RRB NTPC (UG) CBT-I Official Paper (Held On 20 Jun, 2026 Shift 3) (Previous Year Paper)

RRB NTPC • 2026 • 100 questions • 90 minutes • Answer key and solutions

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MATHEMATICS

Q1. Suppose the ratio of income to expenditure is 8 : 5. If income rises by 40% and expenditure falls by 10%, and the initial expenditure is Rs. 10,000, what is the amount (in Rs.) of saving after these changes?

(a) 13,400
(b) 13,200
(c) 13,500
(d) 13,300

Q2. A man sells a watch at a loss of 10%. Had he increased the selling price by Rs. 120, the transaction would have resulted in a gain of 5%. Determine the selling price of the watch.

(a) Rs. 840
(b) Rs. 760
(c) Rs. 720
(d) Rs. 800

Q3. What is the smallest natural number ‘x’ that needs to be subtracted from 13 and 25 so that the fourth proportional of the resulting numbers is 49?

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

Q4. If a and b are two coprime numbers such that a + b = 41, then what is the maximum possible value of a × b?

(a) 420
(b) 540
(c) 210
(d) 360

Q5. An article is sold at a profit of 32%. If the cost price is increased by Rs. 20 and the selling price is reduced by Rs. 42, then the profit would be 27.5%. What is the original cost price (in Rs.) of the article?

(a) 1,700
(b) 1,200
(c) 1,500
(d) 1,800

Q6. The following data represents the weekly wages (in Rs.) of the employees

Find the arithmetic mean of the weekly wages (in Rs.).

Weekly wages (in Rs.)	900	1000	1100	1200	1300	1400	1500

Number of employees	12	12	14	13	14	11	14

(a) Rs. 1186.25
(b) Rs. 1226.85
(c) Rs. 1056.35
(d) Rs. 1204.44

Q7. If 6^x - 6^(x-1) = 180, then the value of (2x-1)/(2x+3) is:
(a) 5/6
(b) 5/14
(c) 5/12
(d) 5/9

Q8. A sum becomes Rs. 9,075 after 2 years at 10% per annum compound interest, compounded annually. What was the principal amount (in Rs.)?
(a) 8,000
(b) 7,650
(c) 7,500
(d) 7,800

Q9. A cyclist travels from point A to B and then returns from B to A along the same route. On the onward journey, he covers two-fifths of the distance at 15 km/hr and the remaining distance at 20 km/hr. On the return journey, he covers one-fourth of the distance at 16 km/hr and the remaining distance at 24 km/hr. Find the average for the entire trip. (Round off your answer to two decimal places.)
(a) 19.32 km/hr
(b) 20.56 km/hr
(c) 17.54 km/hr
(d) 23.34 km/hr

Q10. ABCD is a quadrilateral in which AB||DC, and E and F are the mid points of the diagonals AC and BD, respectively. If AB = 14 cm, BC = 64 cm, DC = 72 cm, and AD = 47 cm, then what is the length (in cm) of EF?
(a) 31
(b) 29
(c) 27
(d) 28

Q11. A person walks 40 km at a speed of 5 km/hr, then runs 30 km at a speed of 10 km/hr. What is the ratio of walking time to running time?
(a) 3 : 8
(b) 8 : 3
(c) 5 : 3
(d) 3 : 5

Q12. S's expenditure is double the difference between his savings and expenditure. What percentage of his salary is his expenditure?
(a) 46%
(b) 42%
(c) 40%
(d) 44%

Q13. Simplify: 0.375+3/8-0.125
(a) 0.875
(b) 0.625
(c) 0.5
(d) 0.75

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Q14. The 7-digit number 12A916B is divisible by 24. What is the maximum value of (A + B)?

(a) 16
(b) 17
(c) 12
(d) 13

Q15. Three bags A, B, and C contain only red and blue marbles.

In Bag A, the ratio of red to blue marbles is 2 : 3.

In Bag B, the ratio of red to blue marbles is 4 : 1.

In Bag C, the ratio of red to blue marbles is 3 : 2.

Which bag has the highest proportion of red marbles?

(a) Bag B
(b) Bag A
(c) All bags have the same proportion.
(d) Bag C

Q16. The simple interest on Rs. 55,000 at 5.5% per annum simple rate of interest is Rs. _____ in 5.5 years.

(a) 17,712.5
(b) 15,525.5
(c) 16,637.5
(d) 14,452.5

Q17. Two taps can fill a cistern in 4 hours and 20 hours, respectively. A third tap can empty it in 20 hours. How long (in hours) will it take to fill one-fourth of the empty cistern if all the taps are opened together?

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

Q18. The largest four-digit number which when divided by 6, 10 and 14 leaves remainder 3 in each case is:

(a) 9889
(b) 9873
(c) 9932
(d) 9716

Q19. From the top of a building 20 m high, the angles of depression of the top and the bottom of a tower standing on the same horizontal ground are observed to be 30° and 60°, respectively. The height (in meter) of the tower is:

(Round off your answer to two decimal places.)

(a) 12.33 m
(b) 13.67 m
(c) 13.33 m
(d) 12.67 m

Q20. If the median of the data x/5, x, x/3, 2x/3, x/4, 2x/5 and 3x/4, where x > 0 is 8.4, then find the value of x.

(a) 21
(b) 12
(c) 16
(d) 24

Q21. Simplify: 30 + [{-9 × (26 - 11 + 3)}]

(a) -133
(b) -135
(c) -134
(d) -132

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Q22. Three positive numbers are in the ratio 3:5:7. If the sum of their squares is 2075, then the middle number is:

(a) 15
(b) 20
(c) 30
(d) 25

Q23. Eight years ago, the age of Mr Gupta was four times that of his nephew, Rohit. After 6 years, Mr Gupta's age will be twice that of Rohit. Find the present age of Mr Gupta.

(a) 38 years
(b) 36 years
(c) 40 years
(d) 42 years

Q24. A customer is given two options for purchasing a product priced at Rs. 8,000:

Option 1: A single discount of 30%.

Option 2: Successive discounts of 20% and 15%.

Which option provides a greater discount, and by how much?

(a) Option 1 and by Rs. 150
(b) Option 1 and by Rs. 160
(c) Option 2 and by Rs. 150
(d) Option 2 and by Rs. 160

Q25. Saumya has Rs. 24,800 in denominations of Rs. 500 and Rs. 100 notes. The number of Rs. 500 notes is 4 more than the number of Rs. 100 notes. Find the number of Rs. 100 notes.

(a) 38
(b) 40
(c) 36
(d) 42

Q26. The area of a regular polygon with a side of 11 cm is 247.5 cm^2. If the perpendicular distance from the centre to the side of the polygon is 9 cm, what is the number of sides of the polygon?

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

Q27. A trader fixes the marked price of an article at Rs. 10,630. He sells it to customers for Rs. 9248.10 after giving certain discount. Find the discount percentage.

(a) 9%
(b) 14%
(c) 13%
(d) 12%

Q28. A solid cylinder of radius R and height H, is melted and recast into three identical cylinders, each having the same height as the original cylinder but half the radius of the original cylinder. What fraction of the original cylinder's volume remains unused?

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

Q29. The sum of two positive numbers is 88 and their product is 1927. The positive difference between them is:

(a) 17
(b) 21
(c) 6

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(d) 26

Q30. Pipe A can fill a cistern in 10 hours, pipe B in 15 hours, and pipe C can empty it in 30 hours. All three pipes are opened together. After 6 hours, pipe A is closed, but B and C continue working. How much total time will it take to completely fill the cistern?

(a) 15 hours
(b) 10 hours
(c) 12 hours
(d) 20 hours

GENERAL AWARENESS

Q31. What was the primary theme of ClimateNXT 2025, the Indian summit held on World Environment Day (June 5, 2025)?

(a) Clean air / urban pollution
(b) Renewable energy transition
(c) Beat Plastic Pollution
(d) Water conservation

Q32. When was the Rangarajan Committee constituted to review the Methodology for Measurement of Poverty in India?

(a) 2008
(b) 2010
(c) 2014
(d) 2012

Q33. In a Word document form, when you press the Tab key after filling a name field, to which element does the focus shift?

(a) Moves cursor to subsequent input field or table cell
(b) Saves document and closes the form view
(c) Prints the form with current entries
(d) Deletes all entered form data instantly

Q34. Which of the following landforms develops when a river cuts through a ridge, forming a narrow and steep-sided passage?

(a) Dune
(b) Plain
(c) Moraines
(d) Gorge

Q35. As per Indian Constitution the Election Commission of India is a _____.

(a) Non-Constitutional body
(b) Constitutional body
(c) Statutory body
(d) Quasi-judicial body only

Q36. The Human Development Index (HDI) rankings are based on a score between _____.

(a) 0 to 1
(b) 1 to 10
(c) 1 to 2
(d) 0 to 5

Q37. Which of the following was a major reason for the arrival of Europeans in India?

(a) To promote European art and culture
(b) To spread industrialization
(c) To establish democratic governance

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(d) To find a direct sea route for the spice trade

Q38. Which trophy is presented to the national football team that wins the UEFA European Championship?

(a) FIFA World Cup Trophy
(b) Copa America Trophy
(c) Henri Delaunay Trophy
(d) Confederations Cup Trophy

Q39. The balance of payments crisis that India faced in 1991 occurred mainly due to:

(a) Rapid growth in service exports
(b) Large fiscal and current account deficits
(c) Excess industrial production
(d) Sudden surge in foreign remittances

Q40. During the 2025 event, SAMANVAY-2025, how many licensing agreements for technology transfer were handed over to industry partners by DRDO?

(a) 8
(b) 5
(c) 12
(d) 20

Q41. By what percentage did the union government ask the states to cut down cooking oil use in mid-day meals in government and aided schools in March 2025?

(a) 20%
(b) 15%
(c) 25%
(d) 10%

Q42. Which of the following densities measures the pressure of population on net cultivated area in India?

(a) Physiological density
(b) Agricultural density
(c) Nutritional density
(d) Economic density

Q43. In December 2025, which state government announced that the Veerangana Durgavati Tiger Reserve will be developed as a cheetah habitat before the onset of the next monsoon?

(a) Nagaland
(b) Bihar
(c) Uttar Pradesh
(d) Madhya Pradesh

Q44. Which of the following provisions of the Constitution of India specifies the power of Parliament to amend the Constitution?

(a) Article 356
(b) Article 368
(c) Article 352
(d) Article 370

Q45. Which type of mixture is formed when Ethyl alcohol is dissolved in water?

(a) Heterogeneous
(b) New element
(c) Compounds
(d) Homogeneous

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Q46. According to the Constitution of India, freedom of the press is implicitly protected as part of which specific Article guaranteeing freedom of speech and expression?

(a) Article 21
(b) Article 19(1)(a)
(c) Article 22
(d) Article 32

Q47. The development of high-level programming languages such as FORTRAN and COBOL changed computer use in which significant way?

(a) It eliminated the need for compilers.
(b) It allowed programs to be written in more human-readable forms, making complex software easier to develop.
(c) It forced all programmers to use binary numbers only.
(d) It made computers work only for scientific calculations.

Q48. Which of the following organisations releases the National Multidimensional Poverty Index (MPI) in India?

(a) Bureau of Indian Standards
(b) Union Public Service Commission
(c) Reserve Bank of India
(d) NITI Aayog

Q49. The Vidhan Sabha is also known as the:

(a) State Parliament
(b) Legislative Assembly
(c) Council of Ministers
(d) Legislative Council

Q50. Which of the following statements about Lok Adalat is correct?

(a) Lok Adalat follows a lengthy and complex procedure similar to regular courts.
(b) Lok Adalat mainly resolves disputes through arbitration.
(c) Lok Adalat has the power to enforce its decisions like a civil court.
(d) Lok Adalat decisions are not binding on parties.

Q51. Before becoming Sultan, Alauddin Khalji held which important post under Jalaluddin?

(a) Diwan-i-Arz
(b) Amir-i-Tuzuk
(c) Sadr-us-Sudur
(d) Wazir

Q52. Which of the following rivers helps define a portion of the India–Bangladesh border?

(a) Ganga
(b) Brahmaputra
(c) Narmada
(d) Mahanadi

Q53. The Pattachitra paintings, known for intricate detailing and mythological themes, originate from which Indian state?

(a) Madhya Pradesh
(b) Rajasthan
(c) Assam
(d) Odisha

Q54. The Rowlatt Satyagraha of 1919 was launched by Gandhi to protest against:

(a) New salt tax and increase in land revenue
(b) Partition of Bengal and separate electorates
(c) Laws allowing detention and punishment without trial
(d) Ban on vernacular press and public meetings

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Q55. Which power mode is required for systems using Instant-on / Always-Connected experiences in Windows 10 and 11?

(a) Modern Standby
(b) Legacy Hibernate
(c) S3 Sleep
(d) Hybrid Sleep

Q56. What is the primary purpose of Task Manager in Windows?

(a) To manage user passwords
(b) To edit text documents
(c) To monitor and manage running applications, processes and system performance
(d) To install new applications

Q57. Who authored the book ‘Das Paise ka Postcard’, released in 2025?

(a) Capt. S.N. Ahmed
(b) Prakash Chand Kandpal
(c) Bidyut Chakrabarty
(d) V.S. Ravi

Q58. The 26^(th)of January is celebrated every year in India as which of the following?

(a) Constitution Day
(b) National Girl Child Day
(c) National Consumer Day
(d) Republic Day

Q59. The 'Saila' dance is associated with which of the following states?

(a) Chhattisgarh
(b) Haryana
(c) Goa
(d) Jharkhand

Q60. Which statement correctly describes the role of Gopal Krishna Gokhale in the early Indian National Movement?

(a) He worked via constitutional reforms and moderate methods, respected as Gandhi’s political mentor.
(b) He led the Salt March in 1930 as a protest against the salt tax.
(c) He initiated armed revolutionary propaganda against British oppression.
(d) He founded the Swaraj Party in 1923 to contest British-imposed elections.

Q61. The Battle of Chausa, fought on 26 June 1539, was a military engagement between:

(a) Humayun and Sher Shah Suri
(b) Aurangzeb and Dara Shikoh
(c) Babur and Ibrahim Lodi
(d) Akbar and Hemu

Q62. Which leader in their keynote address at the World Sustainable Development Summit 2025 exemplified "Guyana’s growth without compromising environmental sustainability"?

(a) Marina Silva
(b) Mark Phillips
(c) Vibha Dhawan
(d) Bharrat Jagdeo

Q63. In which year was the Taj Mahal of India inscribed as a UNESCO World Heritage Site?

(a) 1981
(b) 1984
(c) 1980
(d) 1983

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Q64. Which of the following physiographic regions of India receives average annual rainfall of more than 200 cm?

(a) Ladakh region
(b) Thar Desert
(c) Western Ghats
(d) Interior Deccan Plateau

Q65. Which among the following sector contributed 26.67% of India's overall merchandise export in 2024-25?

(a) Gold
(b) Edible oil
(c) Engineering goods
(d) Crude petroleum

Q66. Tallness in pea plants as identified by Mendel, represents which type of trait?

(a) Hidden traits
(b) Recessive traits
(c) Acquired traits
(d) Dominant traits

Q67. India became a founding member of which global organization promoting peace and cooperation?

(a) OPEC
(b) ASEAN
(c) NATO
(d) United Nations

Q68. What record did Smriti Mandhana break in the 2025 Women's Cricket World Cup?

(a) Most wickets by a batter
(b) Fastest century ever in WODIs
(c) Highest individual score in a Women's World Cup final
(d) Most runs in a single edition of the Women's World Cup

Q69. Which Swiss chemist was the first to formulate his ideas about the structures of coordination compounds?

(a) John Dalton
(b) Robert Bunsen
(c) Alfred Werner
(d) Isaac Newton

Q70. Mirage is an optical illusion which can be explained based on which of the following phenomena of light?

(a) Interference
(b) Photoelectric Effect
(c) Total Internal Reflection
(d) Diffraction

GENERAL INTELLIGENCE AND REASONING

Q71. Rishi starts from Point A and drives 23 km towards the north. He then takes a left turn, drives 8 km, turns left and drives 28 km. He then takes a left turn and drives 17 km. He takes a final left turn, drives 5 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 9 km to the west
(b) 8 km to the east
(c) 9 km to the east
(d) 8 km to the west

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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?

BVY 32, WQT 16, RLO 8, MGJ 4, ?

(a) HCD 2
(b) REX 4
(c) LFY 8
(d) HBE 2

Q73. Seven people, A, B, U, D, R, H and J, are sitting in a row, facing north. Only five people sit to the right of D. Only four people sit to the left of H. R is the immediate neighbour of A and D. J sits to the immediate right of B. How many people sit between U and D?

(a) Three
(b) None
(c) One
(d) Two

Q74. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. Only three boxes are kept above C. Only one box is kept between D and C. Only three boxes are kept between D and E. E is kept at some place above C. G is kept immediately below E. F is kept at one of the places above B. A is not kept immediately above or below D.

Which box is kept immediately above F?

(a) G
(b) C
(c) D
(d) A

Q75. In a certain code language, ‘tale jaw bow’ is coded as 'vl ud np' and ‘law bow fresh’ is coded as ‘pq re ud’. How is ‘bow’ coded in the given language?

(a) np
(b) ud
(c) pq
(d) vl

Q76. In a certain code language,

A × B means ‘A is the mother of B’,

A – B means ‘A is the brother of B’,

A + B means ‘A is the wife of B’ and

A * B means ‘A is the father of B’.

How is H related to J if ‘H + I * O × D – J’?

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

Q77. Each vowel in the word PERBLAD is changed to the letter immediately following it in the English alphabetical order, and each consonant is changed to the letter immediately preceding it in the English alphabetical order. How many letters will appear exactly twice in the new group of letters thus formed?

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

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Q78. In a certain code language, ‘bat view month’ is coded as 'nd wz nh' and ‘oven month gum’ is coded as ‘on ju wz’. How is ‘month’ coded in the given language?

(a) on
(b) nh
(c) nd
(d) wz

Q79. Six boxes D, E, F, G, H and A are kept one over the other but not necessarily in the same order. Only three boxes are kept below A. Only two boxes are kept between A and E. No box is kept above G. H is kept at some place below F and at some place above D. How many boxes are kept between H and D?

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

Q80. What should come in place of the ‘?’ in the given series?

6 15 29 54 84 125 ?

(a) 173
(b) 179
(c) 177
(d) 171

Q81. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

FORT - RTFO - TROF

SIGN - GNSI - NGIS

(a) DOVE - OVED - EVOD
(b) DIRT - TRID - IRTD
(c) RAFT - FTRA - TFAR
(d) FILE - LEFI - ELFI

Q82. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the one that 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 pairs.)

(a) PV – MH
(b) KQ-IC
(c) SY – QK
(d) VB-TN

Q83. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

ADG 3 EHK 6 ILO 9 MPS 12 ?

(a) QTV 15
(b) QTW 15
(c) RUX 15
(d) QSW 15

Q84. In a certain code language,

A ← B means ‘A is the wife of B’,

A ≥ B means ‘A is the brother of B’,

A @ B means ‘A is the father of B’, and

A £ B means ‘A is the daughter of B’.

Based on the above, how is P related to U if 'P £ D ← M @ L ≥ U’?

(a) Wife

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(b) Mother
(c) Sister
(d) Daughter

Q85. Refer to the given letter series and answer the question that follows.

(Left) S E S I B V V R R I Y S S P B T K S A P P (Right)

How many such consonants are there, each of which is immediately preceded by a vowel and also immediately followed by a vowel?

(a) Three
(b) None
(c) One
(d) Two

Q86. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) KS – GO
(b) YH – UD
(c) DP – ZL
(d) RM – IN

Q87. Refer to the following letter series and answer the question that follows. Counting to be done from left to right only.

(Left) L R I D P E Q Y H D V Q U Y L X F H A U Z (Right)

How many such vowels are there, each of which is immediately preceded by a consonant and also immediately followed by a consonant?

(a) Two
(b) Three
(c) None
(d) One

Q88. Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusions logically follow/s from the given statements.

Statements: All vans are trailers. No trailer is a scooter.

Conclusion (I) : No van is a scooter

Conclusion (II) : Some scooters are trailers

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

Q89. If 3 is added to each odd digit and 2 is subtracted from each even digit in the number 8254316, then how many digits will appear more than once in the new number thus formed?

(a) One
(b) Two
(c) Three
(d) None

Q90. Each of the digits in the number 3749685 is arranged in ascending order from left to right. The position of how many digits will remain unchanged as compared to that in the original number?

(a) None
(b) Two
(c) Three
(d) One

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Q91. What should come in place of '?' in the given series?

80 ? 89 98 110 125

(a) 85
(b) 82
(c) 83
(d) 84

Q92. In the following triad, each group of letters is related to the subsequent one following a certain logic. Select, from the given options, the one which follows the same logic.

WORD - RWOD - DROW

JAMS - MJAS - SMAJ

(a) VAST - SVAT - ASTV
(b) AGES - AEGS - SEGA
(c) POLE - OPLE - EOLP
(d) YEAR - AYER - RAEY

Q93. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. 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 / subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

89, 104

157, 172

(a) 138, 153
(b) 56, 72
(c) 39, 64
(d) 97, 111

Q94. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. Only three boxes are kept below D. Only two boxes are kept between D and C. Only F is kept above G. B is kept at some place below A and some place above E. Which box is kept immediately above B?

(a) F
(b) D
(c) C
(d) A

Q95. Based on the English alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) KMP
(b) QSV
(c) DFJ
(d) FHK

Q96. Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

VUT−PON

TSR−NML

(a) YXW−SRQ
(b) YXW−RRP
(c) YWU−SRQ
(d) YWU−RQP

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Q97. Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusions logically follow/s from the given statements.

Statements: Some pens are markers. All markers are stands.

Conclusion (I) : Some pens are stands

Conclusion (II) : All stands are markers

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

Q98. Which two numbers should be interchanged to make the given equation correct?

(6 × 14) ÷ 2 + 18 × 4 - 28 ÷ 7 + 34 = 87

(a) 4 and 2
(b) 14 and 18
(c) 6 and 4
(d) 7 and 4

Q99. Seven people, S, T, I, C, K, E and R, are sitting in a row, facing north. Only two people sit between C and I. Only K sits to the right of E. Only one person sits between I and E. S sits at some place to the right of R but at some place to the left of T. Who sits third from the right end of the line?

(a) T
(b) I
(c) C
(d) S

Q100. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

BDF 2 FHJ 5 JLN 8 NPR 11 ?

(a) SSV 14
(b) RUV 14
(c) SVX 14
(d) RTV 14

ANSWER KEY

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

SOLUTIONS

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Q1. Answer: (a) 13,400

Shortcut Trick

Income : Expenditure ratio is 8 : 5.

Expenditure 5 units = Rs. 10,000 => 1 unit = Rs. 2,000 Therefore Initial Income = 8 × 2,000 = Rs. 16,000.

New Income = 16,000 ± 40% = 16,000 × 1.4 = Rs. 22,400.

New Expenditure = 10,000 − 10% = 10,000 × 0.9 = Rs. 9,000.

New Saving = 22,400 − 9,000 = Rs. 13,400.

Therefore The correct answer is Rs. 13,400.

Alternate Method

Given: Ratio of Income (I1) to Expenditure (E1) = 8 : 5. Initial Expenditure = Rs. 10,000. Income rise = 40%. Expenditure fall = 10%.

Formula: Saving = Income − Expenditure

Calculations:

=> Let Initial Income = 8x and Initial Expenditure = 5x.

=> 5x = 10,000 => x = 2,000.

=> Initial Income = 8 × 2,000 = Rs. 16,000.

=> New Income = 16,000 + (40/100 × 16,000) = 16,000 + 6,400 = Rs. 22,400.

=> New Expenditure = 10,000 − (10/100 × 10,000) = 10,000 − 1,000 = Rs. 9,000.

=> New Saving = New Income − New Expenditure = 22,400 − 9,000 = Rs. 13,400.

Therefore The correct answer is Rs. 13,400.

Additional Information

Income, Expenditure, and Savings Relationship

Income = Expenditure + Savings. Any change in two variables directly affects the third.

Percentage Change Formula

New Value = Original Value × (100 ± Percentage Change)/100.

Ratio Unitary Method

If a : b is the ratio and the value of 'b' is V, then the value of 1 unit = V/b and value of 'a' = (V/b) × a.

Q2. Answer: (c) Rs. 720

Shortcut Trick

Net percentage change = 5% (gain) − (−10% loss) = 15%

This 15% difference corresponds to the price increase of Rs. 120.

15% → Rs. 120

1% → Rs. 8

Initial Selling Price (at 10% loss) = 90% → 90 × 8 = Rs. 720

Therefore The correct answer is Rs. 720.

Alternate Method

Given: Initial loss = 10%, New gain = 5%, Increase in SP = Rs. 120.

Formula Used: Selling Price (SP) = Cost Price (CP) × (100 ± Profit/Loss)% / 100

=> Let the Cost Price (CP) of the watch be 100 units.

=> Initial Selling Price (SP1) = 100 − 10 = 90 units.

=> New Selling Price (SP2) = 100 + 5 = 105 units.

=> Difference between SP2 and SP1 = 105 − 90 = 15 units.

=> According to the question, 15 units = Rs. 120.

=> 1 unit = 120 ÷ 15 = Rs. 8.

=> Initial Selling Price (SP1) = 90 × 8 = Rs. 720.

Therefore The correct answer is Rs. 720.

Additional Information

Profit and Loss Percentage

Profit % = (Profit ÷ CP) × 100 and Loss % = (Loss ÷ CP) × 100. Profit and loss are always calculated on the Cost Price unless otherwise mentioned.

Selling Price Calculation

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When there is a gain of G%, SP = CP × (100 + G) ÷ 100. When there is a loss of L%, SP = CP × (100 − L) ÷ 100.

Marked Price and Discount

Discount is always calculated on the Marked Price (MP). SP = MP − Discount. MP = CP + Markup.

Q3. Answer: (a) 4

Shortcut Trick

Test the options to satisfy the continued proportion condition: (13 − x) / (25 − x) = (25 − x) / 49.

Try x = 4: (13 − 4) / (25 − 4) = 9 / 21 = 3 / 7.

Check the second ratio: (25 − 4) / 49 = 21 / 49 = 3 / 7.

Since the ratios are equal, x = 4 is the required natural number.

Therefore The correct answer is 4.

Alternate Method

Given: Original numbers are 13 and 25. The fourth proportional of the resulting numbers after subtracting x is 49.

Formula Used: If three numbers a, b, and c are in continued proportion, then a/b = b/c, where c is the third proportional (or the fourth term in the sequence a, b, b, c).

=> (13 − x) × 49 = (25 − x) × (25 − x)

=> 637 − 49x = 625 − 50x + x^2

=> x^2 − 50x + 49x + 625 − 637 = 0

=> x^2 − x − 12 = 0

=> x^2 − 4x + 3x − 12 = 0

=> x(x − 4) + 3(x − 4) = 0

=> (x − 4)(x + 3) = 0

=> x = 4 or x = −3

=> Since x must be a natural number, x = 4.

Therefore The correct answer is 4.

Additional Information

Mean Proportional

For two numbers a and b, the mean proportional is given by √(a × b).

Third Proportional

If a : b :: b : c, then c is the third proportional to a and b, calculated as c = b^2 / a.

Fourth Proportional

If a : b :: c : d, then d is the fourth proportional to a, b, and c, calculated as d = (b × c) / a.

Q4. Answer: (a) 420

Shortcut Trick

To maximize the product of two numbers with a fixed sum, the numbers should be as close to each other as possible.

Given a + b = 41, the closest integers are 20 and 21.

Check if 20 and 21 are coprime: HCF(20, 21) = 1 (Condition satisfied).

Maximum product = 20 × 21 = 420.

Therefore The correct answer is 420.

Alternate Method

Given:

Sum of two coprime numbers, a + b = 41.

Calculations:

=> Let the numbers be a and b. We know a + b = 41.

=> According to the AM-GM inequality, for a constant sum, the product is maximized when numbers are equal: a = b = 41 ÷ 2 = 20.5.

=> Since a and b must be integers, we test integers closest to 20.5, which are 20 and 21.

=> Verify coprime condition: Factors of 20 = {1, 2, 4, 5, 10, 20} and Factors of 21 = {1, 3, 7, 21}.

=> HCF(20, 21) = 1, therefore they are coprime.

=> Maximum Product = 20 × 21 = 420.

=> Testing other pairs: 19 × 22 = 418; 18 × 23 = 414. The product decreases as the difference between numbers increases.

Therefore The correct answer is 420.

Additional Information

Coprime Numbers

Two numbers are coprime (or relatively prime) if their Greatest Common Divisor (GCD) or HCF is 1. Any two consecutive integers are always coprime.

Sum and Product Relationship

If the sum of two positive numbers is constant, their product is maximum when the numbers are equal, and their product is minimum when the difference between them is maximum.

Prime Sum Property

If the sum S = a + b is a prime number, then every pair of positive integers (a, b) that sums to S is coprime, because HCF(a, S−a) = HCF(a, S), and a prime S has no divisors other than 1 and itself.

Q5. Answer: (c) 1,500

Shortcut Trick

Let the Original Cost Price (CP) be 100 units. Initial SP = 132 units.

New CP = 100 units + 20 and New SP = 132 units − 42.

New Profit is 27.5%, so New SP = 127.5% of New CP.

=> 132 units − 42 = 1.275 × (100 units + 20) = 127.5 units + 25.5.

=> (132 − 127.5) units = 25.5 + 42 => 4.5 units = 67.5.

=> 1 unit = 67.5 ÷ 4.5 = 15. Therefore 100 units = 100 × 15 = Rs. 1,500.

Therefore The correct answer is Rs. 1,500.

Alternate Method

Given: Original Profit = 32%, Increase in CP = Rs. 20, Decrease in SP = Rs. 42, New Profit = 27.5%.

Formula Used: Selling Price (SP) = Cost Price (CP) × (100 + Profit %)/100

=> Let the Original Cost Price be x.

=> Original Selling Price = 1.32x.

=> New Cost Price = x + 20.

=> New Selling Price = 1.32x − 42.

=> According to the problem: 1.32x − 42 = (x + 20) × (127.5/100)

=> 1.32x − 42 = (x + 20) × 1.275

=> 1.32x − 42 = 1.275x + 25.5

=> 1.32x − 1.275x = 25.5 + 42

=> 0.045x = 67.5

=> x = 67.5 ÷ 0.045 = 1500.

Therefore The correct answer is Rs. 1,500.

Additional Information

Profit and Loss Fundamentals

Profit % is always calculated on the Cost Price (CP) unless otherwise stated. Profit = SP − CP.

Relationship between CP and SP

SP = CP × (100 + P)/100 for profit and SP = CP × (100 − L)/100 for loss.

Successive Changes

When CP and SP both change, the New Profit Percentage is applied to the Modified Cost Price to find the Modified Selling Price.

Q6. Answer: (d) Rs. 1204.44

Shortcut Trick

Let the Assumed Mean (A) be Rs. 1200.

Calculate deviations (d = x − A): −300, −200, −100, 0, 100, 200, 300.

Net deviation (∑fd) = 12(−300) + 12(−200) + 14(−100) + 13(0) + 14(100) + 11(200) + 14(300)

∑fd = −3600 − 2400 − 1400 + 0 + 1400 + 2200 + 4200 = 400.

Total employees (∑f) = 90. Corrected Mean = 1200 + (400 ÷ 90) = 1200 + 4.44 = 1204.44.

Therefore The correct answer is Rs. 1204.44.

Alternate Method

Given: Weekly wages (x) and Number of employees (f).

Formula Used: Arithmetic Mean (μ) = ∑fx ÷ ∑f

=> Total employees (∑f) = 12 + 12 + 14 + 13 + 14 + 11 + 14 = 90
=> Total wages (∑fx) = (900 × 12) + (1000 × 12) + (1100 × 14) + (1200 × 13) + (1300 × 14) + (1400 × 11) + (1500 × 14)
=> ∑fx = 10800 + 12000 + 15400 + 15600 + 18200 + 15400 + 21000 = 108400
=> Arithmetic Mean = 108400 ÷ 90
=> Arithmetic Mean = 1204.444...
Therefore The correct answer is Rs. 1204.44.
Additional Information
Arithmetic Mean of Discrete Series
It is the sum of the products of observations and their respective frequencies divided by the total frequency: Mean = ∑f_ix_i ÷ ∑f_i.
Assumed Mean Method
Used to simplify calculations: Mean = A + (∑fd ÷ N), where A is the assumed mean and d = x − A is the deviation.
Properties of Mean
The sum of deviations of all observations from their arithmetic mean is always zero (∑(x − μ) = 0).

Q7. Answer: (d) 5/9

Given:
6^x − 6^(x−1) = 180
Formula used:
a^(m−n) = a^m ÷ a^n
a^m = a^n => m = n (when bases are same)
Calculations:
6^x − 6^(x−1) = 180
=> 6^x − (6^x ÷ 6^1) = 180
=> 6^x (1 − 1/6) = 180
=> 6^x (5/6) = 180
=> 6^x = 180 × (6 ÷ 5)
=> 6^x = 36 × 6
=> 6^x = 216
=> 6^x = 6^3
=> x = 3
Now, substitute the value of x in the expression (2x − 1) / (2x + 3):
=> (2 × 3 − 1) / (2 × 3 + 3)
=> (6 − 1) / (6 + 3)
=> 5/9
Therefore The correct answer is option (4).

Q8. Answer: (c) 7,500

Shortcut Trick
Rate 10% = 1/10, so the Multiplier for 1 year is 11/10.
For 2 years, the ratio of Principal to Amount = 10^2 : 11^2 = 100 : 121.
=> 121 units = Rs. 9,075
=> 1 unit = 9075 ÷ 121 = 75
=> Principal (100 units) = 75 × 100 = Rs. 7,500.
Therefore The correct answer is Rs. 7,500.
Alternate Method
Given:
Total Amount (A) = Rs. 9,075
Rate of Interest (R) = 10% per annum
Time period (n) = 2 years
Formula Used:
A = P(1 + R/100)^n
Calculations:

=> 9075 = P(1 + 10/100)²

=> 9075 = P(110/100)²

=> 9075 = P(11/10)²

=> 9075 = P × (121/100)

=> P = (9075 × 100) ÷ 121

=> P = 75 × 100

=> P = Rs. 7,500

Therefore The correct answer is Rs. 7,500.

Additional Information

Effective Rate of Interest

For 2 years, the effective interest rate can be calculated as x + y + (xy/100)%. For 10%, it is 10 + 10 + 1 = 21%.

Difference between CI and SI

The difference between Compound Interest and Simple Interest for 2 years is given by the formula: Diff = P × (R/100)².

Compound Interest Formula

Total Compound Interest = Amount − Principal = P[(1 + R/100)ⁿ − 1].

Q9. Answer: (a) 19.32 km/hr

Shortcut Trick

Assume distance d = 240 km (LCM of 5, 4, 15, 20, 16, 24).

Onward time = (96 ÷ 15) + (144 ÷ 20) = 6.4 + 7.2 = 13.6 hrs.

Return time = (60 ÷ 16) + (180 ÷ 24) = 3.75 + 7.5 = 11.25 hrs.

Total Average Speed = Total Distance ÷ Total Time = 480 ÷ 24.85 = 19.32 km/hr.

Therefore The correct answer is 19.32 km/hr.

Alternate Method

Given: Onward journey speeds are 15 km/hr (2/5th) and 20 km/hr (3/5th). Return journey speeds are 16 km/hr (1/4th) and 24 km/hr (3/4th).

Formula: Average Speed = (Total Distance) ÷ (Total Time taken)

Let the distance from A to B be d.

=> Total distance for the entire trip = d + d = 2d

=> Time for onward journey (T1) = (2d/5 ÷ 15) + (3d/5 ÷ 20)

=> T1 = 2d/75 + 3d/100 = (8d + 9d)/300 = 17d/300

=> Time for return journey (T2) = (d/4 ÷ 16) + (3d/4 ÷ 24)

=> T2 = d/64 + 3d/96 = d/64 + d/32 = (d + 2d)/64 = 3d/64

=> Total Time (T) = 17d/300 + 3d/64 = (544d + 450d)/9600 = 994d/9600

=> Average Speed = 2d ÷ (994d/9600) = (2 × 9600) ÷ 994 = 19200 ÷ 994

=> Average Speed ≈ 19.3158... km/hr

Therefore The correct answer is 19.32 km/hr.

Additional Information

Average Speed for Equal Distances

If two equal distances are covered at speeds v1 and v2, average speed = 2v1v2 ÷ (v1 + v2).

Weighted Average Speed

When different parts of a journey (d1, d2, ...) are covered at different speeds (v1, v2, ...), Average Speed = (d1 + d2 + ...) ÷ (d1/v1 + d2/v2 + ...).

Unit Conversions

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q10. Answer: (b) 29

Given: ABCD is a trapezium with AB || DC. AB = 14 cm, DC = 72 cm, BC = 64 cm, and AD = 47 cm. E and F are the midpoints of AC and BD respectively.

Formula Used: In a trapezium with bases a and b, the distance between the midpoints of the diagonals is |a − b| / 2.

Calculations:

=> Length of the parallel side AB = 14 cm

=> Length of the parallel side DC = 72 cm

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=> According to the geometry property of a trapezium, the distance EF joining the midpoints of the diagonals is:

=> EF = (DC − AB) ÷ 2

=> EF = (72 − 14) ÷ 2

=> EF = 58 ÷ 2

=> EF = 29 cm

The calculated length is 29 cm, which corresponds to Option (2).

Therefore The correct answer is 29 cm.

Additional Information

Median of a Trapezium

The line segment joining the midpoints of the non-parallel sides is called the median. Its length is equal to half the sum of the parallel sides: Median = (a + b) ÷ 2.

Midpoint of Diagonals Theorem

The segment connecting the midpoints of the diagonals of a trapezium is always parallel to the bases and its length is half the absolute difference of the bases.

Area of a Trapezium

The area of a trapezium is calculated as ½ × (sum of parallel sides) × height, where the height is the perpendicular distance between the bases.

Q11. Answer: (b) 8 : 3

Shortcut Trick

Walking time = 40 ÷ 5 = 8 hours.

Running time = 30 ÷ 10 = 3 hours.

Ratio of walking time to running time = 8 : 3.

Therefore The correct answer is 8 : 3.

Alternate Method

Given:

Walking distance = 40 km, Walking speed = 5 km/hr.

Running distance = 30 km, Running speed = 10 km/hr.

Formula Used:

Time = Distance ÷ Speed

=> Walking time (T_w) = 40 ÷ 5 = 8 hours

=> Running time (T_r) = 30 ÷ 10 = 3 hours

=> Ratio = T_w : T_r = 8 : 3

Therefore The correct answer is 8 : 3.

Additional Information

Average Speed

The average speed for the entire journey is calculated as Total Distance ÷ Total Time. Here, (40 + 30) ÷ (8 + 3) = 70 ÷ 11 km/hr.

Speed Conversion

To convert speed from km/hr to m/s, multiply the value by 5/18. For example, 10 km/hr = 10 × (5/18) m/s.

Inverse Proportion

When distance is constant, the time taken is inversely proportional to the speed (T prop. to 1/S).

Q12. Answer: (c) 40%

Shortcut Trick

Let the difference between Savings and Expenditure be 1 unit.

Then, Expenditure = 2 × 1 = 2 units.

Savings = Expenditure + Difference = 2 + 1 = 3 units.

Total Salary = Expenditure + Savings = 2 + 3 = 5 units.

Expenditure % = (2 ÷ 5) × 100 = 40%.

Therefore The correct answer is 40%.

Alternate Method

Given:

Expenditure (E) = 2 × (Savings (V) − Expenditure (E))

Formula Used:

Salary = Expenditure + Savings

Expenditure Percentage = (Expenditure ÷ Salary) × 100

=> E = 2V − 2E

=> 3E = 2V

=> V = (3 ÷ 2)E = 1.5E

=> Salary = E + V = E + 1.5E = 2.5E

=> Expenditure Percentage = (E ÷ 2.5E) × 100

=> Expenditure Percentage = (100 ÷ 2.5) = 40%

Therefore The correct answer is 40%.

Additional Information

Income Expenditure Relation

The basic formula for income problems is: Salary = Expenditure + Savings.

Percentage Calculation

Percentage of any component is calculated as: (Component ÷ Total Salary) × 100.

Ratio and Proportion

When components are given in linear equations, converting them into Ratios (e.g., E:V = 2:3) simplifies calculations.

Q13. Answer: (b) 0.625

Given:

0.375 + 3/8 − 0.125

Formula used:

Decimal conversion: 3/8 = 0.375

Calculations:

0.375 + 3/8 − 0.125

=> 0.375 + 0.375 − 0.125

=> 0.750 − 0.125

=> 0.625

Therefore The correct answer is option (2).

Q14. Answer: (b) 17

Shortcut Trick

For the number 12A916B to be divisible by 24, it must be divisible by both 8 and 3.

Divisibility by 8: Last three digits 16B must be divisible by 8. Possible values for B are 0 or 8. To maximize (A + B), let B = 8.

Divisibility by 3: Sum of digits (1 + 2 + A + 9 + 1 + 6 + 8 = 27 + A) must be divisible by 3.

Since 27 is already divisible by 3, A can be 0, 3, 6, or 9. To maximize (A + B), let A = 9.

Maximum value of (A + B) = 9 + 8 = 17.

Therefore The correct answer is 17.

Alternate Method

Given: The 7-digit number is 12A916B and it is divisible by 24.

For divisibility by 24, the number must satisfy divisibility rules for 3 and 8 simultaneously.

Step 1: Apply divisibility rule of 8.

=> The last three digits 16B must be divisible by 8.

=> 160 + B must be divisible by 8.

=> Since 160 is divisible by 8, B must be 0 or 8.

=> For maximum (A + B), we choose B = 8.

Step 2: Apply divisibility rule of 3.

=> Sum of digits = 1 + 2 + A + 9 + 1 + 6 + B

=> Sum = 19 + A + B

=> Substitute B = 8: Sum = 19 + A + 8 = 27 + A

=> For (27 + A) to be divisible by 3, A can be 0, 3, 6, or 9.

=> For maximum value, we choose A = 9.

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Step 3: Calculate the maximum value.

=> Maximum (A + B) = 9 + 8 = 17.

Therefore The correct answer is 17.

Additional Information

Divisibility Rule of 8

A number is divisible by 8 if its last three digits are divisible by 8 or if the last three digits are zero.

Divisibility Rule of 3

A number is divisible by 3 if the sum of its digits is a multiple of 3.

Divisibility of Composite Numbers

To check divisibility by a composite number like 24, we check divisibility by its co-prime factors (3 and 8 in this case, because 3 × 8 = 24 and HCF(3, 8) = 1).

Q15. Answer: (a) Bag B

Shortcut Trick

Convert the red marble ratios into percentages to compare the proportion directly.

Bag A: 2 ÷ (2 + 3) = 2/5 = 40%

Bag B: 4 ÷ (4 + 1) = 4/5 = 80%

Bag C: 3 ÷ (3 + 2) = 3/5 = 60%

Comparing the values: 80% > 60% > 40%.

Therefore The correct answer is Bag B.

Alternate Method

Given:

Ratio of red marbles to blue marbles in:

Bag A = 2 : 3

Bag B = 4 : 1

Bag C = 3 : 2

Formula Used:

Proportion of red marbles = Red Marbles ÷ (Red Marbles + Blue Marbles)

Calculations:

=> Red proportion in Bag A = 2 ÷ (2 + 3) = 2/5 = 0.40

=> Red proportion in Bag B = 4 ÷ (4 + 1) = 4/5 = 0.80

=> Red proportion in Bag C = 3 ÷ (3 + 2) = 3/5 = 0.60

=> Comparing the fractions: 0.80 > 0.60 > 0.40

=> Bag B has the highest proportion of red marbles at 0.80 (or 80%).

Therefore The correct answer is Bag B.

Additional Information

Ratio to Proportion Conversion

To find the proportion of a specific component in a ratio x : y, use the formula x ÷ (x + y).

Comparing Fractions

Fractions can be compared by converting them to a common denominator or by converting them into decimal or percentage forms.

Percentage Calculation

The percentage of a component is (Value ÷ Total) × 100. This is useful for standardized comparison across different total quantities.

Q16. Answer: (c) 16,637.5

Shortcut Trick

Net interest percentage = Rate × Time = 5.5% × 5.5 = 30.25%

Simple Interest = 30.25% of Rs. 55,000

SI = (30.25 ÷ 100) × 55,000 = 0.3025 × 55,000 = 16,637.5

Therefore The correct answer is Rs. 16,637.5.

Alternate Method

Given:

Principal (P) = Rs. 55,000

Rate (R) = 5.5% per annum

Time (T) = 5.5 years

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Calculations:

=> SI = (55,000 × 5.5 × 5.5) ÷ 100

=> SI = 550 × 5.5 × 5.5

=> SI = 550 × 30.25

=> SI = 16,637.5

Therefore The correct answer is Rs. 16,637.5.

Additional Information

Amount Formula

The total Amount (A) to be paid back after the time period is the sum of the Principal and the Simple Interest: A = P + SI.

Simple Interest vs Compound Interest

In Simple Interest, the interest is calculated only on the initial principal, whereas in Compound Interest, it is calculated on the principal plus any accumulated interest.

Rate of Interest p.a.

The Rate of Interest is usually expressed as a percentage per annum (p.a.). If the time is in months, it must be divided by 12 to convert it to years.

Q17. Answer: (b) 1

Shortcut Trick

Net filling rate of cistern = 1/4 + 1/20 − 1/20 = 1/4 cistern/hr.

Target work is to fill one-fourth of the empty cistern.

Time taken = Work ÷ Net Rate = (1/4) ÷ (1/4) = 1 hour.

Therefore The correct answer is 1 hr.

Alternate Method

Given:

Time taken by Tap 1 (Filling) = 4 hr

Time taken by Tap 2 (Filling) = 20 hr

Time taken by Tap 3 (Emptying) = 20 hr

Person/Tap	Time (hr)	Total Work (units)	Efficiency (units/hr)
Tap 1	4	20	5
Tap 2	20	1	
Tap 3	20	−1	

Calculations:

=> Total Capacity of cistern = LCM(4, 20, 20) = 20 units

=> Target to fill = 1/4 × 20 = 5 units

=> Combined Efficiency of all taps = 5 + 1 − 1 = 5 units/hr

=> Time required = Target Work ÷ Combined Efficiency

=> Time required = 5 ÷ 5 = 1 hour

Therefore The correct answer is 1 hr.

Additional Information

Negative Efficiency

In Pipes and Cisterns, the efficiency of an outlet/emptying tap is always taken as negative while the efficiency of an inlet/filling tap is positive.

Work-Time Relation

Total Work = Efficiency × Time. For fractional work, Time = (Total Work × Fraction) ÷ Combined Efficiency.

Combined Rate Formula

If two taps fill in X and Y hours and one empties in Z hours, the net rate is (1/X + 1/Y − 1/Z) parts per hour.

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Q18. Answer: (b) 9873

Shortcut Trick

Find the LCM of 6, 10, and 14, which is 210.

Divide the largest 4-digit number (9999) by 210; the remainder is 129.

Largest multiple = 9999 − 129 = 9870.

Add the required remainder: 9870 + 3 = 9873.

Therefore The correct answer is 9873.

Alternate Method

Given: Divisors = 6, 10, 14 and Remainder = 3.

Formula Used: Required Number = (LCM(Divisors) × k) + Remainder

=> First, find the prime factors of the divisors:

=> 6 = 2 × 3

=> 10 = 2 × 5

=> 14 = 2 × 7

=> LCM = 2 × 3 × 5 × 7 = 210

=> The largest 4-digit number is 9999.

=> 9999 ÷ 210 => Quotient = 47, Remainder = 129.

=> Largest multiple of 210 = 9999 − 129 = 9870.

=> Required number = 9870 + 3 = 9873.

Therefore The correct answer is 9873.

Additional Information

General Form of Numbers

Any number that leaves a common remainder r when divided by x, y, z is written in the form [LCM(x, y, z) × k] + r.

LCM Calculation

LCM is calculated by taking the highest power of all prime factors involved in the prime factorization of the given numbers.

Divisibility Verification

To verify, subtract the remainder from the result; the value 9870 is exactly divisible by 6, 10, and 14.

Q19. Answer: (c) 13.33 m

Shortcut Trick

For a Building of height H and a Tower of height h, if the angles of depression to the top and bottom are θ1 and θ2:

Height of Tower h = H × [1 − (tan θ1 / tan θ2)]

Given: H = 20 m, θ1 = 30°, θ2 = 60°

h = 20 × [1 − (tan 30° / tan 60°)]

h = 20 × [1 − (1/√3 / √3)] = 20 × [1 − 1/3] = 20 × 2/3 = 13.33 m

Therefore The correct answer is 13.33 m.

Alternate Method

Given:

Height of the Building (AB) = 20 m

Angle of depression of the Tower top (C) = 30°

Angle of depression of the Tower bottom (D) = 60°

Let the Height of the Tower be h and the distance between the building and the tower be x.

=> In right triangle ABD, tan 60° = AB / BD

=> √3 = 20 / x

=> x = 20 / √3

=> Draw a horizontal line from C to the building meeting it at E. Then, AE = 20 − h and CE = x.

=> In right triangle ACE, tan 30° = AE / CE

=> 1 / √3 = (20 − h) / (20 / √3)

=> 1 / √3 = (20 − h) × √3 / 20

=> 20 = 3 × (20 − h)

=> 20 = 60 − 3h

=> 3h = 40

=> h = 40 / 3 = 13.33 m

Therefore The correct answer is 13.33 m.

Additional Information

Angle of Depression

The angle between the horizontal line and the line of sight when an observer looks at an object situated at a lower level.

Trigonometric Ratios

For any right-angled triangle, tan θ = Perpendicular / Base. Common values: tan 30° = 1/√3 and tan 60° = √3.

Relationship between H and h

If angles of depression from height H to the top and bottom of another object of height h are α and β respectively, then h = H(1 − tan α / tan β).

Q20. Answer: (a) 21

Calculation:

Arrange the terms in ascending order based on their coefficients: x/5, x/4, x/3, 2x/5, 2x/3, 3x/4, x.

Equate the median-representing term 2x/5 to the given median value:

2x/5 = 8.4

x = (8.4 × 5) ÷ 2 = 21

Therefore The correct answer is 21.

Q21. Answer: (d) -132

Given:

30 + [{-9 × (26 − 11 + 3)}]

Formula used:

The BODMAS rule (Brackets, Of, Division, Multiplication, Addition, Subtraction) is used to simplify the expression.

Calculations:

30 + [{-9 × (26 − 11 + 3)}]

=> 30 + [{-9 × (15 + 3)}]

=> 30 + [{-9 × 18}]

=> 30 + (−162)

=> 30 − 162

=> −132

Therefore The correct answer is option (4).

Q22. Answer: (d) 25

Shortcut Trick

Sum of ratio squares = $3^2 + 5^2 + 7^2 = 9 + 25 + 49 = 83$ parts.

Value of 1 part² = 2075 ÷ 83 = 25.

Value of 1 part = √25 = 5.

Middle number (5 parts) = 5 × 5 = 25.

Therefore The correct answer is 25.

Alternate Method

Given:

Ratio of three positive numbers = 3 : 5 : 7

Sum of their squares = 2075

Calculations:

=> Let the three positive numbers be 3x, 5x, and 7x.

=> Sum of their squares = $(3x)^2 + (5x)^2 + (7x)^2 = 2075$

=> $9x^2 + 25x^2 + 49x^2 = 2075$

=> $83x^2 = 2075$

=> $x^2 = 2075 \div 83$

=> $x^2 = 25$

=> x = √25 = 5 (Since numbers are positive)

=> The middle number = 5x = 5 × 5 = 25

Therefore The correct answer is 25.

Additional Information

Ratio and Proportion Basics

A ratio compares two quantities. If a : b = c : d, then a × d = b × c. To find actual values from a ratio, always multiply by a common constant x.

Duplicate Ratio

The duplicate ratio of a : b is $a^2 : b^2$. When squares of numbers in a ratio are given, the ratio of those squares is the duplicate ratio.

Mean Proportional

The mean proportional between two numbers a and b is √(a × b). This is a common property used in geometric progression and ratio problems.

Q23. Answer: (b) 36 years

Shortcut Trick

Ratio (8 years ago) G : R = 4 : 1 (Difference = 3 units)

Ratio (6 years later) G : R = 2 : 1 (Difference = 1 unit)

Make Difference equal by multiplying second ratio by 3 → 6 : 3

Change in units = 6 − 4 = 2 units | Total years gap = 8 + 6 = 14 years

2 units = 14 years => 1 unit = 7 years | G (8 years ago) = 4 × 7 = 28 years

Therefore The correct answer is 36 years.

Alternate Method

Given:

Age of Mr. Gupta (8 years ago) = 4 × age of Rohit (8 years ago)

Age of Mr. Gupta (after 6 years) = 2 × age of Rohit (after 6 years)

Let Rohit's age 8 years ago be x.

=> Mr. Gupta's age 8 years ago = 4x

=> Present ages: Rohit = x + 8, Mr. Gupta = 4x + 8

=> Ages after 6 years: Rohit = x + 8 + 6 = x + 14, Mr. Gupta = 4x + 8 + 6 = 4x + 14

According to the question:

=> 4x + 14 = 2 × (x + 14)

=> 4x + 14 = 2x + 28

=> 4x − 2x = 28 − 14

=> 2x = 14

=> x = 7

=> Present Age of Mr. Gupta = 4x + 8 = 4 × 7 + 8 = 28 + 8 = 36 years

Therefore The correct answer is 36 years.

Additional Information

Constant Age Difference

The difference between the ages of two individuals always remains constant regardless of the number of years passed or preceding.

Ratio Balancing Method

To solve age problems quickly, ensure the difference between ratio parts is equal for both time periods by multiplying with suitable constants.

Linear Equation Formulation

Always define variables for the past or future to simplify the present age expression: Present = Past + t or Present = Future − t.

Q24. Answer: (d) Option 2 and by Rs. 160

Shortcut Trick

Net discount for Option 2 = 20 + 15 − (20 × 15) ÷ 100 = 32%

Discount for Option 1 = 30%

Difference in discount percentage = 32% − 30% = 2%

Amount difference = 2% of Rs. 8,000 = Rs. 160

Since 32% > 30%, Option 2 provides the greater discount.

Therefore The correct answer is Option 2 and by Rs. 160.

Alternate Method

Given:

Marked Price (MP) = Rs. 8,000

Option 1: Single discount = 30%

Option 2: Successive discounts = 20% and 15%

Calculations:

=> Discount in Option 1 = 30% of 8,000 = (30 ÷ 100) × 8,000 = Rs. 2,400

=> Successive discount formula = x + y − (xy ÷ 100)

=> Effective discount % for Option 2 = 20 + 15 − (20 × 15 ÷ 100) = 35 − 3 = 32%

=> Discount in Option 2 = 32% of 8,000 = (32 ÷ 100) × 8,000 = Rs. 2,560

=> Difference in discount amounts = Rs. 2,560 − Rs. 2,400 = Rs. 160

=> Comparing both, Option 2 offers a discount that is Rs. 160 more than Option 1.

Therefore The correct answer is Option 2 and by Rs. 160.

Additional Information

Successive Discount Formula

For two successive discounts of a% and b%, the single equivalent discount is calculated as (a + b − ab/100)%.

Marked Price and Selling Price

Discount is always calculated on the Marked Price (MP). The price after deduction is the Selling Price (SP), where SP = MP × (100 − Discount%)/100.

Three Successive Discounts

If three discounts a%, b%, and c% are given, first find the equivalent of a and b, then use that result with c using the same formula.

Q25. Answer: (a) 38

Shortcut Trick

Value of 4 extra Rs. 500 notes = 4 × 500 = Rs. 2,000.

Remaining Total Amount = 24,800 − 2,000 = Rs. 22,800.

Combined value of one Rs. 100 note and one Rs. 500 note = 100 + 500 = Rs. 600.

Number of Rs. 100 notes = 22,800 ÷ 600 = 38.

Therefore The correct answer is 38.

Alternate Method

Given: Total Amount = Rs. 24,800; Rs. 500 notes = 4 + Rs. 100 notes.

=> Let the number of Rs. 100 notes be x.

=> Number of Rs. 500 notes = x + 4.

=> Total Value = (x × 100) + ((x + 4) × 500) = 24,800.

=> 100x + 500x + 2,000 = 24,800.

=> 600x + 2,000 = 24,800.

=> 600x = 24,800 − 2,000 = 22,800.

=> x = 22,800 ÷ 600 = 38.

Therefore The correct answer is 38.

Additional Information

Currency Denomination Principle

The Total Value of currency is calculated by the sum of (Value of one note × Number of notes) for each denomination.

Linear Equations in One Variable

A Linear Equation involves solving for an unknown variable by balancing constants and variables on either side of the equals sign.

Unitary Method Adjustment

In problems where one quantity is more than another, subtracting the extra value first allows the remaining amount to be divided by the sum of unit values.

Q26. Answer: (c) 5

Shortcut Trick

Number of sides (n) = (2 × Area) ÷ (Side × Apothem)

n = (2 × 247.5) ÷ (11 × 9)

n = 495 ÷ 99
n = 5
Therefore The correct answer is 5.
Alternate Method
Given:
Side length (s) = 11 cm
Area (A) = 247.5 cm²
Perpendicular distance from centre to side (apothem, a) = 9 cm
Formula Used:
Area of a regular polygon = (1/2) × Perimeter × Apothem
Where Perimeter (P) = Number of sides (n) × Side length (s)
Calculations:
=> Area = (1/2) × (n × s) × a
=> 247.5 = (1/2) × (n × 11) × 9
=> 247.5 = (99/2) × n
=> 247.5 = 49.5 × n
=> n = 247.5 ÷ 49.5
=> n = 5
Therefore The correct answer is 5.
Additional Information
Interior Angle of a Regular Polygon
The measure of each interior angle is given by [(n − 2) × 180°] ÷ n, where n is the number of sides.
Sum of Exterior Angles
For any convex polygon, the sum of all exterior angles is always 360°.
Relation between Side and Apothem
For a regular polygon, the side length (s) and apothem (a) are related by: s = 2 × a × tan(180°/n).

Q27. Answer: (c) 13%

Shortcut Trick
Discount = 10630 − 9248.10 = 1381.90
Discount % = (Discount ÷ Marked Price) × 100
Discount % = (1381.90 ÷ 10630) × 100 = 13%
Therefore The correct answer is 13%.
Alternate Method
Given:
Marked Price (MP) of the article = Rs. 10,630
Selling Price (SP) of the article = Rs. 9248.10
Formula Used:
Discount = Marked Price − Selling Price
Discount Percentage = (Discount ÷ Marked Price) × 100
Calculations:
=> Discount = 10630 − 9248.10
=> Discount = 1381.90
=> Discount % = (1381.90 ÷ 10630) × 100
=> Discount % = 138190 ÷ 10630
=> Discount % = 13%
Therefore The correct answer is 13%.
Additional Information
Marked Price (List Price)
The price at which an article is listed or labeled by the retailer or manufacturer is called its Marked Price.
Successive Discounts
If two discounts d1% and d2% are given, the single equivalent discount is [d1 + d2 − (d1 × d2) ÷ 100]%.

Relationship between CP and MP

The ratio of Cost Price to Marked Price is given by: CP ÷ MP = (100 − Discount%) ÷ (100 + Profit%).

Q28. Answer: (b) 1/4

Shortcut Trick

Since the height H remains constant, the Volume of a cylinder is directly proportional to the square of its radius R (V prop. to R^2).

Original Radius = R => Original Volume prop. to R^2.

New Radius = R/2 => Volume of one new cylinder prop. to $(R/2)^2 = R^2/4$.

Total Volume of 3 new cylinders = $3 \times (R^2/4) = 3/4$ of the original volume.

Unused fraction of Volume = 1 − 3/4 = 1/4.

Therefore The correct answer is 1/4.

Alternate Method

Given: Original radius = R, height = H. New radius = R/2, height = H, and number of new cylinders = 3.

Formula Used: Volume of a Cylinder = $\pi \times r^2 \times h$

=> Volume of original cylinder (V1) = $\pi R^2 H$

=> Volume of one new cylinder (v) = $\pi \times (R/2)^2 \times H = \pi \times (R^2/4) \times H = \pi R^2 H/4$

=> Total volume of 3 new cylinders (V2) = $3 \times (\pi R^2 H/4) = 3\pi R^2 H/4$

=> Unused Volume = V1 − V2 = $\pi R^2 H - 3\pi R^2 H/4$

=> Unused Volume = $(4\pi R^2 H - 3\pi R^2 H) / 4 = \pi R^2 H/4$

=> Fraction of original volume remaining unused = (Unused Volume) ÷ (Original Volume)

=> Fraction = $(\pi R^2 H/4) \div (\pi R^2 H) = 1/4$

Therefore The correct answer is 1/4.

Additional Information

Volume of a Cylinder

The amount of space occupied by a cylinder is given by $V = \pi r^2 h$, where r is the radius and h is the height.

Scaling Effect on Volume

If the radius is changed by a factor of 'k' and the height remains constant, the volume changes by a factor of k^2.

Total Surface Area of Cylinder

The total surface area including the top and bottom bases is given by $2\pi r(h + r)$.

Q29. Answer: (c) 6

Shortcut Trick

Identify the direct algebraic relationship: $(\text{Difference})^2 = (\text{Sum})^2 - 4 \times (\text{Product})$.

Substitute the given values: $(\text{Difference})^2 = 88^2 - 4 \times 1927$

$(\text{Difference})^2 = 7744 - 7708 = 36$

Difference = $\sqrt{36} = 6$

Therefore The correct answer is 6.

Alternate Method

Given:

Sum of two numbers (x + y) = 88

Product of two numbers (xy) = 1927

Formula Used:

$(x - y)^2 = (x + y)^2 - 4xy$

Calculations:

=> $(x - y)^2 = (88)^2 - 4 \times (1927)$

=> Square of 88 = $(90 - 2)^2 = 8100 - 360 + 4 = 7744$

=> $4 \times 1927 = 7708$

=> $(x - y)^2 = 7744 - 7708$

=> $(x - y)^2 = 36$

=> $x - y = \sqrt{36}$

=> $x - y = 6$

Therefore The correct answer is 6.

Additional Information

Algebraic Identity

The relation $(x + y)^2 - (x - y)^2 = 4xy$ is a fundamental identity used to find the difference when sum and product are known.

Quadratic Roots Property

For a quadratic equation $t^2 - (\text{Sum})t + (\text{Product}) = 0$, the roots are the two numbers. The difference between roots is given by $\sqrt{D}/a$ where $D = b^2 - 4ac$.

Squaring Shortcut

To square numbers near 100 like 88: $(100 - 12)^2 = 10000 - 2400 + 144 = 7744$.

Q30. Answer: (c) 12 hours

Shortcut Trick

Let Total Work (Capacity) = LCM(10, 15, 30) = 30 units.

Efficiencies: Pipe A = +3, Pipe B = +2, Pipe C = −1. Combined = +4 units/hr.

Work done by all three in 6 hr = 4 × 6 = 24 units.

Remaining Work = 30 − 24 = 6 units.

Efficiency of (B + C) = 2 − 1 = 1 unit/hr. Additional time = 6 ÷ 1 = 6 hr.

Total time = 6 (initial) + 6 (extra) = 12 hr.

Therefore The correct answer is 12 hr.

Alternate Method

Given: Pipe A fills in 10 hr, Pipe B fills in 15 hr, and Pipe C empties in 30 hr.

Total Work is the LCM of 10, 15, and 30.

Pipe	Hours	Total Work	Efficiency
Pipe A	10	30 units	30 ÷ 10 = +3
Pipe B	15	30 ÷ 15 = +2	
Pipe C	30	30 ÷ 30 = −1	

=> Combined Efficiency (A + B + C) = 3 + 2 − 1 = 4 units/hr

=> Work completed by all pipes in first 6 hours = 4 × 6 = 24 units

=> Remaining capacity to be filled = 30 − 24 = 6 units

=> Since Pipe A is closed, remaining pipes (B and C) fill the rest.

=> Combined Efficiency of (B + C) = 2 − 1 = 1 unit/hr

=> Time taken to fill remaining 6 units = 6 ÷ 1 = 6 hr

=> Total Time taken to fill the cistern = Initial time + Extra time = 6 hr + 6 hr = 12 hr

Therefore The correct answer is 12 hr.

Additional Information

Inlet and Outlet Pipes

The rate of work of an inlet pipe (filling) is taken as positive, while that of an outlet pipe (emptying) is taken as negative efficiency.

Net Work Done

If multiple pipes work together, the net efficiency is the algebraic sum of their individual efficiencies (e.g., Net E = E1 + E2 − E3).

Time and Efficiency Relation

Total Capacity = Efficiency × Time. If the net efficiency is negative, the cistern will eventually be emptied rather than filled.

Q31. Answer: (c) Beat Plastic Pollution

The correct answer is Beat Plastic Pollution.

Key Points

• World Environment Day, celebrated globally on June 5, serves as the principal vehicle of the United Nations for encouraging awareness and action for the protection of the environment.

• The ClimateNXT 2025 summit in India adopted the theme Beat Plastic Pollution to align with the international environmental priority of the year, focusing on the global crisis of plastic waste.

• The year 2025 marks a critical milestone in environmental policy, as the Republic of Korea served as the global host for World Environment Day with a specific mandate to end plastic pollution through a circular economy approach.

• According to UNEP data, more than 430 million tonnes of plastic are produced annually worldwide, of which two-thirds are

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short-lived products that soon become waste, significantly impacting marine ecosystems and human health.

• The ClimateNXT platform brought together policymakers, climate tech innovators, and industry leaders in India to discuss the implementation of Extended Producer Responsibility (EPR) and the phase-out of Single-Use Plastics (SUPs).

• The summit emphasized the Lifecycle Assessment (LCA) of plastic products, advocating for alternative materials and sustainable packaging solutions to mitigate the environmental footprint of urban consumption.

Additional Information

• Clean air / urban pollution:

• This theme is central to India's National Clean Air Programme (NCAP), which aims for a 20-30% reduction in PM2.5 and PM10 concentrations in 131 non-attainment cities.

• It focuses on vehicular emissions, industrial smog, and stubble burning issues prevalent in the Indo-Gangetic Plain.

• Renewable energy transition:

• Relates to India's Panchamrit goals announced at COP26, including reaching 500 GW of non-fossil energy capacity by 2030.

• Key components include the National Green Hydrogen Mission and the expansion of solar photovoltaic (PV) infrastructure.

• Water conservation:

• Associated with the Jal Shakti Abhiyan: Catch the Rain campaign and Sustainable Development Goal 6 (SDG 6).

• Focuses on groundwater recharge, rainwater harvesting, and the rejuvenation of traditional water bodies.

• Historical Context:

• World Environment Day was established by the UN General Assembly in 1972 during the Stockholm Conference.

• The first theme in 1974 was Only One Earth.

Q32. Answer: (d) 2012

The correct answer is 2012.

Key Points

• The Planning Commission of India established the Expert Group to Review the Methodology for Measurement of Poverty under the chairmanship of Dr. C. Rangarajan in June 2012.

• The primary objective of the committee was to revisit the poverty estimation methodology recommended by the Suresh Tendulkar Committee, which had faced criticism for setting the poverty line at a level considered too low for basic subsistence.

• The Rangarajan Committee expanded the Poverty Line Basket (PLB) by incorporating not only calorie intake but also requirements for proteins, fats, and essential non-food expenses like clothing, house rent, education, and conveyance.

• The committee submitted its final report in June 2014, recommending a poverty threshold of Rs. 32 per day in rural areas and Rs. 47 per day in urban areas.

• Based on this methodology, the committee estimated the number of poor in India to be 363 million (29.5 percent of the population) for the year 2011−12, which was significantly higher than the 269.8 million (21.9 percent) estimated by the Tendulkar methodology.

Additional Information

• History of Poverty Estimation Committees:

• Alagh Committee (1979): It was the first to define a poverty line based on nutritional requirements, specifically 2400 kcal for rural and 2100 kcal for urban areas.

• Lakdawala Committee (1993): This group suggested that poverty lines should be updated using the Consumer Price Index-Industrial Workers (CPI-IW) for urban areas and the Consumer Price Index-Agricultural Labourers (CPI-AL) for rural areas.

• Tendulkar Committee (2009): It shifted the focus from mere calorie consumption to a broader basket of goods, including private expenditure on health and education, and introduced the use of the Mixed Reference Period (MRP).

• NITI Aayog Task Force: Following the dissolution of the Planning Commission, a task force on poverty elimination was formed in 2015 under the chairmanship of Arvind Panagariya.

Q33. Answer: (a) Moves cursor to subsequent input field or table cell

The correct answer is Moves cursor to subsequent input field or table cell.

Key Points

• In Microsoft Word, the Tab key is the standard keyboard shortcut used for sequential navigation through interactive elements, such as form fields, content controls, and table cells.

• When a user is filling out a Word document form, pressing Tab signals the application to move the insertion point (cursor) from the current active input field to the next logical field in the tab order.

• This functionality is particularly critical in Restricted Documents where editing is limited to Filling in forms; in such cases, the cursor is prevented from moving to non-editable text and can only jump between entry points.

• If the form is structured within a Table, the Tab key moves the focus to the adjacent cell to the right; if the cursor is in the final

cell of a row, it moves to the first cell of the subsequent row.

• Using the Tab key improves data entry efficiency and ensures accessibility, as it allows users to navigate complex forms entirely without the use of a computer mouse.

Additional Information

• Keyboard Shortcuts for Navigation:

• Shift + Tab: This combination performs the inverse action, moving the cursor to the previous input field or the preceding table cell.

• Enter Key: Depending on the Content Control settings, the Enter key may create a new paragraph within a field rather than advancing the focus.

• Alt + F4: This shortcut is used to close the active window or application, rather than navigating within a form.

• Ctrl + P: This is the standard command to open the Print menu for the current document.

• Developer Tab Tools:

• Forms in Word are typically designed using the Developer Tab, which provides access to Legacy Forms and ActiveX Controls like Check Boxes, Combo Boxes, and Text Input Fields.

• In a standard table (not a form), pressing Tab in the bottom-right cell will automatically insert a new row at the end of the table.

Q34. Answer: (d) Gorge

The correct answer is Gorge.

Key Points

• A Gorge is a deep, narrow valley with very steep, often near-vertical rocky walls, formed by the continuous erosive action of a river.

• This landform typically develops when a river cuts through a resistant mountain ridge or a plateau, emphasizing vertical downcutting over lateral erosion.

• Gorges are common in the youthful stage of a river's development, where the high velocity and steep gradient provide the kinetic energy necessary to carve through hard rock.

• Unlike regular V-shaped valleys, a gorge maintains a width at the top that is nearly equal to the width at the bottom, creating a canyon-like appearance but usually on a more constrained scale.

• Geologically, many gorges result from antecedent drainage, where a river existed before the mountain range was uplifted and maintained its course by eroding the rising land. Notable examples include the Indus Gorge and the Brahmaputra Gorge in the Himalayas.

Additional Information

• Dune:

• A mound or ridge of sand formed through Aeolian (wind) processes.

• Primarily found in deserts like the Thar or along coastlines where sand deposition is prevalent.

• Plain:

• An extensive area of low-relief, flat land.

• Can be formed by the deposition of silt (alluvial plains) or the gradual erosion of elevated landmasses.

• Moraines:

• Accumulations of dirt and rocks (glacial till) deposited by a moving glacier.

• They serve as indicators of past glacial movements and are categorized as terminal, lateral, or medial moraines based on their position.

Q35. Answer: (b) Constitutional body

The correct answer is Constitutional body.

Key Points

• The Election Commission of India (ECI) is an autonomous, permanent, and independent body established directly by the Constitution of India to ensure the conduct of free and fair elections.

• Under Article 324 of the Constitution, the power of superintendence, direction, and control of elections to the Parliament, State Legislatures, and the offices of the President and Vice-President is vested in the Commission.

• It was established on January 25, 1950, a day now commemorated annually as National Voters' Day to enhance electoral participation.

• Since its inception, the body has evolved from a single-member body to a multi-member body; currently, it consists of one Chief Election Commissioner and two Election Commissioners.

• The Commission derives its authority and existence from the foundational text of the Constitution, making it a Constitutional body rather than one created by an ordinary law of Parliament.

Additional Information

• Statutory Body

• These are organizations created by an Act of Parliament or State Legislature, such as the National Human Rights Commission (NHRC) or the Securities and Exchange Board of India (SEBI).

• Non-Constitutional / Extra-Constitutional Body

• These bodies are not mentioned in the Constitution and can be Statutory or Executive (formed by government resolution). NITI Aayog is a primary example of an executive non-constitutional body.

• Quasi-judicial Body

• While the Election Commission performs quasi-judicial functions—such as deciding on disputes related to the recognition of political parties and allotment of symbols—this is a functional attribute and not its primary legal classification.

• Constitutional Framework

• Part XV of the Indian Constitution (Articles 324 to 329) specifically deals with the election machinery and the mandate of the Commission.

Q36. Answer: (a) 0 to 1

The correct answer is 0 to 1.

Key Points

• The Human Development Index (HDI) is a statistical composite index used to measure and rank countries based on their level of human development. The scores are normalized to fall within a range of 0 to 1.

• A score closer to 1 signifies a very high level of human development, while a score closer to 0 indicates a very low level. This standardized scale allows for easy comparison across different nations and regions.

• The index was introduced by the United Nations Development Programme (UNDP) in its first Human Development Report in 1990.

• The HDI is calculated as the geometric mean of three individual dimension indices: Health, Education, and Standard of Living. Because each component index is scaled between 0 and 1, the resulting geometric mean also remains within the 0 to 1 interval.

Additional Information

• Three Dimensions of HDI:

• Health: Measured by Life Expectancy at Birth. It reflects the ability to live a long and healthy life.

• Knowledge (Education): Calculated using two indicators: Mean years of schooling for adults aged 25 years and older, and Expected years of schooling for children of school-entry age.

• Standard of Living: Measured by Gross National Income (GNI) per capita adjusted for Purchasing Power Parity (PPP) in International Dollars.

• Classification Tiers:

• Very High: Countries with a score of 0.800 or higher.

• High: Countries with a score between 0.700 and 0.799.

• Medium: Countries with a score between 0.550 and 0.699.

• Low: Countries with a score below 0.550.

• Founders: The index was primarily developed by Pakistani economist Mahbub ul Haq and Indian Nobel laureate Amartya Sen.

Q37. Answer: (d) To find a direct sea route for the spice trade

The correct answer is To find a direct sea route for the spice trade.

Key Points

• The fall of Constantinople to the Ottoman Turks in 1453 resulted in the closure of traditional overland trade routes, compelling European monarchs to seek alternative maritime paths to reach the Orient.

• During the 15th century, Indian spices such as pepper, cinnamon, cloves, and ginger were highly prized in Europe for their utility in meat preservation, flavor enhancement, and the pharmaceutical industry.

• The monopoly held by Arab merchants and Venetian traders over the Mediterranean trade routes made Eastern goods extremely expensive, driving Atlantic nations like Portugal and Spain to find a direct route to the source.

• The Portuguese explorer Vasco da Gama successfully rounded the Cape of Good Hope and reached Calicut (India) in 1498, marking the beginning of direct maritime trade between Europe and the Indian subcontinent.

Additional Information

• Industrialization:

• The Industrial Revolution did not begin until the mid to late 18th century in Britain, several centuries after the initial arrival of the Portuguese and Dutch in India.

• Initial European contact was purely mercantile and focused on commercial exchange rather than the dissemination of

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manufacturing technology.

• Governance and Culture:

• The establishment of Democratic Governance was not an objective; instead, European powers eventually established Colonial Rule and Imperialism to exploit Indian resources.

• While Christianity and Western Education were introduced later, the primary driver for the initial voyages was the accumulation of wealth through mercantilism.

Q38. Answer: (c) Henri Delaunay Trophy

The correct answer is Henri Delaunay Trophy.

Key Points

• The UEFA European Championship, commonly known as the Euro, is the most prestigious national football competition in Europe, held every four years since its inception in 1960.

• The Henri Delaunay Trophy is named in honor of Henri Delaunay, the first General Secretary of UEFA, who first proposed the idea of a pan-European football tournament in 1927.

• The original trophy was designed by Arthur Bertrand in Paris; however, a modern version was commissioned for the 2008 tournament to reflect the increased size and prestige of the competition.

• The contemporary trophy is made of Sterling Silver, stands 60 centimeters tall, and weighs approximately 8 kilograms.

• Unlike the original version, the new trophy features the names of the winning nations engraved on the back of the silver body rather than on a marble plinth.

Additional Information

• FIFA World Cup Trophy

• This is awarded to the winners of the FIFA World Cup; the current version was designed by Silvio Gazzaniga in 1974 and is made of 18-carat gold with a malachite base.

• Copa America Trophy

• The trophy presented to the champions of South America, organized by CONMEBOL; it is one of the oldest international football trophies, dating back to 1916.

• Confederations Cup Trophy

• Awarded to the winner of the FIFA Confederations Cup, a tournament that featured winners of the six continental championships; the competition was officially abolished by FIFA after the 2017 edition in Russia.

Q39. Answer: (b) Large fiscal and current account deficits

The correct answer is Large fiscal and current account deficits.

Key Points

• The 1991 Balance of Payments (BoP) crisis was primarily driven by a chronic fiscal deficit that escalated to about 8.4 percent of the GDP during 1990-91, resulting from high government expenditure and low revenue.

• A widening Current Account Deficit (CAD) occurred as India’s imports significantly exceeded its export earnings, leaving the nation unable to pay for essential goods.

• External shocks, specifically the Gulf War (1990-91), caused a sharp surge in international crude oil prices, drastically increasing India’s import bill.

• The war also led to a massive decline in remittances from Indian workers in West Asia, further straining the foreign exchange inflows.

• By June 1991, foreign exchange reserves plummeted to approximately $1.2 billion, which was only enough to cover roughly two weeks of essential imports.

• This situation forced the Indian government to airlift gold reserves to the Bank of England and the Union Bank of Switzerland as collateral to secure emergency loans.

Additional Information

• Analysis of Incorrect Options:

• Rapid growth in service exports: This trend emerged only after the 1991 reforms and the subsequent IT revolution; it was not a feature of the pre-crisis economy.

• Excess industrial production: Prior to 1991, India faced industrial stagnation and inefficiencies due to the restrictive License Raj system, rather than excess production.

• Sudden surge in foreign remittances: Remittances actually faced a steep decline during 1990-91 because of the displacement of the Indian diaspora during the Middle East conflict.

• Impact of the Crisis:

• The crisis served as the catalyst for the New Economic Policy (NEP), introduced by then-Finance Minister Dr. Manmohan Singh.

• This led to the implementation of LPG reforms (Liberalization, Privatization, and Globalization) to integrate India with the global

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economy.

• India received a bailout of $7 billion from the International Monetary Fund (IMF) and the World Bank subject to these structural economic adjustments.

Q40. Answer: (c) 12

The correct answer is 12.

Key Points

• SAMANVAY-2025 is a high-level conclave organized by the Defence Research and Development Organisation (DRDO) to strengthen the Industry-Academia-DRDO synergy.

• The event focuses on the Transfer of Technology (ToT) mechanism, which is vital for achieving the goal of Aatmanirbhar Bharat (Self-reliant India) in the defence sector.

• During this specific event, DRDO handed over 12 Licensing Agreements for Transfer of Technology (LAToT) to various Indian industry partners.

• These agreements allow private and public sector companies to utilize DRDO-developed technical know-how to manufacture and supply advanced equipment to the Indian Armed Forces.

• The technologies covered under these 12 agreements include critical components in domains like Aeronautics, Armaments, Combat Vehicles, and Electronics.

• The initiative aims to reduce the gestation period for product development and move towards a technology-led economy in the defence manufacturing landscape.

Additional Information

• DRDO (Defence Research and Development Organisation):

• Formed in 1958 by the merger of the Technical Development Establishment and the Directorate of Technical Development & Production.

• It functions under the Ministry of Defence and is headed by the Secretary, Department of Defence R&D.

• It operates a network of more than 50 laboratories dedicated to developing various defence technologies.

• Licensing Agreement for Transfer of Technology (LAToT):

• It is a formal contract where DRDO grants the right to use its patents or technical expertise to an industry partner.

• This policy promotes domestic manufacturing and helps in lowering the cost of advanced military hardware.

• It supports the Make in India mission by converting indigenous R&D into scalable industrial production.

Q41. Answer: (d) 10%

The correct answer is 10%.

Key Points

• In March 2025, the Union Ministry of Education issued a specific directive to all States and Union Territories to implement a 10% reduction in the consumption of cooking oil within the PM POSHAN (Pradhan Mantri Poshan Shakti Nirman) scheme.

• This decision was primarily driven by the revised Dietary Guidelines for Indians (DGI) issued by the Indian Council of Medical Research (ICMR) and the National Institute of Nutrition (NIN), which emphasize reducing the intake of fats to prevent lifestyle-related diseases.

• The directive targets government and government-aided schools, where the nutrition norms for hot cooked meals are strictly monitored to ensure the healthy development of school-going children.

• Prior to this cut, the nutritional norms typically prescribed 5 grams of oil for Primary (Classes I-V) and 7.5 grams for Upper Primary (Classes VI-VIII) students; the 10% cut aims to refine these portions to align with modern health standards.

• The move is part of a broader strategy by the Government of India to combat the double burden of malnutrition, addressing both undernutrition and the rising trend of childhood obesity in urban and semi-urban areas.

• By reducing oil intake, the government intends to replace "empty fat calories" with more nutrient-dense food groups, ensuring that the energy (Kcal) and protein requirements of the children are met through healthier sources.

Additional Information

• PM POSHAN Scheme Details:

• Formerly known as the National Programme of Mid-Day Meal in Schools, it was renamed in September 2021 to provide a more holistic approach to nutrition.

• It covers nearly 11.80 crore children studying in 11.20 lakh schools across India, making it one of the largest school feeding programs in the world.

• The scheme is a Centrally Sponsored Scheme, where the cost of food grains and transportation is borne by the Central Government, while other costs are shared with States.

• Nutritional Innovations:

• Alongside the oil reduction, the Union Government has been promoting the inclusion of Millets (Shree Anna) in school menus to

enhance fiber and mineral content.

• The FSSAI (Food Safety and Standards Authority of India) provides the 'Eat Right School' framework which complements these governmental directives to ensure food safety and balanced nutrition.

• Regular Nutritional Audits and the setup of School Nutrition Gardens (Kitchen Gardens) are encouraged to provide fresh, organic produce to students.

Q42. Answer: (a) Physiological density

The correct answer is Physiological density.

Key Points

• Physiological density is a specialized measure of population pressure calculated by dividing the total population of a region by its net cultivated area (also known as net sown area).

• In a country like India, where a large portion of the land is consumed by settlements, infrastructure, or is geographically unsuitable for farming, this density provides a more realistic picture of the man-land ratio than simple arithmetic density.

• It specifically highlights the carrying capacity of the available agricultural land, showing how many people are being supported by each unit of land that is actually producing crops.

• The formula for this metric is Total Population / Net Sown Area. This is critical for food security analysis because it reflects the physical limits of land productivity relative to human requirements.

• Since India has a relatively fixed net sown area (approximately 141 million hectares) and a rapidly growing population, the physiological density has been increasing significantly, indicating heightened environmental stress on arable resources.

Additional Information

• Agricultural Density:

• This measures the ratio between the total agricultural population and the net cultivated area.

• The agricultural population includes cultivators, agricultural laborers, and their immediate family members.

• It is used to determine the level of labor intensity and the degree of population dependence on the farming sector.

• Arithmetic Density:

• This is the most common measure, calculated by dividing the total population by the total land area of the country.

• According to the 2011 Census, India's arithmetic density was 382 persons per square kilometer.

• Nutritional Density:

• It is the ratio of the total population to the area under food crops specifically.

• While similar to physiological density, it excludes land used for cash crops or non-food agricultural production.

Q43. Answer: (d) Madhya Pradesh

The correct answer is Madhya Pradesh.

Key Points

• In December 2025, the Madhya Pradesh state government announced that the Veerangana Durgavati Tiger Reserve (VDTR) will be prepared to receive cheetahs before the onset of the 2026 monsoon.

• The Veerangana Durgavati Tiger Reserve was established in 2023, becoming the 7th tiger reserve in Madhya Pradesh and the 54th tiger reserve in India.

• It was formed by the amalgamation of the Nauradehi Wildlife Sanctuary and the Veerangana Durgavati Wildlife Sanctuary, creating a massive landscape across the Sagar, Damoh, and Narsinghpur districts.

• The reserve covers an area of approximately 2,339 square kilometers, providing the vast open spaces and diverse prey base required for the Project Cheetah reintroduction program.

• The state government has initiated specialized fencing, prey augmentation, and vet training to ensure the habitat is ready for the relocation of the felines from Kuno National Park or through fresh translocations.

• The landscape of Nauradehi (now part of VDTR) was scientifically identified by the Wildlife Institute of India (WII) as one of the most suitable environments for cheetahs due to its semi-arid and grassland ecology.

• Therefore, Madhya Pradesh is the correct answer.

Additional Information

• Project Cheetah and Madhya Pradesh:

• Kuno National Park: Located in Sheopur, it was the first site for the reintroduction of cheetahs in India in September 2022.

• Gandhi Sagar Wildlife Sanctuary: Situated in the Mandsaur and Neemuch districts, it is designated as the second site for cheetahs in the state.

• Connectivity: The Veerangana Durgavati Tiger Reserve acts as a vital corridor for tiger movement between Panna Tiger Reserve and Bandhavgarh Tiger Reserve.

• Eco-diversity: The reserve features Tropical Dry Deciduous Forest and is home to species like the Indian Wolf, Leopard, and

Sloth Bear.

Q44. Answer: (b) Article 368

The correct answer is Article 368.

Key Points

• Article 368, located in Part XX of the Indian Constitution, specifically details the power of Parliament to amend the Constitution and the procedure to be followed for such amendments.

• It empowers Parliament to add, vary, or repeal any provision of the Constitution through its constituent power, provided the prescribed procedure is strictly adhered to.

• An amendment bill can be introduced in either the Lok Sabha or the Rajya Sabha, but it cannot be initiated in the State Legislatures.

• The article classifies amendments into two categories: those requiring a Special Majority of Parliament, and those requiring a Special Majority plus ratification by at least half of the State Legislatures (reserved for federal provisions).

• The Supreme Court of India, in the Kesavananda Bharati case (1973), clarified that Article 368 does not permit Parliament to alter the Basic Structure of the Constitution.

Additional Information

• Article 352:

• Relates to the proclamation of a National Emergency by the President in situations where the security of India is threatened by war, external aggression, or armed rebellion.

• Article 356:

• Provides for the imposition of President's Rule in a state upon the failure of its constitutional machinery, transferring executive authority to the Union Government.

• Article 370:

• Historically provided temporary provisions and a special autonomous status to the state of Jammu and Kashmir; most of its provisions were effectively abrogated by the President in August 2019.

Q45. Answer: (d) Homogeneous

The correct answer is Homogeneous.

Key Points

• Ethyl alcohol (ethanol) and water are both polar substances. The presence of the hydroxyl (-OH) group in ethanol allows it to form strong intermolecular hydrogen bonds with water molecules.

• A homogeneous mixture is a type of mixture where the components are distributed uniformly throughout the volume, and there are no visible boundaries of separation between the substances.

• Because ethanol and water are completely miscible in all proportions, they intermix at the molecular level to form a single liquid phase. This resulting solution has the same chemical and physical properties in every part of the mixture.

• In chemistry, such a mixture is also referred to as a true solution, where the solute (ethanol) particles are less than 1 nanometer in diameter and do not settle over time or scatter light (the Tyndall effect).

Additional Information

• Heterogeneous Mixture

• Characterized by a non-uniform composition where the components remain physically distinct.

• Examples include oil and water or suspensions like chalk powder in water, where visible boundaries exist.

• Compounds

• A compound is a substance formed when two or more elements chemically combine in a fixed ratio (e.g., CO_2 or NaCl).

• Mixing ethanol and water is a physical process, not a chemical reaction; therefore, no new chemical bonds are formed to create a different compound.

• New Element

• An element consists of only one type of atom and cannot be broken down by chemical means.

• Creating a new element requires nuclear reactions (fusion or fission), not simple physical mixing of liquids.

• Miscibility and Polarity

• The rule 'like dissolves like' applies here; both water and ethanol are polar solvents, facilitating their perfect blending.

• Azeotropes: A specific mixture of ethanol (95.6 percent) and water (4.4 percent) forms an azeotrope, which boils at a constant temperature, behaving like a pure substance during distillation.

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Q46. Answer: (b) Article 19(1)(a)

The correct answer is Article 19(1)(a).

Key Points

• Article 19(1)(a) of the Constitution of India guarantees the freedom of speech and expression to all citizens, which forms the bedrock of a democratic setup.

• While the freedom of the press is not explicitly mentioned as a separate right in the Indian Constitution, it is implicitly protected under this article as an essential component of 'speech and expression'.

• The Supreme Court of India has reinforced this interpretation through various landmark judgments, stating that the right to propagate ideas and opinions via any medium, including the press, is fundamental to Article 19(1)(a).

• In the case of Romesh Thappar v. State of Madras (1950), the court held that freedom of speech includes the freedom of circulation, which is vital for the press to function effectively.

• This article ensures that the media can function as the Fourth Estate of democracy, facilitating the flow of information and holding the government accountable.

Additional Information

• Article 21:

• Guarantees the Protection of Life and Personal Liberty, stating that no person shall be deprived of their life or liberty except according to the procedure established by law.

• It has been widely expanded by the judiciary to include the right to privacy and the right to a clean environment.

• Article 22:

• Provides protection against arbitrary arrest and detention.

• It mandates that an arrested person must be informed of the grounds for arrest and produced before a magistrate within 24 hours.

• Article 32:

• Known as the Right to Constitutional Remedies, described by Dr. B.R. Ambedkar as the 'Heart and Soul' of the Constitution.

• It empowers citizens to move the Supreme Court for the enforcement of fundamental rights through writs such as Habeas Corpus and Mandamus.

• Article 19(2):

• Provides reasonable restrictions on the freedom of speech and expression on grounds like national security, public order, and sovereignty and integrity of India.

Q47. Answer: (b) It allowed programs to be written in more human-readable forms, making complex software easier to develop.

The correct answer is It allowed programs to be written in more human-readable forms, making complex software easier to develop..

Key Points

• The introduction of high-level programming languages represented a massive shift from machine language (binary code) and assembly language, which required programmers to have intimate knowledge of the computer hardware architecture.

• By utilizing English-like commands and mathematical notation, languages like FORTRAN and COBOL abstracted the complexities of the hardware, allowing developers to write instructions in a format that was much closer to natural human language.

• This abstraction significantly reduced programming errors and the time required to write code, which paved the way for the development of massive, complex software systems that were previously impossible or too tedious to manage in low-level code.

• The use of these languages necessitated the creation of compilers, which are specialized programs that translate the human-readable source code into machine code that the CPU can execute.

• High-level languages provided portability, meaning that a program written for one machine could, with minimal modification, be compiled and run on a different computer system, breaking the dependency on specific instruction set architectures.

Additional Information

• FORTRAN (Formula Translation):

• Developed by IBM in 1957 under the leadership of John Backus.

• It was the first widely used high-level language, specifically designed for scientific, engineering, and numerical calculations.

• COBOL (Common Business-Oriented Language):

• Developed in 1959 by the CODASYL committee, with significant contributions from Rear Admiral Grace Hopper.

• It was designed for business data processing, focusing on file management and report generation, and is still used in legacy systems within banking and government sectors today.

• Software Evolution:

• Prior to high-level languages, computers were primarily used by scientists and mathematicians; these languages allowed businesses and non-specialists to leverage computing power for data analysis and administration.

Q48. Answer: (d) NITI Aayog

The correct answer is NITI Aayog.

Key Points

• The National Multidimensional Poverty Index (MPI) is a comprehensive measure released by NITI Aayog, which serves as the nodal agency for its development and implementation in India.

• The index uses the globally recognized Alkire-Foster (AF) methodology, developed by the Oxford Poverty and Human Development Initiative (OPHI) and the United Nations Development Programme (UNDP), to capture overlapping deprivations.

• It evaluates poverty across three equally weighted dimensions: Health, Education, and Standard of Living, which are further broken down into 12 macro-indicators.

• Unlike traditional poverty lines based solely on consumption or income, the National MPI includes indicators such as Nutrition, Maternal Health, School Attendance, Cooking Fuel, Sanitation, Drinking Water, and Bank Accounts.

• This index is instrumental in monitoring India's progress toward Sustainable Development Goal (SDG) Target 1.2, which aims to reduce multidimensional poverty by at least half by 2030.

• The latest reports utilize data from the National Family Health Survey (NFHS) to provide granular, district-level insights into the status of poverty across the country.

Additional Information

• Bureau of Indian Standards (BIS)

• It is the national standards body of India established under the BIS Act 2016 for the harmonious development of activities of standardization, marking, and quality certification of goods.

• Union Public Service Commission (UPSC)

• A constitutional body established under Articles 315 to 323 of the Indian Constitution, responsible for conducting examinations for appointments to the services of the Union.

• Reserve Bank of India (RBI)

• India's central bank established on April 1, 1935, under the RBI Act 1934, tasked with maintaining monetary stability and regulating the nation's currency and credit system.

Q49. Answer: (b) Legislative Assembly

The correct answer is Legislative Assembly.

Key Points

• The Vidhan Sabha is the lower house of the State Legislature in India, which represents the people of the state at the provincial level.

• It is officially known as the Legislative Assembly in English. Members of this house are called MLAs (Members of the Legislative Assembly) and are chosen through direct elections based on adult suffrage.

• According to Article 170 of the Constitution of India, the maximum strength of a Legislative Assembly is fixed at 500 members, while the minimum strength is 60 members, though smaller states like Goa, Sikkim, and Mizoram have exceptions.

• The normal tenure of the Vidhan Sabha is five years, but it can be dissolved earlier by the Governor on the advice of the Chief Minister or during a state of emergency.

• The Vidhan Sabha holds more power than the upper house (where it exists) regarding Money Bills and the overall administration of the state government.

Additional Information

• Legislative Council:

• Commonly known as the Vidhan Parishad, this is the upper house of the state legislature in a bicameral system.

• It is a permanent body and not subject to dissolution; however, one-third of its members retire every second year.

• Currently, only a few Indian states like Uttar Pradesh, Bihar, Maharashtra, Karnataka, Andhra Pradesh, and Telangana have a Legislative Council.

• Council of Ministers:

• This is the executive wing of the state government, headed by the Chief Minister.

• The Council of Ministers is collectively responsible to the Legislative Assembly (Vidhan Sabha) for all their actions.

Q50. Answer: (c) Lok Adalat has the power to enforce its decisions like a civil court.

The correct answer is Lok Adalat has the power to enforce its decisions like a civil court..

Key Points

• Lok Adalats are designed for the speedy disposal of cases and follow a summary and informal procedure. They are not strictly

bound by the rigid procedural technicalities of the Code of Civil Procedure, 1908, or the Indian Evidence Act, 1872, but are guided by the principles of natural justice. Hence, statement 1 is incorrect.

• The primary function of a Lok Adalat is to facilitate a compromise or settlement between the disputing parties through conciliation and mediation. While it is a form of Alternative Dispute Resolution (ADR), it does not typically resolve disputes through formal arbitration where an arbitrator imposes a decision. Hence, statement 2 is incorrect.

• Under Section 21 of the Legal Services Authorities Act, 1987, every award made by a Lok Adalat is deemed to be a decree of a civil court. This confers the award with the same legal status as a court judgment, making it executable through the standard judicial machinery. Hence, statement 3 is correct.

• The award passed by a Lok Adalat is final and binding on all the parties involved. Furthermore, no appeal lies against the award of a Lok Adalat in any court of law to ensure the finality of the settlement. Hence, statement 4 is incorrect.

Additional Information

• Legal Framework and Scope:

• The Lok Adalat (Peoples Court) was given statutory status under the Legal Services Authorities Act, 1987, to realize the constitutional goal of Article 39A, which mandates free legal aid for the poor and weaker sections of society.

• It has jurisdiction over any case pending before any court (at the sub-judice stage) or any matter which is at the pre-litigation stage and has not yet been brought before a court.

• They can deal with civil matters and compoundable criminal offences; however, they have no jurisdiction over any matter relating to an offence not compoundable under any law.

• Composition:

• A Lok Adalat bench generally consists of a judicial officer (sitting or retired) acting as the chairman, along with two other members—usually a legal practitioner (lawyer) and a social worker experienced in ADR.

Q51. Answer: (b) Amir-i-Tuzuk

The correct answer is Amir-i-Tuzuk.

Key Points

• Alauddin Khalji, whose original name was Ali Gurshasp, was the nephew and son-in-law of Jalaluddin Khalji, the founder of the Khalji Dynasty.

• Upon the accession of Jalaluddin Khalji to the throne of Delhi in 1290 AD, he assigned significant administrative roles to his family members; Alauddin Khalji was appointed to the post of Amir-i-Tuzuk.

• The Amir-i-Tuzuk served as the Master of Ceremonies at the royal court, a position responsible for managing court protocol, organizing public ceremonies, and overseeing the arrangement of the Sultan's processions.

• This role was crucial as it placed Alauddin in constant proximity to the Sultan, allowing him to observe the inner workings of the central administration and build influence among the nobility.

• After successfully suppressing the rebellion of Malik Chajju at Kara in 1291 AD, Alauddin was further rewarded with the governorship of Kara, and later, following his raid on Bhilsa in 1292 AD, he was promoted to Ariz-i-Mamalik.

• Therefore, Amir-i-Tuzuk is the correct answer as it was the first major post he held at the court after Jalaluddin became the Sultan.

Additional Information

• Diwan-i-Arz:

• This was the Military Department of the Delhi Sultanate, responsible for the recruitment, inspection, and payment of the army.

• The head of this department was known as the Ariz-i-Mamalik, a post Alauddin held later in 1292 AD, but it was not his initial post.

• Sadr-us-Sudur:

• This office was the head of the Religious and Judicial affairs of the state.

• The Sadr-us-Sudur was responsible for enforcing Islamic Law and managing charitable endowments (waqf).

• Wazir:

• The Wazir was the Prime Minister and the head of the Diwan-i-Wizarat, which primarily dealt with Finance and Revenue.

• The Wazir was the most powerful official after the Sultan, acting as his chief advisor.

• Khalji Revolution:

• The rise of the Khalji Dynasty in 1290 AD is often termed a 'revolution' because it ended the monopoly of the Ilbari Turks over the administration and opened high offices to non-Turks and Indian Muslims.

Q52. Answer: (a) Ganga

The correct answer is Ganga.

Key Points

• The India-Bangladesh border is the fifth-longest land border in the world, stretching approximately 4,096 kilometers. It is

characterized by a complex fluvial geography where numerous rivers cross or define the international boundary.

• The Ganga River, one of the most significant transboundary rivers, serves as a natural boundary between the two nations. Specifically, it forms a portion of the border between the Murshidabad district of West Bengal in India and the Rajshahi district in Bangladesh.

• After flowing along the border, the main stream of the Ganga enters Bangladesh, where it is known as the Padma River. It eventually joins the Jamuna (the main distributary of the Brahmaputra) and later the Meghna before reaching the Bay of Bengal.

• There are 54 transboundary rivers shared between India and Bangladesh, and the management of these water resources is overseen by the Indo-Bangladesh Joint Rivers Commission (JRC), established in 1972.

Additional Information

• Brahmaputra:

• Originates from the Angsi Glacier in Tibet as the Yarlung Tsangpo.

• Enters India through Arunachal Pradesh and flows through the Assam Valley before entering Bangladesh near Dhubri.

• In Bangladesh, it is primarily called the Jamuna and does not define a major political boundary stretch like the Ganga.

• Narmada:

• Known as the Lifeline of Madhya Pradesh, it is a west-flowing river of Central India.

• It flows through Madhya Pradesh, Maharashtra, and Gujarat before emptying into the Arabian Sea via the Gulf of Khambhat.

• It is located entirely within Indian territory and has no geographical connection to Bangladesh.

• Mahanadi:

• A major river in East Central India that originates in the Sihawa mountains of Chhattisgarh.

• It flows through Chhattisgarh and Odisha and is famous for the Hirakud Dam, one of the longest earthen dams in the world.

• It drains into the Bay of Bengal through a vast delta in Odisha.

Q53. Answer: (d) Odisha

The correct answer is Odisha.

Key Points

• Pattachitra is a traditional, cloth-based scroll painting that originated in the state of Odisha, dating back to the 12th century.

• The name is derived from the Sanskrit words 'Patta', meaning 'canvas' or 'cloth', and 'Chitra', meaning 'picture'.

• These paintings are renowned for their intricate detailing, sharp lines, and the use of natural pigments derived from minerals, shells, and plants.

• The primary themes of Odia Pattachitra are centered around the Jagannath cult and the Vaishnava sect, specifically depicting Lord Jagannath, Balabhadra, and Subhadra.

• The village of Raghurajpur in Puri district is the most famous hub for this art form, where it is preserved by the traditional Chitrakar community.

Additional Information

• Regional Art Forms of other states:

• Madhya Pradesh: Home to Gond painting, which uses dots and lines to create textures, and Bagh prints, a traditional hand-block printing technique.

• Rajasthan: Famous for Phad paintings (large scroll paintings) and Pichwai art, which primarily depicts Lord Shrinathji.

• Assam: Known for its Manuscript paintings performed on Sanchi bark, often illustrating the Bhagavata Purana under the Neo-Vaishnavite tradition.

• Technical Features:

• The preparation of the Patta involves coating a cotton cloth with a mixture of chalk and tamarind seed gum to create a leathery surface.

• Artists traditionally use a hair-thin brush to execute the fine lines and do not use pencils for sketching; the outlines are drawn directly with lampblack or red paint.

Q54. Answer: (c) Laws allowing detention and punishment without trial

The correct answer is Laws allowing detention and punishment without trial.

Key Points

• The Rowlatt Act, officially known as the Anarchical and Revolutionary Crimes Act of 1919, was passed by the Imperial Legislative Council in March 1919.

• The legislation authorized the British government to imprison individuals suspected of revolutionary activities for up to two years without trial, effectively suspending the right to habeas corpus.

• Mahatma Gandhi denounced the act as a 'Black Act' because it denied basic civil liberties and judicial protection to Indians.

• To protest against this repressive measure, Gandhi launched the Rowlatt Satyagraha, which was the first nationwide movement

involving a hartal (strike) on 6 April 1919.

• The movement saw massive participation through rallies, closure of shops, and strikes in railway workshops across various Indian cities.

Additional Information

• Rowlatt Committee:

• The act was based on the recommendations of the Sedition Committee headed by Sir Sidney Rowlatt to investigate the 'seditious conspiracy' of the Indian revolutionary movement.

• Jallianwala Bagh Massacre:

• The intense protests against the Rowlatt Act and the arrest of local leaders Dr. Saifuddin Kitchlew and Dr. Satyapal eventually led to the tragic massacre at Amritsar on 13 April 1919.

• Other Historical Contexts:

• Salt Tax: This was the focal point of the Civil Disobedience Movement (1930), famously initiated by the Dandi March.

• Partition of Bengal: This event took place in 1905 under Lord Curzon, leading to the Swadeshi Movement.

• Vernacular Press Act: Enacted in 1878 by Lord Lytton, this law aimed to restrict the freedom of Indian-language newspapers.

Q55. Answer: (a) Modern Standby

The correct answer is Modern Standby.

Key Points

• Modern Standby is the technical implementation of the S0 Low Power Idle state, which was introduced to replace the traditional S3 power model in modern devices running Windows 10 and Windows 11.

• This power mode provides an Instant-on experience, allowing the system to resume from a low-power state in less than 500 milliseconds, providing responsiveness similar to a smartphone.

• The Always-Connected capability ensures that the Network Interface Card (NIC) remains active while the device is in standby, enabling background processes like Email synchronization, VoIP calls, and Windows Updates to continue.

• Unlike legacy sleep modes, Modern Standby manages power by transitioning between Active (software running) and Low Power (hardware idle) phases, utilizing the Deepest Runtime Idle Platform State (DRIPS) to maximize battery life.

• It supports a wide range of hardware configurations, including systems with Solid State Drives (SSD) and traditional Hard Disk Drives (HDD), provided they meet the specific firmware and driver requirements for S0 low power idle.

Additional Information

• S3 Sleep:

• This is a legacy ACPI state where the CPU is powered off and the system state is stored in Volatile RAM.

• It does not support background network activity or instant-on responsiveness, as the system must perform a full POST (Power-On Self-Test) sequence to wake up.

• Legacy Hibernate (S4):

• The system saves all active data from the RAM to the hiberfil.sys file on the hard drive and powers down completely.

• While it offers the highest power savings, it has the slowest wake time and does not allow for real-time updates while the system is inactive.

• Hybrid Sleep:

• Primarily used on Desktop PCs, this mode writes the session to both the RAM and the HDD/SSD simultaneously.

• It combines the speed of S3 Sleep with the data safety of Hibernate in case of a power failure, but it is not compatible with Always-Connected requirements.

Q56. Answer: (c) To monitor and manage running applications, processes and system performance

The correct answer is To monitor and manage running applications, processes and system performance.

Key Points

• Task Manager (taskmgr.exe) is a critical system monitoring utility integrated into Microsoft Windows that provides real-time information about the computers current state and resource consumption.

• Its primary purpose is to allow users to oversee and control active processes, background services, and software applications that are currently executing in the Random Access Memory (RAM).

• The utility serves as a vital troubleshooting tool by providing the End Task feature, which allows users to force-quit unresponsive or hung applications without needing to restart the entire operating system.

• It offers detailed telemetry on hardware utilization, including the Central Processing Unit (CPU) usage, Disk I/O throughput, Network bandwidth, and GPU (Graphics Processing Unit) activity.

• Historically introduced in Windows NT 4.0, it has evolved to include advanced features like Process Trees and historical resource usage data to help identify memory leaks or performance bottlenecks.

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Additional Information

• Methods of Access:

• Users can launch Task Manager instantly using the keyboard shortcut Ctrl + Shift + Esc.

• It can also be accessed via the Ctrl + Alt + Delete security screen or by right-clicking the Taskbar.

• Functional Tabs:

• Startup Tab: Enables users to manage startup impact by disabling programs that launch automatically during boot, thereby reducing startup latency.

• Performance Tab: Provides graphical displays of system metrics such as clock speed, uptime, and IP addresses.

• Users Tab: Displays resource consumption categorized by different user accounts logged into the Windows station.

• Distinct Windows Utilities:

• Credential Manager: Unlike Task Manager, this tool is specifically used to manage user passwords and login certificates.

• Windows Installer: This service, or the Microsoft Store, is the standard platform used to install new applications, rather than the monitoring interface.

Q57. Answer: (a) Capt. S.N. Ahmed

The correct answer is Capt. S.N. Ahmed.

Key Points

• The book 'Das Paise ka Postcard' is authored by Capt. S.N. Ahmed, a retired Indian Army officer, author, and theatre enthusiast. It was officially released in July 2025 at the Plaza Hotel, Begumpet, Hyderabad.

• The work is a unique collection of four fictional Hindi plays. The titular play, 'Das Paise ka Postcard', highlights the vital role of letter writing in the life of a soldier during the 1960s, when postcards were the primary thread of communication tying hearts together.

• Other plays included in the collection are 'Sandhya Tum Kahaan Ho', which follows the story of an old man with Alzheimer's, 'Baasira Mata Ki Jai', a humorous take on traditional family values, and 'Doorbell'.

• The book serves as a poignant tribute to the forgotten era of handwritten communication, contrasting the deep human connection of the past with the instant but often impersonal nature of modern digital messaging.

• The book launch was graced by notable figures, including renowned actor and director Vinay Varma, who served as the Chief Guest.

Additional Information

• Other Authors and their 2025 Releases:

• Bidyut Chakrabarty and Prakash Chand Kandpal: These academic authors co-authored a significant textbook titled 'Public Administration in India', which was also published in July 2025.

• V.S. Ravi: He released a book titled 'Confessions of a Shakespeare Addict' in 2025, which is an evocative exploration of the timeless influence of William Shakespeare's literary works.

Q58. Answer: (d) Republic Day

The correct answer is Republic Day.

Key Points

• Republic Day is celebrated every year on 26th January to honor the date on which the Constitution of India came into effect in 1950.

• While India achieved independence from British rule on 15th August 1947, it remained a Dominion until the formal adoption of its own sovereign law.

• The date 26th January was chosen for its historical significance; it was on this day in 1930 that the Indian National Congress (INC) proclaimed Purna Swaraj (Complete Independence) at the Lahore Session.

• With the enactment of the Constitution, the Government of India Act 1935 was replaced, and India officially became a Democratic Republic.

• The national celebration is marked by a massive parade at Kartavya Path (formerly Rajpath) in New Delhi, where the President of India unfurls the National Flag.

• The Drafting Committee of the Constitution was headed by Dr. B.R. Ambedkar, who is revered as the chief architect of the Indian legal framework.

Additional Information

• Constitution Day:

• Also known as Samvidhan Divas, it is celebrated on 26th November.

• This day commemorates the formal adoption of the Constitution by the Constituent Assembly in 1949, before it was legally enforced two months later.

• National Girl Child Day:

• Observed on 24th January annually.

• It was started by the Ministry of Women and Child Development in 2008 to raise awareness about inequalities faced by girls and to promote their education and health.

• National Consumer Day:

• Celebrated on 24th December in India.

• It marks the day the Consumer Protection Act, 1986 received the assent of the President, aiming to protect consumers from unfair trade practices.

Q59. Answer: (a) Chhattisgarh

The correct answer is Chhattisgarh.

Key Points

• The Saila dance is a highly popular tribal folk dance originating from the Chhattisgarh region, particularly prevalent in districts like Sarguja, Chhindwara, and Baitul.

• It is traditionally performed by the Baiga, Gond, and Yaduvanshi tribes to celebrate the post-harvest season, specifically during the Hindu month of Margashirsha (November-December).

• This dance form is characterized by the use of sticks, earning it the name Danda Nach or Stick Dance. Dancers strike their small sticks against those of their partners in a rhythmic synchronized pattern.

• The performance serves as a medium for social harmony and community bonding, as the dancers move from house to house in various villages, receiving grain or rewards as a token of appreciation.

• The movements are initially slow but gradually gain intensity and speed, often culminating in a spirited climax accompanied by traditional instruments like the Mandhar and Timki.

• There are distinct variations of this dance style, such as the Dussehra Saila, Shikhar Saila, and Dasera Saila, each featuring unique rhythmic nuances and formations.

Additional Information

• Haryana:

• Known for the Phag dance, which is performed by farmers during the month of Phalgun to celebrate the harvest and Holi festival.

• Other notable forms include the Loor dance, Daph dance, and the Gugga dance.

• Goa:

• Famous for the Fugdi and Dhalo dances, traditionally performed by women during Ganesh Chaturthi and other local religious festivals.

• The Dekhni is another unique form that combines traditional music with Western rhythms.

• Jharkhand:

• Renowned for the Chhau dance, a masked martial dance that is recognized as an Intangible Cultural Heritage by UNESCO.

• Other major tribal dances include Santhali, Karma, and Paika, which often depict tribal history and agriculture.

Q60. Answer: (a) He worked via constitutional reforms and moderate methods, respected as Gandhi’s political mentor.

The correct answer is He worked via constitutional reforms and moderate methods, respected as Gandhi’s political mentor.

Key Points

• Gopal Krishna Gokhale (1866−1915) was a distinguished leader of the Moderate faction of the Indian National Congress (INC).

• He advocated for self-government through constitutional means, emphasizing the use of petitions, dialogue, and legislative reforms to achieve political rights.

• In 1905, he founded the Servants of India Society in Pune, which aimed to train young Indians to devote their lives to the cause of social welfare and national service.

• He served as a member of the Imperial Legislative Council from 1902, where he famously criticized the British government’s budgetary policies and heavy military spending.

• Mahatma Gandhi regarded Gokhale as his political guru (mentor). Upon Gokhale’s advice, Gandhi spent his first year back in India (after returning from South Africa in 1915) traveling across the country to understand its social and political realities.

• He played a vital role in the discussions leading to the Morley−Minto Reforms (Indian Councils Act 1909), which introduced the first elements of representative government in colonial India.

Additional Information

• Salt March (1930):

• This was a major campaign of non-violent protest and Civil Disobedience led by Mahatma Gandhi against the British salt monopoly.

• The march took place from Sabarmati Ashram to Dandi, long after Gokhale’s passing.

• Armed Revolutionary Propaganda:

• This method was adopted by revolutionary nationalists like Bhagat Singh, Chandrashekhar Azad, and organizations such as the HSRA.

• They believed in using force and armed struggle to overthrow the British, which was contrary to Gokhale's Moderate philosophy.

• Swaraj Party:

• Founded in January 1923 by Chittaranjan Das and Motilal Nehru.

• The party aimed to contest elections for the Legislative Councils to obstruct British administration from within, following the suspension of the Non-Cooperation Movement.

Q61. Answer: (a) Humayun and Sher Shah Suri

The correct answer is Humayun and Sher Shah Suri.

Key Points

• The Battle of Chausa was a significant military conflict fought on June 26, 1539, between the second Mughal Emperor Humayun and the Afghan chieftain Sher Shah Suri (originally known as Farid Khan).

• The engagement took place at Chausa, a location situated on the banks of the Ganges River, near the modern-day border of Bihar and Uttar Pradesh.

• Sher Shah Suri employed superior military tactics and a surprise night attack that caught the Mughal army off guard, leading to a disastrous defeat for Humayun.

• To save his life, Humayun was forced to plunge into the Ganges River on horseback; he was rescued from drowning by a water-carrier named Nizam.

• This victory allowed Sher Shah Suri to assume the royal title of Sher Shah and laid the foundation for the establishment of the Sur Empire in Northern India.

Additional Information

• Following the defeat at Chausa, the two forces met again in the Battle of Kannauj (also known as the Battle of Bilgram) in 1540, where Humayun was decisively defeated and forced into a 15-year exile.

• Other significant historical battles involving the figures mentioned in the options include:

• Babur and Ibrahim Lodi: They fought the First Battle of Panipat in 1526, which led to the end of the Delhi Sultanate and the birth of the Mughal Empire.

• Akbar and Hemu: The Second Battle of Panipat was fought between them in 1556, confirming Akbar's control over the throne of Delhi.

• Aurangzeb and Dara Shikoh: These brothers fought the Battle of Samugarh in 1658 during the Mughal war of succession, resulting in Aurangzeb's eventual victory.

Q62. Answer: (b) Mark Phillips

The correct answer is Mark Phillips.

Key Points

• Mark Phillips, the Prime Minister of Guyana, delivered a prominent keynote address at the World Sustainable Development Summit (WSDS) 2025 held in New Delhi, India.

• The summit was organized by The Energy and Resources Institute (TERI), focusing on the theme of sustainable development and climate justice.

• During his address, he highlighted Guyana as a global leader in balancing rapid economic expansion with environmental stewardship, particularly through the use of its oil and gas revenues to fund a green transition.

• The central pillar of this approach is the Low Carbon Development Strategy (LCDS) 2030, which emphasizes maintaining Guyana's vast rainforest cover while pursuing industrial growth.

• He explained that the nation remains a net-zero carbon emitter due to its status as a High Forest Low Deforestation (HFLD) country, effectively sequestering more carbon than it produces.

• His speech exemplified the concept of growth without compromising environmental sustainability, positioning the Guyanese model as a blueprint for other resource-rich developing nations.

Additional Information

• Marina Silva:

• She serves as the Minister of Environment and Climate Change for Brazil.

• A globally recognized environmentalist, she is known for her efforts to curb deforestation in the Amazon but did not present the specific Guyanese growth address.

• Vibha Dhawan:

• She is the Director General of The Energy and Resources Institute (TERI).

• She plays a leadership role in organizing the annual World Sustainable Development Summit and promoting sustainable

agricultural and energy technologies.

• Bharrat Jagdeo:

• Currently the Vice President of Guyana and a former President.

• He is the primary architect of the original LCDS; however, the keynote at WSDS 2025 was officially delivered by the Prime Minister.

Q63. Answer: (d) 1983

The correct answer is 1983.

Key Points

• The Taj Mahal was inscribed as a UNESCO World Heritage Site in 1983 during the 7th Session of the World Heritage Committee.

• It is located on the southern bank of the Yamuna River in the city of Agra, Uttar Pradesh.

• The site was recognized under Criterion (i) as a masterpiece of human creative genius and as the jewel of Muslim art in India.

• The Taj Mahal was among the first four sites in India to be granted UNESCO status, alongside the Agra Fort, Ajanta Caves, and Ellora Caves, all inscribed in the same year.

• It is globally celebrated as a premier example of Mughal architecture, which masterfully combines elements from Islamic, Persian, and Indian styles.

Additional Information

• Historical Background:

• Commissioned by the Mughal Emperor Shah Jahan in 1632 to serve as a mausoleum for his favorite wife, Mumtaz Mahal.

• The construction of the main mausoleum was finished in 1648, while the surrounding buildings and the Charbagh (four-part garden) were completed by 1653.

• The chief architect of this monumental project is believed to be Ustad Ahmad Lahauri.

• Architectural Features:

• The entire structure is built from polished white marble brought from the quarries of Makrana, Rajasthan.

• It features exquisite Pietra Dura (parchin kari) inlay work using semi-precious stones such as lapis lazuli, jade, turquoise, and carnelian.

• The central dome reaches a height of 73 meters and is surrounded by four minarets, each over 40 meters tall, designed with a slight outward tilt to protect the main tomb from potential collapse.

Q64. Answer: (c) Western Ghats

The correct answer is Western Ghats.

Key Points

• The Western Ghats, also known as the Sahyadri, constitute a major physiographic region that receives heavy annual rainfall exceeding 200 cm, particularly along its western slopes.

• This high precipitation is a result of the Southwest Monsoon (Arabian Sea branch), which brings moisture-laden winds from the ocean toward the Indian landmass between June and September.

• The mountain range acts as a continuous physical barrier, forcing the monsoon winds to rise abruptly; this process leads to intense orographic rainfall on the windward side of the mountains.

• Specific locations within this belt, such as Agumbe in Karnataka and Mahabaleshwar in Maharashtra, frequently record annual rainfall levels between 300 cm and 600 cm.

• The dense Tropical Evergreen forests found in this region are a direct consequence of these high moisture levels and consistent rainfall patterns.

Additional Information

• Ladakh region:

• It is categorized as a high-altitude cold desert situated in the Trans-Himalayas.

• The region receives very little precipitation, often less than 10 cm annually, because it lies in the rain shadow of the Great Himalayan range.

• Thar Desert:

• Located primarily in Rajasthan, this arid region receives scant rainfall, generally ranging from 15 cm to 50 cm per year.

• The low rainfall is due to the Aravalli Range being aligned parallel to the monsoon winds and the presence of dry, descending air masses.

• Interior Deccan Plateau:

• This area is located on the leeward side of the Western Ghats, forming a significant rain shadow zone.

• As the monsoon winds cross the ghats and descend toward the plateau, they lose moisture, resulting in moderate to low rainfall

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between 60 cm and 100 cm.

Q65. Answer: (c) Engineering goods

The correct answer is Engineering goods.

Key Points

• Engineering goods remained the largest contributor to India's merchandise export basket in the early months of the financial year 2024-25, specifically accounting for a substantial 26.67% share of the total exports.

• The sector includes a wide range of products such as Industrial Machinery, Automobiles and Auto Components, Iron and Steel products, Electrical Machinery, and Medical Devices.

• According to data from the Ministry of Commerce and Industry, this sector showed resilient growth despite global geopolitical tensions, supported by the Engineering Export Promotion Council (EEPC) India.

• The performance is largely driven by the Production Linked Incentive (PLI) Scheme, which has boosted domestic manufacturing capabilities and competitive pricing in international markets.

• The Engineering goods sector is vital for India's Make in India initiative, as it represents high-value-added exports compared to raw materials or primary commodities.

Additional Information

• Crude petroleum:

• India is one of the world's largest importers of crude petroleum, importing over 80% of its domestic requirements to satisfy energy needs and feed its Refineries.

• While India is a major exporter of Refined Petroleum Products, it does not export raw crude in significant quantities, making it an incorrect choice for merchandise exports.

• Gold:

• India is a major consumer and importer of Gold, which significantly impacts the Current Account Deficit (CAD).

• Exports in this segment are primarily restricted to Gems and Jewellery rather than raw gold bullions.

• Edible oil:

• India is a net importer of Edible oils like Palm Oil, Soybean Oil, and Sunflower Oil to bridge the gap between domestic production and consumption.

• It does not constitute a major portion of India's merchandise export revenue.

Q66. Answer: (d) Dominant traits

The correct answer is Dominant traits.

Key Points

• Gregor Mendel, the Father of Genetics, conducted landmark hybridization experiments on the garden pea plant (Pisum sativum) between 1856 and 1863.

• Mendel studied seven pairs of contrasting traits, one of which was stem height, specifically comparing Tall and Dwarf varieties.

• In his monohybrid cross, Mendel mated a pure-breeding Tall (TT) plant with a pure-breeding Dwarf (tt) plant; the resulting first filial generation (F1) consisted entirely of Tall plants.

• This observation led to the Law of Dominance, which states that in a heterozygous condition (Tt), one trait (the dominant trait) completely masks or suppresses the expression of the alternative trait.

• Because the trait for tallness was expressed in the F1 generation and masked the dwarf character, tallness is categorized as a Dominant trait.

Additional Information

• Recessive traits:

• These are characters that are only expressed physically when an organism possesses two copies of the same allele (homozygous recessive, e.g., tt).

• In Mendel's height experiment, Dwarfness is the recessive trait because it remains hidden in the presence of the tall allele.

• Acquired traits:

• These refer to characteristics or variations developed by an organism during its lifetime due to environmental factors, learning, or physical use (e.g., scarring or muscle growth).

• Acquired traits do not involve changes in the germ cells (DNA) and are therefore not inheritable by the next generation.

• Hidden traits:

• This is a non-technical term often used interchangeably with recessive traits to describe genetic information that is carried in the genotype but not visible in the phenotype of a hybrid individual.

Q67. Answer: (d) United Nations

The correct answer is United Nations.

Key Points

• India's Founding Role: India is one of the original founding members of the United Nations (UN). Along with 50 other nations, India's delegation, led by Sir Arcot Ramasamy Mudaliar, signed the UN Charter on June 26, 1945 during the San Francisco Conference.

• Official Admission: Even before gaining independence from British rule in 1947, India officially joined the United Nations on October 30, 1945, after ratifying the charter, becoming one of the 51 original members of the global organization promoting peace and cooperation.

• Prior Engagement: Prior to this, India had also signed the Declaration by United Nations in Washington, D.C., on January 1, 1942, represented by Girija Shankar Bajpai, demonstrating its long-standing commitment to international cooperation.

Additional Information

• Other Global and Regional Organizations:

• OPEC (Organization of the Petroleum Exporting Countries):

• Established in 1960 in Baghdad, Iraq, to coordinate petroleum policies among member nations and ensure stable oil prices. Headquartered in Vienna, Austria. India is not a member.

• ASEAN (Association of Southeast Asian Nations):

• Established on August 8, 1967, in Bangkok, Thailand, to promote political and economic cooperation and regional stability. India is not a member but is a key dialogue partner.

• NATO (North Atlantic Treaty Organization):

• A military alliance established on April 4, 1949, by the North Atlantic Treaty for collective defense. Headquartered in Brussels, Belgium. India is not a member.

Q68. Answer: (d) Most runs in a single edition of the Women’s World Cup

The correct answer is Most runs in a single edition of the Women’s World Cup.

Key Points

• During the ICC Women’s Cricket World Cup 2025, Indian opening batter and vice-captain Smriti Mandhana created history by scoring the most runs by an Indian batter in a single edition of the tournament.

• She accumulated 434 runs in 9 innings at an impressive average of 54.25 and a strike rate of 99.08.

• With this milestone, she surpassed the previous Indian record of 409 runs, which was set by legendary former captain Mithali Raj during the 2017 World Cup.

• Mandhana’s outstanding run in the tournament included one century and two half-centuries, leading India to its historic first-ever Women’s Cricket World Cup title.

Additional Information

• Fastest Century in WODIs:

• The global record for the fastest century in women's ODIs is held by Australia’s Meg Lanning, who reached the mark in 45 balls against New Zealand in 2012.

• However, Smriti Mandhana holds the record for the fastest WODI century by an Indian, achieving it off just 70 balls against Ireland in January 2025.

• Highest Score in a Women’s World Cup Final:

• Australia’s Alyssa Healy holds the world record with her dominant 170 runs against England in the 2022 World Cup final.

• India’s Shafali Verma holds the record for the highest score by an Indian opener in a World Cup final with her 87 runs in 2025.

• Most ODI runs in a Calendar Year:

• In October 2025, Mandhana became the first woman cricketer to cross 1,000 WODI runs in a calendar year, breaking Belinda Clark’s 28-year-old record of 970 runs set in 1997.

Q69. Answer: (c) Alfred Werner

The correct answer is Alfred Werner.

Key Points

• Alfred Werner was a prominent Swiss chemist who is widely regarded as the Father of Coordination Chemistry for his groundbreaking work in the late 19th century.

• In 1893, Werner published his landmark paper, 'Contribution to the Constitution of Inorganic Compounds', which challenged existing chemical bonding theories of that era.

• He proposed the Coordination Theory, postulating that metal atoms exhibit two types of valency: Primary Valence (satisfied by negative ions and corresponding to the oxidation state) and Secondary Valence (satisfied by neutral molecules or negative ions,

corresponding to the coordination number).

• Werner was the first to recognize the spatial arrangement or stereochemistry of atoms surrounding a central metal ion, correctly predicting geometries such as octahedral and square planar.

• His systematic study of isomers in complexes like cobalt ammines provided the first definitive proof of the structural nature of inorganic compounds.

• For his revolutionary insights into the linkage of atoms within molecules, he was awarded the Nobel Prize in Chemistry in 1913, becoming the first person to win the prize for work in inorganic chemistry.

Additional Information

• John Dalton:

• An English chemist and physicist best known for pioneering the Modern Atomic Theory and identifying the Law of Partial Pressures in gases.

• Robert Bunsen:

• A German chemist famous for the invention of the Bunsen burner and for his work in emission spectroscopy, leading to the discovery of Caesium and Rubidium.

• Isaac Newton:

• An English mathematician and physicist who formulated the Laws of Motion and the Law of Universal Gravitation, laying the foundations for classical mechanics.

Q70. Answer: (c) Total Internal Reflection

The correct answer is Total Internal Reflection.

Key Points

• A mirage is a naturally occurring optical illusion where light rays bend via refraction to produce a displaced image of distant objects or the sky, commonly observed in hot deserts or on asphalt roads.

• On hot summer days, the sun heats the ground, which in turn heats the air layer in direct contact with it. This results in the air near the ground becoming rarer (lower density) compared to the cooler, denser air layers above.

• As light from a distant object (like a tree or the sky) travels downward from denser to rarer air layers, it continuously undergoes refraction, bending further away from the normal.

• When the angle of incidence for the light ray eventually exceeds the critical angle for that specific air-gradient interface, the light undergoes Total Internal Reflection (TIR).

• The reflected light then travels upward toward the observer's eye. Because the human brain assumes light travels in a straight line, it perceives the light as originating from the ground, creating an inverted image that looks like a reflection in a pool of water.

Additional Information

• Conditions for Total Internal Reflection:

• The light ray must travel from an optically denser medium to an optically rarer medium.

• The angle of incidence in the denser medium must be greater than the critical angle for the pair of media.

• Other Optical Phenomena:

• Interference: This involves the superposition of two or more light waves, resulting in a new wave pattern (e.g., colors in soap bubbles).

• Photoelectric Effect: A quantum mechanical phenomenon where electrons are emitted from a material surface upon absorbing energy from electromagnetic radiation.

• Diffraction: The bending of light around the corners or edges of an obstacle or through an aperture, characteristic of the wave nature of light.

Q71. Answer: (a) 9 km to the west

1. Rishi starts from Point A and drives 23 km towards the north. He then takes a left turn, drives 8 km, turns left and drives 28 km.

2. He then takes a left turn and drives 17 km.

3. He takes a final left turn, drives 5 km and stops at Point P

The Final Diagram,

He drives 9 km to the west in order to reach Point A again.

Hence, the correct answer is "option 1."

Q72. Answer: (d) HBE 2

The logic follows here,

Combining the results, the next cluster in the series is HBE 2.

Hence, the correct answer is "option 4"

Q73. Answer: (b) None

Given: Seven people, A, B, U, D, R, H, and J, are sitting in a row, facing north.

1. Only five people sit to the right of D.
2. Only four people sit to the left of H.
3. R is the immediate neighbour of A and D.
4. J sits to the immediate right of B

The Final Arrangement,

No, people sit between U and D.

Hence, the correct answer is " Option 2"

Q74. Answer: (b) C

Given: Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order

1. Only three boxes are kept above C.
2. Only one box is kept between D and C.
3. Only three boxes are kept between D and E.
4. E is kept at some place above C.

Position	Box
7	
6	E
5	
4	C
3	
2	D
1	

1. G is kept immediately below E.
2. A is not kept immediately above or below D.
3. F is kept at one of the places above B.

Final Arrangement:

Position	Box
7	A
6	E
5	G
4	C
3	F
2	D
1	B

Box C is kept immediately above box F.

Hence, the correct answer is 'Option 2'.

Q75. Answer: (b) ud

The logic follows here,

Hence, the correct answer is "option 2"

Q76. Answer: (d) Mother's mother

The family tree diagram is

Symbol	×	•	•	•

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Meaning	Mother	Brother	Wife	Father

Given: 'H + I * O × D – J'

Therefore, H is the mother of O, who is the mother of J. H is the mother's mother of J.

Hence, the correct answer is 'Option 4'.

Q77. Answer: (d) Zero

The logic followed here is as follows:

Given word : PERBLAD

Original Letter	**P**	**E**	**R**	**B**	**L**	**A**	**D**
Operation	− 1	• 1	− 1	− 1	− 1	• 1	− 1
New Letter	O	F	Q	A	K	B	C

The new group of letters formed is O, F, Q, A, K, B, C.

Therefore, the number of letters appearing exactly twice is zero.

Hence, the correct answer is "Option 4"

Q78. Answer: (d) wz

The logic followed here is,

Therefore, the code for month is wz.

Hence, the correct answer is "option 4"

Q79. Answer: (b) Zero

Given: Six boxes D, E, F, G, H and A are kept one over the other but not necessarily in the same order

1. Only three boxes are kept below A.
2. Only two boxes are kept between A and E.
3. No box is kept above G.

Position	**Box**
6	G
5	
4	A
3	
2	
1	E

1. H is kept at some place below F and at some place above D.

Final Arrangement:

6	**G**
5	F
4	A
3	H
2	D
1	E

Thus, the number of boxes kept between H and D is Zero.

Hence, the correct answer is 'Option 2'.

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Q80. Answer: (d) 171

The logic followed here is:

• 6 + 9 = 15

• 15 + 14 = 29

• 29 + 25 = 54

• 54 + 30 = 84

• 84 + 41 = 125

• 125 + 46 = 171

Thus, the missing term in the series is 171.

Hence, the correct answer is 'Option 4';

Q81. Answer: (c) RAFT - FTRA - TFAR

The logic followed here is,

FORT − RTFO − TROF

SIGN − GNSI − NGIS

RAFT − FTRA − TFAR,

Hence, the correct answer is " Option 3"

Q82. Answer: (a) PV – MH

The position and positional values or English Alphabets are:

PV − MH,

KQ − IC,

SY − QK,

VB − TN,

Therefore, the letter-cluster pair that is different from the others is PV − MH.

Hence, the correct answer is 'Option 1'.

Q83. Answer: (b) QTW 15

The logic follows here,

Combining the results, the cluster that replaces the question mark is QTW 15.

Hence, the correct answer is " Option 2"

Q84. Answer: (c) Sister

Given: P £ D ← M @ L ≥ U'

Let us first decode the given symbols and then draw a family tree.

Symbol	•	≥	@	£
Meaning	Wife	Brother	Father	Daughter

Therefore, P is the daughter of D and M, and L and U are also children of D and M. P is the Sister of U.

Hence, the correct answer is 'Option 3'.

Q85. Answer: (c) One

(Left) S E S I B V V R R I Y S S P B T K S A P P (Right)

Required Pattern: Vowel → Consonant → Vowel

(Left) S E S I B V V R R I Y S S P B T K S A P P (Right)

Therefore, there is only One such consonant that satisfies the given condition.

Hence, the correct answer is "Option 3"

Q86. Answer: (d) RM – IN

The position and positional values or English Alphabets are:

KS - GO,

YH - UD,

DP - ZL,

RM - IN,

Therefore, the letter-cluster pair that is different from the others is RM - IN.
Hence, the correct answer is 'Option 4'.

Q87. Answer: (b) Three

The logic followed here is,
(Left) L R I D P E Q Y H D V Q U Y L X F H A U Z (Right)
Required Pattern: Consonant - Vowel - Consonant
(Left) L R I D P E Q Y H D V Q U Y L X F H A U Z (Right)
There are a total of three such vowels in the series.
Hence, the correct answer is "Option 2"

Q88. Answer: (b) Only conclusion (I) follows

The least possible Venn diagram for the given statements is:
(I) No van is a scooter - Follows
(There is no direct relation between a van and a scooter; hence, it is true).
(II) Some scooters are trailers - Doesn't follow
(There is no direct relation established between scooters and trailers; maybe it is possible but not definite. Hence, it is false)
Only conclusion (I) follows.
Hence, the correct answer is " Option 2"

Q89. Answer: (b) Two

Given number : 8254316

Digit	8	2	5	4	3	1	6
Condition	−2	−2	+3	−2	+3	+3	−2
New Digit	6	0	8	2	6	4	4

• Digits in the new number: 6, 0, 8, 2, 6, 4, 4
• Therefore, 2 digits appear more than once.= 6 and 4
Hence, the correct answer is "Option 2".

Q90. Answer: (b) Two

Original Number: 3 7 4 9 6 8 5
Arrange the digits in ascending order:
New Number: 3 4 5 6 7 8 9

Position	1	2	3	4	5	6	7
Original	3	7	4	9	6	8	5
New	3	4	5	6	7	8	9

The digits 3 and 8 remain at the same positions in both numbers.
Therefore, the number of digits whose positions remain unchanged is 2.
Hence, the correct answer is 'Option 2"

Q91. Answer: (c) 83

The logic follows here,
• 80 + 3 = 83
• 83 + 6 = 89
• 89 + 9 = 98
• 98 + 12 = 110
• 110 + 15 = 125
Hence, the correct answer is "Option 3"

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Q92. Answer: (d) YEAR - AYER - RAEY

The logic follows here,

JAMS − MJAS − SMAJ,

Applying same logic for YEAR - AYER - RAEY,

Hence, the correct answer is " Option 4"

Q93. Answer: (a) 138, 153

The logic followed here is:

Logic: Second Number = First Number + 15

For the first pair 89 : 104

=> 89 + 15 = 104

For the second pair 157 : 172

=> 157 + 15 = 172

Applying the same logic to the options:

In Option 1

138 : 153

=> 138 + 15 = 153

Hence, the correct answer is 'Option 1'.

Q94. Answer: (b) D

Given:Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order

1. Only three boxes are kept below D.
2. Only F is kept above G.
3. Only two boxes are kept between D and C.

Position	Box
7	F
6	G
5	
4	D
3	
2	
1	C

1. B is kept at some place below A and some place above E.

Final Arrangement:

7	F
6	G
5	A
4	D
3	B
2	E
1	C

Thus, the box kept immediately above B is D.

Hence, the correct answer is 'Option 2'.

Q95. Answer: (c) DFJ

The position and positional values of English Alphabets are:

KMP

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QSV
FHK
DFJ
This cluster does not follow the (+2, +3) pattern.
Therefore, the letter cluster that is different from the others is DFJ.
Hence, the correct answer is 'Option 3'.

Q96. Answer: (a) YXW−SRQ

The logic followed here is:
VUT-PON:
TSR-NML:
Applying the same logic,
The resulting pair is YXW-SRQ.
Hence, the correct answer is "option 1"

Q97. Answer: (a) Only conclusion (I) follows

The least possible Venn diagram for the given statements is:
(I) Some pens are stands - Follow
(Some pens are markers, and all markers are Stand. Hence, Some pens are stands is true)
(II) All stands are markers - Doesn't follow
All markers are stands, but all stands are markers is may be possible but not definite. Hence, it is false)
Only conclusion (I) follows
Hence, the correct answer is " Option 1"

Q98. Answer: (a) 4 and 2

The logic followed here is,
BODMAS Table:
Given Equation: (6 × 14) ÷ 2 + 18 × 4 - 28 ÷ 7 + 34 = 87
Interchanging 4 and 2 and applying BODMAS rule,
= 84 ÷ 4 + 18 × 2 − 28 ÷ 7 + 34
= 21 + 18 × 2 − 4 + 34
= 21 + 36 − 4 + 34
= 21 + 36 + 34 − 4
= 91− 4
= 87
Since LHS = RHS, the equation is correct after interchanging these numbers.
Hence, the correct answer is "option 1"

Q99. Answer: (a) T

Given : Seven people, S, T, I, C, K, E and R, are sitting in a row, facing north.
1. Only two people sit between C and I.
2. Only K sits to the right of E.
3. Only one person sits between I and E.
4. S sits at some place to the right of R but at some place to the left of T.
Final Arrangement:
Therefore, T sits third from the right end of the line.
Hence, the correct answer is "option 1"

Q100. Answer: (d) RTV 14

The logic followed here is,
Combining the results for letters and numbers, the next cluster in the series is RTV 14.
Hence, the correct answer is " Option 4"

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