diagram

The correct answer is 'Option 1' i.e. 'Studied a diagram'.

Key Points

The given sentence is grammatically incorrect because "diagrams" is plural.

The verb "studied" should be used with a singular noun.

Therefore, the correct form should be "studied a diagram."

Therefore, the correct sentence is: 'The students studied a diagram of a plant cell.'

Additional Information

Explanation for the other options:

Study a diagrams: This option is incorrect because the verb "study" should be in the past tense to match the tense of the sentence. Additionally, "diagrams" should be singular, not plural.

Studying a diagram: This option is incorrect because it changes the tense of the sentence to present continuous ("studying"), which doesn't match the tense of the original sentence.

Q91. Answer: (d) Embarked

The correct answer is 'Option 4' i.e. 'Embarked'.

Additional Information

The given sentence, "We opened on a new travel venture," contains an incorrect word segment.

"Opened" does not fit in the context of starting a new travel venture.

Instead, the word "embarked" is more appropriate and provides a clearer meaning.

"Embarked" means to begin or start a new venture, journey, or activity.

It is commonly used to indicate the start of a new endeavor or project, which aligns well with the context of starting a new travel venture.

Therefore, the correct sentence is: 'We embarked on a new travel venture.'

Additional Information

Explanation for the other options:

Begun: While "begun" is the past participle form of "begin," it does not fit well in the sentence structure or convey the desired meaning of starting a new travel venture.

Initiated: "Initiated" is a possible option, as it means to start or begin something. However, "embarked" more accurately captures the meaning in the given sentence.

Q92. Answer: (b) Anything from the past that isn't significant or important anymore.

The solution is in Hindi. Read it online.

Q93. Answer: (c) To watch over closely

The solution is in Hindi. Read it online.

Q94. Answer: (d) patterns are made more scarcer, other

The correct answer is 'Option 4' i.e. 'Patterns are made more scarcer other'.

Key Points

The error in the original sentence is the use of the comparative form "more scarcer."

The word "scarcer" is already a comparative form of the adjective "scarce."

Adding "more" before "scarcer" creates redundancy. To correct the error, we remove "more" and use "scarcer" on its own.

The corrected sentence maintains the intended meaning, stating that if conventional arrangements and patterns are made scarcer, other arrangements and patterns will emerge or come into existence.

Therefore, the correct sentence is: If conventional arrangements and patterns are made scarcer, other arrangements and patterns

will spring up.

Q95. Answer: (d) Many input devices perform specific functions.

The correct answer is 'Option 4'.

Key Points

Correct Sentence: Many input devices perform specific functions.

The sentence is grammatically correct and free of spelling errors.

It uses the correct spelling of the words "input," "devices," "perform," "specific," and "functions."

The sentence effectively communicates the idea that multiple input devices have the capability to carry out specific functions.

Therefore, the correct sentence is: 'Many input devices perform specific functions.'

Q96. Answer: (b) common

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

Key Points

In the context of the sentence, the word "common" fits well as it indicates a shared characteristic or trait among the mentioned items (fresh pineapple, chilled watermelon, and an icy cold soft drink).

The sentence suggests that there is something these things have in common, and the subsequent sentence explains that it is the sweetness provided by sugar.

Therefore, "common" is the most suitable choice.

Therefore, the correct sentence is: What do these things have in common?

Additional Information

Explanation for the other options:

Tandem- Does not fit in the given context. It refers to two or more things working together or in coordination, and it does not convey the idea of a shared characteristic among the items mentioned.

Collision- Refers to a violent impact or crash between two objects. It does not relate to the concept of shared characteristics or what the items have in common.

Balance- Does not align with the meaning intended in the sentence. It refers to an equilibrium or stability and does not convey the idea of a shared characteristic or trait.

Q97. Answer: (d) granules

The correct answer is 'Option 4' i.e. 'Granules'.

Key Points

In the given context, the sentence is discussing sugar, specifically referring to the white form commonly used in various ways.

The word "granules" accurately describes the texture and appearance of this type of sugar, which typically consists of small, crystalline particles or granules.

This aligns with the intended meaning of the sentence.

Therefore, the correct sentence is: When you think of sugar, you probably picture the white granules you put in cookies

Additional Information

Explanation for the other options:

Rubbles refers to broken fragments or pieces of rock, which is not related to the concept of sugar or its appearance.

Capsules are small containers or enclosures, typically used for medication or other substances. It does not relate to the appearance or form of sugar.

Stones refers to solid, mineral-like substances, usually larger in size and not applicable to describing the texture of sugar.

Q98. Answer: (b) sprinkle

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

Key Points

In the given context, the sentence is discussing sugar and its various uses, such as putting it in cookies, coffee, or cereal.

The word "sprinkle" accurately describes the action of adding a small amount of sugar on top of something, typically in a scattered or dispersed manner.

It fits well with the context of using sugar as a topping or flavor enhancer.

Therefore, the correct sentence is: that your parents put in their coffee, or that you sprinkle on your cereal.

Additional Information

Explanation for the other options:

Raise does not fit in the given context. It means to lift or elevate something, which is unrelated to the action of adding sugar to

cookies, coffee, or cereal.

Send is not applicable in this context. It refers to the action of causing something to go or be delivered to another place, which is not relevant to the discussion of sugar and its use.

Place does not align with the intended meaning. It denotes putting something in a particular location, but it does not convey the idea of adding sugar as a topping or ingredient.

Q99. Answer: (a) extracted

The correct answer is 'Option 1' i.e. 'Extracted'.

Key Points

In the given context, the sentence is discussing sugar and its origin.

The word "extracted" accurately describes the process of obtaining sugar from its sources, such as sugar cane or sugar beets.

Extraction involves separating or obtaining a desired substance from a raw material, and this is how sugar is obtained from sugar cane or sugar beets.

Therefore, the correct sentence is: Actually, this is just one kind of sugar, called sucrose, which is extracted from sugar cane or sugar beets.

Additional Information

Explanation for the other options:

Rugged does not fit in the given context. It means having a rough or uneven surface, and it does not relate to the process of obtaining sugar from sugar cane or sugar beets.

Shelved refers to the act of placing something on a shelf or removing it from use, which is not relevant to the process of obtaining sugar.

Excavated means to dig out or remove earth or other materials from the ground, which does not relate to the extraction of sugar from sugar cane or sugar beets.

Q100. Answer: (d) naturally

The correct answer is 'Option 4' i.e. 'Naturally'.

Key Points

In the given context, the sentence is discussing the nature of sugar as a carbohydrate and its occurrence in every fruit and vegetable.

The word "naturally" accurately describes the occurrence of sugar in these natural food sources.

It conveys the idea that sugar is naturally present in fruits and vegetables as part of their composition.

Therefore, the correct sentence is: Technically, sugar is a carbohydrate that occurs naturally in every fruit and vegetable.

Additional Information

Explanation for the other options:

Fortunately does not fit in the given context. It refers to a favorable or lucky circumstance, which is unrelated to the occurrence of sugar in fruits and vegetables.

Mentally does not align with the intended meaning. It relates to the mind or mental processes, which is not relevant to the discussion of sugar in fruits and vegetables.

Happily does not convey the intended meaning. It refers to a feeling of happiness or joy, which is unrelated to the occurrence of sugar in natural food sources.

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