RRB NTPC (UG) CBT-I Official Paper (Held On: 19 Aug, 2025 Shift 1) (Previous Year Paper)

RRB Group D • 2025 • 100 questions • 90 minutes • Answer key and solutions

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GENERAL AWARENESS

Q1. Which event is considered the turning point in Gandhi's political life, converting him from a moderate to a mass leader?

(a) Jallianwala Bagh Massacre
(b) Salt Satyagraha
(c) Rowlatt Act protest
(d) Champaran Satyagraha

Q2. In which Indian state is Rushikonda Beach, which received the Blue Flag Beach certification in 2023, located?

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

Q3. Which Indian sprinter won both the 100 m and 200 m titles at the Indian Open Athletics 2025?

(a) Archana Suseendran
(b) Hima Das
(c) Srabani Nanda
(d) Dutee Chand

Q4. Which of the following countries is located to the southeast of India?

(a) China
(b) Bhutan
(c) Nepal
(d) Sri Lanka

Q5. Which DRDO-developed missile is India's first indigenous air-launched anti-ship missile?

(a) NASM-SR
(b) BrahMos
(c) Varunastra
(d) Astra

Q6. What was the primary objective of the 88th Constitutional Amendment Act, 2003?

(a) Abolition of Privy Purses
(b) Provision for Service Tax
(c) Introduction of GST
(d) Formation of the NJAC

Q7. In which year did French physicist Sadi Carnot create the Carnot engine, which uses thermodynamic principles to function as an ideal heat engine?

(a) 1830
(b) 1820
(c) 1824
(d) 1813

Q8. The Paris Agreement is a significant agreement aimed at keeping global warming well below Celsius.

(a) 1°
(b) 3°
(c) 2°
(d) 4°

Q9. Which authority is the appellate body under the RTI Act?

(a) Chief Vigilance Commission
(b) National Human Rights Commission
(c) Lokpal
(d) Central Information Commission

Q10. Which keyboard shortcut allows you to select multiple specific files or folders at once?

(a) Tab + Click
(b) Alt + Click
(c) Ctrl + Click
(d) Shift + Click

Q11. What defines land as “Culturable Wasteland” in land revenue records in India?

(a) Urban infrastructure land
(b) Land that is fallow for over five years
(c) Land under tree crops
(d) Barren rocky land

Q12. Which country held federal elections after the collapse of its coalition government amid economic unrest?

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

Q13. The drain of wealth theory was a major critique of colonial economic policies. Who propounded the ‘Drain of wealth theory’ in the late 19th century?

(a) Dadabhai Naoroji
(b) Mahatma Gandhi
(c) Gopal Krishna Gokhale
(d) Jawaharlal Nehru

Q14. Which Indian institution collaborated with Inria Saclay in May 2025 to develop an AI tool aimed at combating antimicrobial resistance by identifying alternative antibiotics?

(a) IISc Bangalore
(b) IIIT - Delhi
(c) IIT Madras
(d) IIT Bombay

Q15. What is the name of India's newly launched high-resolution, fully indigenous weather prediction platform in May 2025?

(a) Bharat Forecast System
(b) IndraNet

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(c) VarshaNet
(d) Mausam 2.0

Q16. Which of the following architectural styles is predominantly associated with the Gateway of India in Mumbai?
(a) Indo-Saracenic
(b) Art Deco
(c) Bauhaus
(d) Victorian Gothic

Q17. In which landmark case did the Supreme Court of India impose a three-month deadline for the President to give assent to State Bills reserved under Article 201?
(a) Minerva Mills vs. Union of India (1980)
(b) SR Bommai vs. Union of India (1994)
(c) State of Tamil Nadu vs. Governor of Tamil Nadu (2023)
(d) Kesavananda Bharati vs. State of Kerala (1973)

Q18. Which Constitutional Amendment introduced a cap on the size of the State Council of Ministers?
(a) 73^(rd) Constitutional Amendment Act, 1992
(b) 91^(st) Constitutional Amendment Act, 2003
(c) 61^(st) Constitutional Amendment Act, 1988
(d) 42^(nd) Constitutional Amendment Act, 1976

Q19. Which irrigation method is considered most efficient for water conservation in agriculture?
(a) Furrow
(b) Drip
(c) Flood
(d) Sprinkler

Q20. Which site provides archaeological evidence of the earliest known urban civilisation in the Indian subcontinent with planned city structures?
(a) Mehrgarh
(b) Harappa
(c) Kalibangan
(d) Lothal

Q21. Which of the following is the correct longitudinal extent of the Prime Meridian?
(a) 0°
(b) 90° E
(c) 180° E
(d) 23.5° N

Q22. In which sport did Deepika Kumari earn her 12th individual World Cup medal at the 2025 Shanghai World Cup?
(a) Archery
(b) Shoong
(c) Table Tennis
(d) Badminton

Q23. Which of the following Indian English writers created the fictional town of Malgudi?
(a) Raja Rao
(b) Mulk Raj Anand
(c) RK Narayan
(d) Khushwant Singh

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Q24. Geological Survey of India (GSI) organised a Pan-India Walkathon in March 2025 under which theme?

(a) Geoscience for a Safe World
(b) Geoscience: Unlocking the Secrets of Climate Change
(c) Geoscience Innovating for Earth and People
(d) Geoscience Everywhere

Q25. Which of the following is true about the second frigate of Project 1135.6 named 'Tavasya'?

(a) It has a displacement of approximately 4,500 tons
(b) It is the first frigate of the follow-on order
(c) It was built in Russia and later transferred to India
(d) It was launched at Goa Shipyard Limited on 22 March 2025

Q26. Which Constitutional Amendment reduced the voting age from 21 years to 18 years in India?

(a) Sixty-first Amendment Act, 1988
(b) Fifty-second Amendment Act, 1985
(c) Eighty-sixth Amendment Act, 2002
(d) Forty-fourth Amendment Act, 1978

Q27. Human development also involves freedom, security and dignity in life. The first Human Development Report was published in which year?

(a) 1971
(b) 1990
(c) 1995
(d) 1980

Q28. How can you create a new folder in Windows?

(a) By opening Task Manager
(b) Using the right-click context menu
(c) By changing system date
(d) By restarting the computer

Q29. Which Indian artist made his debut at Cannes 2025 by showcasing a watercolour inspired by India's diversity?

(a) Jitish Kallat
(b) Subodh Gupta
(c) Anish Kapoor
(d) Paresh Maity

Q30. Which body was formed by Gandhi on 24 February 1919 to oppose the Rowlatt Act?

(a) Congress Committee
(b) Swaraj Sabha
(c) Khilafat Committee
(d) Satyagraha Sabha

Q31. Why are soft drink and soda water bottles sealed under high pressure in beverage industries?

(a) To increase the temperature
(b) To prevent freezing
(c) To decrease the amount of sugar
(d) To increase the solubility of carbon dioxide

Q32. In which of the following years was the first British East India Company founded in India?

(a) 1620
(b) 1600
(c) 1605
(d) 1588

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Q33. The Supreme Court struck down certain provisions of the Tribunals (Rationalisation and Conditions of Service) Ordinance, 2021. Which provision did the Court declare invalid?

(a) The rule that tribunal decisions are not appealable to any court
(b) Requirement that all tribunal members be retired judges of High Courts
(c) Establishment of administrative tribunals for service matters (which is in the Constitution)
(d) A fixed four-year tenure limit for tribunal members

Q34. What is the primary objective of the Dx-EDGE initiative launched in 2025?

(a) To provide financial subsidies to large corporations
(b) To promote foreign investments in India
(c) To empower MSMEs with digital tools and knowledge
(d) To regulate e-commerce businesses

Q35. On 29 April 2025, which major facility was inaugurated at the National Centre for Sports Science and Research (NCSSR) to transform athlete rehabilitation and performance tracking in India?

(a) National Talent Scouting Wing
(b) Return to Play Facility
(c) Elite Coaching Analytics Centre
(d) Sports Nutrition Research Lab

Q36. Who among the following are eligible for the training programs under Deen Dayal Upadhyay – Gramin Kaushalya Yojana (DDU-GKY)?

(a) Individuals between the ages of 15 and 35 years
(b) Individuals between the ages of 15 and 25 years
(c) Individuals between the ages of 18 and 35 years
(d) Individuals between the ages of 25 and 55 years

Q37. Digital literacy is now essential for human development in the knowledge economy. Which programme was launched to promote digital literacy among rural citizens in India?

(a) BharatNet
(b) PMGDISHA
(c) Digital India
(d) PM-WANI

Q38. Which of the following Fundamental Rights is guaranteed under Article 25 of the Indian Constitution?

(a) Right to move the Supreme Court
(b) Right to freedom of religion
(c) Right against untouchability
(d) Right to culture and language

Q39. The Battle of Plassey 1757 was fought between the British forces led by Robert Clive and the Nawab of Bengal _____.

(a) Shah Alam II
(b) Alivardi Khan
(c) Sarfaraz Khan
(d) Siraj-ud-Daula

Q40. Which of the following physical quantities has zero dimension in mass and time?

(a) Force
(b) Work
(c) Volume
(d) Momentum

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MATHEMATICS

Q41. Two successive discounts of 65% and 24% are equivalent to a single discount of _____.

(a) 77%
(b) 74.5%
(c) 76.6%
(d) 73.4%

Q42. If 38% of first number is equal to two-sevenths of second number, what is the ratio of first number to the second number?

(a) 101 : 129
(b) 103 : 132
(c) 100 : 133
(d) 96 : 131

Q43. The selling price of 50 books is equal to the cost price of 39 books. Find the loss or gain percentage.

(a) 100/11 % gain
(b) 100/11 % loss
(c) 22% loss
(d) 22%gain

Q44. The sum of the squares of two consecutive odd natural numbers is 34. The sum of the numbers is:

(a) 8
(b) 28
(c) 24
(d) 18

Q45. Sapna invested Rs. 22,800 on simple interest, partly at 14% per annum and partly at 7% per annum. If she earns equal interests from the two investments after 6 years, then find the sum invested at 14% per annum (in Rs.).

(a) 7,600
(b) 7,599
(c) 7,597
(d) 7,603

Q46. A shopkeeper purchased an item listed at Rs. 1,600 after receiving two successive discounts of 35% and 5% from the wholesaler. The shopkeeper then changed the list price so as to gain 25% after allowing 5% discount. For how much did he list the item?

(a) Rs. 1,388
(b) Rs. 1,200
(c) Rs. 1,235
(d) Rs. 1,300

Q47. In an election between two candidates 87% of the registered voters cast their vote and 5% of the votes polled were found invalid. The winning candidate got 52% of the valid votes and won the election by a margin of 1653 votes. How many voters were registered?

(a) 50001
(b) 50003
(c) 50000
(d) 49998

Q48. Find the curved surface area of a sphere whose radius is 2.8 cm.

(Use π = frac227)

(a) 98.56 cm²
(b) 97.52 cm²
(c) 95.32 cm²

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(d) 91.28 cm²

Q49. Ritik and Sanjay together invested Rs. 62,400 in a business. At the end of the year, out of a total profit of Rs. 15,600, Sanjay's share was Rs. 1,900. What was the difference between their investments?

(a) Rs. 46,800
(b) Rs. 47,200
(c) Rs. 47,000
(d) Rs. 46,200

Q50. A number when increased by 100% gives 2740. The number is:

(a) 4110
(b) 1370
(c) 685
(d) 2740

Q51. Shan bought some sharpeners at the rate of Rs. 150 a dozen. He sold them for Rs. 19 each. His profit percentage is _____%.

(a) 56
(b) 54
(c) 50
(d) 52

Q52. In triangle ABC, BD ? AC at D and angle DBC = 65°. E is a point on BC such that angle CAE = 48°. What is the measure of angle AEB?

(a) 77°
(b) 73°
(c) 76°
(d) 79°

Q53. If the interest earned during the 2^(nd)year on a certain sum is Rs. 9,828, and the rate of interest is 12% per annum compounded annually, then the sum is:

(a) Rs. 73,520
(b) Rs. 73,475
(c) Rs. 73,125
(d) Rs. 72,185

Q54. What is the mode of the following data?

67, 75, 81, 70, 65, 61, 65, 84, 75, 76, 85, 89, 62, 84, 72, 74, 89, 68, 83, 60, 82, 82, 66, 77, 75

(a) 81
(b) 75
(c) 70
(d) 67

Q55. The average of first 158 even numbers is

(a) 160
(b) 159.5
(c) 158.5
(d) 159

Q56. Find the value of: 47^(−11)÷ 47^(16) × 47^(−10)

(a) 47^(-35)
(b) 47^(-37)
(c) 47^(-27)
(d) 47^(-44)

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Q57. Find the value of x satisfying: $2(4x^2 - 6) - 4(2x^2 + 9x - 3) = 18$

(a) -frac92
(b) frac32
(c) -frac12
(d) -frac52

Q58. Given that 54^(0.2) = x, 54^(0.47)= y and x^z = y^3, then the value of z is close to:

(a) 7.05
(b) 6.17
(c) 9.48
(d) 6.54

Q59. Train A leaves station M at 6:45 AM and reaches station N at 3:45 PM on the same day. Train B leaves station N at 8:45 AM and reaches station M at 2:45 PM on the same day. Find the time when trains A and B meet.

(a) 11:13 AM
(b) 11:53 AM
(c) 11:33 AM
(d) 12:23

Q60. X, Y and Z invested a sum in the ratio of 32 : 40 : 68, respectively. If they earned a total profit of Rs. 3,210 at the end of the year, what is the difference between the shares of Y and Z?

(a) Rs. 771
(b) Rs. 742
(c) Rs. 642
(d) Rs. 777

Q61. The largest six digit number which when divided by 3, 5, 7 and 9 leaves remainders 1, 3, 5 and 7, respectively, is:

(a) 999808
(b) 999998
(c) 999893
(d) 999685

Q62. A man driving a car at a speed of 72 km/hr crosses a bridge in 4.9 minutes. Find the length of the bridge.

(a) 5.68 km
(b) 6.29 km
(c) 5.88 km
(d) 6.91 km

Q63. The number 966181 is divisible by which of the following?

(a) 36
(b) 38
(c) 30
(d) 37

Q64. Solve the following:

(cosec 23° - sin 23°)(tan 23° + cot 23°)(sec 23° - cos 23°)

(a) 1
(b) tan 23°
(c) sin 23°
(d) 0

Q65. The H.C.F. and the L.C.M. of two numbers are 3 and 672, respectively. If one of the numbers is 96, find the other one.

(a) 3
(b) 48

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(c) 94
(d) 21

Q66. A can do a work in 11 days and B can do the same work in 19 days. If they work on it together for 6 days, then what fraction of the work is left?
(a) 32/209
(b) 26/209
(c) 24/209
(d) 29/209

Q67. Four times the present age of P exceeds the present age of Q by 19 years. After 7 years, twice the age of Q will be 47 years less than seven times the age of P at that time. What is the present age of Q (in years)?
(a) 91
(b) 86
(c) 85
(d) 79

Q68. A hollow spherical shell is made of a metal of density 7 g/cm³. Its internal and external radii are 1 cm and 2 cm, respectively. What is the weight (in grams) of the shell?
(Use π = frac227, and round off your answer to the nearest gram.)
(a) 273
(b) 205
(c) 221
(d) 214

Q69. Isha can do a certain piece of work in 22 days. Isha and Smriti can together do the same work in 11 days, and Isha, Smriti and Ashlesha can do the same work together in 10 days. In how many days can Isha and Ashlesha do the same work?
(a) frac643
(b) frac494
(c) frac553
(d) frac615

Q70. The value of 3/4 + (1/(1 + 3/7)) - 3/4 is
(a) 5/16
(b) 2/11
(c) 16/19
(d) 7/10

GENERAL INTELLIGENCE AND REASONING

Q71. 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 conclusion(s) logically follow(s) from the statements.
Statements:
All mansions are flats.
All flats are buildings.
Conclusions:
(I) Some flats are mansions.
(II) All buildings are mansions
(a) Only conclusion (I) follows
(b) Neither conclusion (I) nor (II) follows.
(c) Both conclusions (I) and (II) follow.
(d) Only conclusion (II) follows

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Q72. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

EBF 11, JGK 17, OLP 23, TQU 29, ?

(a) YUV 35
(b) WUZ 35
(c) YVZ 35
(d) WVZ 24

Q73. What should come in place of the question mark (?) in the given series?

103, 1000, 9970, 99670, 996670, ?

(a) 9999670
(b) 9966667
(c) 9966670
(d) 9996670

Q74. BGSN is related to XLOS in a certain way based on the English alphabetical order. In the same way, TQKX is related to PVGC. To which of the given options is LACH related, following the same logic?

(a) GEZN
(b) HFYM
(c) FGXO
(d) GFYL

Q75. What will come in the place of the question mark (?) in the following equation, if '+' and '÷' are interchanged and '−' and '×' are interchanged?

80 × 16 − 2 ÷ 12 + 4 = ?

(a) 55
(b) 59
(c) 47
(d) 51

Q76. Each of the digits in the number 7312648 is arranged in the ascending order from left to right. What will be the sum of the digits that are second from the left and second from the right in the new number thus formed?

(a) 11
(b) 5
(c) 7
(d) 9

Q77. 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 conclusion(s) logically follow(s) from the statements.

Statements:

All crows are sparrows.

No crow is a pigeon.

Conclusions (I): No sparrow is a pigeon.

Conclusions (II): Some pigeons are crows.

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

Q78. Town Q is to the south of Town R. Town S is to the east of Town R. Town T is to the north of Town S. Town U is to the east of Town T. Town V is to the north-east of Town U. What is the position of Town V with respect to Town Q?

(a) South-west
(b) North-east

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(c) South-east
(d) South

Q79. Seven people A, B, C, D, E, F and G are sitting in a row, facing the north. Only three people sit to the left of D. B sits third to the left of D. F sits to the right of A but left of D. E sits to the right of C but left of G. How many people sit to the right of F?

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

Q80. What should come in place of the question mark (?) in the given series?

10, 30, 90, 270, ?, 2430

(a) 1080
(b) 540
(c) 810
(d) 720

Q81. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) € 5 & % 2 7 5 & % 7 8 @ 9 5 $ & # $ @ 2 9 © (Right)

How many such symbols are there each of which is immediately preceded by a number and also immediately followed by a symbol?

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

Q82. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

WUP : YYS

OPU : QTX

(a) PUX : RYZ
(b) RUV : TYZ
(c) XQO : ZTS
(d) UQQ : WUT

Q83. In a row of 46 people facing the north, Lalita sits 17th from the left end. If only 15 people sit to the right of Damini, then how many people sit between Damini and Lalita?

(a) 15
(b) 13
(c) 16
(d) 17

Q84. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(32, 497, 23)

(20, −19, 1)

(a) (18, −17, 2)
(b) (21, 40, 8)
(c) (3, 3, 3)
(d) (3, 222, 15)

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Q85. Shruti starts from point A and runs 2 km west. She then takes a left turn and runs 1 km. She takes a left turn again and runs 7 km. She then takes a final left turn and runs 1 km to reach a point B. How far (shortest distance) and towards which direction should she run in order to reach point A again? (All turns are 90 degrees turns only unless specified.)

(a) 5 km west
(b) 2 km west
(c) 5 km east
(d) 7 km east

Q86. AWER is related to HDLY in a certain way based on the English alphabetical order. In the same way, CYGT is related to JFNA. To which of the given options is XTBO related, following the same logic?

(a) EVIA
(b) EAIV
(c) EAVI
(d) EVAI

Q87. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

WIX 15 TKV 12 QMT 9 NOR 6 ?

(a) KGS 1
(b) QKJ 4
(c) KQP 3
(d) PKG 2

Q88. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) NRM
(b) RVQ
(c) LPJ
(d) UYT

Q89. If 1 is subtracted from each even digit of the number 36719542, find the sum of the digits that are repeated more than once in the new number formed.

(a) 4
(b) 6
(c) 8
(d) 9

Q90. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) AGB
(b) IOK
(c) EKF
(d) CID

Q91. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 6274385, which of the following digits will be third from the right in the new number thus formed?

(a) 3
(b) 9
(c) 5
(d) 1

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Q92. In a certain code language, ‘LACE’ is coded as ‘5689’ and ‘LEAK’ is coded as ‘5786’. What is the code for ‘K’ in that language?

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

Q93. In a row of people all facing North, Nima is 17^(th) from the left end. Dina is 27^(th) from the left end. Dina is exactly between Nima and Uma. If Uma is 13^(th) from the right end of the line, how many people are there in the row?

(a) 49
(b) 47
(c) 48
(d) 50

Q94. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 9 @ # 8 £ 4 & $ 7 2 * 5 Ω % 6 1 % & 3 (Right)

How many such symbols are there, each of which is immediately preceded by a number and also immediately followed by another number?

(a) More than two
(b) One
(c) Two
(d) None

Q95. In a certain code language, ‘DUAL’ is coded as ‘4629’ and ‘ARCS’ is coded as ‘1435’. What is the code for ‘A’ in the given code language?

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

Q96. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) XRY
(b) TNV
(c) RLT
(d) VPX

Q97. In a row of 42 people facing north, Soma is 17^(th) from the right end. If Amit sits 9^(th) to the left of Soma, what is Amit’s position from the left end of the line?

(a) 19^(th)
(b) 17^(th)
(c) 16^(th)
(d) 18^(th)

Q98. Seven people, I, J, K, L, M, N and O, are sitting in a row, facing north. Only three people sit to the left of M. Only I sits to the right of O. Only three people sit between O and N. J sits at some place to the left of K but at some place to the right of L. How many people sit between L and K?

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

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Q99. A is the brother of H. H is the mother of R. R is the son of M. G is the mother of M. How is A related to M?

(a) Son's son
(b) Wife's brother
(c) Son's wife's brother
(d) Son's wife's father

Q100. What should come in place of the question mark (?) in the given series?

318 263 213 168 128 ?

(a) 106
(b) 65
(c) 93
(d) 79

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Champaran Satyagraha

The correct answer is Champaran Satyagraha.

Key Points

• Champaran Satyagraha (1917) marked the first instance of Gandhi's active involvement in Indian politics. It was a pivotal event where Gandhi transitioned from a moderate reformer to a mass leader.

• The agitation was aimed at addressing the plight of the indigo farmers in Champaran district, Bihar, who were subjected to exploitative practices by British planters.

• Gandhi employed his strategy of non-violent civil disobedience for the first time in India during this movement, inspiring widespread participation and support from the masses. Hence, Champaran Satyagraha was a turning point in Gandhi's political life.

• It established Gandhi's leadership and laid the foundation for his future movements based on the principles of truth, non-violence, and satyagraha.

• Gandhi's success in resolving the farmers' grievances demonstrated his ability to mobilize people, connect with grassroots issues, and challenge British authority. This was a significant shift in his approach to Indian politics. Hence, statement is correct.

Additional Information

• Jallianwala Bagh Massacre (1919):

• This tragic event involved the killing of hundreds of unarmed civilians by British troops under General Dyer's orders.

Q2. Answer: (a) Andhra Pradesh

The correct answer is Andhra Pradesh.

Key Points

• Rushikonda Beach is located in the state of Andhra Pradesh, India.

• It is situated near Visakhapatnam, a prominent coastal city in Andhra Pradesh.

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• Rushikonda Beach was awarded the prestigious Blue Flag Certification in 2023, recognizing it as an environmentally sustainable and clean beach. Hence, the location is correct.

• The Blue Flag Certification is an international recognition granted by the Foundation for Environmental Education (FEE), Denmark, to beaches that meet stringent environmental, safety, and cleanliness standards.

• Rushikonda Beach is known for its pristine waters and is a major tourist destination in Andhra Pradesh. Hence, the answer is correct.

Additional Information

• Blue Flag Certification:

• Blue Flag Certification is a globally recognized eco-label awarded to beaches, marinas, and sustainable boating tourism operators.

• It is administered by the Foundation for Environmental Education (FEE), based in Denmark.

• The certification ensures that the beach meets 33 stringent criteria, which include water quality, environmental management, safety, and services.

• Rushikonda Beach:

• Located in Visakhapatnam, Andhra Pradesh, Rushikonda Beach is a popular tourist destination for its scenic beauty and water sports activities.

• The beach is managed by the local authorities to maintain its cleanliness and provide visitors with adequate safety measures.

• It is known for its environmentally friendly practices, which contributed to its Blue Flag Certification.

• Other Blue Flag Beaches in India:

• India currently has 12 Blue Flag beaches, including Rushikonda Beach.

• Other certified beaches include Kappad Beach in Kerala, Golden Beach in Odisha, and Ghoghla Beach in Diu.

Important Points

• Criteria for Blue Flag Certification:

• The beach must meet standards related to water quality, environmental management, safety, and education.

• It must have clean sanitation facilities, lifeguards, and proper signage to educate visitors about eco-friendly practices.

• Significance for India:

• The inclusion of Indian beaches in the Blue Flag list highlights the country's commitment to sustainable tourism and environmental conservation.

• This certification promotes India as a global tourist destination while ensuring that beaches remain clean and safe for visitors.

Q3. Answer: (c) Srabani Nanda

The correct answer is Srabani Nanda.

Key Points

• Srabani Nanda is an accomplished Indian sprinter known for her expertise in short-distance running events such as the 100 meters and 200 meters.

• She achieved a remarkable feat by winning both the 100 m and 200 m titles at the Indian Open Athletics 2025.

• The Indian Open Athletics is a prestigious event conducted annually, showcasing the best talents in athletics from across the country.

• Srabani Nanda’s victory demonstrates her exceptional speed, endurance, and dedication to the sport, making her one of the top sprinters in India.

• Her performance in the competition was a testament to her rigorous training regime and ability to excel in both sprint categories.

• The competition featured several other skilled athletes, but Srabani Nanda stood out due to her consistent and outstanding performance.

• Her achievements contribute significantly to India’s athletics representation on the international stage, inspiring young athletes to pursue sports.

Additional Information

• About Srabani Nanda:

• Srabani Nanda is an Indian sprinter from Odisha, known for her prowess in short-distance running.

• She has represented India in various international competitions, including the Asian Games and the Olympics.

• Her specialties include the 100 meters and 200 meters events, where she has consistently performed at a high level.

• Indian Open Athletics:

• The Indian Open Athletics is one of India’s key athletics competitions, providing a platform for athletes to showcase their talent at the national level.

• The event includes various categories such as sprint races, long-distance running, jumps, and throws.

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• It serves as a qualifying event for international competitions, helping athletes gain recognition and further opportunities.

• Other Competitors:

• Archana Suseendran: An Indian sprinter who specializes in 100 m and 200 m events, she is known for her speed and competitive spirit.

• Hima Das: Nicknamed the “Dhing Express,” Hima Das is a celebrated Indian sprinter famous for winning gold at the IAAF World U20 Championships in 2018.

• Dutee Chand: An internationally recognized Indian athlete, Dutee Chand specializes in short-distance sprints and has represented India in several global events.

Important Points

• Key Achievements of Srabani Nanda:

• She has competed in the 2016 Rio Olympics in the 200 m event, representing India on the global stage.

• She has also won medals at the South Asian Games, further solidifying her position as a top sprinter in India.

• Significance of Sprinting Events:

• Sprinting events, such as the 100 m and 200 m, require explosive power and speed, making them some of the most exciting events in athletics.

• Indian athletes have been making significant progress in sprinting, gaining international recognition and inspiring upcoming generations.

Q4. Answer: (d) Sri Lanka

The correct answer is Sri Lanka.

Key Points

• Sri Lanka is located to the southeast of India. It is an island country situated in the Indian Ocean.

• It is separated from mainland India by the Palk Strait and the Gulf of Mannar. Geographically, it lies below the southern tip of India.

• Sri Lanka is closest to the Indian state of Tamil Nadu, making it a neighboring country that is southeast of India. Hence, Sri Lanka is the correct answer.

• The other options like China, Bhutan, and Nepal are located to the north or northeast of India, making them incorrect answers.

• To the north of India lies Nepal and Bhutan, while China is situated further northeast. These countries are not in the southeast direction from India. Hence, only Sri Lanka is southeast of India.

Additional Information

• Sri Lanka:

• Sri Lanka is an island nation located in the Indian Ocean. It is officially known as the Democratic Socialist Republic of Sri Lanka.

• It has a rich cultural heritage, with influences from both India and other Asian nations. The capital city is Colombo, and its administrative capital is Sri Jayawardenepura Kotte.

• Geography: Sri Lanka is separated from India by the Palk Strait. The Adam’s Bridge, also known as the Ram Setu, is a chain of limestone shoals connecting India and Sri Lanka.

• Other Countries Mentioned:

• China: Located to the northeast of India, China shares borders with Indian states like Arunachal Pradesh, Sikkim, Uttarakhand, Himachal Pradesh, and Ladakh.

• Bhutan: Bhutan is a landlocked country situated in the Himalayas and lies to the north of India. It shares borders with Sikkim, Arunachal Pradesh, West Bengal, and Assam.

• Nepal: Nepal is another landlocked country located to the north of India. It shares borders with Indian states like Uttarakhand, Uttar Pradesh, Bihar, and Sikkim.

Important Points

• Geographical Features of Sri Lanka:

• Area: Sri Lanka covers an area of approximately 65,610 square kilometers.

• Climate: It has a tropical climate with distinct wet and dry seasons influenced by monsoons.

• Economy: Sri Lanka’s economy is largely dependent on agriculture, tourism, and the export of goods like tea, rubber, and textiles.

• Historical and Cultural Importance:

• Historical Ties: Sri Lanka shares cultural and historical ties with India, particularly in terms of Buddhism and ancient trade routes.

• Ramayana Connection: According to Indian mythology, Sri Lanka is considered the kingdom of Lanka, ruled by Ravana in the epic Ramayana.

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Q5. Answer: (a) NASM-SR

The correct answer is NASM-SR.

Key Points

• NASM-SR (Naval Anti-Ship Missile – Short Range) is India’s first indigenous air-launched anti-ship missile developed by the Defence Research and Development Organisation (DRDO).

• It was successfully test-fired in May 2022 from the Indian Navy's Sea Harrier fighter aircraft, marking a significant milestone in India's defense capabilities.

• The missile is designed to be launched from aircraft and targets enemy warships, providing precision strike capability. Hence, NASM-SR is the correct answer.

• Key features: The missile is equipped with state-of-the-art navigation and guidance systems, ensuring high accuracy in hitting targets.

• It has a range of approximately 55 km and is capable of engaging medium-range targets with high precision.

• NASM-SR enhances India’s maritime strike capabilities and strengthens the defense of coastal regions and naval operations.

• Hence, the correct answer is NASM-SR.

Additional Information

• Other Missiles Mentioned:

• BrahMos: A joint venture between India and Russia, BrahMos is a supersonic cruise missile used for land, air, and sea-based platforms. Its high speed and precision make it one of the fastest cruise missiles globally.

• Varunastra: An anti-submarine torpedo developed by DRDO, used by the Indian Navy. It is not an air-launched missile but operates underwater to target submarines.

• Astra: Astra is India’s indigenous air-to-air missile designed for fighter aircraft. It is not anti-ship but is primarily used for aerial combat.

• NASM-SR Characteristics:

• Launch Platform: Designed to be launched from aircraft, enhancing the Indian Navy’s operational capabilities.

• Guidance Systems: Equipped with advanced navigation and guidance systems for precision strikes.

• Strategic Importance: NASM-SR strengthens India’s maritime defense and provides a credible deterrence against enemy warships.

• DRDO’s Role:

• Organization: DRDO is India’s premier defense research organization responsible for developing indigenous defense technologies.

• Development: NASM-SR is a testament to DRDO’s commitment to enhancing India’s self-reliance in defense technologies.

Important Points

• NASM-SR Development:

• NASM-SR signifies India’s shift towards self-reliance in defense manufacturing, reducing dependence on imports.

• The missile enhances the Indian Navy’s operational readiness and contributes to modernizing its defense arsenal.

• Global Context:

• Air-launched anti-ship missiles are vital for maritime security and are used by various countries to protect territorial waters and project power.

• NASM-SR puts India in an elite group of nations with the capability to manufacture advanced indigenous air-launched anti-ship missiles.

Q6. Answer: (b) Provision for Service Tax

The correct answer is Provision for Service Tax.

Key Points

• The 88th Constitutional Amendment Act, 2003 was enacted to introduce provisions for levying Service Tax in India.

• This amendment added Article 268A to the Constitution, empowering the Union Government to levy taxes on services while allowing states to collect them.

• The Service Tax was created as a tool to increase revenue from the growing service sector, which contributes significantly to the Indian economy. Hence, the focus of this amendment was on service tax provisions.

• Service Tax was initially introduced in 1994, but the constitutional amendment was required to provide a legal framework for its collection.

• The revenue from Service Tax was shared between the Union and State Governments, ensuring a balanced distribution of resources. Hence, the primary objective of the amendment was tied to service tax.

• This amendment was significant in broadening the tax base and ensuring that the service sector contributes to the nation's tax system.

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Additional Information

• Service Tax in India:

• Introduced in 1994, the Service Tax focused on taxing services like telecommunications, insurance, banking, and IT.

• It became a crucial source of revenue for the government, especially as the service sector contributes nearly 55% of India's GDP.

• Evolution of Service Tax:

• Service Tax rates initially began at 5% and gradually increased over the years, aligning with economic requirements.

• Before the introduction of GST in 2017, Service Tax was one of the major indirect taxes levied on services.

• 88th Amendment Act:

• The amendment gave constitutional backing to Service Tax under Article 268A.

• It ensured that services became a taxable entity, paving the way for a structured taxation system for services.

Important Points

• Transition from Service Tax to GST:

• GST replaced Service Tax in 2017, unifying all indirect taxes under a single framework.

• This transition streamlined the taxation system, eliminating complexities related to multiple taxes.

• Significance of Service Tax:

• Service Tax contributed significantly to the government's revenue during its tenure.

• It encouraged the growth and formalization of the service sector, which plays a vital role in India's economy.

Q7. Answer: (c) 1824

The correct answer is 1824.

Key Points

• Sadi Carnot, a French physicist and engineer, is often regarded as the "Father of Thermodynamics" due to his groundbreaking contributions to the field.

• In 1824, Carnot published a seminal work titled "Reflections on the Motive Power of Fire", in which he introduced the concept of the Carnot engine. This engine represents an idealized heat engine that operates on reversible processes.

• The Carnot engine is based on the principles of thermodynamics, particularly the idea of maximizing efficiency by minimizing energy waste. Carnot's model became fundamental to understanding heat transfer and energy conversion.

• Carnot explained that no engine working between two heat reservoirs can be more efficient than a Carnot engine, and its efficiency depends solely on the temperature difference between the reservoirs.

• This concept laid the foundation for the Second Law of Thermodynamics, which governs the direction of heat flow and energy transformation. Hence, the year 1824 is correct.

Additional Information

• About Sadi Carnot:

• Sadi Carnot was born in 1796 in France. He is best known for his work on the theoretical aspects of heat engines, which contributed significantly to the field of thermodynamics.

• His work emphasized the importance of reversible processes in achieving maximum efficiency in heat engines, setting the stage for advancements in energy systems.

• The Carnot Engine:

• The Carnot engine is a theoretical construct that operates in a closed cycle, consisting of four reversible stages: two isothermal processes and two adiabatic processes.

• It demonstrates the maximum efficiency achievable by a heat engine, which depends on the temperature difference between the heat source and the heat sink.

• Example: Modern heat engines, such as steam turbines and refrigeration systems, are designed based on the principles outlined in Carnot's work.

• Second Law of Thermodynamics:

• Carnot's work directly contributed to the development of the Second Law of Thermodynamics, which states that heat cannot spontaneously flow from a colder body to a hotter body.

• This law also establishes the concept of entropy, which measures the level of disorder or randomness in a thermodynamic system.

Important Points

• Efficiency of the Carnot Engine:

• The efficiency of a Carnot engine is determined by the formula $\eta = 1 - (T_{cold} / T_{hot})$, where T_{hot} and T_{cold} are the temperatures of the heat source and sink, respectively.

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• This formula highlights the impact of temperature difference on the engine's performance.

• Legacy of Carnot's Work:

• Carnot's ideas influenced the development of practical heat engines and the understanding of energy efficiency.

• His work forms the basis of modern thermodynamics and continues to guide engineers in optimizing energy systems.

Q8. Answer: (c) 2°

The correct answer is 3) 2°.

Key Points

• The Paris Agreement is a global climate accord adopted in December 2015 during the 21st Conference of the Parties (COP21) in Paris, France.

• Its primary goal is to limit the increase in global average temperature to well below 2° Celsius above pre-industrial levels and pursue efforts to limit the temperature rise to 1.5° Celsius.

• This agreement is legally binding, meaning countries that are party to it are obligated to take action to meet their commitments. Hence, statement is correct.

• Global Warming Limit: The agreed-upon limit of 2° Celsius is considered essential to mitigate the worst impacts of climate change, such as rising sea levels, extreme weather events, and biodiversity loss.

• The pursuit of the more ambitious 1.5° Celsius target aims to further reduce risks associated with climate change, particularly for vulnerable countries and populations. Hence, the correct temperature limit is 2° Celsius.

Additional Information

• Paris Agreement Details:

• The agreement includes commitments from countries to submit Nationally Determined Contributions (NDCs), outlining their plans for reducing greenhouse gas emissions.

• It encourages developed countries to provide financial and technological support to developing nations for climate adaptation and mitigation.

• 2° Celsius Target:

• The Intergovernmental Panel on Climate Change (IPCC) recognizes the 2° Celsius limit as crucial to avoid catastrophic climate impacts.

• Exceeding this threshold could result in severe consequences, including the loss of ecosystems, food shortages, and increased natural disasters.

• Developing Nations: Countries like Bangladesh, Maldives, and Pacific Island nations are particularly vulnerable to climate change impacts and advocate for the 1.5° Celsius target.

• Efforts to Achieve the Targets:

• Countries aim to transition to renewable energy, adopt sustainable practices, and limit reliance on fossil fuels.

• Global organizations like the United Nations Framework Convention on Climate Change (UNFCCC) oversee and support implementation efforts.

Important Points

• Key Statistics:

• The average global temperature has already risen by approximately 1.1° Celsius compared to pre-industrial levels.

• Carbon Emissions: Major emitters like China, USA, and India have pledged to reduce emissions under the Paris Agreement.

• Challenges in Implementation:

• Despite commitments, countries face challenges such as funding gaps, technological limitations, and political resistance.

• The agreement requires transparent reporting and accountability mechanisms to ensure compliance.

Q9. Answer: (d) Central Information Commission

The correct answer is Central Information Commission.

Key Points

• Central Information Commission (CIC): The Central Information Commission is the designated appellate authority under the Right to Information (RTI) Act, 2005. It addresses grievances and resolves disputes related to RTI requests.

• The CIC is responsible for ensuring transparency and accountability in the functioning of public authorities by adjudicating appeals and complaints filed under the RTI Act.

• The commission functions as an independent body and has the authority to summon public officials, review documents, and order disclosure of information if required. Hence, the correct answer is Central Information Commission.

• Structure of the CIC: The commission consists of the Chief Information Commissioner and up to ten Information Commissioners, appointed by the President of India.

• The Chief Information Commissioner and Information Commissioners have a tenure of five years or until they reach the age of

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65 years, whichever is earlier.

• Role in RTI: The CIC acts as a final appellate authority to hear appeals against decisions made by the Public Information Officer (PIO) or the First Appellate Authority in cases where applicants are dissatisfied with the responses received.

Additional Information

• Right to Information Act, 2005:

• The RTI Act was enacted to promote transparency and accountability in the functioning of public authorities.

• It gives citizens the right to access information held by public authorities, subject to certain exemptions and conditions.

• The act applies to all levels of government—Central, State, and local bodies.

• Functions of the Central Information Commission:

• The CIC adjudicates on appeals and complaints related to RTI applications, ensuring compliance with the RTI Act.

• It has the power to direct public authorities to take necessary actions, such as providing information or justifying its denial.

• The CIC can impose penalties on public officials for non-compliance or delay in providing information.

• Appointment of Commissioners:

• The Chief Information Commissioner and Information Commissioners are appointed by the President of India based on recommendations by a committee comprising the Prime Minister, Leader of Opposition in Lok Sabha, and a Union Cabinet Minister.

• This ensures that the commission operates independently and impartially.

Important Points

• Exemptions under RTI Act:

• Certain sensitive information is exempted from disclosure under the RTI Act, including matters related to national security, sovereignty, and integrity of India.

• Information prohibited by courts of law or relating to commercial confidence, trade secrets, or intellectual property is also exempted.

• Other Authorities Mentioned in the Options:

• Chief Vigilance Commission: This authority deals primarily with vigilance and corruption cases in government offices and does not have a role in RTI appeals.

• National Human Rights Commission: The NHRC addresses issues related to human rights violations and does not serve as the appellate authority under the RTI Act.

• Lokpal: Lokpal is an anti-corruption ombudsman that investigates complaints of corruption against public officials. It is not involved in RTI appeals.

Q10. Answer: (c) Ctrl + Click

The correct answer is Ctrl + Click.

Key Points

• The Ctrl + Click shortcut allows users to select multiple specific files or folders. This is useful when the files are not adjacent to each other and need to be selected individually.

• Using Ctrl + Click ensures that the selection is additive, meaning that each additional click adds to the already selected items without deselecting others. Hence, the statement is correct.

• Tab + Click is not used for selecting multiple files; it is typically used for navigation between fields or elements in applications. Hence, this statement is incorrect.

• Alt + Click is not a standard shortcut for selecting multiple files; it is often used for specific actions in software (e.g., selecting objects in design software). Hence, this statement is incorrect.

• Shift + Click allows users to select a range of files that are adjacent to each other. However, it is not suitable for selecting non-adjacent files. Hence, this statement is correct in a different context.

Additional Information

• Functionality of Ctrl + Click:

• The Ctrl key, when held down, allows users to make multiple selections without overriding previous selections.

• It is commonly used in Windows File Explorer or macOS Finder to select multiple files or folders that are spread across different positions.

• Shift + Click Usage:

• While Shift + Click is used to select a range of items, it is limited to selecting items that are adjacent to each other.

• For example, if you click the first file, hold Shift, and click the last file, all files in between will be selected.

• Tab Key Usage:

• Tab + Click is not a valid shortcut for file selection. The Tab key is primarily used for navigation between fields or interactive elements.

• For example, pressing Tab allows users to move to the next field in a form or navigate through buttons and menus.

• Alt Key Usage:

• The Alt key is generally used for accessing menus and shortcuts specific to particular software, not for file selection.

• In some applications like graphic design software, Alt + Click allows advanced selection techniques, but it does not apply to regular file selection.

Important Points

• Advantages of Ctrl + Click:

• It enables users to select specific items without affecting the selection of others, making it flexible and efficient.

• This shortcut is particularly useful when working with large datasets or organizing files.

• Applications in Operating Systems:

• Windows OS: The Ctrl key is widely used for multiple selections in File Explorer and other applications.

• macOS: The equivalent shortcut in macOS is Command + Click, serving the same purpose for selecting multiple files.

Q11. Answer: (b) Land that is fallow for over five years

The correct answer is Land that is fallow for over five years.

Key Points

• Culturable Wasteland: In India, land recorded as "Culturable Wasteland" in revenue records refers to land that is capable of cultivation but has not been used for agricultural purposes for a prolonged period, specifically for more than five years.

• This category of land includes areas that have the potential for agricultural production but have been left uncultivated due to various reasons, such as poor soil quality, lack of irrigation facilities, or socio-economic issues.

• The classification of "Culturable Wasteland" ensures that such land is identified for possible reclamation and use in agricultural development programs.

• Hence, the correct answer is "Land that is fallow for over five years."

• Incorrect Options:

• Urban infrastructure land: This type of land is utilized for development purposes, such as construction of buildings, roads, and other urban facilities. It does not qualify as "Culturable Wasteland" because it is not suitable for agriculture.

• Land under tree crops: Land with tree crops is already in use for cultivation, particularly for horticulture or forestry. It cannot be categorized as wasteland.

• Barren rocky land: This type of land is unsuitable for cultivation due to its rocky terrain and poor soil quality. It is categorized separately and does not fall under "Culturable Wasteland."

Additional Information

• Land Classification in India: The land in India is categorized into various types based on its usage and productivity:

• Cultivable Land: Land that is actively used for agricultural purposes.

• Culturable Wasteland: Land that is arable but has been left uncultivated for a long time, typically for over five years.

• Barren and Uncultivable Land: Land that cannot be used for agriculture due to poor soil quality, rocky terrain, or other physical limitations.

• Uses of Culturable Wasteland:

• Such land can be reclaimed for agricultural production by improving soil fertility, providing irrigation, and addressing socio-economic challenges.

• It can also be used for plantation, forestry, or other sustainable practices to enhance its productivity.

• Government Initiatives:

• The Indian government has implemented various programs, such as the Integrated Watershed Management Program (IWMP), to reclaim and improve wasteland for agricultural use.

• The National Wasteland Development Board (NWDB) was established in 1985 to identify and utilize wasteland effectively.

Important Points

• Significance of Land Records:

• Land revenue records play a crucial role in identifying the types of land and their utilization patterns.

• They help in planning land use, implementing agricultural policies, and managing resources effectively.

• Relevance of Culturable Wasteland in Agriculture:

• Reclaiming such land can contribute significantly to increasing agricultural productivity in India.

• It is vital for achieving food security and promoting sustainable agricultural practices.

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Q12. Answer: (d) Italy

The correct answer is Italy.

Key Points

• Italy held federal elections after the collapse of its coalition government due to economic unrest and political instability. This was a significant event in Italian politics.

• The coalition government in Italy faced internal disagreements and challenges addressing economic issues such as rising inflation, unemployment, and public debt.

• The situation in Italy highlights the fragility of coalition governments, especially during periods of economic turmoil. This led to the need for fresh elections to establish a stable leadership. Hence, statement is correct.

• Italy's economic unrest: The country has been grappling with slow economic growth, structural issues, and the impact of global crises like the COVID-19 pandemic and the Russia-Ukraine conflict.

• The collapse of the government reflects the difficulty in managing economic reforms and maintaining political unity in times of crisis. Hence, Italy's federal elections were essential for political stability.

Additional Information

• Italy's Political System:

• Italy operates under a parliamentary system where the government is formed by a coalition of parties. This system can sometimes lead to instability, especially when there are disagreements among coalition partners.

• The Italian Parliament consists of the Chamber of Deputies and the Senate. Federal elections determine the composition of these bodies and the subsequent formation of the government.

• Economic Challenges in Italy:

• Italy's economy is one of the largest in Europe, but it has been plagued by issues such as high public debt, slow growth, and unemployment.

• The global crisis, including the COVID-19 pandemic, further exacerbated economic challenges, making governance difficult for coalition governments.

• Significance of Federal Elections:

• Federal elections provide an opportunity for Italian citizens to choose a new government that can address economic and political challenges effectively.

• A stable government is crucial for implementing reforms and ensuring socio-economic growth in Italy.

Important Points

• Key Characteristics of Coalition Governments:

• Coalition governments often involve partnerships between multiple political parties, which can lead to disagreements and instability.

• Economic crises or political conflicts can weaken coalition governments, necessitating fresh elections to restore stability.

• Historical Context:

• Italy has experienced frequent changes in government since World War II, highlighting its political volatility.

• Recent elections aimed to establish a majority government capable of addressing Italy's pressing issues, such as economic reforms and recovery from the pandemic.

Q13. Answer: (a) Dadabhai Naoroji

The correct answer is Dadabhai Naoroji.

Key Points

• Dadabhai Naoroji, also known as the "Grand Old Man of India," propounded the Drain of Wealth Theory in the late 19th century.

• The theory stated that the British colonial rule in India led to the systematic transfer of wealth and resources from India to Britain.

• This theory was first articulated in Naoroji's book titled "Poverty and Un-British Rule in India", published in 1901.

• Naoroji highlighted that the colonial policies drained India's economic resources, leading to widespread poverty and stagnation among Indians.

• He identified various mechanisms through which wealth was drained, such as home charges, salaries for British officials in India, and the profits earned by British companies operating in India.

• Naoroji argued that this drain of wealth was the primary reason for India's economic backwardness during colonial rule.

• The Drain of Wealth Theory became a cornerstone for economic critiques of British imperialism and influenced the early Indian nationalist movement.

• Other leaders like Gopal Krishna Gokhale and Mahatma Gandhi also acknowledged Naoroji's contributions and expanded upon his ideas in their struggle against colonial rule.

Additional Information

• Dadabhai Naoroji:

• Born: In 1825 in Bombay (now Mumbai), India.
• Profession: An educator, political leader, and one of the first Indian members of the British Parliament.
• Significance: Naoroji was instrumental in laying the foundation for economic nationalism in India and advocating for Indian rights.
• The Drain of Wealth Mechanisms:
• Home Charges: Payments made by India to Britain for administrative expenses, military costs, and pensions for British officials.
• Trade Policies: India was used as a supplier of raw materials for British industries and a market for British goods, adversely affecting Indian industries.
• Salaries: High salaries and profits paid to British officials and traders working in India drained wealth from the country.
• Impact of the Theory:
• The Drain of Wealth Theory raised awareness among Indians about the exploitative nature of British colonialism.
• It became a key argument for Indian nationalists demanding economic and political independence.

Important Points

• Key Contributions of Dadabhai Naoroji:
• Naoroji was the first Indian to be elected to the British House of Commons in 1892.
• He played a significant role in the formation of the Indian National Congress (INC) in 1885.
• His book, "Poverty and Un-British Rule in India", provided a detailed analysis of the economic impact of British policies on India.
• Legacy:
• Naoroji's ideas inspired future leaders like Mahatma Gandhi and Jawaharlal Nehru in their fight for India's independence.
• He is considered one of the pioneers of modern economic thought in India.

Q14. Answer: (b) IIIT - Delhi

The correct answer is IIIT-Delhi.

Key Points

• IIIT-Delhi collaborated with Inria Saclay in May 2025 to develop an advanced AI tool aimed at addressing the critical global issue of antimicrobial resistance (AMR).
• The primary goal of this collaboration was to identify alternative antibiotics using artificial intelligence methodologies, thereby tackling the rising global health threat posed by drug-resistant bacteria.
• Antimicrobial resistance occurs when microbes, such as bacteria, viruses, fungi, and parasites, become resistant to the medications that once successfully treated them. This can make infections harder to treat and increase the risk of disease spread, severe illness, and death.
• The AI tool developed by IIIT-Delhi and Inria Saclay aims to analyze large datasets and use machine learning algorithms to predict potential alternative antibiotics by understanding bacterial resistance patterns.
• This collaboration signifies a step forward in leveraging cutting-edge technology and international partnership to combat pressing global health challenges.
• IIIT-Delhi is known for its excellence in research and development in the field of information technology and computer science, making it a strong partner in this initiative.
• Inria Saclay is a renowned French research institute specializing in computer science and automation, known for its expertise in developing innovative technological solutions, including artificial intelligence.

Additional Information

• About IIIT-Delhi:
• The Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi), established in 2008, is a leading institute in India dedicated to research and education in IT and allied fields.
• Located in New Delhi, India, the institute offers undergraduate, postgraduate, and doctoral programs in computer science and engineering, electronics, and communication engineering, and other related fields.
• IIIT-Delhi has been at the forefront of innovative research in areas such as artificial intelligence, data science, cybersecurity, and computational biology.
• About Inria Saclay:
• Inria Saclay is one of the research centers of the French National Institute for Research in Computer Science and Automation.
• The institute focuses on the development of core technologies in the fields of AI, machine learning, robotics, and high-performance computing.
• Inria has a strong history of international collaboration and has been instrumental in driving technological innovations in Europe.
• Antimicrobial Resistance (AMR):
• AMR is a global health threat that occurs when microorganisms evolve to resist the effects of antimicrobial drugs, such as antibiotics.

• It is estimated that by 2050, AMR could cause up to 10 million deaths annually if not addressed effectively.

• AI and machine learning offer promising solutions to tackle AMR by enabling the discovery of new antibiotics and predicting resistance patterns in microbes.

Important Points

• Role of AI in Combating AMR:

• AI can analyze large-scale datasets and identify patterns that may not be evident through traditional research methods.

• Machine learning models can predict the effectiveness of existing antibiotics and suggest combinations or alternatives to combat resistant strains.

• The use of AI has already led to the discovery of a new antibiotic, Halicin, which was identified using machine learning algorithms in 2020.

• Global Collaboration in Research:

• Partnerships like the one between IIIT-Delhi and Inria Saclay highlight the importance of international cooperation in solving global challenges.

• Such collaborations enable the sharing of expertise, resources, and technology to accelerate research and innovation.

Q15. Answer: (a) Bharat Forecast System

The correct answer is Bharat Forecast System.

Key Points

• Bharat Forecast System: India launched its fully indigenous high-resolution weather prediction platform named Bharat Forecast System in May 2025. This platform is designed to improve the accuracy of weather predictions significantly.

• The system uses advanced algorithms and state-of-the-art technology to provide precise forecasts, including warnings about severe weather conditions such as cyclones, heavy rainfall, and heatwaves.

• It is developed by India's meteorological department and leading research institutions, ensuring complete indigenous capabilities and reduced dependence on international platforms.

• The Bharat Forecast System is expected to cover predictions for various sectors, including agriculture, disaster management, aviation, and urban planning. It also aims to enhance India's preparedness for climate change impacts.

• Being fully indigenous, the system is tailored to India's geographical diversity, allowing accurate predictions for mountains, plains, coastal areas, and desert regions.

• The system incorporates machine learning and artificial intelligence to improve its prediction models constantly, making it a significant leap forward in India's meteorological capabilities.

• It also includes real-time monitoring tools and high-resolution data analysis, ensuring timely dissemination of critical weather information to the public and relevant authorities.

Additional Information

• Importance of Weather Forecasting:

• Weather forecasting plays a critical role in agriculture, disaster management, transportation, and energy sectors. It helps farmers plan their activities, enables authorities to prepare for natural disasters, and ensures the safety of air and sea travel.

• Accurate predictions are essential for reducing economic losses caused by adverse weather conditions and improving public safety and infrastructure planning.

• Comparison with Other Options:

• IndraNet: While the name suggests relevance to weather or environmental systems, this option does not align with the actual name of the newly launched platform.

• VarshaNet: Although the term "Varsha" relates to rain, this is not the name of the newly launched system.

• Mausam 2.0: This option hints at an upgraded version of an older system but is not the correct name of the weather platform launched in May 2025.

• Development of Indigenous Technology:

• The launch of the Bharat Forecast System reflects India's commitment to self-reliance in advanced technologies and its focus on developing systems tailored to its unique environmental conditions.

• This initiative is in line with the Indian Government’s Atmanirbhar Bharat (Self-reliant India) mission, promoting domestic innovation and reducing dependence on foreign systems.

Important Points

• Global Context:

• Weather forecasting systems like ECMWF (European Centre for Medium-Range Weather Forecasts) and the US-based NOAA have been pioneers in providing global weather predictions. Bharat Forecast System aims to complement these efforts and focus on regional accuracy for India.

• The integration of AI and machine learning in weather systems is becoming increasingly common worldwide, and Bharat

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Forecast System reflects India's ability to adopt and innovate such technologies.

• Impact on Climate Change Preparedness:

• The system will play a vital role in addressing challenges posed by climate change, including erratic monsoon patterns, extreme weather events, and rising temperatures.

• It will assist policymakers in making informed decisions regarding climate adaptation strategies and disaster risk reduction.

Q16. Answer: (a) Indo-Saracenic

The correct answer is Indo-Saracenic.

Key Points

• Gateway of India: The Gateway of India, located in Mumbai, is a historic monument that was built to commemorate the visit of King George V and Queen Mary to India in 1911. Its construction was completed in 1924.

• The architectural style of the Gateway of India is predominantly Indo-Saracenic, which is a blend of traditional Indian architectural elements and Islamic, Gothic, and Neoclassical styles.

• The monument is made of basalt and reinforced concrete, featuring intricate detailing, arches, and domes, which are hallmarks of the Indo-Saracenic style.

• The central dome of the Gateway of India is about 26 meters high and is flanked by intricately designed honeycomb-like lattice stonework, reflecting traditional Indian craftsmanship.

• This architectural style was widely used during the British colonial era in India and represents a blend of Indian and Western architectural influences.

• The Gateway of India is one of the most iconic landmarks in Mumbai and serves as a symbol of India’s rich heritage and colonial history.

• Hence, the correct answer is Indo-Saracenic.

Additional Information

• Indo-Saracenic Architecture:

• Indo-Saracenic architecture, also known as Indo-Gothic, is an architectural style that emerged during British colonial rule in India. It combines elements of Indian, Islamic, and Western Gothic architectural styles.

• It often features domes, arches, minarets, and intricate ornamentation influenced by Mughal and Hindu architectural traditions, along with elements of Gothic revival and Victorian architecture.

• Examples of Indo-Saracenic architecture in India include the Gateway of India, the Victoria Memorial in Kolkata, and the Chhatrapati Shivaji Maharaj Terminus in Mumbai.

• Art Deco Architecture:

• Art Deco is a modernist architectural style that originated in the early 20th century and is characterized by geometric patterns, bold colors, and luxurious materials.

• Mumbai is home to a significant number of Art Deco buildings, particularly along Marine Drive and the Oval Maidan.

• However, the Gateway of India is not an example of Art Deco architecture.

• Bauhaus Architecture:

• The Bauhaus style originated in Germany during the early 20th century and is characterized by minimalism, functionality, and modern industrial materials.

• This architectural style emphasizes simplicity and rejects unnecessary ornamentation, which is quite different from the intricate design of the Gateway of India.

• Victorian Gothic Architecture:

• The Victorian Gothic style, popular during the 19th century, features pointed arches, ribbed vaults, and flying buttresses, inspired by medieval Gothic architecture.

• In Mumbai, the Chhatrapati Shivaji Maharaj Terminus is a prime example of Victorian Gothic architecture, but the Gateway of India does not fall into this category.

Important Points

• Construction of the Gateway of India:

• The foundation stone for the Gateway of India was laid in March 1913, and the structure was completed in 1924.

• It was designed by the British architect George Wittet, who combined elements of Hindu, Islamic, and European architectural styles.

• Significance of Indo-Saracenic Style:

• The Indo-Saracenic style was widely used in colonial India, as it blended local architectural traditions with Western influences, symbolizing the fusion of cultures.

• The style was often used for public and government buildings, including railway stations, courthouses, and memorials.

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Q17. Answer: (c) State of Tamil Nadu vs. Governor of Tamil Nadu (2023)

The correct answer is State of Tamil Nadu vs. Governor of Tamil Nadu (2023).

Key Points

• The Supreme Court of India, in the landmark case of State of Tamil Nadu vs. Governor of Tamil Nadu (2023), imposed a three-month deadline for the President to decide on State Bills reserved for consideration under Article 201.

• Article 201 of the Indian Constitution deals with the procedure for assent to bills reserved by the Governor for the consideration of the President. The President may either give assent or withhold assent to the bill.

• This judgment emphasizes the importance of preventing undue delays in the assent process for bills passed by state legislatures and reserved for the President's consideration. Hence, this is the correct case.

• This decision is significant in maintaining the federal structure of India, ensuring that the states' legislative processes are not hindered by indefinite delays in decision-making.

• The Supreme Court's ruling provides clarity on the procedure and timelines for decisions related to state bills, promoting accountability and efficiency in governance.

Additional Information

• Article 201 of the Indian Constitution:

• Article 201 empowers the President to either give assent to a bill reserved by the Governor or withhold assent.

• The article is designed to ensure that bills passed by state legislatures align with the central laws and policies. However, it does not specify any time frame for the President's decision, leading to delays in some cases.

• The Supreme Court's ruling in 2023 sets a precedent by introducing a three-month deadline for the President to decide, ensuring better legislative efficiency.

• State of Tamil Nadu vs. Governor of Tamil Nadu (2023):

• This case highlights the issue of delays in decision-making regarding bills reserved under Article 201.

• The judgment reinforces the principle of cooperative federalism, ensuring that state legislations are not indefinitely stalled.

• It serves as a benchmark for similar cases in the future, bringing clarity to the process of granting assent to state bills.

• Other Landmark Cases:

• Minerva Mills vs. Union of India (1980): This case dealt with the balance between fundamental rights and directive principles but did not address Article 201.

• SR Bommai vs. Union of India (1994): This case focused on the application of President's Rule and federalism, not Article 201.

• Kesavananda Bharati vs. State of Kerala (1973): This case was pivotal in establishing the Basic Structure Doctrine but did not involve Article 201.

Important Points

• Key Legal Significance:

• The judgment in State of Tamil Nadu vs. Governor of Tamil Nadu (2023) underscores the importance of timely decision-making in the legislative process.

• By imposing a three-month deadline, the Supreme Court ensures that governance at the state level is not compromised due to procedural delays.

• Impact on Federalism:

• The case strengthens the concept of cooperative federalism, where both the Center and States work in harmony without undue interference.

• It provides a clear framework for handling bills under Article 201, fostering trust and transparency between the state and central authorities.

Q18. Answer: (b) 91^(st) Constitutional Amendment Act, 2003

The correct answer is 91st Constitutional Amendment Act, 2003.

Key Points

• The 91st Constitutional Amendment Act, 2003 introduced a cap on the size of the State Council of Ministers.

• According to this amendment, the total number of ministers, including the Chief Minister, in the State Council of Ministers cannot exceed 15% of the total strength of the State Legislative Assembly.

• This amendment was enacted to ensure efficient governance and to curb unnecessary expansion of ministries, which could lead to financial burdens and administrative inefficiencies.

• The amendment also introduced provisions for disqualification of legislators under the anti-defection law, strengthening the political structure and promoting accountability.

• The anti-defection law, added as the Tenth Schedule of the Constitution, was amended to ensure that defecting legislators lose their right to hold any ministerial position.

• This amendment applies to both the Union Council of Ministers and the State Council of Ministers, bringing uniformity to the

structure and size of government across the country.

• Hence, the correct answer is the 91st Constitutional Amendment Act, 2003.

Additional Information

• 91st Constitutional Amendment Act, 2003:

• This amendment was implemented to promote efficient governance and reduce the financial burden caused by oversized councils of ministers.

• It introduced a mandatory cap of 15% on the size of councils of ministers at both the central and state levels.

• It strengthened the anti-defection law by disqualifying defectors from holding ministerial positions, ensuring political stability.

• Anti-Defection Law:

• Added to the Constitution as the Tenth Schedule by the 52nd Constitutional Amendment Act, 1985.

• It seeks to prevent political defections by disqualifying members of the legislature who switch parties.

• The 91st Constitutional Amendment Act further strengthened this law by including provisions to disqualify defectors from holding ministerial positions.

• Impact of the 91st Amendment:

• Promotes transparent governance by limiting the size of councils of ministers.

• Ensures financial prudence by reducing unnecessary expenditure on salaries and allowances for ministers.

• Encourages political accountability by preventing defectors from being rewarded with ministerial positions.

Important Points

• Historical Background of the 91st Amendment:

• Before the 91st Amendment, there was no cap on the size of councils of ministers, leading to excessive expansion and inefficiencies.

• The amendment was introduced in response to growing concerns about governance inefficiencies and financial burdens caused by oversized ministries.

• Other Relevant Amendments:

• 73rd Constitutional Amendment Act, 1992: Introduced provisions for Panchayati Raj, establishing a three-tier system of governance at the local level.

• 61st Constitutional Amendment Act, 1988: Reduced the minimum voting age from 21 to 18 years for Lok Sabha and state assembly elections.

• 42nd Constitutional Amendment Act, 1976: Known as the Mini Constitution, it brought significant changes to the Constitution, including the addition of the words “Socialist” and “Secular” to the Preamble.

Q19. Answer: (b) Drip

The correct answer is Drip Irrigation.

Key Points

• Drip irrigation is considered the most efficient irrigation method for conserving water. It delivers water directly to the root zone of plants through small emitters, minimizing water wastage.

• This system significantly reduces evaporation and runoff, ensuring that plants receive only the required amount of water.

• Drip irrigation systems are ideal for areas with low water availability or arid regions, as they use water more effectively compared to traditional methods like flood or furrow irrigation.

• The method enhances soil health by preventing waterlogging and ensuring consistent moisture levels, which leads to better crop yield.

• Drip irrigation systems are highly suitable for greenhouses, orchards, vineyards, and vegetable farms, where precise water application is critical.

• Although the initial installation of a drip irrigation system can be costly, its long-term benefits in terms of water conservation and crop yield outweigh the investment.

• This method also allows for the efficient application of fertilizers and nutrients by mixing them with water, reducing waste and ensuring targeted nourishment of crops.

Additional Information

• Furrow Irrigation:

• Furrow irrigation involves creating shallow channels along the field where water flows to irrigate crops. While it is less costly and easier to implement, it leads to significant water loss due to evaporation and runoff.

• This method is suitable for crops like maize, sugarcane, and cotton, but it is less efficient compared to drip irrigation.

• Flood Irrigation:

• Flood irrigation involves flooding the entire field with water. It is one of the oldest methods but is highly inefficient, as a large quantity of water is wasted due to evaporation and seepage.

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• This method is primarily used for crops like rice, but it can lead to waterlogging and soil erosion, affecting the crop yield negatively in the long term.

• Sprinkler Irrigation:

• Sprinkler irrigation involves spraying water over crops through overhead sprinkler systems. While it is more efficient than furrow or flood irrigation, it still leads to water loss due to evaporation.

• Sprinkler systems are suitable for crops like cereals, vegetables, and lawns, but they are not as precise or water-conserving as drip irrigation.

• Advantages of Drip Irrigation:

• Drip irrigation can save up to 30-50% of water compared to conventional methods like flood irrigation.

• It reduces weed growth since water is applied only to the root zones, minimizing moisture in other areas.

• This system enhances the efficiency of fertilizer application, reducing costs and environmental impact.

Important Points

• Environmental Benefits:

• Drip irrigation helps conserve water resources and minimizes soil erosion, making it a sustainable choice for agriculture.

• It reduces the risk of water contamination due to reduced runoff, which is beneficial for protecting nearby water bodies.

• Global Adoption:

• Countries like Israel have adopted drip irrigation extensively to address water scarcity issues and improve agricultural productivity.

• India has also promoted drip irrigation under schemes like the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) to enhance water use efficiency in agriculture.

Q20. Answer: (b) Harappa

The correct answer is Harappa.

Key Points

• Harappa, located in present-day Punjab, Pakistan, is one of the most significant archaeological sites of the Indus Valley Civilization (2600–1900 BCE).

• It was among the first sites to provide evidence of a highly advanced urban civilization, characterized by planned city structures, including streets aligned in grid patterns, advanced drainage systems, and fortified areas.

• The discovery of Harappa in the early 20th century was instrumental in identifying the vast and complex Indus Valley Civilization, which is considered the earliest urban civilization in the Indian subcontinent.

• Harappa provided evidence of advanced craftsmanship, including artifacts such as seals, pottery, and tools made of stone and bronze, which demonstrated a high level of technological development.

• The site also showcased evidence of a structured economic system, including trade networks, agriculture, and animal domestication. This indicates its role as a major urban center in the civilization.

• Harappa revealed the existence of a written language, known as the Indus script, which remains undeciphered but is considered one of the earliest forms of written communication.

• Hence, the correct answer is Harappa.

Additional Information

• Mehrgarh:

• Mehrgarh, located in present-day Balochistan, Pakistan, is one of the earliest sites of human settlements in South Asia, dating back to around 7000 BCE.

• It provides evidence of early agricultural practices, domestication of animals, and pottery, but it is not considered part of the urban Indus Valley Civilization.

• Kalibangan:

• Located in present-day Rajasthan, India, Kalibangan was another significant site of the Indus Valley Civilization.

• It showcased evidence of fire altars, advanced drainage systems, and agricultural practices, but Harappa was older and more prominent in terms of urban planning.

• Lothal:

• Lothal, situated in Gujarat, India, is an important site known for its dockyard and evidence of maritime trade.

• While Lothal exhibits advanced technology and urban planning, it is not as old as Harappa and does not hold the distinction of being the earliest urban center.

Important Points

• Significance of the Indus Valley Civilization:

• The Indus Valley Civilization was one of the three earliest urban civilizations globally, alongside Mesopotamia and Ancient Egypt.

• It showcased advanced knowledge in urban planning, metallurgy, and trade, with a structured and complex society.

• Discovery of Harappa:

• Harappa was first excavated in the 1920s by archaeologists such as John Marshall and Rai Bahadur Daya Ram Sahni.

• The excavation revealed the widespread nature of the Indus Valley Civilization, which spanned regions of present-day India, Pakistan, and Afghanistan.

• Urban Features of Harappa:

• Harappa's urban planning included grid-based streets, multi-room houses, granaries, and public baths.

• The city was divided into a citadel and a lower town, showcasing organized social structures.

Q21. Answer: (a) 0°

The correct answer is 0°.

Key Points

• Prime Meridian: The Prime Meridian is the longitudinal line designated at 0° longitude. It serves as the starting point for measuring longitude around the globe.

• It is also known as the Greenwich Meridian because it passes through the Royal Observatory in Greenwich, London.

• The Prime Meridian divides the Earth into two hemispheres: the Eastern Hemisphere and the Western Hemisphere. This makes it a significant reference point in geography.

• The longitudinal extent of the Prime Meridian is measured as 0°, and it is used as the basis for the Global Coordinate System.

• The Prime Meridian is universally accepted as the reference for calculating time zones, with Greenwich Mean Time (GMT) being based on this meridian.

• Other options mentioned in the question, such as 90° E, 180° E, and 23.5° N, refer to different coordinates on Earth. They do not represent the Prime Meridian, which is always 0° longitude. Hence, these options are incorrect.

• Hence, the correct answer is 0°.

Additional Information

• Prime Meridian History:

• The concept of the Prime Meridian was formalized during the International Meridian Conference in 1884 in Washington, D.C.

• It was decided that the meridian passing through the Royal Observatory in Greenwich, London, would be the global Prime Meridian.

• Importance of Prime Meridian:

• It serves as the reference line for measuring longitude, which ranges from 0° to 180° east and west.

• The Prime Meridian is crucial in defining time zones. The time at the Prime Meridian is referred to as Greenwich Mean Time (GMT).

• It helps in determining the International Date Line, which is located at 180° longitude.

• Significance of Greenwich:

• Greenwich was chosen as the location for the Prime Meridian due to its historical importance in navigation and astronomy.

• The Royal Observatory, established in 1675 by King Charles II of England, played a pivotal role in advancing maritime navigation.

Important Points

• Longitude and its Measurement:

• Longitude is measured in degrees east or west of the Prime Meridian, ranging from 0° at the Prime Meridian to 180°.

• Longitude lines are used in conjunction with latitude lines to define coordinates for any location on Earth.

• Other Meridians:

• 90° E: Refers to the longitude passing through eastern Asia, including parts of India and China.

• 180°: Refers to the International Date Line, which serves as the opposite side of the Prime Meridian.

• 23.5° N: Refers to the latitude of the Tropic of Cancer, not a longitude.

Q22. Answer: (a) Archery

The correct answer is Archery.

Key Points

• Deepika Kumari is a renowned Indian archer who has represented India in numerous international competitions, including the Olympics.

• She earned her 12th individual World Cup medal at the 2025 Shanghai World Cup, marking another milestone in her illustrious career.

• Deepika Kumari specializes in the recurve category of archery, which is the only discipline featured in the Olympics.

• The Shanghai World Cup is one of the prestigious events in the World Archery Federation calendar, drawing top-tier competitors

from across the globe.

• Her achievements at the World Cup have cemented her position as one of the top archers in the world and a source of pride for India.

• Archery requires precision, strength, and focus, which Deepika Kumari has demonstrated consistently throughout her career.

• Winning a medal at the Shanghai World Cup involves competing against the best archers globally, showcasing her ability to excel in high-pressure environments.

Additional Information

• About Deepika Kumari:

• Deepika Kumari was born on June 13, 1994, in Ranchi, Jharkhand, India.

• She began her journey in archery at a young age and gained recognition after winning the Cadet World Championship in 2009.

• She has been awarded the prestigious Arjuna Award in 2012 and the Padma Shri in 2016 for her contributions to Indian sports.

• Archery in India:

• Archery has gained popularity in India over the years, with several athletes excelling at the international level.

• The Archery Association of India is the governing body responsible for promoting and managing archery in the country.

• India has produced world-class archers like Atanu Das, Tarundeep Rai, and Deepika Kumari, who have brought laurels to the nation.

• About World Archery Federation:

• The World Archery Federation (WA), founded in 1931, governs international archery competitions.

• WA organizes events like the World Archery Championships, World Cup, and Olympic Archery.

• The World Cup series consists of various stages held in different countries, including the Shanghai World Cup.

Important Points

• Deepika Kumari's Achievements:

• Deepika Kumari has consistently ranked among the top archers globally and has won numerous medals across different competitions.

• She clinched the gold medal in the individual recurve event at the 2010 Commonwealth Games in Delhi.

• In 2021, she achieved the World No. 1 ranking in the recurve category.

• Archery Disciplines:

• The primary disciplines in archery are recurve, compound, and traditional archery.

• The recurve bow is used in the Olympics, whereas the compound bow is popular in non-Olympic archery tournaments.

• Prominent Competitions:

• The World Archery Championships is the most prestigious event organized by WA.

• The World Cup series includes multiple stages held across the globe, culminating in the World Cup Final.

Q23. Answer: (c) RK Narayan

The correct answer is RK Narayan.

Key Points

• RK Narayan is one of the most prominent Indian writers in English, widely known for his depiction of Indian life and society.

• He is the creator of the fictional town of Malgudi, which serves as the backdrop for many of his novels and short stories.

• Malgudi is a semi-urban town inspired by South Indian settings and reflects the everyday lives of its characters. Hence, RK Narayan is the correct answer.

• RK Narayan's works often highlight the simplicity, struggles, and humor of common people, making Malgudi relatable and memorable.

• His books, such as "Swami and Friends", "The Bachelor of Arts", and "The Guide", feature Malgudi as a central part of the narrative. Hence, RK Narayan's contribution to Indian English literature is remarkable.

• The fictional town of Malgudi is celebrated for its vivid descriptions, cultural authenticity, and universal appeal.

• Through Malgudi, RK Narayan introduced the world to a quintessentially Indian setting, making it a unique literary creation. Hence, RK Narayan is correctly credited for creating Malgudi.

Additional Information

• RK Narayan:

• RK Narayan was born in 1906 in Madras (now Chennai), India. He is one of the pioneers of Indian English literature.

• His writing style is characterized by simplicity and humor, and his works often explore themes such as human relationships, societal norms, and the transition of Indian society.

• Malgudi:

• Malgudi is a fictional town that captures the essence of small-town life in South India.

• It is not based on any specific real location but incorporates elements of Indian culture, traditions, and landscapes.

• Example: In "Swami and Friends", Malgudi provides the backdrop for the adventures and struggles of a young boy named Swami.

• Other Indian English Writers:

• Raja Rao: Known for works like "Kanthapura", which explores Indian village life and the freedom movement.

• Mulk Raj Anand: Famous for novels like "Untouchable" and "Coolie", focusing on social issues and marginalized communities.

• Khushwant Singh: Renowned for his wit and novels like "Train to Pakistan", which depict partition-era India.

Important Points

• Malgudi's Significance:

• Malgudi is symbolic of the Indian middle-class life and represents the cultural and social dynamics of the time.

• The town is a microcosm of India, blending tradition and modernity, making RK Narayan's works universally relatable.

• RK Narayan's Legacy:

• He was awarded the Padma Bhushan in 1964 and the Padma Vibhushan in 2000 for his contributions to literature.

• His works continue to be celebrated and adapted, such as the "Malgudi Days" TV series, which brought his stories to a wider audience.

Q24. Answer: (a) Geoscience for a Safe World

The correct answer is Geoscience for a Safe World.

Key Points

• Geological Survey of India (GSI): The Geological Survey of India, established in 1851, is one of the oldest scientific organizations in India. It operates under the Ministry of Mines and plays a pivotal role in geological and mineral exploration in the country.

• Pan-India Walkathon: In March 2025, the GSI organized a Pan-India Walkathon under the theme "Geoscience for a Safe World." This initiative aimed to raise awareness about the significance of geoscience in ensuring a safer and sustainable environment.

• The theme "Geoscience for a Safe World" highlights the importance of geological research in addressing challenges like natural disasters, climate change, and sustainable resource management. Hence, this is the correct answer.

• Objective of the Walkathon: The walkathon aimed to spread awareness among citizens regarding the applications of geoscience in disaster mitigation, environmental safety, and resource conservation.

• The event also sought to emphasize the role of geoscientific research in understanding the Earth's processes, which can help in creating a safer world for future generations. Hence, the theme aligns perfectly with the objectives of GSI.

Additional Information

• Role of Geoscience in Disaster Management:

• Geoscience plays a critical role in understanding natural disasters like earthquakes, landslides, tsunamis, and volcanic eruptions. By studying geological formations and tectonic activities, scientists can predict and mitigate these disasters.

• For instance, earthquake monitoring systems and landslide risk assessments are based on geoscientific research and data.

• Geoscience and Climate Change:

• Geoscience contributes to understanding climate change by studying past geological records, ice cores, and sediment samples.

• It helps scientists analyze the Earth's historical climate patterns and predict future changes, thus guiding policymakers in creating sustainable solutions.

• Sustainable Resource Management:

• Geoscientific studies are crucial for identifying and managing natural resources like minerals, groundwater, and fossil fuels. This ensures sustainable utilization of resources without harming the environment.

• For example, the GSI conducts surveys to locate mineral deposits and assess their environmental impact before extraction.

Important Points

• Significance of the Theme:

• The theme "Geoscience for a Safe World" underscores the importance of geological studies in creating a safer and sustainable environment for society.

• It encourages collaboration among scientists, policymakers, and citizens to address global challenges like climate change, disaster management, and resource conservation.

• Other Relevant Themes:

• Geoscience: Unlocking the Secrets of Climate Change: Focuses on the role of geoscience in analyzing climate patterns and developing climate change mitigation strategies.

• Geoscience Innovating for Earth and People: Highlights the innovative applications of geoscience in improving living conditions and solving environmental challenges.

• Geoscience Everywhere: Celebrates the omnipresence of geoscience in our daily lives, emphasizing its role in infrastructure development and environmental sustainability.

Q25. Answer: (d) It was launched at Goa Shipyard Limited on 22 March 2025

The correct answer is option 4.

Key Points

• Project 1135.6: This is a series of frigates constructed under an Indo-Russian collaboration, primarily meant for the Indian Navy. These ships are equipped with advanced weapon systems and sensors to ensure operational readiness.

• Tavasya: The second frigate under Project 1135.6 was named 'Tavasya'. It is part of India's effort to bolster naval capabilities and enhance maritime security.

• The frigate was launched at Goa Shipyard Limited (GSL) on 22 March 2025. GSL is one of the leading shipyards in India responsible for constructing modern naval vessels. Hence, option 4 is correct.

• The frigate has a displacement of approximately 4,500 tons, which makes it a significant addition to the fleet of medium-sized naval vessels. However, this fact pertains to option 1, which is not fully correct in this context.

• Option 2 states that it is the first frigate of the follow-on order, but this is incorrect as Tavasya is the second frigate under Project 1135.6.

• Option 3 mentions that the frigate was built in Russia and later transferred to India, which is not correct for Tavasya. It was built indigenously in India at GSL.

Additional Information

• Project 1135.6 Frigates:

• These frigates are advanced stealth-capable vessels equipped with cutting-edge weapons and sensor systems.

• They are designed to perform multi-role tasks, including anti-submarine warfare, anti-aircraft warfare, and surface warfare.

• Features: These frigates are equipped with systems like BrahMos missiles, advanced radar systems, and modern electronic warfare capabilities.

• Goa Shipyard Limited (GSL):

• GSL is a premier shipbuilding facility located in Goa, India. It specializes in constructing state-of-the-art naval vessels for the Indian Navy and other global customers.

• GSL has delivered multiple vessels under various government projects, contributing significantly to the indigenization of defense production.

• India's Naval Modernization:

• India is focusing on enhancing its maritime capabilities to address strategic challenges in the Indian Ocean region.

• Projects like 1135.6 align with India's vision of strengthening its naval power through collaboration and indigenous efforts.

Important Points

• Significance of Indigenous Shipbuilding:

• Indigenous shipbuilding reduces dependency on foreign nations and ensures self-reliance in defense production.

• It provides employment opportunities and strengthens the domestic industrial base.

• Strategic Importance of Frigates:

• Frigates play a crucial role in maintaining maritime security and projecting power in international waters.

• They are versatile vessels capable of performing a wide range of missions, including escort duties, patrolling, and combat operations.

Q26. Answer: (a) Sixty-first Amendment Act, 1988

The correct answer is Sixty-first Amendment Act, 1988.

Key Points

• The Sixty-first Amendment Act of 1988 reduced the voting age for elections to the Lok Sabha and State Legislative Assemblies from 21 years to 18 years.

• This amendment aimed to enhance political participation by empowering the youth of India to take part in the electoral process.

• The amendment modified Article 326 of the Constitution of India, which deals with elections to the House of the People and Legislative Assemblies of States based on adult suffrage. Hence, the statement is correct.

• The reduction in voting age was considered essential for increasing democratic participation and ensuring that more citizens, especially the younger population, can actively contribute to decision-making in governance.

• This move was seen as a step towards recognizing the importance of youth in shaping the future of the nation. Hence, the Sixty-first Amendment Act is the correct answer.

Additional Information

• Article 326 of the Constitution:

• Article 326 mandates that elections to the Lok Sabha and State Legislative Assemblies are based on adult suffrage.

• Prior to the Sixty-first Amendment Act, 1988, the minimum voting age was 21 years, which was reduced to 18 years through this amendment.

• Significance of the Sixty-first Amendment:

• The amendment was introduced to strengthen the democratic process by allowing the youth to participate in elections and express their opinions.

• It acknowledged the changing demographics of India, where the younger population was becoming a significant part of society.

• Example: Today, individuals aged 18 years or above are eligible to vote in elections to both the Lok Sabha and State Legislative Assemblies.

• Impact of Reduced Voting Age:

• The reduction in voting age has led to increased political awareness and participation among the youth.

• It has encouraged political parties to focus on youth-centric policies and issues, considering the substantial number of young voters.

• This change has contributed to a more inclusive and representative electoral process in India.

Important Points

• Key Legal Framework:

• The Sixty-first Amendment Act underscores the importance of ensuring that democratic rights are extended to a larger section of the population.

• This amendment aligns with the principles of democracy, which emphasize equal participation and representation for all eligible citizens.

• Global Context:

• Many countries, including the United States, the United Kingdom, and Australia, also have a minimum voting age of 18 years, highlighting the global recognition of youth as active participants in democracy.

Q27. Answer: (b) 1990

The correct answer is 1990.

Key Points

• Human Development Report: The Human Development Report (HDR) is an annual report published by the United Nations Development Programme (UNDP). Its purpose is to analyze and advocate policies that promote human development worldwide.

• The first Human Development Report was published in 1990. It was prepared under the guidance of economist Mahbub ul Haq, along with contributions from notable scholars such as Amartya Sen. Hence, 1990 is the correct answer.

• The report introduced the concept of Human Development Index (HDI), which measures development not only in economic terms but also in terms of factors such as health, education, and income levels. This was a revolutionary idea in development economics.

• The HDR emphasized that human development is about expanding the choices people have, focusing on their ability to lead a life of freedom, security, and dignity. This notion remains central to the HDR series. Hence, the statement is correct.

Additional Information

• Human Development Index (HDI):

• The HDI is a composite index introduced in the first HDR in 1990. It measures development based on three dimensions: life expectancy (health), education level (knowledge), and per capita income (standard of living).

• The HDI ranks countries annually to assess their progress in human development, offering a broader perspective than traditional economic indicators like GDP.

• Key Contributors:

• Mahbub ul Haq: A Pakistani economist who pioneered the concept of human development and was the chief architect of the HDR.

• Amartya Sen: An Indian economist whose work on capabilities and welfare economics significantly influenced the HDR's framework.

• Objectives of Human Development Reports:

• To promote development policies that prioritize human well-being, freedom, and dignity.

• To shift the focus of development discourse from economic growth alone to social and human factors.

• To provide actionable recommendations for governments, international organizations, and policymakers.

Important Points

• 1990 as a Milestone:

• The launch of the Human Development Report in 1990 marked a significant shift in global development discourse, emphasizing human-centric approaches over purely economic measurements.

• The report's introduction of the Human Development Index (HDI) has been widely adopted and remains a key metric for measuring development progress globally.

• Other Relevant Years:

• 1971: Incorrect. While there were global discussions on development during this time, the HDR was not introduced until 1990.

• 1980: Incorrect. The HDR was conceptualized later, during the late 1980s.

• 1995: Incorrect. While HDRs were published annually after 1990, the first report was not in 1995.

Q28. Answer: (b) Using the right-click context menu

The correct answer is Using the right-click context menu.

Key Points

• In Windows Operating System, creating a new folder can be done easily using the right-click context menu. This is one of the most efficient and widely used methods for creating folders.

• To create a new folder, users can follow these steps:

• Navigate to the location where you want the folder to be created (e.g., desktop or within a specific drive).

• Right-click on any blank space at the location.

• From the context menu that appears, hover over the option "New".

• Click on "Folder". A new folder will appear, and users can rename it as desired.

• This method is user-friendly and works across all versions of Windows OS. Hence, statement 2 is correct.

• Other options mentioned in the question are incorrect:

• Opening the Task Manager does not have any functionality related to creating a folder. It is primarily used for managing processes and system performance. Hence, statement 1 is incorrect.

• Changing the system date does not contribute to folder creation in any way. It simply alters the date and time of the computer. Hence, statement 3 is incorrect.

• Restarting the computer does not create folders. It is a process for rebooting the system and has no relevance to folder creation. Hence, statement 4 is incorrect.

• Hence, the correct answer is Using the right-click context menu.

Additional Information

• Uses of New Folders:

• Organization: Folders are used to organize files and data into manageable categories, making it easier to locate specific items.

• Storage: Folders allow users to group related files together, optimizing storage space within drives.

• Features of Windows Right-Click Context Menu:

• The context menu provides quick access to various actions such as creating new folders, copying, pasting, and renaming files or folders.

• It is accessible by right-clicking anywhere on the desktop or within a drive.

• Applications of Folders:

• Personal Use: Organizing personal data such as photos, videos, and documents.

• Professional Use: Managing work-related files like spreadsheets, presentations, and reports.

Important Points

• Additional Methods for Creating Folders:

• Users can create folders by using the keyboard shortcut Ctrl + Shift + N. This shortcut instantly creates a new folder in the current location.

• Folders can also be created via the File Explorer toolbar. Navigate to the "Home" tab and click on "New Folder."

• System Requirements:

• Operating System: The described method works on Windows XP, Windows 7, Windows 8, Windows 10, and Windows 11.

• File Management: Windows supports advanced file management features, including folder creation, renaming, and deletion.

Q29. Answer: (d) Paresh Maity

The correct answer is Paresh Maity.

Key Points

• Paresh Maity is an acclaimed Indian artist known for his mastery in watercolour art. He has created a plethora of artworks inspired by the rich culture and diversity of India.

• He made his debut at the prestigious Cannes Film Festival in 2025, showcasing a unique watercolour that represents the vibrant and diverse heritage of India.

• His work is often characterized by vivid colors, intricate detailing, and themes that highlight the essence of Indian traditions,

landscapes, and people. Hence, Paresh Maity is the correct answer.

• The debut artwork showcased by him at Cannes 2025 reflects India's cultural richness, diversity, and its harmonious blend of various traditions and practices.

• Paresh Maity's contribution to the art world has been widely recognized, and his participation in Cannes underscores the importance of Indian art on the global stage. Hence, he represents India's artistic talent internationally.

Additional Information

• About Paresh Maity:

• Born in 1965, Paresh Maity hails from West Bengal, India. He is renowned for his watercolour paintings, although he also works with oils, acrylics, and mixed media.

• He is celebrated for capturing the essence of Indian life, landscapes, and festivals in his works, often showcasing the vibrancy and diversity of Indian culture.

• Maity has received several accolades, including the Padma Shri award, one of the highest civilian awards in India, for his contribution to the field of art.

• Cannes Film Festival:

• The Cannes Film Festival, held annually in Cannes, France, is one of the most prestigious film festivals globally. It also serves as a platform to celebrate and exhibit artistic creations from various fields.

• The inclusion of Paresh Maity's artwork in Cannes 2025 highlights the growing importance of Indian art and culture on an international level.

• Other notable Indian artists:

• Jitish Kallat: Known for his contemporary art and installations reflecting Indian history and culture.

• Subodh Gupta: Famous for his sculptures and installations that often utilize everyday objects to represent Indian lifestyle.

• Anish Kapoor: Recognized globally for his abstract sculptures and innovative use of materials.

Important Points

• Indian artists in international platforms:

• Indian artists, including Paresh Maity, have gained recognition for their contributions to global art platforms such as Cannes, Venice Biennale, and Art Basel.

• This representation highlights the growing appreciation of Indian art that blends traditional and contemporary elements.

• Watercolour Art:

• Watercolour is a unique medium in painting that uses pigments mixed with water to create vibrant and translucent artwork.

• Paresh Maity is particularly skilled in this medium, using it to represent the subtle nuances of Indian landscapes, traditions, and emotions.

Q30. Answer: (d) Satyagraha Sabha

The correct answer is Satyagraha Sabha.

Key Points

• Satyagraha Sabha was founded by Mahatma Gandhi on 24 February 1919 to oppose the Rowlatt Act.

• The Rowlatt Act, enacted in 1919, allowed the colonial government to detain individuals suspected of sedition without a trial. It was perceived as a direct attack on the civil liberties of Indians.

• The Satyagraha Sabha was formed to organize protests and promote non-violent resistance (Satyagraha) against the unjust law. The Sabha served as a platform for spreading awareness and mobilizing the masses against the Rowlatt Act.

• Gandhi believed in the principle of Satyagraha, which emphasized non-violence and truth as a means to oppose injustice. The Sabha was one of the first concrete steps toward a nationwide movement against British colonial policies.

• The formation of the Sabha marked the beginning of a more organized and large-scale resistance by Indians against the oppressive colonial regime.

Additional Information

• Rowlatt Act:

• The Rowlatt Act, also known as the Anarchical and Revolutionary Crimes Act of 1919, was passed by the British Government to curb growing nationalist activities. It gave the government extensive powers to arrest and detain individuals without trial.

• The Act faced widespread opposition as it suppressed civil liberties such as freedom of expression and the right to legal representation. It led to significant unrest and protests across the country.

• Satyagraha Movement:

• Satyagraha is a concept of non-violent resistance developed by Mahatma Gandhi. It involves using truth and non-violence as tools to fight injustice and oppression.

• The Satyagraha Sabha was an organization created to implement and spread the principles of Satyagraha across India. It played a crucial role in mobilizing masses against British policies.

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• The movement also included boycotts, non-cooperation, and peaceful protests to challenge British authority.

• Other Organizations:

• Congress Committee: This refers to the Indian National Congress, the principal political organization that led India's independence movement. However, it was not specifically formed to oppose the Rowlatt Act.

• Swaraj Sabha: This organization was part of the broader nationalist movement but was not directly connected to the Rowlatt Act protests.

• Khilafat Committee: This was a separate movement initiated to protest against the British dismantling of the Ottoman Caliphate after World War I. It was not related to the Rowlatt Act.

Important Points

• Jallianwala Bagh Massacre:

• The protest against the Rowlatt Act culminated in the infamous Jallianwala Bagh Massacre on 13 April 1919, where British troops under General Dyer opened fire on unarmed civilians in Amritsar.

• This tragic event significantly intensified the Indian freedom struggle and led to greater participation in Gandhi's non-cooperation movement.

• Legacy of Satyagraha Sabha:

• The principles of non-violence and truth advocated by the Satyagraha Sabha became the cornerstone of India's freedom movement.

• It inspired future movements such as the Non-Cooperation Movement (1920), the Civil Disobedience Movement (1930), and the Quit India Movement (1942).

Q31. Answer: (d) To increase the solubility of carbon dioxide

The correct answer is To increase the solubility of carbon dioxide..

Key Points

• Soft drink and soda bottles are sealed under high pressure specifically to enhance the solubility of carbon dioxide (CO_2) in the liquid. Under high pressure, CO_2 dissolves more efficiently, creating the fizzy texture that is characteristic of carbonated beverages.

• At lower pressures, carbon dioxide escapes from the liquid, leading to a loss of the signature fizz and carbonation. Hence, sealing under high pressure ensures long-lasting carbonation. This statement is correct.

• The process of sealing bottles under high pressure is an application of Henry's Law, which states that the amount of gas dissolved in a liquid is directly proportional to the pressure of the gas above the liquid. Hence, this principle supports the practice in beverage industries.

• Soft drink companies use this technique to maintain the desired taste, as the dissolved CO_2 contributes to the tangy taste and fizzy sensation. Without sealing the bottles under pressure, the drink would lose its flavor and appeal. This is an important factor for customer satisfaction.

• Other options mentioned in the question, such as increasing temperature, preventing freezing, or decreasing the amount of sugar, are irrelevant to the carbonation process. Hence, these options are incorrect.

Additional Information

• Henry's Law:

• Henry's Law states that the amount of gas that dissolves in a liquid is proportional to the pressure of the gas in contact with the liquid. This is why soft drink manufacturers utilize high pressure to dissolve CO_2 effectively.

• When the bottle is opened, the pressure is released, and CO_2 escapes in the form of bubbles, creating the fizz that we enjoy.

• Applications of Carbonation:

• Carbonated beverages like soda, sparkling water, and soft drinks rely on this process to enhance taste and texture.

• The carbonation process also plays a role in beverages such as beer and champagne, where natural fermentation creates CO_2.

• Importance of Pressure:

• High-pressure sealing ensures long-term storage of carbonated drinks without losing their fizz.

• It also prevents microbial growth as CO_2 creates an acidic environment, extending the shelf life of the beverage.

Important Points

• Incorrect Options:

• Increasing the temperature does not contribute to carbonation. In fact, higher temperatures reduce CO_2 solubility.

• Preventing freezing is not relevant to soft drink bottling under pressure. Freezing is controlled through storage conditions.

• Decreasing the amount of sugar is unrelated to the carbonation process. Sugar content is determined by the recipe for taste.

• Global Practices:

• Beverage manufacturers worldwide use similar techniques to preserve the fizz in carbonated drinks, adhering to industry standards.

• The use of CO2 in beverages is regulated by food safety authorities like the FDA in the United States and FSSAI in India.

Q32. Answer: (b) 1600

The correct answer is 1600.

Key Points

• The British East India Company was founded on 31st December 1600 through a royal charter granted by Queen Elizabeth I.

• It was established as a joint-stock company to enable British merchants to trade in the East Indies, primarily in the regions of India and Southeast Asia.

• The company initially traded in spices, which were highly valued in Europe during that era. Over time, its focus shifted to other goods, including textiles, tea, and opium.

• By the early 17th century, the British East India Company had begun establishing trading posts and factories in India, marking the beginning of British commercial influence in the region.

• In the subsequent centuries, the company transitioned from being a commercial entity to a colonial power, eventually leading to the establishment of British rule in India.

• The founding of the company in 1600 laid the groundwork for later British dominance over India, which culminated in the establishment of the British Raj in 1858.

Additional Information

• Foundation of the British East India Company:

• The company was created to compete with other European powers, such as the Portuguese and the Dutch, who were already active in the Indian Ocean trade.

• The royal charter granted by Queen Elizabeth I provided the company exclusive rights to trade in the East Indies, ensuring no other English company could compete in the same markets.

• Role in Indian History:

• The company's arrival in India marked the beginning of European colonial influence in the subcontinent. It started with trade but eventually expanded to political and military control.

• The company established its first factory in Surat in 1613, followed by major trading posts in Madras (Chennai), Bombay (Mumbai), and Calcutta (Kolkata).

• By the 1750s, the company had its own army and began to take control of large territories in India, including Bengal, after the famous Battle of Plassey in 1757.

• Transition to British Rule:

• The British East India Company's administrative control over India ended with the Indian Rebellion of 1857, after which the British Crown took direct control of the Indian territories.

• The company was formally dissolved in 1874, but its legacy shaped the socio-economic and political landscape of modern India.

Important Points

• Option Analysis:

• Option 1: 1620 - Incorrect, as the British East India Company was already established and operating in India by this time. Its foundation date was earlier.

• Option 2: 1600 - Correct, as this is the year when the British East India Company was officially founded with a royal charter.

• Option 3: 1605 - Incorrect, as the company was already operational by this time and had started trading activities.

• Option 4: 1588 - Incorrect, as this date does not correlate with the company's foundation year.

• Historical Significance:

• The establishment of the British East India Company in 1600 marked the beginning of British involvement in Indian trade, which later transitioned to colonial rule.

• The company's influence on India includes both positive contributions, such as the development of infrastructure, and negative impacts, such as exploitation and economic drain.

Q33. Answer: (d) A fixed four-year tenure limit for tribunal members

The correct answer is A fixed four-year tenure limit for tribunal members.

Key Points

• The Supreme Court of India struck down provisions of the Tribunals (Rationalisation and Conditions of Service) Ordinance, 2021 that imposed a fixed four-year tenure limit for tribunal members.

• This decision was based on the principle that tribunal members must have sufficient tenure to ensure independence and a fair decision-making process. The fixed tenure of four years was seen as insufficient to maintain the integrity of the tribunal system.

• The Court emphasized that the independence of tribunals is a key element of the judicial process and reducing the tenure to four years undermines this independence. Hence, this provision was declared invalid.

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• Other provisions of the Ordinance, such as the requirement that tribunal members be retired judges or the establishment of administrative tribunals, were not invalidated as they were deemed constitutional. Hence, the correct answer focuses on the tenure limit.

• The Court held that maintaining an appropriate tenure for tribunal members is crucial for ensuring justice and accountability in decisions. This aligns with the broader principles of judicial independence and efficiency.

Additional Information

• Tribunals (Rationalisation and Conditions of Service) Ordinance, 2021:

• This Ordinance was introduced to streamline the working of tribunals in India. It aimed to reduce the number of tribunals and establish uniform service conditions for tribunal members.

• The fixed four-year tenure was introduced to create uniformity but was criticized for being too short to ensure independence and discourage undue influence.

• Role of Tribunals:

• Tribunals in India serve as quasi-judicial institutions dealing with specialized areas like taxation, service matters, and environmental disputes.

• Examples include the Income Tax Appellate Tribunal, National Green Tribunal, and Central Administrative Tribunal.

• Tribunals are meant to provide speedy justice and reduce the burden on regular courts.

• Judicial Review:

• The Supreme Court regularly reviews the functioning and provisions related to tribunals to ensure their compliance with the Constitution of India.

• Judicial independence and adequate tenure are considered essential for upholding the rule of law.

Important Points

• Supreme Court's Observations:

• The Court observed that reducing the tenure of tribunal members to four years would compromise their ability to make unbiased and independent decisions.

• Tribunal members need sufficient time to understand the complexities of their duties and contribute meaningfully to adjudication processes.

• Impact of the Decision:

• The striking down of the four-year tenure provision ensures that tribunals maintain their independence from external pressures.

• It reinforces the idea that judicial institutions, including tribunals, must operate in accordance with constitutional principles.

Q34. Answer: (c) To empower MSMEs with digital tools and knowledge

The correct answer is To empower MSMEs with digital tools and knowledge.

Key Points

• Dx-EDGE Initiative: The primary objective of the Dx-EDGE initiative launched in 2025 is to empower Micro, Small, and Medium Enterprises (MSMEs) by equipping them with advanced digital tools and providing necessary knowledge and resources to enhance their productivity and competitiveness. This is the correct answer.

• The initiative focuses on promoting digital transformation among MSMEs to help them compete effectively in the global and domestic markets.

• MSMEs form the backbone of the Indian economy, contributing significantly to GDP, employment generation, and exports. Hence, empowering them with digitalization is crucial.

• The program aims to foster innovation, improve operational efficiency, and enhance market access for MSMEs through the use of digital technologies.

• By leveraging digital tools, MSMEs can automate processes, reduce costs, and improve customer satisfaction, ensuring their sustainable growth.

• The initiative includes training programs, workshops, and collaborations with technology providers to facilitate digital adoption.

Additional Information

• About MSMEs:

• Micro, Small, and Medium Enterprises (MSMEs) are enterprises defined by their investment in equipment and annual turnover under the MSME Act, 2006.

• They contribute to approximately 30% of India’s GDP and nearly 50% of its exports.

• MSMEs play a significant role in employment generation, especially in rural and semi-urban areas.

• Importance of Digital Tools for MSMEs:

• Adopting digital technologies allows MSMEs to access broader markets, improve customer engagement, and reduce operational costs.

• Technologies like AI, Big Data, IoT, and cloud computing enable data-driven decision-making and innovation.

• Digital platforms and e-commerce help MSMEs expand globally and cater to diverse customer bases.

• Other Options Explained:

• Option 1: Providing financial subsidies to large corporations is incorrect as the Dx-EDGE initiative is focused on MSMEs, not large corporations.

• Option 2: Promoting foreign investments in India is not the primary goal of this program. While foreign investments are crucial for economic growth, Dx-EDGE specifically targets MSMEs for their digital transformation.

• Option 4: Regulating e-commerce businesses is not the objective of Dx-EDGE. Regulation typically involves policy formulation, not empowerment through digital tools.

Important Points

• Government Support for MSMEs:

• The government of India has launched several initiatives to support MSMEs, including the Atmanirbhar Bharat Abhiyan and Startup India.

• Financial schemes like PMEGP (Prime Minister's Employment Generation Program) and MUDRA Yojana provide funding to MSMEs.

• Challenges Faced by MSMEs:

• Lack of digital infrastructure and limited financial resources hinder MSMEs from adopting advanced technologies.

• Skill gaps and limited knowledge about digital tools also act as barriers.

Q35. Answer: (b) Return to Play Facility

The correct answer is Return to Play Facility.

Key Points

• Return to Play Facility: The Return to Play Facility inaugurated at the National Centre for Sports Science and Research (NCSSR) on 29 April 2025 aims to revolutionize the way athlete rehabilitation and performance tracking are conducted in India.

• This facility is equipped with cutting-edge technologies and advanced methodologies designed to aid athletes in recovering from injuries and enhancing their overall performance.

• The facility focuses on ensuring athletes can safely return to competitive sports after injuries by utilizing scientific principles and personalized recovery plans. Hence, the statement is correct.

• The primary goal of the facility is to reduce the risk of reinjury, optimize recovery, and provide athletes with tools for improving their physical and mental readiness for competition.

• Additionally, the facility includes performance tracking systems that monitor progress, analyze data, and provide feedback to athletes and coaches. Hence, the statement is correct.

Additional Information

• National Centre for Sports Science and Research (NCSSR):

• The NCSSR is a premier institution in India dedicated to sports science research and development. It aims to enhance the performance of Indian athletes using scientific and technological advancements.

• It serves as a hub for promoting evidence-based practices in sports, including rehabilitation, nutrition, coaching analytics, and talent scouting.

• Features of the Return to Play Facility:

• Equipped with advanced rehabilitation equipment, including motion analysis systems, strength and conditioning tools, and recovery technologies.

• Uses scientific techniques such as biomechanics, sports psychology, and physiotherapy to ensure athletes return to optimal performance levels.

• Examples: Athletes recovering from ACL injuries, hamstring tears, or shoulder dislocations can benefit from this facility's personalized rehabilitation programs.

• Significance of Performance Tracking:

• Performance tracking systems analyze an athlete's progress using metrics such as speed, agility, endurance, and strength.

• These insights help coaches and medical staff make informed decisions about training intensity and readiness for competition.

• For example, data on heart rate variability and oxygen consumption can be used to monitor an athlete's recovery and fitness levels.

Important Points

• Key Objectives:

• To minimize the risk of reinjury and ensure athletes can return to competitive sports safely and effectively.

• To use advanced technologies for personalized recovery plans tailored to each athlete's unique needs.

• Complementary Facilities at NCSSR:

• The Sports Nutrition Research Lab focuses on optimizing athletes' diets and hydration levels.

• The Elite Coaching Analytics Centre uses data analytics to improve coaching strategies and athlete performance.

• The National Talent Scouting Wing identifies and nurtures promising athletes from across the country.

Q36. Answer: (a) Individuals between the ages of 15 and 35 years

The correct answer is Individuals between the ages of 15 and 35 years.

Key Points

• Deen Dayal Upadhyay – Gramin Kaushalya Yojana (DDU-GKY) is a flagship program under the Ministry of Rural Development (MoRD), Government of India. It aims to provide skill training to rural youth to enhance their employability.

• The program is specifically designed for individuals aged between 15 and 35 years. This age group is considered ideal for acquiring skills and entering the workforce. Hence, the eligibility criteria mentioned in the correct option are accurate.

• Special provisions: For certain categories like Scheduled Castes (SC), Scheduled Tribes (ST), and Persons with Disabilities (PwDs), the upper age limit has been relaxed up to 45 years.

• The program targets youth from Below Poverty Line (BPL) households, households with National Rural Employment Guarantee Act (NREGA) job card holders, and other disadvantaged sections of society.

• The training program under DDU-GKY is designed to address the skill gap among rural youth and prepare them for industry-relevant job roles. It includes classroom training, practical sessions, and on-the-job training.

• The program ensures placement support after completion of the training, with a focus on wage employment in various sectors.

• Hence, the correct answer is Individuals between the ages of 15 and 35 years.

Additional Information

• Overview of DDU-GKY:

• DDU-GKY was launched on 25th September 2014, coinciding with the birth anniversary of Pandit Deen Dayal Upadhyay. It is part of the National Rural Livelihoods Mission (NRLM).

• The scheme aims to skill rural youth in various domains like healthcare, construction, retail, hospitality, and IT/ITES, helping them secure sustainable livelihoods.

• It emphasizes the inclusion of socially disadvantaged groups such as women, minorities, SC/ST, and PwDs, ensuring equitable access to opportunities.

• Eligibility Criteria:

• Age: The standard age limit for eligibility is 15 to 35 years. However, relaxations are provided for vulnerable groups, extending the upper age limit to 45 years.

• Socio-economic status: Priority is given to individuals from BPL families, households with NREGA job card holders, or families identified by the Social Economic Caste Census (SECC).

• Training Features:

• Duration: Training programs typically range from 3 to 12 months, depending on the skill sector.

• It includes practical training sessions, industry exposure, and soft skills development, along with digital literacy.

• Placement support is provided, with a focus on securing wage employment in sectors such as retail, manufacturing, healthcare, and IT.

Important Points

• Implementation:

• DDU-GKY works through a network of Project Implementing Agencies (PIAs). These agencies are responsible for training delivery, placement, and post-placement support.

• The program is monitored by state rural livelihood missions to ensure quality and transparency.

• Achievements:

• Since its inception, DDU-GKY has trained and placed thousands of rural youth, contributing to employment generation and rural development.

• It has partnered with various industries and organizations to ensure training aligns with market demands.

Q37. Answer: (b) PMGDISHA

The correct answer is PMGDISHA.

Key Points

• Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA): Launched by the Government of India under the Digital India programme, PMGDISHA aims to make six crore rural households digitally literate by covering one member from each household.

• It focuses on empowering rural citizens with basic digital literacy skills to operate computers, digital devices, and access various online services like banking, healthcare, and education. Hence, the statement is correct.

• This initiative is implemented by the Ministry of Electronics and Information Technology (MeitY). It is specifically targeted towards rural citizens, ensuring that they are equipped to participate in the evolving knowledge economy.

• PMGDISHA aims to bridge the digital divide in India, especially among rural communities, by providing training on using computers and accessing the internet. It also enables individuals to access government schemes and services online. Hence, this addresses digital literacy effectively.

Additional Information

• BharatNet:

• BharatNet is a flagship programme aimed at providing high-speed broadband connectivity to rural areas. It is not directly focused on digital literacy but rather on internet infrastructure development.

• Under BharatNet, optical fiber networks have been laid to connect Gram Panchayats across India, enabling access to internet services.

• Digital India:

• Digital India is a broader initiative launched in 2015 with the aim of transforming India into a digitally empowered society and knowledge economy.

• It encompasses various programmes, including PMGDISHA, to promote digital infrastructure, digital literacy, and e-governance.

• PM-WANI:

• PM-WANI (Prime Minister Wi-Fi Access Network Interface) is an initiative to provide affordable internet access to all citizens through public Wi-Fi hotspots.

• While PM-WANI increases access to the internet, it is not specifically designed to promote digital literacy among rural citizens.

Important Points

• Key Features of PMGDISHA:

• Target audience includes rural citizens, with a focus on marginalized communities such as Scheduled Castes (SC), Scheduled Tribes (ST), Below Poverty Line (BPL), and minorities.

• The programme is designed to teach individuals how to use smartphones, computers, and tablets, along with access to digital payments and e-governance services.

• Overall Impact:

• PMGDISHA plays a crucial role in enhancing digital inclusion, thereby improving the socio-economic status of rural citizens.

• The programme aims to foster a digitally empowered India, where every citizen can contribute to the knowledge economy.

Q38. Answer: (b) Right to freedom of religion

The correct answer is Right to freedom of religion.

Key Points

• Article 25 of the Indian Constitution guarantees the Right to Freedom of Religion to all citizens of India. This right is fundamental for ensuring religious liberty.

• It provides individuals the freedom to profess, practice, and propagate their religion, subject to public order, morality, and health.

• The Article ensures that the State does not interfere in religious practices unless necessary to maintain public order or safeguard other constitutional provisions. Hence, the statement is correct.

• Article 25 also protects the rights of religious groups to manage their own affairs in matters of religion.

• The provision ensures that religious practices are safeguarded but also allows the State to regulate or restrict practices that may conflict with social welfare or the rights of others. Hence, the statement is correct.

• Key Limitations: The freedom of religion under Article 25 is not absolute. It is subject to public order, morality, health, and other provisions of Part III of the Constitution.

• The State can also regulate non-religious aspects of religious practices that have economic, political, or social implications. Hence, the statement is correct.

• Hence, the correct answer is Right to freedom of religion.

Additional Information

• Article 25 of the Constitution of India:

• Article 25 is one of the most significant provisions for ensuring religious freedom in India. It provides individuals the right to freely practice their religion, subject to certain restrictions.

• The Article also protects the rights of religious groups and communities to manage their own affairs in matters related to religion.

• Other Articles Related to Religious Freedom:

• Article 26: Provides every religious denomination the right to manage its religious affairs.

• Article 27: Prohibits the use of taxpayer money for promoting or maintaining any particular religion.

• Article 28: States that no religious instruction shall be provided in educational institutions funded by the State.

• Key Features of Article 25:

• The freedom extends to individuals and groups of all religions.

• It ensures equal treatment of all religions and prohibits discrimination based on religion.

• Allows the State to regulate religious practices that may conflict with other constitutional principles, such as social welfare or public order.

Important Points

• Key Legal Considerations:

• Article 25 ensures religious freedom but imposes restrictions to maintain public order, morality, and health.

• The State can regulate or restrict practices that infringe upon the rights of others or conflict with social welfare.

• Notable Judicial Interpretations:

• Shirur Mutt Case (1954): The Supreme Court held that religious practices are protected under Article 25, but only those practices considered essential to the religion.

• Azan Case (2020): The court ruled that the use of loudspeakers for religious purposes is not an essential religious practice and can be regulated.

Q39. Answer: (d) Siraj-ud-Daula

The correct answer is Siraj-ud-Daula.

Key Points

• The Battle of Plassey was fought on 23 June 1757 between the British East India Company, led by Robert Clive, and the forces of the Nawab of Bengal, Siraj-ud-Daula.

• The battle marked a turning point in Indian history, as it laid the foundation for British colonial rule in India.

• Siraj-ud-Daula was the last independent Nawab of Bengal, and his defeat by the British resulted in Bengal becoming a foothold for British expansion. Hence, the correct answer is Siraj-ud-Daula.

• The battle was influenced by the betrayal of Siraj-ud-Daula's commander, Mir Jafar, who sided with the British in return for the promise of becoming the next Nawab.

• The British used their political and military strategies to defeat the Nawab's forces despite being outnumbered. This was a classic example of exploiting internal divisions among Indian rulers. Hence, the significance of the battle lies in its political consequences.

• The victory at Plassey gave the British East India Company control over Bengal's vast resources, which significantly contributed to their economic dominance in India.

• This battle also showcased the beginning of British imperialism in India, which eventually led to the establishment of British rule. Hence, the Battle of Plassey is a pivotal event in Indian history.

Additional Information

• Siraj-ud-Daula:

• Siraj-ud-Daula was the Nawab of Bengal from 1756 to 1757. He is remembered for his resistance against British expansion and his role in the Battle of Plassey.

• He opposed the British East India Company's misuse of trade privileges and their fortification of settlements in Bengal, leading to his confrontation with the British.

• Robert Clive:

• Robert Clive was a British military officer and administrator who played a key role in establishing British dominance in India.

• He used political alliances, bribery, and betrayal to secure victory in the Battle of Plassey.

• After Plassey, Clive became the de facto ruler of Bengal and laid the groundwork for British administration in India.

• Mir Jafar:

• Mir Jafar betrayed Siraj-ud-Daula and sided with the British during the battle. In return, he was made the Nawab of Bengal by the British.

• His betrayal is often cited as one of the reasons for Siraj-ud-Daula's defeat in the Battle of Plassey.

• Impact of the Battle:

• The British East India Company gained control over Bengal, enabling them to extract vast revenues and resources for their operations.

• It marked the beginning of British colonial domination in India, which lasted until 1947.

Important Points

• Significance of the Battle of Plassey:

• The battle effectively marked the beginning of British rule in India.

• It exposed the vulnerabilities of Indian rulers, particularly the lack of unity and internal betrayal.

• Economic Impact:

• The British East India Company gained access to Bengal's revenues, which helped them finance their expansion in India.

• The control of Bengal's resources allowed the British to strengthen their military and administrative presence in India.

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• Political Consequences:

• The battle established British dominance and paved the way for their subsequent conquests in India.

• It marked the decline of regional powers and the emergence of British imperialism in the Indian subcontinent.

Q40. Answer: (c) Volume

The correct answer is Volume.

Key Points

• Volume is a physical quantity that measures the three-dimensional space occupied by an object or substance.

• It is represented mathematically as the product of length, width, and height.

• The formula for calculating volume for a rectangular object is Volume = Length × Width × Height.

• In terms of dimensions, volume is expressed as L^3, where L represents length.

• It has zero dimensions in mass and time since its dimensions are only related to length and not to mass or time. Hence, the correct answer is Volume.

• Other quantities such as Force, Work, and Momentum involve mass and/or time in their dimensional formulas.

• For instance, force is expressed as MLT^-², work as ML^2T^{-2}, and momentum as MLT^-¹, indicating their dependency on mass and time. Hence, these options are incorrect.

Additional Information

• Explanation of Dimensions:

• Dimensions are used to express the dependence of a physical quantity on fundamental quantities such as mass (M), length (L), and time (T).

• For example, the dimensional formula of force is MLT^-², indicating its dependency on mass, length, and time.

• Characteristics of Volume:

• Volume is a scalar quantity, meaning it has only magnitude and no direction.

• It is measured in cubic units such as cubic meters (m^3), liters (L), or milliliters (mL).

• Volume is commonly used to measure liquids, gases, and solid objects in various fields such as engineering, medicine, and construction.

• Other Physical Quantities:

• Force: It is the interaction that causes an object to move or change its motion. Its SI unit is Newton (N).

• Work: Work is done when force is applied to an object, causing displacement. Its SI unit is joule (J).

• Momentum: It is the product of mass and velocity, representing the quantity of motion an object possesses. Its SI unit is kg·m/s.

Important Points

• Understanding Dimensional Analysis:

• Dimensional analysis is a mathematical tool used to check the correctness of physical equations and relationships.

• It is based on the principle that dimensions of all terms in a physical equation must be consistent.

• Applications:

• Volume measurement is essential in industries like chemical engineering, civil engineering, and medicine.

• It is used for calculating the capacity of containers, determining the amount of liquid or gas stored, and assessing storage requirements.

Q41. Answer: (d) 73.4%

Shortcut Trick

Equivalent discount for two successive discounts D1 and D2 can be calculated using the direct formula: D1 + D2 − (D1 × D2) ÷ 100

=> Equivalent Discount = 65 + 24 − (65 × 24) ÷ 100

=> Equivalent Discount = 89 − (1560 ÷ 100)

=> Equivalent Discount = 89 − 15.6 = 73.4%

Therefore The correct answer is 73.4%.

Alternate Method

Given:

First discount = 65%

Second discount = 24%

100

Marked Price

35

After 65% Off

26.6

Final Price

−65%

−24%

Total Discount: 73.4%

Calculations:

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

=> Price after the first 65% discount = 100 − (65% of 100) = 100 − 65 = 35 units.

=> The second discount of 24% is applied on the new price (35 units).

=> Amount of second discount = 24% of 35 = (24 ÷ 100) × 35 = 8.4 units.

=> Final Selling Price = 35 − 8.4 = 26.6 units.

=> Total Discount given = MP − Final Selling Price = 100 − 26.6 = 73.4 units.

=> Since the assumed Marked Price was 100, the equivalent percentage discount is 73.4%.

Therefore The correct answer is 73.4%.

Additional Information

Three Successive Discounts

To find the equivalent of three successive discounts D1, D2, and D3, first find the equivalent of D1 and D2, let's call it D'. Then apply the same formula on D' and D3.

Multiplying Factor Method

The final Selling Price (SP) can directly be evaluated using the formula: SP = MP × (1 − D1÷100) × (1 − D2÷100).

Buy X Get Y Free

This is a form of discount where the equivalent discount percentage is calculated as: (Free Items ÷ Total Items) × 100.

Q42. Answer: (c) 100 : 133

Shortcut Trick

Let the first number be A and the second number be B.

Given, 38% of A = ²/7 of B

=> ^(19)/50 × A = ²/7 × B

=> A : B = (2 × 50) : (7 × 19)

=> A : B = 100 : 133

Therefore The correct answer is 100 : 133.

Alternate Method

Given:

38% of the first number is equal to two-sevenths of the second number.

First Number (A)

38 parts

Total = 100 parts

Second Number (B)

38 parts

Total = 133 parts

=

38% of A

2/7 of B

Ratio A : B = 100 : 133

Calculations:

Let the first number be A and the second number be B.

=> 38% of A = ²/7 of B

=> (^(38)/100) × A = (²/7) × B

Simplifying the fraction on the left side,

=> (^(19)/50) × A = (²/7) × B

Cross-multiplying to find the ratio A : B,

=> ^A/_B = (²/7) × (^(50)/19)

=> ^A/_B = (2 × 50) / (7 × 19)

=> ^A/_B = 100 / 133

=> A : B = 100 : 133

Therefore The correct answer is 100 : 133.

Additional Information

Ratio & Proportion

A ratio compares two quantities by division, written as a:b. If a:b = c:d, the relationship is called a proportion, where a×d = b×c.

Percentage to Fraction Conversion

To convert any percentage to a fraction, replace the % sign by dividing the value by 100 and simplifying (e.g., 38% = 38/100 = 19/50).

Cross-Multiplication

When moving a fraction to the opposite side of an equation, you multiply by its reciprocal. Example: If (x/y) × A = B, then A = B × (y/x).

Q43. Answer: (c) 22% loss

Shortcut Trick

Given that the Selling Price (SP) of 50 books is equal to the Cost Price (CP) of 39 books.

Convert this into a ratio: SP / CP = 39 / 50.

Assuming CP is 50 units and SP is 39 units, there is a loss since CP > SP.

Loss = 50 − 39 = 11 units.

Loss % = (11 ÷ 50) × 100 = 22%.

Therefore The correct answer is 22% loss.

Alternate Method

Given:

SP of 50 books = CP of 39 books

Formula Used:

Loss = CP − SP

Loss % = (Loss ÷ CP) × 100

Cost Price (CP) = 50 units

Selling Price = 39 units

Loss = 11

Loss % = (11 ÷ 50) × 100 = 22%

Calculations:

=> 50 × SP = 39 × CP

=> SP / CP = 39 / 50

=> Let CP = 50 units and SP = 39 units.

=> Loss = 50 − 39 = 11 units.

=> Loss % = (11 ÷ 50) × 100

=> Loss % = 11 × 2 = 22%

Therefore The correct answer is 22% loss.

Additional Information

Profit and Loss Basics

Profit = SP − CP and Loss = CP − SP. Both percentages are always calculated on the Cost Price (CP) unless specifically stated otherwise.

Dishonest Dealer

If a dealer claims to sell goods at CP but uses false weight, Gain % = [Error ÷ (True Weight − Error)] × 100.

Successive Discount

If two successive discounts of a% and b% are given on an article, the equivalent single discount is given by the formula (a + b − ab ÷ 100)%.

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Q44. Answer: (a) 8

Shortcut Trick

The smallest odd natural numbers are 1, 3, 5, 7, 9.

Their respective squares are 1, 9, 25, 49, 81.

By observation, the sum of adjacent squares 9 and 25 is exactly 34 (9 + 25 = 34).

Thus, the two consecutive odd numbers are 3 and 5.

Required sum = 3 + 5 = 8.

Therefore The correct answer is 8.

Alternate Method

Given:

The sum of the squares of two consecutive odd natural numbers is 34.

Formula Used:

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

Calculations:

Let the two consecutive odd natural numbers be x and x + 2.

$\Rightarrow x^2 + (x + 2)^2 = 34$

$\Rightarrow x^2 + (x^2 + 4x + 4) = 34$

$\Rightarrow 2x^2 + 4x + 4 - 34 = 0$

$\Rightarrow 2x^2 + 4x - 30 = 0$

Dividing the entire equation by 2:

$\Rightarrow x^2 + 2x - 15 = 0$

Factorizing the quadratic equation:

$\Rightarrow x^2 + 5x - 3x - 15 = 0$

$\Rightarrow x(x + 5) - 3(x + 5) = 0$

$\Rightarrow (x - 3)(x + 5) = 0$

$\Rightarrow x = 3$ or $x = -5$

Since the given numbers are natural numbers, x must be positive. So, x = 3.

The second consecutive odd number is x + 2 = 3 + 2 = 5.

Sum of the numbers = 3 + 5 = 8.

Therefore The correct answer is 8.

Additional Information

Properties of Odd Numbers

The difference between any two consecutive odd numbers is always 2. The general form of an odd natural number is $2n - 1$, where n is a natural number.

Sum of First n Odd Numbers

The sum of the first n consecutive odd natural numbers is always equal to a perfect square, given by n^2.

Quadratic Roots Nature

For a quadratic equation $ax^2 + bx + c = 0$, the roots are real and distinct if the discriminant ($D = b^2 - 4ac$) is greater than 0.

Q45. Answer: (a) 7,600

Shortcut Trick

For equal simple interests over the same time period, principals are inversely proportional to the interest rates.

Ratio of investments P1 : P2 = R2 : R1 = 7 : 14 = 1 : 2.

Total ratio parts = 1 + 2 = 3 parts.

3 parts → Rs. 22,800 => 1 part → Rs. 7,600.

Sum invested at 14% is 1 part, which is Rs. 7,600.

Therefore The correct answer is Rs. 7,600.

Alternate Method

Given:

Total investment = Rs. 22,800

Rate for 1st part (R1) = 14% per annum

Rate for 2nd part (R2) = 7% per annum

Time (T) = 6 years

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Total: Rs. 22,800

P1 @ 14%

Time = 6 years

P2 @ 7%

Time = 6 years

SI1 = SI2

Calculations:

Let the sum invested at 14% be P1 and at 7% be P2.

=> SI1 = (P1 × 14 × 6) ÷ 100

=> SI2 = (P2 × 7 × 6) ÷ 100

Since the interests earned from both investments are equal:

=> (P1 × 14 × 6) ÷ 100 = (P2 × 7 × 6) ÷ 100

=> P1 × 84 = P2 × 42

=> P1 ÷ P2 = 42 ÷ 84 = 1 ÷ 2

=> The ratio of investments P1 : P2 = 1 : 2

=> Total ratio sum = 1 + 2 = 3 parts

=> 3 parts = Rs. 22,800

=> 1 part = 22,800 ÷ 3 = Rs. 7,600

=> Sum invested at 14% = P1 = 1 part = Rs. 7,600

Therefore The correct answer is Rs. 7,600.

Additional Information

Simple Interest (SI) Formula

SI = (P × R × T) ÷ 100, where P is the principal amount, R is the rate of interest per annum, and T is the time in years.

Equal Interest Case Shortcut

If a total sum is divided into multiple parts P1, P2, P3... such that the simple interest earned on them is equal, the ratio of their investments is P1 : P2 : P3... = (1 ÷ R1T1) : (1 ÷ R2T2) : (1 ÷ R3T3)...

Amount Formula

The total amount (A) after T years is the sum of Principal and Simple Interest. It is calculated as A = P + SI = P × [1 + (R × T) ÷ 100].

Q46. Answer: (d) Rs. 1,300

Shortcut Trick

Cost Price (CP) = 1600 × (65/100) × (95/100) = Rs. 988

Required Selling Price (SP) to gain 25% = 988 × (125/100) = Rs. 1235

New List Price (MP) after 5% discount = 1235 × (100/95) = Rs. 1300

Therefore The correct answer is Rs. 1,300.

Alternate Method

Given:

Original List Price = Rs. 1,600

Successive discounts from wholesaler = 35% and 5%

Desired profit for shopkeeper = 25%

Discount allowed on new list price = 5%

Old MP = Rs. 1600

-35% & -5%

Discounts

CP = Rs. 988

SP = Rs. 1235

MP = Rs. 1300

+25% Profit

-5% Discount

New List Price = Rs. 1300

Calculations:

=> Cost Price (CP) = Original List Price × (1 − 35/100) × (1 − 5/100)

=> CP = 1600 × 0.65 × 0.95 = Rs. 988

=> Selling Price (SP) for a 25% profit = CP × (1 + 25/100)

=> SP = 988 × 1.25 = Rs. 1235

=> The new Marked Price (MP) must allow a 5% discount to arrive at the SP.

=> SP = MP × (1 − 5/100)

=> 1235 = MP × 0.95

=> MP = 1235 ÷ 0.95 = Rs. 1300

Therefore The correct answer is Rs. 1,300.

Additional Information

Successive Discounts

When two discounts a% and b% are given successively, the equivalent single discount can be calculated directly using the formula: (a + b − ab/100)%.

Marked Price & Cost Price Relation

The direct ratio between Cost Price (CP) and Marked Price (MP) can be given by: CP / MP = (100 − Discount%) / (100 + Profit%).

Effective Multiplier Concept

For repeated percentage changes, the final value is found by multiplying the base value by scaling factors: Final Value = Initial Value × (1 ± x/100) × (1 ± y/100).

Q47. Answer: (c) 50000

Shortcut Trick

Let the total registered voters be V.

Winner gets 52% and loser gets 48% of valid votes, so the margin is 4% of valid votes.

Margin = V × Polled% × Valid% × Margin%

1653 = V × (87/100) × (95/100) × (4/100)

1653 = V × (87/100) × (19/20) × (1/25) => 1653 = V × (1653/50000) => V = 50000

Therefore The correct answer is 50000 voters.

Alternate Method

Registered (100%) = V

Polled (87%)

Valid (95% of Polled)

Winner (52%)

Loser (48%)

Margin = 4% = 1653 votes

Given:

Total voters cast their vote = 87%

Invalid votes = 5% of polled votes

Winner's vote share = 52% of valid votes

Winning margin = 1653 votes

Calculations:

=> Let the total registered voters be V.

=> Number of polled votes = 87% of V = (87/100) × V

=> Since 5% are invalid, valid votes = 95% of polled votes = (95/100) × (87/100) × V = (19/20) × (87/100) × V

=> Loser's vote share = 100% − 52% = 48% of valid votes

=> Winning margin = Winner's share − Loser's share = 52% − 48% = 4% of valid votes

=> 4% of valid votes = (4/100) × (19/20) × (87/100) × V = (1/25) × (19/20) × (87/100) × V

=> Margin is 1653 votes:

=> (1/25) × (19/20) × (87/100) × V = 1653

=> (1653 / 50000) × V = 1653

=> V = 1653 × (50000 / 1653)

=> V = 50000

Therefore The correct answer is 50000 voters.

Additional Information

Election Percentage Concept

In election problems, valid votes are always calculated from polled votes, and the winning margin is strictly the difference between the percentages of the candidates based on valid votes.

Successive Percentage

Reductions in an election (voters who did not vote, invalid votes) can be calculated successively as continuous fraction multiplications: Base × (100 − x)% × (100 − y)%.

Margin of Victory Formula

Margin of Victory = Votes of Winner − Votes of Loser. If the winner gets x% of the votes, the loser gets (100 − x)%, making the margin exactly (2x − 100)% of the total valid votes.

Q48. Answer: (a) 98.56 cm²

Shortcut Trick

For a sphere, Curved Surface Area (CSA) and Total Surface Area (TSA) are identical.

Direct formula: Area = $4\pi r^2$

=> Area = $4 \times (22 \div 7) \times (2.8)^2$

=> Area = $88 \times 1.12 = 98.56$ cm²

Therefore The correct answer is 98.56 cm².

Alternate Method

r = 2.8 cm

Sphere

Given:

Radius of the sphere (r) = 2.8 cm

Value of $\pi \approx 22 \div 7$

Formula Used:

Curved Surface Area of a sphere = $4\pi r^2$

Calculations:

=> Area = $4 \times (22 \div 7) \times 2.8 \times 2.8$

=> Area = $4 \times 22 \times 0.4 \times 2.8$

=> Area = 88×1.12

=> Area = 98.56 cm²

Therefore The correct answer is 98.56 cm².

Additional Information

Volume of a Sphere

The volume (V) of a sphere is given by $V = (4 \div 3)\pi r^3$, where r is the radius of the sphere.

Hemisphere

When a sphere is cut exactly into two equal halves, each identical half is known as a hemisphere.

Surface Areas of a Hemisphere

Unlike a sphere, a hemisphere has distinct surface areas: Curved Surface Area (CSA) = $2\pi r^2$ and Total Surface Area (TSA) = $3\pi r^2$.

Q49. Answer: (b) Rs. 47,200

Shortcut Trick

Since the time period is identical, Investment prop. to Profit.

Multiplying factor = Total Investment ÷ Total Profit = 62400 ÷ 15600 = 4.

Ritik's profit = Total profit − Sanjay's profit = 15600 − 1900 = 13700.

Difference in profit = Ritik's profit − Sanjay's profit = 13700 − 1900 = 11800.

Difference in investment = Difference in profit × 4 = 11800 × 4 = 47200.

Therefore The correct answer is Rs. 47,200.

Alternate Method

Given:

Total investment = Rs. 62,400

Total profit = Rs. 15,600

Sanjay's profit = Rs. 1,900

Formula Used:

When investment time is constant, Profit Ratio = Investment Ratio.

Total Profit = Rs. 15,600

Total Inv = Rs. 62,400 (×4)

Ritik's Profit = Rs. 13,700

Inv = 13700 × 4 = Rs. 54,800

Sanjay's Profit = Rs. 1,900

Inv = 1900 × 4 = Rs. 7,600

Difference in Investment

54800 − 7600 = Rs. 47,200

Calculations:

=> Ritik's profit = Total profit − Sanjay's profit

=> Ritik's profit = 15600 − 1900 = 13700

=> Ratio of profits (Ritik : Sanjay) = 13700 : 1900 = 137 : 19

=> Since time is identical, Investment Ratio = 137 : 19

=> Total ratio parts = 137 + 19 = 156

=> 156 units = 62400

=> 1 unit = 62400 ÷ 156 = 400

=> Difference in ratio parts = 137 − 19 = 118

=> Difference in investments = 118 × 400 = 47200

Therefore The correct answer is Rs. 47,200.

Additional Information

Profit Ratio Formula

The ratio in which the total profit is distributed among partners is equal to the ratio of the products of their respective investments and time periods. Formula: P1 : P2 = (C1 × T1) : (C2 × T2)

Equal Investment Period

If all partners invest for the exact same duration, their profit share is directly proportional to the amount they invested. (P1 : P2 = C1 : C2)

Active and Sleeping Partners

Active partners manage the business and receive a salary/percentage from the profit before the remainder is split. Sleeping partners only invest capital and get a share proportional to their investment and time.

Q50. Answer: (b) 1370

Shortcut Trick

Let the original number be considered as 100%.

When increased by 100%, the new value becomes 100% + 100% = 200%.

Given that 200% of the number = 2740.

100% of the number = 2740 ÷ 2 = 1370.

Therefore The correct answer is 1370.

Alternate Method

Given:

A number when increased by 100% gives 2740.

Formula Used:

New Value = Original Value × (1 + Percentage Increase ÷ 100)

Original Number

100% (Base)

• 100% Increase

• 100%

Total = 200%

200% → 2740

Calculations:

=> Let the required number be x.

=> New Value = x + (100 ÷ 100) × x

=> New Value = x + x

=> 2x = 2740

=> x = 2740 ÷ 2

=> x = 1370

Therefore The correct answer is 1370.

Additional Information

Percentage Change

Percentage change is calculated as (Final Value − Initial Value) ÷ Initial Value × 100.

Successive Percentage

If a number changes by a% and then by b%, the net percentage change is given by (a + b + a × b ÷ 100)%.

Base Change Comparison

If A is x% more than B, then B is [x ÷ (100 + x)] × 100% less than A.

Q51. Answer: (d) 52

Shortcut Trick

CP of 1 sharpener = 150 ÷ 12 = Rs. 12.5

Profit per sharpener = SP − CP = 19 − 12.5 = Rs. 6.5

Profit % = (6.5 ÷ 12.5) × 100 = (65 ÷ 125) × 100 = 52%

Therefore The correct answer is 52%.

Alternate Method

Given:

Cost price (CP) of 1 dozen (12 pieces) sharpeners = Rs. 150

Selling price (SP) of 1 sharpener = Rs. 19

Formula Used:

Profit = SP − CP

Profit % = (Profit ÷ CP) × 100

CP = Rs. 12.5

Profit = Rs. 6.5

• 52%

SP = Rs. 19

Profit % = (6.5 ÷ 12.5) × 100 = 52%

Calculations:

=> CP of 1 sharpener = 150 ÷ 12 = Rs. 12.5

=> Profit = 19 − 12.5 = Rs. 6.5

=> Profit % = (6.5 ÷ 12.5) × 100

=> Profit % = (65 ÷ 125) × 100

=> Profit % = 13 × (100 ÷ 25)

=> Profit % = 13 × 4 = 52%

Therefore The correct answer is 52%.

Additional Information

Profit & Loss Basics

Profit occurs when the Selling Price (SP) is greater than the Cost Price (CP). Profit = SP − CP. Profit percentage is always calculated on the CP: Profit % = (Profit ÷ CP) × 100.

Marked Price & Discount

Discount is offered on the Marked Price (MP). SP = MP − Discount. The discount percentage is calculated on MP: Discount % = (Discount ÷ MP) × 100.

Successive Discount

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When two discounts of a% and b% are given successively, the equivalent single discount is given by: (a + b − ab ÷ 100)%.

Q52. Answer: (b) 73°

Shortcut Trick

In right triangle BDC, the acute angles are complementary.

=> angle C = 90° − angle DBC = 90° − 65° = 25°.

In triangle AEC, angle AEB is the exterior angle at vertex E.

By the exterior angle theorem:

=> angle AEB = angle CAE + angle C = 48° + 25° = 73°.

Therefore The correct answer is 73°.

Alternate Method

Given:

=> BD perpendicular to AC at D, which makes triangle BDC a right-angled triangle (angle BDC = 90°).

=> angle DBC = 65° and angle CAE = 48°.

A

B

C

D

E

65°

48°

25°

73°

Calculations:

=> In triangle BDC, the sum of angles is 180°.

=> angle C = 180° − angle BDC − angle DBC

=> angle C = 180° − 90° − 65° = 25°

=> Now, consider triangle AEC formed by the points A, E, and C. Since E lies on the line segment BC, extending CE towards B forms the exterior angle angle AEB.

=> According to the exterior angle theorem, the measure of an exterior angle is equal to the sum of its two remote interior angles.

=> Therefore angle AEB = angle CAE + angle ACE

=> angle AEB = 48° + 25° = 73°

Therefore The correct answer is 73°.

Additional Information

Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the sum of the measures of its two remote interior angles. This helps solve many related geometry problems instantly.

Angle Sum Property of a Triangle

The sum of all interior angles of a triangle is always 180°. In a right-angled triangle, since one angle is 90°, the sum of the two remaining acute angles is exactly 90°.

Altitude of a Triangle

A perpendicular drawn from a vertex to the opposite side forms two right angles with that side, actively splitting the main triangle into smaller right-angled triangles.

Q53. Answer: (c) Rs. 73,125

Shortcut Trick

Compound interest for the 1^(st) year = 12% of Principal

Compound interest for the 2^(nd) year = 12% + (12% of 12%) = 13.44% of Principal

Given, CI for 2^(nd) year = Rs. 9,828 => 13.44% = 9828

Principal (100%) = (9828 ÷ 13.44) × 100 = Rs. 73,125

Therefore The correct answer is Rs. 73,125.

Alternate Method

Given:

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Interest for the 2^(nd) year = Rs. 9,828
Rate of Interest (R) = 12% per annum
Formula Used:
Amount after 1 year (A1) = P × (1 + R/100)
Interest for 2^(nd) year = A1 × R/100
Year 0
Year 1
Year 2
1st Yr CI = 12% of P
2nd Yr CI = 13.44% of P
= Rs. 9,828
P = ?
1.12 P
1.2544 P
Calculation:
=> Let the principal be P.
=> Amount at the end of 1^(st) year = P × (1 + 12/100) = 1.12P
=> Compound Interest for the 2^(nd) year = Amount at the end of 1^(st) year × Rate / 100
=> Interest for 2^(nd) year = 1.12P × (12/100) = 0.1344P
=> Given, Interest for 2^(nd) year = Rs. 9,828
=> 0.1344P = 9828
=> P = 9828 ÷ 0.1344
=> P = (9828 × 10000) ÷ 1344 = 73125
Therefore The correct answer is Rs. 73,125.
Additional Information
Compound Interest for a Specific Year
The CI for the n^(th) year can be calculated directly using the formula: CI_n = P × (R/100) × (1 + R/100)^(n−1).
Effective Rate of Compound Interest
For 2 years at R% per annum, the overall effective rate of CI = R + R + (R × R)/100 %.
Difference Between 2nd Year CI and 1st Year CI
The difference between the CI for the 2^(nd) year and the 1^(st) year is simply the interest earned on the 1^(st) year's interest: P × $(R/100)^2$.

Q54. Answer: (b) 75

Shortcut Trick
The mode is the value that appears most frequently in a given dataset.
Instead of counting all numbers, we can save time by checking the frequencies of the given options only.
Count from the data: 81 → 1 time, 70 → 1 time, 67 → 1 time.
Count from the data: 75 → 3 times.
Since 75 appears the maximum number of times among all options, it is the mode.
Therefore The correct answer is 75.
Alternate Method
Given:
Dataset: 67, 75, 81, 70, 65, 61, 65, 84, 75, 76, 85, 89, 62, 84, 72, 74, 89, 68, 83, 60, 82, 82, 66, 77, 75
Formula Used:
Mode = The observation that occurs with the highest frequency in a given dataset.
Calculations:
=> Let us systematically count the frequency of the repeated numbers in the dataset to find the mode.
=> The number 65 appears exactly 2 times.
=> The number 82 appears exactly 2 times.
=> The number 84 appears exactly 2 times.
=> The number 89 appears exactly 2 times.

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=> The number 75 appears exactly 3 times.

=> All the other remaining numbers appear only 1 time each.

=> The maximum frequency in the entire dataset is 3, which corresponds to the number 75.

Therefore The correct answer is 75.

Additional Information

Mean

The arithmetic average of a dataset. Formula: Mean = Sum of all observations ÷ Total number of observations.

Median

The middle value when the data is arranged in ascending or descending order. For an even number of observations (n), it is the average of the (n ÷ 2)^(th) and (n ÷ 2 + 1)^(th) terms.

Empirical Relationship

For a moderately skewed distribution, the relationship between mean, median, and mode is given by the formula: Mode = 3 × Median − 2 × Mean.

Bimodal Dataset

A dataset that contains two distinct values with the same highest frequency is called bimodal. In such distributions, there are two separate modes.

Q55. Answer: (d) 159

Shortcut Trick

The average of the first n even numbers is directly given by the formula (n + 1).

Here, the number of terms n = 158.

=> Average = 158 + 1

=> Average = 159

Therefore The correct answer is 159.

Alternate Method

Given:

Number of terms (n) = 158

The sequence of the first 158 even numbers forms an Arithmetic Progression (AP).

Formula Used:

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

2

1st Term

316

158th Term

159

Average = Middle Value

Avg = (2 + 316) ÷ 2

Calculations:

=> First even number (a) = 2

=> 158^(th) even number (l) = 158 × 2 = 316

=> Average = (2 + 316) ÷ 2

=> Average = 318 ÷ 2

=> Average = 159

Therefore The correct answer is 159.

Additional Information

Average of first n natural numbers

The sum of first n natural numbers is n(n + 1) ÷ 2. Therefore, their average is (n + 1) ÷ 2.

Average of first n odd numbers

The sum of first n odd numbers is n^2. Therefore, their average is n.

Average of first n even numbers

The sum of first n even numbers is n(n + 1). Therefore, their average is (n + 1).

Average of an Arithmetic Progression (AP)

For any consecutive sequence or series with a constant difference, Average = (First term + Last term) ÷ 2.

Q56. Answer: (b) 47^(-37)

Shortcut Trick

For operations on the same base, process exponents left to right based on BODMAS.

Apply rule: a^m ÷ a^n × a^p = a^(m − n + p)

=> 47^(−11 − 16 − 10)

=> 47^(−37)

Therefore The correct answer is 47^(−37).

Alternate Method

Given:

Expression: 47^(−11) ÷ 47^(16) × 47^(−10)

Formula Used:

According to the laws of exponents:

1. a^m ÷ a^n = a^(m − n)

2. a^m × a^n = a^(m + n)

Calculations:

Evaluate the division first, moving from left to right:

=> (47^(−11) ÷ 47^(16)) × 47^(−10)

=> 47^((−11 − 16)) × 47^(−10)

=> 47^(−27) × 47^(−10)

Now evaluate the multiplication:

=> 47^((−27 + (−10)))

=> 47^(−37)

Therefore The correct answer is 47^(−37).

Additional Information

Product Rule of Exponents

When multiplying terms with the same base, add their exponents: a^m × a^n = a^(m+n)

Quotient Rule of Exponents

When dividing terms with the same base, subtract the exponent of the divisor from the dividend: a^m ÷ a^n = a^(m−n)

Power of a Power Rule

When raising a power to another power, multiply the exponents: $(a^m)^n$ = a^(m × n)

Negative Exponent Rule

A negative exponent indicates the reciprocal of the base raised to the positive exponent: a^(−n) = 1 ÷ a^n

Q57. Answer: (c) -frac12

Shortcut Trick

Expand the brackets to cancel the squared and constant terms directly:

=> $8x^2 − 12 − 8x^2 − 36x + 12 = 18$

=> −36x = 18

=> x = −1/2

Therefore The correct answer is −1/2.

Alternate Method

Given:

$2(4x^2 − 6) − 4(2x^2 + 9x − 3) = 18$

Calculation:

=> Expand the expression using the distributive property:

=> $(2 × 4x^2) − (2 × 6) − (4 × 2x^2) − (4 × 9x) − (4 × −3) = 18$

=> $8x^2 − 12 − 8x^2 − 36x + 12 = 18$

=> Group the like terms together:

=> $(8x^2 − 8x^2) − 36x + (12 − 12) = 18$

=> 0 − 36x + 0 = 18

=> −36x = 18

=> x = 18 ÷ (−36)

=> x = −1/2

Therefore The correct answer is −1/2.

Additional Information

Simplification Rules (BODMAS)

Always solve operations inside Brackets first, followed by Orders (powers/roots), Division/Multiplication, and finally Addition/Subtraction.

Distributive Property

When a factor is multiplied by a sum or difference, it applies to each term inside the bracket: a(b + c) = ab + ac.

Linear Equations

An equation where the highest power of the variable is 1. It always has exactly one unique solution: ax + b = 0 => x = −b/a.

Q58. Answer: (a) 7.05

Shortcut Trick

Equate the powers by applying the rule (a^m)^n = a^(mn) directly:

=> z × (Power of x) = 3 × (Power of y)

=> z × 0.2 = 3 × 0.47

=> 0.2z = 1.41

=> z = 1.41 ÷ 0.2 = 7.05

Therefore The correct answer is 7.05.

Alternate Method

Given:

x = 54^(0.2)

y = 54^(0.47)

x^z = y^3

Formula Used:

(a^m)^n = a^(mn)

If a^m = a^n, then m = n (for a ≠ 1, 0).

Calculations:

=> x^z = y^3

Substitute the given values of x and y in the equation:

=> (54^(0.2))^z = $(54^{(0.47)})^3$

Using the power of a power rule, multiply the exponents:

=> 54^(0.2 × z) = 54^(0.47 × 3)

=> 54^(0.2z) = 54^(1.41)

Since the bases (54) are equal on both sides, their exponents must be equal:

=> 0.2z = 1.41

=> z = 1.41 ÷ 0.2

=> z = 14.1 ÷ 2

=> z = 7.05

Therefore The correct answer is 7.05.

Additional Information

Product Rule of Exponents

When multiplying two numbers with the same base, add their exponents: a^m × a^n = a^(m+n)

Quotient Rule of Exponents

When dividing two identical bases, subtract their exponents: a^m ÷ a^n = a^(m−n)

Power of a Power Rule

To raise a power to a power, multiply the exponents: (a^m)^n = a^(mn)

Negative Exponent Rule

A negative exponent denotes the reciprocal of the base raised to a positive power: a^(−n) = 1 ÷ a^n

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Q59. Answer: (c) 11:33 AM

Shortcut Trick

Time taken by A = 9 hours and B = 6 hours. Let Total Distance = LCM(9, 6) = 18 units.

Speed of A = 18 ÷ 9 = 2 units/hr, Speed of B = 18 ÷ 6 = 3 units/hr.

Train A starts 2 hours earlier (6:45 AM to 8:45 AM), covering 2 × 2 = 4 units.

Remaining distance = 18 − 4 = 14 units, Relative speed = 2 + 3 = 5 units/hr.

Time to meet = 14 ÷ 5 = 2.8 hours = 2 hours 48 minutes after 8:45 AM.

Therefore The correct answer is 11:33 AM.

Alternate Method

Given:

Departure of A = 6:45 AM, Arrival of A = 3:45 PM => Time taken = 9 hours

Departure of B = 8:45 AM, Arrival of B = 2:45 PM => Time taken = 6 hours

Let the total distance between M and N be D km.

Formula Used:

Speed = Distance ÷ Time

Time to meet = Distance Gap ÷ Relative Speed

Station MStation NTrain A6:45 AMTrain B8:45 AMA at 8:45 AM2D/9 covered7D/9 remainingTotal Distance = D

Calculations:

=> Speed of Train A = D ÷ 9 km/hr

=> Speed of Train B = D ÷ 6 km/hr

=> Train A starts 2 hours earlier. Distance covered by A from 6:45 AM to 8:45 AM = 2 × (D ÷ 9) = 2D/9

=> Remaining distance gap at 8:45 AM = D − 2D/9 = 7D/9

=> Relative Speed (moving towards each other) = (D ÷ 9) + (D ÷ 6) = (2D + 3D) ÷ 18 = 5D/18

=> Time to meet = Remaining Distance ÷ Relative Speed

=> Time to meet = (7D/9) ÷ (5D/18) = (7/9) × (18/5) = 14/5 hours

=> 14/5 hours = 2 hours + (4/5 × 60) minutes = 2 hours 48 minutes

=> Meeting time = 8:45 AM + 2 hours 48 minutes = 11:33 AM

Therefore The correct answer is 11:33 AM.

Additional Information

Relative Speed in Opposite Directions

When two bodies move towards each other, their relative speed is the sum of their individual speeds (S1 + S2).

Relative Speed in Same Direction

When two bodies move in the same direction, their relative speed is the difference of their individual speeds |S1 − S2|.

Time of Meeting

The exact time to cross or meet is always calculated by dividing the initial distance gap between the two objects by their effective relative speed.

Q60. Answer: (c) Rs. 642

Shortcut Trick

Ratio of investments = 32 : 40 : 68

Total investment parts = 32 + 40 + 68 = 140

Difference between parts of Y and Z = 68 − 40 = 28

Required Difference = (28 ÷ 140) × 3210

Required Difference = (1 ÷ 5) × 3210 = 642

Therefore The correct answer is Rs. 642.

Alternate Method

Given:

Investment ratio of X, Y and Z = 32 : 40 : 68

Total profit at the end of the year = Rs. 3,210

Formula Used:

Profit Ratio = Ratio of Investments (when time period is constant)

Share of partner = (Partner's ratio part ÷ Total ratio parts) × Total Profit

X

8 parts

Y

10 parts

Z

17 parts

Diff = 7 parts

Calculations:

=> Simplified investment ratio = 32 : 40 : 68 = 8 : 10 : 17

=> Let the profits of X, Y and Z be 8k, 10k and 17k respectively.

=> Total profit = 8k + 10k + 17k = 35k

=> Difference between the shares of Y and Z = 17k − 10k = 7k

=> Since 35k = 3210

=> 7k = (7 ÷ 35) × 3210

=> 7k = (1 ÷ 5) × 3210

=> 7k = 642

Therefore The correct answer is Rs. 642.

Additional Information

Simple Partnership

When the capital of all partners is invested for the same time period, the total profit or loss is distributed purely in the ratio of their invested capital.

Compound Partnership

When the capital is invested for different time durations, the profit ratio is calculated as the product of capital and time. Profit Ratio = C1T1 : C2T2 : C3T3.

Working vs Sleeping Partner

A working partner manages the business operations and receives a fixed salary or a certain percentage of the total profit. A sleeping partner only invests capital. The remaining profit is then distributed among all partners based on their effective investment ratios.

Q61. Answer: (a) 999808

Shortcut Trick

The difference between each divisor and its remainder is consistently 2 (3 − 1 = 2, 5 − 3 = 2, 9 − 7 = 2).

This means that (Required Number + 2) must be perfectly divisible by all the divisors (3, 5, 7, and 9).

Using the divisibility rule of 9, let us check which option + 2 gives a sum of digits divisible by 9:

Option 1: 999808 + 2 = 999810 → Sum of digits = 27 (Divisible by 9)

Option 2: 999998 + 2 = 1000000 → Sum of digits = 1 (Not divisible by 9)

Since only Option 1 satisfies this condition, we can immediately identify the correct answer.

Therefore The correct answer is 999808.

Alternate Method

Given:

Divisors = 3, 5, 7, and 9

Remainders = 1, 3, 5, and 7

Formula Used:

Required Number = (Largest 6-digit multiple of LCM) − k

Where k is the common difference between the divisors and their respective remainders.

Calculations:

=> Common difference (k) = 3 − 1 = 5 − 3 = 7 − 5 = 9 − 7 = 2

=> LCM of 3, 5, 7, and 9 = 315

=> Largest 6-digit number = 999999

=> Divide 999999 by 315: 999999 ÷ 315 = 3174 with a remainder of 189

=> Largest 6-digit multiple of 315 = 999999 − 189 = 999810

=> Required Number = 999810 − k

=> Required Number = 999810 − 2 = 999808

Therefore The correct answer is 999808.

Additional Information

LCM Method for Common Remainders

If a number divided by x, y, and z leaves remainders a, b, and c respectively such that (x − a) = (y − b) = (z − c) = k, the general form of the number is: N = LCM(x, y, z) × p − k.

Divisibility Rule of 9

A number is completely divisible by 9 if the sum of its individual digits is a multiple of 9. This rule is highly efficient for eliminating incorrect options in remainder and LCM problems.

Finding the Largest n-digit Multiple

To find the largest n-digit number perfectly divisible by a given divisor D, completely divide the maximum n-digit number (e.g., 999, 9999, 999999) by D and subtract the obtained remainder from it.

Q62. Answer: (c) 5.88 km

Shortcut Trick

Convert time directly to hours and multiply by speed.

Distance = Speed × Time

Distance = 72 × (4.9 / 60)

Distance = 1.2 × 4.9 = 5.88 km

Therefore The correct answer is 5.88 km.

Alternate Method

Distance = ?Speed = 72 km/hrTime = 4.9 minStartEnd

Given:

Speed of the car = 72 km/hr

Time taken to cross the bridge = 4.9 minutes

Formula Used:

Distance = Speed × Time

Calculation:

=> Speed in m/s = 72 × (5 / 18) = 20 m/s

=> Time taken in seconds = 4.9 × 60 = 294 seconds

=> Distance = 20 × 294 = 5880 meters

=> Distance in km = 5880 / 1000 = 5.88 km

Therefore The correct answer is 5.88 km.

Additional Information

Unit Conversion for Speed

To convert km/hr to m/s, multiply the speed value by 5/18. To convert m/s to km/hr, multiply the speed value by 18/5.

Relative Speed

When two objects move in the same direction, their relative speed is the difference of their individual speeds (S1 − S2). When moving in opposite directions, it is the sum of their individual speeds (S1 + S2).

Average Speed

If two equal distances are covered at speeds S1 and S2 respectively, the overall average speed for the entire journey is given by (2 × S1 × S2) ÷ (S1 + S2).

Q63. Answer: (d) 37

Shortcut Trick

The given number is 966181.

Since the unit digit of the number is 1, it is an odd number.

An odd number can never be perfectly divided by an even number (such as 36 and 38) or a number ending in zero (such as 30).

By eliminating options 36, 38, and 30, the only possible divisor is 37.

Therefore The correct answer is 37.

Alternate Method

Given:

The number is 966181.

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Method Used:

Check divisibility by observing basic properties and performing division.

Calculations:

=> Let us test each given option for divisibility.

=> Option 1 (36): Since 36 is an even number, its multiples must also be even. 966181 is an odd number, so it is not divisible by 36.

=> Option 2 (38): Similarly, 38 is an even number. Thus, 966181 is not divisible by 38.

=> Option 3 (30): A number divisible by 30 must have 0 as its unit digit. Since 966181 ends in 1, it is not divisible by 30.

=> Option 4 (37): Let us divide 966181 by 37.

=> 966181 ÷ 37 = 26113

=> Since it divides perfectly leaving a remainder of 0, 966181 is exactly divisible by 37.

Therefore The correct answer is 37.

Additional Information

Divisibility by Even Numbers

No odd number can ever be exactly divided by an even number because an even number always contains 2 as a prime factor, which is inherently absent in all odd numbers.

Divisibility by 10 and its Multiples

Any integer that is perfectly divisible by 10 or its multiples (like 20, 30, 40) must inherently have its unit digit as 0.

Special Divisibility by 37

Any 3-digit number formed by repeating the same digit three times sequentially (e.g., 111, 222, 555) is always exactly divisible by 3 and 37.

Q64. Answer: (a) 1

Shortcut Trick

For trigonometric expressions of this form, the result is independent of the angle θ.

Substitute a standard angle, let θ = 45°.

=> (cosec 45° − sin 45°)(tan 45° + cot 45°)(sec 45° − cos 45°)

=> (√2 − 1/√2) × (1 + 1) × (√2 − 1/√2)

=> (1/√2) × 2 × (1/√2) = 2/2 = 1

Therefore The correct answer is 1.

Alternate Method

Given:

(cosec 23° − sin 23°)(tan 23° + cot 23°)(sec 23° − cos 23°)

Formula Used:

cosec θ = 1 / sin θ, sec θ = 1 / cos θ

tan θ = sin θ / cos θ, cot θ = cos θ / sin θ

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

Calculations:

Let θ = 23°.

=> (1 / sin θ − sin θ) × (sin θ / cos θ + cos θ / sin θ) × (1 / cos θ − cos θ)

=> $[(1 - \sin^2\theta) / \sin\theta] \times [(\sin^2\theta + \cos^2\theta) / (\sin\theta \times \cos\theta)] \times [(1 - \cos^2\theta) / \cos\theta]$

=> $[\cos^2\theta / \sin\theta] \times [1 / (\sin\theta \times \cos\theta)] \times [\sin^2\theta / \cos\theta]$

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

=> $(\sin^2\theta \times \cos^2\theta) / (\sin^2\theta \times \cos^2\theta)$

=> 1

Therefore The correct answer is 1.

Additional Information

Pythagorean Identities

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

Reciprocal Identities

sin θ = 1 / cosec θ, cos θ = 1 / sec θ, tan θ = 1 / cot θ.

Quotient Identities

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tan θ = sin θ / cos θ, cot θ = cos θ / sin θ.

Q65. Answer: (d) 21

Shortcut Trick

For any two numbers, the product of the numbers equals the product of their H.C.F. and L.C.M.

Other Number = (H.C.F. × L.C.M.) ÷ First Number

Other Number = (3 × 672) ÷ 96

Other Number = 2016 ÷ 96 = 21

Therefore The correct answer is 21.

Alternate Method

Given:

H.C.F. of the two numbers = 3

L.C.M. of the two numbers = 672

First number = 96

Formula Used:

Product of two numbers = H.C.F. × L.C.M.

Calculation:

=> Let the second number be x.

=> 96 × x = 3 × 672

=> 96 × x = 2016

=> x = 2016 ÷ 96

=> x = 21

Therefore The correct answer is 21.

Additional Information

Product Rule for HCF and LCM

For any two positive integers a and b, the product of their HCF and LCM is strictly equal to the product of the numbers themselves: HCF(a, b) × LCM(a, b) = a × b. This rule does not apply to three or more numbers.

Co-prime Numbers

Two numbers are said to be co-prime if their HCF is 1. For any two co-prime numbers, their LCM is directly equal to their product.

HCF and LCM of Fractions

HCF of fractions = (HCF of numerators) ÷ (LCM of denominators)

LCM of fractions = (LCM of numerators) ÷ (HCF of denominators)

Q66. Answer: (d) 29/209

Shortcut Trick

Total work = 11 × 19 = 209 units.

Combined efficiency = 19 + 11 = 30 units/day.

Work done in 6 days = 30 × 6 = 180 units.

Work left = 209 − 180 = 29 units.

Therefore The correct answer is 29/209.

Alternate Method

Given:

Time taken by A to complete the work = 11 days

Time taken by B to complete the work = 19 days

They work together for 6 days.

Person	Days	Total Work	Efficiency
A	11	209	19
B	19	11	

Calculations:

=> Total efficiency of A and B = 19 + 11 = 30 units/day

=> Work completed by A and B in 6 days = 30 × 6 = 180 units

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=> Remaining work = 209 − 180 = 29 units

=> Fraction of work left = Remaining Work ÷ Total Work

=> Fraction of work left = 29 / 209

Therefore The correct answer is 29/209.

Additional Information

Work and Wages

Wages are distributed in proportion to the work done by individuals. If they work for the same number of days, wages are shared in the ratio of their efficiencies.

Alternate Day Work

When individuals work on alternate days, calculate the work done in a complete cycle (e.g., 2 days for 2 people) and multiply by the maximum possible cycles to reach near the total work.

Pipes and Cisterns

It is similar to Time and Work. Inflow pipes have positive efficiency, and outflow (leakage) pipes have negative efficiency. Net efficiency is their algebraic sum.

Q67. Answer: (c) 85

Shortcut Trick

Let present ages be P and Q.

From 1st condition: 4P − Q = 19 => Q = 4P − 19

From 2nd condition (after 7 years): 2(Q + 7) = 7(P + 7) − 47

=> 2Q + 14 = 7P + 2 => 7P − 2Q = 12

Substituting Q: 7P − 2(4P − 19) = 12 => −P = −26 => P = 26

Therefore The correct answer is 85 years.

Alternate Method

Given:

Four times the present age of P exceeds the present age of Q by 19 years.

After 7 years, twice the age of Q will be 47 years less than seven times the age of P at that time.

Present Ages

P and Q

4P − Q = 19

+7 Years

Future Ages

P+7 and Q+7

7(P+7) − 2(Q+7) = 47

Solve for Q → Q = 85

Calculations:

Let the present age of P = P years

Let the present age of Q = Q years

According to the first condition:

=> 4P − Q = 19

=> Q = 4P − 19 ---- (Equation 1)

According to the second condition (after 7 years):

Age of P = P + 7

Age of Q = Q + 7

=> 2 × (Q + 7) = 7 × (P + 7) − 47

=> 2Q + 14 = 7P + 49 − 47

=> 2Q + 14 = 7P + 2

=> 7P − 2Q = 12 ---- (Equation 2)

Substitute the value of Q from Equation 1 into Equation 2:

=> 7P − 2 × (4P − 19) = 12

=> 7P − 8P + 38 = 12

=> −P = 12 − 38

=> −P = −26

=> P = 26 years

Now, find the present age of Q by putting P = 26 in Equation 1:

=> Q = 4 × 26 − 19

=> Q = 104 − 19

=> Q = 85 years

Therefore The correct answer is 85 years.

Additional Information

Present Age Assumption

Always assume the current ages as variables (e.g., x and y) to prevent confusion. Ages 'n' years ago will be (x − n) and 'm' years hence will be (x + m).

Linear Equations in Two Variables

A system of two linear equations like a1x + b1y + c1 = 0 and a2x + b2y + c2 = 0 can be easily solved using either the substitution method or the elimination method.

Age Differences Remain Constant

The difference between the ages of two individuals is always the same at any point in time, whether it is evaluated in the past, present, or future.

Q68. Answer: (b) 205

Shortcut Trick

Weight = Volume × Density = [(4/3) × π × (R^3 − r^3)] × d

Weight = (4/3) × (22/7) × (2^3 − 1^3) × 7

Weight = (4/3) × (22/7) × 7 × 7 = 88/3 × 7 = 616/3 g

Weight ≈ 205.33 g

Therefore The correct answer is 205 g.

Alternate Method

Given:

Density of metal = 7 g/cm^3

External radius (R) = 2 cm

Internal radius (r) = 1 cm

Formula Used:

Volume of a hollow sphere = (4/3) × π × (R^3 − r^3)

Mass (Weight) = Volume × Density

R = 2 cm

r = 1 cm

Hollow Spherical Shell Cross-Section

Calculations:

=> Volume = (4/3) × (22/7) × (2^3 − 1^3)

=> Volume = (4/3) × (22/7) × (8 − 1)

=> Volume = (4/3) × (22/7) × 7 = 88/3 cm^3

=> Weight = Volume × Density

=> Weight = (88/3) × 7 = 616/3 g

=> Weight = 205.33 g

=> Rounding off to the nearest gram gives 205 g.

Therefore The correct answer is 205 g.

Additional Information

Volume of a Solid Sphere

The volume of a completely solid sphere is given by V = (4/3) × π × r^3, where r is its constant outer radius.

Surface Area of a Hollow Sphere

The total surface area includes both the outer and inner surfaces, logically calculated as TSA = 4 × π × (R^2 + r^2).

Mass and Volume Relationship

Density serves as the uniform ratio that connects the geometrical size of an object to its physical weight using Mass = Volume ×

Density.

Q69. Answer: (c) frac553

Shortcut Trick

Let Total Work = LCM of (22, 11, 10) = 110 units.

Efficiency of Isha = 110 ÷ 22 = 5 units/day.

Efficiency of Ashlesha = (110 ÷ 10) − (110 ÷ 11) = 11 − 10 = 1 unit/day.

Combined efficiency of Isha and Ashlesha = 5 + 1 = 6 units/day.

Time taken = Total Work ÷ Combined Efficiency = 110 ÷ 6 = 55/3 days.

Therefore The correct answer is 55/3 days.

Alternate Method

Given:

Time taken by Isha = 22 days

Time taken by Isha + Smriti = 11 days

Time taken by Isha + Smriti + Ashlesha = 10 days

Formula Used:

Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
Isha	22	110	5
Isha + Smriti	11	10	
Isha + Smriti + Ashlesha	10	11	

Calculations:

=> Total work is the LCM of 22, 11, and 10, which is 110 units.

=> Efficiency of Isha = 110 ÷ 22 = 5 units/day.

=> Efficiency of Ashlesha = Efficiency of (Isha + Smriti + Ashlesha) − Efficiency of (Isha + Smriti)

=> Efficiency of Ashlesha = 11 − 10 = 1 unit/day.

=> Combined efficiency of Isha and Ashlesha = 5 + 1 = 6 units/day.

=> Time taken by Isha and Ashlesha = Total Work ÷ Combined Efficiency

=> Time taken = 110 ÷ 6 = 55/3 days.

Therefore The correct answer is 55/3 days.

Additional Information

Pipes & Cisterns

Works exactly like Time & Work, but filling pipes have positive efficiency and emptying pipes have negative efficiency.

Work & Wages

Wages are distributed in direct proportion to the amount of total work done by each individual. If they work for the same number of days, wages are shared in the ratio of their efficiencies.

Alternate Day Work

When individuals work on alternate days, calculate the work done in a complete cycle of days, then determine the remaining work and assign it to the correct person in sequence.

Q70. Answer: (d) 7/10

Shortcut Trick

Observe the given expression: 3/4 + (1 / (1 + 3/7)) − 3/4

The first term (+3/4) and the last term (−3/4) cancel each other out directly.

We are left with only the middle term: 1 / (1 + 3/7)

Simplify the denominator: 1 + 3/7 = (7 + 3) / 7 = 10/7

Taking the reciprocal: 1 / (10/7) = 7/10

Therefore The correct answer is 7/10.

Alternate Method

Given:

Expression: 3/4 + 1 / (1 + 3/7) − 3/4

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Method Used:

BODMAS Rule: Brackets, Orders, Division, Multiplication, Addition, and Subtraction.

Calculations:

=> First, solve the lowest denominator part inside the large fraction.

=> 1 + 3/7 = 7/7 + 3/7

=> 1 + 3/7 = 10/7

=> Now, substitute this back into the fraction:

=> 1 / (10/7) = 7/10

=> Substitute this result into the original expression:

=> 3/4 + 7/10 − 3/4

=> Rearrange the expression to group the similar fractions together:

=> (3/4 − 3/4) + 7/10

=> 0 + 7/10 = 7/10

Therefore The correct answer is 7/10.

Additional Information

BODMAS Rule

It dictates the order of operations in any mathematical expression: Brackets, Orders (Powers/Roots), Division & Multiplication (left to right), and finally Addition & Subtraction (left to right).

Reciprocal of a Fraction

The reciprocal of any fraction a/b is inverted to b/a. Therefore, 1 ÷ (a/b) = b/a.

Addition of Mixed Fractions

To add a whole number to a proper fraction, you multiply the whole number by the denominator and add the numerator: x + (y/z) = (x × z + y) / z.

Q71. Answer: (a) Only conclusion (I) follows

The least possible Venn diagram is:

Conclusions:

(I) Some flats are mansions.- True (All mansions are flats. Some flats are mansion and some mansion are flats are true.)

(II) All buildings are mansions - False (All mansions are flats.All flats are buildings.may be it possible but not definite hence, it is false)

Only conclusion (I) follows.

Hence, the correct answer is "Option 1"

Q72. Answer: (c) YVZ 35

The pattern followed here is:

Hence, the correct answer is "Option 3"

Q73. Answer: (c) 9966670

The logic follows here,

Each difference is 10 times the previous one.

Hence, the correct answer is "Option 3"

Q74. Answer: (b) HFYM

The logic is as follows-

Hence, the correct answer is "Option 2"

Q75. Answer: (d) 51

Given: 80 × 16 − 2 ÷ 12 + 4 = ?

'+' and '÷' are interchanged and '−' and '×' are interchanged.

80 − 16 × 2 + 12 ÷ 4 = ?

80 − 16 × 2 + 3 = ?

80 + 3 − 32 = ?

83 - 32 = 51.

Hence, the correct answer is "Option 4".

Q76. Answer: (d) 9

Given number 7312648

Arranged in the ascending order : 1 2 3 4 6 7 8

(Left) 1 2 3 4 6 7 8 (Right)

Sum of the digits that are second from the left and second from the right in the new number thus formed = 2 + 7 = 9.

Hence, the correct answer is "Option 4"

Q77. Answer: (a) Neither conclusion (I) nor (II) follows

The least possible diagram for the given statements is as follows

Conclusions (I): No sparrow is a pigeon. - False (As their is no direct relation between sparrow and pigeon so, no sparrow is a pigeon" may be possible but not definite.)

Conclusions (II): Some pigeons are crows.- False (No crow is a pigeon so, Some pigeons are crows" is false)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 1"

Q78. Answer: (b) North-east

Given:

• Town Q is to the south of Town R.

• Town S is to the east of Town R.

• Town T is to the north of Town S.

• Town U is to the east of Town T.

• Town V is to the north-east of Town U

The Final Diagram,

Hence, the correct answer is "Option 2"

Q79. Answer: (c) Four

Given:Seven people A, B, C, D, E, F and G are sitting in a row, facing the north.

• Only three people sit to the left of D.

• B sits third to the left of D.

• F sits to the right of A but left of D.

• E sits to the right of C but left of G

The Final Arrangement,

Hence, the correct answer is "Option 3"

Q80. Answer: (c) 810

The logic follows here,

Hence, the correct answer is "Option 3"

Q81. Answer: (c) 3

Given: (Left) € 5 & % 2 7 5 & % 7 8 @ 9 5 $ & # $ @ 2 9 © (Right)

Required Conditions: Number - Symbol - Symbol.

(Left) € 5 & % 2 7 5 & % 7 8 @ 9 5 $ & # $ @ 2 9 © (Right)

Hence, the correct answer is "Option 3"

Q82. Answer: (d) UQQ : WUT

The logic followed here is,

Similarly,

Hence, the correct answer is "Option 4"

Q83. Answer: (b) 13

Given:

Total people = 46

• All are facing north (so left → right is left end → right end)

• Lalita sits 17th from the left end.

• 15 people sit to the right of Damini.
• If 15 people are to the right of Damini,
• then Damini's position from the right end is: 15+1=16^(th)
• Since there are 46 people in total, her position from the left end is: 46−16+1=31^(st)
So, Damini is 31st from the left end.
• Lalita = 17^(th) from the left
• Damini = 31st from the left
• Number of people between them =
Hence, the correct answer is "Option 2"

Q84. Answer: (d) (3, 222, 15)

Logic: (Third number) ²- first number = second number.
Similarly,
Hence, the correct answer is "Option 4"

Q85. Answer: (a) 5 km west

• Shruti starts from point A and runs 2 km west.
• She then takes a left turn and runs 1 km.
• She takes a left turn again and runs 7 km.
• She then takes a final left turn and runs 1 km to reach a point B
The Final Diagram,
Hence, the correct answer is "Option 1"

Q86. Answer: (b) EAIV

The logic followed here is:
Hence, the correct answer is "Option 2"

Q87. Answer: (c) KQP 3

Hence, the correct answer is "Option 3"

Q88. Answer: (c) LPJ

The logic followed here is:
Hence, the correct answer is "Option 3"

Q89. Answer: (d) 9

Given number 36719542
1 is subtracted from each even digit of the number 36719542,
Sum of the digits that are repeated more than once in the new number formed
= 5 + 3 +1
= 9.
Hence, the correct answer is "Option 4"

Q90. Answer: (b) IOK

The pattern followed here is:
Hence, the correct answer is "Option 2"

Q91. Answer: (d) 1

Given number 6274385
1 is added to each even digit and 2 is subtracted from each odd digit in the number
Hence, the correct answer is "Option 4"

Q92. Answer: (c) 7

• 'LACE' is coded as '5689'
• 'LEAK' is coded as '5786'
LACE' is coded as '5689'

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‘LEAK’ is coded as ‘5786’

• The code for K is 7.

• Hence, the correct answer is "Option 3"

Q93. Answer: (a) 49

Given:

• Nima is 17th from the left end.

• Dina is 27th from the left end.

• Dina is exactly between Nima and Uma.

• Uma is 13th from the right end.

• Dina’s position=Nima’s position + Uma’s position / 2

Substitute: 27=217+x

Solve for xxxxxxx

54=17+x

x=37

So, Uma is 37th from the left end.

• If the total number of people is N,

Unknown node type: spanUnknown node type: spanUnknown node type: spanUnknown node type: span

[Math Processing Error]

Position from left + Position from right - 1 = NPosition from left + Position from right − 1 = N

Substitute: 37+13−1=N

N=49

Hence, the correct answer is "Option 1"

Q94. Answer: (c) Two

Given Series: (Left) 9 @ # 8 £ 4 & $ 7 2 * 5 Ω % 6 1 % & 3 (Right)

Required Conditions: Number - Symbol - Another Number.

(Left) 9 @ # 8 £ 4 & $ 7 2 * 5 Ω % 6 1 % & 3 (Right)

Hence, the correct answer is "Option 3"

Q95. Answer: (b) 4

Given: ‘DUAL’ is coded as ‘4629’ and ‘ARCS’ is coded as ‘1435’

‘DUAL’ - ‘4629’

‘ARCS’ - ‘1435’

The Code for A is 4.

Hence, the correct answer is "Option 2"

Q96. Answer: (a) XRY

The logic follows here,

Hence, the correct answer is "Option 1"

Q97. Answer: (b) 17^(th)

• Total number of people = 42

• All facing north (so “left” and “right” directions are as usual).

• Soma is 17th from the right end.

• Amit sits 9th to the left of Soma.

• We need to find Amit’s position from the left end.

• Position from left = Total people - Position from right + 1Position from left = Total people − Position from right+1

= 42 - 17 + 1 = 26=42−17+1=26

• Amit’s position from left=26−9=17.

• Hence, the correct answer is "Option 2"

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Q98. Answer: (a) Three

Seven people, I, J, K, L, M, N and O, are sitting in a row, facing north.

• Only three people sit to the left of M.

• Only I sits to the right of O.

• Only three people sit between O and N.

• J sits at some place to the left of K but at some place to the right of L

The Final Diagram,

Hence, the correct answer is "Option 1"

Q99. Answer: (b) Wife's brother

Using the following notations, we can draw the Family Tree:

The Final Diagram,

A is brother of H and H is wife of M.

Hence, the correct answer is "Option 2."

Q100. Answer: (c) 93

The logic follows here,

Hence, the correct answer is "Option 3"

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