RRB NTPC CBT-I Official Paper (Held On: 21 Jan 2021 Shift 1) (Previous Year Paper)

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

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Scan the QR code or click the link to open it.

Q1. Which country hosted the ICC Men's Cricket World cup in 2023?

(a) India
(b) Australia
(c) England
(d) South Africa

Q2. Which of the following is an example of non-volatile memory?

(a) LSI
(b) RAM
(c) ROM
(d) VLSI

Q3. If tan A = 3/4, then the value of (cos A - sin A)/(cos A + sin A) is:

(a) 1/4
(b) 1/3
(c) 1/7
(d) 1/8

Q4. If 0.75 : x : : 25 : 8, then what is the value of x?

(a) 25/6
(b) 24
(c) 2.34375
(d) 6/25

Q5. Rabindranath Tagore won the Nobel Prize for Literature for which book?

(a) Gitanjali
(b) Sanchayita
(c) Gora
(d) Gitabitan

Q6. Where is the NSE (National Stock Exchange of India) headquartered?

(a) Pune
(b) Chennai
(c) Mumbai
(d) New Delhi

Q7. Which one of the following is not an operating system?

(a) Ubuntu
(b) Java
(c) Mint
(d) MS DOS

Q8. Which among the following is the largest gland in the human body?

(a) Sweat glands
(b) Liver
(c) Mammary gland
(d) Esophageal glands

Q9. How many languages are enlisted in the eighth schedule of the Indian Constitution?

(a) 25
(b) 23
(c) 22
(d) 21

Q10. Let a set S = {1, 2, 2, 3, 3, 3, 4, 4, 4, 4). Then the value of 4 × mean + 2 × mode – 8 × median is:

(a) –4
(b) 4
(c) 10
(d) 14

Q11. The angle of elevation of a ladder leaning against a wall is 45°. The foot of the ladder is 4 √2 metres away from wall. The length of the ladder is:

(a) 5 m
(b) 7 m
(c) 8 m
(d) 6 m

Q12. If a : b = 7 : 9 and b : c = 1 : 12, then a : b : c is:

(a) 7 : 9 : 108
(b) 7 : 9 : 12
(c) 7 : 8 : 9
(d) 7 : 9 : 8

Q13. Among the four numbers listed, three are alike in some manner and one is different. Select the number that is different from the rest.

(a) 343
(b) 512
(c) 225
(d) 216

Q14. Which among the following Indian states does NOT share its boundaries with Nepal?

(a) Bihar
(b) Uttar Pradesh
(c) West Bengal
(d) Jharkhand

Q15. Which Indian state was the first to establish the institution of Panchayat raj?

(a) Punjab
(b) Andhra Pradesh
(c) Rajasthan
(d) Uttar Pradesh

Q16. What is the area of a rhombus, whose sides are 25 cm and one of the diagonals is 14 cm?

(a) 310 cm^2
(b) 300 cm^2
(c) 336 cm^2
(d) 330 cm^2

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Q17. Hindi was declared as the official language of Union under Article _____ of Indian Constitution.

(a) 333
(b) 334
(c) 345
(d) 343

Q18. What is the LCM of 2√169, cbrt27, cbrt64 and 2√144 ?

(a) 156
(b) 312
(c) 182
(d) 468

Q19. What is the sum of the following two series?

(8 + 27 + 64 + ... + 1000) + (2 + 4 + 6 + ... + 20) = ?

(a) 3135
(b) 3134
(c) 3133
(d) 3136

Q20. What will be the amount of simple interest on Rs. 75,000 at the rate of 2 5/3 % per annum for a period of 5 years?

(a) Rs. 13,000
(b) Rs. 13,050
(c) Rs. 13,750
(d) Rs. 13,005

Q21. The process of depositing a layer of any desired metal on another material, by means of electricity, is called _____.

(a) electrode
(b) electromagnet
(c) electroplating
(d) electro conductor

Q22. Who predicted 'nuclear technology is going to be very essential and not just in the power sector but for other societal uses intended for betterment of life'?

(a) APJ Abdul Kalam
(b) JC Bose
(c) Sir CV Raman
(d) Homi J Bhabha

Q23. India's first biofuel-powered flight landed at IGI Airport in New Delhi from _____ in 2018.

(a) Mumbai
(b) Patna
(c) Dehradun
(d) Hyderabad

Q24. Select the industry in which goods are produced in the home of the producer.

(a) Large-scale industry
(b) Cottage industry
(c) Quaternary industry
(d) Secondary industry

Q25. Which one among the following languages is one of the six official languages of the United Nations?

(a) Urdu
(b) Japanese
(c) Hindi

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(d) Chinese

Q26. Select the number from among the given options that can replace the question mark (?) in the following series.

40, 36, 33, 31, ?

(a) 31
(b) 29
(c) 32
(d) 30

Q27. A large marble building in Kolkata, built by the British whose design echoes the Taj Mahal is _____.

(a) Writers Building
(b) St. Paul's Cathedral
(c) Fort William
(d) Victoria Memorial

Q28. The 'Third Mysore War' was fought between the years:

(a) 1790-92
(b) 1796-98
(c) 1792-94
(d) 1794-96

Q29. Select the option that is related to the third number in the same way as the second number is related to the first number.

2 : 32 : : 4 : ?

(a) 728
(b) 1536
(c) 1024
(d) 128

Q30. Who was the first UN Secretary-General?

(a) Trygve Lie
(b) Dag Hammarskjold
(c) U Thant
(d) Kofi A Annan

Q31. In which one of the following types of economy are the factors of production owned individually?

(a) Mixed
(b) Capitalist
(c) Communist
(d) Socialist

Q32. What is the number of all positive solutions of the equation $|x \times 1| = 0$?

(a) 1
(b) 2
(c) 0
(d) 3

Q33. What is the value of the following expression?

$81/7 \times 21/3 - 4\ 2/3 \div 7/9 \times 121/6$

(a) –45
(b) –40
(c) 40
(d) 45

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Q34. There are 40 persons in a palace. If every person shakes hands with every other person, what will be the total number of handshakes?

(a) 800
(b) 790
(c) 750
(d) 780

Q35. The book which keeps a record of all the endangered animals and plants is _____.

(a) Eco Survey Book
(b) Red Data Book
(c) Animal Survey Book
(d) Wild Life Analysis Book

Q36. Among the four terms listed, three are alike in some manner and one is different. Select the term that is different from the rest.

(a) K14
(b) A4
(c) P19
(d) R22

Q37. When is National Pollution Prevention Day observed in India?

(a) April 2^(nd)
(b) March 2^(nd)
(c) December 2^(nd)
(d) January 2^(nd)

Q38. Height of seven girls A, B, C, D, E, F and G are compared. Height of D is more than atleast four girls but she is not the tallest. Height of A is more than B and F and height of F is less than E. Height of A is less than D. Height of G is more than C and D both.

Which of the following statement is NOT correct?

(a) G can be second tallest
(b) A can be fifth tallest
(c) C can be fourth tallest
(d) G can be fifth tallest

Q39. A computer program that converts an entire program into machine language is called an:

(a) Compiler
(b) Interpreter
(c) Simulator
(d) Converter

Q40. What is the value of the following expression?

(tan 2°tan 88°) (tan 3°tan 87°)... (tan 43° tan 47°) tan 45°

(a) –1
(b) 1
(c) 0
(d) ∞

Q41. Which of the following banks became State Bank of India after nationalisation in the year 1955 and has the largest number of branches in the world?

(a) Indus Bank of India
(b) National Bank of India
(c) Imperial Bank of India
(d) Bank of India

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Q42. The value of ({$(13)^3$ - 4^3})/(13 -8 ÷ 2) ÷ 8 – {2 + 6 × 9} is:

(a) -685/8
(b) -217/8
(c) 685/8
(d) -211/8

Q43. Read the given paragraph carefully and answer the question.

Ram walks 5 km straight from his home. After taking a right turn he walks for another 8 km. He then takes a left turn and reaches shop A after 2 km. From there he takes a right turn and walks 2 km. He covers another 7 km to the right to reach shop B.

What is the distance covered by Ram to reach shop A from his home?

(a) 22 km
(b) 15 km
(c) 7 km
(d) 13 km

Q44. The value of (32 ÷ 4 - 5 × 8 ÷ 3)/(5 × 3 - {6 + 3}) is:

(a) -8/9
(b) 8/9
(c) 4/9
(d) 1/9

Q45. How many years will it take for an amount of Rs. 400 to yield Rs. 450 as interest at 5% per annum on simple interest?

(a) 22.5
(b) 23
(c) 22
(d) 21.5

Q46. What is the value of √(1.21 × 0.9)/(1.1 × 0.11)

(a) 9
(b) 3
(c) 6
(d) 12

Q47. The Big Inch pipeline transports which among the following?

(a) Edible oil
(b) Water
(c) Sugar syrup
(d) Petroleum

Q48. The LCM of two numbers is 721, and the numbers are in the ratio of 1 : 7. What is the sum of the numbers?

(a) 825
(b) 824
(c) 721
(d) 728

Q49. A alone can complete 2/5 of a task in 12 days, while B alone can complete 3/4 of the same task in 25 days. In how many days can they complete the task if they work together?

(a) 1/19
(b) 150/19
(c) 300/19
(d) 75/19

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Q50. What is the value of sin(48° + θ) – cos(42° – θ)?

(a) 2
(b) 1
(c) –1
(d) 0

Q51. If '+' means 'subtraction', '÷' means 'addition', '–' means 'multiplication' and '×' means 'division', then what is the value of (8 + 2 –19) – (4 + 27 × 3)?

(a) –150
(b) 85
(c) –85
(d) 150

Q52. In which year were the powers of the East India Company passed to the British crown by the British Parliament?

(a) 1862
(b) 1859
(c) 1857
(d) 1858

Q53. Vikas took a loan of Rs. 1,200 on simple interest that is equal to as many years as the rate of interest. If he paid Rs. 768 as interest at the end of the loan period, then what was the rate of interest?

(a) 7.8%
(b) 8.0%
(c) 8.5%
(d) 7.5%

Q54. Grey revolution in India is related to which of the following?

(a) Fertilizer production
(b) Mustard production
(c) Coal production
(d) Crude oil production

Q55. If '+' means 'subtraction', '÷' means 'addition, '–' means multiplication' and '×' means 'division', then what is the value of 15 ÷ (5 + 8)?

(a) 28
(b) 11
(c) 12
(d) 15

Q56. Which ruler wanted to build the Alai Minar near the Qutub Minar, but could not complete it?

(a) Raziya Sultana
(b) Nasir-ud-Din Mahmud
(c) Iltutmish
(d) Ala-ud-Din Khilji

Q57. The process of seeping of water into the ground is known as _____.

(a) aquifer
(b) infiltration
(c) well
(d) bawris

Q58. If A/4 = B/5 = C/6, then A : B : C is:

(a) 4 : 6 : 5
(b) 4 : 5 : 6
(c) 4 : 8 : 9

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(d) 5 : 6 : 4

Q59. Which of the following is NOT a part of the human eye?

(a) Cochlea
(b) Cornea
(c) Ciliary muscles
(d) Iris

Q60. The first five year plan's main emphasis was to improve the condition of agriculture in India. It began in the year _____.

(a) 1951
(b) 1931
(c) 1950
(d) 1961

Q61. What is the value of x, if – 3 × √196 + √x = 8 × 3 – 2?

(a) 4096
(b) 135
(c) 1064
(d) 128

Q62. A sector of a circle has a radius of 18 cm and a central angle of 125°. What will be its approximate perimeter? (Use π = 22/7)

(a) 73.85 cm
(b) 74 cm
(c) 75.3 cm
(d) 73 cm

Q63. A sum of money amounts to Rs. 12,000 after 6 years and Rs. 15,000 after 9 years at the same rate of simple interest. What is the rate of interest per annum?

(a) 16 2/3 %
(b) 16 1/3 %
(c) 18 2/3 %
(d) 16%

Q64. 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 follows from the statements.

Statements:

1. Some kiwis are green.
2. Some apples are kiwis.

Conclusions:

1. Some kiwis are yellow.
2. An apple is green.

(a) Only conclusion 1 follows.
(b) Only conclusion 2 follows.
(c) Either conclusion 1 or 2 follows.
(d) Neither conclusion 1 nor 2 follows.

Q65. The ratio of the volumes of two cubes is 64 : 1331. What is the ratio of their total surface areas?

(a) 16 : 121
(b) 16 : 4
(c) 4 : 121
(d) 121 : 16

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Q66. Select the term from among the given options that can replace the question mark (?) in the following series.

A11, D8, G5, ?

(a) K2
(b) J11
(c) J2
(d) G2

Q67. Which of the following is NOT an environmental concern?

(a) Increasing consumption and use of plastics
(b) Growing pollution levels
(c) Global warming
(d) Raising ozone layer

Q68. In which year was the International Bank for Reconstruction and Development (IBRD), better known as the World Bank, established to help Europe recover from the devastation of World War II?

(a) 1947
(b) 1945
(c) 1946
(d) 1944

Q69. Read the given statement and conclusions carefully and decide which of the conclusions logically follow(s) from the statement.

Statement:

Company ABC has the highest number of customers as compared to its competitors.

Conclusions:

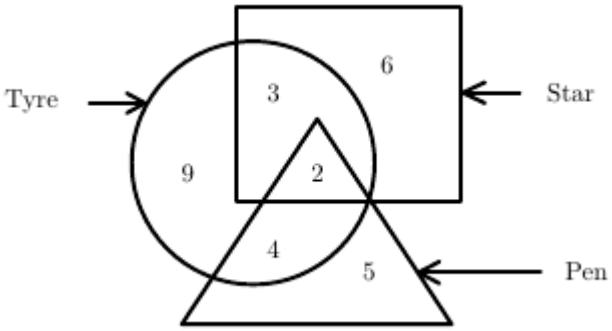
1. Company ABC has 58% of the total customers.
2. Company ABC's products are the cheapest in the market.

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

Q70. In human beings, excretory products in the form of soluble nitrogen compounds are removed by the _____ in the kidneys.

(a) nephrons
(b) nucleus
(c) nutrition
(d) mitochondria

Q71. How many stars are both Tyres and Pen?



(a) 2
(b) 6
(c) 3
(d) 4

Q72. The Mysuru Palace in Karnataka was an official residence of which of the following dynasties?

(a) Pallava
(b) Wadiyar
(c) Chalukya
(d) Chola

Q73. Which among the following nations won the 2019 Copa America Soccer Tournament?

(a) Argentina
(b) Brazil
(c) Colombia
(d) Ecuador

Q74. Which one of the following is the second highest peak in Himalayas?

(a) K2
(b) Makalu
(c) Mount Everest
(d) Dhaulagiri

Q75. If a train runs at an average speed of 42 km/h, then it covers a certain distance in 45 min. What is the speed at which the train must run to reduce the time of the same journey to 35 min?

(a) 52 km/h
(b) 52.5 km/h
(c) 54 km/h
(d) 49 km/h

Q76. Name the Viceroy of India who was associated with the controversial Ilbert Bill during the Indian freedom struggle.

(a) Lord Ripon
(b) Lord Dufferin
(c) Lord Mayo
(d) Lord Lansdowne

Q77. If A, B and C can complete a task alone in 15 days, 20 days and 25 days, respectively, then in how many days can they complete the same task if they work together?

(a) 150/47
(b) 75/47
(c) 300/47
(d) 225/47

Q78. Which of the following is a prime number?

(a) 121
(b) 81
(c) 1331
(d) 157

Q79. Who among the following has never been a Governor for Reserve Bank of India?

(a) Dr. Manmohan Singh
(b) Bimal Jalan
(c) K Kasturirangan
(d) D. Subba Rao

Q80. Which one of the following provisions was a part of the Indian Independence Act of 1947?

(a) India will be divided into two parts
(b) India will become a part of Britain
(c) All princely states will remain dependent on British
(d) India will become a monarchy

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Q81. Select the number from among the given options that can replace the question mark (?) in the following series.

256, 625, 1296, 2401, ?

(a) 4142
(b) 4128
(c) 4102
(d) 4096

Q82. In a triangle, if angle A = 30° and angle B = 45°, then what is the angle of C?

(a) 150°
(b) 105°
(c) 75°
(d) 180°

Q83. Pointing to a boy, Sohan said, "He is the son of Raj, who is my younger sister's father." How is Raj related to Sohan?

(a) Maternal uncle
(b) Brother
(c) Father
(d) Son

Q84. In the word VIBGYOR, which of the following two consecutive letters have the least difference between them in terms of letters of the English alphabet?

(a) I and B
(b) Y and O
(c) O and R
(d) B and G

Q85. Which of the following satellites launched by the Indian Space Research Organisation (ISRO) is a navigation satellite?

(a) SARAL
(b) IRNSS-1I
(c) SCATSAT-1
(d) RESOURCESAT-2A

Q86. Observe the given table and answer the question.

India's Natural Gas Production: A Turnaround

Financial Year	Total Gas Production	Change (%)	Offshore Production	Onshore Production
2011-12	47.55	(8.92)	38.47	9
2012-13	40.67	(14.46)	31.80	8.87
2013-14	35.40	(13)	26.39	9.01
2014-15	33.65	(5)	24.86	8.79
2015-16	32.24	(4.19)	23.01	9.23
2016-17	31.89	(1.08)	22.03	9.85
2017-18	32.64	2.35	22.01	10.63

All Figures in Billion Cubic Meter (BCM)

Source: Ministry of Petroleum and Natural Gas (MoPNG)

In which year did the production fall the most as compared to the previous year, in offshore production?

(a) 2013-14
(b) 2014-15
(c) 2012-13

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(d) 2015-16

Q87. Observe the given table and answer the question.

India's Natural Gas Production: A Turnaround

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2011-12	47.55	(8.92)	38.47	9
2012-13	40.67	(14.46)	31.80	8.87
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2016-17	31.89	(1.08)	22.03	9.85
2017-18	32.64	2.35	22.01	10.63

All Figures in Billion Cubic Meter (BCM)

Source: Ministry of Petroleum and Natural Gas (MoPNG)

What is the approximate percentage decline in offshore production in the year 2013-14?

(a) 20%
(b) 15%
(c) 17%
(d) 19%

Q88. Observe the given table and answer the question.

India's Natural Gas Production: A Turnaround

Financial Year	Total Gas Production	Change (%)	Offshore Production	Onshore Production
2011-12	47.55	(8.92)	38.47	9
2012-13	40.67	(14.46)	31.80	8.87
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2016-17	31.89	(1.08)	22.03	9.85
2017-18	32.64	2.35	22.01	10.63

All Figures in Billion Cubic Meter (BCM)

Source: Ministry of Petroleum and Natural Gas (MoPNG)

What is the total onshore production during all the years (in BCM)?

(a) 65.38
(b) 67.38
(c) 68.38
(d) 64.38

Q89. Observe the given table and answer the question.

India's Natural Gas Production: A Turnaround

Financial Year	Total Gas Production	Change (%)	Offshore Production	Onshore Production
2011-12	47.55	(8.92)	38.47	9

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2012-13	40.67	(14.46)	31.80	8.87
2013-14	35.40	(13)	26.39	9.01
2014-15	33.65	(5)	24.86	8.79
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2017-18	32.64	2.35	22.01	10.63

All Figures in Billion Cubic Meter (BCM)

Source: Ministry of Petroleum and Natural Gas (MoPNG)

Which of the following years showed the highest growth rate in onshore production?

(a) 2015-16
(b) 2016-17
(c) 2013-14
(d) 2012-13

Q90. Select the letter from among the given options that can replace the question mark (?) in the following series.

A, A, B, D?

(a) J
(b) E
(c) G
(d) H

Q91. Select the number set from among the given options that can replace the question mark (?) in the following series.

4 : 9, 25 : 49, ?, 289 : 361

(a) 121 : 169
(b) 49 : 216
(c) 729 : 64
(d) 225 : 245

Q92. Select the number from among the given options that can replace the question mark (?) in the following series.

12496, 12448, 12424, ?

(a) 12464
(b) 12400
(c) 6212
(d) 12412

Q93. Select the number from among the given options that can replace the question mark (?) in the following series.

4, 6, 8, 18, 16, ?

(a) 36
(b) 54
(c) 32
(d) 20

Q94. In a certain code language, 'RSMPLDFN' is written as 'LLEGFWXE'. What is the code for 'XZBHQNTV' in that code language?

(a) RSTYLGKN
(b) RSTXKGKN
(c) RSTYKGLM
(d) RSTWKGLN

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Q95. Read the given paragraph and answer the question.

There are five persons A, G, M, J and D. Every person has to select one item each from a box containing items numbered from 1 to 5. A and J selected items 5 and 2 respectively. G cannot select item 3, while M cannot select item 3 or 5.

Which item can G select?

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

Q96. In a certain code language, SELFISH is written as TDMEJRI. How will MONITOR be written as in that language?

(a) NOOHUNS
(b) NNOHUNS
(c) NNOHUNO
(d) NNOHHNS

Q97. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

Examinations must be conducted without any favours to evaluate the true performance of the students.

Assumptions:

1. No unfair means or help shall be provided to the students.
2. Teachers should help their favourite students perform better.

(a) Only assumption 2 is implicit.
(b) Only assumption 1 is implicit
(c) Either assumption 1 or 2 is implicit.
(d) Both assumptions 1 and 2 are implicit.

Q98. In a certain code language 'Ram is boy' is written as 'qaz wsx edc', 'boy has car' is written as 'plm qaz ijb' and 'car is blue' is written as 'edc ijb ftb'. How will 'Ram' be written as in that language?

(a) edc
(b) qaz
(c) wsx
(d) ftb

Q99. A team is to be selected from 9 players A, B, C, D, E, F, G, H and M. There will be six players in the team. A cannot be selected with B. G cannot be selected with H. H and A should be in the same team. E cannot be selected with F. C cannot be selected with H but always must be selected with D.

Which of the following is a correct selection of the team?

(a) B, C, D, E, H and M
(b) B, C, D, E, G and M
(c) A, D, G, E, C and H
(d) A, C, D, E, G and M

Q100. 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 from the statements.

Statements:

1. All red are white.
2. All white are black.

Conclusions:

1. Some white are red.
2. Some black are red
3. Some red are not black.

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4. All black are white.

(a) Only conclusions 2 and 4 follow.
(b) Only conclusions 1 and 4 follow.
(c) Only conclusions 1 and 3 follow.
(d) Only conclusions 1 and 2 follow.

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) India

The correct answer is India.

• The ICC Men's Cricket World Cup 2023 will be the 13th edition of the tournament, and it will be held in India in October and November 2023.

• The competition is being held fully in India for the first time.

• Three earlier events – 1987, 1996, and 2011 – were partially hosted there.

• The tournament was originally slated to take place from February 9 through March 26, 2023.

• Namibia, along with Zimbabwe and South Africa, will host the Men's Cricket World Cup for the first time in October/November 2027. The event was last held in 2003 in South Africa and Zimbabwe.

• The Cricket World Cup is a one-day international (ODI) cricket tournament held every four years.

• The International Cricket Council (ICC), the sport's governing body, hosts the event every four years, with preliminary qualification stages leading up to a finals competition.

• First edition: 1975 - Held in England

• Latest edition: 2019 - Held in England & Wales

• Current champion - England (1st title)

• Most successful - Australia (5 titles)

• Most runs - (India) Sachin Tendulkar (2,278)

• Most wickets - (Australia) Glenn McGrath (71)

Q2. Answer: (c) ROM

The correct answer is ROM.

Key Points

• Read-only memory (ROM), EPROM (erasable programmable ROM) and EEPROM (electrically erasable programmable ROM), ferroelectric RAM, most types of computer data storage devices (e.g. disc storage, hard disc drives, optical discs, floppy discs, and magnetic tape), and early computer storage methods like punched tape and cards are all examples of non-volatile memory.

• In computers and other electronic devices, read-only memory (ROM) is a type of non-volatile memory.

• After the memory device is manufactured, data saved in ROM cannot be electronically manipulated. Read-only memory, commonly known as firmware, is useful for storing software that is rarely modified during the life of the device.

• Plug-in cartridges containing ROM can be used to deploy software applications (such as video games) for programmable devices.

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• Non-volatile memory (NVM) is a type of computer memory that can preserve data even after the power is turned off.

Important Points

• Random-access memory (RAM) is a type of computer memory that allows data to be read and written in any sequence and is commonly used to store working data and machine code. To connect the data lines to the designated store for reading or writing the entry, RAM contains multiplexing and demultiplexing hardware.

• The technique of building an integrated circuit by putting millions of MOS transistors onto a single chip is known as very large-scale integration(VLSI).

Q3. Answer: (c) 1/7

Given

tan A = 3over4

Formula used

cos A = side adjacent to A/Hypotenuse

sin A = side opposite to A/Hypotenuse

Calculation

In triangle ABC

$(AC)^2 = (AB)^2 + (BC)^2$

$\Rightarrow (AC)^2 = (4)^2 + (3)^2$

$\Rightarrow (AC)^2 = 16 + 9$

$\Rightarrow (AC)^2 = 25$

$\Rightarrow AC = 5$ units

cos A = AB/AC

$\Rightarrow 4/5$

sin A = BC/AC

$\Rightarrow 3/5$

$[(4/5) - (3/5)]/[(4/5) + (3/5)]$

$\Rightarrow [(4 - 3)/5]/[(4 + 3)/5]$

$\Rightarrow [(1/5)]/[(7/5)]$

$\Rightarrow (1/5) \times (5/7)$

$\Rightarrow 1/7$

Therefore The value of (cos A - sin A)/(cos A + sin A) is 1/7

Q4. Answer: (d) 6/25

The logic followed here is :-

Third number × 3/100 = First number.

Fourth number × 3/100 = Second number.

Hence, the correct answer is " 6/25 ".

Q5. Answer: (a) Gitanjali

The correct answer is Gitanjali.

Key Points

• In 1913, poet Rabindranath Tagore was awarded the Nobel Prize for Literature for his collection Gitanjali, which was published in London in 1912.

• The fact that the prize was handed to an Indian for the first time added to its prominence.

• Tagore's literary reputation was cemented by this award. In protest at the 1919 Amritsar Massacre, Tagore surrendered his Knighthood for Services to Literature, which he had received in 1915.

Important Points

• Rabindranath Tagore's Poetry Compilation book is titled 'Sanchayita.'

• Gora is a novel by Rabindranath Tagore set in the 1880s during the British Raj in Calcutta (now Kolkata). It is the fifth and longest of Tagore's twelve books in terms of writing sequence.

• Gitabitan is a book that contains all 2,232 of Bengali polymath Rabindranath Tagore's songs.

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Q6. Answer: (c) Mumbai

The correct answer is Mumbai.

Key Points

• The National Stock Exchange of India Limited (NSE), headquartered in Mumbai, Maharashtra, is India's largest stock exchange.

• According to the Futures Industry Association (FIA), a derivatives trade association, it will be the world's largest derivatives exchange in 2021 by the number of contracts traded.

• According to World Federation of Exchanges (WFE) figures for the calendar year 2021, the NSE is ranked fourth in the world in cash equities by a number of deals.

• It is owned by a number of major financial institutions, banks, and insurance firms.

• The NSE was founded in 1992 as the country's first dematerialized electronic exchange.

• NSE's Managing Director & Chief Executive Officer is Vikram Limaye.

• As of August 2021, the National Stock Exchange had a total market capitalization of around US$3.4 trillion, making it the world's tenth-largest stock exchange.

Q7. Answer: (b) Java

The correct answer is Java.

Key Points

• Java is an object-oriented programming language with a high level of abstraction and as few implementation dependencies as possible.

• It is a general-purpose programming language designed to allow programmers to write once and run anywhere (WORA), which means that compiled Java code can run on any platform that supports Java without having to be recompiled.

• Java applications are often compiled to bytecode, which may execute on any Java virtual machine (JVM), regardless of the computer architecture.

Important Points

• Ubuntu is a Debian-based Linux distribution that uses largely free and open-source software. For Internet of Things devices and robots, Ubuntu is available in three editions: Desktop, Server, and Core.

• Linux Mint is an Ubuntu-based community-driven Linux distribution that comes with a number of free and open-source software.

• MS-DOS is a Microsoft-developed operating system for x86-based personal computers.

Q8. Answer: (b) Liver

The correct answer is Liver.

Key Points

• The liver is the biggest gland in the body and a digestive system auxiliary organ.

• On the right side of the abdomen, it is located.

• The falciform ligament divides the liver into two lobes, the left and right.

• Hepatocytes, or liver cells, have a unique ability to reproduce in response to any type of liver injury.

Important Points

• Perspiration glands are little tubular structures that create sweat on the surface of the skin. Sweat glands are an example of an exocrine gland, which produces and secretes chemicals onto an epithelial surface via a duct.

• The mammary gland is made up of connective tissue, fat, and tissue, and it houses milk-producing glands.

• Esophageal cardiac glands are mucous glands in the lamina propria mucosae that are placed near the cardiac orifice (esophago-gastric junction).

Q9. Answer: (c) 22

The correct answer is 22.

Key Points

• The eighth schedule, according to Articles 344(1) and 351 of the Indian Constitution, recognises the following 22 languages.

• The official languages of India are listed in the Eighth Schedule to the Indian Constitution.

• Despite the fact that there are hundreds of languages spoken throughout the country, the eighth schedule recognises only 22 as official languages.

• While 14 of these languages were initially included in the constitution, the remaining languages were added through subsequent changes.

• The Indian government is now required to take steps to help these languages evolve so that "they increase fast in richness and become effective ways of transmitting modern knowledge."

• Assamese, Bengali, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Manipuri, Marathi, Nepali, Oriya, Punjabi, Sanskrit,

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Sindhi, Tamil, Telugu, Urdu, Bodo, Santhali, Maithili, and Dogri are among the 22 languages listed in the Constitution's Eighth Schedule.

• The Indian Constitution is divided into 12 schedules. The constitution originally included only eight schedules.

• The ninth, tenth, eleventh, and twelfth schedules were later introduced by the 1st, 52nd, 73rd, and 74th Constitutional Amendments Acts, respectively.

Q10. Answer: (a) –4

Given

S = {1, 2, 2, 3, 3, 3, 4, 4, 4, 4)

Formula used

Mean = Sum of all observation/ number of observation

Medain = {(n/2)th term + [(n/2) + 1]}th term/2

Mode = A number which occurred maximum number of times in a data

Calculation

Mean = (1 + 2 + 2 + 3 + 3 + 3 + 4 + 4 + 4 + 4)/10

=> 30/10

=> 3

Median = {[n/2] th term + [(n/2) + 1]}th term/2

=> (10/2)th term + [(10/2) + 1]th term/2

=> (5th term + 6th term)/2

=> (3 + 3)/2

=> 6/2

=> 3

Mode = 4

4 × 3 + 2 × 4 - 8 × 3

=> 12 + 8 - 24

=> 20 - 24

=> - 4

Therefore The value of 4 × mean + 2 × mode – 8 × median is - 4

Q11. Answer: (c) 8 m

Given

Angle of elevation = 45°

Distance of ladder from the wall = 4√2 metres

Identities

Cos A = Side adjacent to A/Hypotenuse and cos 45° = 1/√2

Calculation

let AB is a ladder, BC is a wall and AC is a distance between wall and the ladder.

cos 45° = AC/AB

=> (1/√ 2) = 4√2/AB

=> AB = 4√2 × √2

=> AB = 4 × 2

=> AB = 8

Therefore The length of the ladder is 8 m

Q12. Answer: (a) 7 : 9 : 108

Given

a : b = 7 : 9

b : c = 1 : 12

concept

when ratio a : b = m : n and c : d = o : p is given, then a : b : c = mo : no : np

Calculation

a : b : c = 7 × 1 : 9 × 1 : 9 × 12

=> 7 : 9 : 108

Therefore a : b : c is 7 : 9 : 108.

Q13. Answer: (c) 225

The logic followed here is-

1) 343 = 7^3 (Cube of 7)

2) 512 = 8^3 (Cube of 8)

3) 225 = Not a cube of any natural number

4) 216 = 6^3 (Cube of 6)

Hence, 'option 3' is the correct answer.

Q14. Answer: (d) Jharkhand

The correct answer is Jharkhand.

Key Points

• Nepal shares a border with five Indian states: Uttarakhand, Uttar Pradesh, Bihar, West Bengal, and Sikkim, which spans 1850 kilometres.

• Jharkhand is bordered on the north by Bihar, on the west by Uttar Pradesh and Chhattisgarh, on the south by Odisha, and on the east by West Bengal.

• "Jharkhand" literally means "Land of Forests." The Bihar Reorganization Act established the 28th state of the Indian Union on November 15, 2000, the birth anniversary of the legendary Bhagwan Birsa Munda.

• Ranchi is the state's capital, with Dumka serving as a sub-capital. Jamshedpur is the state's largest and most industrial city.

Important Points

• Nepal is a landlocked South Asian country. It is primarily located in the Himalayas, but also contains parts of the Indo-Gangetic Plain, bordering Tibet in China to the north and India to the south, east, and west, with the Siliguri Corridor separating it from Bangladesh and Bhutan, respectively.

• Nepal is a multiethnic, multilingual, multireligious, and multicultural country with Nepali as its official language.

• Kathmandu is the capital and largest city of Nepal.

Q15. Answer: (c) Rajasthan

The correct answer is Rajasthan.

Key Points

• On October 2, 1959, at Nagaur in Rajasthan, then-Prime Minister Pandit Jawaharlal Nehru inaugurated the Panchayati Raj system, which was later called Panchayati Raj.

• In September and October 1959, the first elections under the Rajasthan Panchayat Samitis and Zilla Parishads Act were held.

• The three-tier scheme of Panchayati Raj began functioning on October 2, 1959, with the already existing Panchayats at the village level under the Rajasthan Panchayat Act, 1953.

• Rajasthan holds the distinction of being the first state to approve the democratic decentralization concept, which calls for a three-tier structure of representative bodies at the village, block, and district levels.

• The Rajasthan Panchayat Act was passed in 1953, and village panchayats were formed across the state.

Important Points

• Rajasthan:

• Established: 30 March 1949

• Capital: Jaipur

• Largest city: Jaipur

• Governor: Kalraj Mishra

• Chief Minister: Ashok Gehlot (INC)

• Legislature: Unicameral (200 seats)

• Parliamentary constituency: Rajya Sabha (10 seats)

• Lok Sabha: (25 seats)

• High Court: Rajasthan High Court

Q16. Answer: (c) 336 cm^2

Given

Sides of a rhombus = 25 cm

Diagonal of rhombus = 14 cm

Formula used

Area of triangle = √s(s -a) (s -b) (s - c)

s is the semi - the perimeter of the triangle. a, b and c are the sides of the triangle

Calculation

Let ABCD is a rhombus. Side AB = BC = CD = DA = 25 cm and AC = 14 cm

a = 25 cm, b = 25 cm, c = 14 m

s = (25 + 25 + 14)/2

s = 64/2

s = 32

Area of triangle = √32(32 - 25) (32 - 25) (32 - 14)

=> √32 × 7 × 7 × 18

=> √2 × 2 × 2 × 2 × 2 × 7 × 7 × 2 × 3 × 3

=> 2 × 2 × 2 × 7 × 3

=> 168 cm²

Similarly,Area of ADC = 168 cm²

area ABCD = area ABC + area ADC

=> 168 + 168

=> 336 cm²

Therefore Area of rhombus is 336 cm²

Q17. Answer: (d) 343

The correct answer is 343.

Key Points

• The official language of the Union is Hindi in the Devanagari script, according to Article 343(1) of the Indian Constitution.

• Article 343(2) stated that English would continue to be used in official Union activities for a period of 15 years from the date of the constitution's inception, i.e. until January 25, 1965.

• Again, article 343(3) empowered the parliament to pass laws to ensure that English would continue to be spoken after January 25, 1965.

• Both Houses of Parliament passed the Official Language Resolution on January 18, 1968.

• This Resolution was approved to create a comprehensive programme for the Union of India to expand the use of the Hindu language for official purposes.

• As a result, the Official Languages Act of 1963 was passed, allowing English to be used after the stated date of 1965.

• According to the Act, resolutions, regulations, general instructions, notices, press communiqués, administrative and other reports, licences, tenders, and other documents must be written in both English and Hindi.

Important Points

• The number of Anglo-Indians who may be nominated to the State Legislative Assemblies is left to the Governor's discretion under Article 333 of the Constitution.

• Article 334 established a time limit for these reservations, however, it is periodically extended by the parliament.

• In making appointments to services and posts in connection with the operations of the Union or a State, Article 335 states that the claims of members of the Scheduled Castes and Scheduled Tribes shall be taken into account, commensurate with the maintenance of administrative efficiency.

Q18. Answer: (a) 156

Given

2√169, cbrt27, cbrt64 and 2√144

Calculation

2√169 = 13

cbrt27 = 3

cbrt64 = 4

2√144 = 12

factors of 13 = 1 × 13

factors of 3 =1 × 3

factors of 4 = 1 × 2 × 2

factors of 12 = 1 × 2 × 2 × 3
LCM of 13, 3, 4 and 12 = 1 × 2 × 2 × 3 × 13
=>156
Therefore The LCM of 2√169, cbrt27, cbrt64 and 2√144 is 156

Q19. Answer: (b) 3134

Given
(8 + 27 + 64 + ... + 1000) + (2 + 4 + 6 + ... + 20)
Concept
Sum of cubes of first n natural numbers: Sum of n^3 : $1^3 + 2^3 + 3^3 + 4^3 + ... + n^3 = [n(n + 1)/2]^2$
Calculation
(8 + 27 + 64 + ... + 1000)
$2^3 + 3^3 + 4^3 + ... + 10^3$
as these is a series of cube of first 10 natural number except 1. Let take n = 10 and subtract 1 from the above mentioned formula.
$\{10(10 + 1)/2\}^2 - 1$
=> $[5(11)]^2 - 1$
=> $[55]^2 - 1$
=> 3025 - 1
=> 3024 ---- (1)
(2 + 4 + 6 + ... + 20)
This series is an arithmetic progression. As common difference, d = 2 i.e. (4 - 2= 2; 6 - 4 = 2)
a_n = a + (n - 1)d
=> 20 = 2 + (n - 1)2
=> 20 = 2 + 2n - 2
=> 20 = 2n
n = 10
S = n/2[2a + (n -1)d]
=> 10/2 [2 × 2 + (10 - 1)2]
=> 5 [4 + 18]
=> 5 [22]
=> 110 ---- (2)
adding 1 and 2
=> 3024 + 110
=> 3134
Therefore (8 + 27 + 64 + ... + 1000) + (2 + 4 + 6 + ... + 20) is 3134.

Q20. Answer: (c) Rs. 13,750

Given
Principal = Rs. 75,000
rate = 2 5over3 %
Time = 5 years
Formula used
simple interest = (principal × rate × time)/100
Calculation
simple interest = (75000 × 11 × 5)/(3 × 100)
=> 250 × 11 × 5
=> 250 × 55
=> 13,750
Therefore The amount will be Rs.13,750.

Q21. Answer: (c) electroplating

The correct answer is electroplating.
Key Points

• Electroplating (also known as electrodeposition) is a method of reducing cations of the desired metal in solution and forming a metallic coating using an electrical signal supplied by an external power source.

• Electroplating is a method of applying a metallic coating to a substrate. Heat tolerance and corrosion resistance are improved by electroplating a substrate material.

• Because electrodeposition is accomplished through a crystalline mechanism, electroplating is an electrocrystallization process.

Important Points

• An electrode is an electric conductor, generally made of metal, that conducts current into and out of an electrically conducting medium, which can be an electrolytic solution, such as in a storage battery, or a solid, gas, or vacuum.

• An electromagnet is a device that consists of a magnetic core encircled by a coil through which an electric current is carried to magnetise the core.

• A conductor is an object or type of material in physics and electrical engineering that permits charge (electric current) to travel in one or more directions.

Q22. Answer: (d) Homi J Bhabha

The correct answer is Homi J Bhabha.

Key Points

• Homi J Bhabha, the founder of India's nuclear programme, predicted that "nuclear technology will be highly important not only in the power industry but also for various societal uses aimed at improving life."

• India's nuclear programme dates back to March 1944, and its three-stage technological efforts were formed by Homi Jehangir Bhabha when he built the Tata Institute of Fundamental Research, a nuclear research centre.

• In 1956, India developed its first research reactor, and by 1964, it had completed its first plutonium reprocessing unit.

Important Points

• Homi Jehangir Bhabha was an Indian nuclear scientist, founder of the Tata Institute of Fundamental Research, and professor of physics (TIFR). Bhabha was the founding director of the Atomic Energy Establishment, Trombay (AEET), which is now known as the Bhabha Atomic Research Centre in his honour.

• He is also recognised as the "Father of the Indian Nuclear Program." TIFR and AEET were the cornerstones of India's nuclear weapons development, which Bhabha oversaw as director.

• Avul Pakir Jainulabdeen Abdul Kalam was the 11th President of India, serving from 2002 to 2007.

• Sir Jagadish Chandra Bose was a major force behind the expansion of experimental science on the Indian subcontinent. He pioneered the investigation of radio and microwave optics, made significant contributions to plant science, and was a major force behind the expansion of experimental science on the Indian subcontinent.

• Sir Chandrasekhara Venkata Raman was an Indian physicist who pioneered light scattering research.

Q23. Answer: (c) Dehradun

The correct answer is Dehradun.

Key Points

• In August 2018, India's first biofuel flight took off from Dehradun (the capital of Uttarakhand) and landed at Indira Gandhi International Airport in Delhi.

• SpiceJet's turboprop Q-400 plane took part in the world's first biofuel test flight.

• These test flights have already taken place in developed countries such as Canada, Australia, and the United States.

• India was the first country in the developing world to do a biofuel test flight.

Important Points

• The main international airport servicing Delhi is Indira Gandhi International Airport.

• The airport is located in Palam, Delhi, 15 kilometres south of the New Delhi Railway Station and 16 kilometres from the city centre.

• It is stretched out on 5,106 acres. Since 2009, it has been India's busiest airport in terms of passenger volume, having been named after former Prime Minister Indira Gandhi.

• In terms of freight traffic, it has surpassed Mumbai since late 2015.

• Before its management was passed to the Airports Authority of India, the airport was operated by the Indian Air Force.

Q24. Answer: (b) Cottage industry

The correct answer is Cottage industry.

Key Points

• A cottage industry is a small-scale, decentralised manufacturing firm that is often run from a house rather than a dedicated facility.

• The amount of capital required to start a cottage industry, as well as the number of people employed, define cottage industries.

• They frequently concentrate on the creation of labour-intensive commodities, but they face severe competition from factory-based businesses that mass-produce things.

• Cottage industries play an important part in developing countries' economies.

• Larger industries may require money and financial infrastructures that these economies lack.

• Smaller businesses may find it difficult to expand due to a lack of available cash or uncertainties surrounding private property and legal rights.

Important Points

• Large-scale industries are defined as those with extensive infrastructure, raw materials, significant workforce demands, and high capital requirements.

• The intellectual or knowledge-based economy is represented by the quaternary sector or quaternary industry.

• The raw materials produced by the primary sector are processed into manufactured commodities and products by secondary industries.

Q25. Answer: (d) Chinese

The correct answer is Chinese.

Key Points

• The United Nations has six official languages. Arabic, Chinese, English, French, Russian, and Spanish are among them.

• The right interpretation and translation of these six languages, in both spoken and written form, is critical to the Organization's work because it allows for clear and succinct communication on global concerns.

• The General Assembly (Article 51 of the Rules of Procedure), the Economic and Social Council, and the Security Council all employ these languages at their meetings (Article 41 of its Rules of Procedure).

• Each country's delegate may talk in any of the six official languages, or in any language with interpretation in one of the six official languages.

• Official documents are distributed in the six official languages as well. In general, all six languages have equally authoritative texts. English and French are the official working languages of the United Nations Secretariat.

Important Points

• United Nations:

• Headquarters: New York City, U.S. (international territory)

• Official languages: Arabic, Chinese, English, French, Russian, Spanish

• Type: Intergovernmental organization

• Membership: 193 member states

• Secretary-General: António Guterres

• Deputy Secretary-General: Amina J. Mohammed

Q26. Answer: (d) 30

The logic followed here is-

Hence, 'option 4' is the correct answer.

Q27. Answer: (d) Victoria Memorial

The correct answer is Victoria Memorial.

Key Points

• White Makrana marble was used to construct the Victoria Memorial.

• With its dome, four subsidiary, octagonal-domed chattris, towering portals, terrace, and domed corner towers, it resembles the Taj Mahal in design.

• The Victoria Memorial is a magnificent marble structure in Kolkata's central business district that was constructed between 1906 and 1921.

• It is the world's largest royal monument and is now a museum under the supervision of the Ministry of Culture. It is dedicated to the memory of Queen Victoria.

• The memorial is located on the Maidan and is one of Kolkata's most iconic monuments.

Important Points

• The Writers' Buildings is the official administrative building of West Bengal's state government in Kolkata, India.

• St. Paul's Church is a Church of North India (CNI) cathedral in Kolkata, West Bengal, India, dedicated to Paul the Apostle and known for its Gothic architecture.

• The Fort William is located in Hastings, Calcutta (Kolkata). It was constructed during the British India Bengal Presidency's early years.

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Q28. Answer: (a) 1790-92

The correct answer is 1790-92.

Key Points

• The Kingdom of Mysore fought the British East India Company, the Kingdom of Travancore, the Maratha Empire, and the Nizam of Hyderabad during the Third Anglo-Mysore War (1790–1792).

• The Anglo-Mysore War was a third of four.

• In 1789, Tipu launched a war on Travancore.

• Travancore was a British-friendly state.

• Lord Cornwallis, the Governor-General of Bengal, declared war on Tipu Sultan in 1790.

• Tipu was defeated early in the war, and his soldiers were forced to retire.

• Later, the English marched on Tipu's capital Seringapatam, forcing Tipu to make a peace deal.

• The Treaty of Seringapatam concluded the conflict in 1792.

• Tipu had to hand over half of his empire to the English as part of the pact, which included the provinces of Malabar, Dindigul, Coorg, and Baramahal.

• He also had to pay the British Rs. 3 crore in war indemnity.

• Tipu also had to provide the British with two of his sons as sureties until he fulfilled his debt.

Thus the correct answer is 1790-92.

Q29. Answer: (c) 1024

The logic followed here is-

Hence, 'option 3' is the correct answer.

Q30. Answer: (a) Trygve Lie

The correct answer is Trygve Lie.

Key Points

• Trygve Halvdan Lie was elected the first Secretary-General of the United Nations on February 1, 1946.

• On February 2, 1946, the General Assembly formally inaugurated him at its 22nd meeting. Mr. Lie was re-elected by the General Assembly on November 1, 1950, for a third term beginning February 1, 1951.

• In November 1952, he resigned as Secretary-General of the United Nations.

• The United Nations Secretary-General (UNSG or SG) is the UN's highest administrative officer and heads the UN Secretariat, one of the UN's six main institutions.

• Chapter XV (Articles 97 to 101) of the United Nations Charter defines the secretary and general's secretariat's roles.

Important Points

• Carl Hammarskjöld was a Swedish economist and diplomat who served as the UN's second Secretary-General from April 1953 until September 1961, when he died in a plane crash.

• U Thant was a Burmese diplomat who served as the UN's third Secretary-General from 1961 to 1971, the first non-Scandinavian to do so.

• Kofi Atta Annan was a Ghanaian diplomat who served as the United Nations' seventh Secretary-General from 1997 to 2006.

Q31. Answer: (b) Capitalist

The correct answer is Capitalist.

Key Points

• Capitalism, often known as the capitalist economy, is an economic system in which private firms control and govern the factors of production such as capital goods, labour, natural resources, and entrepreneurship.

• The production of all commodities and services in a capitalist economy is based on demand and supply in the market, often known as a market economy.

• It differs from the central planning system, which is also referred to as a command or planned economy.

• The primary feature of a capitalist economy is the desire to make money.

Important Points

• A mixed economy is an economic system that combines parts of a market economy with elements of a planned economy, markets with state interventionism, or private enterprise with public enterprise, among other definitions.

• A communist economic system is one in which economic decisions are determined by the entire community in theory.

• A socialist economy is one in which products and services are produced for use rather than profit, as opposed to a capitalist economy in which goods and services are produced for profit.

Q32. Answer: (c) 0

Given:

|x × 1| = 0

Calculation:

The equation is |x * 1| = 0

Since x * 1 = x, the equation simplifies to |x| = 0.

The absolute value of a number is its distance from zero. The only number whose distance from zero is zero is zero itself.

Therefore, x = 0.

However, the question asks for the number of positive solutions. Since 0 is neither positive nor negative, there are no positive solutions to the equation.

Hence, the number of positive solutions is zero (0).

Therefore The correct answer is option (3).

Q33. Answer: (b) –40

Given

81over7 × 21over3 - 4 2over3 ÷ 7over9 × 121over6

Concept

BODMAS

B	**Brackets,[,[,(**
o	'oF'
D	Division, ÷
M	Multiplication, ×
A	Addition, +
S	Subtraction, -

Calculation

81 - 14over3 × 9over7 × 121over6

=>81 - 121

=>-40

Therefore The value of 81over7 × 21over3 - 4 2over3 ÷ 7over9 × 121over6 is - 40

Q34. Answer: (d) 780

Given

Number of persons = 40

Formula used

$^{n}C_r = n!/r! (n - r)!$

Calculation

n = 40 and r = 2.

^(40)C2 = 40!/(2 !)(40 - 2)!

=> 40!/(2 ! × 38!)

=> 40 × 39 × 38!/2! × 38!

=> 20 × 39

=> 780

Therefore Total number of handshakes is 780.

Q35. Answer: (b) Red Data Book

The correct answer is Red Data Book.

Key Points

• All endangered plants and animals are listed in the Red Data Book.

• Endangered animals are those that are on the verge of extinction.

• The Red Data Book is a public document used to record endangered and rare plant, animal, and fungus species, as well as some local subspecies, that exist in a given region.

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• The Red Data Book assists us in gathering comprehensive data for research, studies, and monitoring initiatives involving rare and endangered animals and their ecosystems.
• The Red Data Book is a comprehensive list of endangered species.
• The major goal of this documentation is to give comprehensive information for species research and analysis.
• The Red Data Book offers colour-coded information sheets organised by extinction danger for a variety of species and subspecies.

Q36. Answer: (d) R22

This question is based on the concept of positional value of alphabets.
The logic followed here is-
1) K14 → 14 = Positional value of K + 3 = 11 + 3
2) A4 → 4 = Positional value of A + 3 = 1 + 3
3) P19 → 19 = Positional value of P + 3 = 16 + 3
4) R22 → 22 ≠ Positional value of R + 3 = 18 + 3
Hence, 'option 4' is the correct answer.

Q37. Answer: (c) December 2^(nd)

The correct answer is December 2nd.
Key Points
• Every year on December 2nd, National Pollution Prevention Day is celebrated.
• To honour the lives of those who died in the Bhopal gas tragedy in 1984, the day is marked as a national pollution control day.
• The major goal of the day is to educate and inform the public about pollution control laws and industrial disasters.
• The 38th National Pollution Prevention Day will be observed this year.
• The day is commemorated in honour of those who perished in the Bhopal gas disaster.
• The industrial tragedy occurred in 1984 when the gas Methyl Isocyanate escaped and killed thousands of people.

Q38. Answer: (d) G can be fifth tallest

According to the information given,
• Height of D is more than at least four girls but she is not the tallest.
• Height of G is more than C and D both.
• Height of A is less than D.
• Height of A is more than B and F and height of F is less than E.
♦ Using the given options,
1) G can be second tallest
One of the possible arrangement: E > G > D > C > A > B > F
So, it's possible.
2) A can be fifth tallest
One of the possible arrangement: E > G > D > C > A > B > F
So, it's possible.
3) C can be fourth tallest
One of the possible arrangement: E > G > D > C > A > B > F
So, it's possible.
4) G can be fifth tallest
For this to be possible, arrangement should be like: _ > _ > _ > _ > G > C > D or _ > _ > _ > _ > G > D > C
However, in both of these arrangements the condition of 'height of A is less than D' is not applicable.
Thus, it is not possible for G to be the fifth tallest.
Hence, 'option 4' is the correct answer.

Q39. Answer: (a) Compiler

The correct answer is Compiler.
Key Points
• A compiler is a type of computer programme that turns an entire programme into machine language at once.
• A compiler is a programme that converts high-level code into object/machine code.

• A compiler is a piece of software that converts code written in one programming language (the source language) into code written in another programming language (the target language) (the target language).

• Compilers are a form of translator that helps digital devices, typically computers, communicate.

• Compilers are programmes that convert source code from a high-level programming language to a lower-level language (such as assembly language, object code, or machine code) in order to build an executable programme.

Important Points

• An interpreter's job is to translate what someone says into a different language.

• A simulator is a programme or machine that creates a virtual version of a real-world situation, usually for the purposes of training or experimentation.

• A computer device that converts continuously varying analogue signals from instruments and sensors that monitor conditions such as sound, movement, and temperature into binary code.

Q40. Answer: (b) 1

Given:

(tan 2°tan 88°) (tan 3°tan 87°)... (tan 43° tan 47°) tan 45°

Formula used:

tan 45° = 1

tanθ × cotθ = 1

Calculation:

(tan 2°tan 88°) (tan 3°tan 87°)... (tan 43° tan 47°) tan 45°

=> tan 2° × tan(90° – 2) tan 3° × tan(90° – 3) ..... tan 43° × tan(90° – 43°) tan 45°

=> (tan 2° × cot 2°) × (tan 3° × cot 3°) .....(tan 43° × cot 43°) × 1

=> 1 × 1 .....1 × 1

=> 1

Therefore The required value is 1.

Q41. Answer: (c) Imperial Bank of India

The correct answer is Imperial Bank of India.

Key Points

• The Imperial Bank of India (IBI) was the Indian subcontinent's oldest and largest commercial bank until it was changed into the State Bank of India in 1955.

• Prior to the foundation of the Reserve Bank of India (RBI) in 1935, it served as the central bank for British India under its royal charter.

• The Imperial Bank of India was formed on January 27, 1921, when the three Presidency Banks of colonial India were reorganized and merged into a single banking organization.

• The decision of his Majesty's cabinet was undoubtedly inspired by John Maynard Keynes' 1912 book "Indian Currency and Finance."

• The State Bank of India is a worldwide public sector bank and statutory organization located in Mumbai, Maharashtra, India.

Important Points

• The Bank of India (BOI) is a nationalized Indian bank. It is owned by the Ministry of Finance of the Government of India, with headquarters at Mumbai's Bandra Kurla Complex.

• Since its nationalization in 1969, it has been held by the government.

• SWIFT (Society for Worldwide Inter Bank Financial Telecommunications) is a founding member of BoI, which allows the supply of cost-effective financial processing and communication services.

Q42. Answer: (d) -211/8

Concept Used:

Follow the BODMAS rule according to the table given below:

Calculation:

({(13)³ - 4³})/(13 -8 ÷ 2) ÷ 8 – {2 + 6 × 9}

=> (2197 – 64)/(13 – 8 ÷ 2) ÷ 8 – {2 + 6 × 9}

=> 2133/(13 – 4) ÷ 8 – {2 + 6 × 9)

=> 2133/9 ÷ 8 – {2 + 54}

=> 237 ÷ 8 – 56

=> 237/8 – 56
=> (237 – 448)/8
=> -211/8
Therefore The required value is -211/8.

Q43. Answer: (b) 15 km

• Let's assume that Ram was facing the North when he walked straight from his home.
Then, the given information can be depicted as-
Total distance covered by Ram from home to shop A = 5 km + 8 km + 2 km
= 15 km
Hence, 'option 2' is the correct answer.

Q44. Answer: (a) -8/9

Concept Used:
Follow the BODMAS rule according to the table given below:
Calculation:
(32 ÷ 4 - 5 × 8 ÷ 3)/(5 × 3 - {6 + 3})
=> (8 – 5 × 8 ÷ 3)/(5 × 3 – 9)
=> (8 – 5 × 8/3)/(15 – 9)
=> (8 – 40/3)/6
=> (24 – 40)/3/6
=> (-16/3)/6
=> -16/18
=> -8/9
Therefore The required value is -8/9.

Q45. Answer: (a) 22.5

Given:
Amount = Rs. 400
Interest = Rs. 450
Rate = 5%
Formula used:
Time = (Interest × 100)/(Amount × Rate)
Calculation:
According to the question:
Time = (Interest × 100)/(Amount × Rate)
=> (450 × 100)/(400 × 5)
=> (90/4)
=> 22.5 years
Therefore The required time is 22.5.

Q46. Answer: (b) 3

Given:
√(1.21 × 0.9)/(1.1 × 0.11)
Calculation:
√(1.21 × 0.9)/(1.1 × 0.11)
=> √(1.089/0.121)
=> √9
=> 3
Therefore The required value is 3.
Shortcut Trick √(1.21 × 0.9)/(1.1 × 0.11)
=> √(121 × 9)/(11 × 11)
=> √9

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=> 3

Therefore The required value is 3.

Q47. Answer: (d) Petroleum

The correct answer is Petroleum.

Key Points

• Petroleum is transported from Texas to New Jersey via large and small inch pipes. Inch pipelines were constructed as emergency measures following WWII.

• The Big Inch and Little Big Inch pipelines, generally known as the Inch pipelines, are petroleum pipelines that run from Texas to New Jersey and were erected as emergency war measures in the United States between 1942 and 1944.

• Prior to WWII, petroleum products were carried by oil tankers from Texas' oil resources to the northeastern states.

• Although the pipelines were financed and controlled by the government, they were built and administered by the War Emergency Pipelines Company, a non-profit organisation supported by a group of the country's top oil firms.

• The Big and Little Big Inch pipelines were 1,254 and 1,475 miles (2,018 and 2,374 kilometres) long, respectively, with 35 pumping stations along with their courses, making it the longest, largest, and heaviest project of their kind at the time.

• In 1957, the Little Big Inch was reintroduced as an oil carrier. The pipes are still in service and are owned by Spectra Energy Partners and Enterprise Products.

Q48. Answer: (b) 824

Given:

The LCM of two numbers = 721

The ratio of the two numbers = 1 : 7

Calculation:

Let the ratio of two numbers be 1x and 7x respectively

The LCM of two numbers = 7x

According to the question:

=> 7x = 721

=> x = 103

Now,

The sum of two numbers = (1 × 103 + 7 × 103)

=> 103 + 721

=> 824

Therefore The required sum is 824.

Q49. Answer: (c) 300/19

Given:

Time taken by A alone to complete 2/5 of work = 12 days

Time taken by B alone to complete 3/4 of work = 25 days

Formula used:

Work = Efficiency × Time

Calculation:

Time taken by A alone to complete 2/5 of work = (12 × 5/2)

=> 30 days

Time taken by B alone to complete 3/4 of work = (25 × 4/3)

=> 100/3 days

LCM of 30 and 100/3 is 300

Efficiency of A = (300/30) = 10 units/day

Efficiency of B = (300/100/3) = (900/100)

=> 9 units/day

Now,

Time taken by both to complete the work together = [300/(10 + 9)] days

=> 300/19 days

Therefore The required time taken by both is 300/19 days.

Q50. Answer: (d) 0

Shortcut Trick

Observe the two angles in the expression: (48° + θ) and (42° − θ).

Find their sum: (48° + θ) + (42° − θ) = 90°.

Since the angles are complementary, we know that sin A = cos(90° − A), hence sin(48° + θ) = cos(42° − θ).

The expression becomes: cos(42° − θ) − cos(42° − θ) = 0.

Thus, Option 4 is the correct choice.

Therefore The correct answer is 0.

Alternate Method

Given: sin(48° + θ) − cos(42° − θ)

Formula Used: sin A = cos(90° − A)

Calculations:

=> Let A = 48° + θ

=> We know that sin A = cos(90° − A)

=> sin(48° + θ) = cos(90° − (48° + θ))

=> sin(48° + θ) = cos(90° − 48° − θ)

=> sin(48° + θ) = cos(42° − θ)

=> Substituting this into the original expression:

=> sin(48° + θ) − cos(42° − θ) = cos(42° − θ) − cos(42° − θ)

=> Result = 0

Therefore, Option 4 represents the correct value.

Therefore The correct answer is 0.

Additional Information

Complementary Angle Identities

For any angle θ, sin(90° − θ) = cos θ, cos(90° − θ) = sin θ, tan(90° − θ) = cot θ, and sec(90° − θ) = cosec θ.

Pythagorean Identities

The three fundamental identities are $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \text{cosec}^2\theta$.

Trigonometric Ratios of Negative Angles

sin(−θ) = −sin θ, cos(−θ) = cos θ, and tan(−θ) = −tan θ.

Q51. Answer: (d) 150

Given expression: (8 + 2 –19) – (4 + 27 × 3)

And sign changes are as follow-

• '+' → '–'

• '÷' → '+'

• '–' → '×'

• '×' → '÷'

On changing signs, given expression becomes: (8 – 2 × 19) × (4 – 27 ÷ 3)

Solve using BODMAS-

(8 – 2 × 19) × (4 – 27 ÷ 3)

= (8 – 38) × (4 – 9)

= (– 30) × (– 5)

= 150

Hence, 'option 4' is the correct answer.

Q52. Answer: (d) 1858

The correct answer is 1858.

Key Points

• Parliament passed the Government of India Act on August 2, 1858, less than a month after Canning declared the victory of British arms, transferring British power over India from the East India Company, whose ineptness was primarily blamed for the mutiny, to the crown.

• The secretary of state for India, a member of the British cabinet, was given residual powers over the merchant company.

• He would preside over the India Office in London and be assisted and advised, particularly in financial matters, by a Council of

India, which consisted initially of 15 Britons, 7 of whom were elected from the old company's board of directors and 8 of whom were appointed by the crown.

• Lord Canning announced Queen Victoria's proclamation to "the Princes, Chiefs, and Peoples of India" on November 1, 1858, establishing a new British policy of perpetual support for "local princes" and nonintervention in matters of religious belief or worship within British India.

Important Points

• The East India Company was a joint-stock company created in 1600 by the English and later the British.

• It was established to trade in the Indian Ocean region, first with the East Indies (the Indian subcontinent and Southeast Asia), then with East Asia. The business took over significant swaths of the Indian subcontinent, colonised sections of Southeast Asia and Hong Kong, and maintained trading ports and colonies in the Persian Gulf Residencies.

• The United Kingdom's Parliament is the supreme legislative body of the UK, its Crown dependencies, and British overseas territories.

• It is the only political body in the UK and its overseas territories that have legislative supremacy and thus ultimate power over all other political entities.

Q53. Answer: (b) 8.0%

Given:

Principal = Rs. 1200

Simple interest = Rs. 768

Time = Rate

Formula used:

SI = (P × R × T)/100

Where, P = Principal, R = Rate of interest and T = Time

Calculation:

According to the question:

t = r

So,

SI = (P × R × T)/100

=> 768 = (1200 × r × r)/100

=> 768 = 12r²

=> r² = 64

=> r = 8%

Therefore The rate of interest is 8.0%.

Q54. Answer: (a) Fertilizer production

The correct answer is Fertilizer production.

Key Points

• Fertilizer output has increased in India as a result of the Grey Revolution.

• This came after the green revolution, which was responsible for the high-yielding seed varieties.

• The grey revolution was started to correct the problems that had arisen in the agricultural sector.

• Its goal is to give farmers a bright future and to improve India's agricultural economy.

Important Points

• The Yellow Revolution began in 1986-87 with the goal of increasing edible oil production, particularly mustard and sesame seeds, in order to achieve self-sufficiency. Sam Pitroda is widely regarded as the father of India's Yellow Revolution.

• The "Shale Revolution" refers to the use of hydraulic fracturing and horizontal drilling to greatly boost oil and natural gas output in the United States, particularly from tight oil formations.

Q55. Answer: (c) 12

Given expression: 15 ÷ (5 + 8)

And sign changes are as follow-

• '+' → '–'

• '÷' → '+'

• '–' → '×'

• '×' → '÷'

On changing signs, given expression becomes: 15 + (5 – 8)

Solve using BODMAS-

15 + (5 – 8)

= 15 + (– 3)

= 15 – 3

= 12

Hence, 'option 3' is the correct answer.

Q56. Answer: (d) Ala-ud-Din Khilji

The correct answer is Ala-ud-Din Khilji.

Key Points

• Alauddin Khilji began building the Alai Minar, an incomplete tower in the Qutub Complex.

• Khilji chose to build a tower twice the height of the Qutub Minar after expanding the Quwwat-ul-Islam Mosque.

• After Alauddin Khilji's death in 1316, the Alai Minar's construction came to a standstill.

• The Alai Minar, a large red rubble building that stands at 2.5 metres, is still standing today.

Important Points

• Alauddin Khilji, commonly known as Alauddin Khilji, was a Turco-Afghan ruler of the Khalji dynasty that controlled the Delhi Sultanate in the Indian subcontinent.

• He was born Ali Gurshasp. Alauddin implemented a variety of key administrative measures, including revenue controls, pricing controls, and societal improvements.

• The Qutub Minar is a minaret and "victory tower" that is part of the Qutub complex, which is located on the site of Lal Kot, Delhi's earliest fortified city constructed by the Tomar Rajputs.

Additional Information

• Razia Sultana was the monarch of the Delhi Sultanate in the Indian subcontinent's northwestern region.

• Nasir ud din Mahmud Shah was the Mamluk Sultanate's seventh ruler.

• Shams ud-Din Iltutmish was the third Mamluk monarch of northern India, ruling over the erstwhile Ghurid territory.

Q57. Answer: (b) infiltration

The correct answer is infiltration.

Key Points

• Infiltration is the process through which water enters the soil's ground surface.

• An instrument called an infiltrometer is used to measure the rate of water penetration into the soil.

• Water on the ground surface infiltrates the soil through infiltration. It is widely utilized in the fields of hydrology and soil science.

• The greatest rate of infiltration is described as infiltration capability.

• It is most commonly measured in meters per day, however, other units of distance over time can be used if necessary.

• As the moisture content of the soil surface layers increases, the infiltration capacity of the soil decreases.

Important Points

• Aquifers are layers of rock and/or sediment that store groundwater. The term "groundwater" refers to precipitation that has entered the soil below the surface and accumulated in voids underground.

• A well is an excavation or structure dug, driven, or drilled into the ground to access liquid resources, most commonly water.

• Bawris is an old technique for managing rainwater. These are deep wells dug into the ground with steps leading up to the stored water.

Q58. Answer: (b) 4 : 5 : 6

Given:

A/4 = B/5 = C/6

Calculation:

Let the value of A/4 = B/5 = C/6 = k

=> A = 4k, B = 5k and C = 6k

Now,

=> A : B : C = 4k : 5k : 6k

=> 4 : 5 : 6

Therefore The required ratio of A : B : C is 4 : 5 : 6.

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Q59. Answer: (a) Cochlea

The correct answer is Cochlea.

Key Points

• The cochlea is a hollow, spiral-shap

• - It regulates the flow of aqueous humour into Schlemm's canal and governs accommodation for viewing objects at different distances.

• ed bone in the inner ear that plays an important role in hearing and is involved in the auditory transduction process.

• Sound waves are converted into electrical impulses, which the brain interprets as distinct sound frequencies.

• The human eye is a sensory organ that responds to visible light and allows humans to use visual information for a variety of reasons, including perceiving things, maintaining balance, and keeping our circadian rhythm.

Important Points

• The cornea is the transparent outer layer of the eye that covers the entire front of the eye. The cornea aids in the focus of light in your eye, allowing you to see clearly.

• The ciliary muscle is an intrinsic eye muscle that is developed as a ring of smooth muscle in the central layer of the eye, called the uvea (vascular layer).

• The iris is a thin, annular structure in the eye that regulates the size and diameter of the pupil, and thus the amount of light that reaches the retina.

Q60. Answer: (a) 1951

The correct answer is 1951.

Key Points

• The primary goal of the first Five-Year Plan was to improve India's agricultural situation. The plan was started in 1951.

• Following independence, India's First Five-Year Plan (FYP) was launched in 1951, under the socialist influence of Prime Minister Jawaharlal Nehru.

• Agriculture, price stability, power, and transportation were all part of the plan. The Harrod-Domar Model was used to create it.

• The process began with the establishment of the Planning Commission in March 1950, in order to achieve the government's stated goals of promoting a rapid rise in the people's standard of living through efficient exploitation of the country's resources, increased production, and providing opportunities for all to work in the community's service.

• The first Five-Year Plan was started in 1951, and two more five-year plans were developed until 1965 when the Indo-Pakistan conflict forced a pause.

Important Points

• Five-Year Plans (FYPs) are national economic programs that are controlled and integrated.

• In 1928, Joseph Stalin implemented the Soviet Union's first Five-Year Plan. They have since been adopted by the majority of communist regimes as well as a number of capitalist countries.

• The Indian economy was built on the concept of planning from 1947 to 2017.

• This was carried out through the Planning Commission (1951-2014) and the NITI Aayog's Five-Year Plans, which were established, implemented, and monitored (2015-2017).

Q61. Answer: (a) 4096

Given:

$-3 \times \sqrt{196} + \sqrt{x} = 8 \times 3 - 2$

Calculation:

$-3 \times \sqrt{196} + \sqrt{x} = 8 \times 3 - 2$

$\Rightarrow -3 \times 14 + \sqrt{x} = 24 - 2$

$\Rightarrow -42 + \sqrt{x} = 22$

$\Rightarrow \sqrt{x} = (42 + 22)$

$\Rightarrow \sqrt{x} = 64$

Squaring both the sides

$\Rightarrow (\sqrt{x})^2 = (64)^2$

$\Rightarrow x = 64 \times 64$

$\Rightarrow x = 4096$

Therefore The required value of x is 4096.

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Q62. Answer: (c) 75.3 cm

Given:

Radius = 18 cm

Central angle = 125°

Formula used:

Perimeter of sector of a circle = θ/360° × 2πr + 2r

Calculation:

According to the question:

Perimeter of sector of a circle = θ/360° × 2πr + 2r

=> (125/360 × 2 × 22/7 × 18 + 2 × 18)

=> (25/72 × 44/7 × 18 + 36)

=> (275/7 + 36)

=> (275 + 252)/7

=> 527/7

=> 75.28 cm ~ 75.3 cm

Therefore The required perimeter is 75.3 cm.

Q63. Answer: (a) 16 2/3 %

Given:

A sum of money amounts to Rs. 12,000 after 6 years and Rs. 15,000 after 9 years at the same rate of simple interest.

Formula used:

SI = (P × R × T)/100

Where, P = Principal, R = Rate of interest and T = Time

Calculation:

According to the question:

SI of (9 – 6) years = Rs. (15,000 – 12,000)

=> SI of 3 years = Rs. 3,000

SI of 6 years = Rs. 6,000

Now,

Principal = Rs. (12,000 – 6,000) = Rs. 6,000

Let Rate = r% yearly

SI = (P × R × T)/100

=> 6,000 = (6,000 × r × 6)/100

=> 50 = 3r

=> r = 50/3

=> r = 16 2/3 %

Therefore The required rate of interest is 16 2/3 %.

Q64. Answer: (d) Neither conclusion 1 nor 2 follows.

The least possible Venn diagram for the given statements can be-

Conclusions:

1. Some kiwis are yellow. → Does not follow (Yellow is not mentioned anywhere.)

2. An apple is green. → Does not follow (Possible but not definitely true.)

Hence, 'option 4' is the correct answer.

Q65. Answer: (a) 16 : 121

Given:

Cubes ratio = 64 : 1331

Formula used:

The volume of cubes = a^3

The total surface area of the cube = $6a^2$

Where, a = Side of the cube

Calculation:

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Let the side of the cubes are x and y respectively

According to the question,

$x^3/y^3 = 64 : 1331$

$\Rightarrow x/y = 4/11$

$\Rightarrow x = (4/11)y$

The Ratio of total surface area = $6x^2 : 6y^2$

$\Rightarrow 6 \times (4y/11)^2 : 6y^2$

$\Rightarrow (16/121) : 1$

$\Rightarrow 16 : 121$

Therefore The required ratio of the total surface area is 16 : 121.

Q66. Answer: (c) J2

Using positional value of alphabets-

The logic followed here is-

Hence, 'option 3' is the correct answer.

Q67. Answer: (d) Raising ozone layer

The correct answer is Raising ozone layer.

Key Points

• As the world's ability to cope with the fast-rising output of disposable plastic products overwhelms the world's ability to deal with them, plastic pollution has emerged as one of the most important environmental challenges.

• Plastic pollution is especially noticeable in developing Asian and African countries, where rubbish collection services are frequently ineffective or nonexistent.

• However, the industrialised world, particularly in nations with low recycling rates, has difficulty collecting discarded plastics in a proper manner.

• Globally, air pollution and nutrient emissions from agriculture and wastewater are still significant, causing ecosystem acidification and eutrophication, as well as crop yield losses.

• Global warming is the long-term warming of Earth's climate system that has been seen from the pre-industrial period (between 1850 and 1900) as a result of human activity, principally fossil fuel combustion, which increases heat-trapping greenhouse gas levels in the atmosphere.

• The gradual thinning of the Earth's ozone layer in the upper atmosphere caused by the discharge of chemical compounds containing gaseous chlorine or bromine from industry and other human activities is referred to as ozone depletion.

• Thus, the raizing of the ozone layer is not an environmental concern.

Q68. Answer: (d) 1944

The correct answer is 1944.

Key Points

• The World Bank is made up of two primary institutions: the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA).

• The International Development Association (IDA) is a financial institution dedicated to providing development loans to the world's poorest countries.

• The International Bank for Reconstruction and Development (IBRD) was established in 1944 with the objective of assisting war-torn European countries in rebuilding their infrastructure and economies.

• Following World War II, the International Bank for Reconstruction and Development expanded its mandate to include promoting global economic growth and poverty eradication.

Important Points

• During the Bretton Woods Conference in 1944, a gathering of the 44 Allied Nations of World War II aimed at establishing the post-war global financial order, the IBRD was established in anticipation of World War II's end.

• The Bretton Woods Conference was also the birthplace of the International Monetary Fund and the International Bank for Reconstruction and Development.

• The International Bank for Repair and Development's first loan was to the French government to help finance the reconstruction of essential infrastructure.

Additional Information

• International Bank of Reconstruction and Development (IBRD):

• Headquarters: Washington, D.C., U.S.

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• Purpose: Development assistance, poverty reduction
• Founded: 1944
• Membership: 189 countries
• President of the World Bank: David Malpass

Q69. Answer: (a) Neither conclusion 1 nor 2 follows.

The statement suggests that Company ABC has the most customers among its competitors.
• There is no mention of percentage of customers in the statement, therefore conclusion 1 does not follow.
• Company ABC has the highest number of customers but that doesn't imply that its products are the cheapest. Thus, conclusion 2 does not follow.
Hence, neither conclusion 1 nor 2 follows.

Q70. Answer: (a) nephrons

The correct answer is nephrons.
Key Points
• In human beings, excretory products in the form of soluble nitrogen compounds are removed by the nephrons in the kidneys.
• The physiological process of eliminating metabolic waste from the body is known as excretion.
• Amino acids, urea, uric acid, carbon dioxide, water, and ammonia are among the excretory products.
• Amino acids are excreted by some Molluscs and Echinoderms as waste products from the body. Ammonia is the principal excretory product in mammals, and it is made up of proteins found in our meals.
• It is the most poisonous nitrogenous waste, and most amphibians and aquatic creatures excrete it through diffusion.
• The principal excretory organs in humans are the kidneys, which are positioned on the left and right sides of the spine, near the liver.
• The renal cortex, renal medulla, and renal pelvis are the three parts of the kidney.
Important Points
• The structure that actually produces urine in the process of eliminating waste and excess substances from the blood is known as a nephron.
• In genomics, a nucleus is a membrane-enclosed organelle within a cell that houses the chromosomes.
• The study of nutrients in food, how the body uses them, and the link between diet, health, and disease is known as nutrition.
• Mitochondria are membrane-bound cell organelles that provide the majority of the chemical energy required to fuel the cell's metabolic activities.

Q71. Answer: (a) 2

In the given diagram-
• Sections under star are- 3, 2, 6
• Sections under tyre and star are- 3, 2
• Section under pen and star is- 2
• Section common to star, tyre and pen- 2

Hence, 'option 1' is the correct answer.

Q72. Answer: (b) Wadiyar

The correct answer is Wadiyar.
Key Points
• Amba Vilas Palace, commonly known as Mysore Palace, is a historical palace and a royal house in Mysore, India. It is located in the state of Karnataka, in the city of Mysore.
• It serves as the formal residence of the Wadiyar dynasty and the capital of the Mysore Kingdom. The palace is located in the heart of Mysore, overlooking the Chamundi Hills to the east.
• The ground where the palace presently sits was formerly known as puragiri (literally, citadel). It is now known as the old fort.
• The original palace inside the Old Fort was built in the 14th century by Yaduraya, and it has been damaged and rebuilt multiple times since then.
• Following the fire that destroyed the Old Palace, the current structure was constructed between 1897 and 1912.
Important Points
• With a brief hiatus in the late 1700s, the Wadiyar dynasty controlled the Kingdom of Mysore from 1399 to 1950.
• They were a feudatory house under the Vijayanagar Emperor who took advantage of the Empire's weakness to gain

independence.

• In 1610, Raja Odeyar took control of Srirangapatna, the seat of the Vijaynagar Viceroy.

• Following its independence from the British administration, the kingdom was included in the Dominion of India.

Additional Information

• The Pallava dynasty was a Tamil dynasty that ruled over a large part of southern India known as Tondaimandalam from 275 to 897 CE.

• Between the 6th and 12th centuries, the Chalukya dynasty dominated wide swaths of southern and central India.

• The Chola Dynasty was a Tamil thalassocratic empire in southern India, and it was one of the world's longest-ruling empires.

Q73. Answer: (b) Brazil

The correct answer is Brazil.

Key Points

• Brazil won their seventh World Cup title after defeating Peru 3–1 in the final.

• Argentina finished third after a 2–1 victory over Chile in the third-place match.

• Copa América, formerly the South American Championship of Nations (until 1975), is a quadrennial South American football (soccer) tournament that is the continent's top championship in the sport.

• The Copa América is the oldest international football competition in the world.

• The tournament was first conducted in 1916 to commemorate Argentina's 100th year of independence, with Uruguay winning the inaugural title.

• It was held every fourth year until 2007 when it switched to its present quadrennial structure.

Important Points

• The Copa América, formerly known as the South American Football Championship until 1975, is the premier men's football event in South America.

• It is the world's third most-watched football competition and the oldest still running continental competition.

Q74. Answer: (a) K2

The correct answer is K2.

Key Points

• K2 is the world's second-highest mountain, at 8,611 metres (28,251 feet) above sea level, after Mount Everest (at 8,849 metres (29,032 feet)).

• It is located in the Karakoram range, partially in Pakistan-administered Kashmir's Gilgit-Baltistan area and partially in a China-administered Kashmir region included in the Taxkorgan Tajik Autonomous County of Xinjiang.

• After George Bell, a climber on the 1953 American expedition, informed reporters, "It's a savage peak that attempts to kill you," K2 became known as the Savage Mountain.

• The mountaineering achievement was completed by a team of Nepalese climbers led by Nirmal Purja and Mingma Gyalje Sherpa in January 2021, making K2 the final eight-thousander to be summited in the winter.

Important Points

• At 8,485 metres, Makalu is the world's fifth-highest peak. It is 19 kilometres southeast of Mount Everest in the Mahalangur Himalayas, on the boundary between Nepal and Tibet Autonomous Region, China. Makalu, one of the eight-thousanders, is a solitary summit with a four-sided pyramid shape.

• Mount Everest, located in the Mahalangur Himal sub-range of the Himalayas, is the world's highest mountain above sea level.

• Dhaulagiri, at 8,167 metres above sea level, is the world's seventh-tallest mountain and the highest mountain within a single country's borders.

Additional Information

• The Himalayas are an Asian mountain range that separates the Indian subcontinent's lowlands from the Tibetan Plateau.

• The range contains some of the world's highest peaks, including Mount Everest, the world's highest mountain.

• In the Himalayas, there are over 100 peaks that are higher than 7,200 metres (23,600 feet).

• The tallest peak outside of Asia (Aconcagua in the Andes) stands at 6,961 metres (22,838 feet).

Q75. Answer: (c) 54 km/h

Given:

Average speed of the train = 42 km/h

Time taken to complete the journey = 45 min

Concept used:

Speed = Distance/time

1 hour = 60 min

Calculation:

In 45 min the train will go 42 × 3/4 = 31.5 km

Now, the same distance should be covered in 35 minutes

So, speed for that = 31.5 × 60/35 = 54 km/h

Therefore Required speed of the train will be 54 km/h

Q76. Answer: (a) Lord Ripon

The correct answer is Lord Ripon.

Key Points

• Sir Courtney Pergine Ilbert, a law member of the Viceroy's council, authored the Ilbert Bill during Lord Ripon's viceroyship in 1883.

• It was recommended that top Indian magistrates preside over matters involving British personnel in India.

• Owners of British tea and indigo estates in Bengal were vehemently opposed to the bill. In reaction to the popular condemnation of the Ilbert Bill by a majority of English women, Viceroy Ripon (who had introduced the Bill) passed an amendment mandating a jury of 50% Europeans if an Indian judge was to face a European on the dock.

• During the Viceroyalty of the Marquess of Ripon, Sir Courtenay Peregrine Ilbert, a valid member of the Council of the Governor-General of India, prepared the Ilbert Bill, which was formally tabled on 9 February 1883.

• The Ilbert Bill was named after Courtenay Ilbert's "Bill to alter the Code of Criminal Procedure, 1882, so far as it relates to the exercise of jurisdiction over European British persons."

Important Points

• Lord Dufferin served as Governor-General of India and Viceroy from 1884 to 1888. During his tenure, the Third Burmese war led to the annexation of the whole of Burma, and the Burmese ruler was exiled to India. In 1885, AO Hume laid the foundation of the Indian National Congress.

• Lord Mayo or Lord Naas served as 4th Viceroy of India from 12 January 1869 to 8 February 1872. He started the process of decentralization of finance. In foreign affairs, he followed the policy of non-intervention. He opened up Mayo College in Ajmer for educating children of aristocratic families. India’s census began during his tenure. He was the first Governor-General to be murdered in office by a Pathan Sher Ali in Port Blair.

• Lord Lansdowne served as Governor-General and Viceroy of India from 1888 to 1893. During his tenure, the Indo-Afghan border {Durand Line} was demarcated. The Indian Council Act of 1892 was enacted and a system of indirect elections started in India.

Q77. Answer: (c) 300/47

Given:

A, B and C can complete a task alone in 15 days, 20 days and 25 days

Concept used:

Total work = Time × Efficiency

Calculation:

LCM of 15, 20, 25 = 300 i.e total work,

Efficiency of A = 300/15 = 20

Efficiency of B = 300/20 = 15

Efficiency of C = 300/25 = 12

Effective efficiency = 20 + 15 + 12 = 47

Now,

If they work together they will take 300/47 days

Therefore Required time is 300/47 days

Q78. Answer: (d) 157

Concept used:

A number that is divisible only by itself and 1 (e.g. 2, 3, 5, 7, 11).

Calculation:

Option 1:

121 = 1 × 11 × 11

Option 2:

81 = 1 × 3 × 3 × 3 × 3

Option 3:

1331 = 1 × 11 × 11 × 11

Option 4:

157 = 1 × 157

So, 157 is a prime number

Therefore Required answer is Option 4

Q79. Answer: (c) K Kasturirangan

The correct answer is K Kasturirangan.

Key Points

• Krishnaswamy Kasturirangan is an Indian space scientist who served as the Director-General of the Indian Space Research Organisation (ISRO) between 1994 and 2003.

• He is currently the Chancellor of the Central University of Rajasthan and the National Institute of Technology.

• He is the chairman of the Karnataka Knowledge Commission and the former chancellor of Jawaharlal Nehru University.

• He was a member of the Rajya Sabha from 2003 to 2009, as well as the now-defunct Planning Commission of India.

• From April 2004 to 2009, he was the director of the National Institute of Advanced Studies in Bangalore. He has received the Padma Shri (1982), Padma Bhushan (1992), and Padma Vibhushan (1993) civilian honours from the Indian government (2000).

Important Points

• Dr. Manmohan Singh served as Governor of the Reserve Bank of India from 1982 to 1985, as Deputy Chairman of the Planning Commission from 1985 to 1987, and as India's Finance Minister from 1991 to 1996.

• From November 22, 1997, to September 6, 2003, Bimal Jalan was the Governor of the Reserve Bank of India.

• Duvvuri Subbarao was the Reserve Bank of India's 22nd Governor.

Additional Information

• Reserve Bank of India:

• First Governor: Sir Osborne Smith

• First Indian Governor: Sir C D Deshmukh

Q80. Answer: (a) India will be divided into two parts

The correct answer is India will be divided into two parts.

Key Points

• In 1947, the Indian Independence Act was passed. India and Pakistan became separate nations as a result of the act.

• The provinces of Bengal and Punjab were divided between the two new countries. These dominions divided the Muslim, Hindu, and Sikh populations, resulting in the largest forced migration in history that was not driven by conflict or hunger.

• The Act abolished the usage of the title "Emperor of India" for the British Crown, as well as any previous treaties with princely nations.

• Lord Mountbatten remained Governor-General, and Jawaharlal Nehru was named India's first Prime Minister.

• Muhammad Ali Jinnah was named Governor-General of Pakistan, and Liaquat Ali Khan was named Prime Minister.

• The Indian National Congress, the Muslim League, and the Sikh community reached an agreement with Lord Mountbatten on the 3 June Plan, also known as the Mountbatten Plan, in the Indian assembly. The last plan for independence was this one.

• The Indian Independence Act was later abolished by Article 395 of the Indian Constitution and Article 221 of the Pakistan Constitution of 1956, both of which aimed to give the new republics more independence.

Q81. Answer: (d) 4096

The logic followed here is-

Hence, 'option 4' is the correct answer.

Q82. Answer: (b) 105°

Given:

Angle A = 30° and angle B = 45°

Concept used:

Sum of angles of a triangle is 180°

Calculation:

According to the concept,

angle C = 180° - 30° - 45°

=> angle C = 105°

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Therefore Required answer is 105°

Q83. Answer: (c) Father

Symbols used to depict the given information are-

And the given information can be represented as-

Thus, Raj is also the father of Sohan.

Hence, 'option 3' is the correct answer.

Q84. Answer: (c) O and R

This question is based on the positional value of alphabets.

♦ Difference between any two letters in terms of letters of the English alphabet = Difference between the positional value of alphabets - 1

• Number of alphabets between V and I = 13 - 1 = 12

• Number of alphabets between I and B = 7 - 1 = 6

• Number of alphabets between B and G = 5 - 1 = 4

• Number of alphabets between G and Y = 18 - 1 = 17

• Number of alphabets between Y and O = 10 - 1 = 9

• Number of alphabets between O and R = 3 - 1 = 2

Thus, O and R have the least number of letters between them.

Hence, 'option 3' is the correct answer.

Q85. Answer: (b) IRNSS-1I

The correct answer is IRNSS-1I.

Key Points

• IRNSS-1I is the eighth satellite in the Indian Regional Navigational Satellite System (IRNSS) series of satellites.

• Although IRNSS - 1I is the ninth satellite to launch in the IRNSS constellation, it is counted as the eighth satellite because IRNSS - 1I is the eighth satellite to successfully launch in the IRNSS constellation.

• IRNSS-1A, IRNSS-1B, IRNSS-1C, IRNSS-1D, IRNSS-1E, IRNSS-1F, IRNSS-1G, and IRNSS-1H have already been launched by ISRO.

• The assembly, integration, and testing of the satellite are done in part by a consortium of six small companies managed by Alpha Design Technologies, a Bengaluru-based aerospace corporation overseen by URSC.

Important Points

• SARAL is a joint mission of the Indian Space Research Organisation and the Centre National d'Études Spatiales to develop altimetry technology. SARAL collects altimetric data in order to better understand ocean circulation and sea surface elevation.

• SCATSAT-1 was an Indian weather satellite that provided forecasting, cyclone prediction, and tracking services. The ISRO Satellite Centre in Bangalore created it, while the Space Applications Centre in Ahmedabad designed the payload.

• Resourcesat-2A is a follow-up mission to Resourcesat-1 and Resourcesat-2, both of which were launched in October 2003 and April 2011. The new satellite performs the same functions as the previous Resourcesat missions.

Additional Information

• ISRO:

• Formed 15 August 1969; 52 years ago

• Preceding agency: Indian National Committee for Space Research (INCOSPAR)

• Headquarters Bengaluru, Karnataka

• Chairman: Sreedhara Panicker Somanath

Q86. Answer: (c) 2012-13

Calculation:

Offshore production in 2011 -12 = 38.47

Offshore production in 2012 - 13 = 31.80

Difference = 38.47 - 31.80 = 6.67

Offshore production in 2013 - 14 = 26.39

Difference = 31.80 - 26.39 = 5.41

After the year 2013 - 14 production fall the years is minimal so we do not need to calculate the difference between them

Therefore Required answer is 2012-13

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Q87. Answer: (c) 17%

Calculation:

Decline in offshore production in the year 2013-14 = 31.80 - 26.39 = 5.41

Required % = (5.41/31.80) × 100

=> 17.012 ≈ 17%

Therefore Required answer is 17%

Q88. Answer: (a) 65.38

Calculation:

Total onshore production during all the years = 9 + 8.87 + 9.01 + 8.79 + 9.23 + 9.85 + 10.63

=> 65.38

Therefore Required answer is 65.38

Q89. Answer: (b) 2016-17

Calculation:

Growth in 2015 - 16 = 9.23 - 8.79 = 0.44

Growth in 2016 - 17 = 9.85 - 9.23 = 0.62

Growth in 2013 - 14 = 9.01 - 8.87 = 0.14

Growth in 2012 - 13 has been declined

Therefore Required answer is 2016 - 17

Q90. Answer: (c) G

The given question is based on the concept of positional value of alphabets.

The logic followed here is-

Hence, 'option 3' is the correct answer.

Q91. Answer: (a) 121 : 169

The logic followed here is-

The given pairs of numbers are squares of consecutive prime numbers starting from 2.

Hence, 'option 1' is the correct answer.

Q92. Answer: (d) 12412

The logic followed here is-

Hence, 'option 4' is the correct answer.

Q93. Answer: (b) 54

The logic followed here is-

Hence, 'option 2' is the correct answer.

Q94. Answer: (c) RSTYKGLM

This question is based on the positional value of alphabets.

The logic followed here is-

Similarly,

Hence, 'option 3' is the correct answer.

Q95. Answer: (a) Item 1 or 4

Number of persons = 5

Number of items = 5

Name of persons → A, G, M, J and D

According to given information,

1. A and J selected items 5 and 2 respectively.

• A → 5

• J → 2

2. M cannot select item 3 or 5.

• A → 5

• J → 2
• M → 1 or 4
3. G cannot select item 3.
• A → 5
• J → 2
• M → 1 or 4
• G → 1 or 4
• D → 3
Thus, G can either select item 1 or 4.
Hence, 'option 1' is the correct answer.

Q96. Answer: (b) NNOHUNS

This question is based on the positional value of alphabets.
The logic followed here is-
Similarly,
Hence, 'option 2' is the correct answer.

Q97. Answer: (b) Only assumption 1 is implicit

The statement suggests that exams must happen without any bias.
• Assumption 1 agrees with it and promotes that unfair means should not be allowed so that students are evaluated fairly.
• Assumption 2 talks against the given statement and promotes bias towards favourite students. So, assumption 2 is not implicit.
• The words "without any favours" implies that assumption 1 is implicit but assumption 2 is not.
Hence the correct answer is option 2.

Q98. Answer: (c) wsx

The given information can be represented as-
Clearly, 'Ram' is written as 'wsx'.
Hence, 'option 3' is the correct answer.

Q99. Answer: (b) B, C, D, E, G and M

Given conditions are-
• A cannot be selected with B.
• G cannot be selected with H.
• H and A should be in the same team.
• E cannot be selected with F.
• C cannot be selected with H.
• C must be selected with D.
Considering the given options-
1) B, C, D, E, H and M → C cannot be selected with H. So, it's incorrect.
2) B, C, D, E, G and M → All conditions are followed. So, it's correct.
3) A, D, G, E, C and H → G cannot be selected with H. So, it's incorrect.
4) A, C, D, E, G and M → H and A should be in the same team. So, it's incorrect.
Hence, 'option 2' is the correct answer.

Q100. Answer: (d) Only conclusions 1 and 2 follow.

The least possible Venn diagram for the given statements is-
Conclusions:
1. Some white are red. → It follows (Because all red are white, a part of white will be red)
2. Some black are red → It follows (Because all red are white and all white are black, a part of black will be red)
3. Some red are not black. → Does not follow (This is not possible as all red are black.)
4. All black are white. → Does not follow (Possible but not definite)
Hence, 'option 4' is the correct answer.

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