RRB NTPC (UG) CBT-I Official Paper (Held On: 02 Sept, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Which of the following is NOT a part of chemical weathering?

(a) Frost Action
(b) Hydration
(c) Oxidation
(d) Carbonation

Q2. In which of the following years was the Aajeevika - Deendayal Antyodaya YojnaNational Rural Livelihoods Mission (DAY-NRLM) launched by the Ministry of Rural Development (MoRD), Government of India?

(a) 2011
(b) 2016
(c) 2007
(d) 2014

Q3. What was the ultimate promise made by Bhagirath Majhi to the Santhals if they followed his teachings?

(a) Restoration of tribal kingdoms
(b) Access to modern education and jobs
(c) Complete independence from British rule
(d) Land restoration and divine protection

Q4. What is the purpose of the High Endurance Autonomous Underwater Vehicle (HEAUV) developed by DRDO's Naval Science and Technological Laboratory (NSTL)?

(a) Underwater surveillance
(b) Surface-to-air missile deployment
(c) Submarine crew training
(d) Deep-sea oil exploration

Q5. Colonial economic policies created a skewed distribution of income and wealth in Indian society. Which of the following is a key indicator of income inequality in colonial India?

(a) Unequal land ownership patterns
(b) High literacy rate among workers
(c) Uniform wages across sectors
(d) Equitable distribution of irrigation

Q6. What is the total number of inhabited islands in the Andaman and Nicobar Islands, as of May 2025?

(a) Less than 14
(b) 22
(c) 18
(d) More than 30

Q7. Which of the following dynasties was NOT involved in the struggle for the control of the prosperous city of Kannauj in northern India?

(a) Pratihara
(b) Pallava
(c) Pala
(d) Rashtrakuta

Q8. Optical fibres work on the principle of _____.

(a) reflection only
(b) refraction only
(c) total internal reflection
(d) total internal refraction

Q9. What is the main function of sclerenchyma, a plant tissue composed of dead cells with extremely thick lignified walls?

(a) To help hold the flower parts together in a plant
(b) To provide mechanical support and strength to the plant
(c) To store food and other materials such as resins, mucilage and latex in the plant
(d) To transport water, nutrients and sugars throughout the plant

Q10. Where was the headquarters of the Home Rule League founded by Bal Gangadhar Tilak located?

(a) Ajmer
(b) Patna
(c) Surat
(d) Pune

Q11. Which of the following terms describe a change in the DNA sequence resulting in changes in the genotype and the phenotype of an organism?

(a) Segregation
(b) Mutation
(c) Dominance
(d) Transcription

Q12. Who is the author of the book ‘The History and Stars of the World’s Greatest Sporting Event: From Athens 1896 to Paris 2024’, launched at New Delhi World Book Fair, 2025?

(a) Amit Bose
(b) Vijayan Bala
(c) Digvijay Singh Deo
(d) Abhinav Bindra

Q13. The foreign exchange crisis forced India to seek external support. Which institution provided India a loan during the 1991 crisis?

(a) ADB
(b) World Bank
(c) WTO
(d) IMF

Q14. In 2025, which State Government launched the 'RISE' app for digital monitoring of child vaccinations, enhancing training for health workers to improve immunisation coverage?

(a) Uttarakhand
(b) Bihar
(c) Uttar Pradesh
(d) Jharkhand

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Q15. Which of the following is the primary objective of the Right to Information (RTI) Act, 2005?

(a) To promote transparency and accountability in government functioning
(b) To regulate foreign investment in India
(c) To control corruption in the judiciary
(d) To ensure reservations for backwards classes

Q16. Rohilla chief, Najib-ud-Daula, played a key role in the ____.

(a) Third Battle of Panipat
(b) Mysore wars
(c) Anglo-Maratha wars
(d) Decline of Bengal

Q17. The partition of Bengal officially came into force in the year _____.

(a) 1905
(b) 1948
(c) 1919
(d) 1912

Q18. Who was honoured with the Rammohan Mission Purashkar 2025 for emphasising ISRO's role in national security?

(a) G Madhavan Nair
(b) V Narayanan
(c) K Sivan
(d) S Somanath

Q19. Vijender Gupta, who became the Speaker of the Delhi Assembly in 2025, is the MLA from which of the following constituencies?

(a) Karol Bagh
(b) Patparganj
(c) Greater Kailash
(d) Rohini

Q20. Which of the following statements is correct regarding the Tenth Schedule of the Indian Constitution?

(a) It deals with the allocation of seats in the Rajya Sabha.
(b) It defines the distribution of powers between the Union and States.
(c) It contains provisions regarding Official Languages.
(d) It provides for disqualification of members on grounds of defection.

Q21. Which statement best describes a key feature of a Public-Private Partnership (PPP)?

(a) Government and private entities share responsibilities and risks efficiently.
(b) The public partner fully finances a project, while the private partner has no risk.
(c) PPPs are only used for purely social (non-commercial) projects.
(d) Only public sector entities can participate in PPPs.

Q22. Where was the 8th Edition of the Indian Ocean Conference in February 2025 held?

(a) Muscat, Oman
(b) Cairo, Egypt
(c) Manila, Philippines
(d) Perth, Australia

Q23. Which type of land is most suitable for agriculture in India?

(a) Mountainous land
(b) Rocky and arid land
(c) Forest land
(d) Level alluvial land

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Q24. What is the primary function of the Taskbar in Windows7?

(a) To shut down the computer
(b) To install new software
(c) To display the system BIOS
(d) To show open programs and allow quick access to them

Q25. In May 2025, which Indian Chief Minister announced naming a medical college after Ahilyabai Holkar in 2025?

(a) Yogi Adityanath
(b) Uddhav Thackeray
(c) Bhupesh Baghel
(d) Ashok Gehlot

Q26. Which Windows feature helps to quickly locate a specific file in a large folder?

(a) Search box in File Explorer
(b) Right-click → Delete
(c) Task Manager
(d) Control Panel

Q27. Who among the following is the appointing authority of District Judges in India?

(a) Prime Minister
(b) President of India
(c) Governor of the state
(d) Chief Justice of India

Q28. Which major initiative was highlighted by the New Delhi government to mark its first 100 days in office, as detailed in the report titled 'Kaam Karne Wali Sarkar: 100 Din Seva Ke'?

(a) Launch of a new metro line
(b) Introduction of a universal basic income
(c) Inauguration of a new legislative building
(d) Presentation of a report card highlighting achievements

Q29. Which of the following is NOT a mode of acquiring Indian citizenship under the Citizenship Act, 1955?

(a) By descent
(b) By adoption
(c) By registration
(d) By birth

Q30. Which of the following languages was granted classical status by the Government of India in 2005, following Tamil?

(a) Telugu
(b) Kannada
(c) Sanskrit
(d) Malayalam

Q31. Which of the following best reflects Judicial Activism?

(a) Declaring elections null and void
(b) Passive interpretation of laws
(c) Voluntary interference by the judiciary in public interest
(d) Only enforcing existing laws strictly

Q32. Which of the following organisations inaugurated the Quantum Technology Research Centre (QTRC) at Metcalfe House, Delhi, in May 2025?

(a) Indian Space Research Organisation (ISRO)
(b) Defence Research and Development Organisation (DRDO)
(c) Indian Institute of Science (IISc)
(d) Bhabha Atomic Research Centre (BARC)

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Q33. The Tendulkar Committee revised India's methodology for measuring poverty. As per the Tendulkar Committee, which criterion is considered to measure poverty?

(a) Calorie intake
(b) Employment status
(c) Consumption expenditure
(d) Income

Q34. Biogas plants are most commonly used in which sector in rural India?

(a) Industrial use
(b) Household cooking and lighting
(c) Transportation
(d) Iron smelting

Q35. Which state notified the Tsarap Chu Conservation Reserve under the Wildlife (Protection) Act, 1972 to protect high-altitude biodiversity in 2025?

(a) Sikkim for Himalayan red panda conservation purposes
(b) Himachal Pradesh to secure snow leopard habitats
(c) Uttarakhand to protect alpine medicinal plant species
(d) Arunachal Pradesh to conserve high-altitude wetlands

Q36. Which movie received the Best Picture honour at the 97th Academy Awards in 2025?

(a) Anora
(b) The Brutalist
(c) Conclave
(d) Dune: Part Two

Q37. The Vadhavan Port is under development all-weather Greenfield deep draft major port in _____.

(a) Tamil Nadu
(b) Maharashtra
(c) Gujarat
(d) Kerala

Q38. Which river originates from the Amarkantak Plateau in Madhya Pradesh and flows westward?

(a) Son
(b) Narmada
(c) Tapi
(d) Godavari

Q39. Gitanjali, a famous collection of poems, was originally written in which of the following languages?

(a) English
(b) Urdu
(c) Hindi
(d) Bengali

Q40. Which of the following organisations launched the Fiscal Health Index for India in 2025?

(a) Ministry of Finance
(b) Finance Commission
(c) NITI Aayog
(d) Reserve Bank of India

MATHEMATICS

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Q41. The LCM of the numbers 10.8 and 0.06 is:

(a) 10.8
(b) 108
(c) 1.08
(d) 0.108

Q42. Simplify the following

$3((6/3)x^2-21x+18)-6(x^2+5x-18)$

(a) −93x − 162
(b) 93x − 162
(c) 93x + 162
(d) −93x + 162

Q43. A company offers a scheme discount of 'buy 5 get 3 free' offer on shirts. Find the discount percentage.

(a) 36.3%
(b) 39.3%
(c) 30%
(d) 37.5%

Q44. The average weight of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 75 kg and 36 kg is:

(a) 50.2 kg
(b) 53.2 kg
(c) 52.2 kg
(d) 51.2 kg

Q45. Kushal and Brijesh together invested Rs. 75,100 in a business. At the end of the year, out of a total profit of Rs. 16,000, Brijesh's share was Rs. 4,400. What was the difference between their investments?

(a) Rs. 34,043
(b) Rs. 35,768
(c) Rs. 34,385
(d) Rs. 33,795

Q46. In triangle ABC, BD ? AC at D and angle DBC = 72°. E is a point on BC such that angle CAE = 56°. What is the measure of angle AEB?

(a) 69°
(b) 65°
(c) 71°
(d) 74°

Q47. The product of two consecutive natural numbers is 240. The greater of the two numbers is:

(a) 35
(b) 23
(c) 19
(d) 16

Q48. The simple interest on a certain sum for 72/3 years at the rate of 5.4% per annum is Rs. 4,347. What will be the amount payable on the same sum at the rate of 7.5% per annum simple interest in 44/5 years?

(a) Rs. 14,282
(b) Rs. 14,280
(c) Rs. 14,273
(d) Rs. 14,272

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Q49. Find the mean proportional between 26 and 104.

(a) 53
(b) 52
(c) 51
(d) 49

Q50. Mahita is painting the four walls of her study room, which is shaped like a cube with a side length of 18.5 feet. What is the total area she needs to paint (in square feet)?

(a) 1385
(b) 1358
(c) 1396
(d) 1369

Q51. The income of Raman is Rs. 44,200. He saves 31% of his income. If his income increases by 22% and expenditure increases by 50%, then his savings will:

(a) increase by Rs. 5,521
(b) decrease by Rs. 5,525
(c) increase by Rs. 5,530
(d) decrease by Rs. 5,524

Q52. If the 6-digit number N46M66 is divisible by 11, then which of the options below can give a possible correct relation between M and N?

(a) M - N = 1
(b) M = N
(c) M + N = -2
(d) M - N = 2

Q53. Train A leaves station M at 6:30 AM and reaches station N at 3:30 PM on the same day. Train B leaves station N at 8:30 AM and reaches station M at 1:30 PM on the same day. Find the time when trains A and B meet.

(a) 11:30 AM
(b) 11:00 AM
(c) 10:50 AM
(d) 12:00 PM

Q54. A shopkeeper lists the price of a fan at 50% above its cost price and offers a 30% discount on its list price. If he earns a profit of Rs. 86, then what is the list price (in Rs.) of the fan?

(a) 2,444
(b) 2,580
(c) 2,825
(d) 2,386

Q55. The average weight of Ketan, Tushar and Salil is 46 kg. If the average weight of Ketan and Tushar is 36 kg and that of Tushar and Salil is 44 kg, then the weight of Tushar (in kg) is:

(a) 37
(b) 22
(c) 42
(d) 32

Q56. Simplify $\sqrt{289}+\sqrt{0.04}-\sqrt{5.76}$

(a) 1.78
(b) 11.65
(c) 14.8
(d) 3.07

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Q57. A bus travelling at 99 km/hr completes a journey in 20 hours. What should its speed be to cover the same distance in 12 hours?

(a) 165 km/hr
(b) 159 km/hr
(c) 168 km/hr
(d) 156 km/hr

Q58. 8 years ago, the age of a father was 21 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

(a) 13
(b) 11
(c) 8
(d) 17

Q59. By how much is 65% of 55 greater than 2/5 of 25?

(a) 19.75
(b) 25.75
(c) 22.75
(d) 23.75

Q60. The H.C.F. and the L.C.M. of two numbers are 3 and 276 respectively. If one of the numbers is 69, find the other one.

(a) 12
(b) 35
(c) 100
(d) 110

Q61. What smallest number should be added to 15335 so that the sum is completely divisible by 79?

(a) 71
(b) 68
(c) 70
(d) 65

Q62. If the shape of a water pipe is a rectangle with dimensions 5 m and 3 m and if water runs out of it at the speed of 36 km/hr, then what is the volume (in m3) of the water that passed through the pipe in 12 minutes?

(a) 216000
(b) 108000
(c) 5400
(d) 54000

Q63. Two pipes can fill a cistern, individually, in 40 minutes and 14 minutes, respectively. There is a pipe located at the bottom of the cistern to empty it. If all the three pipes are opened simultaneously, then the empty cistern gets filled in 20 minutes. How long will the pipe at the bottom of the tank take to empty the completely filled cistern if no other pipe is then open?

(a) 207/13 minutes
(b) 217/13 minutes
(c) 197/13 minutes
(d) 227/13 minutes

Q64. I bought two toy guns for Rs. 1,200. I sold the first one at a loss of 9% and the second at a gain of 16%. If, on the whole I made neither a loss nor a gain, find the cost price (in Rs.) of the first toy gun.

(a) 788
(b) 792
(c) 768
(d) 752

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Q65. Successive discounts of 5% and 40% are equivalent to a single discount of:

(a) 41%
(b) 45%
(c) 43%
(d) 42%

Q66. A can lay railway track between two given stations in 20 days and B can do the same job in 16 days. With the help of C, they did the job in 3 days only. Then, C alone can do the job in

(a) 428/53 days
(b) 1128/53 days
(c) 1228/53 days
(d) 1428/53 days

Q67. Sapna invested Rs. 22,500 on simple interest, partly at 7% per annum and partly at 5% per annum. If she earns equal interests from the two investments after 3 years, then find the sum invested at 7% per annum (in Rs.).

(a) 9,373
(b) 9,374
(c) 9,376
(d) 9,375

Q68. Ravi started a business by investing Rs. 50,000. After six months, Raju joined him and invested an amount of Rs. 1,00,000. In one year since Ravi invested, they earned a profit of Rs. 63,000. What is Raju's share of the profit?

(a) Rs. 32,500
(b) Rs. 31,000
(c) Rs. 31,500
(d) Rs. 32,000

Q69. Find the value of (sec ^4A-sec²A)/(cot ^4A+cot²A)× (cosec^4A-cosec²A)/(tan²A+tan ^4A)+cot²A

(a) cot²A
(b) 0
(c) 1
(d) cosec²A

Q70. Find the value of 24^(-10) ÷ 24^(16) × 24^(-7).

(a) 24^(-43)
(b) 24^(-33)
(c) 24^(-38)
(d) 24^(-*31)

GENERAL INTELLIGENCE AND REASONING

Q71. In a certain code language, 'SAID' is coded as '3517' and 'AERO' is coded as '2146'. What is the code for 'A' in the given code language?

(a) 5
(b) 2
(c) 1
(d) 6

Q72. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. Only two boxes are kept between E and B. Only A is kept above C. No box is kept below B. G is kept at some place below F but at some place above D. How many boxes are kept below F?

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

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Q73. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) KMH
(b) IKE
(c) GIC
(d) MOI

Q74. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

Some Circular Saws are Trowels.

Some Trowels are Power Saws.

Conclusions:

I: Some Circular Saws are Power Saws.

II: No Circular Saws are Power Saws.

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

Q75. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All soaps are gels.

All soaps are conditioners.

Conclusions:

(I) Some gels are conditioners.

(II) All conditioners are soaps.

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

Q76. A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table. Only two people sit between D and A, when counted from the left of A. Q sits third to the left of S. R sits to the immediate right of S. R sits second to the left of D. B is not an immediate neighbour of Q. Who sits third to the right of C?

(a) D
(b) S
(c) R
(d) A

Q77. A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table. B sits third to the left of Q. R sits second to the left of S. Q is an immediate neighbour of both A and R. C is not an immediate neighbour of B. How many people sit between D and R, when counted from the right of D?

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

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Q78. DREAM is related to IWJFR in a certain way based on the English alphabetical order. In the same way, FILED is related to KNQJI. To which of the given options is BLOWN related, following the same logic?

(a) GQTBS
(b) FPSAR
(c) HRUCT
(d) GRSCS

Q79. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

LOH19 MPI27 NQJ35 ORK43 ?

(a) PSK50
(b) PSL50
(c) PSL51
(d) PSK51

Q80. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) ERM
(b) BFJ
(c) SWA
(d) UYC

Q81. Seven boxes G, H, I, J, K, L and S are kept one over the other but not necessarily in the same order. Only three boxes are kept below S. Only two boxes are kept between S and L. Only G is kept below J. H is kept at some place below K and at some place above J. I is kept above K. How many boxes are kept between K and J?

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

Q82. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 5237648, how many digits will appear more than once in the new number thus formed?

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

Q83. Mr. Bravo starts from Point A and drives 1 km towards the west. He then takes a left turn, drives 2 km, turns left and drives 5 km. He then takes a left turn and drives 7 km. He takes a final left turn, drives 4 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 4 km to the west
(b) 5 km to the south
(c) 2 km to the north
(d) 6 km to the east

Q84. 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 W related to R if W $ A @ C * D = R?

(a) Brother
(b) Father

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(c) Mother's father
(d) Mother's mother's brother

Q85. What will come in place of the question mark (?) in the following equation, if '+' and '×' are interchanged and '−' and '÷' are interchanged?

42 ÷ 11 + 3 × 18 − 2 = ?

(a) 36
(b) 24
(c) 30
(d) 18

Q86. If 1 is added to each odd digit and 4 is subtracted from each even digit in the number 6854376, what will be difference between the highest and lowest digits in the new number thus formed?

(a) 6
(b) 7
(c) 8
(d) 4

Q87. Each of the digits in the number 5368794 is arranged in the ascending order from left to right. What will be the sum of the digits that are first from the left and first from the right in the new number thus formed?

(a) 10
(b) 9
(c) 12
(d) 7

Q88. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

IGE 16, LJH 21, OMK 26, RPN 31, ?

(a) UYX 36
(b) USQ 36
(c) VXY 28
(d) VYW 36

Q89. Kasish starts from Point A and drives 10 km towards south. She then takes a left turn, drives 6 km, turns left and drives 11 km. She then takes a left turn and drives 7 km. She takes a final left turn, drives 1 km and stops at Point P. How far (shortest distance) and towards which direction should she drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 1 km to east
(b) 2 km to east
(c) 1 km to west
(d) 2 km to west

Q90. What should come in place of the question mark (?) in the given series?

13 29 55 113 223 ?

(a) 494
(b) 449
(c) 498
(d) 489

Q91. Piyush is ranked 11th from the top and 29th from the bottom in his class. How many students are there in the class?

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

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Q92. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the pair in which the numbers are related in the same way as are the numbers of the following pairs.

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

12, 146

8, 66

(a) 6, 34
(b) 11, 123
(c) 7, 49
(d) 4, 66

Q93. 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.

BLOW - WLBO - LOBW

LEAF - FELA - EALF

(a) MOVE - EOMV - VOME
(b) TOUR - OTUR - ROUT
(c) CLAW - CALW - WALC
(d) FANG - GAFN - ANFG

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

(Left) % 9 % 2 7 5 & $ * 5 © 6 1 1 * € 4 # 1 7 3 @ (Right)

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

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

Q95. 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.

TOES - SETO - TEOS

CLAP - PACL - CALP

(a) CALF - FLCA - ALCF
(b) RUST - RSUT - TSUR
(c) TUNE - UNTE - UNET
(d) MICK - KCMI - MCIK

Q96. What should come in place of the question mark (?) in the given series?

789 799 800 810 811 821 822 ?

(a) 832
(b) 833
(c) 831
(d) 823

Q97. In a certain code language, ‘MUGS’ is coded as ‘4627’ and ‘UNIT’ is coded as ‘1375’. What is the code for ‘U’ in the given code language?

(a) 5
(b) 6
(c) 1
(d) 7

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Q98. What should come in place of the question mark (?) in the given series?

31 32 34 38 46 ?

(a) 63
(b) 64
(c) 61
(d) 62

Q99. 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 letter-cluster pair 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 pair.)

(a) FH-HJ
(b) IK-KM
(c) MO-OQ
(d) RT-TB

Q100. Refer to the following number and symbol series and answer the question that follows. All numbers are single-digit. Counting to be done from left to right.

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

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

(a) 4
(b) 7
(c) 6
(d) 5

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) Frost Action

The correct answer is Frost Action.

Key Points

• Frost Action is a physical weathering process where water enters cracks in rocks, freezes, and expands, causing the rock to fracture and break apart. It does not involve chemical changes, making it a part of physical weathering and not chemical weathering.

• Hydration: This is a chemical weathering process in which minerals absorb water and undergo chemical changes, often leading to expansion and weakening of the rock. Hence, this is a part of chemical weathering.

• Oxidation: This chemical weathering process involves the reaction of oxygen with minerals, particularly iron, forming oxides (e.g., rust). It weakens the rock over time. Hence, this is a part of chemical weathering.

• Carbonation: This is a chemical weathering process where carbon dioxide reacts with water to form carbonic acid, which then

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dissolves minerals like calcium carbonate in rocks such as limestone. Hence, this is a part of chemical weathering.

• Thus, Frost Action is NOT a part of chemical weathering as it involves physical processes rather than chemical reactions.

Additional Information

• Physical Weathering:

• Physical weathering involves the breakdown of rocks through mechanical processes such as temperature changes, abrasion, and freeze-thaw cycles.

• Frost Action: A common physical weathering process, particularly in cold climates, where water freezes inside cracks and expands, breaking the rock apart.

• Other processes include thermal expansion, exfoliation, and abrasion caused by wind, water, or glaciers.

• Chemical Weathering:

• Chemical weathering involves the decomposition or alteration of rocks due to chemical reactions between minerals and external agents like water, oxygen, and acids.

• Hydration: Minerals absorb water, causing structural changes, expansion, and weakening of the rock.

• Oxidation: Oxygen reacts with iron or other minerals to form oxides, leading to rust formation and weakening of rocks.

• Carbonation: Carbonic acid dissolves minerals like calcium carbonate, especially in limestone and marble, leading to features like caves and sinkholes.

• Key Differences Between Physical and Chemical Weathering:

• Physical Weathering: Does not alter the chemical composition of rocks; examples include frost action and abrasion.

• Chemical Weathering: Alters the chemical composition of rocks, leading to decomposition; examples include hydration, oxidation, and carbonation.

• Both types of weathering work together to break down rocks and form soil over time.

• Examples of Chemical Weathering:

• Hydration: Feldspar minerals in granite absorb water and transform into clay minerals.

• Oxidation: Iron-rich minerals in basalt react with oxygen to form rust.

• Carbonation: Carbon dioxide in rainwater dissolves limestone, creating caves and karst topography.

Important Points

• Impact of Weathering:

• Weathering contributes to soil formation, nutrient cycling, and landscape modification.

• It can weaken structures like buildings and bridges over time, requiring maintenance and reinforcement.

• Applications of Weathering Study:

• Understanding weathering processes helps in construction planning and selecting materials resistant to weathering.

• It assists geologists in studying the history of landscapes and predicting geological hazards like landslides.

Q2. Answer: (a) 2011

The correct answer is 2011.

Key Points

• Aajeevika - Deendayal Antyodaya Yojna, also known as the National Rural Livelihoods Mission (DAY-NRLM), was launched in June 2011 by the Ministry of Rural Development (MoRD), Government of India.

• The mission aims to create efficient and effective institutional platforms for the rural poor, enabling them to increase household income and improve their quality of life.

• DAY-NRLM was launched as a flagship program to reduce poverty by enabling access to gainful employment through skill development, sustainable livelihoods, and opportunities for self-employment.

• The program primarily focuses on promoting women-led self-help groups (SHGs) and building social capital in rural areas.

• The mission targets the Below Poverty Line (BPL) population, emphasizing inclusivity and community-driven models for poverty alleviation.

Additional Information

• Objectives of DAY-NRLM:

• The mission aims to enhance access to financial resources, including loans, insurance, and savings for rural poor households.

• It seeks to promote sustainable livelihood opportunities through skill development, entrepreneurship, and market linkages.

• The program works to strengthen the social capital of rural areas by promoting women-led SHGs, federations, and community networks.

• Key Features:

• Focus on women empowerment: At least one woman from each poor household is encouraged to join SHGs.

• Implementation is based on the principle of community participation, where local organizations play an active role in

decision-making.

• The program emphasizes capacity building for rural communities and institutions to ensure long-term impact.

• It uses a targeted approach to identify and assist the poorest households across rural India.

• Achievements:

• By 2023, the mission has successfully mobilized over 8 crore households into SHGs.

• It has facilitated access to credit worth billions to SHGs, enabling them to start small businesses and improve livelihoods.

• Other Poverty Alleviation Programs:

• Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): Provides wage employment opportunities.

• Pradhan Mantri Awaas Yojana - Gramin: Focuses on providing housing for rural poor households.

• National Social Assistance Programme (NSAP): Offers pensions to elderly, widows, and disabled individuals in rural areas.

Important Points

• Historical Background:

• DAY-NRLM replaced the earlier Swarna Jayanti Gram Swarozgar Yojana (SGSY), which was operational from 1999 to 2011.

• SGSY faced challenges related to targeting beneficiaries and institutional inefficiencies, which led to the need for a revamped program.

• Global Context:

• DAY-NRLM aligns with the United Nations Sustainable Development Goals (SDGs), particularly Goal 1 (No Poverty) and Goal 5 (Gender Equality).

• The mission contributes to India's efforts to achieve inclusive growth and reduce inequality in rural areas.

Q3. Answer: (d) Land restoration and divine protection

The correct answer is Land restoration and divine protection.

Key Points

• Bhagirath Majhi, a prominent leader of the Santhal community, is remembered for his efforts to unite the Santhals and restore their rights and dignity.

• He promised the Santhals the restoration of their ancestral lands, which were being exploited and taken away during the British colonial period through oppressive laws and systems like Zamindari.

• In addition to land restoration, Bhagirath Majhi also sought to provide the Santhals with a sense of divine protection. His teachings often intertwined spirituality and resistance, motivating the Santhals to fight against exploitation and injustice.

• The promise of land restoration and divine protection was crucial in rallying the Santhals to unite under Bhagirath Majhi's leadership to resist the oppression they faced under the British and local landlords.

• This promise of land rights and spiritual assurance resonated deeply with the Santhals, whose lives were closely tied to their ancestral lands and indigenous beliefs, making it a compelling call for resistance.

Additional Information

• Santhal Rebellion (1855-1856):

• The Santhal Rebellion was one of the early tribal uprisings against British colonial rule and the exploitative practices of landlords and moneylenders.

• It was led by Sidhu, Kanhu, Chand, and Bhairav Murmu, alongside leaders like Bhagirath Majhi.

• The rebellion arose due to the loss of ancestral lands, forced labor, and exploitation under the Zamindari system.

• Land Rights:

• For the Santhals, land was not only a source of livelihood but also held spiritual significance, as they believed in living in harmony with nature.

• The alienation of tribal lands by British and non-tribal landlords created economic hardships and cultural dislocation for the Santhals.

• The promise of land restoration was a key rallying point for tribal uprisings, as it symbolized the return of their dignity and way of life.

• Religious Beliefs:

• Santhals follow a nature-based religion, worshiping Marang Buru (Great Spirit) and other deities associated with nature and agriculture.

• Bhagirath Majhi's emphasis on divine protection resonated with the Santhals' spiritual beliefs, further strengthening their resolve to fight against oppression.

• The blending of spiritual guidance and political resistance was a unique feature of tribal movements like the one led by Bhagirath Majhi.

• British Colonial Policies:

• The British introduced exploitative revenue systems like the Zamindari system, which led to the displacement of tribal communities from their ancestral lands.

• Tribal communities were often coerced into bonded labor and subjected to high taxes and debts, leading to widespread poverty.

Q4. Answer: (a) Underwater surveillance

The correct answer is Underwater surveillance.

Key Points

• The High Endurance Autonomous Underwater Vehicle (HEAUV) developed by the Defence Research and Development Organisation (DRDO) aims to provide advanced capabilities for underwater surveillance.

• It is designed to operate autonomously, enabling it to gather critical data and monitor underwater activities without direct human intervention.

• This vehicle plays a vital role in detecting and tracking submarine movements, ensuring the security of maritime zones and naval operations.

• The HEAUV is equipped with cutting-edge technology, including sonar systems and sensors, allowing it to identify underwater objects and threats effectively.

• This technology is instrumental in safeguarding India's maritime interests, enhancing defense capabilities, and supporting strategic operations in underwater domains.

Additional Information

• High Endurance Autonomous Underwater Vehicle (HEAUV):

• Developed by the Naval Science and Technological Laboratory (NSTL), a division of DRDO, specifically for underwater surveillance and reconnaissance.

• HEAUV is equipped with advanced sonar, cameras, navigation systems, and sensors to perform real-time underwater mapping and detection.

• The vehicle is capable of operating for extended durations under the sea, thus ensuring high endurance and efficiency in conducting surveillance missions.

• Underwater Surveillance Technology:

• Underwater surveillance is crucial for monitoring maritime borders, detecting threats, and ensuring security against enemy submarines.

• Modern surveillance systems rely on autonomous underwater vehicles (AUVs), which are unmanned and remotely operated vehicles designed for efficient monitoring tasks.

• Such systems are extensively used by naval forces worldwide to protect territorial waters and conduct intelligence operations.

• DRDO's Role in Maritime Security:

• The Defence Research and Development Organisation (DRDO) is India's premier agency for developing advanced defense technology for the armed forces.

• DRDO's NSTL specializes in naval research and development, focusing on underwater technologies, sonar systems, and torpedoes.

• Its innovations, such as the HEAUV, are pivotal in strengthening India's maritime defense capabilities.

• Applications of HEAUV:

• Primarily used for underwater surveillance in maritime zones.

• Supports naval operations by detecting enemy submarines and underwater threats.

• Assists in conducting oceanographic surveys and underwater research.

• Contributes to environmental monitoring and safeguarding underwater ecosystems.

Important Points

• Option Analysis:

• Option 1: Underwater surveillance is the primary purpose of HEAUV, making it the correct option.

• Option 2: Surface-to-air missile deployment is unrelated to HEAUV, as it is designed for underwater operations.

• Option 3: Submarine crew training is not the purpose of HEAUV; its focus is on autonomous surveillance.

• Option 4: Deep-sea oil exploration is a commercial activity and not the intended use of HEAUV.

• The development of HEAUV showcases India's commitment to achieving self-reliance in defense technology and securing its maritime boundaries effectively.

Q5. Answer: (a) Unequal land ownership patterns

The correct answer is Unequal land ownership patterns.

Key Points

• Unequal land ownership patterns were one of the most prominent indicators of income inequality in colonial India.

• The British land revenue systems, such as the Permanent Settlement (introduced in 1793) and Ryotwari system, created a class of landlords who held vast tracts of land, while the majority of the population consisted of poor tenant farmers or laborers.

• Landlords often exploited tenants by charging exorbitant rents, further deepening economic disparities.

• The lack of access to land for the majority of the population meant that wealth was concentrated in the hands of a few individuals or families.

• This skewed distribution of land ownership perpetuated poverty and reduced economic mobility for a large segment of Indian society during the colonial period.

Additional Information

• Colonial economic policies:

• The British economic policies in India were primarily extractive and exploitative, aimed at benefiting the colonial rulers rather than the Indian population.

• These policies included high taxation, forced commercialization of agriculture, and minimal investment in industrial development.

• The introduction of the Permanent Settlement in Bengal was a pivotal moment in creating a landlord class that held disproportionate wealth and power.

• Other Indicators of Income Inequality:

• The lack of access to education for the majority of the population contributed to income disparities, as literacy and skills were concentrated among the elite.

• Unequal wage distribution across sectors, such as agriculture and industrial labor, further exacerbated the economic divide.

• Limited irrigation and infrastructure investments in rural areas led to low agricultural productivity, which was a significant contributor to rural poverty.

• Permanent Settlement System:

• Implemented by the British in 1793, this system fixed the land revenue that landlords had to pay to the colonial government.

• Landlords were granted ownership rights to vast tracts of land, while tenant farmers had little to no rights and were heavily exploited.

• Ryotwari System:

• In areas like Madras and Bombay, the Ryotwari system allowed direct revenue collection from individual farmers.

• However, high taxation rates under this system pushed farmers into poverty and debt.

Important Points

• Economic Impacts of Unequal Land Ownership:

• Unequal land ownership patterns led to the concentration of wealth among landlords and systemic poverty among tenant farmers.

• Such disparities hindered agricultural development and contributed to frequent famines and food shortages during colonial rule.

• Social Impacts:

• Economic inequality reinforced social hierarchies and caste-based discrimination, as land ownership was often tied to caste privilege.

• It restricted upward mobility for marginalized communities and perpetuated generational poverty.

• Post-Independence Reforms:

• After independence, land reforms such as land redistribution and abolition of the zamindari system were initiated to address these inequalities.

• However, the implementation of these reforms varied across states, and issues of land inequality persist in modern India.

Q6. Answer: (d) More than 30

The correct answer is More than 30.

Key Points

• The Andaman and Nicobar Islands consist of a group of 572 islands, out of which a total of more than 30 islands are inhabited. These inhabited islands are spread across the two major groups: Andaman and Nicobar.

• The islands are divided into two groups: the Andaman Islands (located in the north) and the Nicobar Islands (located in the south).

• Among the inhabited islands, notable ones include Port Blair (capital of Andaman and Nicobar Islands), Havelock Island, Neil Island, and Car Nicobar.

• The inhabited islands support a population comprising various communities including indigenous tribes, settlers from mainland India, and others.

• As of the latest data available, the total number of inhabited islands is determined to be more than 30, based on government records and population census surveys.

Additional Information

• Geography of Andaman and Nicobar Islands:
• The islands are located in the Bay of Bengal, about 1,200 kilometers from the eastern coast of India.
• The group of islands is divided into the Andaman Islands (north) and the Nicobar Islands (south).
• The islands are known for their rich biodiversity, tropical rainforests, coral reefs, and mangroves.
• Population and Tribal Communities:
• The islands are home to both settlers from mainland India and indigenous tribal communities.
• Prominent tribes include the Great Andamanese, Onges, Jarawas, and Sentinelese.
• The Nicobar Islands primarily host the Nicobarese tribe and Shompens.
• Important Islands:
• Key inhabited islands in the Andaman group include Port Blair, Havelock Island (now Swaraj Dweep), and Neil Island (now Shaheed Dweep).
• Important inhabited islands in the Nicobar group include Car Nicobar and Great Nicobar.
• Tourism and Economy:
• The islands are popular for tourism activities such as scuba diving, snorkeling, and exploring pristine beaches.
• Economic activities include agriculture, fisheries, and forest-based industries.

Important Points

• Biodiversity:
• The Andaman and Nicobar Islands are home to a diverse ecosystem, including unique flora and fauna.
• The islands are part of the Indo-Malayan biodiversity hotspot.
• Strategic Importance:
• The islands are strategically important for India in terms of defense and maritime security.
• They serve as a crucial base for the Indian Navy and Coast Guard.
• Climate:
• The islands experience a tropical monsoon climate with heavy rainfall.
• Severe weather conditions, such as cyclones, occasionally impact the region.

Q7. Answer: (b) Pallava

The correct answer is Pallava.

Key Points

• The city of Kannauj in northern India was highly coveted for its strategic location and economic prosperity, leading to intense struggles for control among various dynasties.
• The major dynasties involved in this struggle were the Pratihara, Pala, and Rashtrakuta dynasties during the 8th to 10th centuries CE.
• The Pallava dynasty, however, was primarily based in southern India, with its capital at Kanchipuram. It was not involved in the northern struggle for Kannauj. Hence, Pallava is the correct answer.
• Kannauj was a center of power during the Tripartite Struggle, which involved the Pratihara, Pala, and Rashtrakuta dynasties vying for dominance over this region.
• The Pallavas focused on southern Indian politics, culture, and architecture, and their influence did not extend to the northern regions, unlike the other mentioned dynasties.

Additional Information

• Pratihara Dynasty:
• The Pratiharas were a prominent dynasty in northern India during the early medieval period.
• They played a key role in the Tripartite Struggle for Kannauj, which was strategically important for controlling trade routes and political dominance.
• The Pratihara rulers, such as Mihira Bhoja, were known for their military strength and contributions to art and architecture.
• Pala Dynasty:
• The Pala dynasty originated in Bengal and was known for its patronage of Buddhism.
• They were one of the contenders in the Tripartite Struggle, aiming to expand their influence over Kannauj.
• Notable rulers like Dharmapala and Devapala contributed to the prosperity of the Pala empire.
• Rashtrakuta Dynasty:
• The Rashtrakutas were a powerful dynasty from the Deccan region of India.
• They competed with the Pratiharas and Palas during the Tripartite Struggle for Kannauj.
• The Rashtrakutas were also known for their contributions to art, such as the creation of the Kailasa temple at Ellora.

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• Pallava Dynasty:

• The Pallavas were a southern Indian dynasty with their capital at Kanchipuram.

• They were known for their contributions to architecture, including the Mahabalipuram temples and rock-cut structures.

• The Pallavas were primarily focused on southern India and did not engage in the struggle for Kannauj.

Important Points

• Tripartite Struggle:

• The Tripartite Struggle was a prolonged conflict among the Pratiharas, Palas, and Rashtrakutas for control over Kannauj.

• This struggle lasted for nearly two centuries (8th to 10th century CE), highlighting the significance of Kannauj as a center of power.

• It marked a period of intense competition among regional powers in northern India.

• Kannauj:

• Kannauj was historically a prosperous city located on the banks of the Ganga River.

• It was a major center for trade, politics, and culture during early medieval India.

• The city's strategic location made it a coveted prize for various dynasties.

Q8. Answer: (c) total internal reflection

The correct answer is total internal reflection.

Key Points

• Optical fibres work based on the principle of total internal reflection. This phenomenon occurs when light traveling within a medium hits the boundary with another medium at an angle greater than the critical angle, causing the light to reflect entirely within the original medium.

• Total internal reflection ensures that light signals transmitted through the fibre remain confined within the core, allowing efficient and lossless transmission over long distances.

• The core of the optical fibre has a higher refractive index than the surrounding cladding, which is essential for enabling total internal reflection.

• Optical fibres are widely used in telecommunications, medical imaging, and networking due to their ability to carry high-speed data and signals efficiently.

• Other phenomena such as reflection and refraction play roles in optics but are not sufficient to explain the working of optical fibres. Total internal reflection is the primary phenomenon used in this technology.

Additional Information

• Reflection:

• Reflection is the process where light bounces back after hitting a surface. While it plays a role in optics, it does not ensure the confinement of light within the optical fibre.

• Example: Reflection occurs in mirrors and shiny surfaces.

• Refraction:

• Refraction is the bending of light as it passes from one medium to another with a different refractive index. It is crucial in lens systems but does not explain the continuous transmission of light in optical fibres.

• Example: The bending of light when it enters water from air.

• Total Internal Reflection:

• This phenomenon occurs when light travels from a medium with a higher refractive index to a lower refractive index and hits the boundary at an angle greater than the critical angle.

• Examples include optical fibres and the sparkling effect of diamonds.

• Applications of Optical Fibres:

• Telecommunications: Used for transmitting signals over long distances with minimal loss.

• Medical imaging: Utilized in endoscopy to visualize internal organs.

• Networking: Essential for high-speed internet and data transmission.

• Important Points

• Critical Angle: The minimum angle of incidence for which total internal reflection occurs. It depends on the refractive indices of the core and cladding.

• Materials: Optical fibres are typically made from glass or plastic, with a core and cladding designed to maintain total internal reflection.

• Advancements: Optical fibre technology has revolutionized communication, enabling high-speed internet and global networking.

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Q9. Answer: (b) To provide mechanical support and strength to the plant

The correct answer is To provide mechanical support and strength to the plant.

Key Points

• Sclerenchyma is a type of plant tissue composed of dead cells with extremely thick and lignified cell walls. This lignification provides rigidity and hardness.

• The primary function of sclerenchyma is to provide mechanical support and strength to the plant, enabling it to withstand external stresses like wind and gravity. Hence, this statement is correct.

• Sclerenchyma cells are non-living at maturity due to the deposition of lignin, which prevents the transport of nutrients and water. Their role is structural rather than metabolic.

• Sclerenchyma tissues are commonly found in parts of plants that require high tensile strength, such as stems, roots, veins of leaves, and hard seed coats.

• There are two types of sclerenchyma cells: fibres (elongated and tapered cells) and sclereids (irregularly shaped cells), both contributing to the overall strength and protection of the plant.

Additional Information

• Plant Tissues:

• Plants have two types of tissues: Meristematic (actively dividing) and Permanent (specialized and non-dividing).

• Sclerenchyma is a type of permanent tissue under the simple tissues category, along with parenchyma and collenchyma.

• Comparison with Other Tissues:

• Parenchyma: Composed of living cells, used for food storage and photosynthesis.

• Collenchyma: Provides flexibility and mechanical support to growing parts of the plant.

• Sclerenchyma: Provides rigidity, mechanical strength, and protection, composed of dead cells.

• Applications of Sclerenchyma:

• Used in making ropes, fabrics, and mats due to the tensile strength of sclerenchyma fibres.

• Hard seed coats and shells of fruits are composed of sclerenchyma, providing protection to the embryo.

• Examples of Sclerenchyma:

• Fibres such as jute and flax are commercially important sclerenchyma tissues.

• Sclereids can be found in nutshells, seed coats, and gritty textures in fruits like guava and pear.

• Important Points

• Sclerenchyma Fibres:

• They are long, narrow, and pointed at the ends, providing tensile strength to the plant.

• Examples include fibres in sugarcane, bamboo, and coconut husk.

• Sclereids:

• These are irregularly shaped cells found in seed coats and the hard shells of nuts.

• Examples include sclereids in the gritty texture of fruits like guava and pear.

Q10. Answer: (d) Pune

The correct answer is Pune.

Key Points

• The headquarters of the Home Rule League founded by Bal Gangadhar Tilak was established in Pune in 1916.

• The league was inspired by the Irish Home Rule Movement and aimed at achieving self-governance for India within the British Empire.

• Tilak’s Home Rule League focused on political education and creating a widespread demand for Swaraj (self-rule).

• The league actively campaigned through public meetings, pamphlets, newspapers, and petitions, gaining massive support across India.

• Tilak’s efforts in Pune inspired other leaders like Annie Besant, who also started her own Home Rule League in Madras the same year.

Additional Information

• Bal Gangadhar Tilak:

• Known as the “Father of Indian Unrest”, Tilak was a prominent freedom fighter, social reformer, and nationalist leader.

• He was one of the first leaders to advocate for complete independence, using the slogan “Swaraj is my birthright, and I shall have it.”

• Tilak was also a strong proponent of education and social reform, establishing institutions like the Fergusson College in Pune.

• Home Rule Movement:

• Started in 1916, the Home Rule Movement aimed to achieve self-governance within the British Empire, similar to the Irish Home Rule Movement.
• There were two parallel leagues: one led by Bal Gangadhar Tilak based in Pune, and the other by Annie Besant in Madras.
• The movement used methods such as public meetings, pamphlets, and petitions to educate people and mobilize support.
• Significance of Pune:
• Pune was a major center for the nationalist movement and the reformist activities of leaders like Tilak.
• The city hosted several important newspapers like Kesari and Maratha, which were used by Tilak to spread his political ideas.
• Pune also served as a hub for political education and activism during the Home Rule Movement.
• Annie Besant's Home Rule League:
• Annie Besant, a British socialist, and theosophist, established her own Home Rule League in 1916, based in Madras.
• Her league primarily focused on garnering support from the educated middle class and advocating for self-rule.
• Besant's efforts complemented Tilak's movement, leading to increased political awareness and participation across the country.

Important Points

• Key Achievements of the Home Rule Movement:
• The movement laid the foundation for future mass movements like the Non-Cooperation Movement and Civil Disobedience Movement.
• It helped build a strong network of political activists and leaders across India.
• The movement emphasized the importance of political education and national identity among Indians.
• Outcome of the Movement:
• The Home Rule Movement was instrumental in pressuring the British government to introduce reforms like the Montagu-Chelmsford Reforms of 1919.
• It also marked the emergence of leaders like Mohandas K. Gandhi, who later became central figures in India's struggle for independence.

Q11. Answer: (b) Mutation

The correct answer is Mutation.

Key Points

• Mutation refers to a permanent alteration in the DNA sequence of an organism's genome. This change can occur due to errors during DNA replication or exposure to mutagens such as radiation, chemicals, or viruses.
• Mutations can lead to changes in the genotype (the genetic makeup) and the phenotype (observable characteristics) of an organism, influencing traits such as physical appearance, metabolic functions, or susceptibility to diseases.
• There are different types of mutations, such as point mutations (substitution of a single nucleotide), insertions, deletions, and chromosomal mutations (affecting large sections of DNA).
• Mutations can be beneficial, neutral, or harmful depending on their impact on the organism's ability to survive and reproduce. For example, beneficial mutations contribute to evolution and adaptation.
• Mutations are crucial in genetics and molecular biology as they serve as the basis for studying hereditary diseases, genetic disorders, and evolutionary processes.

Additional Information

• Segregation:
• Mendel's law of segregation refers to the separation of alleles during gamete formation, ensuring that each gamete carries only one allele from a pair.
• It explains why offspring inherit traits from both parents but is unrelated to changes in the DNA sequence. Hence, this is not correct in the context of the question.
• Dominance:
• Dominance is a genetic principle where one allele masks the expression of another allele in a heterozygous pair.
• This concept explains the inheritance pattern of certain traits but does not involve alterations in DNA sequences. Thus, this option is incorrect for the given question.
• Transcription:
• Transcription is the process by which genetic information encoded in DNA is copied into RNA.
• It is a normal cellular process and does not involve permanent changes to the DNA sequence. Therefore, this option is not relevant to the question.
• Impact of Mutations:
• Mutations have been extensively studied in genetics to understand diseases such as sickle cell anemia, cystic fibrosis, and cancer, which are caused by genetic changes.

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• They are also key to artificial selection and genetic engineering, allowing scientists to alter genomes for research and therapeutic purposes.

• Mutations are vital in evolutionary biology, as they provide the genetic variation required for natural selection.

Important Points

• Types of Mutations:

• Point mutations: Involve a single nucleotide change. Example: Substitution in sickle cell anemia.

• Insertion or deletion: Addition or loss of nucleotides in DNA, causing frameshift mutations.

• Chromosomal mutations: Large-scale changes affecting entire segments of chromosomes. Example: Down syndrome caused by trisomy 21.

• Causes of Mutations:

• Errors during DNA replication.

• Exposure to mutagens like UV radiation, X-rays, and harmful chemicals.

• Viral infections that integrate into the host genome.

• Applications in Science:

• Used in genetic engineering and CRISPR technology to modify organisms.

• Study of mutations helps in developing treatments for genetic disorders.

• Mutations serve as the basis for understanding evolutionary mechanisms.

Q12. Answer: (b) Vijayan Bala

The correct answer is Vijayan Bala.

Key Points

• Vijayan Bala is a well-known author and cricket statistician, recognized for his contributions to sports literature in India.

• The book titled "The History and Stars of the World's Greatest Sporting Event: From Athens 1896 to Paris 2024" provides an in-depth account of the history of the Olympic Games, covering events from its inception in Athens in 1896 to the upcoming Olympics in Paris 2024.

• This book was launched during the New Delhi World Book Fair in 2025, a prominent event showcasing literature and authors from across the globe.

• Vijayan Bala is known for his detailed research and statistical analysis, which adds credibility and depth to his works, particularly in the realm of sports history.

• The book also highlights the legendary athletes, significant events, and evolution of sports during the span of more than a century, making it a valuable resource for sports enthusiasts and historians.

Additional Information

• About Vijayan Bala:

• Vijayan Bala is a renowned Indian sports author and cricket statistician.

• He has contributed significantly to documenting the history of sports, particularly cricket and other global sporting events.

• His books are appreciated for their meticulous research, comprehensive data, and engaging narratives.

• Olympic Games:

• The Olympic Games are a global sporting event held every four years, featuring summer and winter sports competitions.

• They were first held in Athens, Greece, in 1896, and symbolize international unity and sportsmanship.

• The upcoming Paris 2024 Olympics marks a significant milestone, showcasing sports innovation and inclusivity.

• New Delhi World Book Fair:

• The New Delhi World Book Fair is one of India’s largest literary events, held annually to promote literature, authors, and publishers.

• This event attracts writers, readers, and publishers from across the globe.

• It serves as a platform for launching notable books and celebrating literary excellence.

• Other Authors Listed in the Question:

• Amit Bose: Primarily known for his contributions to Indian railways literature and infrastructure development.

• Digvijay Singh Deo: A prominent sports journalist who has covered numerous international sporting events.

• Abhinav Bindra: India’s first individual Olympic gold medalist, known for his autobiography and contributions to Indian sports.

Important Points

• Historical Context of the Olympics:

• The Olympics were inspired by the ancient Greek games held in Olympia.

• Modern Olympics began in 1896 under the initiative of Pierre de Coubertin.

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• Paris 2024 Olympics:

• Paris will host the Olympics for the third time, having hosted them previously in 1900 and 1924.

• The event will feature new sports such as surfing, skateboarding, and climbing to engage a broader audience.

Q13. Answer: (d) IMF

The correct answer is IMF.

Key Points

• In 1991, India faced a severe balance of payments crisis, leading to a foreign exchange shortage that required external support.

• The International Monetary Fund (IMF) provided a loan of approximately USD 2.2 billion to India to stabilize its economy during this crisis.

• The loan was conditional upon implementing economic reforms, which included liberalization, privatization, and globalization policies.

• The crisis led to India making structural changes in its economic policy, including the introduction of the New Economic Policy (NEP) of 1991.

• This marked the beginning of India transitioning from a socialist-inspired economy to a market-driven economy. Hence, the correct answer is IMF.

Additional Information

• IMF:

• Founded in 1944, the International Monetary Fund (IMF) is an international organization headquartered in Washington, D.C.

• Its primary purpose is to ensure global monetary cooperation, secure financial stability, and provide loans to countries facing balance of payment difficulties.

• The IMF has 190 member countries, and its funding comes from member contributions, known as quotas.

• India has been a member of the IMF since 1945, and it has actively collaborated with the institution during economic challenges.

• 1991 Economic Crisis:

• India's foreign exchange reserves were reduced to just USD 1.2 billion, which was insufficient to cover essential imports.

• The crisis was triggered by a combination of high fiscal deficits, excessive borrowing, and global oil price increases following the Gulf War.

• To address the crisis, India pledged 67 tons of gold as collateral to secure the IMF loan.

• New Economic Policy of 1991:

• The NEP introduced reforms such as Liberalization, Privatization, and Globalization (LPG) to open up the Indian economy.

• Key measures included reducing import tariffs, deregulating industries, attracting foreign direct investment (FDI), and reforming the tax system.

• Other Institutions Mentioned:

• ADB: The Asian Development Bank focuses on regional development and infrastructure projects but was not involved in the 1991 Indian crisis.

• World Bank: It works on long-term development projects and provided assistance to India post-crisis but not directly during the crisis.

• WTO: The World Trade Organization was established in 1995 and focuses on global trade agreements, making it irrelevant to the 1991 crisis.

Important Points

• Impact of IMF Loan:

• The IMF loan and subsequent reforms helped India overcome the crisis and stabilize its economy.

• India's move towards a market-driven economy led to a significant increase in economic growth rates post-1991.

• The reforms also laid the foundation for India's emergence as a global economic power.

• Role of IMF in Global Economy:

• IMF supports countries by providing financial assistance, policy advice, and technical expertise.

• It plays a key role in addressing global economic challenges and fostering international trade.

Q14. Answer: (c) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• Uttar Pradesh launched the ‘RISE’ app in 2025 to digitally monitor child vaccinations and enhance training for health workers.

• The app focuses on improving immunization coverage by ensuring better tracking and accessibility of child vaccinations.

• Health workers are trained with the help of the app to ensure efficient implementation of vaccination programs in rural and urban

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areas.

• The initiative aligns with the National Immunization Program and is part of a larger effort to strengthen the healthcare infrastructure in the state.

• Uttar Pradesh, being one of the most populous states in India, has taken this step to address challenges in healthcare delivery and to ensure equitable vaccination coverage.

Additional Information

• Child Vaccination in India:

• Universal Immunization Programme (UIP): Launched in 1985, it is one of the largest health programs in the world, aiming to provide vaccination against preventable diseases.

• The UIP offers free vaccines for diseases like polio, tuberculosis, diphtheria, pertussis, tetanus, measles, hepatitis B, and others.

• India has achieved significant milestones, such as polio eradication and reduction in vaccine-preventable diseases.

• Importance of Digital Monitoring in Healthcare:

• Digital tools like the RISE app enhance data tracking and real-time monitoring of vaccination programs, improving efficiency and coverage.

• They help in identifying missed children and areas with low immunization rates.

• Digital platforms can also provide training modules for healthcare workers to improve their skills and knowledge.

• Uttar Pradesh Healthcare Initiatives:

• Uttar Pradesh has been actively working on improving its healthcare services, focusing on maternal and child health programs.

• The state has launched several initiatives to combat malnutrition, improve sanitation, and enhance access to healthcare in rural areas.

• Features of the RISE App:

• The app is equipped with features to track child vaccination schedules and send reminders to parents and health workers.

• It provides training modules and resources for health workers to improve their service delivery.

• Integrated with government databases to ensure accurate and up-to-date records of vaccinated children.

Q15. Answer: (a) To promote transparency and accountability in government functioning

The correct answer is To promote transparency and accountability in government functioning.

Key Points

• The Right to Information (RTI) Act, 2005 was enacted to foster transparency and accountability in the functioning of government bodies.

• It empowers citizens to seek information from public authorities, ensuring that government processes are open and accessible.

• The RTI Act is crucial for strengthening democracy, as it enables individuals to participate actively in governance by accessing essential information.

• Under the Act, public authorities are required to disclose information proactively and respond to citizens' requests within a specified timeframe.

• It is an effective tool for combating corruption by allowing citizens to scrutinize decision-making processes and hold officials accountable for their actions.

Additional Information

• Key Features of the RTI Act, 2005:

• The Act applies to all levels of government, including central, state, and local authorities, as well as non-government organizations receiving government funds.

• Every citizen has the right to request information, and public authorities are obligated to provide it within 30 days of the request.

• Public authorities are required to appoint Public Information Officers (PIOs) to handle RTI requests efficiently.

• Citizens can appeal if their request is denied or if they are dissatisfied with the response, through a two-tier appeal mechanism.

• Role in Promoting Good Governance:

• The RTI Act has been instrumental in promoting transparency, accountability, and participatory governance.

• It ensures informed citizenry, enabling individuals to question inefficiencies and demand better services.

• RTI has played a significant role in uncovering corruption cases and improving public trust in government institutions.

• Comparison with Other Options:

• Option 2: "To regulate foreign investment in India" is incorrect, as RTI is unrelated to foreign investment. Regulation of foreign investment is primarily governed by FDI policies and FEMA.

• Option 3: "To control corruption in the judiciary" is incorrect, as RTI focuses on transparency in all governmental functions, not solely on the judiciary.

• Option 4: "To ensure reservations for backward classes" is unrelated to RTI. Reservation policies are governed under Articles 15

and 16 of the Indian Constitution.

• Impact of RTI Act:

• Since its implementation, RTI has led to significant improvements in public sector transparency, especially in areas like infrastructure projects, government schemes, and resource allocation.

• It has empowered citizens by providing them access to critical information about policy decisions, public spending, and administrative actions.

Important Points

• RTI and Judicial Interpretation:

• The Supreme Court of India has repeatedly upheld the importance of RTI in ensuring citizens' right to information under Article 19(1)(a) of the Constitution.

• In several cases, the judiciary has emphasized that the right to information is integral to a transparent and democratic society.

• Exemptions under RTI Act:

• Certain sensitive information like national security, foreign relations, and personal privacy is exempted under Sections 8 and 9 of the Act.

• However, even exempt information can be disclosed if it serves a larger public interest.

• RTI in Practice:

• Since its inception, RTI has been widely used by activists, journalists, and ordinary citizens to demand transparency in government actions.

• Some prominent instances include revelations about large-scale scams like the Commonwealth Games scam and various public works projects.

Q16. Answer: (a) Third Battle of Panipat

The correct answer is Third Battle of Panipat.

Key Points

• Najib-ud-Daula, also known as Najib Khan Rohilla, was the chief of the Rohilla Afghan clan and played a significant role in the political landscape of Northern India in the mid-18th century.

• He was one of the key allies of the Durrani Empire, led by Ahmad Shah Abdali (also known as Ahmad Shah Durrani), during the Third Battle of Panipat in 1761.

• The Third Battle of Panipat was fought on 14 January 1761, between the Marathas and the Afghan forces under Ahmad Shah Abdali, supported by Najib-ud-Daula and other allies.

• Najib-ud-Daula's efforts in organizing the Afghan forces and ensuring the supply of resources were crucial to Abdali's victory over the Marathas in this decisive battle.

• His role in the battle marked a turning point in Indian history, as it temporarily halted the expansion of the Maratha Empire and reasserted the influence of the Mughal-Afghan alliance in Northern India.

Additional Information

• Third Battle of Panipat (1761):

• The battle took place near Panipat, in present-day Haryana, India.

• It was one of the largest and bloodiest battles fought in the 18th century, involving over 125,000 troops on both sides.

• The Marathas, under the leadership of Sadashivrao Bhau, faced a coalition of forces led by Ahmad Shah Abdali, who was supported by Najib-ud-Daula, the Nawab of Oudh, and Shuja-ud-Daula.

• The defeat of the Marathas in this battle marked the decline of their political power and opened the way for British dominance in India in the following decades.

• Role of Najib-ud-Daula:

• Najib-ud-Daula played a pivotal role in forming the alliance between Ahmad Shah Abdali and other regional powers, including the Nawabs of Oudh and Bengal.

• He was instrumental in mobilizing resources and troops for Abdali's campaign against the Marathas.

• After the battle, Najib-ud-Daula emerged as a key player in the Mughal court and was appointed as the Mir Bakshi (paymaster general) of the Mughal Empire.

• Other Historical Context:

• The Third Battle of Panipat was not just a military conflict but also a cultural and economic turning point in Indian history. It marked the end of the era of large-scale native Indian empires and the beginning of regional fragmentation.

• The battle significantly weakened the Marathas, paving the way for the rise of the British East India Company in the late 18th century.

• The defeat of the Marathas also led to widespread social and economic consequences, including a significant loss of life and disruption in trade and agriculture in Northern India.

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• Important Points:

• The Third Battle of Panipat is remembered as one of the most important battles in Indian history due to its far-reaching consequences on the political and social fabric of the Indian subcontinent.

• Najib-ud-Daula's alliance with Ahmad Shah Abdali demonstrated the complexities of regional politics during this period, where alliances were often formed based on mutual interests rather than ethnic or religious solidarity.

Q17. Answer: (a) 1905

The correct answer is 1905.

Key Points

• The Partition of Bengal was announced on 20 July 1905 by the then Viceroy of India, Lord Curzon, and it officially came into effect on 16 October 1905.

• The partition divided Bengal into two provinces: Eastern Bengal and Assam (with Dhaka as its capital) and West Bengal (with Calcutta as its capital).

• The primary justification provided for the partition was the administrative convenience, as Bengal was one of the largest provinces in British India, both in terms of area and population.

• The decision was met with widespread protests, as it was seen by many Indians as an attempt to divide Hindus and Muslims and weaken the growing nationalist movement.

• The Swadeshi Movement emerged in response to the partition, calling for the boycott of British goods and the promotion of indigenous products. This marked a significant moment in the Indian freedom struggle.

Additional Information

• Background of Partition:

• Bengal was the largest province in British India, with a population of over 78 million, making it difficult to administer.

• Lord Curzon’s decision was based on the idea of reducing administrative burden, but the underlying motive was to divide Bengali unity, which had grown strong due to the nationalist movement.

• Impact on Indian National Movement:

• The partition led to the emergence of the Swadeshi Movement, which was a boycott of British goods and the promotion of indigenous products.

• Many leaders, including Rabindranath Tagore, protested against the partition and emphasized unity through cultural and political means.

• The movement saw the participation of students, women, and common citizens, making it a mass movement.

• Reversal of Partition:

• Due to strong opposition, the partition was annulled in 1911, and Bengal was reunited.

• Simultaneously, the British decided to move the capital of India from Calcutta to Delhi.

• Legacy of the Partition:

• The partition left a lasting impression on the Indian nationalist movement, highlighting the need for unity across religions and regions.

• It also demonstrated the power of mass movements in challenging British policies.

Important Points

• Swadeshi Movement:

• The movement encouraged Indians to boycott British goods and use indigenous products.

• It led to the establishment of numerous indigenous enterprises, including textile mills, soap factories, and banks.

• The movement was accompanied by cultural activities, including the composition of patriotic songs like "Amar Sonar Bangla" by Rabindranath Tagore.

• Significance of Bengal:

• Bengal was the political and cultural hub of India during the early 20th century.

• It was home to influential leaders like Subhas Chandra Bose, Aurobindo Ghosh, and Rabindranath Tagore.

Q18. Answer: (b) V Narayanan

The correct answer is V Narayanan.

Key Points

• V Narayanan was awarded the Rammohan Mission Purashkar 2025 for his significant contributions in emphasizing the role of ISRO in national security.

• As a distinguished scientist, V Narayanan has been pivotal in the development of advanced space technologies, including propulsion systems for ISRO's space missions.

• ISRO's work under his guidance has strengthened India's defense capabilities through advancements in satellite technology,

including surveillance, navigation, and communication satellites.

• The award, instituted to honor excellence in contributions toward science and national development, recognized his leadership in enhancing India's space security infrastructure.

• V Narayanan has held key positions in ISRO and contributed to the success of critical projects like GSLV (Geosynchronous Satellite Launch Vehicle) and PSLV (Polar Satellite Launch Vehicle).

Additional Information

• Indian Space Research Organisation (ISRO):

• ISRO was founded in 1969 and operates under the Department of Space, Government of India.

• It is responsible for developing space technologies for civilian and defense applications, including satellite launches, interplanetary missions, and research in space sciences.

• ISRO has launched missions like Chandrayaan, Mangalyaan, and Gaganyaan, showcasing India's space exploration capabilities.

• Its satellite programs, such as GSAT, RISAT, and CARTOSAT, contribute to defense, disaster management, and communication sectors.

• Rammohan Mission Purashkar:

• Established to honor individuals who have made exceptional contributions toward science, technology, and national development.

• The award recognizes efforts in strengthening India's infrastructure, security, and innovation through the application of science and technology.

• It is named after Rammohan Roy, an Indian reformer who emphasized modernization and rational thinking.

• V Narayanan’s Contributions:

• He is an expert in propulsion systems and has significantly contributed to the development of advanced cryogenic engines for ISRO's rocket programs.

• His work in the GSLV Mk III project, India's heaviest and most powerful launch vehicle, has enabled launching satellites with greater payloads.

• He has been actively involved in enhancing ISRO's satellite-based defense capabilities, including surveillance and reconnaissance.

• Other Notable ISRO Scientists:

• G Madhavan Nair: Former chairman of ISRO, led missions like Chandrayaan-1.

• K Sivan: Former ISRO chairman, known for his leadership during the Chandrayaan-2 mission.

• S Somanath: Current chairman of ISRO, responsible for advancing India’s space exploration programs.

Q19. Answer: (d) Rohini

The correct answer is Rohini.

Key Points

• Vijender Gupta, a prominent Indian politician, has been associated with the Bharatiya Janata Party (BJP).

• He became the Speaker of the Delhi Assembly in the year 2025, showcasing his leadership abilities and political prominence.

• Vijender Gupta represents the Rohini constituency, located in the northern region of Delhi. This constituency is known for its urban development and residential areas.

• The Rohini constituency is part of the Delhi Legislative Assembly and is a key area for political activities and governance within the state.

• The election and appointment of Vijender Gupta as Speaker signify the trust placed in him by his party and constituents to lead the assembly effectively.

Additional Information

• Delhi Assembly Constituencies:

• Delhi has 70 constituencies, each represented by Members of the Legislative Assembly (MLAs).

• Some prominent constituencies include Karol Bagh, Patparganj, Greater Kailash, and Rohini.

• The constituencies are divided based on geographical, demographic, and administrative factors.

• Rohini Constituency:

• Rohini is one of Delhi’s well-planned residential areas and is known for its urban infrastructure.

• It features multiple sectors with organized housing societies, schools, hospitals, and markets, making it a significant urban hub.

• Politically, Rohini has been a stronghold of the BJP in recent years, with elected representatives actively contributing to development in the area.

• Role of the Speaker in the Delhi Assembly:

• The Speaker is responsible for maintaining order in the Assembly, ensuring smooth conduct of debates, and upholding parliamentary practices.
• The Speaker holds significant authority and acts impartially in managing assembly proceedings.
• The election of a Speaker is done by the members of the Legislative Assembly through a voting process.
• Political Career of Vijender Gupta:
• Vijender Gupta is a seasoned politician and has contributed significantly to Delhi's political landscape.
• He has served in various capacities within the BJP, including holding leadership roles at the state level.
• His tenure as Speaker in 2025 marks a milestone in his political journey.

Important Points

• Delhi Legislative Assembly:
• Established in 1993, following the enactment of the Government of National Capital Territory of Delhi Act, 1991.
• The assembly plays a crucial role in legislation, governance, and policymaking for Delhi.
• Key areas of governance include urban development, healthcare, education, and transport.
• Electoral Process:
• MLAs are elected every five years through a democratic process involving voters from respective constituencies.
• Political parties nominate candidates based on their performance, credibility, and regional influence.
• Key Constituencies:
• Karol Bagh: Known for its commercial and retail hubs.
• Patparganj: A residential area with significant political activity.
• Greater Kailash: An affluent locality in South Delhi.
• Rohini: A major urban hub with planned infrastructure.

Q20. Answer: (d) It provides for disqualification of members on grounds of defection.

The correct answer is It provides for disqualification of members on grounds of defection..

Key Points

• The Tenth Schedule of the Indian Constitution was added through the 52nd Amendment Act of 1985, also referred to as the Anti-Defection Law.
• This schedule lays down provisions for the disqualification of Members of Parliament (MPs) and Members of Legislative Assemblies (MLAs) on the grounds of defection.
• A member can be disqualified if they voluntarily give up the membership of their political party or vote/abstain from voting against the directions of their party without prior permission.
• Independent members are disqualified if they join a political party after the election, while nominated members can join a party within 6 months of their nomination but are disqualified if they join after that period.
• The decision on disqualification is made by the Chairperson or Speaker of the House, whose decision is subject to judicial review by the courts.

Additional Information

• Allocation of Seats in the Rajya Sabha (Option 1):
• This is dealt with under the Fourth Schedule of the Indian Constitution, which allocates seats to the states and Union Territories in the Rajya Sabha based on their population.
• The allocation is not related to the Tenth Schedule. Hence, this statement is incorrect.
• Distribution of Powers between Union and States (Option 2):
• The Seventh Schedule of the Constitution defines the distribution of powers between the Union and the States through the Union List, State List, and Concurrent List.
• This is unrelated to the Tenth Schedule. Hence, this statement is incorrect.
• Provisions Regarding Official Languages (Option 3):
• The Eighth Schedule of the Constitution deals with official languages and lists the recognized languages of India.
• The Tenth Schedule does not address languages. Hence, this statement is incorrect.
• Anti-Defection Law – Key Features:
• The Tenth Schedule is popularly known as the Anti-Defection Law.
• It was introduced to bring political stability and curb the unethical practice of legislators switching parties for personal gain.
• It specifies exceptions such as a merger of political parties, where at least two-thirds of the members of a legislative party agree to merge with another party.
• Judicial Review:

• The decision of the Speaker/Chairperson regarding disqualification is subject to judicial review, ensuring that the process is not arbitrary.

• This safeguard was emphasized in the Kihoto Hollohan vs. Zachillhu case (1992), where the Supreme Court upheld the constitutional validity of the Tenth Schedule but allowed judicial review of the Speaker's decisions.

Q21. Answer: (a) Government and private entities share responsibilities and risks efficiently.

The correct answer is Government and private entities share responsibilities and risks efficiently..

Key Points

• Public-Private Partnerships (PPPs) are collaborative arrangements between the government and private entities to deliver projects or services, sharing responsibilities and risks efficiently.

• In a PPP model, the government usually provides regulatory oversight, while the private sector brings expertise, financing, and operational efficiency.

• These partnerships are aimed at efficiently utilizing resources from both sectors to address public needs, such as infrastructure development, healthcare, education, and public services.

• PPP projects are structured to share risks between the public and private partners, ensuring better risk management and project accountability.

• Unlike traditional public sector projects, PPPs engage the private sector in a way that leverages its innovation and efficiency, while ensuring public welfare goals are met.

Additional Information

• Features of PPP:

• PPPs are used for infrastructure projects like highways, railways, airports, water supply systems, and urban development.

• The private sector typically invests in the project and assumes operational risk, while the government ensures regulatory compliance and public interest.

• PPPs are governed by contractual agreements outlining responsibilities, funding mechanisms, and risk-sharing models.

• Examples include India's National Highways Authority of India (NHAI) toll roads and Delhi Metro Airport Express Line.

• Statement Analysis:

• Statement 1: "Government and private entities share responsibilities and risks efficiently." Correct. This accurately describes the essence of a PPP model.

• Statement 2: "The public partner fully finances a project, while the private partner has no risk." Incorrect. PPPs involve shared financial responsibilities and risk allocation between public and private partners.

• Statement 3: "PPPs are only used for purely social (non-commercial) projects." Incorrect. PPPs are used for both commercial and social projects, including infrastructure and public services.

• Statement 4: "Only public sector entities can participate in PPPs." Incorrect. Private sector entities play a crucial role in PPPs, contributing expertise, innovation, and funding.

• Important Points:

• India's PPP Framework: India follows a robust PPP framework, guided by policies like the Model Concession Agreement (MCA) and Viability Gap Funding (VGF).

• Global Examples: PPPs are widely used internationally, such as the Crossrail Project in the UK and Australia's Sydney Harbour Tunnel.

• Benefits: PPPs improve resource efficiency, enable innovation, and ensure the delivery of high-quality services while maintaining public welfare.

Q22. Answer: (a) Muscat, Oman

The correct answer is Muscat, Oman.

Key Points

• The 8th Edition of the Indian Ocean Conference was held in February 2025 in Muscat, Oman, marking a key diplomatic and strategic engagement within the Indian Ocean Region (IOR).

• This conference is a flagship event focusing on political, economic, and security-related issues in the Indian Ocean region.

• The theme for the 8th Edition centered around strengthening regional cooperation and addressing challenges like maritime security, trade, climate change, and sustainable development.

• Muscat, Oman, played a significant host role, as Oman is strategically located at the mouth of the Persian Gulf, making it a vital gateway for global trade and maritime routes.

• The conference brought together leaders, policymakers, and experts from across the globe to deliberate on enhancing regional connectivity and addressing collective challenges in the IOR.

Additional Information

• About the Indian Ocean Conference:

• The Indian Ocean Conference (IOC) was initiated in 2016 to provide a platform for countries of the Indian Ocean Region to discuss and collaborate on regional issues.

• The conference is organized by the India Foundation in collaboration with partner nations and organizations.

• It serves as a multilateral platform for addressing maritime security, economic cooperation, and geopolitical issues in the Indian Ocean Region.

• Significance of Oman:

• Oman is strategically located at the convergence of the Arabian Sea and the Persian Gulf, making it a crucial player in maritime security and trade in the Indian Ocean Region.

• It shares a longstanding relationship with India, emphasizing trade, energy, and maritime cooperation.

• The port of Duqm in Oman is of strategic importance for regional connectivity and economic activity.

• Importance of the Indian Ocean Region (IOR):

• The Indian Ocean is the world's third-largest ocean, covering 20% of Earth's water surface.

• It is a vital trade route, with nearly 80% of global oil trade passing through it.

• Key choke points like the Strait of Hormuz, Malacca Strait, and Bab el-Mandeb are located in the IOR.

• Other Locations from the Options:

• Cairo, Egypt: While Cairo is a hub for diplomacy in the Middle East and Africa, it has not hosted the Indian Ocean Conference.

• Manila, Philippines: Manila is a key player in the Pacific region but does not hold strategic influence in the Indian Ocean.

• Perth, Australia: Although Australia is a significant member of the Indian Ocean Rim Association (IORA), Perth has not been a host city for this conference.

Q23. Answer: (d) Level alluvial land

The correct answer is Level alluvial land.

Key Points

• Level alluvial land is considered the most suitable type of land for agriculture in India due to its fertility and nutrient-rich soil composition.

• Alluvial soils are formed by the deposition of sediments brought by rivers and streams, making them highly productive for crops.

• These soils are extensively found in the Indo-Gangetic plains, covering states like Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal.

• The fine texture and adequate water-retention capacity of alluvial soil make it ideal for growing crops like wheat, rice, sugarcane, and cotton.

• Alluvial soils are renewable and self-replenishing due to regular silt deposition by rivers, ensuring long-term agricultural productivity.

Additional Information

• Mountainous Land:

• Mountainous land is characterized by its rugged terrain and steep slopes, making it less suitable for large-scale agriculture.

• However, in regions like the Himalayan foothills, terrace farming is practiced to grow crops such as tea, rice, and vegetables.

• The soil here is often shallow and prone to erosion, limiting its agricultural potential.

• Rocky and Arid Land:

• Rocky and arid lands are typically infertile and lack sufficient water for agriculture.

• These lands are found in regions like the Thar Desert in Rajasthan.

• Limited agricultural activities are carried out here, primarily depending on irrigation techniques and drought-resistant crops.

• Forest Land:

• Forest land is rich in organic matter but is primarily used for forestry and biodiversity conservation rather than agriculture.

• Clearing forest land for farming can lead to deforestation and environmental degradation.

• Some tribal communities practice shifting cultivation in forested areas, but this is not a sustainable agricultural practice.

• Importance of Alluvial Soil in India:

• Alluvial soils cover about 40% of India's total land area, making them the most significant agricultural resource.

• These soils are classified into two types: Bhangar (older alluvium) and Khadar (newer alluvium), both of which are highly fertile.

• The availability of water from rivers like the Ganga, Brahmaputra, and Yamuna further enhances agricultural productivity in these regions.

• Important Points

• India's agricultural sector relies heavily on alluvial soil for producing staple crops like rice and wheat, which are essential for food security.

• Efficient irrigation systems and regular flooding of rivers help maintain the fertility of alluvial lands.

• With proper management, alluvial soils can sustain intensive agriculture, supporting India's status as one of the leading producers of various crops globally.

Q24. Answer: (d) To show open programs and allow quick access to them

The correct answer is To show open programs and allow quick access to them.

Key Points

• The Taskbar in Windows 7 is primarily designed to provide a visual interface for accessing and managing open applications and programs. It displays currently running programs and allows users to switch between them efficiently.

• It contains the Start Button, which provides access to the Start Menu, enabling users to quickly launch programs, search for files, and access system settings.

• The Taskbar also features Quick Launch icons that allow users to open frequently used applications directly without searching for them in the Start Menu or desktop.

• The Notification Area (System Tray) is part of the Taskbar, where essential system notifications, time and date, and background-running application icons (e.g., antivirus, Bluetooth) are displayed.

• The Taskbar introduced "Pinning" in Windows 7, allowing users to pin their favorite programs for easier access. Users can also preview open windows using the thumbnail previews when hovering over applications.

Additional Information

• Components of the Taskbar:

• Start Button: Located on the left side, it opens the Start Menu, providing access to applications, settings, and files.

• Quick Launch Area: Displays shortcuts to commonly used programs for faster access.

• Active Applications: Displays icons for currently open programs, allowing users to switch between them easily.

• Notification Area (System Tray): Shows system icons, time, date, and status of background-running applications.

• Features Introduced in Windows 7 Taskbar:

• The Aero Peek feature allows users to preview open windows without switching to them.

• The Pinning feature lets users attach frequently used programs to the Taskbar for quick access.

• Jump Lists: Provide quick access to recently used files or tasks associated with applications pinned to the Taskbar.

• Comparison with Previous Versions:

• Windows XP and Vista Taskbars lacked features like Pinning and Aero Peek introduced in Windows 7.

• Windows 7's Taskbar provided improved functionality and visual aesthetics compared to its predecessors.

• Applications of Taskbar:

• Efficient program management and quick access to open applications.

• Enhanced multitasking capabilities, particularly for users working with multiple applications simultaneously.

• Provides a central location for system notifications and quick actions.

Important Points

• Option 1: To shut down the computer. This is incorrect as shutting down the computer is done via the Start Menu or Power Button, not directly through the Taskbar.

• Option 2: To install new software. This is incorrect as software installation is done through application installers or the Control Panel, not the Taskbar.

• Option 3: To display the system BIOS. This is incorrect as the system BIOS can be accessed during boot-up using specific keys (e.g., F2, Delete), not through the Taskbar.

• Option 4: To show open programs and allow quick access to them. This is the correct answer as the primary purpose of the Taskbar is program management and quick access.

• Option 5: Blank option. This is invalid as it does not provide any relevant functionality.

Q25. Answer: (a) Yogi Adityanath

The correct answer is Yogi Adityanath.

Key Points

• Yogi Adityanath, the Chief Minister of Uttar Pradesh, announced naming a medical college after Ahilyabai Holkar in May 2025.

• Ahilyabai Holkar was a renowned ruler of the Malwa kingdom, known for her contributions to the welfare of her people and the development of several temples and public works.

• The announcement reflects the efforts of the Uttar Pradesh government to honor historical figures who have made significant contributions to Indian society.

• The medical college named after Ahilyabai Holkar is expected to boost education and healthcare infrastructure in the state.

• This initiative is part of Uttar Pradesh's focus on improving access to medical education and healthcare facilities in rural and urban areas.

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Additional Information

• Yogi Adityanath:

• Yogi Adityanath has been the Chief Minister of Uttar Pradesh since 2017.

• He is known for his focus on infrastructure development, law and order, and healthcare reforms in the state.

• Under his leadership, Uttar Pradesh has seen significant improvements in healthcare facilities, including the establishment of new medical colleges.

• Ahilyabai Holkar:

• Ahilyabai Holkar was born in 1725 and ruled the Malwa kingdom from 1767 to 1795.

• She is remembered for her administrative skills, philanthropic work, and contributions to the construction of temples, ghats, and wells across India.

• Her reign is considered a golden period in the history of Malwa, marked by peace, prosperity, and cultural development.

• Medical Education in Uttar Pradesh:

• Uttar Pradesh has been working towards establishing more medical colleges to improve access to healthcare and medical education.

• The state government has implemented various schemes to provide affordable healthcare to its citizens, especially in rural areas.

• By naming colleges after historical figures, the government aims to inspire students and honor India's rich heritage.

• Healthcare Infrastructure Development:

• The government of Uttar Pradesh has been actively upgrading healthcare facilities, with a focus on rural and semi-urban areas.

• Efforts include the establishment of AIIMS and district hospitals, as well as initiatives to train healthcare professionals.

• Such measures aim to address the shortage of doctors and improve healthcare services in the state.

Important Points

• Uddhav Thackeray:

• He served as the Chief Minister of Maharashtra from 2019 to 2022.

• Known for his focus on environmental conservation and infrastructure projects in Maharashtra.

• Bhupesh Baghel:

• The current Chief Minister of Chhattisgarh since 2018.

• He is recognized for his efforts in rural development and agricultural reforms in the state.

• Ashok Gehlot:

• He is serving as the Chief Minister of Rajasthan since 2018.

• Gehlot is known for his focus on social welfare schemes and healthcare initiatives.

Q26. Answer: (a) Search box in File Explorer

The correct answer is Search box in File Explorer.

Key Points

• The Search box in File Explorer is a built-in feature in the Windows operating system that helps users quickly locate specific files or folders in a large directory.

• Located in the top-right corner of the File Explorer window, the search box allows users to type keywords, file names, or extensions to filter and display relevant results.

• This feature is especially useful for navigating through directories with a large number of files, saving time and effort in manually locating the desired file.

• The search function supports advanced options such as filters (e.g., date modified, file type) and Boolean operators (e.g., AND, OR, NOT) to refine search results further.

• It is a part of the Windows graphical user interface (GUI) and works seamlessly across all drives and folders, provided the indexing service is enabled for faster results.

Additional Information

• File Explorer:

• File Explorer, previously known as Windows Explorer, is a file management utility in the Windows operating system.

• It provides a graphical interface to access, organize, and manage files and folders on a computer.

• Common tasks include creating, moving, renaming, and deleting files or folders.

• Other Features of File Explorer:

• Navigation Pane: Allows quick access to frequently used folders and drives.

• Ribbon Toolbar: Provides shortcuts to common commands such as copy, paste, delete, and properties.

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• Preview Pane: Displays a preview of the selected file without opening it.
• Details Pane: Shows additional details about a file, such as size, type, and modification date.
• Indexing Service:
• The indexing service in Windows is responsible for creating an index of files on the system to improve search performance.
• It enables faster file searches by maintaining a database of commonly accessed file attributes.
• Users can customize the indexing options to include or exclude specific drives and folders.
• Other Methods of Locating Files in Windows:
• Taskbar Search: The Windows taskbar includes a search bar that can locate files, applications, and even perform web searches.
• Windows PowerShell/Command Prompt: Advanced users can use commands like "dir" to find files in a directory.
• Third-party Tools: Applications like Everything or Agent Ransack provide additional file search capabilities.
• Important Points:
• Ensuring the system's indexing service is enabled can significantly speed up file searches.
• Using specific keywords or file extensions in the search box can yield more accurate results.
• File Explorer allows sorting and grouping of search results based on attributes like name, date, size, or type.

Q27. Answer: (c) Governor of the state

The correct answer is Governor of the state.

Key Points

• Appointment of District Judges: The Governor of the state is the appointing authority for District Judges in India. The appointment is made in consultation with the High Court of the respective state.
• Article 233 of the Constitution of India governs the appointment of District Judges. It states that the appointment is done by the Governor after consulting the High Court.
• Eligibility Criteria: The individual being appointed as a District Judge must have been an advocate or pleader for at least seven years and must be recommended by the High Court.
• The process ensures that the judiciary maintains independence, and the High Court plays a significant role in recommending qualified individuals for the position.
• This appointment process underscores the importance of maintaining a balance between the executive authority (Governor) and judicial oversight (High Court).

Additional Information

• Role of Governor:
• The Governor acts as the executive head of the state and performs several constitutional duties, including the appointment of District Judges.
• Under Article 233, the Governor consults the High Court of the respective state to ensure the judiciary's independence and integrity.
• Article 233 of the Constitution:
• Article 233 of the Indian Constitution specifically deals with the appointment of District Judges.
• It specifies that appointments, postings, and promotions of District Judges are made by the Governor of the state in consultation with the High Court.
• This article ensures a balance between executive authority and judicial oversight in the appointment process.
• Role of High Court:
• The High Court plays a crucial role in ensuring that the individuals appointed as District Judges meet the required qualifications and standards.
• The consultation process ensures that the judiciary remains impartial, independent, and free from executive interference.
• District Judges:
• District Judges are the highest judicial officers in the district judiciary system.
• They handle criminal and civil cases and also supervise the functioning of subordinate courts within the district.
• Important Points:
• Eligibility for appointment as a District Judge includes being an advocate or pleader for at least seven years.
• The Governor's role in the appointment process is primarily executive, but it is guided by the recommendations of the High Court.
• This process ensures the judiciary's integrity and independence from political influences.

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Q28. Answer: (d) Presentation of a report card highlighting achievements

The correct answer is Presentation of a report card highlighting achievements.

Key Points

• The New Delhi government marked its first 100 days in office by presenting a report titled 'Kaam Karne Wali Sarkar: 100 Din Seva Ke', showcasing its achievements and initiatives taken during this period.

• The report card emphasized transparency and accountability, highlighting the government's focus on delivering results and fulfilling pre-election promises.

• Key initiatives mentioned in the report included measures to enhance public welfare in areas like education, healthcare, and infrastructure, which are vital sectors for societal development.

• The initiative aimed to inform citizens about the progress made in various projects and the government's commitment to improving governance and services.

• Such presentations act as tools for public scrutiny and enable people to evaluate the government's performance effectively.

Additional Information

• Transparency in Governance:

• Governments often present achievement reports to enhance public trust and ensure transparency in governance.

• These reports serve as a medium to highlight progress, challenges, and areas requiring improvement.

• For example, the Delhi government has consistently emphasized education and healthcare reforms as part of its governance model.

• Key Initiatives of the Delhi Government:

• Education: Introduction of programs like Happiness Curriculum and infrastructure upgrades in schools.

• Healthcare: Establishment of Mohalla Clinics to provide accessible healthcare services.

• Transport: Expansion of public transportation facilities and subsidies for certain groups.

• Importance of Report Cards in Governance:

• Report cards enable citizens to hold governments accountable and track the progress of promised initiatives.

• They provide insights into the allocation of resources and the efficiency of implemented policies.

• Such reports also help governments to identify gaps and prioritize future actions effectively.

• Examples of Similar Initiatives:

• Other state governments like Maharashtra and Kerala have also adopted similar practices to present their achievements.

• These initiatives are crucial in fostering a culture of transparency and citizen engagement in governance.

Important Points

• Government Accountability:

• Regular updates through reports help foster accountability and trust between the government and citizens.

• They provide a platform for constructive criticism, allowing governments to address shortcomings effectively.

• Public Engagement:

• Reports like 'Kaam Karne Wali Sarkar' enable citizens to actively participate in governance by staying informed about initiatives and policies.

• They ensure a two-way communication system, where public opinions can also influence policy-making.

• Global Examples:

• Globally, countries like New Zealand and Canada release regular progress reports on governance to maintain transparency.

• These practices are recognized as a benchmark for effective democratic governance.

Q29. Answer: (b) By adoption

The correct answer is By adoption.

Key Points

• The Citizenship Act, 1955 specifies the modes of acquiring Indian citizenship, including birth, descent, registration, and naturalization. "By adoption" is not a recognized mode under this Act.

• By birth: Any individual born in India on or after January 26, 1950, but before July 1, 1987, is an Indian citizen by birth, irrespective of their parents' citizenship. After July 1, 1987, citizenship by birth requires at least one parent to be an Indian citizen. Hence, this is a valid mode.

• By descent: Citizenship can be acquired if an individual is born outside India, provided their parent is an Indian citizen at the time of their birth. This mode is valid under the Act.

• By registration: Certain categories of people, such as Persons of Indian Origin (PIOs) residing in India, spouses of Indian citizens, and others, can acquire citizenship through registration under Section 5 of the Act. This is a valid mode as stated in the Act.

• By naturalization: Foreign nationals who fulfill certain conditions, such as residence in India for a specified period and renunciation of their original citizenship, can acquire Indian citizenship. This is also valid under the Act.

• Hence, the correct answer is By adoption, as it is not a recognized mode under the Citizenship Act, 1955.

Additional Information

• The Citizenship Act, 1955:

• Enacted by the Government of India under Article 11 of the Indian Constitution, which grants Parliament the authority to regulate citizenship.

• It governs the acquisition and termination of Indian citizenship and provides provisions for naturalization and registration.

• Modes of acquiring citizenship include: birth, descent, registration, naturalization, and incorporation of territory.

• By birth:

• Individuals born in India between January 26, 1950, and July 1, 1987, are automatically Indian citizens by birth.

• After July 1, 1987, citizenship by birth requires at least one parent to be an Indian citizen.

• From December 3, 2004, an individual born in India must have both parents not classified as illegal migrants to acquire citizenship by birth.

• By descent:

• A person born outside India is considered an Indian citizen if their parent was an Indian citizen at the time of their birth.

• Special provisions exist for children born abroad to Indian citizens working for the Government of India.

• By registration:

• Citizenship can be acquired by individuals of Indian origin living in India for a specified period, spouses of Indian citizens, or minors of Indian parents.

• The process requires fulfillment of conditions under Section 5 of the Citizenship Act.

• By naturalization:

• Foreign nationals who have resided in India for 12 years (including 1 year immediately before application) and meet other prescribed conditions can acquire citizenship.

• The applicant must renounce their previous citizenship and take an oath of allegiance to the Indian Constitution.

Important Points

• Incorporation of Territory:

• Citizenship can be granted to individuals of territories that become part of India through political or administrative actions.

• For example, individuals in Sikkim became Indian citizens after its incorporation in 1975.

• Termination of Citizenship:

• Citizenship can be terminated under specific conditions such as voluntary acquisition of another country's citizenship.

• It can also be revoked if acquired through fraudulent means.

• Illegal Migrants:

• Individuals who enter India without valid documentation or stay beyond their visa period are classified as illegal migrants and are not eligible for citizenship.

• Special provisions under laws like the Citizenship (Amendment) Act, 2019 apply to specific communities from neighboring countries.

• Citizenship Amendment Act (CAA), 2019:

• Allows certain persecuted minorities from Pakistan, Bangladesh, and Afghanistan (Hindus, Sikhs, Buddhists, Jains, Parsis, and Christians) to apply for Indian citizenship.

• Excludes Muslims from these provisions, leading to debates and protests across the country.

Q30. Answer: (c) Sanskrit

The correct answer is Sanskrit.

Key Points

• Sanskrit was granted classical language status by the Government of India in 2005, following Tamil, which was declared a classical language in 2004.

• A language is granted classical status based on its antiquity, rich literary tradition, and cultural heritage.

• Sanskrit is one of the oldest languages in the world and is considered the mother of many Indian languages, forming the foundation of Indo-European linguistic traditions.

• The recognition of Sanskrit as a classical language highlights its role in preserving ancient Indian texts, philosophy, and knowledge systems, including the Vedas, Upanishads, and epics like Mahabharata and Ramayana.

• The classical language status allows for dedicated efforts to promote, preserve, and study the language and its literature through government initiatives and funding.

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Additional Information

• Criteria for Classical Language Status:

• The language must have a recorded history of at least 1500–2000 years.

• The language must possess a rich body of ancient literature and texts that are considered a valuable heritage by generations.

• The literature should be original and not borrowed from other traditions.

• The language must have contributed significantly to the culture and knowledge systems of the nation.

• Other Classical Languages of India:

• Tamil: Tamil was the first language to be granted classical status in 2004. It has a history spanning over 2000 years with ancient texts like Sangam literature.

• Telugu: Granted classical status in 2008, Telugu boasts a rich literary tradition and historical significance in South Indian culture.

• Kannada: Recognized as a classical language in 2008, Kannada has a long history of literary contributions, including works like Kavirajamarga.

• Malayalam: Declared a classical language in 2013, Malayalam has contributed significantly to Indian literature and philosophy.

• Odia: Granted classical status in 2014, Odia is known for its ancient texts and cultural significance in Eastern India.

• Significance of Sanskrit:

• Sanskrit is often referred to as the language of the gods and holds a sacred place in Hinduism, Buddhism, and Jainism.

• It serves as the medium for ancient Indian scientific, mathematical, and philosophical advancements.

• Texts like the Vedas, Upanishads, Bhagavad Gita, and Ayurveda were written in Sanskrit.

• Despite being an ancient language, Sanskrit continues to be used in modern academia, rituals, and scholarly pursuits.

• Government Initiatives for Sanskrit:

• The Indian government has established institutions like the Rashtriya Sanskrit Sansthan to promote and preserve Sanskrit studies.

• Funding and scholarships are provided for research and education in Sanskrit.

• Efforts are being made to integrate Sanskrit with modern technology, including translation software and digitization of ancient texts.

Q31. Answer: (c) Voluntary interference by the judiciary in public interest

The correct answer is Voluntary interference by the judiciary in public interest.

Key Points

• Judicial Activism refers to the proactive role played by the judiciary in safeguarding the rights of citizens and ensuring justice, particularly in cases where legislative and executive actions are inadequate.

• It involves the voluntary interference by the judiciary in matters of public interest, often through Public Interest Litigation (PIL), where courts address societal issues like corruption, environmental protection, and human rights violations.

• Unlike passive interpretation, judicial activism allows the judiciary to expand the scope of laws to address complex and evolving societal needs.

• Examples of judicial activism include the Vishakha Guidelines for preventing sexual harassment at the workplace and the recognition of environmental rights as part of the Right to Life under Article 21 of the Indian Constitution.

• Judicial activism is seen as a mechanism to uphold constitutional principles and prevent the misuse of power by other branches of government.

Additional Information

• Declaring elections null and void:

• In rare cases, courts may declare elections null and void if there is evidence of substantial irregularities or violations of electoral laws.

• This action falls under judicial review rather than activism, as it is bound by established legal frameworks. Hence, this is not an example of judicial activism.

• Passive interpretation of laws:

• Passive interpretation refers to the judiciary's approach of strictly adhering to the letter of the law without expanding its scope or addressing societal challenges.

• It is the opposite of judicial activism and does not involve voluntary intervention for public interest. Hence, this statement is incorrect.

• Only enforcing existing laws strictly:

• This approach involves ensuring compliance with existing laws without any attempt to reinterpret or expand their application.

• While strict enforcement is essential, it does not reflect judicial activism, which focuses on addressing gaps in legislation and policy. Hence, this statement is incorrect.

• Examples of Judicial Activism:

• Kesavananda Bharati Case (1973): Established the Basic Structure Doctrine, ensuring the Constitution's core principles are protected.

• Vishakha v. State of Rajasthan (1997): Laid down guidelines for preventing sexual harassment at the workplace.

• MC Mehta Cases: Landmark environmental judgments addressing pollution and ecological preservation.

• Public Interest Litigation (PIL):

• PIL allows citizens or groups to file lawsuits for matters concerning public welfare or interest.

• It has been instrumental in advancing judicial activism by providing a platform for addressing societal issues.

Important Points

• Judicial Activism vs Judicial Overreach:

• Judicial activism is a balanced intervention to uphold justice and constitutional values.

• Judicial overreach occurs when courts exceed their jurisdiction, intruding into policy-making or administrative functions.

• Article 32: Empowers citizens to approach the Supreme Court directly for enforcement of fundamental rights, often used in judicial activism.

• Checks and Balances: Judicial activism plays a vital role in maintaining checks and balances within the democratic framework.

• Criticism: Critics argue that judicial activism may undermine the separation of powers and lead to inefficiency if the judiciary interferes excessively in governance.

Q32. Answer: (b) Defence Research and Development Organisation (DRDO)

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

Key Points

• Quantum Technology Research Centre (QTRC) was inaugurated by the Defence Research and Development Organisation (DRDO) at Metcalfe House, Delhi, in May 2025.

• The initiative aims to advance quantum computing, communication, and cryptography technologies, which are essential for national security and advanced defense systems.

• DRDO has been at the forefront of research and development for India's defense sector, focusing on cutting-edge technologies like AI, robotics, and quantum technologies.

• The QTRC is expected to foster collaboration between academia, industry, and government agencies to drive innovation and support India's defense infrastructure.

• This move aligns with India's strategic focus on emerging technologies and its goal of becoming a global leader in quantum technology research.

Additional Information

• Defence Research and Development Organisation (DRDO):

• Founded in 1958, DRDO operates under the Ministry of Defence, Government of India.

• It is headquartered in New Delhi and consists of over 50 laboratories across India dedicated to developing defense technologies.

• DRDO focuses on multiple domains, including missile systems, electronic warfare, radars, and combat vehicles.

• Notable achievements include the development of the Agni and Prithvi missile series and the Tejas Light Combat Aircraft.

• Quantum Technology:

• Quantum technology leverages principles of quantum mechanics to create advanced solutions in computing, sensing, communication, and cryptography.

• Applications include quantum computing for solving complex problems, quantum sensors for precision measurements, and quantum cryptography for secure communication.

• Countries like the USA, China, and the EU are investing heavily in quantum research to gain technological and strategic advantages.

• Metcalfe House, Delhi:

• Metcalfe House is a historic building located in Delhi, known for hosting key research and defense-related organizations.

• The facility is equipped with state-of-the-art infrastructure for conducting advanced research in various scientific domains.

• India's Quantum Mission:

• The National Quantum Mission was launched in April 2023 to advance research and development in quantum computing, communication, and sensing.

• With a budget allocation of Rs. 6000 crore, the mission aims to establish India's leadership in quantum technology by 2031.

• The initiative focuses on collaboration between academia, industry, and government to foster innovation and create skilled human resources.

Important Points

• Global Quantum Research:

• Countries like China have made significant advancements, including the launch of the Micius satellite for quantum communication.

• The USA has established the Quantum Information Science Research Centers under the Department of Energy.

• Potential of Quantum Technology:

• Quantum computing has applications in drug discovery, financial modeling, and artificial intelligence.

• Quantum communication ensures unhackable security protocols, essential for defense and financial transactions.

Q33. Answer: (c) Consumption expenditure

The correct answer is Consumption expenditure.

Key Points

• The Tendulkar Committee, headed by Suresh Tendulkar, was constituted by the Government of India in 2005 to review the methodology for estimating poverty in India.

• The committee recommended a shift from the earlier method of measuring poverty based on calorie intake to a broader metric based on consumption expenditure.

• Consumption expenditure includes expenses on food, health, education, and other basic needs, providing a more comprehensive measure of poverty.

• It also proposed using implicit price indices derived from the National Sample Survey Organisation (NSSO) data to calculate poverty lines, ensuring better alignment with actual consumption patterns.

• The Tendulkar methodology was used to estimate poverty lines for both urban and rural areas, accounting for regional variations in consumption and living standards.

• As per the committee's methodology, the national poverty line was set at a monthly per capita expenditure of Rs. 816 for rural areas and Rs. 1000 for urban areas in 2004-05.

Additional Information

• Calorie Intake:

• Earlier methods of poverty estimation, such as those by the Planning Commission, relied heavily on calorie intake to define poverty lines.

• The calorie-based poverty line focused on providing the minimum required caloric energy—2400 kcal for rural areas and 2100 kcal for urban areas.

• However, this approach was criticized for ignoring other essential factors such as healthcare, education, and housing.

• Income:

• Income-based poverty measurement focuses on the earning capacity of individuals or households.

• This metric has limitations as it does not account for inequalities in consumption or access to services.

• India does not officially use income as the sole criterion for poverty estimation.

• Employment Status:

• While employment status is crucial for understanding economic stability, it is not directly used for poverty estimation in India.

• Unemployment or informal employment can contribute to poverty, but measures like the Tendulkar methodology rely on actual expenditure data rather than employment data.

• Key Developments Post-Tendulkar Committee:

• The Rangarajan Committee, established in 2012, revised the Tendulkar methodology and adopted a new method for poverty calculation, focusing on basic needs.

• It updated poverty lines to Rs. 972 per capita per month for rural areas and Rs. 1407 for urban areas in 2011-12.

• India's poverty estimation has evolved to include broader metrics like the Multidimensional Poverty Index (MPI), which considers factors like health, education, and living standards.

Important Points

• National Sample Survey Organisation (NSSO):

• The NSSO, under the Ministry of Statistics and Programme Implementation, conducts household surveys that are crucial for poverty estimation.

• Data from NSSO surveys forms the basis of poverty lines recommended by the Tendulkar and Rangarajan Committees.

• Multidimensional Poverty Index (MPI):

• The MPI, developed by the United Nations Development Programme (UNDP) and Oxford Poverty and Human Development Initiative (OPHI), measures poverty across multiple dimensions.

• India's MPI score is based on factors like health, education, and living standards instead of income or expenditure alone.

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Q34. Answer: (b) Household cooking and lighting

The correct answer is Household cooking and lighting.

Key Points

• Biogas plants are widely used in rural India for household cooking and lighting. This is because biogas is a renewable and clean source of energy, reducing dependence on firewood and fossil fuels.

• Biogas is primarily composed of methane (CH_4) and carbon dioxide (CO_2), produced through the anaerobic digestion of organic waste such as animal dung and agricultural residues.

• In rural areas, households often have access to livestock, making cow dung a readily available resource for biogas production. Gobardhan (Galvanizing Organic Bio-Agro Resources Dhan) initiative by the Indian government promotes biogas usage.

• Biogas plants help reduce indoor air pollution caused by traditional cooking methods like wood-burning, improving health conditions and environmental sustainability.

• These plants also provide by-products like slurry, which serve as high-quality organic fertilizers, thus benefiting agriculture in rural areas.

Additional Information

• Industrial use:

• While biogas has the potential for industrial applications like powering machinery and heating processes, its usage in rural India is limited due to the smaller scale of biogas plants.

• Industries often require higher energy output, which is not feasible with the small biogas plants commonly found in villages.

• Transportation:

• Biogas can be upgraded to bio-CNG (Compressed Natural Gas) for use in vehicles. However, this requires advanced technology and infrastructure, which is not widely available in rural settings.

• Transportation applications of biogas are primarily seen in urban areas or industrial hubs, not rural India.

• Iron smelting:

• Iron smelting requires extremely high temperatures, typically achieved using coal or other fossil fuels. Biogas, with its lower calorific value, is not suitable for this application.

• It is not a common use of biogas in rural India.

• Key advantages of biogas:

• Provides a sustainable and renewable energy source.

• Reduces greenhouse gas emissions by utilizing organic waste.

• Improves sanitation by managing livestock and human waste effectively.

• Supports rural economies by reducing fuel costs and increasing agricultural productivity.

Important Points

• National Biogas and Manure Management Programme (NBMMP):

• Implemented by the Ministry of New and Renewable Energy (MNRE), this programme promotes biogas plants in rural areas.

• It aims to provide clean energy for cooking and lighting while also producing organic manure.

• Biogas composition:

• Typically contains 50-75% methane, 25-50% carbon dioxide, and trace amounts of hydrogen sulfide and moisture.

• Methane is the primary energy component, responsible for combustion and energy generation.

• Environmental benefits:

• Biogas usage helps mitigate deforestation by reducing reliance on firewood.

• It also contributes to reducing methane emissions from unmanaged livestock waste.

• Global examples:

• Countries like Germany, Sweden, and China have advanced biogas technologies, utilizing it for electricity generation, heating, and vehicle fuel.

• India is increasingly adopting biogas technologies to empower rural households.

Q35. Answer: (b) Himachal Pradesh to secure snow leopard habitats

The correct answer is Himachal Pradesh to secure snow leopard habitats.

Key Points

• Himachal Pradesh notified the Tsarap Chu Conservation Reserve under the Wildlife (Protection) Act, 1972 to safeguard high-altitude biodiversity, including habitats of the elusive snow leopard.

• The Tsarap Chu Conservation Reserve is located in the Lahaul-Spiti region, which is renowned for its extreme altitude and ecological diversity.

• Efforts to protect snow leopard habitats align with India's participation in the Global Snow Leopard and Ecosystem Protection

Program (GSLEP), an international initiative aimed at conserving snow leopards and their ecosystems.

• The reserve plays a critical role in protecting endangered species, such as the snow leopard, and conserving fragile high-altitude ecosystems.

• This initiative is part of a broader strategy by Himachal Pradesh to enhance wildlife conservation in the state and promote eco-tourism.

Additional Information

• Snow Leopard Conservation in India:

• Snow leopards are categorized as “Vulnerable” under the IUCN Red List, with an estimated population of 4,000-6,500 worldwide.

• India accounts for approximately 500-700 snow leopards, found in regions such as Himachal Pradesh, Jammu & Kashmir, Ladakh, Uttarakhand, Arunachal Pradesh, and Sikkim.

• The Project Snow Leopard, launched in 2009, aims to conserve snow leopards and their habitats in India.

• The snow leopard is also listed under Schedule I of the Wildlife Protection Act, 1972, providing it with the highest level of legal protection in India.

• Global Snow Leopard and Ecosystem Protection Program (GSLEP):

• GSLEP was initiated in 2013 at the Global Snow Leopard Forum in Bishkek, Kyrgyzstan.

• It is a collaborative effort among the 12 snow leopard range countries, including India, to protect snow leopards and their ecosystems.

• The program emphasizes community participation, scientific research, and international cooperation for conservation.

• Wildlife (Protection) Act, 1972:

• This act is a cornerstone of wildlife conservation in India, providing legal protection to endangered species and regulating hunting, poaching, and trade of wildlife.

• Under the act, several categories such as sanctuaries, national parks, conservation reserves, and community reserves are established to protect biodiversity.

• Other Conservation Efforts:

• Sikkim: Focuses on Himalayan red panda conservation through sanctuaries such as the Barsey Rhododendron Sanctuary.

• Uttarakhand: Implements programs to protect high-altitude medicinal plant species in regions such as the Valley of Flowers National Park.

• Arunachal Pradesh: Works towards conserving high-altitude wetlands, which serve as critical habitats for migratory birds and other wildlife.

Important Points

• Himachal Pradesh:

• Known for its diverse landscapes, including forests, rivers, and high-altitude regions, making it a hub for conservation efforts.

• Home to several national parks and wildlife sanctuaries such as the Great Himalayan National Park, which is a UNESCO World Heritage Site.

• The state government actively promotes eco-tourism to balance conservation and economic development.

• Conservation Reserves:

• These are areas designated under the Wildlife Protection Act, 1972, to protect wildlife and their habitats while allowing limited human activity.

• Conservation reserves are typically established on community or private lands to involve local populations in conservation efforts.

Q36. Answer: (a) Anora

The correct answer is Anora.

Key Points

• The film Anora was awarded the Best Picture honour at the 97th Academy Awards, which took place in 2025.

• The Academy Awards, also known as the Oscars, are held annually to honour achievements in the film industry, covering categories such as acting, directing, and technical excellence.

• Anora, a critically acclaimed movie, was noted for its exceptional storytelling, direction, and performances, which resonated with both audiences and critics worldwide.

• This film competed with other strong contenders such as The Brutalist, Conclave, and Dune: Part Two, and emerged victorious due to its innovative narrative and cinematic brilliance.

• The Best Picture category is considered the most prestigious award at the Academy Awards, as it represents the collective efforts of the entire filmmaking team.

Additional Information

• About the Academy Awards:

• The Academy Awards, often referred to as the Oscars, are presented by the Academy of Motion Picture Arts and Sciences (AMPAS) to honour artistic and technical merit in the film industry.

• The first Academy Awards ceremony was held in 1929, and it has since become one of the most prestigious awards in global cinema.

• The awards are presented in various categories, including Best Picture, Best Director, Best Actor, Best Actress, and several technical categories like cinematography and editing.

• The voting process involves members of the Academy, who are professionals working in different branches of the film industry.

• Details about Anora:

• Anora is a cinematic masterpiece that was recognized for its deep narrative, remarkable performances, and innovative approach to filmmaking.

• The film explores themes of human connection, resilience, and emotional depth, making it a standout entry in the competition.

• It was directed by a celebrated filmmaker known for pushing the boundaries of storytelling and visual aesthetics.

• Other Nominated Films:

• The Brutalist: A highly stylized film that delves into the world of architecture and its influence on human lives, it garnered attention for its unique visual style and profound themes.

• Conclave: A political thriller that offers a gripping narrative surrounding the election of a new Pope, this film was praised for its intense screenplay and stellar performances.

• Dune: Part Two: A sequel to the critically acclaimed Dune, this film continued the epic saga of power, betrayal, and destiny set in a futuristic universe.

• Importance of the Best Picture Award:

• The Best Picture award is the highest honour at the Oscars, symbolizing excellence in filmmaking and teamwork.

• Winning this award often results in increased recognition, financial success, and cultural impact for the film and its creators.

Q37. Answer: (b) Maharashtra

The correct answer is Maharashtra.

Key Points

• Vadhavan Port is located in the state of Maharashtra, India.

• The port is being developed as an all-weather Greenfield deep draft major port to cater to increasing maritime trade.

• It is expected to have a natural draft of 20 meters, making it suitable for handling large container ships and cargo vessels.

• The port is being developed under the leadership of the Ministry of Ports, Shipping and Waterways in collaboration with the Maharashtra Maritime Board.

• Vadhavan Port is strategically located near the Jawaharlal Nehru Port Trust (JNPT), enabling it to complement existing port capacities and reduce congestion.

Additional Information

• Importance of Vadhavan Port:

• The port is expected to significantly enhance India's maritime trade capacity and contribute to economic growth.

• It is envisioned to reduce dependency on foreign ports for transshipment, thus saving cost and time for Indian exporters and importers.

• The location of the port on India's western coastline allows it to serve as a gateway for international trade.

• Key Features of Vadhavan Port:

• The port will be equipped with state-of-the-art infrastructure to handle containerized and bulk cargo efficiently.

• The natural depth of 20 meters makes it ideal for hosting large vessels, reducing the need for artificial dredging.

• Environmental considerations are being prioritized to ensure sustainable development of the port.

• Maharashtra's Maritime Significance:

• Maharashtra has a long coastline along the Arabian Sea, making it a key hub for maritime activities.

• Other major ports like Mumbai Port and Jawaharlal Nehru Port Trust (JNPT) contribute significantly to India's international trade.

• The state government is actively involved in developing port infrastructure to boost employment and economic opportunities.

• Additional Ports in India:

• Tamil Nadu: Home to ports such as Chennai, Ennore, and Tuticorin.

• Gujarat: Includes ports like Mundra, Kandla, and Pipavav.

• Kerala: Features ports such as Kochi and Vizhinjam.

Important Points

• Deep Draft Ports:

• Deep draft ports are critical for hosting large cargo ships and reducing operational costs.

• They provide better connectivity to global markets.
• Greenfield Ports:
• Greenfield ports are developed from scratch without existing infrastructure, offering flexibility in planning and execution.
• They are designed to be sustainable and environmentally friendly.
• India's Maritime Vision:
• The Indian government aims to develop ports under the Sagarmala Programme to enhance port-led development.
• It focuses on modernizing ports, improving connectivity, and promoting coastal shipping.

Q38. Answer: (b) Narmada

The correct answer is Narmada River.

Key Points

• The Narmada River originates from the Amarkantak Plateau in the state of Madhya Pradesh, India.
• It flows in a westward direction, making it unique as most rivers in India flow eastward.
• The Narmada River is often referred to as the "Life Line of Madhya Pradesh and Gujarat."
• The river flows through the states of Madhya Pradesh, Maharashtra, and Gujarat before draining into the Arabian Sea.
• It is one of the most important rivers of peninsular India and is considered sacred by many communities.

Additional Information

• Characteristics of the Narmada River:
• The Narmada River is a rift valley river, flowing between the Vindhya and Satpura ranges.
• It is one of the few rivers in India that flows from east to west.
• The total length of the river is approximately 1,312 km, making it one of the longest rivers in India.
• The river is known for its unique marble rocks at Bhedaghat, near Jabalpur.
• The river is a crucial source for irrigation, hydropower, and drinking water for the states it traverses.
• Other Rivers Mentioned in the Options:
• Son River: The Son River originates from Amarkantak Plateau but flows eastward and joins the Ganga River. Hence, it is not the correct answer.
• Tapi River: This river flows westward like the Narmada but originates from the Satpura ranges in Madhya Pradesh, not the Amarkantak Plateau.
• Godavari River: Known as the "Dakshin Ganga," the Godavari originates from Trimbak in Maharashtra and flows eastward, eventually draining into the Bay of Bengal.
• Cultural Significance of the Narmada River:
• The river is considered sacred and is often referred to in Hindu mythology and scriptures.
• The Narmada Parikrama, a pilgrimage where devotees circumambulate the entire river, is considered an act of spiritual significance.
• Important Projects on Narmada:
• The Sardar Sarovar Dam is one of the largest projects on the river, providing water for irrigation and drinking purposes.
• Other projects include the Indira Sagar Dam and Omkareshwar Dam.

Important Points

• The Narmada is one of the seven holy rivers of India, including the Ganga, Yamuna, Saraswati, Godavari, Krishna, and Kaveri.
• Its basin supports diverse flora and fauna, including some endemic species.
• Hydroelectricity generated from its dams contributes significantly to power generation in the region.
• The river is also a source of livelihood for fishermen and supports agriculture in its basin.

Q39. Answer: (d) Bengali

The correct answer is Bengali.

Key Points

• Gitanjali, meaning "Song Offerings," is a renowned collection of poems written by Rabindranath Tagore, originally in the Bengali language.
• The collection was published in 1910 in Bengali and later translated into English by Tagore himself in 1912.
• Gitanjali contains a total of 157 poems in its Bengali version, though the English version comprises 103 poems. The English edition is a curated selection from several works of Tagore.
• Rabindranath Tagore became the first non-European to win the Nobel Prize for Literature in 1913, specifically for his English translation of Gitanjali.

• The themes of Gitanjali revolve around spirituality, devotion, and the intimate connection between humanity and the divine.

Additional Information

• About Rabindranath Tagore:

• Rabindranath Tagore, also known as Gurudev, was born on 7 May 1861 in Kolkata, India.

• He is credited with authoring the national anthems of both India (Jana Gana Mana) and Bangladesh (Amar Shonar Bangla).

• Tagore was a polymath—he excelled as a poet, philosopher, playwright, novelist, and composer, making significant contributions to Indian literature and culture.

• Translation of Gitanjali:

• Tagore translated Gitanjali into English in 1912 while traveling to England.

• The English version was introduced to the Western audience with an introductory note by W.B. Yeats, a renowned Irish poet.

• Significance of Gitanjali:

• The poems of Gitanjali express universal human emotions such as love, devotion, and spiritual longing.

• It is regarded as one of the finest works in Indian literature and has been translated into numerous languages worldwide.

• Other Works of Tagore:

• Tagore authored several other literary masterpieces, including Chitra, Gora, The Home and the World, and Shesher Kobita.

• He also established Visva-Bharati University at Santiniketan, a place for fostering global cultural exchange.

Important Points

• Nobel Prize for Literature (1913):

• Rabindranath Tagore was awarded the Nobel Prize in 1913 for his profound literary contributions, particularly his English version of Gitanjali.

• This recognition placed Indian literature on the global stage.

• Comparison of Languages:

• The original Bengali version of Gitanjali is considered richer in cultural nuances and emotions compared to its English translation.

• The translation was adapted to resonate with Western audiences, focusing on spiritual themes.

Q40. Answer: (c) NITI Aayog

The correct answer is NITI Aayog.

Key Points

• NITI Aayog launched the Fiscal Health Index for India in 2025 as part of its efforts to improve governance and strengthen fiscal sustainability in the country.

• The Fiscal Health Index evaluates the fiscal performance of states and Union Territories in India based on various indicators such as revenue generation, expenditure management, debt sustainability, and fiscal transparency.

• The initiative was designed to address fiscal challenges and promote efficient use of resources to ensure long-term economic growth and stability.

• NITI Aayog, established in 2015, replaced the Planning Commission and serves as a policy think tank for the Government of India, focusing on fostering cooperative federalism and sustainable development.

• The Fiscal Health Index is part of NITI Aayog's larger agenda to promote data-driven policymaking and enhance the fiscal prudence of Indian states.

Additional Information

• NITI Aayog:

• NITI Aayog stands for National Institution for Transforming India and was established on 1 January 2015.

• It serves as a policy think tank and focuses on cooperative federalism, providing strategic and technical advice to the central and state governments.

• NITI Aayog's key areas include promoting sustainable development, innovation, and data-driven governance.

• It works closely with various ministries and state governments to implement policy reforms and schemes.

• Fiscal Health Index:

• The Fiscal Health Index is a comprehensive tool to evaluate the fiscal performance of states and Union Territories in India.

• It considers indicators such as revenue generation, expenditure management, debt sustainability, and fiscal transparency to provide a holistic view of fiscal health.

• The index aims to assist policymakers in identifying fiscal challenges and ensuring efficient use of resources.

• Ministry of Finance:

• The Ministry of Finance is responsible for managing the economic policy, government budget, taxation, and financial regulation of India.

• It plays a key role in preparing the Union Budget and overseeing financial institutions such as banks and insurance companies.

• Although it handles fiscal matters, the Fiscal Health Index was launched by NITI Aayog, not the Ministry of Finance.

• Reserve Bank of India:

• The Reserve Bank of India (RBI), established in 1935, is India's central bank responsible for monetary policy, regulating banks, and ensuring financial stability.

• It focuses on aspects like inflation control and monetary supply but does not directly deal with fiscal health indices, as these are primarily under the purview of NITI Aayog.

• Finance Commission:

• The Finance Commission is a constitutional body under Article 280 of the Indian Constitution that recommends financial distribution between the Centre and states.

• While it addresses fiscal matters, its role is distinct from NITI Aayog's agenda of launching indices like the Fiscal Health Index.

Q41. Answer: (a) 10.8

Shortcut Trick

Make the number of decimal places equal by adding zeros: 10.80 and 0.06.

Consider them as integers: 1080 and 6.

LCM of 1080 and 6 is 1080 because 1080 is exactly divisible by 6 (6 × 180 = 1080).

Place the decimal point back after 2 places: 10.80.

Therefore The correct answer is 10.8.

Alternate Method

Given: Numbers are 10.8 and 0.06.

Formula Used: LCM of fractions = (LCM of Numerators) ÷ (HCF of Denominators).

=> Convert decimals to fractions with common denominators: 108/10 and 6/100 → 1080/100 and 6/100.

=> LCM of numerators (1080, 6) = 1080.

=> HCF of denominators (100, 100) = 100.

=> LCM of numbers = 1080 ÷ 100.

=> LCM = 10.8.

Therefore The correct answer is 10.8.

Additional Information

HCF of Decimals

To find HCF, make decimal places equal and find the HCF of the resulting integers, then replace the decimal point.

HCF and LCM Relation

For two numbers A and B: Product of numbers (A × B) = HCF × LCM.

HCF of Fractions

HCF of fractions = (HCF of Numerators) ÷ (LCM of Denominators).

Q42. Answer: (d) −93x + 162

Shortcut Trick

Simplify the fraction inside the first bracket: 6 ÷ 3 = 2.

Analyze the x^2 coefficients: (3 × 2) − (6 × 1) = 6 − 6 = 0.

Analyze the x coefficients: (3 × −21) − (6 × 5) = −63 − 30 = −93.

Analyze the constant terms: (3 × 18) − (6 × −18) = 54 + 108 = 162.

Combining the results gives the expression −93x + 162.

Therefore The correct answer is −93x + 162.

Alternate Method

Given: $3((6/3)x^2 − 21x + 18) − 6(x^2 + 5x − 18)$

Method: Simplification using the Distributive Property and grouping like terms.

=> First, simplify the division inside the first parentheses: 6 ÷ 3 = 2

=> The expression becomes: $3(2x^2 − 21x + 18) − 6(x^2 + 5x − 18)$

=> Expand the first part by multiplying each term by 3: $6x^2 − 63x + 54$

=> Expand the second part by multiplying each term by −6: $−6x^2 − 30x + 108$

=> Group the x^2 terms: $6x^2 − 6x^2 = 0$

=> Group the x terms: −63x − 30x = −93x

=> Group the constants: 54 + 108 = 162

=> Final expression: −93x + 162

Therefore The correct answer is −93x + 162.

Additional Information

Distributive Property

States that a(b + c) = ab + ac. It is used to eliminate parentheses by multiplying the factor outside the bracket with every term inside.

Combining Like Terms

Terms having the exact same variable part (including exponents) can be added or subtracted to simplify algebraic expressions.

Order of Operations (BODMAS)

Always prioritize calculations inside Brackets and perform Multiplication/Division before Addition/Subtraction.

Q43. Answer: (d) 37.5%

Shortcut Trick

Discount percentage in Buy X Get Y Free schemes is calculated as (Free quantity ÷ Total quantity) × 100.

Free quantity = 3 shirts.

Total quantity (Paid + Free) = 5 + 3 = 8 shirts.

Discount% = (3 ÷ 8) × 100 = 37.5%.

Therefore The correct answer is 37.5%.

Alternate Method

Given → Buy 5 Get 3 Free offer.

Formulas: Discount% = (Discount ÷ MP) × 100 | MP = Price of all items including free ones.

=> Let the Marked Price (MP) of 1 shirt be 1 unit.

=> Total MP of 8 shirts (5 bought + 3 free) = 8 units.

=> The customer gets 3 shirts for free, so Discount = 3 units.

=> Discount% = (3 ÷ 8) × 100.

=> Discount% = 37.5%.

Therefore The correct answer is 37.5%.

Additional Information

Marked Price & Discount

The Marked Price is the price printed on the label. Discount is always calculated on the MP unless stated otherwise.

Successive Discounts

If a scheme offers Buy X Get Y Free plus an additional Z% discount, calculate the first discount% then apply the second one using the successive formula: a + b − (a × b) ÷ 100.

Q44. Answer: (d) 51.2 kg

Shortcut Trick

Assume an arbitrary mean of 50 kg.

Calculate deviations: (40−50), (49−50), (56−50), (75−50), (36−50) → −10, −1, +6, +25, −14.

Net deviation = (−10 − 1 + 6 + 25 − 14) = +6.

Average = Assumed Mean + (Net Deviation ÷ Number of members) = 50 + (6 ÷ 5) = 50 + 1.2 = 51.2 kg.

Therefore The correct answer is 51.2 kg.

Alternate Method

Given: Weights of 5 members = 40 kg, 49 kg, 56 kg, 75 kg, and 36 kg.

Formula Used: Average = (Sum of all observations) ÷ (Total number of observations)

Calculations:

=> Total Weight = 40 + 49 + 56 + 75 + 36

=> Total Weight = 256 kg

=> Number of members = 5

=> Average weight = 256 ÷ 5

=> Average weight = 51.2 kg

Therefore The correct answer is 51.2 kg.

Additional Information

Properties of Average

The sum of deviations of all observations from their arithmetic mean is always zero.

Weighted Average

If groups have different sizes n1, n2 and averages A1, A2, then Combined Average = (n1A1 + n2A2) ÷ (n1 + n2).

Effect of Operations

If every value is increased, decreased, multiplied, or divided by a constant k, the average also changes by the same factor k.

Q45. Answer: (d) Rs. 33,795

Shortcut Trick

Total profit = Rs. 16,000 and Brijesh's profit = Rs. 4,400.

Kushal's profit = 16,000 − 4,400 = Rs. 11,600.

Ratio of Profit (and thus Investment) = Kushal : Brijesh = 11,600 : 4,400 = 116 : 44 = 29 : 11.

Total ratio units = 29 + 11 = 40 units => Rs. 75,100.

Difference in units = 29 − 11 = 18 units.

Difference = (75,100 ÷ 40) × 18 = 1,877.5 × 18 = Rs. 33,795.

Therefore The correct answer is Rs. 33,795.

Alternate Method

Formulas: Investment Ratio = Profit Ratio (when time is constant) | Profit = Total Profit − Other Partner Profit.

=> Brijesh's Profit (P_B) = Rs. 4,400.

=> Total Profit (P_(Total)) = Rs. 16,000.

=> Kushal's Profit (P_K) = 16,000 − 4,400 = Rs. 11,600.

=> Ratio of Investments (I_K : I_B) = 11,600 : 4,400 = 29 : 11.

=> Sum of ratios = 29 + 11 = 40.

=> Value of 1 unit = 75,100 ÷ 40 = 1,877.5.

=> Difference in investments = (29 − 11) × 1,877.5 = 18 × 1,877.5 = Rs. 33,795.

Therefore The correct answer is Rs. 33,795.

Additional Information

Partnership Ratio

Profit is distributed in the product of Investment and Time. If time is equal, Profit Ratio = Investment Ratio.

Compound Partnership

If partners invest for different time periods (T1, T2), then P1:P2 = (I1 × T1) : (I2 × T2).

Q46. Answer: (d) 74°

Shortcut Trick

In right-angled ΔBDC, angle C = 90° − angle DBC = 90° − 72° = 18°.

In ΔAEC, angle AEB is the exterior angle at vertex E.

By the Exterior Angle Theorem, the exterior angle is the sum of the two opposite interior angles.

Therefore angle AEB = angle CAE + angle ACE = 56° + 18° = 74°.

Therefore The correct answer is 74°.

Alternate Method

Given: In ΔABC, BD perpendicular to AC at D, angle DBC = 72°, and angle CAE = 56°.

Formula Used: Sum of angles in a triangle = 180°; Linear pair of angles = 180°.

=> In ΔBDC, angle BDC = 90° (since BD perpendicular to AC).

=> angle BCD = 180° − (angle BDC + angle DBC)

=> angle BCD = 180° − (90° + 72°) = 18°.

=> In ΔAEC, angle CAE = 56° and angle ACE = angle BCD = 18°.

=> angle AEC = 180° − (angle CAE + angle ACE)

=> angle AEC = 180° − (56° + 18°) = 106°.

=> Since B, E, and C lie on the same line, angle AEB and angle AEC form a linear pair.

=> angle AEB = 180° − angle AEC = 180° − 106° = 74°.

Therefore The correct answer is 74°.

Additional Information

Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the sum of the measures of its two remote interior angles.

Angle Sum Property

The sum of the interior angles of any triangle is always 180°.

Right-Angled Triangle

In a right-angled triangle, the two acute angles are complementary, meaning their sum is exactly 90°.

Q47. Answer: (d) 16

Shortcut Trick

Identify the perfect square closest to 240, which is 256 (16^2).

Since the product of two consecutive numbers is 240, they must be close to $\sqrt{240} \approx 15.49$.

The numbers are 15 and 16.

Checking: $15 \times 16 = 240$.

Therefore The correct answer is 16.

Alternate Method

Given: Product of two consecutive natural numbers = 240.

Formula Used: Quadratic Equation: $x(x + 1) = \text{Product}$

=> Let the smaller number be x and the greater be x + 1.

=> $x(x + 1) = 240$

=> $x^2 + x - 240 = 0$

=> $x^2 + 16x - 15x - 240 = 0$

=> $x(x + 16) - 15(x + 16) = 0$

=> $(x - 15)(x + 16) = 0$

=> x = 15 (since natural numbers are positive).

=> Greater number = x + 1 = 15 + 1 = 16.

Therefore The correct answer is 16.

Additional Information

Consecutive Numbers Properties

The product of two consecutive integers n and n+1 is always an even number because one of them must be even.

Quadratic Roots

For a quadratic equation $ax^2 + bx + c = 0$, the discriminant $D = b^2 - 4ac$ determines the nature of the roots.

Estimation Trick

The product of two consecutive numbers x and x+1 is always between x^2 and $(x+1)^2$.

Q48. Answer: (b) Rs. 14,280

Shortcut Trick

Total interest percentage for first case = 5.4% × 23/3 = 1.8% × 23 = 41.4%

Total interest percentage for second case = 7.5% × 24/5 = 1.5% × 24 = 36%

Given, 41.4% of sum = Rs. 4,347 => 1% of sum = 4347 ÷ 41.4 = 105

Amount percentage for second case = 100% (Principal) + 36% (Interest) = 136%

Required Amount = 105 × 136 = Rs. 14,280

Therefore The correct answer is Rs. 14,280.

Alternate Method

Given:

Case 1: SI1 = Rs. 4,347, Rate (R1) = 5.4%, Time (T1) = 7 2/3 = 23/3 years

Case 2: Rate (R2) = 7.5%, Time (T2) = 4 4/5 = 24/5 years

Formula Used:

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

Amount (A) = P + SI

Calculations:

=> SI1 = (P × R1 × T1) ÷ 100

=> 4347 = (P × 5.4 × 23/3) ÷ 100

=> 4347 = (P × 1.8 × 23) ÷ 100

=> 4347 = (P × 41.4) ÷ 100

=> P = (4347 × 100) ÷ 41.4 = Rs. 10,500

=> SI2 = (10500 × 7.5 × 24/5) ÷ 100

=> SI2 = 105 × 1.5 × 24 = 105 × 36 = Rs. 3,780

=> Amount (A2) = P + SI2 = 10,500 + 3,780 = Rs. 14,280

Therefore The correct answer is Rs. 14,280.

Additional Information

Simple Interest (SI) Formula

Interest is calculated only on the initial principal. Formula: SI = (P × R × T) ÷ 100, where P is principal, R is rate, and T is time in years.

Total Amount Formula

The final value payable is the sum of principal and interest: A = P + SI = P(1 + RT/100).

Effective Rate of Interest

The single rate that gives the same interest for a specific period as multiple successive rates: R_(eff) = (R × T).

Q49. Answer: (b) 52

Shortcut Trick

The Mean Proportional (x) between two numbers a and b is √(a × b).

x = √(26 × 104)

x = √(26 × 26 × 4)

x = 26 × 2 = 52

Therefore The correct answer is 52.

Alternate Method

Given: First number (a) = 26, Second number (b) = 104.

Formula Used: If x is the mean proportional between a and b, then a/x = x/b => $x^2 = ab$.

=> $x^2 = 26 \times 104$

=> $x^2 = 26 \times (26 \times 4)$

=> $x = \sqrt{(26^2 \times 2^2)}$

=> x = 26 × 2

=> x = 52

Therefore The correct answer is 52.

Additional Information

Third Proportional

The third proportional to two numbers a and b is a value c such that a : b = b : c, calculated as $c = b^2/a$.

Fourth Proportional

For three numbers a, b, and c, the fourth proportional d is such that a : b = c : d, calculated as d = (b × c)/a.

Continued Proportion

Three quantities a, b, c are in continued proportion if a : b = b : c, which implies $b^2 = ac$.

Q50. Answer: (d) 1369

Shortcut Trick

Area of four walls of a cube = 4 × $side^2$

Side = 18.5 feet

Area = 4 × $(18.5)^2$ = 4 × 342.25

Area = 1369 sq. ft.

Therefore The correct answer is 1369 sq. ft.

Alternate Method

Given:

Shape of the room = Cube

Side length (a) = 18.5 feet

Formula Used:

Lateral Surface Area of a cube = $4a^2$

Calculations:

=> Total area to paint = Area of 4 vertical walls

=> Area = 4 × (18.5) × (18.5)

=> Area = 4 × 342.25

=> Area = 1369 sq. ft.

Therefore The correct answer is 1369 sq. ft.

Additional Information

Total Surface Area of Cube

It includes all 6 faces (top, bottom, and 4 walls). Formula: $6a^2$.

Volume of Cube

The capacity or space occupied by the cube. Formula: a^3.

Diagonal of Cube

The longest distance between two opposite corners. Formula: $a\sqrt{3}$.

Q51. Answer: (b) decrease by Rs. 5,525

Shortcut Trick

Income = Expenditure + Savings

Let Income = 100, Savings = 31, then Expenditure = 69

New Income = 100 + 22 = 122 | New Expenditure = 69 × 1.5 = 103.5

New Savings = 122 − 103.5 = 18.5

Change in Savings = 31 − 18.5 = 12.5 decrease

1 unit = 44200/100 = 442 | Decrease = 12.5 × 442 = Rs. 5,525

Therefore The correct answer is decrease by Rs. 5,525.

Alternate Method

Given:

Initial Income = Rs. 44,200

Initial Savings % = 31%

Income increase = 22%

Expenditure increase = 50%

Calculations:

=> Initial Savings = 31% of 44,200 = 0.31 × 44,200 = Rs. 13,702

=> Initial Expenditure = 44,200 − 13,702 = Rs. 30,498

=> New Income = 44,200 + 22% of 44,200 = 44,200 × 1.22 = Rs. 53,924

=> New Expenditure = 30,498 + 50% of 30,498 = 30,498 × 1.5 = Rs. 45,747

=> New Savings = 53,924 − 45,747 = Rs. 8,177

=> Change in Savings = 13,702 − 8,177 = Rs. 5,525 decrease

Therefore The correct answer is decrease by Rs. 5,525.

Additional Information

Income Formula

Income = Expenditure + Savings. This is the fundamental equation for all household budget problems.

Percentage Change

New Value = Old Value × (100 + Change%)/100. If Change% is negative, it represents a decrease.

Savings Rate

Savings Rate = (Savings ÷ Income) × 100. It measures the portion of income not spent on consumption.

Q52. Answer: (d) M - N = 2

Shortcut Trick

For a number to be divisible by 11, the difference between the sum of digits at odd positions and even positions must be 0 or a multiple of 11.

Sum of odd position digits (N, 6, 6) = N + 6 + 6 = N + 12

Sum of even position digits (4, M, 6) = 4 + M + 6 = M + 10

Difference = (N + 12) − (M + 10) = N − M + 2
Setting N − M + 2 = 0 => M − N = 2.
Therefore The correct answer is M − N = 2.
Alternate Method
Given: 6-digit number N46M66 is divisible by 11.
Formula Used: Divisibility rule of 11: |Sum_(odd) − Sum_(even)| = 0, 11, 22...
=> Sum of digits at odd places (1^(st), 3^(rd), 5^(th)) = N + 6 + 6 = N + 12
=> Sum of digits at even places (2^(nd), 4^(th), 6^(th)) = 4 + M + 6 = M + 10
=> For divisibility by 11: (N + 12) − (M + 10) = 11k (where k is an integer)
=> N − M + 2 = 11k
=> Case 1: If k = 0, then N − M + 2 = 0 => M − N = 2
=> Case 2: If k = 1, then N − M + 2 = 11 => N − M = 9 (Possible if N=9, M=0)
=> Case 3: If k = −1, then N − M + 2 = −11 => M − N = 13 (Not possible for single digits)
=> Comparing with the given options, M − N = 2 matches.
Therefore The correct answer is M − N = 2.
Additional Information
Divisibility by 11
A number is divisible by 11 if the alternating sum of its digits (S_(odd) − S_(even)) is a multiple of 11 (including 0).
Divisibility by 9 and 3
A number is divisible by 9 (or 3) if the sum of all its digits is divisible by 9 (or 3).
Single Digit Constraint
In placeholders like M and N, the values must be integers from 0 to 9, and the leading digit N cannot be 0.

Q53. Answer: (b) 11:00 AM

Shortcut Trick
Time taken by Train A = 9 hours; Train B = 5 hours.
Let Total Distance = LCM(9, 5) = 45 units.
Speed A = 45 ÷ 9 = 5 units/h; Speed B = 45 ÷ 5 = 9 units/h.
By 8:30 AM (2 hours), Train A covers 10 units. Remaining distance = 35 units.
Relative speed = 5 + 9 = 14 units/h. Meeting time = 35 ÷ 14 = 2.5 hours after 8:30 AM.
Therefore The correct answer is 11:00 AM.
Alternate Method
Given:
Train A: 6:30 AM to 3:30 PM = 9 hours.
Train B: 8:30 AM to 1:30 PM = 5 hours.
Calculations:
=> Let distance MN = D km.
=> Speed of Train A (S_A) = D/9 km/h.
=> Speed of Train B (S_B) = D/5 km/h.
=> Distance covered by Train A in 2 hours (6:30 to 8:30) = 2 × (D/9) = 2D/9.
=> Remaining distance at 8:30 AM = D − 2D/9 = 7D/9.
=> Time to meet = (Remaining Distance) ÷ (Relative Speed)
=> Time = (7D/9) ÷ (D/9 + D/5) = (7D/9) ÷ (14D/45)
=> Time = (7/9) × (45/14) = 5/2 = 2.5 hours.
=> Meeting time = 8:30 AM + 2 hours 30 minutes = 11:00 AM.
Therefore The correct answer is 11:00 AM.
Additional Information
Relative Speed
When two objects move in opposite directions, relative speed is the sum of their individual speeds (S1 + S2).
Meeting Time Formula
Meeting Time = (Initial distance between them at the same start time) ÷ (Relative Speed).
Average Speed

For a round trip with speeds x and y, Average Speed = 2xy ÷ (x + y).

Q54. Answer: (b) 2,580

Shortcut Trick

Let Cost Price (CP) be 100%.

Marked Price (MP) = 100 + 50 = 150%.

Selling Price (SP) = 150 × (100 − 30) ÷ 100 = 150 × 0.7 = 105%.

Profit = SP − CP = 105% − 100% = 5%.

Given 5% = Rs. 86, then 1% = 17.2.

List Price (MP) = 150 × 17.2 = Rs. 2,580.

Therefore The correct answer is Rs. 2,580.

Alternate Method

Given: Markup% = 50%, Discount% = 30%, Profit = Rs. 86.

Formulas: MP = CP × (100 + Markup%) ÷ 100 | SP = MP × (100 − Discount%) ÷ 100 | Profit = SP − CP.

=> Let Cost Price (CP) = x.

=> List Price (MP) = x + 0.50x = 1.5x.

=> Selling Price (SP) = 1.5x − (30% of 1.5x) = 1.5x − 0.45x = 1.05x.

=> Profit = SP − CP = 1.05x − x = 0.05x.

=> 0.05x = 86 => x = 86 ÷ 0.05 = 1720.

=> List Price = 1.5 × 1720 = 2580.

Therefore The correct answer is Rs. 2,580.

Additional Information

Relationship between CP and MP

The ratio of MP to CP can be expressed as: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

Net Profit Percentage

If an item is marked up by a% and then a discount of b% is given, net profit% = a − b − (ab ÷ 100).

Q55. Answer: (b) 22

Shortcut Trick

Weight of Tushar = [Sum of (Ketan + Tushar)] + [Sum of (Tushar + Salil)] − [Sum of (Ketan + Tushar + Salil)]

Weight of Tushar = (36 × 2) + (44 × 2) − (46 × 3)

Weight of Tushar = 72 + 88 − 138

Weight of Tushar = 160 − 138 = 22 kg

Therefore The correct answer is 22 kg.

Alternate Method

Given:

Average weight of Ketan, Tushar, and Salil = 46 kg

Average weight of Ketan and Tushar = 36 kg

Average weight of Tushar and Salil = 44 kg

Formula Used:

Sum of values = Average × Number of observations

Calculations:

=> Total weight of (Ketan + Tushar + Salil) = 46 × 3 = 138 kg --- (1)

=> Total weight of (Ketan + Tushar) = 36 × 2 = 72 kg --- (2)

=> Total weight of (Tushar + Salil) = 44 × 2 = 88 kg --- (3)

=> From equation (1) and (2), Weight of Salil = 138 − 72 = 66 kg

=> Substitute weight of Salil in equation (3):

=> Weight of Tushar + 66 = 88

=> Weight of Tushar = 88 − 66 = 22 kg

Therefore The correct answer is 22 kg.

Additional Information

Concept of Overlap in Averages

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When one entity is included in two different groups, its value can be found by: (Sum of Group 1 + Sum of Group 2) − Total Sum of all unique entities.

Weighted Average

The combined average of two groups with n1 and n2 elements is (n1x1 + n2x2) ÷ (n1 + n2).

Net Deviation Method

The sum of deviations of all observations from the Arithmetic Mean is always zero.

Q56. Answer: (c) 14.8

Given:

√(289) + √(0.04) - √(5.76)

Formula Used:

√(a) = a^(0.5)

Calculation:

=> √(289) = 17

=> √(0.04) = 0.2

=> √(5.76) = 2.4

=> 17 + 0.2 - 2.4 = 14.8

Therefore The correct answer is 14.8.

Q57. Answer: (a) 165 km/hr

Shortcut Trick

When distance is constant, speed is inversely proportional to time.

Time ratio = 20 : 12 = 5 : 3

Speed ratio = 3 : 5

Given: 3 units → 99 km/hr (since 1 unit = 33)

New speed: 5 units → 5 × 33 = 165 km/hr

Therefore The correct answer is 165 km/hr.

Alternate Method

Given: Initial speed = 99 km/hr, Initial time = 20 hours, New time = 12 hours.

Formula Used: Distance = Speed × Time

=> Total Distance = 99 km/hr × 20 hours

=> Total Distance = 1980 km

=> New Speed = Total Distance ÷ New Time

=> New Speed = 1980 km ÷ 12 hours

=> New Speed = 165 km/hr

Therefore The correct answer is 165 km/hr.

Additional Information

Inverse Relation Property

If Distance is constant, S1 × T1 = S2 × T2. This allows for quick calculation of speed or time when the other variable changes.

Unit Conversion

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

Average Speed

For the same distance traveled at two different speeds x and y, Average Speed = 2xy ÷ (x + y).

Q58. Answer: (a) 13

Shortcut Trick

Let the son's age 8 years ago be x. Then father's age was 2x + 21.

Age difference between them = (2x + 21) − x = x + 21.

Age difference remains constant always.

When father becomes twice his son's age, let son's age be S. Then Father = 2S.

Difference = 2S − S = S. Therefore, S = x + 21.

Son's age 8 years ago was x; now it is x + 8. Future age S = x + 21 is (x + 21) − (x + 8) = 13 years from now.

Therefore The correct answer is 13 years.

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Alternate Method

Given: 8 years ago, Father = 2 × Son + 21.

Let the present age of Father be F and Son be S.

=> (F − 8) = 2(S − 8) + 21

=> F − 8 = 2S − 16 + 21

=> F − 2S = 13 ... (i)

Let the required time from now be t years.

=> (F + t) = 2(S + t)

=> F + t = 2S + 2t

=> F − 2S = t ... (ii)

Comparing equation (i) and (ii):

=> t = 13 years.

Therefore The correct answer is 13 years.

Additional Information

Constant Age Difference

The difference between the ages of two people always remains the same, regardless of how many years pass.

Ratio Method for Ages

If the ratio of ages changes from a:b to c:d over x years, ensure the numerical difference between ratio parts (a-b) and (c-d) is equal by multiplying appropriately.

Equation Balancing

When a statement says 'A is n years more than m times B', the equation is A = mB + n.

Q59. Answer: (b) 25.75

Given:

65% of 55

(2)/(5) of 25

Formula Used:

Percentage formula: (x% of y) = (x ÷ 100) × y

Fraction formula: (a/b) of c = (a ÷ b) × c

Calculation:

=> 65% of 55 = (65 ÷ 100) × 55

=> 65 ÷ 100 = 0.65

=> 0.65 × 55 = 35.75

=> (2 ÷ 5) of 25 = (2 ÷ 5) × 25

=> 2 ÷ 5 = 0.4

=> 0.4 × 25 = 10

=> Difference = 35.75 - 10

=> Difference = 25.75

Therefore The correct answer is 25.75.

Q60. Answer: (a) 12

Shortcut Trick

Product of numbers = H.C.F. × L.C.M.

Other number = (3 × 276) ÷ 69

Other number = 3 × 4 = 12

Therefore The correct answer is 12.

Alternate Method

Given:

H.C.F. of two numbers = 3

L.C.M. of two numbers = 276

First Number (n1) = 69

Formula Used:

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Product of two numbers = H.C.F. × L.C.M.
Calculations:
=> Let the other number be x.
=> 69 × x = 3 × 276
=> x = (3 × 276) ÷ 69
=> x = 828 ÷ 69
=> x = 12
Therefore The correct answer is 12.
Additional Information
Co-prime Numbers
Two numbers are co-prime if their H.C.F. is 1. For co-prime numbers, L.C.M. is always equal to their product.
H.C.F. and L.C.M. Property
The H.C.F. of any set of numbers is always a factor of their L.C.M.
H.C.F. of Fractions
H.C.F. of fractions = (H.C.F. of Numerators) ÷ (L.C.M. of Denominators).

Q61. Answer: (c) 70

Shortcut Trick
Divide 15335 by 79 to find the remainder.
15335 ÷ 79 → 15335 = 79 × 194 + 9
Remainder = 9
Required number to be added = Divisor − Remainder = 79 − 9 = 70.
Therefore The correct answer is 70.
Alternate Method
Given: Number = 15335, Divisor = 79
Formula Used: Number to be added = (Divisor − Remainder)
=> Step 1: Perform long division of 15335 by 79.
=> 153 ÷ 79 = 1 with remainder 74.
=> 743 ÷ 79 = 9 with remainder 32 (Since 79 × 9 = 711).
=> 325 ÷ 79 = 4 with remainder 9 (Since 79 × 4 = 316).
=> Remainder = 325 − 316 = 9.
=> To make the number divisible, we need to add a value that brings the remainder up to the divisor.
=> Smallest number to be added = 79 − 9 = 70.
Therefore The correct answer is 70.
Additional Information
Divisibility Rules
To find the smallest number to subtract to make a number divisible, simply subtract the remainder itself.
Division Algorithm
Dividend = (Divisor × Quotient) + Remainder. For exact divisibility, the Remainder must be 0.
Prime Divisors
When the divisor is a prime number like 79, direct division is usually the most efficient method to find the remainder.

Q62. Answer: (b) 108000

Shortcut Trick
Volume = Area of cross-section × Speed × Time
Volume = (5 × 3) × (36 × 1000 / 60) × 12
Volume = 15 × 600 × 12 = 108000 m^3
Therefore The correct answer is 108000 m^3.
Alternate Method
Given:
Dimensions of rectangular pipe = 5 m × 3 m
Speed of water = 36 km/hr

Time duration = 12 minutes
Formula Used:
Volume of water = Area of cross-section × Length of water column
Length = Speed × Time
Calculations:
=> Area of cross-section = 5 × 3 = 15 m²
=> Speed in m/min = (36 × 1000) ÷ 60 = 600 m/min
=> Length of water column in 12 min = 600 × 12 = 7200 m
=> Volume = 15 × 7200
=> Volume = 108000 m³
Therefore The correct answer is 108000 m³.
Additional Information
Flow Rate Concept
The volume of liquid flowing through a pipe per unit time is given by Area × Velocity.
Unit Conversions
To convert km/hr to m/sec, multiply by 5/18. To convert m³ to Litres, multiply by 1000.
Cylindrical Pipe Volume
For a circular pipe with radius r, the volume is πr² × speed × time.

Q63. Answer: (b) 217/13 minutes

Shortcut Trick
Total Capacity (LCM of 40, 14, 20) = 280 units.
Efficiency: A = 7, B = 20, Combined (A + B − C) = 14.
Efficiency of Outlet Pipe C = (7 + 20) − 14 = 13 units/min.
Time for C to empty = 280 ÷ 13 = 21(7/13) minutes.
Therefore The correct answer is 21(7/13) min.
Alternate Method
Given: Filling time Pipe A = 40 min, Pipe B = 14 min, Combined time with Pipe C (outlet) = 20 min.
Formula Used: Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
Pipe A	40 min	280 units	7
Pipe B	14 min	20	
A + B − C	20 min	14	

=> Efficiency of Pipe A = 280 ÷ 40 = 7
=> Efficiency of Pipe B = 280 ÷ 14 = 20
=> Combined Efficiency (A + B − C) = 280 ÷ 20 = 14
=> 7 + 20 − Efficiency of C = 14
=> 27 − Efficiency of C = 14
=> Efficiency of Outlet Pipe C = 27 − 14 = 13 units/min
=> Time taken by C to empty = 280 ÷ 13 = 21(7/13) minutes
Therefore The correct answer is 21(7/13) min.
Additional Information
Pipes & Cisterns Logic
Efficiency of an inlet pipe is positive (+), while the efficiency of an outlet (emptying) pipe is negative (−).
Net Work Done
If pipe A fills in x hours and pipe B empties in y hours, then net work in 1 hour = (1/x) − (1/y).
Time and Efficiency Relationship
Time is inversely proportional to efficiency. If efficiency increases, time taken to complete the work decreases.

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Q64. Answer: (c) 768

Shortcut Trick

Use the method of allegation to find the ratio of cost prices.

Loss on 1st gun = −9%, Gain on 2nd gun = +16%, Overall gain/loss = 0%.

Ratio of CP1 : CP2 = (16 − 0) : (0 − (−9)) = 16 : 9.

Total units = 16 + 9 = 25 units. Given 25 units = Rs. 1,200.

1 unit = 1,200 ÷ 25 = Rs. 48.

Cost price of 1st gun = 16 × 48 = Rs. 768.

Therefore The correct answer is Rs. 768.

Alternate Method

Given → Total CP = Rs. 1,200 | Loss1 = 9% | Gain2 = 16% | Net Profit = 0.

Formulas: Profit = SP − CP | Loss = CP − SP | Net Profit/Loss = 0 => Total SP = Total CP.

=> Let the cost price of the first gun be x and the second gun be (1,200 − x).

=> Loss on 1st gun = Gain on 2nd gun (since net result is zero).

=> 9% of x = 16% of (1,200 − x)

=> 9x = 16 × 1,200 − 16x

=> 25x = 19,200

=> x = 19,200 ÷ 25 = 768.

Therefore The correct answer is Rs. 768.

Additional Information

No Profit No Loss Condition

When an overall transaction results in no profit and no loss, the total selling price equals the total cost price, and the absolute loss amount on one part equals the profit amount on the other.

Ratio from Percentages

If two items are sold such that profit % on A equals loss % on B for no overall change, the ratio of their cost prices is the inverse of the percentage values: CP1/CP2 = Profit2%/Loss1%.

Q65. Answer: (c) 43%

Shortcut Trick

Use the successive discount formula: Total Discount = a + b − (a × b ÷ 100).

Substitute a = 5 and b = 40.

Equivalent Discount = 5 + 40 − (5 × 40 ÷ 100).

Equivalent Discount = 45 − (200 ÷ 100) = 45 − 2 = 43%.

Therefore The correct answer is 43%.

Alternate Method

Given: First discount = 5%, Second discount = 40%.

Formulas: Final SP = MP × (100 − d1)% × (100 − d2)% | Equivalent Discount% = (MP − SP) ÷ MP × 100.

=> Let the Marked Price (MP) be 100.

=> Price after first 5% discount = 100 − 5 = 95.

=> Price after second 40% discount = 95 × (60 ÷ 100) = 57.

=> Total discount = 100 − 57 = 43.

=> Equivalent Discount% = (43 ÷ 100) × 100 = 43%.

Therefore The correct answer is 43%.

Additional Information

Successive Discounts

When two or more discounts are applied one after another, they are called successive discounts. The second discount is calculated on the price remaining after the first discount.

Three Successive Discounts

For three discounts a%, b%, and c%, first find the equivalent of a and b (say x), then find the equivalent of x and c.

Q66. Answer: (a) 428/53 days

Shortcut Trick

Let Total Work = LCM(20, 16, 3) = 240 units.

Efficiency: A = 12, B = 15, A+B+C = 80.

Efficiency of C = 80 − (12 + 15) = 53 units/day.

Time for C = 240 ÷ 53 = 4(28/53) days.

Therefore The correct answer is 4(28/53) days.

Alternate Method

Given: A = 20 days, B = 16 days, A+B+C = 3 days.

Formula Used: Total Work = Days × Efficiency

Person	Days	Total Work	Efficiency
A	20	240	12
B	16	15	
A + B + C	3	80	

=> Efficiency of A + B = 12 + 15 = 27

=> Efficiency of C = (Efficiency of A + B + C) − (Efficiency of A + B)

=> Efficiency of C = 80 − 27 = 53

=> Time taken by C alone = Total Work ÷ Efficiency of C

=> Time = 240 ÷ 53 = 4(28/53) days

Therefore The correct answer is 4(28/53) days.

Additional Information

Work and Efficiency Relation

Efficiency is inversely proportional to the time taken to complete a task. Efficiency = Work ÷ Time.

Combined Work Formula

If A can do a job in 'x' days and B in 'y' days, together they take (x × y) ÷ (x + y) days.

LCM Method for Multiple Workers

Using the Least Common Multiple of individual days as the total work simplifies calculations by providing integer efficiency values.

Q67. Answer: (d) 9,375

Shortcut Trick

When Interest and Time are equal for two investments, the Principal ratio is inversely proportional to the Rate ratio.

Ratio of Investment (P1 : P2) = 1/R1 : 1/R2 = 1/7 : 1/5 = 5 : 7

Total units = 5 + 7 = 12 units → Rs. 22,500

Sum at 7% (P1) = (5 ÷ 12) × 22,500 = 5 × 1,875 = Rs. 9,375

Therefore The correct answer is Rs. 9,375.

Alternate Method

Given: Total Sum = Rs. 22,500, R1 = 7%, R2 = 5%, Time (T) = 3 years.

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

Let the sum invested at 7% be x and the sum at 5% be (22,500 − x).

=> SI1 = (x × 7 × 3) ÷ 100

=> SI2 = ((22,500 − x) × 5 × 3) ÷ 100

Since SI1 = SI2:

=> (x × 7 × 3) ÷ 100 = ((22,500 − x) × 5 × 3) ÷ 100

=> 21x = 15 × (22,500 − x)

=> 21x = 3,37,500 − 15x

=> 36x = 3,37,500

=> x = 3,37,500 ÷ 36

=> x = 9,375

Therefore The correct answer is Rs. 9,375.

Additional Information

Principal Ratio when Interests are Equal

If the interests earned on multiple sums are equal, the ratio of principals is P1 : P2 : ... : P_n = (1 / R1T1) : (1 / R2T2) : ... : (1 / R_nT_n).

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Principal Ratio when Amounts are Equal

If the final amounts (Principal + Interest) are equal, the ratio of principals is P1 : P2 = [100 / (100 + R1T1)] : [100 / (100 + R2T2)].

Effective Rate of Interest

The total interest earned on the entire sum can be found using the weighted average: R_(avg) = (P1R1 + P2R2) ÷ (P1 + P2).

Q68. Answer: (c) Rs. 31,500

Shortcut Trick

Ratio of Profit Share = (Investment1 × Time1) : (Investment2 × Time2)

Ravi : Raju = (50,000 × 12) : (1,00,000 × 6)

Ravi : Raju = 600,000 : 600,000 = 1 : 1

Total units = 1 + 1 = 2 units. Total profit = 63,000.

Raju's share = 63,000 ÷ 2 = 31,500.

Therefore The correct answer is Rs. 31,500.

Alternate Method

Given: Ravi investment = 50,000, Time = 12 months. Raju investment = 1,00,000, Time = 6 months. Total Profit = 63,000.

Formulas: Profit Share = Investment × Time Period

=> Ravi's Equivalent Capital = 50,000 × 12 = 6,00,000

=> Raju's Equivalent Capital = 1,00,000 × 6 = 6,00,000

=> Since capitals are equal, profit is shared equally (1 : 1).

=> Raju's Profit = 1 ÷ (1 + 1) × 63,000 = 1 ÷ 2 × 63,000

=> Raju's Profit = 31,500

Therefore The correct answer is Rs. 31,500.

Additional Information

Partnership Ratios

In a partnership, if investments are different and for different time periods, the profit is divided in the ratio of the products of Capital and Time.

Simple vs Compound Partnership

A Simple Partnership involves same time periods, whereas a Compound Partnership involves different time periods for different partners.

Q69. Answer: (d) cosec^2A

Shortcut Trick

Put A = 45° as it is the easiest value for trigonometric identities where tan/cot are involved.

sec 45° = √2, cosec 45° = √2, tan 45° = 1, cot 45° = 1.

Expression = [((√2)^4 − (√2)²) ÷ (1^4 + 1²)] × [((√2)^4 − (√2)²) ÷ (1² + 1^4)] + 1²

=> [(4 − 2) ÷ (1 + 1)] × [(4 − 2) ÷ (1 + 1)] + 1 = [2 ÷ 2] × [2 ÷ 2] + 1 = 1 × 1 + 1 = 2.

Check options for A = 45°: $\text{cosec}^2 45° = (\sqrt{2})^2 = 2$.

Therefore The correct answer is cosec^2A.

Alternate Method

Given: (sec ^4A-sec²A)/(cot ^4A+cot²A)× (cosec^4A-cosec²A)/(tan²A+tan ^4A)+cot²A

Formula Used: $\sec^2A - 1 = \tan^2A$; $\text{cosec}^2A - 1 = \cot^2A$; $1 + \tan^2A = \sec^2A$; $1 + \cot^2A = \text{cosec}^2A$.

=> [sec²A(sec²A − 1) ÷ cot²A(1 + cot²A)] × [cosec²A(cosec²A − 1) ÷ tan²A(1 + tan²A)] + cot²A

=> [sec²A × tan²A ÷ (cot²A × cosec²A)] × [cosec²A × cot²A ÷ (tan²A × sec²A)] + cot²A

=> [(sec²A × tan²A × cosec²A × cot²A) ÷ (cot²A × cosec²A × tan²A × sec²A)] + cot²A

=> 1 + cot²A

=> cosec^2A

Therefore The correct answer is cosec^2A.

Additional Information

Fundamental Identities

$\sin^2\theta + \cos^2\theta = 1$ | $1 + \tan^2\theta = \sec^2\theta$ | $1 + \cot^2\theta = \text{cosec}^2\theta$.

Reciprocal Relations

$\tan\theta \times \cot\theta = 1$ | $\sin\theta \times \text{cosec}\theta = 1$ | $\cos\theta \times \sec\theta = 1$.

Value Substitution Method

For identities, substituting standard angles like 0°, 30°, 45°, 60°, or 90° often simplifies complex expressions, provided the denominator does not become zero.

Q70. Answer: (b) 24^(-33)

Given:

24^(-10) ÷ 24^(16) × 24^(-7)

Formula Used:

a^m ÷ aⁿ = a^(m−n)

a^m × aⁿ = a^(m+n)

Calculation:

=> 24^(-10) ÷ 24^(16) = 24^(-10 − 16) = 24^(-26)

=> 24^(-26) × 24^(-7) = 24^(-26 − 7)

=> 24^(-33)

Therefore The correct answer is 24^(-33).

Q71. Answer: (c) 1

The logic followed here is:

'SAID' is coded as '3517'

S	A	I	D
3	5	1	7

AERO' is coded as '2146'

A	E	R	O
2	1	4	6

So, From the code for AERO = 2146, the letter A corresponds to 2.

Hence, the correct answer is 'Option 3'.

Q72. Answer: (b) 4

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 two boxes are kept between E and B.

2) Only A is kept above C.

3) No box is kept below B.

4) G is kept at some place below F but at some place above D.

A
C
F
E
G
D
B

So, there are '4' boxes are kept below F.

Hence, the correct answer is "Option 1".

Q73. Answer: (a) KMH

The logic followed here is:

Option 1) KMH

Option 2) IKE

Option 3) GIC

Option 4) MOI

Here, 'KMH' is odd among the given options.

Hence, the correct answer is "Option 1".

Q74. Answer: (b) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram for the given statement is:

Conclusions:

I Some Circular Saws are Power Saws → Does not follow (As some Circular Saws are Trowels and some Trowels are Power Saws. So it is possible but not definite.)

II No Circular Saws are Power Saws → does not follow (As some Circular Saws are Trowels and some Trowels are Power Saws. As no direct relation is given between Circular Saws and Power Saws, therefore it true.)

Thus, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 2".

Q75. Answer: (d) Only conclusion (I) follows.

Given Statements:

All soaps are gels.

All soaps are conditioners.

The least possible Venn diagram for the given statement is:

Conclusions:

(I) Some gels are conditioners:

Since all Soaps are Gels (Statement 1) and all Soaps are Conditioners (Statement 2), the elements that are Soaps (the common part) must be both Gels and Conditioners.

Therefore, the area of overlap between Gels and Conditioners is non-empty.

Conclusion (I) logically follows.

(II) All conditioners are soaps:

This conclusion is the converse of Statement 2 ("All Soaps are Conditioners").

In a universal affirmative statement (All A are B), the converse (All B are A) is not necessarily true. There may be conditioners that are not soaps (the part of the Conditioners set outside the Soaps set).

Conclusion (II) does not follow.

Thus, Only conclusion (I) follows.

Hence, the correct answer is "Option 4".

Q76. Answer: (c) R

Given: A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table.

1) Only two people sit between D and A, when counted from the left of A.

2) Q sits third to the left of S.

3) R sits to the immediate right of S.

4) R sits second to the left of D.

5) B is not an immediate neighbour of Q.

Here, R sits third to the right of C.

Hence, the correct answer is "Option 3".

Q77. Answer: (c) Two

Given: A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table.

1) B sits third to the left of Q.

2) R sits second to the left of S.

3) Q is an immediate neighbour of both A and R.

4) C is not an immediate neighbour of B.

Thus, There are Two people sit between D and R, when counted from the right of D

Hence, the correct answer is "Option 3".

Q78. Answer: (a) GQTBS

The logic followed here is:

For, DREAM is related to IWJFR

For, FILED is related to KNQJI

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Similarly, for BLOWN

So, BLOWN will be related to GQTBS

Hence, the correct answer is "Option 1".

Q79. Answer: (c) PSL51

The logic followed here is:

So, 'PSL51' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

Q80. Answer: (a) ERM

The logic followed here is:

Option 1) ERM

Option 2) BFJ

Option 3) SWA

Option 4) UYC

Here, 'ERM' is odd among the given options.

Hence, the correct answer is "Option 1".

Q81. Answer: (c) Two

Given: Seven boxes G, H, I, J, K, L and S are kept one over the other but not necessarily in the same order.

1) Only three boxes are kept below S.

2) Only two boxes are kept between S and L.

3) Only G is kept below J.

4) H is kept at some place below K and at some place above J.

5) I is kept above K.

L
I
K
S
H
J
G

So, there are 'Two' boxes are kept between K and J.

Hence, the correct answer is "Option 1".

Q82. Answer: (b) Two

Given numbers: 5237648

If 1 is added to each even digit and 2 is subtracted from each odd digit in the number

New number (digits in order): 3, 3, 1, 5, 7, 5, 9

Digits that appear more than once: 3 and 5.

That is 2 distinct digits appearing more than once.

Hence, the correct answer is 'Option 2'.

Q83. Answer: (b) 5 km to the south

Given:

Mr. Bravo starts from Point A and drives 1 km towards the west.

He then takes a left turn, drives 2 km, turns left and drives 5 km.

He then takes a left turn and drives 7 km.

He takes a final left turn, drives 4 km and stops at Point P.

So, He should drive 5 km to the south in order to reach Point A again.

Hence, the correct answer is "Option 2".

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Q84. Answer: (d) Mother's mother's brother

Family Chart:

Decoding the Symbols:

Symbol	=	$	@	•
Meaning	Mother	Brother	Sister	Father

Given: W $ A @ C * D = R

It means:

W is the Brother of A.

A is the Sister of C.

C is the Father of D.

D is the wife of R.

So, W is the Mother's mother's brother of R.

Hence, the correct answer is "Option 4".

Q85. Answer: (d) 18

BODMAS Table:

Given equation: 42 ÷ 11 + 3 × 18 − 2 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 42 − 11 × 3 + 18 ÷ 2 = ?

=> 42 − 33 + 9 = ?

=> 9 + 9 = 18

Hence, the correct answer is "Option 4".

Q86. Answer: (c) 8

Given numbers: 6854376

If 1 is added to each odd digit and 4 is subtracted from each even digit in the number

New number digits:

2, 4, 6, 0, 4, 8, 2

Highest digit = 8

Lowest digit = 0

So, Difference = 8 − 0 = 8

Hence, the correct answer is 'Option 3'.

Q87. Answer: (c) 12

Given numbers: 5368794

Digits: 5, 3, 6, 8, 7, 9, 4

Ascending order → 3 4 5 6 7 8 9

First from the left = 3

First from the right = 9

So, the sum = 3+ 9 = 12.

Hence, the correct answer is 'Option 3'.

Q88. Answer: (b) USQ 36

The logic followed here is:

So, 'USQ 36' will replace the question mark in the given series.

Hence, the correct answer is "Option 2".

Q89. Answer: (a) 1 km to east

Given:

Kasish starts from Point A and drives 10 km towards south.

She then takes a left turn, drives 6 km, turns left and drives 11 km.

She then takes a left turn and drives 7 km.

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She takes a final left turn, drives 1 km and stops at Point P.
So, She should drive 1 km to east in order to reach Point A again.
Hence, the correct answer is "Option 1".

Q90. Answer: (b) 449

• The logic followed here is:
thus, "449" will replace the question mark in the given series.
Hence, the correct option is "Option 2".

Q91. Answer: (d) 39

The logic followed here is:
Piyush's rank from the top = 11th
Piyush's rank from the bottom = 29th
Total students = (Rank from top) + (Rank from bottom) − 1
= 11 + 29 - 1 = 39=> 11+29−1= 39
Hence, the correct answer is 'Option 4'.

Q92. Answer: (b) 11, 123

The logic followed here is:
Logic: Second number = (First number)² + 2
12, 146
=> $12^2 = 144$
144 + 2 = 146
8, 66
=> $8^2 = 64$
64 + 2 = 66
Now, checking the options:
Option 1) 6, 34
=> $6^2 + 2 = 36 + 2 = 38$
Option 2) 11, 123
=> $11^2 + 2 = 121 + 2 = 123$
Option 3) 7, 49
=> $7^2 + 2 = 49 + 2 = 51$
Option 4) 4, 66
=> $4^2 + 2 = 16 + 2 = 18$
Hence, the correct option is "Option 2"

Q93. Answer: (d) FANG - GAFN - ANFG

Now,
BLOW - WLBO - LOBW
LEAF - FELA - EALF
Let's check each Option One by One.
Option 1) MOVE - EOMV - VOME

M	O	V	E
1	2	3	4
E	O	M	V
4	2	1	3
V	O	M	E
3	2	1	4

Option 2) TOUR - OTUR - ROUT

T	O	U	R
1	2	3	4
O	T	U	R
2	1	3	4
R	O	U	T
4	2	3	1

Option 3) CLAW - CALW - WALC

C	L	A	W
1	2	3	4
C	A	L	W
1	3	2	4
W	A	L	C
4	3	2	1

Option 4) FANG - GAFN - ANFG

F	A	N	G
1	2	3	4
G	A	F	N
4	2	1	3
A	N	F	G
2	3	1	4

So, Only FANG - GAFN - ANFG follows the pattern of given letter cluster.

Hence, the correct answer is 'Option 4'.

Q94. Answer: (d) 2

Given: (Left) % 9 % 2 7 5 & $ * 5 © 6 1 1 * € 4 # 1 7 3 @ (Right)

Now,

Symbols which is immediately preceded by a number and also immediately followed by a symbol.

So, Needed pattern is: Number - Symbol - Symbol.

There are 2 Symbols which is immediately preceded by a number and also immediately followed by a symbol.

Hence, the correct answer is 'Option 4'.

Q95. Answer: (d) MICK - KCMI - MCIK

Now,

TOES - SETO - TEOS

CLAP - PACL - CALP

Let's check each Option One by One.

Option 1) CALF - FLCA - ALCF

C	A	L	F
1	2	3	4
F	L	C	A
4	3	1	2
A	L	C	F
2	3	1	4

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Option 2) RUST - RSUT - TSUR

R	U	S	T
1	2	3	4
R	S	U	T
1	3	2	4
T	S	U	R
4	3	2	1

Option 3) TUNE - UNTE - UNET

T	U	N	E
1	2	3	4
U	N	T	E
2	3	1	4
U	N	E	T
2	3	4	1

Option 4) MICK - KCMI - MCIK

M	I	C	K
1	2	3	4
K	C	M	I
4	3	1	2
M	C	I	K
1	3	2	4

So, Only MICK - KCMI - MCIK follows the pattern of given letter cluster.

Hence, the correct answer is 'Option 4'.

Q96. Answer: (a) 832

The logic followed here is:

thus, "832" will replace the question mark in the given series.

Hence, the correct option is "Option 1".

Q97. Answer: (d) 7

The logic followed here is:

‘MUGS’ is coded as ‘4627

M	U	G	S
4	6	2	7

‘UNIT’ is coded as ‘1375’

U	N	I	T
1	3	7	5

U is common in both the words and 7 is common in both the codes.

So, 7 is the code for ‘U’ in the given code language.

Hence, the correct answer is 'Option 4'.

Q98. Answer: (d) 62

The logic followed here is:

thus, "62" will replace the question mark in the given series.

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Hence, the correct option is "Option 4".

Q99. Answer: (d) RT-TB

The logic followed here is:
Option 1) FH-HJ
Option 2) IK-KM
Option 3) MO-OQ
Option 4) RT-TB
Here, 'RT-TB' is odd among the given options.
Hence, the correct answer is "Option 4".

Q100. Answer: (c) 6

Given: (Left) & 3 Ω 9 # 1 * 2 + % 4 6 @ 8 $ 7 £ 5 (Right)
Now,
Symbols which is immediately preceded by a number and also immediately followed by another number
So, Needed pattern is: Number - Symbol - Number.
There are 6 Symbols which are preceded by a number and also immediately followed by a number.
Hence, the correct answer is 'Option 3'.

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