RRB NTPC CBT-I Official Paper (Held On: 15 Mar 2021 Shift 1) (Previous Year Paper)

RRB NTPC • 2021 • 100 questions • 90 minutes • Answer key and solutions

Take this paper as a timed mock test

Practise under exam conditions, then review your answers after you submit.

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Q1. If a - 5 = b, then what is the value of |a - b| + |b - a| ?

(a) 5
(b) 10
(c) 0
(d) -5

Q2. A car covers a distance of 600 m in 5 min. What is the speed of car?

(a) 8.2 km/h
(b) 8.5 km/h
(c) 7.2 km/h
(d) 9.2 km/h

Q3. If x = 25 and y = 13 then find

$\sqrt{(x^2-2xy + y^2)}$

(a) 10
(b) 38
(c) 13
(d) 12

Q4. The Kullu valley with the Lahaul and Spiti valleys in Himachal Pradesh in connected by the _____.

(a) Mayali pass
(b) Nathula pass
(c) Rohtang pass
(d) Bara-Lacha pass

Q5. What would be the highest value of X in the given equation?

5Y6 + 6X7 + 3Z8 = 1511

(a) 6
(b) 7
(c) 9
(d) 5

Q6. A circle of radius 8 cm circumscribed a square. The length of the side of the square is:

(a) 2{ √(2) } cm
(b) 6{ √(2) }cm
(c) 4{ √(2) }cm
(d) 8{ √(2) } cm

Q7. Which of the following is a 'Maharatna' company?

(a) Hindustan Aeronautics Limited
(b) Oil India Limited
(c) Bharat Petroleum Corporation Limited

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(d) Bharat Electronics Limited (BEL)

Q8. If the difference between the compound interest and the simple interest on a certain sum of money for 2 years at 5% per annum is Rs. 16.32, find the sum (in Rs.)

(a) 6,538
(b) 6,529
(c) 6,526
(d) 6,528

Q9. Select the option that will fill in the blank and complete the given series.

A9B, B125C, C49D, D729E, _____

(a) G221H
(b) F122G
(c) E36F
(d) E121F

Q10. Walking at the rate of 3 km/h a man covers a certain distance in 8 hours. If the man runs at a speed of 16 km/h, then how much time will he take to cover the same distance?

(a) 1.5 hours
(b) 2 hours
(c) 1 hour
(d) 2.5 hours

Q11. Durand cup is associated with which game?

(a) Hockey
(b) Football
(c) Table tennis
(d) Basket ball

Q12. The original name of Mahabharata is:

(a) Jaya Samhita
(b) Bhrigu Samhita
(c) Shiva Samhita
(d) Sushruta Samhita

Q13. The battle of Haldighati was fought in:

(a) 1568
(b) 1584
(c) 1576
(d) 1552

Q14. Divide Rs. 20,609 between A and B, such that the amount (in Rs) of A after 7 years is equal to the amount (in Rs) of B after 9 years, if the interest being compounded yearly at 3% per annum.

(a) A = Rs 10,605 B = Rs 10,004
(b) A = Rs 10,601 B = Rs 10,008
(c) A = Rs 10,509 B = Rs 10,100
(d) A = Rs 10,609 B = Rs 10,000

Q15. The power of the President to promulgate ordinance during recess of the parliament is given in which article of the Indian Constitution?

(a) Article 123
(b) Article 63
(c) Article 352
(d) Article 52

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Q16. In which country did the environment ministers of the G7 nations meet in 2019 to discuss alarming report on the state of the planet?

(a) Germany
(b) Canada
(c) France
(d) Italy

Q17. In a certain code language, SCHOOL is coded as the number 72. What number will FLOWER be coded as in that language?

(a) 89
(b) 79
(c) 54
(d) 71

Q18. Which of the following is membrance-bound sac filled with digestive enzymes?

(a) Mitochondria
(b) Lysosomes
(c) Golgi apparatus
(d) Vacuoles

Q19. Mouse and _____ are also examples of input devices.

(a) Speakers
(b) Printer
(c) Scanner
(d) Monitor

Q20. What is the name of the engineer who brought to light the ruins at Hampi?

(a) Matthew Boulton
(b) Edward Barlow
(c) James Atkinson
(d) Colonel Colin Mackenzie

Q21. Pick the odd one out.

Eastern Railway, Western Railway, West Coast Railway, East Coast Railway

(a) Eastern Railway
(b) West Coast Railway
(c) East Coast Railway
(d) Western Railway

Q22. If today is a Tuesday, what will be the 64^(th) day from today?

(a) Tuesday
(b) Thursday
(c) Wednesday
(d) Friday

Q23. Kolkata metro rail was opened for commercial services in _____.

(a) 1980
(b) 1984
(c) 2004
(d) 1992

Q24. Cobalt is present in which vitamin?

(a) Vitamin B1
(b) Vitamin B5
(c) Vitamin B3

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(d) Vitamin B12

Q25. Find the value of √(587/9)

(a) 77/9
(b) 27/9
(c) 22/3
(d) 72/3

Q26. A and B can complete a piece of work in 56 and 70 days respectively. They began the work together but A left after some days and B finished the remaining work in 34 days. After how many days did A leave?

(a) 12
(b) 15
(c) 16
(d) 9

Q27. If p : q = 9 : 2, then find the ration (4p + 7q) : (4p - 7q)

(a) 50 : 13
(b) 25 : 11
(c) 11 : 13
(d) 11 : 6

Q28. Ozone layer thickness is measured in:

(a) Dobson unit
(b) decibels
(c) del unit
(d) Sievert unit

Q29. Tulughama is a:

(a) water conservation method used by Akbar
(b) punishment given to criminals by Jahangir
(c) military strategy used by Babur
(d) tax imposed by Jahangir

Q30. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

1) All goats are cats.

2) All cats are rats.

Conclusions:

1) Some rats are cats

2) All rats are goat

(a) Only conclusions 2 follows
(b) Neither conclusion 1 nor 2 follows
(c) Only conclusion 1 follows
(d) Both conclusions follow

Q31. Dholavira is in the State of:

(a) Jharkhand
(b) Gujarat
(c) Rajasthan
(d) Chhattisgarh

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Q32. Select the option that is related to the third term in the same way as the second term is related to the first term.

15 August : Freedom :: 26 January : ?

(a) Secularism
(b) Parliament
(c) Democracy
(d) Constitution

Q33. The second schedule of the Indian constitution deals with:

(a) Forms of oaths and affirmations
(b) List of states & union territories
(c) Allocation of seats in council of states
(d) Salary of President, Governors, Chief Judges, Judges of High Court and Supreme Court

Q34. _____ was the largest producer of Uranium in the world in 2019.

(a) Russia
(b) Australia
(c) Kazakhstan
(d) Namibia

Q35. The Ramsar Convention is for the:

(a) conservation of soil fertility
(b) conservation of tropical forests
(c) conservation of wetlands
(d) control of ozone layer depletion

Q36. The selling price of 150 items is equal to the cost price of 125 items. What will be the percentage loss?

(a) {16}{(2)/(3)}
(b) {15}{(1)/(3)}
(c) {11}{(1)/(9)}
(d) {16}{(1)/(3)}

Q37. What will be the correct sequence of the following words if they are arranged as per their order in an English dictionary?

Process, Possess, Purpose, Propose

(a) Possess, Purpose, Propose, Process
(b) Possess, Propose, Process, Purpose
(c) Possess, Process, Purpose, Propose
(d) Possess, Process, Propose, Purpose

Q38. Find the value of x.

11/5 – 32/4 ÷ 13/4 ÷ (x + 31/8) ÷ 11/7 = 1

(a) x = 33/8
(b) x = 75/8
(c) x = 55/8
(d) x = 35/8

Q39. Find the second term in a sequence of number that leaves the remainders 1, 2 and 7 when divided by 2, 3 and 8 respectively.

(a) 38
(b) 37
(c) 48
(d) 47

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Q40. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

1) All boys are chefs.

2) All chefs are villagers.

Conclusions:

1) All boys are villages.

2) All Chefs are boys

(a) Only conclusion 2 follows
(b) Neither conclusion 1 nor 2 follows
(c) Only conclusion 1 follows
(d) Both the conclusions follow

Q41. August Kranti is also known as the _____ Movement.

(a) Khilafat
(b) Quit India
(c) Home Rule
(d) Swadeshi

Q42. What is the value of sin 15o ?

(a) (√6 - √2)/3
(b) (√3 - √2)/4
(c) (√6 - √2)/2
(d) (√6 - √2)/4

Q43. Select the number that will come next in the following series.

2, 6, 12, 20, ?

(a) 30
(b) 35
(c) 28
(d) 25

Q44. Select the number that will come next in the following series.

4, 27, 16, 125, ?

(a) 36
(b) 18
(c) 216
(d) 24

Q45. Find the value of ab, if a + b = 5 and $a^2 – b^2 = 75$

(a) 25
(b) 50
(c) -50
(d) 10

Q46. _____ is a sulphur containing amino acid.

(a) Cysteine
(b) Histidine
(c) Tryptophan
(d) Serine

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Q47. The system of scientific naming or nomenclature of organism which we use today was introduced by which of the following scientists?

(a) George Washington Carver
(b) Carolus Linnaeus
(c) Marie Curie
(d) Charles Darwin

Q48. A sucrose molecule contains _____ carbon atoms.

(a) 15
(b) 18
(c) 6
(d) 12

Q49. Who among the following was one of the finest calligraphers at Akbar's court, who was honoured with the title 'Zarrin Qalam' (golden pen)?

(a) Abul Fazal
(b) Muhammad Husayn
(c) Daswant
(d) Basawan

Q50. Which of the following Indian states has minimum area?

(a) Rajasthan
(b) Maharashtra
(c) Uttar Pradesh
(d) Madhya Pradesh

Q51. Article 17 of the Indian Constitution enforces the :

(a) right to education
(b) right to freedom of religion
(c) joint sitting of both houses in certain cases
(d) abolition of the practice of untouchability

Q52. X - band synthetic aperture radar has been used in which satellite?

(a) CARTOSAT-2B
(b) RISAT-2B
(c) INSAT-4B
(d) GSAT-12

Q53. Find the value of $3(x + y)$ if $x = (\sqrt{3} + 1)/(\sqrt{3} - 1)$ and $y = (\sqrt{3} - 1)/(\sqrt{3} + 1)$

(a) 10
(b) 8
(c) 12
(d) 13

Q54. EMISAT is which type of satellite launched by ISRO?

(a) Remote-sensing satellite
(b) Communications satellite
(c) Navigation satellite
(d) Intelligence satellite

Q55. 10 nibbles are equal to _____ bits.

(a) 60
(b) 40
(c) 20
(d) 80

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Q56. National Highways Authority of India (NHAI) was set up in:

(a) 2014
(b) 2002
(c) 1952
(d) 1988

Q57. A square park is surrounded by a path of uniform width 1.5 m all around it. The area of the path is 225 m2. Find the perimeter of the park.

(a) 144 m
(b) 144.5 m
(c) 143 m
(d) 142 m

Q58. 82% of a number is 738. What is 90% of that number?

(a) 900
(b) 820
(c) 802
(d) 810

Q59. Consider 4^(th) march to be a Wednesday in 2018. What day of the week will it be on 7^(th) March in 2019?

(a) Sunday
(b) Monday
(c) Tuesday
(d) Wednesday

Q60. National Environmental Engineering Research Institute (NEERI) is located at:

(a) Pune
(b) Nainital
(c) Indore
(d) Nagpur

Q61. If a sum invested at simple interest, triples itself in 8 years, how many times of itself will it be in 12 years?

(a) 3.5 times
(b) 4 times
(c) 5 times
(d) 3 times

Q62. If $(a^2 + 1/(a^2)) = 18$ then find $(a - 1/a)$

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

Q63. Which of the following is NOT correctly matched?

(a) Surat - Tapti river
(b) Lucknow - Gomati river
(c) Ujjain - Kshipra river
(d) Jabalpur - Jhelum river

Q64. Who won "All England Open Badminton Championships 2019" Men's Singles Title?

(a) Mohammad Ahsan
(b) Hendra Setiawan
(c) Kento Momota
(d) Chen Yufei

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Q65. Damodar Valley Corporation operates:

(a) fertilizer plants
(b) cement plants
(c) thermal power stations
(d) pesticide plants

Q66. The domain of cosec x is:

(a) R – {nπ|n in Z }
(b) R – {2nπ|n in Z }
(c) {nπ|n in Z }
(d) {2nπ|n in Z }

Q67. Which of the following is a prime number?

(a) 213
(b) 173
(c) 123
(d) 143

Q68. The values of the mode and the mean are 25.2 and 27.5 respectively in a moderately asymmetrical distribution. Find the value of the median of the distribution.

(a) 26.75
(b) 26.70
(c) 26.20
(d) 26.73

Q69. Select the option that will fill in the blank and complete the given series.

MU, KS, IQ, GO,___

(a) EL
(b) DM
(c) IQ
(d) EM

Q70. Which of the following in NOT a GST rate slab in India?

(a) 18%
(b) 28%
(c) 5%
(d) 10%

Q71. Select the option that is related to the third term in the same way as the second term is related to the first term.

Music : Concert :: Acting : ?

(a) Theatre
(b) Song
(c) Gymnastic
(d) Dance

Q72. Pick the odd one out.

Cow, Goat, Rabbit, Cat

(a) Cat
(b) Cow
(c) Rabbit
(d) Goat

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Q73. Calculate the mean for following set of values - 2.2, 4.2, 6.4, 8.3, 10.5

(a) 6.50
(b) 6.12
(c) 6.32
(d) 7

Q74. Which Indian state shares borders with China, Nepal and Bhutan?

(a) Mizoram
(b) Nagaland
(c) Sikkim
(d) Arunachal Pradesh

Q75. Simplify.

1/5.8 + 1/8.11 + 1/11.14 + 1/14.17

(a) 4/17
(b) 4/85
(c) 24/85
(d) 2/85

Q76. Muhammad Yunus was awarded Nobel Peace Prize for pioneering work in the field of _____.

(a) Civil rights
(b) afforestation
(c) Water conservation
(d) microfinance

Q77. If 2x + y = 15, y + 2z = 17 and x + 2y = 9, then the value of 4x + 3y + z = ?

(a) 40
(b) 38
(c) 39
(d) 37

Q78. .PNG file is a/an:

(a) audio file
(b) image file
(c) batch file
(d) video file

Q79. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

RTE has mandated compulsory enrolment of all children of the age 6 to 14 years in the schools.

Assumptions:

I: Enrollment needs to be made compulsory as children don't like education.

II. Each child of the country will get quality Education.

(a) Either assumption I or assumption II is implicit.
(b) Only assumption I is implicit.
(c) Neither assumption I nor assumption II is implicit.
(d) Only assumption II is implicit.

Q80. Which of the following element has maximum density?

(a) Lead
(b) Platinum
(c) Mercury
(d) Osmium

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Q81. Find the number of sides of a regular polygon if each interior angle is 165o.

(a) 22
(b) 24
(c) 20
(d) 26

Q82. Which transport aircraft of the Indian Air Force is certified to fly on blended aviation fuel?

(a) Sukhoi Su-30
(b) AN-32
(c) Mirage 2000
(d) MiG-29

Q83. When 106 is subtracted from a number, it reduces to its 47%. What is 11.5% of that number?

(a) 32
(b) 31
(c) 23
(d) 13

Q84. Find the area of a triangle whose sides are 5 cm, 7 cm and 11 cm.

(a) 12.27 cm2
(b) 12.50 cm2
(c) 12.97 cm2
(d) 12.30 cm2

Q85. The Olympic games of 2024 will be held in _____.

(a) Los Angeles
(b) Ghana
(c) Tokyo
(d) Paris

Q86. Eight friends F1, F2, F3, F4, F5, F6, F7 and F8 are sitting around a circular table facing towards the center (not necessarily in the same order). F2 is not the neighbour of F1 or F8. Only F6 is between F2 and F5. F2 is second to the left of F7, F4 is second to the right of F3. Which of the following could be correct position of F1?

(a) Third to the left of F5
(b) Immediate left of F4
(c) Third to the left of F6
(d) Second to the left of F7

Q87. Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster.

ACEG : PRTV :: SUWY : ?

(a) HJLN
(b) GIKM
(c) HFDM
(d) HKLM

Q88. A question is given, followed by two arguments. Decide which of the arguments is/are strong with respect to the question.

Question:

Should be sale and use of tabacco be completely banned in India?

Arguments:

I. yes. Tobacco causes oral cancer and other diseases

II. No. Millions of workers will lose their jobs.

(a) Both, (I) and (II) are strong.

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(b) Only argument (I) is strong.
(c) Only argument (II) is strong.
(d) Neither (I) nor (II) is strong.

Q89. Seven boxes S, P, L, Q, R, M and N are placed one above the other (not necessarily in the same order). Only three boxes are placed between M and L. M and L are placed neither at the bottom nor at the top. Only two boxes are placed between L and N. S is immediately below R. There is only one box between S and Q. M is placed above L. How many boxes are placed between P and N?
(a) Three
(b) One
(c) Two
(d) Four

Q90. Read the given information carefully and answer the question that follows.
Five children P, Q, R, S, and T, are wearing different coloured clothes, red, yellow, pink, green and purple, but not necessarily in the same order. Each one likes only one fruit out of mangoes, bananas, grapes, apples, and pears. R is in red clothes. Q does not like bananas and grapes. S likes apples and he is in purple clothes. The child in pink coloured clothes likes bananas. T likes mangoes, but is not in green or pink clothes. R likes grapes. Who likes pears?
(a) P
(b) Q
(c) R
(d) S

Q91. Pointing to a photograph, a woman said to a man, "She is the only child of the sister of the only son of your paternal grandfather". How is the man related to the person in the picture?
(a) Brother
(b) Father's Sister's Son
(c) Sister
(d) Mother's Brother's Son

Q92. Pick the odd one out.
Kathmandu, Thimphu, Dhaka, Karachi
(a) Karachi
(b) Dhaka
(c) Kathmandu
(d) Thimphu

Q93. If 24 B 6 B 12 = 42 and 31 B 7 B 13 = 51, then 64 B 9 B 4 = ?
(a) 77
(b) 76
(c) 78
(d) 79

Q94. In a certain code language, 'QZDH' is written as '51', 'PLMQ' is written as '54'. What is the code for 'DNRB' in that code language?
(a) 36
(b) 34
(c) 33
(d) 37

Q95. Select the option that is related to the third letter cluster in the way as the second number is related to the first letter cluster.
ACE : 1925 :: BDF : ?
(a) 41635

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(b) 24661
(c) 42536
(d) 41636

Q96. In a code language, CHILD is written as 412983. How would you write the word ADULT in the same code language?
(a) 124983
(b) 14211220
(c) 142112
(d) 20122141

Q97. Read the given information and answer the question that follows.
C is the sister of F. A is the father of B, husband of E and only son of D. D is the paternal grandfather of F and A does not have any sisters. How many children does A have?
(a) 2
(b) 4
(c) 1
(d) 3

Q98. Select the number from the given options that will replace the question mark in the given series.
2, 4, 3, 3, 9, 6, 4, 16, ?, 5, 25, 15
(a) 18
(b) 15
(c) 10
(d) 20

Q99. Pick the odd one out.
3-6, 4-8, 6-18, 8-32, 10-50
(a) 4-8
(b) 8-32
(c) 6-18
(d) 3-6

Q100. Select the option that is related to the third term in the same way as the second term is related to the first term.
Bed : Pillow :: Sofa : ?
(a) Cushions
(b) Sheets
(c) Covers
(d) Upholstery

ANSWER KEY

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

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SOLUTIONS

Q1. Answer: (b) 10

Given:

If a - 5 = b

Formula Used:

|a - b| + |b - a|

Calculation:

Given a - 5 = b

a = b + 5

Calculate |a - b| :

=> |(b + 5) - b|

=> |5| = 5

|b - a| :

=> |b - (b + 5)|

=> |-5| = 5

Sum of |b - a| :

=> 5 + 5 = 10

The value of |a - b| + |b - a| is 10.

Q2. Answer: (c) 7.2 km/h

Given:

Distance covered by the car = 600 m

Time taken = 5 min

Formula Used:

Speed = Distance / Time

Calculation:

First, convert the time into hours:

Time = 5 min = 5 / 60 hours

=> Time = 1 / 12 hours

Now, convert the distance into kilometers:

Distance = 600 m = 600 / 1000 km

=> Distance = 0.6 km

Now, calculate the speed:

Speed = Distance / Time

=> Speed = 0.6 km / (1 / 12) hours

=> Speed = 0.6 km × 12

=> Speed = 7.2 km/h

The speed of the car is 7.2 km/h.

Q3. Answer: (d) 12

Given:

x = 25 and y = 13

Formula used:

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

Calculation:

By using above identity, we can write:

$\sqrt{(x^2-2xy + y^2)} = \sqrt{((x-y)^2)} = (x - y)$

Now substitute the value of x and y:

(x - y) = (25 - 13) = 12

Option 4 is the correct answer.

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Q4. Answer: (c) Rohtang pass

The correct answer is Rohtang pass

Key Points

• The Rohtang Pass connects the Kullu Valley with the Lahaul and Spiti Valleys of Himachal Pradesh:

• The Rohtang Pass is a high mountain pass in the eastern part of the Pir Panjal Range of the Himalayas, about 51 km from Manali.

• It is at an altitude of 3,979 m.

• The Rohtang Pass links Manali and Leh by road.

• The Rohtang Pass is a gateway to the Lahaul and Spiti Valley

Additional Information

• Nathula Pass

• Located in the Himalayas, this pass connects Sikkim, India with Tibet, China.

• It's one of the highest passes that can be accessed by motor vehicles and offers views of the Himalayas.

• The Old Silk Route used to pass through this pass.

• Bara-Lacha Pass

• Located in the Zanskar range, this pass connects Lahaul district in Himachal Pradesh to Leh district in Ladakh.

• It's one of the highest motor-able mountain passes in the region.

• Mayali Pass is a high-altitude pass in the Bhilangana Valley of the Indian Himalayas

Q5. Answer: (c) 9

Calculation:

Let's break down the numbers as follows:

5Y6, represents a three-digit number where the hundreds digit is 5, the tens digit is Y, and the ones digit is 6.

Thus, it can be written as:

5Y6 = 500 + 10Y + 6

Similarly,

6X7 = 600 + 10X + 7

3Z8 = 300 + 10Z + 8

Substitute these values in the given expression:

=> 5Y6 + 6X7 + 3Z8 = 1511

=> (500 + 10Y + 6) + (600 + 10X + 7) + (300 + 10Z + 8) = 1511

=> 1421 + 10X + 10Y + 10Z = 1511

=> 10X + 10Y + 10Z = 90

Dividing by 9:

=> X + Y + Z = 9

Thus, the maximum possible value of X= 9, when Y = 0 and Z = 0

Option 3 is the correct answer.

Q6. Answer: (d) 8{ √(2) } cm

Shortcut Trick

In a circumscribed circle, the side of the inscribed square is given by the formula:

Side = Radius × √2

Given: Radius (r) = 8 cm

Side = 8 × √2 = 8√2 cm

Therefore The correct answer is 8√2 cm.

Alternate Method

Given:

Radius of the circle (r) = 8 cm

Formula Used:

1. Diameter of circle (D) = 2 × Radius (r)

2. For a square inscribed in a circle, Diagonal of square (d) = Diameter of circle (D)

3. Side of square (a) = Diagonal (d) ÷ √2

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Calculations:

=> Diameter (D) = 2 × 8 = 16 cm

=> Diagonal (d) = 16 cm

=> Side (a) × √2 = 16

=> Side (a) = 16 ÷ √2

=> Side (a) = (8 × 2) ÷ √2 = 8√2 cm

Therefore The correct answer is 8√2 cm.

Additional Information

Circumscribed Circle

When a circle circumscribes a square, the diagonal of the square is equal to the diameter of the circle (d = 2r).

Inscribed Circle

When a circle is inscribed within a square, the side of the square is equal to the diameter of the circle (a = 2r).

Area Comparison

The area of an inscribed square is $2r^2$, while the area of the circumscribing circle is πr^2.

Q7. Answer: (c) Bharat Petroleum Corporation Limited

The correct answer is Bharat Petroleum Corporation Limited

Important Points

• This is the official question asked in RRB NTPC CBT-I Official Paper (Held On: 15 Mar 2021 Shift 1)

• According to it Bharat Petroleum Corporation Limited is the right answer

Key Points

• Maharatna is one of the highest statuses granted to public sector enterprises (PSEs) in India.

• It allows greater financial autonomy and operational freedom to these companies.

• The Maharatna status is granted by the Government of India to public sector companies that meet certain criteria, including having significant financial strength, substantial revenue, and a large market presence.

• Bharat Petroleum Corporation Limited (BPCL) was granted the Maharatna status in 2010.

• As a Maharatna company, BPCL has been granted enhanced autonomy, especially in terms of decision-making for capital expenditure (up to Rs. 5,000 crore without government approval), making it one of the most prominent public sector enterprises in India.

Additional Information

• Oil India Limited (OIL) became a Maharatna Central Public Sector Enterprise (CPSE) on August 3, 2023

• Bharat Electronics Limited (BEL) was granted Navratna status in 2008,

• Hindustan Aeronautics Limited (HAL) became a Maharatna Central Public Sector Enterprise (CPSE) on October 12, 2024.

Q8. Answer: (d) 6,528

Given:

Difference between compound interest and simple interest for 2 years = Rs. 16.32

Rate of interest (R) = 5% per annum

Formula Used:

For 2 years, the difference between compound interest and simple interest on a sum (P) is given by:

Difference = $P \times (R/100)^2$

Calculation:

Let the sum be P.

Difference = $P \times (5/100)^2$

=> $16.32 = P \times (0.05)^2$

=> $16.32 = P \times 0.0025$

=> $P = 16.32 / 0.0025$

=> $P = 6528$

The sum is Rs. 6528.

Q9. Answer: (d) E121F

The logic followed here is:

Hence, the correct answer is "E121F".

Q10. Answer: (a) 1.5 hours

Given:

Speed of walking = 3 km/h.

Time taken while walking = 8 hours.

Speed of running = 16 km/h.

Formula Used:

Distance = Speed × Time

Time = Distance / Speed

Calculation:

Distance covered while walking = 3 km/h × 8 hours

Distance = 24 km

Time taken while running = Distance / Speed

=> Time taken while running = 24 km / 16 km/h

=> Time taken while running = 1.5 hours

The correct answer is option 1

Q11. Answer: (b) Football

The correct answer is Football

Key Points

• The Durand Cup is associated with the game of football:

• The Durand Cup is India's oldest football tournament and Asia's third oldest.

• The first Durand Cup was held in 1888 in Annadale, Shimla.

• Since 1940, the tournament has been played in New Delhi.

• The Durand Football Tournament Society (DFTS) co-hosts the tournament.

• The tournament was originally a football competition for the different departments and regiments of the Indian Armed Forces and the princely states.

• Since independence, several clubs from different regiments of the Indian Armed Forces participate as guest invitees.

Additional Information

• Hockey: The Rangaswamy Cup is associated with hockey.

• Other hockey cups include the Agha Khan Cup, Dhyan Chand Trophy, Beighton Cup, Scindia Gold Cup, and Sultan Azlan Shah Cup.

• Football: The Durand Cup, Subroto Cup, Santosh Cup, FIFA World Cup, and La Liga Cup are all associated with football.

• The Women's FA Cup is the top annual cup tournament for women's clubs in English football.

• Tennis: The Davis Cup and the Grand Slam tournaments (Wimbledon, US Open, Australian Open, and French Open) are associated with tennis.

• The Billi Jean King Cup is associated with women's tennis.

• Basketball: The FIBA Basketball World Cup, Eurobasket, and NBA are associated with basketball.

• Golf: The Canada Cup, Ryder Cup, Walker Cup, and Eisenhower Cup are associated with golf.

• The Solheim Cup is also associated with golf.

• Table tennis: The Corbillon Cup is associated with world table tennis.

• Asian Cup: The Merdeka Cup is associated with the Asian Cup

Q12. Answer: (a) Jaya Samhita

The correct answer is Jaya Samhita

Key Points

• Jaya Samhita is the original name of Mahabharata.

• Mahabharata was written down by Lord Ganesha.

• Mahabharata was narrated by Maharishi Ved Vyasa.

• Mahabharata narrates the struggle between Kaurava and the Pandava princes and their successors.

• Mahabharata is known as "the longest poem ever written"

• Mahabharata was translated in the Persian which was titled "Razmnama", was produced at Akbar's orders, by Faizi and ?Abd al-Qadir Badayuni.

Additional Information

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• Bhrigu Samhita:

• This is an ancient astrological text attributed to the sage Bhrigu.

• It is believed to contain the records of the planetary positions and influences on individuals' lives based on their birth charts.

• The Bhrigu Samhita is highly regarded in Vedic astrology for its predictions and astrological insights, especially in relation to karma and destiny.

• Shiva Samhita:

• The Shiva Samhita is a classical text on yoga and spiritual practice.

• It is attributed to Lord Shiva and is considered one of the major texts in Hatha Yoga.

• It contains detailed instructions on yogic practices, meditation, and the paths to spiritual enlightenment, focusing on the physical and mental benefits of yoga.

• The text is popular among practitioners of traditional Hatha Yoga.

• Sushruta Samhita:

• The Sushruta Samhita is one of the foundational texts of Ayurveda (the ancient system of medicine from India).

• Attributed to the sage Sushruta, it is particularly focused on surgery and surgical techniques.

• The text is known for its detailed descriptions of surgical instruments, procedures, and anatomy, making it one of the earliest works on surgery in the world.

Q13. Answer: (c) 1576

The correct answer is 1576

Key Points

• The Battle of Haldighati was fought on June 18, 1576 at Haldighati, a mountain pass in the Aravalli Range of Rajasthan, India:

• The battle was fought between the forces of the Mughal emperor Akbar and the forces of Maharana Pratap, the Rajput ruler of Mewar:

• Maharana Pratap's forces included cavalry and archers, while the Mughal forces were led by Man Singh I of Amber.

• Result

• The Mughals technically won the battle, but it was considered indecisive because Maharana Pratap was not captured and he continued to fight.

• The Battle of Haldighati is considered a significant event in the history of the Rajputs.

• It is also known for its ambiguous nature, which has left historians to debate the victor.

Q14. Answer: (d) A = Rs 10,609 B = Rs 10,000

Given:

Total amount to be divided = Rs 20,609

Interest rate = 3% per annum compounded yearly

A's amount after 7 years = B's amount after 9 years

Formula Used:

Future Value (FV) = Present Value (PV) × $(1 + r)^n$

Calculation:

Let A's present amount be Rs x and B's present amount be Rs (20,609 - x).

A's amount after 7 years: x × (1 + 0.03)^7

B's amount after 9 years: (20,609 - x) × (1 + 0.03)^9

According to the problem:

x × (1.03)^7 = (20,609 - x) × (1.03)^9

=> x / (20,609 - x) = $(1.03)^2$

=> x / (20,609 - x) = 1.0609

=> x = 1.0609 × (20,609 - x)

=> x = 21,867.5481 - 1.0609x

=> x + 1.0609x = 21,867.5481

=> 2.0609x = 21,867.5481

=> x = 21,867.5481 / 2.0609

=> x ≈ 10,609

Therefore, A's present amount is approximately Rs 10,609 and B's present amount is approximately Rs 10,000.

The correct answer is option 4

Q15. Answer: (a) Article 123

The correct answer is Article 123

Key Points

• The power of the President to promulgate ordinances during the recess of Parliament is given under Article 123 of the Indian Constitution.

• This article grants the President the authority to issue ordinances when either House of Parliament is not in session, provided that immediate action is needed.

• The ordinance must be approved by Parliament within six weeks of reassembling.

Additional Information

• Article 63: This article deals with the office of the Vice-President of India. It states that there shall be a Vice-President of India, who is elected in accordance with the provisions of the Constitution.

• Article 352: This article pertains to the Proclamation of Emergency in India. It allows the President to declare a National Emergency (also called a "War Emergency") if the security of India or any part of it is threatened by war, external aggression, or armed rebellion.

• Article 52: This article states that there shall be a President of India. It provides for the existence of the office of the President and sets the foundation for the executive head of the Indian state.

Q16. Answer: (c) France

The correct answer is France

Key Points

• Environment ministers of the G7 nations met in France, before the release of what is expected to be another alarming report on the state of the planet.

• Ministers from Britain, Canada, France, Germany, Italy, Japan and the US gathered for the two-day meeting in the city of Metz.

• They were due to discuss measures to tackle deforestation, plastic pollution and the degradation of coral reefs.

Additional Information The Group of Seven (G7) is an informal grouping of seven of the world's advanced economies, including Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States, as well as the European Union

Q17. Answer: (b) 79

The logic followed here is:

SCHOOL is coded as the number 72

Similarly, FLOWER will be coded as:

Hence, the correct answer is "79".

Q18. Answer: (b) Lysosomes

The correct answer is Lysosomes

Key Points

• Lysosomes are membrane-bound sacs that contain digestive enzymes:

• Lysosomes are organelles in animal cells that contain enzymes that break down biological polymers like proteins, nucleic acids, carbohydrates, and lipids.

• They are involved in various cell processes, such as breaking down excess or worn-out cell parts.

• Lysosomes are also known as "suicidal bags" because of their phagocytic activity

Additional Information

• Mitochondria, Golgi apparatus, and vacuoles are all organelles found in cells, and each has a specific function:

• Mitochondria

• Known as the "powerhouse of the cell", mitochondria are oval-shaped organelles that convert molecules into energy.

• They are the main site of cellular respiration and store energy as ATP molecules.

• Golgi apparatus

• A stack of flat sacs that modifies and transports proteins and lipids.

• It's also known as the Golgi body or Golgi complex.

• Vacuoles

• Sac-like organelles that store and transport materials in the cell.

• Vacuoles are found in animal, protist, fungus, and bacterial cells, but plant cells have large central vacuoles that help with plant growth.

• Other organelles in cells include:

• Nucleus: The largest organelle, containing the cell's genetic information and controlling the cell's activity
• Chloroplasts: The site of photosynthesis in plants and some algae
• Endoplasmic reticulum: Involved with protein manufacture
• Thylakoid vesicles: Contain chlorophyll, which captures the sun's energy

Q19. Answer: (c) Scanner

The correct answer is Scanner

Key Points

• A mouse and a scanner are both examples of input devices:
• Input devices
• These devices allow users to interact with and control a computer by sending data to it.
• Examples of input devices include keyboards, mice, scanners, joysticks, microphones, and digital cameras.
• Output devices
• These devices receive data from a computer and convert it into a human-readable form.
• Examples of output devices include monitors, printers, speakers, projectors, and plotters.

Q20. Answer: (d) Colonel Colin Mackenzie

The correct answer is Colonel Colin Mackenzie

Key Points

• Colonel Colin Mackenzie was the engineer who discovered the ruins of Hampi in 1800:
• Mackenzie was a British engineer, antiquarian, surveyor, and cartographer who worked for the English East India Company.
• Mackenzie prepared the first survey map of the site, collected manuscripts, and had watercolors painted of the monuments.
• He also gathered information from the priests of the Virupaksha temple and the Pampadevi shrine.
• Mackenzie's work helped bring the ruins of Hampi to the attention of the world, which led to the site's preservation, study, and recognition as a UNESCO World Heritage Site.

Additional Information

• Matthew Boulton (1728–1809):
• An English manufacturer and business partner of James Watt in the development of steam engines.
• Boulton was a key figure in the Industrial Revolution and ran the famous Soho Manufactory in Birmingham, producing metal goods, steam engines, and coins.
• He was also involved in the founding of the Lunar Society of Birmingham.
• Edward Barlow (1626–1705):
• A British naval surgeon, who worked on many ships during the 17th century.
• He is notable for his memoirs detailing his life and the experiences of sailors during his time, offering valuable insight into the medical practices and life at sea during the Age of Sail.
• James Atkinson (1774–1835):
• An English chemist, naturalist, and translator, best known for his work on scientific research and his translations of important texts.
• He contributed to the understanding of the chemistry of gases and also worked in the field of mineralogy.

Q21. Answer: (b) West Coast Railway

The logic followed here is:

Eastern Railway	Zone of Indian Railways
Western Railway	Zone of Indian Railways
East Coast Railway	Zone of Indian Railways
West Coast Railway	Not a Zone of Indian Railways

Eastern Railway, Western Railway, East Coast Railway all are Zones of Indian Railways,

Whereas, West Coast Railway is not a Zone of Indian Railways.

Hence, the correct answer is "West Coast Railway".

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Q22. Answer: (c) Wednesday

As per the question, today is Tuesday.

We have to find the day after 63 days that is the 64^(th) day.

The numbers of odd days in 63 days are

→ 63/7 = 9 weeks (no odd day)

→ 63 days + 0 odd days

The day on the 63^(rd) day is Tuesday.

The day in 64^(th) day will be

Tuesday + 1 day

=> Wednesday

Therefore, the correct answer should be "Option 3: Wednesday".

Q23. Answer: (b) 1984

The correct answer is 1984

Key Points

• The Kolkata Metro opened for commercial services on October 24, 1984:

• The Construction began in 1972

• The first stretch of the metro was between Bhawanipore (now Netaji Bhawan) and Esplanade

• The first stretch was about 3.4 km long

• The Kolkata Metro was India's first operational rapid transit system

• As of 2020, the Kolkata Metro has two operational lines:

• Noapara to Kavi Subhash: This line is 27.22 km long

• Salt Lake Sector V to Phoolbagah: This line is 7.205 km lon

Q24. Answer: (d) Vitamin B12

The correct answer is Vitamin B12

Key Points

• Cobalt is a major component of vitamin B12, also known as cobalamin:

• Vitamin B12 is a large, complex molecule that's not found in plants.

• However, if a diet contains enough cobalt, intestinal and ruminal bacteria can synthesize vitamin B12.

• Adults need about 1.5 micrograms of vitamin B12 per day.

• Vitamin B12 is an important micronutrient for many eukaryotic phytoplankton in the marine environment.

• It's also found in very small quantities in seawater.

Additional Information

• Vitamin B1, B3, and B5 are all B vitamins, which are a group of water-soluble vitamins that play important roles in the body's cellular function:

• Vitamin B1 (thiamin): Also known as vitamin F, this vitamin is a sulfur-containing member of the B complex family.

• Vitamin B3 (niacin): Helps the body release energy from food and keeps the nervous system and skin healthy.

• Vitamin B5 (pantothenic acid): One of the eight B vitamins that make up the B complex.

• Here are some other B vitamins:

• Vitamin B2 (riboflavin): Involved in oxidation and reduction reactions

• Vitamin B6 (pyridoxine): Can cause anemia, depression, dermatitis, confusion, skin rashes, and infection if deficient

• Vitamin B7 (biotin): Part of the B complex

• Vitamin B9 (folate): Works with vitamin B12 to synthesize nucleic acid

Q25. Answer: (d) 72/3

Formula used:

Converting mixed fraction into improper fraction.

Calculation:

Convert the mixed fraction improper fraction

=> 587/9 = 58+7/9 = 529/9

Now, the given expression,

√(587/9) = √(529/9) = 23/3

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Again converting improper fraction to mixed fraction,

23/3 = 72/3

Option 4 is the correct answer.

Q26. Answer: (c) 16

Given:

A takes time to do a work = 56 days.

B takes time to do the same work = 70 days.

They start the work together.

A left after some days and B finished the remaining work in 34 days.

Formula used:

A will do work in one day = (1/56) of the work.

B will do work in one day = (1/70) of the work.

Calculation:

If they work together then they will do work in one day = (1/56 + 1/70) of the work

=>9/280 of the work B has completed the work in 34 days after A leaving the work in the middle.

B can do in one day = 1/70 of the work.

So in 34 days, he can do = 34/70 of work.

So work completed by A and B together is = 1 - 34/70 = 36/70

They together can do in one day = 9/280 of work

They have completed together 36/70 work

So the number of days they work together = (36/70) / (9/280) => 36/70 × 280/9 = 16 days

Therefore A left the work after 16 days.

Q27. Answer: (b) 25 : 11

Given:

p : q = 9 : 2

Formula Used:

Ratio (4p + 7q) : (4p - 7q)

Calculation:

Let p = 9k and q = 2k

4p + 7q = 4 × 9k + 7 × 2k

4p + 7q = 36k + 14k

4p + 7q = 50k

4p - 7q = 4 × 9k - 7 × 2k

4p - 7q = 36k - 14k

4p - 7q = 22k

Ratio (4p + 7q) : (4p - 7q)

=> (50k)/(22k)

=> 50/22

=> 25/11

The ratio (4p + 7q) : (4p - 7q) is 25 : 11

Q28. Answer: (a) Dobson unit

The correct answer is Dobson Unit

Key Points

• The thickness of the ozone layer is measured in Dobson units (DU):

• A DU is a unit of measurement for the total amount of ozone in a vertical column of air above the Earth's surface. It's a convenient way to describe how much ozone would be in a column if it were squeezed into a single layer.

• One DU is equal to the amount of ozone that would form a layer 1 mm thick at sea level if compressed at Standard Temperature and Pressure (STP).

• What is the average ozone layer thickness?

• The average amount of ozone in the atmosphere is about 300 DU, which is equivalent to a layer 3 mm thick.

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• British meteorologist G. M. B. Dobson developed a spectrophotometer that could measure stratospheric ozone from the ground.

• He also established a worldwide network of ozone monitoring stations between 1928 and 1958.

Additional Information

• Decibels are a unit of measurement used to express the intensity of sound or the power level of an electrical signal on a logarithmic scale.

• Del Unit

• This term isn't standard or widely recognized in scientific contexts.

• You may mean something like a "Dalton (Da)" (used for atomic mass) or a "unit related to mechanics".

• Sievert (Sv)

• The Sievert is the SI unit of equivalent radiation dose.

• It measures the health effect of ionizing radiation on the human body

• Formula:

• Sievert=absorbed dose (Gray)×radiation weighting factor

Q29. Answer: (c) military strategy used by Babur

The correct answer is the military strategy used by Babur

Key Points

• Tulughama was a military tactic employed by Babur, the founder of the Mughal Empire in India.

• This strategy involved dividing his army into multiple units and using flanking maneuvers to encircle and attack the enemy from multiple directions.

• This technique was effectively used in the Battle of Panipat (1526) and other battles to defeat larger armies.

• The term refers to a flanking and encirclement tactic that divided the army into three key parts:

• Central Force (Main Body): This group formed the core of the army and held the main battle line. It was tasked with engaging the enemy head-on.

• Flanking Forces (Left and Right Wings): These units were mobile and positioned to move swiftly around the enemy.

• Reserve Force (Ambushers): This group was hidden or positioned strategically to attack unexpectedly.

• The main idea was to simulate a retreat by certain parts of the army, luring the enemy into disarray.

• While the enemy pursued the "retreating" forces, the flanking units and reserves would close in, surround them, and attack from multiple directions.

Q30. Answer: (c) Only conclusion 1 follows

Statements:

1) All goats are cats.

2) All cats are rats.

The least possible Venn diagram:

Conclusions:

1) Some rats are cats - True (Because All cats are rats given. So, Some rats are cats it is definite)

2) All rats are goat - False (Because All goats are cats and All cats are rats given. So, All rats are goat it is not definite)

So, Only conclusion 1 follows.

Hence, the correct answer is "Only conclusion 1 follows".

Q31. Answer: (b) Gujarat

The correct answer is Gujarat

Key Points

• Dholavira is situated in Gujarat.

• Dholavira, an archaeological site, is associated with the Indus Valley Civilization period.

• Dholavira is an archaeological site at Khadirbet in Bhachau Taluka of Kutch District, in the state of Gujarat in western India, which has taken its name from a modern-day village 1 kilometer south of it.

• This village is 165 km from Radhanpur.

• Also known locally as Kotada timba, the site contains ruins of an ancient Indus Valley Civilization/Harappan city.

• Dholavira's location is on the Tropic of Cancer.

Additional Information

• Dholavira site was discovered in 1967-68 by J. P. Joshi, of the Archaeological Survey of India (ASI), and is the fifth largest of eight major Harappan sites.

• The other major Harappan sites discovered so far are Harappa, Mohenjo-daro, Ganeriwala, Rakhigarhi, Kalibangan, Rupnagar and Lothal.

Q32. Answer: (d) Constitution

The logic followed here is:

Logic: National significance of dates.

Here,

15 August : Freedom → 15 August is the day India gained Freedom.

Similarly,

26 January : Constitution → 26 January is the day India adopted its Constitution.

Hence, the correct answer is "Option 4".

Q33. Answer: (d) Salary of President, Governors, Chief Judges, Judges of High Court and Supreme Court

The correct answer is Salary of President, Governors, Chief Judges, Judges of High Court and Supreme Court.

Key Points

• The Second Schedule of the Indian Constitution specifies the emoluments for the highest constitutional offices in India.

• This schedule details the salaries and allowances of the President, Governors, Judges of Supreme Court and High Courts, and the Comptroller and Auditor General of India.

• The intention is to ensure that these key officials receive fair remuneration that reflects their responsibilities and the importance of their roles in governance.

• Amendments to this schedule can be made by the Parliament as per Article 360 of the Indian Constitution, ensuring that the salaries remain relevant and appropriate over time.

Additional Information

• Forms of oaths and affirmations:

• These are covered under the Third Schedule of the Indian Constitution.

• It includes the oaths or affirmations for Union Ministers, Parliament members, judges, etc.

• List of states & union territories:

• These are described in the First Schedule of the Indian Constitution.

• It provides details on the territories of the states and union territories, including any changes to their boundaries.

• Allocation of seats in council of states:

• This is outlined in the Fourth Schedule of the Indian Constitution.

• It specifies the number of seats allotted to each state and union territory in the Rajya Sabha (Council of States).

• Salary of President, Governors, Chief Judges, Judges of High Court and Supreme Court:

• Covered under the Second Schedule, it ensures that these important offices are compensated appropriately.

• This includes provisions for their pensions and allowances in addition to their salaries.

Q34. Answer: (c) Kazakhstan

Here is the source code for the provided question:

The correct answer is Kazakhstan.

Key Points

• Kazakhstan was the largest producer of uranium in the world in 2019, producing approximately 22,808 tonnes of uranium, which accounts for 42% of the world's total production.

• The country has the largest uranium reserves in the world, which makes it a leading player in the global uranium market.

• Kazakhstan's uranium production is managed by the state-owned company Kazatomprom, which is the largest uranium producer in the world.

• The country's uranium industry is a significant contributor to its economy, providing employment and generating substantial revenue from exports.

Additional Information

• Uranium

• Uranium is a heavy metal that has been used as an abundant source of concentrated energy for over 60 years.

• It is a key element used in nuclear reactors to generate electricity.

• Uranium-235, an isotope of uranium, is used as fuel in nuclear reactors because it is easily split apart in the process of nuclear

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fission.

• Uranium mining involves extracting uranium ore from the ground, which is then processed to produce yellowcake, a type of uranium concentrate powder.

• Kazatomprom

• Kazatomprom is the national atomic company of Kazakhstan and the world's largest producer of uranium.

• It was founded in 1997 and is headquartered in Astana, Kazakhstan.

• Kazatomprom operates through its subsidiaries and joint ventures in uranium mining, processing, and nuclear fuel production.

• The company adheres to international standards of environmental protection and safety in its operations.

• Global Uranium Market

• The global uranium market is driven by the demand for nuclear energy, which provides a significant portion of the world's electricity.

• Major uranium-producing countries include Kazakhstan, Canada, Australia, Namibia, and Russia.

• The price of uranium is influenced by factors such as supply and demand, geopolitical events, and regulatory changes in the nuclear power industry.

• Uranium is traded on the global market, and its price is often quoted in terms of dollars per pound of U3O8 (triuranium octoxide).

Q35. Answer: (c) conservation of wetlands

The correct answer is conservation of wetlands.

Key Points

• The Ramsar Convention, also known as the Convention on Wetlands, is an international treaty adopted on 2 February 1971, in the Iranian city of Ramsar.

• The primary aim of the convention is to conserve and ensure the sustainable use of wetlands through local, national, and international cooperation.

• Wetlands are critical ecosystems that provide a range of ecological services such as water filtration, flood control, and habitat for diverse species.

• The convention also promotes the designation of wetlands of international importance (Ramsar Sites) and encourages countries to manage them effectively.

Additional Information

• Convention on Biological Diversity (CBD)

• The CBD is an international treaty aimed at conserving biological diversity, promoting sustainable use of its components, and ensuring the fair and equitable sharing of benefits arising from genetic resources.

• It was adopted during the Earth Summit in Rio de Janeiro in 1992 and entered into force in December 1993.

• The CBD has three main objectives: the conservation of biodiversity, sustainable use of its components, and the equitable sharing of benefits from the use of genetic resources.

• The treaty is legally binding, and countries that are parties to the CBD are required to implement its provisions.

• Montreal Protocol

• The Montreal Protocol on Substances that Deplete the Ozone Layer is an international treaty designed to protect the ozone layer by phasing out the production and consumption of ozone-depleting substances (ODS).

• It was agreed upon on 16 September 1987 and entered into force on 1 January 1989.

• The protocol has been successful in reducing the global production and consumption of ODS, leading to a gradual recovery of the ozone layer.

• The treaty is considered one of the most successful environmental agreements, with universal ratification by all countries.

• United Nations Framework Convention on Climate Change (UNFCCC)

• The UNFCCC is an international environmental treaty aimed at addressing climate change by reducing greenhouse gas emissions and enhancing global responses to climate change.

• It was adopted at the Earth Summit in Rio de Janeiro in 1992 and entered into force on 21 March 1994.

• The treaty established a framework for negotiating specific international treaties (protocols) that may set binding limits on greenhouse gas emissions.

• The Kyoto Protocol and the Paris Agreement are two significant agreements under the UNFCCC framework.

Q36. Answer: (a) {16}{(2)/(3)}

html

Given:

The selling price of 150 items is equal to the cost price of 125 items.

Formula Used:

Percentage Loss = (Cost Price - Selling Price)/(Cost Price) × 100
Calculation:
Let the cost price of 1 item be C.
Cost price of 125 items = 125 × C
Selling price of 150 items = 125 × C
Selling price of 1 item = 125C/150
Selling price of 1 item = 5C/6
Loss per item = C - 5C/6
Loss per item = C/6
Percentage Loss = (C/6)/C × 100
Percentage Loss = 1/6 × 100
Percentage Loss = 162/3%
The percentage loss is 16²/3%.

Q37. Answer: (d) Possess, Process, Propose, Purpose

The correct Dictionary order is:
1. Possess
2. Process
3. Propose
4. Purpose
Hence, the correct answer is "Option 4".

Q38. Answer: (c) x = 55/8

Calculation:
From the given expression, we can defined the range of x:
x ≠ - (25/8)
Convert the mixed fraction into improper fraction:
6/5 - 14/5 ÷7/4 ÷(x+25/8) ÷ 8/7=1
Convert division into multiplication by reciprocate the fraction,
6/5 - 14/5 .4/7 ÷(x+25/8). 7/8=1
Cancel out the common factors,
6/5 - 14.(1/(8x +25)) =1
• (14/(8x +25)) =1 - 6/5
• 14/(8x +25) =- 1/5
Change the sign on both the side of equation,
14/(8x +25) = 1/5
70 = 8x + 25
-8x = 25 - 70
-8x = -45
x = 45/8
convert the improper fraction into a mixed fraction.
x = 55/8
Option 3 is the correct answer.

Q39. Answer: (d) 47

Given:
A sequence of numbers leaves the remainders 1, 2, and 7 when divided by 2, 3, and 8 respectively.
Formula Used:
Chinese Remainder Theorem for solving simultaneous congruences:
x ≡ a1 mod n1
x ≡ a2 mod n2
x ≡ a3 mod n3
Calculation:

We need to find the smallest positive integer x such that:

$x \equiv 1 \mod 2$

$x \equiv 2 \mod 3$

$x \equiv 7 \mod 8$

Let's solve the first two congruences:

$x \equiv 1 \mod 2 \Rightarrow x = 2k + 1$ for some integer k.

Substitute in the second congruence:

$2k + 1 \equiv 2 \mod 3$

$2k \equiv 1 \mod 3$

$k \equiv 2 \mod 3$ (since the multiplicative inverse of 2 mod 3 is 2)

$k = 3m + 2$ for some integer m.

Substitute back:

$x = 2(3m + 2) + 1$

$x = 6m + 5$

Now, consider the third congruence:

$6m + 5 \equiv 7 \mod 8$

$6m \equiv 2 \mod 8$

$3m \equiv 1 \mod 4$ (since $6 \equiv 3 \mod 8$)

$m \equiv 3 \mod 4$ (since the multiplicative inverse of 3 mod 4 is 3)

$m = 4n + 3$ for some integer n.

Substitute back:

$x = 6(4n + 3) + 5$

$x = 24n + 18 + 5$

$x = 24n + 23$

Thus, the sequence is of the form $x = 24n + 23$.

We need the second term in this sequence:

For n = 1 :

$x = 24(1) + 23$

$x = 47$

The second term in the sequence is 47.

Q40. Answer: (c) Only conclusion 1 follows

Statements:

1) All boys are chefs.

2) All chefs are villagers.

The least possible Venn diagram:

Conclusions:

1) All boys are villages. - True (Because All boys are chefs and All chefs are villagers. So, All boys are villages it is definite)

2) All Chefs are boys - False (Because All boys are chefs. So, All Chefs are boys it cannot be possible)

So, Only conclusion 1 follows.

Hence, the correct answer is "Only conclusion 1 follows".

Q41. Answer: (b) Quit India

The correct answer is Quit India.

Key Points

• The Quit India Movement, also known as the August Kranti, was launched by Mahatma Gandhi on 8 August 1942 during World War II, demanding an end to British rule in India.

• The movement was a mass protest involving millions of Indians, including significant participation from students, workers, and peasants.

• Gandhi gave the call for "Do or Die" in his Quit India speech delivered at the Gowalia Tank Maidan in Mumbai.

• Despite the British government's severe repression, the movement marked a crucial turning point in the Indian independence struggle, galvanizing the Indian population against colonial rule.

Additional Information

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• Khilafat Movement

• The Khilafat Movement (1919-1924) was a pan-Islamist political campaign launched by Muslims in British India to influence the British government and protect the Ottoman Caliphate after World War I.

• It was initiated by leaders like Maulana Shaukat Ali, Maulana Mohammad Ali Jauhar, and Abul Kalam Azad.

• The movement also aimed to bring Hindus and Muslims together in the struggle against British colonial rule.

• However, it lost momentum after the abolition of the Caliphate in Turkey in 1924.

• Home Rule Movement

• The Home Rule Movement was led by Bal Gangadhar Tilak and Annie Besant between 1916 and 1918.

• It aimed at achieving self-governance within the British Empire for India.

• The movement used a moderate approach, focusing on petitions and public meetings to build national consciousness.

• It laid the groundwork for more radical movements and played a key role in uniting Indian leaders and the public.

• Swadeshi Movement

• The Swadeshi Movement was part of the Indian independence movement and was a response to the British Partition of Bengal in 1905.

• It encouraged Indians to boycott British goods and promote Indian-made products.

• The movement saw the rise of nationalistic pride and economic self-sufficiency.

• It also led to the establishment of various indigenous industries, schools, and national institutions.

Q42. Answer: (d) (√6 - √2)/4

Given:

We need to find the value of sin 15^o.

Formula Used:

sin (A - B) = sin A cos B - cos A sin B

Calculation:

We can use the angle subtraction formula for sine:

15^o = 45^o - 30^o

So,

sin 15^o = sin (45^o - 30^o)

Using the angle subtraction formula:

sin (45^o - 30^o) = sin 45^o cos 30^o - cos 45^o sin 30^o

We know that:

sin 45^o = (√(2))/2

cos 30^o = (√(3))/2

cos 45^o = (√(2))/2

sin 30^o = 1/2

So,

sin 15^o = (√(2))/2 × (√(3))/2 - (√(2))/2 × 1/2

=> sin 15^o = (√(6))/4 - (√(2))/4

=> sin 15^o = (√(6) - √(2))/4

The value of sin 15^o is (√6 - √2)/4

Q43. Answer: (a) 30

The logic followed here is:

Hence, the correct answer is "30".

Q44. Answer: (a) 36

The logic followed here is:

Hence, the correct answer is "36".

Q45. Answer: (c) -50

Given:

a + b = 5

$a^2 – b^2 = 75$

Formula Used:

$a^2 – b^2 = (a + b)(a – b)$

Calculation:

Given: $a + b = 5$

$a^2 – b^2 = 75$

Using the formula: $a^2 – b^2 = (a + b)(a – b)$

$\Rightarrow 75 = 5(a – b)$

$\Rightarrow a – b = 75 / 5$

$\Rightarrow a – b = 15$

Now, we have the system of equations:

1) $a + b = 5$

2) $a – b = 15$

Adding the two equations:

$\Rightarrow (a + b) + (a – b) = 5 + 15$

$\Rightarrow 2a = 20$

$\Rightarrow a = 20 / 2$

$\Rightarrow a = 10$

Substituting the value of a in $a + b = 5$:

$\Rightarrow 10 + b = 5$

$\Rightarrow b = 5 – 10$

$\Rightarrow b = -5$

Therefore, $a = 10$ and $b = -5$

Finding the value of ab:

$ab = 10 \times (-5)$

$ab = -50$

The value of ab is -50.

The correct answer is option 3.

Q46. Answer: (a) Cysteine

The correct answer is Cysteine.

Key Points

• Cysteine is an amino acid that contains sulfur in its structure.

• It is one of the non-essential amino acids, which means the body can synthesize it.

• Cysteine plays a crucial role in the biosynthesis of proteins, glutathione, and coenzyme A.

• It is important for the stability of protein structures due to the formation of disulfide bonds.

Additional Information

• Amino Acids

• Amino acids are organic compounds that combine to form proteins, which are the building blocks of life.

• There are 20 standard amino acids, which can be categorized into essential and non-essential amino acids.

• Essential amino acids cannot be made by the body and must be obtained from the diet.

• Non-essential amino acids can be synthesized by the body.

• Sulfur-Containing Amino Acids

• Two of the 20 standard amino acids contain sulfur: cysteine and methionine.

• Sulfur-containing amino acids are important for various metabolic processes and the synthesis of important biomolecules.

• They are also crucial for the structure and function of proteins.

• Cysteine

• Cysteine is involved in the detoxification processes in the liver.

• It is a precursor to the antioxidant glutathione, which helps protect cells from oxidative damage.

• Cysteine is also involved in the formation of disulfide bonds, which help stabilize the three-dimensional structure of proteins.

• Disulfide Bonds

• Disulfide bonds are covalent bonds that form between the sulfur atoms of two cysteine residues within or between protein molecules.

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• They play a critical role in maintaining the stability and functionality of proteins.

• The formation of disulfide bonds is a post-translational modification that occurs in the endoplasmic reticulum.

Q47. Answer: (b) Carolus Linnaeus

The correct answer is Carolus Linnaeus.

Key Points

• Carolus Linnaeus, also known as Carl Linnaeus, was a Swedish botanist, physician, and zoologist who formalized the modern system of naming organisms called binomial nomenclature.

• Linnaeus is often referred to as the "father of modern taxonomy" because of his significant contributions to the classification of living organisms.

• His work "Systema Naturae," published in 1735, laid the foundation for the naming and classification of plants and animals.

• In the Linnaean system, each organism is given a two-part Latin name consisting of the genus name and the species name, which provides a unique identifier for each species.

Additional Information

• Binomial Nomenclature:

• Binomial nomenclature is a formal system of naming species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms.

• The first part of the name identifies the genus to which the species belongs, and the second part identifies the species within the genus.

• This system of naming ensures that each species has a unique and universally accepted scientific name.

• For example, the scientific name for humans is Homo sapiens, where Homo is the genus and sapiens is the species.

• Taxonomy:

• Taxonomy is the science of defining and naming groups of biological organisms on the basis of shared characteristics.

• Organisms are grouped into taxa and these groups are given a taxonomic rank; groups of a given rank can be aggregated to form a super group of higher rank, thus creating a taxonomic hierarchy.

• The principal ranks in modern use are domain, kingdom, phylum, class, order, family, genus, and species.

• Systema Naturae:

• Systema Naturae is one of the major works of Carl Linnaeus and introduced the Linnaean taxonomy.

• The first edition was published in 1735, and it underwent many revisions throughout Linnaeus's life.

• It classified thousands of species of plants and animals and laid the groundwork for modern biological classification.

• Importance of Scientific Naming:

• Scientific names avoid the confusion created by common names that vary by region and language.

• They provide a standardized way to refer to species, making it easier for scientists to communicate about them across different regions and languages.

• Scientific names also provide information about the relationships between different species, reflecting their evolutionary history.

Q48. Answer: (d) 12

The correct answer is 12.

Key Points

• A sucrose molecule is composed of two monosaccharides: glucose and fructose.

• Glucose and fructose are both hexose sugars, meaning they each contain six carbon atoms.

• When glucose ($C_6H_{12}O_6$) and fructose ($C_6H_{12}O_6$) combine to form sucrose, a water molecule (H_2O) is removed.

• Therefore, the molecular formula of sucrose is $C_{12}H_{22}O_{11}$, indicating that it contains 12 carbon atoms.

Additional Information

• Monosaccharides

• These are the simplest form of carbohydrates and cannot be hydrolyzed to simpler chemical compounds.

• Examples include glucose, fructose, and galactose.

• Monosaccharides are the building blocks of more complex sugars such as disaccharides and polysaccharides.

• Disaccharides

• These are carbohydrates formed by the combination of two monosaccharides.

• Examples include sucrose (glucose + fructose), lactose (glucose + galactose), and maltose (glucose + glucose).

• They are broken down into their constituent monosaccharides during digestion.

• Polysaccharides

• These are large, complex carbohydrates composed of long chains of monosaccharide units.
• Examples include starch, glycogen, and cellulose.
• They serve various functions such as energy storage (starch, glycogen) and structural support (cellulose in plants).
• Hydrolysis
• This is a chemical process that involves the breakdown of a compound due to a reaction with water.
• In the context of carbohydrates, hydrolysis breaks down disaccharides and polysaccharides into monosaccharides.
• For example, the hydrolysis of sucrose yields glucose and fructose.

Q49. Answer: (b) Muhammad Husayn

The correct answer is Muhammad Husayn.

Key Points

• Muhammad Husayn was one of the most distinguished calligraphers during the reign of Emperor Akbar.
• He was honoured with the title 'Zarrin Qalam' which means 'golden pen'.
• His work was highly regarded and he played a significant role in the cultural and artistic development of Akbar's court.
• Muhammad Husayn's calligraphy was notable for its elegance and precision, earning him a place of high esteem among his contemporaries.

Additional Information

• Calligraphy
• Calligraphy is a visual art related to writing. It is the design and execution of lettering with a broad-tipped instrument, brush, or other writing instruments.
• In the context of Islamic art, calligraphy is a highly venerated form of artistic expression, often used to transcribe verses from the Quran.
• Akbar's Court
• Akbar the Great (1556-1605) was the third Mughal Emperor who is known for his cultural and administrative achievements.
• His court was a hub of artistic and intellectual activities, attracting talents from various fields including literature, music, painting, and calligraphy.
• Akbar's patronage played a crucial role in the development of Mughal art and culture.
• Abul Fazal
• Abul Fazal was a historian and one of the nine jewels (Navaratnas) of Akbar's court.
• He authored the Akbarnama, the official history of Akbar's reign in three volumes.
• Daswant and Basawan
• Daswant and Basawan were prominent painters at Akbar's court known for their contributions to the Mughal school of painting.
• They were instrumental in the development of the miniature painting style that characterized Mughal art.

Q50. Answer: (c) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• Uttar Pradesh is one of the northern states of India.
• It is the most populous state in India, with over 200 million inhabitants.
• The state has a significant cultural heritage, with cities like Agra and Varanasi being major cultural centers.
• Despite its large population, Uttar Pradesh has a smaller geographical area compared to states like Rajasthan, Maharashtra, and Madhya Pradesh.

Additional Information

• Rajasthan:
• Rajasthan is the largest state in India by area.
• It is located in the northwestern part of India.
• Known for its desert landscapes and vibrant culture.
• Maharashtra:
• Maharashtra is the second-most populous state in India.
• It is located in the western part of India.
• Home to Mumbai, the financial capital of India.
• Uttar Pradesh:
• Uttar Pradesh is the fourth largest state in India by area.

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• Located in the northern part of India.
• Known for its historical and religious significance.
• Madhya Pradesh:
• Madhya Pradesh is the second-largest state in India by area.
• It is located in the central part of India.
• Known as the "Heart of India" due to its geographical location.

Q51. Answer: (d) abolition of the practice of untouchability

The correct answer is abolition of the practice of untouchability.

Key Points

• Article 17 of the Indian Constitution explicitly abolishes "untouchability" and forbids its practice in any form.
• It mandates that the enforcement of any disability arising out of "untouchability" shall be an offence punishable in accordance with law.
• The Article is a fundamental right and is enforceable in the courts of law.
• Article 17 is part of the Right to Equality, which spans Articles 14 to 18 in the Indian Constitution.

Additional Information

• Right to Education
• Article 21A of the Indian Constitution mandates free and compulsory education for children aged 6 to 14 years.
• This was added by the 86th Amendment Act in 2002.
• Right to Freedom of Religion
• Articles 25 to 28 of the Indian Constitution guarantee freedom of religion to all citizens.
• These articles provide the right to freely profess, practice, and propagate religion.
• Joint Sitting of Both Houses in Certain Cases
• Article 108 of the Indian Constitution provides for a joint sitting of both Houses of Parliament to resolve a deadlock on a bill.
• This is convened by the President of India.

Q52. Answer: (b) RISAT-2B

The correct answer is RISAT-2B.

Key Points

• RISAT-2B is a radar imaging earth observation satellite developed by ISRO.
• It uses X-band synthetic aperture radar (SAR) which allows it to capture high-resolution images regardless of weather conditions.
• RISAT-2B was launched on May 22, 2019, from the Sriharikota Range.
• The satellite enhances India's capability in applications such as agriculture, forestry, and disaster management support.

Additional Information

• X-band Synthetic Aperture Radar (SAR)
• SAR is a form of radar that is used to create two-dimensional images or three-dimensional reconstructions of objects, such as landscapes.
• X-band refers to the frequency range of the radar waves, which is typically between 8 to 12 GHz.
• X-band SAR is known for its high resolution and is commonly used in earth observation satellites.
• This technology allows the satellite to capture images in all weather conditions, during day and night.
• RISAT-2B
• RISAT stands for Radar Imaging Satellite.
• It is part of India's RISAT series of satellites, which are used for reconnaissance and earth observation.
• RISAT-2B provides all-weather surveillance using its X-band SAR payload.
• Its primary applications include monitoring agriculture, forestry, soil moisture, and disaster management.
• ISRO (Indian Space Research Organisation)
• ISRO is the space agency of the Government of India, headquartered in Bengaluru.
• It is responsible for advancing space technology and using its applications for various national tasks.
• ISRO has successfully launched numerous satellites into space, including communication, earth observation, and interplanetary missions.
• Notable missions include the Mars Orbiter Mission (Mangalyaan) and the Chandrayaan missions to the moon.

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Q53. Answer: (c) 12

Given:

$x = (\sqrt{3} + 1)/(\sqrt{3} - 1)$ and $y = (\sqrt{3} - 1)/(\sqrt{3} + 1)$

Formula used:

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

Calculation:

Substitute the given value of x and y in the expression:

$=>3(x + y)$

$=>3 ((\sqrt{3} + 1)/(\sqrt{3} - 1) + (\sqrt{3} - 1)/(\sqrt{3} + 1))$

Taking LCM and solving for x:

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

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

=>3. 8/2

=>3 ×4

=>12

Option 3 is the correct answer.

Q54. Answer: (d) Intelligence satellite

The correct answer is Intelligence satellite.

Key Points

• EMISAT is a satellite launched by ISRO primarily for electronic intelligence gathering.

• It was launched on April 1, 2019, using the PSLV-C45 rocket.

• The satellite is intended to gather information related to radar signals and other electronic emissions.

• EMISAT is equipped with advanced payloads to support strategic and defense purposes for India.

Additional Information

• Remote-sensing satellite:

• These satellites are used for observing and gathering data about the Earth's surface.

• They play a crucial role in agriculture, forestry, land-use mapping, urban planning, and disaster management.

• ISRO has launched several remote-sensing satellites, including the Cartosat and Resourcesat series.

• Communications satellite:

• These satellites enable telecommunication, broadcasting, and internet services.

• They relay signals between different points on Earth, ensuring seamless communication over long distances.

• ISRO's GSAT series are examples of communications satellites.

• Navigation satellite:

• These satellites are part of a system that provides geolocation and time information to users on Earth.

• ISRO's Indian Regional Navigation Satellite System (IRNSS), also known as NavIC, is an example of a navigation satellite system.

• They are crucial for applications such as aviation, maritime navigation, and personal navigation devices.

• Intelligence satellite:

• These satellites are designed for military and intelligence-gathering purposes.

• They can intercept signals, monitor radar emissions, and provide strategic information to defense forces.

• EMISAT is an example of an intelligence satellite launched by ISRO.

Q55. Answer: (b) 40

The correct answer is 40.

Key Points

• 1 nibble is equal to 4 bits.

• Therefore, 10 nibbles will be equal to 10 * 4 = 40 bits.

• Nibbles are used in computing to represent four binary digits or half of an 8-bit byte.

• This makes it easier to manage and process data in computing systems.

Additional Information

• Bits: The smallest unit of data in a computer, representing a binary value of 0 or 1.

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• Bytes: A group of 8 bits, often used to encode a single character of text in a computer.

• Nibbles: A nibble is half a byte, consisting of 4 bits. It is used to represent hexadecimal digits, which range from 0 to F.

• Hexadecimal System: A base-16 numbering system used in mathematics and computing, utilizing digits 0-9 and letters A-F to represent values.

• Binary System: A base-2 numbering system used internally by almost all modern computers and computer-based devices because it is straightforward to implement with digital electronic circuitry.

Q56. Answer: (d) 1988

The correct answer is 1988.

Key Points

• The National Highways Authority of India (NHAI) was established by an act of Parliament in 1988.

• The main objective of NHAI is to develop, maintain, and manage the national highways and other major roads in India.

• NHAI operates under the administrative control of the Ministry of Road Transport and Highways.

• It is responsible for implementing the National Highways Development Project (NHDP), which is one of the largest highway projects in the world.

Additional Information

• National Highways Development Project (NHDP)

• The NHDP is a project aimed at upgrading, rehabilitating, and widening major highways in India to international standards.

• The project is divided into several phases, each targeting different sections of the highways for development.

• One of the key components of NHDP is the Golden Quadrilateral, which connects four major cities: Delhi, Mumbai, Chennai, and Kolkata.

• The NHDP also includes the North-South and East-West corridors, which further enhance connectivity across the country.

• Ministry of Road Transport and Highways

• This ministry is a branch of the Government of India responsible for the development and maintenance of national highways and roads.

• It oversees policies and programs related to road transport and safety, aiming to improve the road infrastructure in India.

• The ministry works in conjunction with NHAI to implement various road projects and initiatives.

• Bharatmala Pariyojana

• Bharatmala Pariyojana is a centrally-sponsored and funded road and highways project of the Government of India.

• The project focuses on optimizing the efficiency of freight and passenger movement across the country by bridging critical infrastructure gaps.

• It aims to develop around 34,800 kilometers of highways in the first phase, enhancing connectivity across various regions.

Q57. Answer: (a) 144 m

Given:

A square park is surrounded by a path of uniform width 1.5 m all around it.

The area of the path is 225 m^2.

Formula Used:

Area of the path = Area of the outer square - Area of the inner square

Perimeter of the inner square = 4 × side length of the inner square

Calculation:

Let the side length of the inner square be a meters.

Then, the side length of the outer square = a + 3 meters (since the path is 1.5 m wide on each side).

Area of the inner square = a^2

Area of the outer square = $(a + 3)^2$

Area of the path = Area of the outer square - Area of the inner square

$225 = (a + 3)^2 - a^2$

$\Rightarrow 225 = a^2 + 6a + 9 - a^2$

$\Rightarrow 225 = 6a + 9$

$\Rightarrow 6a = 225 - 9$

$\Rightarrow 6a = 216$

$\Rightarrow a = 216 / 6$

$\Rightarrow a = 36$ meters

Perimeter of the inner square = 4 × a

Perimeter = 4 × 36

Perimeter = 144 meters

The perimeter of the park is 144 meters.

Q58. Answer: (d) 810

Given:

82% of a number is 738.

Formula Used:

Let the number be x.

82% of x = 738

To find 90% of x, we use the formula: 90% × x

Calculation:

82% of x = 738

=> (82/100) × x = 738

=> x = (738 × 100) / 82

=> x = 73800 / 82

=> x ≈ 900

Now, 90% of x is:

=> 90% × 900

=> (90/100) × 900

=> 0.9 × 900

=> 810

90% of the number is 810.

Q59. Answer: (a) Sunday

Given: 4th March 2018 was Wednesday.

Now,

2018 to 2019 = 1 Year (1 Ordinary Year).

And, In 1 Year = 1 Ordinary Year.

So, 1 Ordinary Year has 1 odd day.

then, 4th March 2019 will be Wednesday + 1 = Thursday.

Now, the number of days between 4th March 2019 to 7th March 2019

= 3 days.

So, 7th March 2019 will be Thursday + 3 = Sunday.

Hence, the correct answer is "Option 1".

Q60. Answer: (d) Nagpur

The correct answer is Nagpur.

Key Points

• The National Environmental Engineering Research Institute (NEERI) is a research institute created and funded by the Government of India.

• NEERI was established in Nagpur in 1958 and is a part of the Council of Scientific and Industrial Research (CSIR).

• The institute focuses on research and innovations in environmental science and engineering to address environmental issues and promote sustainable development.

• NEERI conducts research in various areas including air pollution, water pollution, solid waste management, and environmental impact assessment.

Additional Information

• National Environmental Engineering Research Institute (NEERI)

• NEERI is one of the premier research institutions in India, dedicated to the study and resolution of environmental issues through scientific research and technological innovation.

• The institute has a multidisciplinary team of scientists and engineers working on various environmental challenges.

• NEERI's mission is to support sustainable development through scientific and technological solutions for environmental protection and management.

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• The institute has several regional centers across India, including in Delhi, Mumbai, Chennai, Kolkata, and Hyderabad, to address region-specific environmental problems.

• Council of Scientific and Industrial Research (CSIR)

• CSIR is an autonomous body under the Ministry of Science and Technology, Government of India.

• It is one of the largest publicly funded research and development organizations in the world.

• CSIR covers a wide spectrum of scientific and industrial research, from aerospace engineering to structural engineering, from oceanography to genomics.

• CSIR has played a pivotal role in the development of India's scientific and technological capabilities.

• Environmental Impact Assessment (EIA)

• EIA is a process used to evaluate the environmental effects of a proposed project or development before it is carried out.

• The aim of EIA is to ensure that decision-makers consider the environmental impacts when deciding whether to proceed with a project.

• EIA involves the assessment of potential impacts on air, water, soil, flora, fauna, and human health.

• It also considers socio-economic impacts and provides mitigation measures to minimize negative effects.

Q61. Answer: (b) 4 times

Given:

A sum triples itself in 8 years at simple interest.

Formula Used:

Simple Interest, SI = (P × R × T) / 100

Total amount, A = P + SI

Calculation:

Let the principal amount be P.

After 8 years, the sum triples itself, so the total amount A = 3P.

Simple Interest (SI) for 8 years = 3P - P = 2P

Using the formula for Simple Interest:

SI = (P × R × 8) / 100

=> 2P = (P × R × 8) / 100

=> 2 = (R × 8) / 100

=> R = (2 × 100) / 8

=> R = 25%

Now, we need to find the total amount after 12 years:

Simple Interest for 12 years = (P × R × 12) / 100

=> SI = (P × 25 × 12) / 100

=> SI = 3P

Total amount after 12 years, A = P + SI

=> A = P + 3P

=> A = 4P

The total amount after 12 years will be 4 times of itself.

Q62. Answer: (c) 4

Calculation:

Let, x = (a - 1/a)

To solve this, let's start by squaring both sides of the equation x = (a - 1/a)

When we square x, we get:

$x^2 = (a - 1/a)^2$

Using the identity for squaring a binomial:

$x^2 = a^2 - 2(a)(1/a) + 1/a^2$

Simplifying the middle term, (a)(1/a) = 1, so the equation becomes:

$x^2 = a^2 - 2 + 1/a^2$

Substitute the given value of $a^2 + 1/a^2$

We know from the given information that:

$a^2 + 1/a^2 = 18$

So, substitute this value into the equation for x^2:

$x^2 = 18 - 2$

$x^2 = 16$

Solve for x:

Now, take the square root of both sides:

$x = \pm 4$

Option 3 is the correct answer.

Q63. Answer: (d) Jabalpur - Jhelum river

The correct answer is Jabalpur - Jhelum river.

Key Points

• Jabalpur is a city located in the central part of India, in the state of Madhya Pradesh.

• The city of Jabalpur is actually situated on the banks of the Narmada river, not the Jhelum river.

• The Jhelum river flows through the Kashmir Valley, in the northern part of India, and is not associated with Jabalpur.

• This mismatch makes option 4 incorrect, as the other city-river pairs are correctly matched.

Additional Information

• Surat - Tapti river

• Surat is a city in the western Indian state of Gujarat.

• The Tapti river (also known as Tapi) flows westwards through central India and passes through Surat before emptying into the Arabian Sea.

• Lucknow - Gomati river

• Lucknow is the capital city of the northern Indian state of Uttar Pradesh.

• The Gomati river, a tributary of the Ganges, flows through Lucknow, providing the city with water resources.

• Ujjain - Kshipra river

• Ujjain is an ancient city in the central Indian state of Madhya Pradesh.

• The Kshipra river flows through Ujjain and is considered sacred in Hinduism, hosting the Kumbh Mela festival.

• Jabalpur - Narmada river

• Jabalpur, located in Madhya Pradesh, is situated on the banks of the Narmada river.

• The Narmada is one of the major rivers in central India and is considered one of the seven holy rivers of India.

Q64. Answer: (c) Kento Momota

The correct answer is Kento Momota.

Key Points

• Kento Momota is a Japanese badminton player known for his explosive playing style and incredible agility on the court.

• He won the All England Open Badminton Championships Men's Singles title in 2019 by defeating Viktor Axelsen in the final.

• Kento Momota has been ranked as the world's number one male singles player by the Badminton World Federation (BWF).

• He has won numerous titles, including the World Championships and the Asian Championships, making him one of the most successful badminton players in recent history.

Additional Information

• All England Open Badminton Championships

• The All England Open Badminton Championships is one of the oldest and most prestigious badminton tournaments in the world.

• It is held annually in Birmingham, England, and is part of the BWF World Tour Super 1000 series.

• The tournament attracts top badminton players from around the globe, competing for one of the most coveted titles in the sport.

• Badminton World Federation (BWF)

• The BWF is the international governing body for the sport of badminton, recognized by the International Olympic Committee (IOC).

• Founded in 1934, the BWF is responsible for the regulation, promotion, and development of badminton worldwide.

• The BWF organizes major international tournaments, including the World Championships, the Thomas & Uber Cup, and the Sudirman Cup.

• Viktor Axelsen

• Viktor Axelsen is a Danish badminton player who has been a prominent figure in international badminton.

• He won the gold medal in Men's Singles at the 2020 Tokyo Olympics.

• Axelsen has also secured numerous titles, including the World Championships and the European Championships.

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• Playing Style of Kento Momota

• Kento Momota is known for his exceptional defensive skills and ability to control rallies with his precise shot placement.

• His agility and quick reflexes make him a formidable opponent on the court.

• Momota's strategic gameplay and mental toughness have contributed to his success in international badminton.

Q65. Answer: (c) thermal power stations

The correct answer is thermal power stations.

Key Points

• The Damodar Valley Corporation (DVC) is a statutory body established in 1948 under the Damodar Valley Corporation Act, 1948.

• DVC operates several thermal power stations in the Damodar River region of West Bengal and Jharkhand.

• DVC's power plants contribute significantly to the power supply in the region, making it a key player in the energy sector.

• The corporation's thermal power plants have a combined installed capacity of over 6,000 MW, making it one of the largest power producers in India.

Additional Information

• Damodar Valley Corporation (DVC)

• DVC was the first multipurpose river valley project undertaken by the Government of India after independence.

• The main objectives of DVC include flood control, irrigation, generation, and transmission of electric power, and the promotion of public health and agriculture within the Damodar Valley region.

• DVC operates several thermal power stations, including the ones at Bokaro, Chandrapura, Mejia, and Durgapur.

• In addition to thermal power generation, DVC also engages in hydroelectric power generation, coal mining, and the development of infrastructure such as irrigation canals and dams.

• Thermal Power Stations

• Thermal power stations convert heat energy from burning fossil fuels such as coal, oil, or natural gas into electrical energy.

• The process involves heating water in a boiler to produce steam, which then drives a steam turbine connected to an electricity generator.

• Thermal power plants are a major source of electricity and play a crucial role in meeting the energy demands of a country.

• Environmental concerns related to thermal power plants include air pollution from the burning of fossil fuels and the disposal of ash and other waste products.

Q66. Answer: (a) R – {nπ|n in Z }

Given:

The domain of cosec x is:

Formula Used:

The cosecant function, csc x, is defined as csc x = 1/(sin x). Therefore, it is undefined when sin x = 0.

Calculation:

sin x = 0 at x = nπ where n in Z (Z is the set of all integers).

Therefore, csc x is undefined at these points.

Hence, the domain of csc x is all real numbers except where sin x = 0.

Domain of csc x = R - {nπ | n in Z}

The correct answer is option 1.

Q67. Answer: (b) 173

Given:

Options: 213, 173, 123, 143

Formula Used:

A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself.

Calculation:

Check each option:

213: Divisible by 3 (213 = 3 × 71)

173: Not divisible by any number other than 1 and 173

123: Divisible by 3 (123 = 3 × 41)

143: Divisible by 11 (143 = 11 × 13)

=> 173 is a prime number.

The correct answer is option 2.

Q68. Answer: (d) 26.73

Given:

Mode = 25.2

Mean = 27.5

Formula Used:

For a moderately asymmetrical distribution:

Mean - Mode ≈ 3(Mean - Median)

Calculation:

Given:

Mean = 27.5

Mode = 25.2

Let's find the Median:

Mean - Mode = 3(Mean - Median)

Substitute the given values:

27.5 - 25.2 = 3(27.5 - Median)

=> 2.3 = 3(27.5 - Median)

=> 2.3 / 3 = 27.5 - Median

=> 0.7667 ≈ 27.5 - Median

=> Median ≈ 27.5 - 0.7667

=> Median ≈ 26.7333

The value of the median of the distribution is approximately 26.73.

Q69. Answer: (d) EM

The logic followed here is:

Hence, the correct answer is "EM".

Q70. Answer: (d) 10%

The correct answer is 0.1.

Key Points

• In India, the GST (Goods and Services Tax) is levied at various rate slabs.

• The GST rate slabs are 0%, 5%, 12%, 18%, and 28%.

• The rate of 0.1% is not a standard GST rate slab in India.

• Common GST rates include 5%, 12%, 18%, and 28% for different categories of goods and services.

Additional Information

• GST (Goods and Services Tax)

• GST is an indirect tax that has replaced many indirect taxes in India such as the excise duty, VAT, services tax, etc.

• It is a single tax on the supply of goods and services, right from the manufacturer to the consumer.

• GST is categorized into CGST (Central GST), SGST (State GST), IGST (Integrated GST), and UTGST (Union Territory GST).

• The GST Council, which includes representatives from the central and state governments, determines the tax rates, rules, and regulations.

• GST Rate Slabs

• There are five primary GST rate slabs in India: 0%, 5%, 12%, 18%, and 28%.

• Essential items are either exempt or taxed at a lower rate, while luxury items and sin goods attract the highest rate of 28%.

• The GST rates are determined based on the type of goods and services provided.

• GST Council

• The GST Council is a constitutional body for making recommendations to the Union and State Government on issues related to GST.

• The council is chaired by the Union Finance Minister and includes the Finance Ministers of all the states.

• The council determines the tax rate, exemptions, and thresholds for the application of GST.

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Q71. Answer: (a) Theatre

The logic followed here is:

Logic: Performance and Venue.

Here,

Music : Concert → Concert is a venue where music performances take place.

Similarly,

Acting : Theatre → Theatre is a venue where acting performances take place.

Hence, the correct answer is "Option 1".

Q72. Answer: (a) Cat

The logic followed here is:

Cow	Herbivores
Goat	Herbivores
Cat	Carnivores
Rabbit	Herbivores

Cow, Goat, Rabbit all are Herbivores,

Whereas, Cat is Carnivores.

Hence, the correct answer is "Cat".

Q73. Answer: (c) 6.32

Given:

Values: 2.2, 4.2, 6.4, 8.3, 10.5

Formula Used:

Mean = (Sum of all values) / (Number of values)

Calculation:

Sum of values = 2.2 + 4.2 + 6.4 + 8.3 + 10.5

=> Sum of values = 31.6

Number of values = 5

Mean = 31.6 / 5

=> Mean = 6.32

The mean for the given set of values is 6.32

Q74. Answer: (c) Sikkim

The correct answer is Sikkim.

Key Points

• Sikkim is a state in northeastern India.

• It shares international borders with China to the north and northeast, Bhutan to the east, and Nepal to the west.

• Sikkim is also bordered by the Indian state of West Bengal to the south.

• It is the least populous and second smallest among the Indian states.

Additional Information

• Geopolitical Significance of Sikkim

• Sikkim's strategic location makes it a crucial state in terms of India's national security.

• The state is a key point for India's defense against potential threats from China, given its close proximity to the Chumbi Valley which is a tri-junction between India, Bhutan, and China.

• Culture and Demographics

• Sikkim is known for its diverse culture and population, consisting of various ethnic groups such as Lepchas, Bhutias, and Nepalis.

• The predominant religions practiced in Sikkim are Hinduism and Vajrayana Buddhism.

• Tourism in Sikkim

• Sikkim is a popular tourist destination known for its scenic beauty, including the Kanchenjunga mountain, the third highest peak in the world.

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• Tourist attractions include Buddhist monasteries, trekking routes, and vibrant cultural festivals.

• Economy

• The economy of Sikkim is largely dependent on agriculture and tourism.

• Major crops include rice, maize, millet, wheat, barley, oranges, tea, and cardamom.

• Sikkim has also made significant progress in organic farming and is known as the first fully organic state in India.

Q75. Answer: (b) 4/85

Calculation:

Multiply the numbers in denominators,

1/40+1/88+1/154+1/238

Taking LCM and solving for x,

=4/85

Option 2 is the correct answer.

Q76. Answer: (d) microfinance

The correct answer is microfinance.

Key Points

• Muhammad Yunus is a Bangladeshi social entrepreneur, banker, economist, and civil society leader.

• He is the founder of Grameen Bank, which was established to provide microloans to the impoverished without requiring collateral.

• Yunus's work in microfinance has had a significant impact on poverty reduction and has empowered many impoverished individuals, especially women, to become financially independent.

• In recognition of his efforts, Muhammad Yunus and Grameen Bank jointly received the Nobel Peace Prize in 2006 for their efforts to create economic and social development from below.

Additional Information

• Microfinance

• Microfinance is a type of banking service provided to unemployed or low-income individuals or groups who otherwise would have no other access to financial services.

• It includes microcredit (small loans), savings accounts, insurance, and other financial products targeted at the poor.

• The goal of microfinance is to give low-income people an opportunity to become self-sufficient by providing a means to save money, borrow money, and obtain insurance.

• Microfinance institutions (MFIs) often operate in developing countries, where they serve as an important tool for economic development.

• Grameen Bank

• Founded by Muhammad Yunus in 1983 in Bangladesh.

• Grameen Bank's approach is based on the idea that the poor have skills that remain underutilized.

• The bank provides loans without requiring collateral, relying instead on a system of solidarity lending where groups of borrowers collectively guarantee repayment.

• It has been widely recognized for its innovative approach to providing financial services to the poor and has inspired similar initiatives worldwide.

• Nobel Peace Prize

• The Nobel Peace Prize is one of the five Nobel Prizes established by the will of Alfred Nobel, the inventor of dynamite, in 1895.

• It is awarded annually to individuals or groups who have made significant contributions to peace.

• Muhammad Yunus and Grameen Bank received the prize in 2006 for their efforts to create economic and social development from below.

• The Nobel Peace Prize is awarded by the Norwegian Nobel Committee, which is selected by the Norwegian Parliament (Storting).

Q77. Answer: (c) 39

Given:

2x + y = 15

y + 2z = 17

x + 2y = 9

Formula Used:

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We need to solve the system of equations to find the values of x, y, and z, and then use these values to find 4x + 3y + z.

Calculation:

From the first equation:

2x + y = 15

From the second equation:

y + 2z = 17

From the third equation:

x + 2y = 9

Step 1: Solve equation (3) for x in terms of y:

x = 9 - 2y

Step 2: Substitute equation (4) into equation (1):

2(9 - 2y) + y = 15

=> 18 - 4y + y = 15

=> 18 - 3y = 15

=> -3y = 15 - 18

=> -3y = -3

=> y = 1

Step 3: Substitute y = 1 back into equation (4):

x = 9 - 2(1)

=> x = 9 - 2

=> x = 7

Step 4: Substitute y = 1 into equation (2):

1 + 2z = 17

=> 2z = 17 - 1

=> 2z = 16

=> z = 8

Step 5: Calculate 4x + 3y + z:

4(7) + 3(1) + 8

=> 28 + 3 + 8

=> 39

The value of 4x + 3y + z is 39.

Q78. Answer: (b) image file

The correct answer is image file.

Key Points

• .PNG stands for Portable Network Graphics.

• It is a raster-graphics file format that supports lossless data compression.

• The .PNG file format was created as an improved, non-patented replacement for Graphics Interchange Format (GIF).

• PNG files are widely used for web graphics, logos, charts, and illustrations due to their high quality and ability to support transparency.

Additional Information

• Audio File Formats

• Audio file formats are used to store digital audio data on computers and other digital devices.

• Common audio file formats include MP3, WAV, and AAC.

• These formats vary in terms of compression, quality, and compatibility with different devices and software.

• Batch Files

• A batch file is a script file in DOS, OS/2, and Microsoft Windows.

• It consists of a series of commands to be executed by the command-line interpreter.

• Batch files have the .BAT or .CMD file extension and are used for automating repetitive tasks.

• Video File Formats

• Video file formats are used to store digital video data on computers and other digital devices.

• Common video file formats include MP4, AVI, and MKV.

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• These formats vary in terms of compression, quality, and compatibility with different devices and software.
• Image File Formats
• Image file formats are used to store digital images on computers and other digital devices.
• Common image file formats include JPEG, PNG, and GIF.
• These formats vary in terms of compression, quality, and compatibility with different devices and software.

Q79. Answer: (c) Neither assumption I nor assumption II is implicit.

Given Statement: RTE has mandated compulsory enrolment of all children of the age 6 to 14 years in the schools.

Now,

Assumptions:

1. Enrollment needs to be made compulsory as children don't like education - Not Implicit (The statement does not provide any information regarding children's attitude towards education)

2. Each child of the country will get quality Education - Not Implicit (The statement mandates enrollment, but does not guarantee the quality of education)

Here, Neither assumption I nor assumption II is implicit.

Hence, the correct answer is "Option 3".

Q80. Answer: (d) Osmium

The correct answer is Osmium.

Key Points

• Osmium is a dense metal belonging to the platinum group and has the highest density of any naturally occurring element.
• Its density is approximately 22.59 grams per cubic centimeter, making it the densest natural element.
• Osmium is used in alloys with other platinum-group metals to produce extremely hard materials for specialized applications.
• It is a hard, brittle metal with a bluish tint and is typically found in nature as an alloy with other platinum group metals.

Additional Information

• Density: Density is defined as the mass per unit volume of a substance. It is typically expressed in grams per cubic centimeter (g/cm^3). The formula for density is:
• Density = Mass / Volume
• Platinum Group Metals (PGM): These are six metallic elements clustered together in the periodic table. They are platinum (Pt), palladium (Pd), rhodium (Rh), ruthenium (Ru), iridium (Ir), and osmium (Os). These metals have similar physical and chemical properties and tend to occur together in the same mineral deposits.
• Applications of Osmium:
• Osmium is used in fountain pen tips, electrical contacts, and in other applications where extreme durability and hardness are needed.
• Osmium tetroxide, a compound of osmium, is used in staining tissues in electron microscopy.
• Comparison with Other Elements:
• Lead has a density of approximately 11.34 g/cm^3, which is significantly lower than osmium.
• Platinum has a density of around 21.45 g/cm^3, which is also lower than osmium but still very high.
• Mercury has a density of approximately 13.53 g/cm^3.

Q81. Answer: (b) 24

Given:

Each interior angle of the regular polygon = 165^o

Formula Used:

Each interior angle of a regular polygon = ((n-2) × 180)/n

Calculation:

Given each interior angle = 165^o

((n-2) × 180)/n = 165

=> (n-2) × 180 = 165n

=> 180n - 360 = 165n

=> 180n - 165n = 360

=> 15n = 360

=> n = 360/15

=> n = 24

The number of sides of the regular polygon is 24.

Q82. Answer: (b) AN-32

The correct answer is AN-32.

Key Points

• The AN-32 is a twin-engine turboprop military transport aircraft developed by the Antonov Design Bureau of Ukraine.

• The Indian Air Force (IAF) operates a significant number of AN-32 aircraft for various logistical and transport missions.

• The AN-32 is certified to operate using blended aviation fuel, which includes a mix of traditional aviation fuel and biofuel.

• This capability enhances the operational flexibility of the IAF while also contributing to environmental sustainability by reducing carbon emissions.

Additional Information

• Blended Aviation Fuel

• Blended aviation fuel is a combination of conventional jet fuel and sustainable biofuel.

• Biofuels are derived from renewable resources such as plant materials and other organic matter.

• The use of blended aviation fuel helps reduce the carbon footprint of aviation operations, contributing to environmental conservation.

• Blended fuels are tested rigorously to ensure they meet the safety and performance standards required for aviation use.

• AN-32 Aircraft

• The AN-32 is known for its capability to operate in diverse and challenging environments, including high-altitude and hot-and-high conditions.

• It has a payload capacity of approximately 6.7 tons and can carry troops, equipment, and supplies to remote locations.

• The aircraft is equipped with robust avionics and navigation systems, making it suitable for varied missions.

• The AN-32 has been a critical asset for the IAF in humanitarian assistance and disaster relief operations.

• Environmental Impact of Aviation

• Aviation is a significant contributor to greenhouse gas emissions, which are a major cause of climate change.

• Efforts to reduce aviation emissions include the development and use of more efficient aircraft, improved flight operations, and the adoption of sustainable fuels.

• Governments and international organizations are working towards setting targets and regulations to minimize the environmental impact of aviation.

• Innovations in fuel technology, such as the use of blended aviation fuel, play a crucial role in achieving these environmental goals.

Q83. Answer: (c) 23

Given:

When 106 is subtracted from a number, it reduces to its 47%.

Formula Used:

Let the number be x.

Then, x - 106 = 0.47x.

11.5% of the number = 0.115x.

Calculation:

From the equation x - 106 = 0.47x :

=> x - 0.47x = 106

=> 0.53x = 106

=> x = 106/0.53

=> x = 200

11.5% of the number:

=> 0.115 × 200

=> 23

11.5% of the number is 23.

Q84. Answer: (c) 12.97 cm2

The given question and solution in HTML format is as follows:

Given:

Sides of the triangle: a = 5 cm, b = 7 cm, c = 11 cm

Formula Used:

Heron's Formula for the area of a triangle:

Area = √(s(s - a)(s - b)(s - c))

where s is the semi-perimeter of the triangle.

s = (a + b + c)/2

Calculation:

First, find the semi-perimeter s:

s = (5 + 7 + 11)/2

s = 23/2

s = 11.5 cm

Now, calculate the area using Heron's Formula:

Area = √(11.5(11.5 - 5)(11.5 - 7)(11.5 - 11))

Area = √(11.5(6.5)(4.5)(0.5))

Area = √(11.5 × 6.5 × 4.5 × 0.5)

Area = √168.1875

Area ≈ 12.97 cm²

The area of the triangle is 12.97 cm².

Q85. Answer: (d) Paris

The correct answer is Paris.

Key Points

• The 2024 Summer Olympics, officially known as the Games of the XXXIII Olympiad, will be held in Paris, France.

• This will be the third time Paris has hosted the Summer Olympics; the previous times were in 1900 and 1924.

• Paris was awarded the 2024 Olympics on 13 September 2017, after a successful bid against Los Angeles, which will host the 2028 Olympics.

• Paris' selection as the host city aligns with the International Olympic Committee's Agenda 2020, which aims to make the Olympics more sustainable and cost-effective.

Additional Information

• International Olympic Committee (IOC)

• The International Olympic Committee is a non-governmental sports organization based in Lausanne, Switzerland.

• It was founded by Pierre de Coubertin and Demetrios Vikelas in 1894, and it is responsible for organizing the modern Olympic Games.

• The IOC is composed of members, organizations, and federations, which represent the Olympic Movement.

• Its mission is to promote Olympism and to lead the Olympic Movement.

• Olympic Games

• The Olympic Games are leading international sporting events featuring summer and winter sports competitions.

• Thousands of athletes from around the world participate in a variety of competitions.

• The Games are held every four years, with the Summer and Winter Games alternating by occurring every four years but two years apart.

• The Olympic Games are considered the world's foremost sports competition, with more than 200 nations participating.

• Agenda 2020

• Agenda 2020 is a set of 40 recommendations approved by the IOC in 2014 to improve the organization and sustainability of the Olympic Games.

• Its objectives include reducing costs for bidding, ensuring sustainability in all aspects of the Olympics, and fostering gender equality and youth participation.

• The agenda also aims to make the Games more attractive to host cities by providing more flexibility in planning and execution.

• Agenda 2020 plays a crucial role in modernizing the Olympic Games and ensuring their future viability.

Q86. Answer: (c) Third to the left of F6

According to the given information:

1) F2 is second to the left of F7.

2) Only F6 is between F2 and F5.

3) F4 is second to the right of F3.

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4) F2 is not the neighbour of F1 or F8. Here case 2 gets eliminate.

Thus the correct position of F1 can be "Third to the left of F6".

Hence, the correct answer is "Third to the left of F6".

Q87. Answer: (a) HJLN

The logic followed here is:

ACEG : PRTV

Similarly, SUWY : ?

Hence, the correct answer is "HJLN".

Q88. Answer: (a) Both, (I) and (II) are strong.

Given:

Statement :

Should the sale and use of tobacco be completely banned in India?

Now,

Arguments :

I. Yes. Tobacco causes oral cancer and other diseases - True (As the argument highlights a significant health concern, which is a valid reason for banning tobacco).

II. No. Millions of workers will lose their jobs - True (As the argument highlights a significant economic concern, which is a valid reason against banning tobacco).

So, Both I and II strengthen the statement.

Hence, the correct answer is "Option 1".

Q89. Answer: (b) One

According to the given information:

1) Only three boxes are placed between M and L.

2) M is placed above L.

3) M and L are placed neither at the bottom nor at the top.

S.No.	Boxes
1	
2	M
3	
4	
5	
6	L
7	

4) Only two boxes are placed between L and N.

S.No.	Boxes
1	
2	M
3	N
4	
5	
6	L
7	

5) S is immediately below R.

6) There is only one box between S and Q.

S.No.	Boxes
1	
2	M
3	N
4	R
5	S
6	L
7	Q

So, only P is remaining then final arrangement:

S.No.	Boxes
1	P
2	M
3	N
4	R
5	S
6	L
7	Q

Thus, One box is placed between P and N.

Hence, the correct answer is "One".

Q90. Answer: (b) Q

According to the given information:

1) R is in red clothes.

2) R likes grapes.

3) S likes apples and he is in purple clothes.

Children	Clothes	Fruits
P		
Q		
R	Red	Grapes
S	Purple	Apples
T		

4) Q does not like bananas and grapes.

Children	Clothes	Fruits
P		
Q		Bananas and Grapes
R	Red	Grapes
S	Purple	Apples
T		

5) T likes mangoes, but is not in green or pink clothes.

Children	Clothes	Fruits
P		

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Q		Bananas and Grapes
R	Red	Grapes
S	Purple	Apples
T	Green or Pink	Mangoes

6) The child in pink coloured clothes likes bananas.

Children	Clothes	Fruits
P	Pink	Banana
Q	Green	Pears
R	Red	Grapes
S	Purple	Apples
T	Yellow	Mangoes

So, Q likes pears.

Hence, the correct answer is "Q".

Q91. Answer: (d) Mother's Brother's Son

Family Chart:

Given: Pointing to a photograph, a woman said to a man, "She is the only child of the sister of the only son of your paternal grandfather".

So, the man is "Mother's Brother's Son" of the person in the picture.

Hence, the correct answer is "Mother's Brother's Son".

Q92. Answer: (a) Karachi

The logic followed here is:

Kathmandu	Capital of Nepal
Thimphu	Capital of Bhutan
Dhaka	Capital of Bangladesh
Karachi	Not a capital city

Kathmandu, Thimphu and Dhaka are all capital cities.

Whereas, Karachi is not a capital city but a major city in Pakistan

Hence, the correct answer is "Karachi".

Q93. Answer: (a) 77

The logic followed here is:

24 B 6 B 12 = 42

=> 24 + 6 + 12 = 42

31 B 7 B 13 = 51,

=> 31 + 7 + 13 = 51

Then 64 B 9 B 4 = ?

=> 64 + 9 + 4 = 77

Hence, the correct answer is "77".

Q94. Answer: (b) 34

The logic followed here is:

'QZDH' is written as '51',

'PLMQ' is written as '54'.

Similarly, the code for 'DNRB':

Hence, the correct answer is "34".

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Q95. Answer: (d) 41636

The logic followed here is:
ACE : 1925
Similarly, BDF : ?
Hence, the correct answer is "41636".

Q96. Answer: (d) 20122141

The logic followed here is:
CHILD is written as 412983.
Similarly, for ADULT:
Hence, the correct answer is "20122141".

Q97. Answer: (d) 3

Family Chart:
Given:
C is the sister of F.
A is the father of B, husband of E and only son of D.
D is the paternal grandfather of F and A does not have any sisters.
So, A have 3 children.
Hence, the correct answer is "3".

Q98. Answer: (c) 10

The logic followed here is:
Hence, the correct answer is "10".

Q99. Answer: (d) 3-6

The logic followed here is: Sum of 1st and 2nd number = Even number.
3-6 → 3 + 6 = 9
4-8 → 4 + 8 = 12
6-18 → 6 + 18 = 24
8-32 → 8 + 32 = 40
10-50 → 10 + 50 = 60
Thus, 3-6 is odd one.
Hence, the correct answer is "3-6".

Q100. Answer: (a) Cushions

The logic followed here is:
Logic: Items associated with furniture.
Here,
Bed : Pillow → A Pillow is an item that is commonly associated with a Bed.
Similarly,
Sofa : Cushions → Cushions are items that are commonly associated with a Sofa.
Hence, the correct answer is "Option 1".

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