RRB NTPC (UG) CBT-I Official Paper (Held On: 13 Aug, 2025 Shift 1) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. In March 2025, which company unveiled Vayu, an overall AI cloud offering for enterprises?

(a) Reliance Communication
(b) Tata Communication
(c) Airtel Communication
(d) Bajaj Communication

Q2. Which act gave statutory status to the Central Vigilance Commission (CVC)?

(a) The Central Vigilance Commission Act, 1964
(b) The Central Vigilance Commission Act, 2003
(c) Prevention of Corruption Act, 1988
(d) Lokpal Act, 2013

Q3. The Earth completes one rotation on its axis approximately in:

(a) 365 days
(b) 24 hours
(c) 30 days
(d) 12 hours

Q4. Which British Prime Minister officially announced the decision to grant independence to India and withdraw British forces from the subcontinent?

(a) Stafford Cripps
(b) Pethick Lawrence
(c) Clement Atlee
(d) Winston Churchill

Q5. What was the theme of the 10th Governing Council Meeting of NITI Aayog that was held on 24 May 2025?

(a) Sustainable Growth for India
(b) Viksit Bharat for All
(c) Empowering States for Development
(d) Viksit Rajya for Viksit Bharat@2047

Q6. Which of the following schemes on Compressed Bio Gas (CBG) encourages entrepreneurs to set up CBG plants, produce and supply CBG to Oil Marketing Companies (OMCs) for sale as automotive and industrial fuels?

(a) Biogas Programme (India)
(b) Waste to Energy Programme (India)
(c) Cent Compressed Bio Gas (CBG) Scheme (India)
(d) Sustainable Alternative Towards Affordable Transportation (SATAT)

Q7. Which of the following belongs to the Lakshadweep group of islands?

(a) Kannur Islands
(b) Kamorta Island
(c) Chowra Island
(d) Milo Island

Q8. Which of the following British officials found India as an uncivilised country and had to be civilised, following which the English Education Act of 1835 was introduced?

(a) Henry Thomas Colebrooke
(b) William Jones
(c) Thomas Macaulay
(d) Nathaniel Halhed

Q9. Which of the following two rice varieties were unveiled as a part of India's genomeediting initiative in May 2025?

(a) Kamala and Pusa DST Rice 1
(b) Pusa DST Rice 2 and Swarna Rice
(c) Swarna Rice and Golden Rice
(d) Kamala and Basmati Gold

Q10. Which of the following Vedic words literally means search for cows and also refers to battle?

(a) Duhitri
(b) Gaveshana
(c) Gopala
(d) Gomat

Q11. Which Article of the Constitution deals with the reservation of seats for Scheduled Castes and Scheduled Tribes in the Lok Sabha?

(a) Article 332
(b) Article 331
(c) Article 334
(d) Article 330

Q12. Which of the following is the primary objective of the Shyama Prasad Mukherji Rurban Mission (SPMRM)?

(a) Electrification of rural households
(b) Development of rural clusters with urban-like facilities
(c) Skill development for rural youth
(d) Ensuring 100 days of wage employment in rural areas

Q13. What does the keyboard shortcut Ctrl + R do in web browsers?

(a) Renames a file or folder
(b) Runs a program
(c) Refreshes the active window
(d) Restores deleted files

Q14. Which of the following is an example of structural unemployment?

(a) A worker choosing not to work due to a lack of job opportunities
(b) A worker being unable to find a job due to discrimination
(c) A worker losing their job due to a recession
(d) A worker being unable to find a job due to a lack of skills in a new and expanding industry

Q15. What is the term period of the Comptroller and Auditor General (CAG) of India?

(a) 5 years or 62 years
(b) 6 years or 60 years
(c) 6 years or 65 years
(d) 4 years or 60 years

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Q16. The northern part of the plains along the Bay of Bengal is referred to as the Northern Circar, while the southern part is known as the _____.

(a) Southern Circar
(b) Utkal Plains
(c) Coromandel Coast
(d) Andhra Plains

Q17. Who was honoured with the Luminous Lummer Dai Literary Award in 2025 for their contributions to Assamese literature?

(a) Nirupama Borgohain
(b) Indira Goswami
(c) Ramchandra Chutia
(d) Homen Borgohain

Q18. Which of the following is a correct representation of a compound formed by ionic bonding?

(a) H2O
(b) CO2
(c) NaCl
(d) NH3

Q19. Which of the following countries does Amelia Kerr, the ICC Women's T20I Cricketer of the Year 2024, represent?

(a) New Zealand
(b) Australia
(c) South Africa
(d) England

Q20. In May 2025, Prime Minister Narendra Modi dedicated 103 redeveloped railway stations under which of the following schemes?

(a) Smart Rail Mission
(b) Udan Scheme
(c) Amrit Bharat Station Scheme
(d) Bharat Mala Scheme

Q21. In which of the following geographical areas of India is Kumaoni spoken by a significant portion of the population?

(a) Himachal Pradesh
(b) West Bengal
(c) Uttarakhand
(d) Jammu and Kashmir

Q22. Who is credited with the discovery of the nucleus through the gold foil experiment?

(a) Bohr
(b) Ernest Rutherford
(c) John Dalton
(d) Lavoisier

Q23. Which of the following chemical reactions does NOT represent a balanced equation?

(a) 3Fe + 4H2O → Fe3O4 + 4H2
(b) 4Fe + 3H2O → Fe3O4 + 2H2
(c) Fe + H2O → FeO + H2
(d) 2Fe + 3H2O → Fe2O3 + 3H2

Q24. Which exercise in 2025 involved India and the United States focusing on amphibious warfare and HADR?

(a) Exercise Vajra Prahar
(b) Exercise Malabar
(c) Exercise Tiger Triumph

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(d) Exercise Yudh Abhyas

Q25. Which of the following minerals is known as 'Brown Coal' in India?

(a) Mica
(b) Copper
(c) Bauxite
(d) Lignite

Q26. According to the IMF's World Economic Outlook released in April 2025, what is India's projected economic growth rate for the year 2025?

(a) 6.2%
(b) 5.6%
(c) 6.5%
(d) 4.8%

Q27. Which of the following central services holds the highest prestige, pay and emoluments among its peers?

(a) Indian Foreign Service
(b) Indian Defence Accounts Service
(c) Indian Postal Service
(d) Indian Audit and Accounts Service

Q28. According to Article 79 of the Indian Constitution, the Parliament of India consists of:

(a) only Lok Sabha and Rajya Sabha
(b) Prime Minister, Lok Sabha, and Rajya Sabha
(c) President, Lok Sabha, and Rajya Sabha
(d) President, Vice President, and Prime Minister

Q29. During the Mughal period, the Ain-i-Dahsala system was introduced by _____.

(a) Babur
(b) Shah Jahan
(c) Akbar
(d) Aurangzeb

Q30. The Tehri Dam, which serves multiple purposes including power generation, is built on which river?

(a) Yamuna
(b) Ganga
(c) Sutlej
(d) Bhagirathi

Q31. In which State has India's first integrated API Green Hydrogen and 2G Ethanol plant been established?

(a) Himachal Pradesh
(b) Uttarakhand
(c) Goa
(d) Andhra Pradesh

Q32. Special Economic Zones (SEZs) were established to promote export-oriented industrialisation. What is a primary incentive offered to firms operating in SEZs?

(a) Higher import duties
(b) Strict labour laws
(c) Tax holidays and infrastructure support
(d) Ban on foreign investments

Q33. Special provisions for certain states are covered under which Part of the Indian Constitution?

(a) Part XIX
(b) Part XXII
(c) Part XX

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(d) Part XXI

Q34. In May 2025, the Ministry of Education launched a nationwide enforcement drive around schools and colleges for what purpose?

(a) Focusing on mental health awareness
(b) Improving safety measures for female students
(c) Promote positive campus culture and prevent incidents of ragging
(d) Making educational institutions free from tobacco and substance

Q35. Which major Indian company was privatised in the 2000s under the Government of India's disinvestment policy?

(a) Maruti Udyog Limited
(b) ISRO
(c) BSNL
(d) LIC

Q36. What happens when a user renames a file in MS Windows?

(a) The file is converted into a different format.
(b) The file is moved to a different location.
(c) The file is deleted and a new file is created.
(d) The file's name changes, but its content remains the same.

Q37. Which nationwide civil defence exercise, conducted on May 7, 2025 by the Ministry of Home Affairs and the National Disaster Management Authority, involved 244 districts across India to enhance emergency preparedness?

(a) Operation Raksha
(b) Operation Abhyaas
(c) Operation Trinetra
(d) Operation Suraksha

Q38. Which district in Nagaland was officially declared as the state's 17th district in November 2024?

(a) Noklak
(b) Meluri
(c) Shamator
(d) Tseminyu

Q39. The International Theatre Festival of India, Bharat Rang Mahotsav (BRM), held in Bengaluru from 1 February 2025 to 8 February 2025, was organised by which of the following institutions?

(a) Sangeet Natak Akademi
(b) National School of Drama
(c) Indian Council for Cultural Relations
(d) Kalidasa Kalakendram

Q40. Who among the following formed a Satyagraha Sabha on 24 February 1919 in Bombay to protest against the Rowlatt Bills?

(a) Motilal Nehru
(b) Maulana Abul Kalam Azad
(c) Sardar Vallabhbhai Patel
(d) Mahatma Gandhi

MATHEMATICS

Q41. The number of prime numbers lying between 476 and 491, both included, is:

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

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Q42. A bus travelling at 75 km/hr completes a journey in 17 hours. What should be its speed to cover the same distance in 5 hours?

(a) 255 km/hr
(b) 264 km/hr
(c) 261 km/hr
(d) 247 km/hr

Q43. Find the value of 48^(−17) ÷ 48^{12} × 48^(−13).

(a) 48^(-34)
(b) 48^(-37)
(c) 48^(-35)
(d) 48^(-42)

Q44. Sneha, Yash and Rohan invested Rs. 1,090, Rs. 1,170 and Rs. 1,340, respectively to start a business. If the profit at the end of the year is Rs. 1,620, what is Rohan's share of the profit?

(a) Rs. 603
(b) Rs. 605
(c) Rs. 606
(d) Rs. 602

Q45. The number 587407 is divisible by which of the following?

(a) 34
(b) 43
(c) 41
(d) 47

Q46. On a marked price, the difference between the selling prices with a single discount of 40% and two successive discounts of 15% and 20% is Rs. 400, then find the marked price (in Rs.).

(a) Rs. 5,150
(b) Rs. 4,900
(c) Rs. 5,000
(d) Rs. 4,950

Q47. Find the volume of the cylinder whose height and radius are 7 cm and 3 cm, respectively (use π = 3.14)

(a) 193.58 cm^3
(b) 190.01 cm3
(c) 195.68 cm3
(d) 197.82 cm3

Q48. By selling 6 articles for a rupee, a man loses 30%. To gain 40% how many must he sell for a rupee?

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

Q49. The marks scored by 10 students are given below.

19, 14, 11, 20, 18, 17, 14, 10, 11, 11

The mode of the given data is:

(a) 19
(b) 14
(c) 11
(d) 20

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Q50. Shivam got an increase of 4% in his sales amount in the first year and 25% in the second year; also with this, his current sales are Rs. 1,40,400, what was his sales (in Rs.) two years ago?

(a) Rs. 88,000
(b) Rs. 1,12,320
(c) Rs. 1,35,000
(d) Rs. 1,08,000

Q51. Which of the following ratio is greatest?

(a) 46 : 75
(b) 34 : 77
(c) 39 : 89
(d) 36 : 69

Q52. If $3\sin^2\theta + 7\cos^2\theta = 4$, $0° < \theta < 90°$, then the value of θ (in degree) is

(a) 45°
(b) 60°
(c) 30°
(d) 15°

Q53. The selling price of 20 books is equal to the cost price of 24 books. Find the loss or gain percentage on these books.

(a) 20% loss
(b) 20% gain
(c) 100/4 % loss
(d) 100/4 % gain

Q54. A can lay railway track between two given stations in 22 days and B can do the same job in 11 days. With the help of C, they did the job in 4 days only. Then, C alone can do the job in how many days?

(a) 114/5 days
(b) 174/5 days
(c) 84/5 days
(d) 134/5 days

Q55. Find the circumference (in m) of the largest circle that can be drawn completely inside a rectangle whose dimensions are given as 249 m and 168 m. (Take $\pi = 22/7$)

(a) 521
(b) 528
(c) 530
(d) 536

Q56. In triangle ABC, BD ? AC at D and angle DBC = 76°. E is a point on BC such that angle CAE = 74°. What is the measure of angle AEB?

(a) 88°
(b) 99°
(c) 77°
(d) 100°

Q57. Four times P's present age exceeds Q's present age by 41 years. After 10 years, three times Q's age will be 33 years less than seven times P's age at that time. What is Q's present age?

(a) 71
(b) 63
(c) 67
(d) 62

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Q58. The marked price of a shirt is Rs. 1,250; the shopkeeper offers a scheme of 'buy four get two free'. What amount does a customer have to pay for taking home six shirts?

(a) Rs. 5,200
(b) Rs. 5,000
(c) Rs. 4,500
(d) Rs. 4,200

Q59. Pipe P can fill 7/9 part of a tank in 14 hours and pipe Q can fill 5/9 part of the same tank in 20 hours. Both P and Q were kept open for 2 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 6 hours. Pipes P, Q and R together can fill the empty tank in:

(a) 19 hours
(b) 18 hours
(c) 3 hours
(d) 12 hours

Q60. A number, when increased by 70%, gives 3230. The number is:

(a) 1900
(b) 950
(c) 5700
(d) 3800

Q61. The value of $\sqrt{144}+\sqrt{0.0225}-\sqrt{6.25}=$

(a) 6.94
(b) 7.22
(c) 9.65
(d) 3.27

Q62. The sum of the squares of two consecutive even natural numbers is 1684. The sum of the numbers is:

(a) 42
(b) 66
(c) 48
(d) 58

Q63. Sapna invested Rs. 21,300 on simple interest, partly at 14% per annum and partly at 11% per annum. If she earns equal interests from the two investments after 3 years, then find the sum invested at 14% per annum (in Rs.).

(a) 9,372
(b) 9,373
(c) 9,369
(d) 9,374

Q64. The average of first 161 even numbers is

(a) 163
(b) 162.5
(c) 161.5
(d) 162

Q65. M and N start a business. M invests Rs. 38,000 more than N invests for 2 months and N for 3 months. M's share is Rs. 461 more than that of N, out of a total profit of Rs. 6,915. Find the capital contributed by M.

(a) Rs. 91,400
(b) Rs. 91,800
(c) Rs. 91,200
(d) Rs. 91,000

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Q66. Simplify: x(2x - 8) + 5(x² -3) + 12

(a) 7x² - 8x + 3
(b) -7x2 - 8x - 3
(c) 7x2 - 8x - 3
(d) -7x2 - 8x + 3

Q67. Find the simple interest (in Rs.) on Rs. 4,000 at 6.75% per annum rate of interest deposited on 26 February 2024 and withdrawn on 27 April 2024.

(a) Rs. 46
(b) Rs. 44
(c) Rs. 43
(d) Rs. 45

Q68. The HCF and the LCM of two numbers are 83 and 498, respectively. If one of the numbers is 166, find the other one.

(a) 166
(b) 230
(c) 332
(d) 249

Q69. Yash travels 200 km at 25 km/hr, the next 210 km at 21 km/hr and the next 204 km at 51 km/hr. What is his average speed (in km/hr) for the whole journey? (Round off your answer to two decimal places)

(a) 30.01
(b) 27.22
(c) 27.91
(d) 18.68

Q70. The number of prime numbers lying between 468 and 476, both included, is:

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

GENERAL INTELLIGENCE AND REASONING

Q71. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘×’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘−’, then what will be come in place of the question mark (?) in the following equation?

18 A 3 D 8 B 2 C 12 = ?

(a) 12
(b) 7
(c) 2
(d) 10

Q72. 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) Mother's father
(c) Mother's mother's brother
(d) Father

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Q73. In a certain code language, ‘DELT’ is coded as ‘1473’ and ‘BLED’ is coded as ‘7234’. What is the code for ‘B’ in the given code language?

(a) 3
(b) 7
(c) 4
(d) 2

Q74. Seven boxes G, H, I, K, L, M and S are kept one over the other but not necessarily in the same order. Only four boxes are kept between I and K. Only S is kept above I. Only two boxes are kept between M and G. H is kept immediately above L. G is not kept immediately above H. Which box is kept fourth from the top?

(a) L
(b) H
(c) G
(d) M

Q75. L, M, N, O, Q, R, and S are sitting around a circular table facing the centre of the table. R sits third to the left of O. Only one person sits between O and S when counted from the left of S. Only two people sit between Q and L when counted from the right of L. N is an immediate neighbour of Q.

Who sits third to the right of M?

(a) N
(b) L
(c) R
(d) Q

Q76. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

FIL ADG VYB QTW ?

(a) LRO
(b) LOR
(c) RLO
(d) ROL

Q77. Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

MUV : QPZ

UKD : YFH

(a) TLW : XQA
(b) FCV : KZQ
(c) CAL : GVP
(d) SLU : VGX

Q78. In a certain code language, ‘LOAN’ is coded as ‘4257’ and ‘NIKE’ is coded as ‘1346’. What is the code for ‘N’ in the given code language?

(a) 1
(b) 6
(c) 7
(d) 4

Q79. Each of the digits in the number 95423671 is arranged in ascending order from left to right. What will be the sum of the digits that are third from the left and fourth from the right in the new number thus formed?

(a) 10
(b) 11
(c) 8
(d) 9

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Q80. 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.)

(a) NQ-SL
(b) JM-OH
(c) CF-HB
(d) FI-KD

Q81. What should come in place of the question mark (?) in the given series?

561 562 564 ? 571 576

(a) 569
(b) 566
(c) 567
(d) 568

Q82. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. Only C is kept above D. Only two boxes are kept between D and E. Only A is kept below B. F is not kept immediately above E. How many boxes are kept between B and F?

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

Q83. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

7 ÷ 4 + 20 − 72 × 6 = ?

(a) 33
(b) 26
(c) 13
(d) 20

Q84. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

Z122Y V101U R82Q N65M ?

(a) J49I
(b) K50L
(c) J50I
(d) K49L

Q85. Seven people G, H, I, K, L, M and S are sitting in a row, facing north. Only three people sit between I and S. M sits to the immediate left of S. No one sits to the right of H. Only two people sit between H and M. K sits to the immediate right of L. How many people sit between G and K?

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

Q86. 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) MHN
(b) SNU
(c) PKQ
(d) IDJ

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Q87. CHRX is related to HMXD in a certain way based on the English alphabetical order. In the same way, WBPV is related to BGVB. To which of the given options is LQHN related, following the same logic?

(a) QTNV
(b) QVTN
(c) QTYU
(d) QVNT

Q88. What should come in place of the question mark (?) in the given series?

18 23 17 24 16 ?

(a) 20
(b) 34
(c) 25
(d) 28

Q89. Seven boxes C, D, E, M, N, O and P are kept one over the other but not necessarily in the same order.

Only D is kept above C. Only E is kept between C and M. Only P is kept below N. How many boxes are kept between O and P?

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

Q90. Laxman starts from Point A and drives 7 km towards south. He then takes a right turn, drives 8 km, turns right and drives 9 km. He then takes a right turn and drives 9 km. He takes a final right turn, drives 2 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 2 km to west
(b) 3 km to west
(c) 1 km to west
(d) 4 km to west

Q91. FI 11 is related to KN 8 in a certain way. In the same way, NQ 25 is related to SV 22. To which of the following is OR 17 related, following the same logic?

(a) TW 15
(b) UW 14
(c) JM 11
(d) TW 14

Q92. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements: All bricks are spoons. No brick is a cricket.

Conclusion (I): Some crickets are spoons.

Conclusion (II): All spoons are crickets.

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

Q93. 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 homestays are resorts.

Some resorts are palaces.

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Conclusions:

(I) Some homestays are palaces.

(II) All palaces are resorts.

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

Q94. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

32 + 8 × 2 − 12 ÷ 5 = ?

(a) 85
(b) 88
(c) 89
(d) 87

Q95. 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) YEI
(b) BIL
(c) PWZ
(d) OVY

Q96. This question is based on the five, three-digit numbers given below.

(Left) 475 648 857 591 362 (Right)

(Example- 697 – First digit = 6, second digit = 9 and third digit = 7)

(NOTE: All operations to be done from left to right.)

If 1 is added to the third digit of every number, then how many numbers will become even?

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

Q97. What should come in place of the question mark (?) in the given series?

6 6 7 11 20 ?

(a) 38
(b) 35
(c) 36
(d) 37

Q98. Refer to the following number and symbol series and answer the question. Counting to be done from left to right only.

(Left) @ 3 5 1 7 % @ 2 © 1 © © 4 4 9 & © 1 © £ 5 5 (Right)

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

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

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Q99. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

24, 66

18, 48

(a) 22, 58
(b) 30, 84
(c) 20, 56
(d) 28, 74

Q100. Tirtha starts from Point Y and drives 23 km towards north. He then takes a right turn, drives 12 km. He then turns right and drives 27 km. He takes a final right turn, drives 12 km and stops at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90° turns only unless specified.)

(a) 9 km towards west
(b) 5 km towards east
(c) 4 km towards north
(d) 5 km towards south

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Tata Communication

The correct answer is Tata Communication.

Key Points

• In March 2025, Tata Communication unveiled Vayu, an advanced AI cloud offering targeted specifically for enterprises. This marks a significant milestone in the company's journey towards leveraging cutting-edge technology to cater to business needs.

• Vayu is designed to provide end-to-end AI solutions, including infrastructure, tools, and platforms, enabling businesses to seamlessly integrate artificial intelligence into their operations and decision-making processes.

• Tata Communication, a global leader in telecommunications and IT services, has consistently demonstrated its commitment to innovation, particularly in the domain of cloud computing, AI, and enterprise solutions. Hence, this statement is correct.

• The unveiling of Vayu reflects the organization's focus on addressing the growing demand for AI-driven cloud platforms among enterprises, empowering them to enhance productivity, efficiency, and scalability.

• This initiative further solidifies Tata Communication's position as a key player in the global market for advanced IT and AI solutions. Hence, the answer aligns perfectly with the statement.

Additional Information

• Tata Communication:

• Tata Communication is a leading provider of telecommunications and IT services globally. Founded in 1986 and headquartered in Mumbai, India, the company is part of the renowned Tata Group.

• It offers a wide range of services, including networking, cloud computing, cybersecurity, IoT solutions, and AI-driven platforms, catering to businesses of all sizes across various industries.

• Vayu AI Cloud Offering:

• The Vayu AI cloud platform is specifically designed for enterprises, providing them with tools to implement artificial intelligence in their processes and drive innovation.

• Its features include data analytics, machine learning capabilities, and scalable infrastructure to support complex AI workloads.

• Reliance Communication: Founded in 2004, it primarily focuses on telecommunications but does not have a significant presence in AI-driven cloud offerings.

• Bajaj Communication: Bajaj Communication is not widely recognized in the IT or cloud computing domain, making it an unlikely contender for launching Vayu.

Important Points

• Global AI Market:

• The global AI market has witnessed exponential growth, with applications in diverse fields such as healthcare, finance, education, and manufacturing.

• • It is predicted to reach a valuation of over $1 trillion by 2030, driven by advancements in machine learning and big data technologies.

• Tata Communication's Role:

• Tata Communication has positioned itself as a major player in the global IT and telecom market, serving over 7,000 customers worldwide.

• Its focus on innovation and the integration of emerging technologies like AI has enabled it to address the evolving needs of businesses effectively.

Q2. Answer: (b) The Central Vigilance Commission Act, 2003

The correct answer is The Central Vigilance Commission Act, 2003.

Key Points

• The Central Vigilance Commission (CVC) was initially established in 1964, following the recommendations of the Santhanam Committee, as an autonomous body to address corruption in government organizations.

• The CVC Act, 2003 was enacted to grant statutory status to the Commission, ensuring its independence and enhancing its powers to combat corruption effectively.

• Under this Act, the CVC became a statutory body, meaning it has a legal foundation and its functioning is governed by laws specifically enacted for it. Hence, the correct answer is The Central Vigilance Commission Act, 2003.

• Key Provisions: The CVC Act, 2003 outlines the composition, powers, and functions of the Commission. It defines its role in supervising vigilance activities in government departments and organizations.

• The Act also ensures the independence of the CVC by making it directly responsible to the President of India rather than subordinate to any ministry. Hence, this Act was pivotal in strengthening anti-corruption measures in India.

Additional Information

• Overview of the Central Vigilance Commission:

• Establishment: The CVC was created in 1964, following recommendations by the Santhanam Committee on Prevention of Corruption.

• Objective: Its primary role is to monitor and supervise vigilance activities in various government departments to prevent corruption.

• Statutory Status: The enactment of the CVC Act in 2003 gave it legal backing, ensuring its independence and authority.

• Functions of CVC:

• The CVC oversees the vigilance activities in central government organizations and ensures adherence to anti-corruption measures.

• Supervision: It monitors the investigations conducted by the Central Bureau of Investigation (CBI) in cases of corruption.

• It advises central government authorities on vigilance matters and recommends actions against corrupt practices.

• Key Provisions of the CVC Act, 2003:

• The Act ensures that the CVC is an independent body, free from the influence of any ministry or department.

• It specifies that the CVC shall consist of a Central Vigilance Commissioner and not more than two Vigilance Commissioners.

• The Act grants the CVC the authority to investigate complaints against government officials and recommend appropriate action.

Important Points

• Other Relevant Acts and Bodies:

• The Prevention of Corruption Act, 1988 complements the CVC's efforts by providing a legal framework for prosecuting corruption cases.

• Lokpal and Lokayuktas Act, 2013: This Act established the Lokpal to address corruption cases involving high-level public officials.

• Comparison of Acts:

• The Central Vigilance Commission Act, 1964: This Act established the CVC but did not provide statutory status.

• The Central Vigilance Commission Act, 2003: This Act granted statutory status, enhancing the CVC's independence and effectiveness.

• Prevention of Corruption Act, 1988: Focuses on prosecuting corruption cases but does not establish an oversight body.

• Lokpal Act, 2013: While addressing corruption, its scope is different as it targets high-level officials, unlike the CVC's broader vigilance role.

Q3. Answer: (b) 24 hours

The correct answer is 24 hours.

Key Points

• Rotation of the Earth: The Earth completes one full rotation around its axis in approximately 24 hours. This rotation is responsible for the alternation of day and night.

• The Earth's axis is tilted at an angle of approximately 23.5 degrees, which plays a significant role in the variation of day length across seasons.

• The rotation occurs from west to east, which is why the Sun appears to rise in the east and set in the west. Hence, the statement is correct.

• Time Division: The 24-hour rotation period is divided into daytime and nighttime. Daytime occurs when a part of the Earth faces the Sun, while nighttime occurs when it faces away from the Sun.

• This rotation impacts various Earth processes, including the movement of air masses, the creation of ocean currents, and the Coriolis effect. Hence, the statement is correct.

• Incorrect Options:

• 365 days: This value refers to the Earth's revolution around the Sun, not its rotation on its axis.

• 30 days: This corresponds roughly to a month and is unrelated to Earth's rotation.

• 12 hours: This is the approximate time for half of a rotation (day or night), not the full rotation.

Additional Information

• Rotation of Earth:

• The Earth rotates around its axis, an imaginary line passing through the North and South Poles.

• The speed of rotation at the equator is approximately 1670 km/hour or 465 meters/second.

• The rotation is responsible for the apparent motion of celestial bodies like the Sun, Moon, and stars.

• Impact of Earth's Rotation:

• The rotation causes the Coriolis effect, influencing wind patterns and ocean currents.

• It leads to the formation of time zones across the globe based on the rotation and division of Earth into 24 zones.

• The rotation also affects the Earth's shape, making it an oblate spheroid, slightly flattened at the poles and bulging at the equator.

• Revolution vs. Rotation:

• Revolution: The Earth's movement around the Sun, taking approximately 365.25 days and resulting in the change of seasons.

• Rotation: The spinning of Earth on its axis, taking approximately 24 hours and causing day and night.

Important Points

• Effects of Earth's Rotation:

• The alternation of day and night is one of the most visible effects of Earth's rotation.

• The rotation influences the direction of wind systems and ocean currents due to the Coriolis effect.

• It also impacts the biological rhythms of living organisms, including humans, known as circadian rhythms.

• Interesting Facts:

• The Earth's rotation is gradually slowing down due to tidal forces, increasing the length of a day by approximately 1.7 milliseconds every century.

• The phenomenon of precession causes a slow change in the orientation of Earth's axis over a period of 26,000 years.

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Q4. Answer: (c) Clement Atlee

The correct answer is Clement Atlee.

Key Points

• Clement Atlee, the Prime Minister of the United Kingdom from 1945 to 1951, officially announced the decision to grant independence to India in February 1947.

• This decision marked a significant turning point in history, as the British Empire had ruled India for nearly 200 years.

• The announcement was made in the context of mounting Indian nationalist movements, including the efforts of leaders such as Mahatma Gandhi and Jawaharlal Nehru, and the INA activities led by Netaji Subhas Chandra Bose. Hence, statement is correct.

• Atlee declared the British intention to withdraw from India by June 1948. This decision was influenced by several factors such as the economic strains caused by World War II, growing pressure from Indian independence movements, and increasing difficulties in administering the colony.

• The process of independence was expedited by the appointment of Lord Mountbatten as the last Viceroy of India. Mountbatten worked to ensure a smooth transition, leading to the partition of India into India and Pakistan on 15th August 1947. Hence, statement is correct.

• Atlee's government also considered the ongoing communal violence between Hindus and Muslims, which led to the decision to partition the subcontinent. This was done to avoid further bloodshed and facilitate a manageable governance structure. Hence, statement is correct.

• Hence, the correct answer is Clement Atlee.

Additional Information

• Factors Leading to India's Independence:

• The Second World War (1939-1945) left Britain economically weakened, making it challenging to sustain its colonial rule in India.

• The rise of Indian nationalist movements, particularly the Quit India Movement of 1942, demonstrated the demand for complete independence and made colonial administration increasingly difficult.

• The Royal Indian Navy Mutiny (1946) and unrest in armed forces also showed Britain the declining control over its colonial subjects.

• Role of Clement Atlee:

• Clement Atlee was the first British Prime Minister to acknowledge that the colonial rule in India was no longer sustainable.

• He appointed Lord Mountbatten as Viceroy in 1947 to oversee the transition to independence and ensure that the process was completed peacefully.

• Atlee's Labour government was ideologically inclined towards decolonization, which aligned with its domestic focus on social reforms and economic recovery.

• Partition of India:

• The communal tensions between Hindus and Muslims led to the decision to partition India into two nations – India and Pakistan.

• The partition resulted in large-scale migration and violence, with millions displaced and thousands killed.

• The partition was enacted under the Indian Independence Act, 1947, which was passed by the British Parliament.

Important Points

• Key Contributions of Clement Atlee:

• He played an instrumental role in ending colonial rule in India, marking the beginning of decolonization across the world.

• His government's policies focused on ensuring a peaceful transition while addressing communal tensions in the subcontinent.

• Other Relevant Figures:

• Stafford Cripps: Known for the Cripps Mission in 1942, which aimed to grant dominion status to India but failed due to lack of support.

• Pethick Lawrence: As Secretary of State for India, he emphasized negotiations and was part of the Cabinet Mission in 1946.

• Winston Churchill: Churchill, a staunch imperialist, opposed granting independence to India during his tenure as Prime Minister before Atlee.

Q5. Answer: (d) Viksit Rajya for Viksit Bharat@2047

The correct answer is Viksit Rajya for Viksit Bharat@2047.

Key Points

• Theme of the 10th Governing Council Meeting: The theme of the meeting was "Viksit Rajya for Viksit Bharat@2047," which translates to "Developed States for a Developed India by 2047."

• Objective: The central focus of the meeting was to align state efforts with the national vision of transforming India into a developed nation by 2047, marking the 100th year of India's independence.

• Collaboration: The meeting emphasized strengthening the partnership between the central and state governments to achieve the goal of holistic development across all states in India.

• Key Areas of Discussion: The council discussed critical areas such as sustainable economic growth, equitable development, and innovative solutions to address challenges faced by states.

• State Empowerment: The theme reflected the importance of empowering states to take proactive roles in governance, development planning, and execution to meet the aspirational goals of 2047.

• National Vision: The idea of "Viksit Rajya for Viksit Bharat" underscored the belief that the progress of individual states is intrinsically linked to the overall development of the nation.

• Hence, the correct answer is Viksit Rajya for Viksit Bharat@2047.

Additional Information

• About NITI Aayog:

• NITI Aayog stands for National Institution for Transforming India. It was established in 2015, replacing the Planning Commission.

• It serves as the apex public policy think tank of the Government of India, providing strategic and technical advice to the central and state governments.

• NITI Aayog focuses on fostering cooperative federalism by involving states in the decision-making process.

• Vision @2047:

• The year 2047 marks the centenary of India's independence, and the government envisions transforming the country into a developed nation.

• This includes achieving goals like sustainable development, equitable resource distribution, technological innovation, and improved quality of life for all citizens.

• Role of States in Development:

• States play a crucial role in implementing policies and schemes, as they are closer to the population and understand localized needs better.

• The theme emphasizes decentralization and empowering states to take charge of their development, in alignment with the national vision.

Important Points

• Significance of Governing Council Meetings:

• The Governing Council of NITI Aayog is the primary platform for dialogue between the central government and state governments.

• These meetings aim to address developmental priorities and challenges faced by states, fostering a spirit of cooperative federalism.

• Focus Areas of the 10th Meeting:

• The meeting emphasized areas like sustainable growth, social justice, innovation, and technology adoption to achieve development goals.

• It also discussed strategies for better implementation of government schemes and policy frameworks at the state level.

Q6. Answer: (d) Sustainable Alternative Towards Affordable Transportation (SATAT)

The correct answer is Sustainable Alternative Towards Affordable Transportation (SATAT).

Key Points

• The Sustainable Alternative Towards Affordable Transportation (SATAT) scheme was launched by the Government of India in October 2018. It aims to promote the use of Compressed Bio Gas (CBG) as an alternative, renewable fuel.

• The scheme encourages entrepreneurs to set up CBG plants and produce fuel using agricultural residue, municipal solid waste, and other biodegradable waste. Hence, the statement in the question is correct.

• Under SATAT, Oil Marketing Companies (OMCs), such as Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL), and Hindustan Petroleum Corporation Limited (HPCL), are authorized to procure CBG produced by these plants.

• The scheme aims to achieve environmental sustainability by reducing dependence on fossil fuels and promoting cleaner fuel alternatives. It also aligns with India's commitment to reducing carbon emissions under the Paris Agreement.

• SATAT provides significant opportunities for rural entrepreneurship and employment, as setting up CBG plants involves local resources and manpower. Hence, this is a key initiative for sustainable transportation.

• CBG under SATAT can be used as an automotive fuel, industrial fuel, and for power generation. It can also serve as a replacement for conventional natural gas.

• Hence, the correct answer is Sustainable Alternative Towards Affordable Transportation (SATAT).

Additional Information

• Sustainable Alternative Towards Affordable Transportation (SATAT):

• Launched by the Ministry of Petroleum and Natural Gas in 2018, SATAT is a significant initiative to promote bio-energy and reduce India's reliance on fossil fuels.

• The scheme supports the establishment of CBG plants and their integration into the fuel ecosystem, thereby promoting waste

management and energy efficiency.

• SATAT also contributes to achieving India's Nationally Determined Contributions (NDCs) under the Paris Agreement by reducing greenhouse gas emissions.

• Compressed Bio Gas (CBG):

• CBG is produced through the anaerobic decomposition of organic waste such as agricultural residue, cattle dung, and municipal solid waste.

• It is a renewable, cleaner fuel that can replace natural gas, liquefied petroleum gas (LPG), and coal in industrial applications.

• CBG is also used for automotive purposes, offering a greener alternative to conventional fuels like diesel and petrol.

• Role of Oil Marketing Companies (OMCs):

• OMCs such as IOCL, BPCL, and HPCL play a pivotal role in the SATAT initiative by procuring CBG from producers.

• They ensure the distribution and accessibility of CBG across the country, integrating it into the energy supply chain.

Important Points

• Key Features of SATAT:

• The SATAT initiative aims to set up 5000 CBG plants across India by 2023-24, producing approximately 15 million tonnes of CBG annually.

• It promotes the use of compressed biogas as a sustainable and affordable alternative to conventional fuels.

• The initiative supports waste-to-energy programs and contributes to effective waste management practices in rural and urban areas.

• Comparison with Other Schemes:

• Biogas Programme: This scheme focuses on the production of biogas for cooking and lighting purposes, primarily aimed at rural areas.

• Waste to Energy Programme: This initiative promotes technologies to convert municipal waste into energy but does not specifically address CBG production for OMCs.

• Cent Compressed Bio Gas (CBG) Scheme: While it promotes CBG production, it is not as comprehensive as SATAT in supporting entrepreneurs and integrating CBG into the fuel market.

Q7. Answer: (a) Kannur Islands

The correct answer is Kannur Islands.

Key Points

• Kannur Islands belong to the Lakshadweep group of islands, which are a group of 36 small islands located in the Arabian Sea, off the southwestern coast of India.

• The Lakshadweep islands are the smallest Union Territory of India and are known for their pristine beaches, coral reefs, and biodiversity.

• The name Lakshadweep translates to "one hundred thousand islands" in Sanskrit, symbolizing the many small islands that form this region. Hence, option 1 is correct.

• Other islands mentioned in the options, such as Kamorta Island and Chowra Island, belong to the Andaman and Nicobar Islands, which are located in the Bay of Bengal and do not form part of the Lakshadweep group.

• Milo Island is not a recognized island in India and does not belong to any Indian island group. Hence, options 2, 3, and 4 are incorrect.

Additional Information

• Lakshadweep Islands:

• Location: The Lakshadweep islands are located approximately 200–440 km off the southwestern coast of Kerala in the Arabian Sea.

• The island group consists of 36 islands, but only 10 islands are inhabited. The capital of Lakshadweep is Kavaratti.

• Famous Islands: Some of the well-known islands include Agatti, Minicoy, Bangaram, and Kalpeni. They are renowned for their coral reefs and marine biodiversity.

• Tourism: Lakshadweep is a popular tourist destination, especially for its water sports, diving, and snorkeling activities.

• Andaman and Nicobar Islands:

• Location: These islands are located in the Bay of Bengal and consist of two major groups: the Andaman Islands and the Nicobar Islands.

• Kamorta and Chowra Islands: Kamorta Island and Chowra Island are part of the Nicobar group of islands and are not related to the Lakshadweep group.

• The Andaman and Nicobar Islands are known for their tropical forests, rich marine life, and historical significance.

• Milo Island:

• Milo Island is not a recognized or official island in India. It is not part of the Lakshadweep or Andaman and Nicobar groups.

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• This option might be fictitious or incorrectly mentioned in the question.

Important Points

• Union Territories in India:

• India has 8 Union Territories, including Lakshadweep, Delhi, Chandigarh, Puducherry, Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu, and Ladakh.

• The Union Territories are directly governed by the Central Government, unlike states which have their own governments.

• Geographical Significance:

• Lakshadweep Islands: These islands are known for their coral reefs and lagoons, making them ecologically important.

• Andaman and Nicobar Islands: These islands serve as an important naval base due to their strategic location in the Bay of Bengal.

Q8. Answer: (c) Thomas Macaulay

The correct answer is Thomas Macaulay.

Key Points

• Thomas Macaulay was a British historian and politician who played a key role in introducing English education in India. He viewed India as a culturally inferior and "uncivilised" country and believed that the British had a moral obligation to "civilise" Indians.

• Macaulay authored the famous Macaulay's Minute on Education (1835), which advocated for the promotion of English education in India instead of traditional Indian education systems based on Sanskrit and Persian. Hence, this statement is correct.

• The English Education Act of 1835 was introduced following Macaulay's recommendations. This act shifted the focus of education in India to English as the medium of instruction and encouraged Western knowledge and literature. Hence, this statement is correct.

• Macaulay's ideas were based on the belief that the British education system was superior and could help "enlighten" Indian society. He argued that English education would create a class of Indians who were "Indian in blood and colour, but English in taste, opinions, morals, and intellect."

• While his policies were criticised for undermining traditional Indian knowledge systems and languages, they laid the foundation for Western-style education in India. Hence, this statement is correct.

• Hence, the correct answer is Thomas Macaulay.

Additional Information

• Key Features of the English Education Act, 1835:

• The act marked a shift from promoting traditional Indian education systems to focusing on English as the medium of instruction.

• It aimed to create a class of Indians educated in Western knowledge and values, who could assist in the administration and governance of the colony.

• Funding was diverted to institutions promoting Western education rather than traditional Indian schools.

• Thomas Macaulay’s Role:

• Macaulay served as a member of the Supreme Council of India from 1834 to 1838. During this time, he wrote his famous Minute on Education.

• He believed that Western knowledge, particularly English literature and science, was far superior to Indian knowledge systems and advocated for prioritising it in the education system.

• Although his views were criticised for being elitist and dismissive of Indian traditions, they influenced the establishment of universities and schools that followed the British model.

• Impact of English Education in India:

• The introduction of English education led to the rise of an educated middle class in India, which played a crucial role in the independence movement.

• It also facilitated the spread of modern ideas, science, and technology, but led to the marginalisation of traditional Indian knowledge systems.

• Examples include institutions like Calcutta University, which became centres for higher learning and intellectual activities.

Important Points

• Key Criticisms of Macaulay’s Policies:

• Macaulay’s policies were criticised for dismissing Indian languages and traditional education systems, leading to cultural alienation among Indians.

• His emphasis on English education contributed to the socio-economic divide, as it primarily benefited the urban elite and excluded rural populations.

• Legacy of English Education in India:

• While Macaulay’s approach was controversial, it established the foundation for India’s modern education system and its global

competitiveness in fields like information technology and science.

• English remains a dominant language in India, serving as a medium for national and international communication.

Q9. Answer: (a) Kamala and Pusa DST Rice 1

The correct answer is Kamala and Pusa DST Rice 1.

Key Points

• Genome editing initiative: India launched a significant genome editing initiative to enhance agricultural productivity, focusing on creating new crop varieties with improved traits.

• Kamala and Pusa DST Rice 1: These two rice varieties were unveiled in May 2025 as part of India's genome editing initiative. Both varieties aim to improve resilience to environmental stress and increase productivity.

• Pusa DST Rice 1: This variety is developed using genome editing techniques to ensure enhanced tolerance to drought conditions, making it suitable for regions with limited water availability. It is highly beneficial for farmers facing unpredictable climate patterns.

• Kamala Rice: Named after a native Indian term, Kamala Rice is engineered to provide increased resistance to diseases and pests, ensuring higher yields and reduced dependency on chemical pesticides.

• Importance: The development of these rice varieties aligns with India's efforts to ensure food security, address climate change challenges, and promote sustainable agriculture.

• Global significance: India's genome editing initiative reflects its commitment to advancing agricultural technology and contributing to global food production research.

• Hence, the correct answer is Kamala and Pusa DST Rice 1.

Additional Information

• Genome editing:

• Genome editing refers to modifying the DNA of organisms, such as plants or animals, to improve specific traits. It is achieved using advanced techniques like CRISPR-Cas9.

• The goal is to enhance agricultural productivity, improve resilience to environmental stress, and reduce dependence on chemical fertilizers and pesticides.

• Kamala Rice:

• Kamala Rice is developed to resist diseases and pests while maintaining high-quality yields.

• It promotes sustainable farming practices by reducing the need for chemical pest control.

• Pusa DST Rice 1:

• This variety is specifically designed for drought tolerance, ensuring better yields in water-scarce regions.

• It contributes to improving farmer livelihoods in areas affected by erratic rainfall.

• India's agricultural innovation:

• India has been a pioneer in developing improved crop varieties, such as hybrid rice and wheat under the Green Revolution.

• The genome editing initiative further strengthens India's position in agricultural research and development.

Important Points

• Significance of genome editing:

• Genome editing helps address global challenges like climate change, food security, and sustainable agriculture.

• It ensures crops are better equipped to handle extreme weather conditions, diseases, and pests.

• Examples of genome editing:

• Golden Rice: Developed to combat Vitamin A deficiency by introducing genes that produce beta-carotene.

• Swarna Rice: Known for its flood tolerance, helping farmers in flood-prone regions.

Q10. Answer: (b) Gaveshana

The correct answer is Gaveshana.

Key Points

• Gaveshana is derived from the Sanskrit word "Gava", which means cow, and "Eshana", which means search or quest. The literal meaning of Gaveshana is "search for cows."

• In Vedic culture, cows were considered sacred and highly valuable assets, symbolizing prosperity and sustenance. The search for cows often led to battles as tribes or groups competed for resources. Hence, the term refers both to searching for cows and to battles.

• The term "Gaveshana" was commonly used in ancient texts to describe the act of recovering stolen cows or engaging in conflicts to protect or claim them. Hence, Gaveshana directly connects to battles in the Vedic era.

• Cows were symbolic of wealth and were essential for survival in the agrarian society during Vedic times. Protecting or reclaiming cows often resulted in disputes and warfare, which were described using the term "Gaveshana." Hence, the term is correct in this

context.

• Hence, the correct answer is Gaveshana.

Additional Information

• The significance of cows in Vedic culture:

• Cows were considered sacred and were associated with prosperity, purity, and life. They were central to the agrarian economy as they provided milk, ghee, and other essential products.

• The protection and search for cows were not only an economic necessity but also a moral duty in the Vedic era.

• Vedic battles and conflicts:

• Many battles described in Vedic texts were fought over cattle raids or protection of cows. The term Gaveshana encapsulates the essence of these conflicts.

• Example: The Rigveda mentions various conflicts involving kings and tribes where cows were a central cause of dispute.

• Linguistic roots of Gaveshana:

• The word is derived from the Sanskrit root "Gava" (cow) and "Eshana" (search). Together, they signify a quest or search for cows, which often led to disputes and battles in ancient times.

• This term is symbolic and reflects the socio-economic conditions of Vedic society, where cattle were a primary source of wealth and livelihood.

Important Points

• Alternative meanings of other options:

• Duhitri: This word means "daughter" in Sanskrit and does not relate to battles or the search for cows.

• Gopala: Refers to a cowherd or protector of cows, often used in the context of Lord Krishna. While it involves cows, it does not relate to battles or searching for cows.

• Gomat: Means "possessing cows" or "rich in cattle." While it describes the abundance of cows, it does not directly relate to the act of searching or battles.

• Historical context:

• The term "Gaveshana" highlights the socio-economic dynamics and priorities of ancient Vedic societies, where cattle were highly valued.

• Understanding terms like "Gaveshana" provides insight into the cultural and economic practices of ancient India.

Q11. Answer: (d) Article 330

The correct answer is Article 330.

Key Points

• Article 330 of the Constitution of India deals with the reservation of seats for Scheduled Castes (SCs) and Scheduled Tribes (STs) in the Lok Sabha.

• This provision ensures adequate representation of SCs and STs in the legislative process, addressing historical inequalities and promoting social justice.

• The reservation under Article 330 is based on the proportion of the population of SCs and STs in the country as determined by the census. Hence, this article provides a mechanism for equitable representation in the Lok Sabha.

• Scheduled Castes and Scheduled Tribes are groups recognized by the Constitution as socially and educationally disadvantaged, requiring special provisions to uplift them. This article contributes to reducing disparities. Hence, this is the correct answer.

Additional Information

• Details of Reservation for SCs and STs in Lok Sabha:

• Article 330 ensures that seats are reserved for SCs and STs based on their population size, promoting their inclusion in the legislative process.

• The reservation is reviewed periodically based on census data to ensure accurate representation.

• This provision is part of India's effort to address historical disadvantages and discrimination faced by these communities.

• Comparison with Other Articles:

• Article 331: Provides representation to the Anglo-Indian community in the Lok Sabha through nomination by the President. This is different from the reservation for SCs and STs.

• Article 332: Deals with the reservation of seats for SCs and STs in the Legislative Assemblies of the states, not the Lok Sabha.

• Article 334: Specifies the time duration for the reservation of seats for SCs and STs in the Lok Sabha and Legislative Assemblies. Initially set for 10 years, this has been extended multiple times via constitutional amendments.

• Importance of Article 330:

• It ensures political representation for marginalized communities, enabling them to voice their concerns and participate in the decision-making process.

• The article upholds the principle of equality enshrined in the Constitution, fostering inclusivity in governance.

Important Points

• Historical Context:

• The reservation for SCs and STs was introduced to address their historical exclusion from governance and decision-making processes.

• The Constitutional Assembly recognized the need for such provisions to promote equality and social justice.

• Extension of Reservation:

• The reservation under Article 330 was initially meant for 10 years but has been extended through constitutional amendments to ensure continued representation.

• For instance, the 104th Amendment Act, 2020 extended the reservation for SCs and STs in Lok Sabha and Legislative Assemblies until 2030.

Q12. Answer: (b) Development of rural clusters with urban-like facilities

The correct answer is Development of rural clusters with urban-like facilities.

Key Points

• Shyama Prasad Mukherji Rurban Mission (SPMRM): Launched by the Government of India in 2016, the primary objective of this mission is to transform rural areas into economically, socially, and physically sustainable regions with the provision of urban-like facilities while retaining the essence of rural life.

• The mission focuses on developing rural clusters by providing essential infrastructure and services, such as roads, electricity, water supply, sanitation, digital connectivity, healthcare, education, and skill development facilities.

• SPMRM is aimed at reducing the migration of rural population to urban areas by creating sustainable and inclusive communities in rural regions. This strengthens rural economies. Hence, the correct answer is "Development of rural clusters with urban-like facilities."

• The mission targets clusters of villages with a population of 25,000 to 50,000 in plain areas and 5,000 to 15,000 in hilly, tribal, and desert areas to ensure equitable development across regions.

• SPMRM operates through two distinct categories of clusters: Non-Tribal Clusters and Tribal Clusters, catering to the specific needs of these regions.

• The mission is a comprehensive approach that integrates various schemes of the government to provide urban-like amenities in rural areas, boosting the rural population's overall quality of life.

Additional Information

• Specific Characteristics of Each Option:

• Option 1: Electrification of rural households – While electrification is an important component of rural development, it is not the primary objective of SPMRM. The Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) focuses on rural electrification.

• Option 3: Skill development for rural youth – Skill development is a significant goal under SPMRM, but it is a part of the broader objective of creating urban-like facilities in rural clusters. Independent schemes like Pradhan Mantri Kaushal Vikas Yojana (PMKVY) focus exclusively on skill development.

• Option 4: Ensuring 100 days of wage employment in rural areas – This refers to the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which ensures employment opportunities in rural areas. However, it is not the primary focus of SPMRM.

• Implementation of SPMRM:

• The mission identifies clusters that have potential for growth and provides them with the necessary support to become "Rurban" clusters through integrated and participatory planning.

• A Critical Gap Funding (CGF) is provided to support the development of infrastructure in these clusters.

• SPMRM incorporates convergence of schemes like MGNREGA, PMKVY, NRLM, and other state-level programs to achieve its objectives.

Important Points

• Focus on Rural Development:

• SPMRM aims to bridge the rural-urban divide by providing urban-like facilities in rural areas while preserving their cultural and natural heritage.

• The mission ensures a holistic development approach, including economic development, environmental sustainability, and social inclusion.

• Key Features:

• SPMRM targets 300 rural clusters across India for development into Rurban areas.

• The program emphasizes public-private partnerships (PPPs) and community participation for effective implementation.

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Q13. Answer: (c) Refreshes the active window

The correct answer is Refreshes the active window.

Key Points

• The keyboard shortcut Ctrl + R is used in most web browsers to refresh or reload the active window or webpage. This ensures that the content displayed is updated with the latest information available.

• When you press Ctrl + R, the browser sends a request to the server to fetch the latest version of the webpage. This is particularly helpful when the webpage content has been updated but is not yet visible due to caching.

• The refresh operation re-fetches all components of the page such as text, images, and multimedia, ensuring that any changes made to the content are displayed. This is an essential function for web browsers to keep users updated. Hence, the statement is correct.

• The shortcut Ctrl + R is universally recognized across popular web browsers such as Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

• In addition to refreshing the page, Ctrl + R can help resolve issues like incomplete page loading or errors, by forcing the browser to reload the content from the server. Hence, this is the correct functionality.

Additional Information

• Other uses of keyboard shortcuts in web browsers:

• Ctrl + T: Opens a new tab, allowing users to browse multiple pages simultaneously.

• Ctrl + W: Closes the active tab to streamline browsing.

• Ctrl + Shift + T: Restores the last closed tab for convenience.

• Ctrl + F: Opens a search bar to locate specific text within the webpage.

• Benefits of refreshing a webpage:

• Ensures the latest content is displayed, particularly for dynamic websites like news portals or social media platforms.

• Resolves issues like broken links, incomplete loading of content, or errors.

• Helps in testing web development changes by fetching updated code from the server.

• Browser compatibility:

• The Ctrl + R shortcut is supported universally across major web browsers like Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, and Opera.

• Some browsers also offer alternative shortcuts like F5 for the refresh function.

Important Points

• Option-specific details:

• Option 1 (Renames a file or folder): This is incorrect as renaming files is typically done using F2 in file management systems, not web browsers.

• Option 2 (Runs a program): Running a program is performed via operating systems, not browsers. This option is incorrect.

• Option 4 (Restores deleted files): Restoration of files is done through the Recycle Bin or recovery tools, not web browsers. Hence, this option is incorrect.

• Browser optimization:

• Regular use of Ctrl + R ensures optimal functioning of websites and enhances user experience by displaying the most up-to-date content.

Q14. Answer: (d) A worker being unable to find a job due to a lack of skills in a new and expanding industry

The correct answer is 4) A worker being unable to find a job due to a lack of skills in a new and expanding industry..

Key Points

• Structural unemployment occurs when there is a mismatch between the skills that workers possess and the skills required by employers for available jobs in the economy.

• This type of unemployment arises due to technological advancements, changes in market demand, or the emergence of new industries that require specialized skills.

• For example, workers in industries such as agriculture or manufacturing might face structural unemployment if those industries decline and they lack the skills needed to transition to growing sectors like technology or healthcare. Hence, option 4 is correct.

• Option 1: "A worker choosing not to work due to a lack of job opportunities" refers to voluntary unemployment rather than structural unemployment. Hence, this statement is incorrect.

• Option 2: "A worker being unable to find a job due to discrimination" refers to unemployment caused by social or systemic biases rather than structural unemployment. Hence, this statement is incorrect.

• Option 3: "A worker losing their job due to a recession" is an example of cyclical unemployment, which occurs due to economic downturns or contractions. Hence, this statement is incorrect.

Additional Information

• Types of Unemployment:

• Structural Unemployment: This occurs when workers' skills do not match the requirements of the job market. It is common during periods of rapid technological change or industry shifts.

• Cyclical Unemployment: This is linked to economic cycles. During recessions, demand decreases, leading to job losses. Conversely, during economic booms, employment opportunities increase.

• Frictional Unemployment: This occurs when workers are temporarily between jobs, such as recent graduates looking for work or individuals transitioning to new jobs.

• Seasonal Unemployment: This type is caused by changes in demand for labor due to seasonal patterns, such as agricultural work or tourism-related jobs.

• Voluntary Unemployment: This occurs when workers opt not to work, often due to personal preferences or lack of suitable opportunities.

• Causes of Structural Unemployment:

• Technological advancements: Automation and artificial intelligence can replace traditional jobs requiring manual labor or repetitive tasks.

• Globalization: Jobs may move overseas, leaving domestic workers unemployed if they lack the skills or opportunities to compete globally.

• Educational limitations: Workers may not have access to training programs or higher education needed to adapt to evolving industries.

• Examples of Structural Unemployment:

• The decline of coal mining jobs due to the shift to renewable energy.

• The reduction of manufacturing jobs in developed countries as production shifts to countries with lower labor costs.

• The rise of jobs requiring digital skills, such as programming, while workers in traditional industries may struggle to adapt to these requirements.

Important Points

• Addressing Structural Unemployment:

• Government policies: Governments can support workers through retraining programs, skill development workshops, and educational initiatives.

• Private sector involvement: Companies can contribute by offering on-the-job training or partnering with educational institutions to ensure the availability of skilled workers.

• Long-term solutions: Investments in education, research, and development can help prevent future structural unemployment by preparing workers for upcoming industry demands.

• Impact of Structural Unemployment:

• It can lead to economic inequality, as certain groups of workers are disproportionately affected.

• It may result in a decline in living standards for those unable to find suitable employment.

• Countries with high levels of structural unemployment may experience slower economic growth due to underutilized labor potential.

Q15. Answer: (c) 6 years or 65 years

The correct answer is 6 years or 65 years.

Key Points

• The Comptroller and Auditor General (CAG) of India is a constitutional authority established under Article 148 of the Indian Constitution. The CAG is responsible for auditing the accounts of the Union and State governments and other public authorities.

• The term period of the CAG is 6 years or until the individual reaches the age of 65 years, whichever comes earlier. This tenure ensures a fixed term and safeguards the independence of the CAG.

• The CAG plays a crucial role in ensuring transparency, accountability, and good governance in the financial administration of India. Hence, the correct answer is "6 years or 65 years."

• Article 149 of the Constitution specifies the duties and powers of the CAG, which include auditing the accounts of the Union and State governments, public sector enterprises, and other entities funded by the government.

• The independence of the CAG is ensured through provisions like fixed tenure, removal only through a process similar to that of a Supreme Court judge, and salary drawn from the Consolidated Fund of India. Hence, the correct answer is "6 years or 65 years."

Additional Information

• Comptroller and Auditor General (CAG):

• CAG is the guardian of the public purse, ensuring that public funds are spent efficiently and effectively.

• The office of the CAG audits the receipts and expenditures of the Union and State governments, government-owned companies, and autonomous bodies funded by the government.

• The CAG submits audit reports to the President or the Governor, who then place these reports before the Parliament or State Legislature, respectively.

• Independence of the CAG:

• The CAG cannot be removed from office except through a process similar to that of the removal of a judge of the Supreme Court of India.

• The salary and expenses of the CAG are charged on the Consolidated Fund of India, ensuring financial independence.

• Key Examples of CAG Reports:

• The CAG audits critical projects and schemes like railway finances, defense expenditure, and infrastructure projects.

• For example, the CAG has highlighted irregularities in schemes such as the Commonwealth Games 2010 and coal block allocations.

Important Points

• Constitutional Provisions:

• Article 148: Establishes the office of the CAG and provides for the appointment, tenure, and removal of the CAG.

• Article 149: Specifies the duties and powers of the CAG regarding audit and accounts.

• Article 151: Mandates that the CAG's audit reports be submitted to the President or Governor and placed before the legislature.

• Role in Governance:

• The CAG ensures accountability and transparency in government finances, reducing corruption and inefficiency.

• The CAG's audit reports play a key role in public administration and policymaking.

Q16. Answer: (c) Coromandel Coast

The correct answer is Coromandel Coast.

Key Points

• The Northern Circars: The Northern Circars refer to the northern coastal plains along the eastern coast of India, specifically near the Bay of Bengal. These plains lie in the regions of present-day Andhra Pradesh and Odisha.

• The Southern Part: The southern region of these plains along the eastern coastline is referred to as the Coromandel Coast. This area stretches along Tamil Nadu and parts of southern Andhra Pradesh.

• Geographical Significance: The Coromandel Coast is known for its distinct geographical features, including flat coastal plains, sandy beaches, and proximity to the Eastern Ghats. It has a tropical climate and is influenced by monsoon winds.

• The term Coromandel Coast is derived from the historical references to the Chola dynasty, which ruled the region for centuries. It is important to highlight that the name has historical and cultural significance.

• Economic Importance: The Coromandel Coast is historically significant for trade and commerce. During colonial times, it was a major trading hub for spices, textiles, and other commodities.

• The plains along the Coromandel Coast are fertile and support agriculture, especially the cultivation of rice, pulses, and other crops. Hence, the southern part is correctly referred to as the Coromandel Coast.

Additional Information

• Geographical Features of the Coromandel Coast:

• The Coromandel Coast lies along the southeastern coastline of India, bordering the states of Tamil Nadu and Andhra Pradesh.

• It is characterized by flat terrain, sandy beaches, lagoons, and low-lying regions. The coast is subject to frequent cyclones during the monsoon season due to its location near the Bay of Bengal.

• Historical Significance:

• The Coromandel Coast has a rich history as a center for maritime trade during the medieval period. It was an important region for the Chola dynasty, Pallavas, and other South Indian empires.

• Colonial powers like the British and the Dutch established trading posts here due to its strategic location for trade in spices, textiles, and other goods.

• Economic Importance:

• The region is agriculturally productive, with crops like rice, sugarcane, and coconut being cultivated extensively.

• It is also important for fishing and aquaculture due to its proximity to the Bay of Bengal.

Important Points

• Key Differences Between Northern Circars and Coromandel Coast:

• The Northern Circars are located in the northern coastal regions, whereas the Coromandel Coast is in the southern coastal regions.

• The Coromandel Coast has a historical connection to the Chola dynasty, while the Northern Circars were more prominent during the colonial period for administrative divisions.

• Climatic Conditions:

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• The Coromandel Coast experiences a tropical climate, with heavy rainfall during the northeast monsoon. The Northern Circars receive rainfall mainly from the southwest monsoon.

• Cyclones are common along the Coromandel Coast due to its proximity to the Bay of Bengal.

Q17. Answer: (c) Ramchandra Chutia

The correct answer is Ramchandra Chutia.

Key Points

• The Luminous Lummer Dai Literary Award: This award is named after Lummer Dai, a renowned literary figure who made significant contributions to Assamese literature and culture.

• The award recognizes individuals who have made exceptional contributions to the enrichment of Assamese literature, promoting its growth and preserving its cultural heritage.

• Ramchandra Chutia: He was honored with the award in 2025 for his outstanding contributions to Assamese literature, showcasing his mastery in storytelling and poetry that resonates deeply with the Assamese community.

• Ramchandra Chutia is widely regarded as a literary figure whose works reflect the essence of Assamese language, culture, and traditions.

• His writings are celebrated for their depth, emotional appeal, and ability to address key societal issues, making him a deserving recipient of this prestigious award.

• The other options, such as Nirupama Borgohain and Indira Goswami, are also renowned Assamese literary figures but were not the recipients of the Luminous Lummer Dai Literary Award in 2025.

• Hence, the correct answer is Ramchandra Chutia.

Additional Information

• Lummer Dai:

• Lummer Dai was a celebrated Assamese author and journalist known for his contributions to literature, particularly focusing on the socio-cultural aspects of Assam.

• His works have inspired several generations of writers and cultural enthusiasts in Assam, making him a pivotal figure in Assamese literature.

• Other Renowned Assamese Literary Figures:

• Nirupama Borgohain: A prominent Assamese writer and journalist known for her novels and short stories that explore societal issues, especially pertaining to women's rights.

• Indira Goswami: Also known as Mamoni Raisom Goswami, she is one of the most celebrated literary figures in Assam. Her works often delve into the complexities of human emotions and societal challenges.

• Homen Borgohain: A respected writer and journalist, he has contributed significantly to Assamese literature through his novels, essays, and journalistic works.

• Significance of the Luminous Lummer Dai Literary Award:

• The award serves to honor individuals who have showcased exemplary contributions to Assamese literature and culture, ensuring its preservation and growth.

• It aims to inspire future generations to engage with and contribute to the rich literary tradition of Assam.

Important Points

• Assamese Literature:

• Assamese literature has a rich history, rooted in ancient traditions and characterized by its unique blend of poetry, prose, and drama.

• The language has produced numerous literary giants who have contributed to its growth and global recognition.

• Role of Literary Awards:

• Literary awards play a crucial role in recognizing and encouraging writers to continue their work, thereby enriching the cultural and literary landscape of a region.

• They also bring attention to lesser-known writers and help preserve the literary heritage of a language or culture.

Q18. Answer: (c) NaCl

The correct answer is NaCl.

Key Points

• Ionic Bonding: Ionic bonding occurs when atoms transfer electrons to achieve stability. In this type of bond, one atom donates electrons, becoming a positively charged cation, while the other atom accepts electrons, becoming a negatively charged anion. The electrostatic attraction between these oppositely charged ions forms the bond.

• NaCl (Sodium Chloride): Sodium chloride is a classic example of a compound formed by ionic bonding. In NaCl, sodium (Na) donates one electron to achieve a stable electronic configuration, forming a positive ion (Na^+). Meanwhile, chlorine (Cl) accepts the electron to complete its octet, forming a negative ion (Cl^-). The electrostatic attraction between Na^+ and Cl^- ions results in

the ionic bond.

• Compounds like NaCl typically have a crystalline structure due to the arrangement of ions in a lattice format. These compounds exhibit high melting and boiling points and conduct electricity in molten or aqueous states. Hence, NaCl is correct.

• Other Options:

• H2O: Water is a covalent compound, not ionic. It forms through sharing of electrons between hydrogen and oxygen atoms. Hence, incorrect.

• CO2: Carbon dioxide is also a covalent compound formed by sharing electrons between carbon and oxygen atoms. Hence, incorrect.

• NH3: Ammonia is another example of a covalent compound formed by sharing electrons between nitrogen and hydrogen atoms. Hence, incorrect.

• Hence, the correct answer is NaCl.

Additional Information

• Characteristics of Ionic Compounds:

• High melting and boiling points: Due to strong electrostatic forces between ions, ionic compounds require significant energy to break the bonds.

• Electrical conductivity: Ionic compounds conduct electricity in molten or aqueous states as ions are free to move.

• Solubility: Ionic compounds are generally soluble in polar solvents like water.

• Crystalline structure: Ionic compounds form well-defined crystals due to the orderly arrangement of ions.

• Applications of NaCl:

• Common salt: NaCl is widely used as table salt in culinary practices.

• Industrial use: It serves as a raw material in the production of chemicals like sodium hydroxide (NaOH) and chlorine gas (Cl2).

• De-icing: NaCl is used to melt ice on roads during winter.

Important Points

• Difference between Ionic and Covalent Bonds:

• Ionic bonds: Formed by the transfer of electrons, leading to the creation of charged ions.

• Covalent bonds: Formed by sharing electrons between atoms.

• Examples of Ionic Compounds:

• Common examples include NaCl (sodium chloride), MgO (magnesium oxide), and CaF2 (calcium fluoride).

Q19. Answer: (a) New Zealand

The correct answer is New Zealand.

Key Points

• Amelia Kerr is a professional cricketer from New Zealand, known for her exceptional performances in international cricket.

• She has been recognized as the ICC Women's T20I Cricketer of the Year 2024, highlighting her extraordinary achievements in the shortest format of the game.

• Amelia Kerr plays as an all-rounder, contributing significantly with both bat and ball for the New Zealand women's cricket team. Her versatility is a key factor in her success. Hence, the correct answer is New Zealand.

• She has displayed remarkable consistency and skill, helping her team achieve success in various international tournaments and series, making her one of the top cricketing talents in the world.

• Amelia Kerr's performances have earned her recognition globally, as she continues to inspire emerging cricketers with her dedication and talent. Hence, New Zealand is the correct answer.

Additional Information

• About Amelia Kerr:

• Amelia Kerr was born on 13 October 2000, in Wellington, New Zealand.

• She is an all-rounder, excelling as a right-handed batter and a leg-spin bowler, making her a valuable asset to the New Zealand women's cricket team.

• She made her debut for the New Zealand women's team in 2016 at the age of just 16, showcasing her immense talent at a very young age.

• Achievements:

• Amelia Kerr is known for her historic double century in a One-Day International (ODI) against Ireland in 2018. She scored an unbeaten 232 runs, which is the highest individual score in women's ODI cricket.

• She has also delivered match-winning performances with her leg-spin bowling, taking crucial wickets in high-pressure situations.

• Her all-round abilities have made her one of the most consistent performers for New Zealand in recent years.

• ICC Women's T20I Cricketer of the Year Award:

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• The award recognizes exceptional performances in T20 International cricket over a calendar year. Amelia Kerr's contributions with both bat and ball made her the standout player of 2024.

• This prestigious recognition highlights her importance to New Zealand cricket and her ability to perform consistently against top teams.

Important Points

• Other Options:

• Australia: Australia has produced several prominent women cricketers like Ellyse Perry and Alyssa Healy, but Amelia Kerr represents New Zealand.

• South Africa: South Africa is home to talented cricketers like Dane van Niekerk and Marizanne Kapp, but Amelia Kerr does not represent South Africa.

• England: England has stars such as Heather Knight and Nat Sciver, but Amelia Kerr is not part of the English cricket team.

• New Zealand Cricket:

• New Zealand has a rich cricketing tradition and has produced world-class players like Suzie Bates, Sophie Devine, and Amelia Kerr.

• The team is known for its competitive spirit and consistent performances in international tournaments.

Q20. Answer: (c) Amrit Bharat Station Scheme

The correct answer is Amrit Bharat Station Scheme.

Key Points

• Amrit Bharat Station Scheme is a government initiative aimed at the redevelopment of railway stations across India to enhance passenger experience and infrastructure.

• The scheme focuses on the modernization and upgradation of facilities such as waiting areas, ticket counters, parking spaces, and passenger amenities at railway stations.

• The initiative envisions the creation of state-of-the-art railway stations with improved accessibility, digital integration, and eco-friendly measures, aligning with the government's vision for infrastructure development.

• Prime Minister Narendra Modi dedicated 103 redeveloped railway stations under this scheme in May 2025, reflecting the government's commitment to enhancing transportation infrastructure.

• The redevelopment under the Amrit Bharat Station Scheme is expected to improve passenger satisfaction, ensure better connectivity, and promote regional development.

• The scheme includes provisions for special facilities for differently-abled persons, energy-efficient systems, and better logistics to cater to growing passenger needs.

• This initiative is part of the larger vision of 'New India', aimed at modernizing infrastructure and promoting sustainable development. Hence, option 3 is correct.

Additional Information

• Amrit Bharat Station Scheme:

• Launched by the Indian government, the Amrit Bharat Station Scheme aims to develop, modernize, and upgrade existing railway stations across India to cater to increasing passenger demands.

• The scheme focuses on long-term planning of stations, including the integration of digital systems, improved logistics, and sustainable energy practices.

• The redevelopment includes better passenger amenities, such as waiting lounges, parking facilities, drinking water kiosks, and improved station designs.

• The initiative also aims to improve accessibility for differently-abled persons and ensure adequate facilities for all passenger categories.

• Other Government Schemes Related to Infrastructure:

• Smart Rail Mission: Focuses on leveraging digital technology for operational efficiency and passenger convenience.

• Udan Scheme: Promotes regional air connectivity by making air travel accessible and affordable to the masses.

• Bharat Mala Scheme: Focuses on road infrastructure, including the construction of highways and expressways for better connectivity.

Important Points

• Significance of the Amrit Bharat Station Scheme:

• The scheme plays a crucial role in enhancing railway infrastructure, which is essential for India's socio-economic development.

• It aligns with the government's focus on sustainable and inclusive development, ensuring improved services for all citizens.

• By modernizing railway stations, the initiative aims to make India's transportation systems more efficient, accessible, and future-ready.

• Impact on Regional Development:

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• Redeveloped stations are expected to boost local tourism, trade, and economy by improving connectivity across regions.

• The improved infrastructure will also encourage private investment and contribute to the overall growth of the Indian railway sector.

Q21. Answer: (c) Uttarakhand

The correct answer is Uttarakhand.

Key Points

• Kumaoni is a language primarily spoken in the state of Uttarakhand, India, especially in the Kumaon region.

• The Kumaon region consists of districts such as Almora, Nainital, Bageshwar, Champawat, Pithoragarh, and Udham Singh Nagar, where Kumaoni is widely spoken.

• Kumaoni belongs to the Indo-Aryan language family and is one of the major dialects of the Central Pahari languages.

• The language is rich in culture and heritage, reflecting the traditions and lifestyle of the Kumaoni people.

• Other options:

• Himachal Pradesh: While Pahari languages are spoken here, Kumaoni is not a significant language in this region.

• West Bengal: This state primarily speaks languages such as Bengali, and Kumaoni is not prevalent here.

• Jammu and Kashmir: The languages spoken here include Kashmiri and Dogri, not Kumaoni.

• Hence, Uttarakhand is the correct answer.

Additional Information

• Geographical Distribution of Kumaoni:

• Kumaoni is spoken predominantly in the Kumaon region, located in the eastern part of Uttarakhand.

• It is also spoken by communities who have migrated from Uttarakhand to other parts of India and abroad.

• Features of Kumaoni Language:

• Kumaoni is written in the Devanagari script, which is also used for Hindi and Sanskrit.

• The language has several dialects, including Johari, Askoti, Chaugarkhiya, and Khasparjia, which vary based on region and community.

• Kumaoni literature includes folk songs, proverbs, and poems that capture the essence of the Kumaoni culture.

• Importance of Kumaoni:

• The language serves as an integral part of the identity and heritage of the people of Kumaon.

• Preservation of Kumaoni is essential to maintaining the cultural legacy of Uttarakhand.

• Comparison with Other Languages:

• Himachal Pradesh: Predominantly speaks Himachali or Pahari languages like Kangri and Mandiali.

• West Bengal: Bengali is the official and widely spoken language here.

• Jammu and Kashmir: Kashmiri, Dogri, and Urdu are the major languages spoken in this region.

Important Points

• Kumaoni in UNESCO Atlas:

• Kumaoni is listed as a vulnerable language in UNESCO’s Atlas of the World’s Languages in Danger.

• This highlights the need for efforts to preserve and promote the language.

• Efforts for Preservation:

• Various organizations and individuals are working to document and promote Kumaoni through literature, music, and education.

• Digital platforms and social media are also being used to raise awareness about the language and its cultural significance.

Q22. Answer: (b) Ernest Rutherford

The correct answer is Ernest Rutherford.

Key Points

• Ernest Rutherford is credited with the discovery of the atomic nucleus through the famous gold foil experiment, conducted in 1909.

• In this experiment, Rutherford and his colleagues Hans Geiger and Ernest Marsden bombarded a thin gold foil with alpha particles to observe their scattering pattern.

• Most of the alpha particles passed straight through the gold foil, while some were deflected at small angles, and a few were deflected at large angles. This observation was unexpected and led to groundbreaking conclusions. Hence, Ernest Rutherford is the correct answer.

• The results of the experiment demonstrated that the atom is mostly empty space, with a small, dense, positively charged center called the nucleus. This finding overturned J.J. Thomson's "plum pudding model" of the atom.

• Rutherford's nuclear model of the atom proposed that electrons orbit the nucleus, which contains most of the atom's mass.

Hence, this experiment revolutionized atomic theory.

Additional Information

• Ernest Rutherford:

• Born: August 30, 1871 in New Zealand.

• Rutherford is often referred to as the "Father of Nuclear Physics" for his contributions to the understanding of atomic structure.

• He received the Nobel Prize in Chemistry in 1908 for his work on the disintegration of elements and the chemistry of radioactive substances.

• Gold Foil Experiment:

• The experiment involved directing alpha particles at a thin sheet of gold foil and measuring their scattering using a fluorescent screen.

• Most particles passed through the foil, indicating that atoms are mostly empty space. However, large deflections showed the presence of a dense, positively charged nucleus.

• This experiment led to the development of the Rutherford atomic model, which replaced the earlier "plum pudding model" proposed by J.J. Thomson.

• Key Contributions of Other Scientists:

• Bohr: Improved upon Rutherford's model by introducing electron energy levels in 1913.

• John Dalton: Proposed the in the early 19th century, suggesting that matter consists of indivisible atoms.

• Lavoisier: Known as the "Father of Modern Chemistry", he identified and named oxygen and contributed to the law of conservation of mass.

Important Points

• Impact of Rutherford's Discovery:

• Rutherford's work laid the foundation for the modern atomic model and further research into subatomic particles.

• It paved the way for the discovery of protons and later the neutron by James Chadwick in 1932.

• Applications of Atomic Theory:

• Rutherford's contributions are crucial in fields like nuclear physics, chemistry, and material science.

• His findings are used in technologies like nuclear reactors, particle accelerators, and medical imaging.

Q23. Answer: (b) $4Fe + 3H_2O \rightarrow Fe_3O_4 + 2H_2$

The correct answer is Option 2.

Key Points

• A chemical equation is considered balanced when the number of atoms for each element is equal on both sides of the equation, adhering to the Law of Conservation of Mass.

• Let's analyze the chemical reactions provided in the question:

• Option 1: $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$

• This equation is balanced because the number of Fe, H, and O atoms are the same on both sides of the equation.

• Hence, Option 1 is correct.

• Option 2: $4Fe + 3H_2O \rightarrow Fe_3O_4 + 2H_2$

• This equation is not balanced. On the left side, there are 4 Fe atoms, but only 3 Fe atoms are present on the right side within Fe_3O_4.

• Additionally, the number of H atoms is not consistent between the sides; there are 6 H atoms on the left but only 4 H atoms on the right.

• Hence, Option 2 is incorrect.

• Option 3: $Fe + H_2O \rightarrow FeO + H_2$

• This equation is balanced because there is 1 Fe atom, 2 H atoms, and 1 O atom on each side of the equation.

• Hence, Option 3 is correct.

• Option 4: $2Fe + 3H_2O \rightarrow Fe_2O_3 + 3H_2$

• This equation is balanced as there are 2 Fe atoms, 6 H atoms, and 3 O atoms on each side of the equation.

• Hence, Option 4 is correct.

• Hence, the correct answer is Option 2.

Additional Information

• Law of Conservation of Mass:

• The Law of Conservation of Mass states that matter cannot be created or destroyed in a chemical reaction, meaning the total mass of reactants must equal the total mass of products.

• In a balanced chemical equation, the number of atoms for each element is equal on both sides, ensuring that the equation adheres to this law.

• Balancing Chemical Equations:

• To balance a chemical equation, one must ensure that the count of atoms for every element is equal on both sides of the equation.

• Coefficients are used before chemical formulas to adjust the number of molecules or atoms in a reaction.

• Example: $H_2 + Cl_2 \rightarrow 2HCl$ is balanced because there are 2 hydrogen atoms and 2 chlorine atoms on both sides.

• Applications of Balanced Equations:

• Balanced equations are essential for calculating the amounts of reactants and products in a reaction.

• They are used in stoichiometry to determine the quantity of products formed or reactants required.

Important Points

• Characteristics of Balanced Equations:

• The equation must represent the actual chemical reaction.

• The physical states of reactants and products are often mentioned (e.g., solid, liquid, gas, aqueous).

• It provides information about reactants and products in their simplest ratio.

• Examples of Real Chemical Reactions:

• Photosynthesis: $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$.

• Combustion of methane: $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$.

Q24. Answer: (c) Exercise Tiger Triumph

The correct answer is Exercise Tiger Triumph.

Key Points

• Exercise Tiger Triumph is a joint military exercise conducted by India and the United States.

• It focuses primarily on amphibious warfare and Humanitarian Assistance and Disaster Relief (HADR) operations.

• The exercise aims to enhance interoperability between the armed forces of both nations in conducting joint operations effectively. Hence, this exercise is relevant to the question.

• The first edition of Exercise Tiger Triumph was held in November 2019, and the event saw participation from the Indian Army, Navy, Air Force, and their U.S. counterparts.

• The exercise involves amphibious operations, evacuation procedures, disaster relief efforts, and other joint strategies to deal with emergencies. Hence, it matches the focus mentioned in the question.

• Hence, the correct answer is Exercise Tiger Triumph.

Additional Information

• Exercise Tiger Triumph:

• It is the only India-U.S. military exercise that involves all three branches of the armed forces: the Army, Navy, and Air Force.

• The exercise is focused on strengthening military-to-military relations and enhancing capabilities in amphibious warfare and HADR operations.

• The importance of this exercise is highlighted by the participation of top-tier military units from both nations, showcasing their readiness and commitment to joint operations.

• Significance of Amphibious Warfare and HADR:

• Amphibious warfare involves military operations launched from the sea by naval and ground forces. It is crucial for operations requiring swift deployment and control over coastal regions.

• Humanitarian Assistance and Disaster Relief (HADR) focuses on providing relief during emergencies such as natural disasters, ensuring swift and efficient evacuation, and delivering aid.

• Other India-U.S. Exercises:

• Exercise Vajra Prahar: A bilateral military exercise focusing on special operations training.

• Exercise Malabar: A multilateral naval exercise involving India, the U.S., Japan, and Australia, emphasizing maritime security.

• Exercise Yudh Abhyas: A joint military exercise between India and the U.S. focusing on counter-terrorism operations and peacekeeping.

Important Points

• India-U.S. Defense Partnership:

• India and the United States have strengthened their defense ties over the years, with joint exercises like Tiger Triumph playing a vital role in enhancing mutual trust and operational readiness.

• These exercises also contribute to regional stability and showcase the commitment of both nations to ensuring peace and security in the Indo-Pacific region.

• Strategic Importance:

• Amphibious operations are essential for ensuring access to critical areas during emergencies, particularly in coastal regions prone to natural disasters.

• HADR operations highlight the role of military forces in providing rapid and effective disaster relief, which is crucial in regions susceptible to cyclones, earthquakes, or tsunamis.

Q25. Answer: (d) Lignite

The correct answer is Lignite.

Key Points

• Lignite, often referred to as "Brown Coal," is a type of soft coal that is primarily used as a fuel for generating electricity and energy production.

• It is considered to be a low-grade coal due to its lower carbon content compared to other types of coal like bituminous or anthracite. However, it is abundant and widely used in India for power generation.

• India has significant reserves of Lignite, particularly in states like Tamil Nadu, Rajasthan, Gujarat, and Jammu & Kashmir. The Neyveli Lignite Corporation in Tamil Nadu is one of the largest producers of lignite in the country.

• Lignite is characterized by its brownish color and relatively high moisture and volatile matter content. This makes it less efficient in terms of energy output compared to higher-grade coal types, but it is still a vital resource for thermal power plants. Hence, lignite is called "Brown Coal" in India.

• The term "Brown Coal" emphasizes the economic importance of lignite as a resource for energy production and industrial applications in India. Hence, lignite is the correct answer.

Additional Information

• Lignite Characteristics:

• Lignite is a sedimentary rock that is formed from compressed peat deposits over geological time.

• It typically has a carbon content of 25–35% and a high moisture content (up to 66%). This makes lignite a less efficient fuel compared to higher-grade coal types.

• The heating value of lignite ranges between 9–17 megajoules per kilogram, which is lower than that of bituminous coal and anthracite.

• Major Lignite Reserves in India:

• India has abundant lignite reserves, with major deposits located in Neyveli (Tamil Nadu), Barmer (Rajasthan), Gujarat, and Jammu & Kashmir.

• The Neyveli Lignite Corporation (NLC) is one of the leading producers of lignite in India and is engaged in the mining and utilization of lignite for power generation.

• Neyveli Lignite Mines in Tamil Nadu are among the most significant lignite mines in India, contributing substantially to the energy sector.

• Applications of Lignite:

• Lignite is primarily used in thermal power plants to generate electricity.

• It is also used as a raw material in industries for the production of synthetic natural gas, fertilizer, and other chemical products.

• Some lignite deposits are utilized in the production of activated carbon and other industrial goods.

Important Points

• Other Coal Types:

• Mica: Mica is not a type of coal; it is a mineral used in the electrical and electronics industry due to its insulating properties.

• Copper: Copper is a metal, not a coal type, and is primarily used in electrical wiring, electronics, and construction.

• Bauxite: Bauxite is an ore of aluminum and is unrelated to coal. It is primarily used in the production of aluminum metal.

• Lignite's Importance:

• Lignite plays a critical role in meeting India's energy demands, especially in regions with limited access to other fossil fuels.

• Its abundance makes it a cost-effective resource for energy production, despite its lower efficiency compared to other coal types.

Q26. Answer: (a) 6.2%

The correct answer is 6.2%.

Key Points

• The International Monetary Fund (IMF) is an international organization that provides economic projections and financial assistance to member countries. Its World Economic Outlook is published regularly and includes global economic trends and forecasts.

• In the April 2025 edition of the World Economic Outlook, the IMF projected India's economic growth rate for the year 2025 to be 6.2%. This projection highlights the strength of India's economy as one of the fastest-growing major economies globally.

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• The growth rate of 6.2% reflects India's sustained recovery and development after economic challenges posed by the global pandemic and other external factors.

• The projected growth rate is an important indicator for policymakers and businesses, as it provides insights into the country's economic direction and potential investment opportunities.

• Hence, the correct answer is 6.2%.

Additional Information

• IMF's World Economic Outlook:

• The World Economic Outlook is a flagship report published by the IMF, providing global economic analysis and forecasts.

• It is released twice a year – in April and October – and includes data on GDP growth, inflation, fiscal policies, and trade.

• The report is widely used by governments, businesses, and financial institutions as a reliable source for economic planning and decision-making.

• India's Economic Growth:

• India has consistently been one of the fastest-growing major economies in the world, driven by factors such as a large working population, robust domestic demand, and structural reforms.

• The growth projection of 6.2% for 2025 reflects the country's ability to maintain stability and resilience despite global challenges like inflation and geopolitical tensions.

• Significance of Economic Growth Rates:

• Economic growth rates indicate the pace at which a country's economy is expanding, measured as the percentage increase in GDP over a specific period.

• Higher growth rates are associated with better employment opportunities, increased investments, and improved living standards.

Important Points

• Factors Influencing India's Economic Growth:

• Government policies: Initiatives like Make in India, Digital India, and structural reforms like GST have stimulated economic growth.

• Global trade dynamics: India's position as a key player in international trade impacts its economic performance positively.

• Foreign investments: Increased foreign direct investment (FDI) inflows contribute to industrial growth and infrastructure development.

• Other Projections in the World Economic Outlook:

• The World Economic Outlook also provides projections for other countries and regions, highlighting global economic recovery trends or challenges.

• For 2025, the report might discuss the impact of major economic policies, geopolitical scenarios, and climate change on global and regional growth.

Q27. Answer: (a) Indian Foreign Service

The correct answer is Indian Foreign Service.

Key Points

• Indian Foreign Service (IFS) is one of the most prestigious services in India, responsible for handling India's foreign relations, diplomacy, and international affairs.

• The IFS officers represent India globally, working in embassies, high commissions, consulates, and multilateral organizations like the United Nations.

• They enjoy privileges such as diplomatic immunity, higher pay scales, and benefits compared to other central services. Hence, statement 1 is correct.

• Indian Defence Accounts Service (IDAS) is responsible for managing the accounts of defense organizations in India. While it holds importance, it does not offer the same level of international exposure or prestige as the IFS. Hence, statement 2 is incorrect.

• Indian Postal Service (IPoS) deals with postal services and their administration. Though highly critical for domestic communication and logistics, it lacks the global influence and prestige associated with the IFS. Hence, statement 3 is incorrect.

• Indian Audit and Accounts Service (IAAS) focuses on auditing and accounts for government departments. While essential for financial governance, it does not match the prestige or pay of the IFS. Hence, statement 4 is incorrect.

• Therefore, the correct answer is Indian Foreign Service.

Additional Information

• Indian Foreign Service (IFS):

• Established in 1946, the IFS is one of the oldest and most prestigious government services in India.

• IFS officers are responsible for negotiating treaties, representing India in bilateral and multilateral forums, and safeguarding India's interests abroad.

• They enjoy higher pay scales, diplomatic immunity, and exclusive privileges such as tax exemptions on foreign income.

• Indian Defence Accounts Service (IDAS):

• This service handles the budgeting, accounting, and financial management of India's defense forces.

• IDAS officers work with defense organizations like the Army, Navy, Air Force, and Defense Research and Development Organization (DRDO).

• Although critical for defense operations, it lacks the international exposure and diplomatic privileges enjoyed by IFS.

• Indian Postal Service (IPoS):

• This service manages the operations of India Post, including postal logistics, financial services, and rural communication.

• IPoS officers are instrumental in ensuring the smooth functioning of postal services and supporting government schemes like Aadhaar linking, financial inclusion, etc.

• Though vital for domestic operations, IPoS does not offer global prestige or high emoluments like IFS.

• Indian Audit and Accounts Service (IAAS):

• IAAS officers audit accounts of government ministries and organizations, ensuring financial transparency and accountability.

• They play a key role in preparing reports for the Comptroller and Auditor General of India (CAG).

• While essential for governance, IAAS does not have the diplomatic privileges or global representation associated with IFS.

Important Points

• IFS Training:

• IFS officers undergo rigorous training in diplomacy, foreign policy, and international relations at institutions like the Foreign Service Institute (FSI).

• They are also trained in foreign languages, cultural sensitivity, and protocol to effectively represent India abroad.

• Global Representation:

• IFS officers work in over 160 Indian embassies and consulates worldwide, ensuring India's global presence.

• They handle critical issues like trade negotiations, diaspora relations, international security, and humanitarian assistance.

Q28. Answer: (c) President, Lok Sabha, and Rajya Sabha

The correct answer is President, Lok Sabha, and Rajya Sabha.

Key Points

• Article 79 of the Indian Constitution defines the composition of the Parliament of India. It states that the Parliament consists of the President, Lok Sabha (House of the People), and Rajya Sabha (Council of States).

• The President of India is an integral part of the Parliament, as all bills passed by both houses require the President's assent to become law. This establishes the President's role as part of the legislative process.

• The Lok Sabha, also known as the Lower House, is composed of representatives directly elected by the citizens of India. It plays a crucial role in legislation, budget approval, and addressing public issues. Hence, Lok Sabha is part of Parliament.

• The Rajya Sabha, also known as the Upper House, is composed of representatives elected by the members of state legislatures and union territories. It provides a federal character to the legislative process and represents the states in the Parliament. Hence, Rajya Sabha is part of Parliament.

• The Prime Minister is the head of the executive branch and not a part of the Parliament as per Article 79. The Prime Minister leads the government but does not constitute the Parliament itself. Hence, option mentioning Prime Minister is incorrect.

• The Vice President serves as the ex-officio Chairman of the Rajya Sabha but is not a formal part of the Parliament's composition under Article 79. The Vice President's role is limited to presiding over the Rajya Sabha sessions. Hence, option mentioning Vice President is incorrect.

• Hence, the correct answer is President, Lok Sabha, and Rajya Sabha.

Additional Information

• Composition of Parliament:

• The Parliament consists of three distinct parts: President, Lok Sabha, and Rajya Sabha, as defined in Article 79 of the Constitution.

• The President's role is to ensure the constitutional validity of bills and acts passed by the Parliament. The President also summons and dissolves sessions of the Lok Sabha and Rajya Sabha.

• The Lok Sabha represents the citizens of India, and its members are directly elected through general elections. It holds significant power in legislative decision-making and budget approval.

• The Rajya Sabha represents the states and union territories of India. It plays a crucial role in reviewing and amending bills and providing a federal aspect to the legislative process.

• Role of President in Parliament:

• The President is integral to the legislative process as their assent is required for bills to become laws.

• The President summons, prorogues, and dissolves Parliament sessions, ensuring the smooth functioning of the legislative branch.

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• Incorrect Options Explained:

• The Prime Minister is part of the executive branch, not the Parliament. While the Prime Minister works closely with the Parliament, they are not mentioned in Article 79.

• The Vice President, despite being the Chairman of the Rajya Sabha, is not formally included in the Parliament's composition under Article 79.

Important Points

• Key Legal Provisions:

• Article 79 explicitly defines the composition of the Parliament as the President, Lok Sabha, and Rajya Sabha.

• All bills must receive the President's assent to become laws, highlighting their integral role in the legislative process.

• Historical Context:

• The structure of the Parliament was designed to ensure representation at both the national and state levels, with the Lok Sabha representing the people and the Rajya Sabha representing the states.

• The President was included as part of the Parliament to ensure that the legislative process adheres to constitutional norms and principles.

Q29. Answer: (c) Akbar

The correct answer is Akbar.

Key Points

• The Ain-i-Dahsala system was introduced by Akbar, one of the greatest Mughal emperors, as a part of his revenue administration reforms.

• The system was developed by Raja Todar Mal, the Finance Minister of Akbar, to ensure a fair and systematic collection of land revenue.

• Under this system, land revenue was calculated based on the average produce and prices of crops over the last 10 years. This helped create consistency and fairness in taxation. Hence, Akbar introduced the Ain-i-Dahsala system.

• The system divided land into categories: Polaj (cultivated yearly), Parauti (left fallow for 1-2 years), Chachar (left fallow for 3-4 years), and Banjar (left fallow for over 5 years).

• The system was widely regarded for its fairness and accuracy in assessing the agricultural productivity and tax potential of land. Hence, the implementation of this system was a hallmark of Akbar's reign.

• The Ain-i-Dahsala system also promoted a sense of trust between the farmers and the Mughal administration, as it removed arbitrary taxation. Hence, the correct answer is Akbar.

Additional Information

• Akbar's Revenue Administration:

• Raja Todar Mal played a crucial role in developing Akbar’s revenue system and introduced systematic measures for land taxation.

• Akbar implemented the Zabt system, under which land was surveyed and measured to assess its productivity and establish revenue rates.

• The Ain-i-Dahsala system was an important part of the Zabt system, ensuring revenue was collected based on a fair average of crop production and prices.

• Categories of Land under the Ain-i-Dahsala System:

• Polaj: Land cultivated annually.

• Parauti: Land left fallow for 1-2 years.

• Chachar: Land left fallow for 3-4 years.

• Banjar: Land left fallow for over 5 years.

• Impact of the Ain-i-Dahsala System:

• It introduced a fair and predictable system of taxation, reducing the burden on farmers and encouraging agricultural productivity.

• The system promoted a sense of stability and trust between the Mughal administration and the agrarian community.

• It became a model for future revenue systems in India and influenced administrative practices during British rule.

Important Points

• Characteristics of Akbar’s Revenue System:

• Akbar’s system relied on a detailed survey of land to ensure accurate assessment of taxes.

• Standardization: The system standardized revenue collection, removing regional variations and arbitrary practices.

• Role of Raja Todar Mal:

• He was a skilled administrator who introduced scientific methods for land measurement and revenue assessment.

• His innovations in revenue collection became a benchmark for future governance in India.

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Q30. Answer: (d) Bhagirathi

The correct answer is Bhagirathi.

Key Points

• The Tehri Dam: The Tehri Dam is one of the largest dams in India. It is located in the state of Uttarakhand and is built on the Bhagirathi River.

• The dam was constructed to serve multiple purposes, including hydroelectric power generation, irrigation, and drinking water supply. It is a major infrastructure project in the region.

• Hydroelectric Power: The Tehri Dam's hydroelectric capacity is significant, with an installed capacity of 1,000 MW from its main hydroelectric plant and additional capacity through auxiliary projects. Hence, the dam is crucial for energy production in the country.

• Bhagirathi River: The Bhagirathi River is considered sacred in India and is one of the key tributaries of the Ganga River. The river originates from the Gangotri Glacier in the Himalayas.

• The dam's construction on the Bhagirathi River has contributed to the region's economic and social development. However, it has also faced challenges related to environmental concerns and rehabilitation. Hence, the Bhagirathi River is significant in the context of the Tehri Dam.

• Environmental Impact: The dam has been criticized for its environmental effects, including submerging villages and altering the local ecosystem. Rehabilitation programs were initiated to address these concerns.

• The dam is an example of balancing development needs with environmental sustainability. Hence, it plays a vital role in Uttarakhand's development.

• Hence, the correct answer is Bhagirathi.

Additional Information

• The Bhagirathi River:

• Origin: The Bhagirathi River originates from the Gangotri Glacier, located in the Uttarkashi district of Uttarakhand.

• Significance: It holds immense spiritual and cultural importance in India, as it is considered the main source stream of the Ganga River.

• Tehri Dam Characteristics:

• Construction: The dam is an earth-fill embankment dam, meaning it is constructed using natural materials like earth and rock.

• Height: The Tehri Dam is 260.5 meters tall, making it the highest dam in India and one of the highest in the world.

• Reservoir: The dam creates a reservoir known as Tehri Lake, which has a storage capacity of approximately 3.5 billion cubic meters.

• Uses of Tehri Dam:

• Power Generation: The dam generates hydroelectric power, providing electricity to northern states.

• Irrigation: It supports irrigation for approximately 2,700 square kilometers of agricultural land.

• Water Supply: The dam supplies drinking water to cities like Delhi and other regions in northern India.

Important Points

• Environmental Concerns:

• Relocation: The dam's construction led to the relocation of thousands of families. Rehabilitation programs were implemented, but many faced challenges in adapting to new areas.

• Ecosystem Impact: The dam altered the local ecosystem, affecting flora, fauna, and water flow patterns in the region.

• Economic Contribution:

• Development: The Tehri Dam has boosted economic activities in the region, including tourism around Tehri Lake.

• Employment: The dam's construction and maintenance have created job opportunities for thousands of people.

Q31. Answer: (a) Himachal Pradesh

The correct answer is Himachal Pradesh.

Key Points

• India's first integrated API Green Hydrogen and 2G Ethanol Plant has been established in Himachal Pradesh. This makes Himachal Pradesh the pioneer state in green hydrogen production in India.

• Green Hydrogen is produced using renewable energy sources such as solar and wind power, making it a cleaner and sustainable fuel alternative. The plant aligns with India's commitment to reduce carbon emissions and achieve net-zero targets by 2070.

• 2G Ethanol refers to second-generation ethanol produced from non-food biomass like agricultural residues. It is a renewable biofuel and contributes to reducing dependency on fossil fuels. Hence, Himachal Pradesh becomes a significant contributor to India's biofuel industry.

• The establishment of the plant supports India's National Hydrogen Mission, launched in 2021. This mission aims to make India a

global hub for green hydrogen production and export. Hence, Himachal Pradesh plays a crucial role in achieving this vision.

• The location in Himachal Pradesh was chosen due to its proximity to renewable energy sources, such as hydro and solar power, which are abundant in the region. Hence, the state is ideal for green hydrogen production.

• The plant is expected to provide employment opportunities, boost the local economy, and encourage technological advancements in renewable energy production in Himachal Pradesh. Hence, the project has socio-economic benefits.

• Hence, the correct answer is Himachal Pradesh.

Additional Information

• Green Hydrogen:

• Green Hydrogen is produced using electrolysis powered by renewable energy sources. It does not emit greenhouse gases, making it an environmentally friendly fuel source.

• It is used in industries like steel production, refining, and transportation. It plays a crucial role in reducing dependency on fossil fuels and mitigating climate change.

• 2G Ethanol:

• Second-generation ethanol is derived from lignocellulosic biomass, such as agricultural waste, rather than food crops.

• It is a sustainable fuel alternative that reduces greenhouse gas emissions and supports rural economies by utilizing agricultural residues.

• National Hydrogen Mission:

• Launched in 2021, the mission aims to make India a global leader in green hydrogen production and use.

• It focuses on creating infrastructure, technological advancements, and policies to support green hydrogen development.

• Himachal Pradesh and Renewable Energy:

• Himachal Pradesh is rich in renewable energy sources like hydropower and solar energy, making it ideal for green hydrogen production.

• The state has been a leader in adopting clean energy solutions, contributing to India's sustainability goals.

Important Points

• Significance of Green Hydrogen:

• Green hydrogen serves as a clean energy carrier and helps in decarbonizing industries and transport sectors.

• It is essential for achieving India's climate goals, including the net-zero target by 2070.

• Advantages of 2G Ethanol:

• It reduces reliance on fossil fuels and minimizes greenhouse gas emissions.

• Promotes the utilization of agricultural waste, creating additional income opportunities for farmers.

• Economic and Environmental Impact:

• The integrated plant in Himachal Pradesh boosts local employment and encourages technological innovations in renewable energy.

• It contributes to India's economic growth while adhering to global environmental sustainability standards.

Q32. Answer: (c) Tax holidays and infrastructure support

The correct answer is Tax holidays and infrastructure support.

Key Points

• Special Economic Zones (SEZs):

• SEZs are designated geographical regions within a country where business and trade laws differ from the rest of the nation to promote economic growth and exports.

• These zones aim to attract foreign investment, enhance industrialization, and boost export-oriented growth. They are significant contributors to a country’s economic development.

• Primary Incentives Offered:

• Tax holidays: Firms operating in SEZs often enjoy exemptions from corporate taxes for a specific period, encouraging businesses to invest and operate within these zones. Hence, this is correct.

• Infrastructure support: SEZs provide state-of-the-art infrastructure, including transportation, communication, power supply, and other utilities, ensuring optimal business operations. This helps companies reduce operational costs and enhances productivity. Hence, this is correct.

• Incorrect Options:

• Higher import duties: SEZs aim to reduce import duties to facilitate the import of raw materials and technology. Offering higher import duties contradicts the purpose of SEZs and is incorrect.

• Strict labour laws: SEZs often have more flexible labour laws to attract investments and streamline operations. Strict labour laws are not a feature of SEZs and are incorrect.

• Ban on foreign investments: SEZs are established to attract foreign direct investments (FDIs). A ban on foreign investments would defeat the purpose of SEZs, making this option incorrect.

Additional Information

• Special Economic Zones in India:

• India introduced SEZs in 2005 with the enactment of the Special Economic Zones Act. The primary goal was to enhance exports, attract foreign investment, and create employment.

• Prominent SEZs in India include Noida SEZ, SEEPZ (Mumbai), and Chennai SEZ.

• Global Examples of SEZs:

• China established SEZs like Shenzhen in the late 20th century, which played a significant role in transforming the country into a global manufacturing hub.

• Dubai's Jebel Ali Free Zone (JAFZA) is another successful example, contributing to the city's position as a global trade and logistics hub.

• Key Features of SEZs:

• Duty-free imports for companies operating within the zone.

• Tax exemptions for a specific period to attract investments.

• Enhanced infrastructure and logistics support for seamless operations.

• Simplified laws and regulations, including relaxed labour laws and streamlined customs processes.

Important Points

• Economic Impact of SEZs:

• SEZs contribute significantly to a country's GDP growth by promoting export-oriented industries.

• They create job opportunities and improve the standard of living in surrounding areas.

• SEZs attract foreign direct investment (FDI), facilitating technology transfer and enhancing the global competitiveness of domestic industries.

• Challenges Faced by SEZs:

• Land acquisition and displacement issues often create social and political challenges.

• Infrastructure development requires significant financial investment and time.

• Compliance with environmental regulations and managing ecological concerns can be challenging for SEZs.

Q33. Answer: (d) Part XXI

The correct answer is Part XXI.

Key Points

• Special provisions for certain states in India are outlined under Part XXI of the Constitution, titled "Temporary, Transitional, and Special Provisions."

• This part of the Constitution primarily addresses the unique conditions of certain states and regions, allowing them to have special privileges and provisions due to their distinctive social, cultural, or geographical conditions.

• Article 370 (now abrogated) provided special status to Jammu & Kashmir, granting it autonomy in various areas except defense, foreign affairs, finance, and communications. Hence, this was part of Part XXI.

• Article 371 and its sub-clauses (Article 371-A to 371-J) provide special provisions for states like Maharashtra, Gujarat, Nagaland, Assam, Andhra Pradesh, Karnataka, etc., focusing on administrative, cultural, and economic development. Hence, this is covered under Part XXI.

• These provisions ensure that the rights and interests of the residents in these states are safeguarded, considering their unique circumstances. Hence, Part XXI applies to special provisions for certain states.

• Part XXI reflects the diverse nature of India and acknowledges the need for flexible governance in states with distinct characteristics.

Additional Information

• Special Provisions under Part XXI:

• Article 370: Provided temporary provisions for Jammu & Kashmir, granting it autonomy in certain legislative areas. This article was abrogated in August 2019.

• Article 371: Contains special provisions for states like Maharashtra and Gujarat to ensure equitable distribution of resources and development.

• Article 371-A: Ensures the protection of the customary laws and social practices of Nagaland, as well as the religious and land-related rights of its people.

• Article 371-B: Provides special representation for the tribal areas of Assam in its legislature.

• Article 371-J: Grants special provisions for the Hyderabad-Karnataka region, ensuring reservation in employment and education.

• Key Features of Part XXI:

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• Part XXI is unique to the Indian Constitution as it addresses temporary, transitional, and special provisions.

• It reflects India's commitment to addressing the diverse needs of its states and regions, ensuring their protection and development.

• The provisions have helped integrate culturally, geographically, and administratively distinct states into the Indian Union.

Important Points

• Examples of Special Provisions:

• Nagaland (Article 371-A): Protects the cultural and religious practices of the Naga people, including their land ownership rights.

• Assam (Article 371-B): Ensures political representation for tribal areas.

• Andhra Pradesh (Article 371-D): Focuses on equitable opportunities in education and employment.

• Karnataka (Article 371-J): Provides reservations for the Hyderabad-Karnataka region to address socio-economic disparities.

• Constitutional Amendments:

• Special provisions are created or amended through constitutional amendments based on the needs of specific states.

• For example, Article 371-J was added through the 98th Constitutional Amendment Act, 2012.

Q34. Answer: (d) Making educational institutions free from tobacco and substance

The correct answer is Making educational institutions free from tobacco and substance..

Key Points

• Purpose of the enforcement drive: The nationwide enforcement drive initiated by the Ministry of Education in May 2025 focused on making educational institutions free from tobacco and substance abuse. This is part of a larger campaign to promote a healthy and safe environment for students.

• The initiative specifically targeted schools and colleges to ensure that young individuals are not exposed to harmful substances like tobacco, drugs, and alcohol. Such exposure can lead to addiction and negative physical and mental health outcomes.

• The campaign involved collaboration with authorities, educators, and local stakeholders to ensure effective enforcement and create awareness among students regarding the harmful effects of substance abuse.

• This drive aligns with the government's broader goals of promoting public health and ensuring that educational institutions serve as safe spaces for learning and development. The initiative also emphasized preventive measures and counseling for students prone to substance abuse.

• Efforts were made to implement strict regulations prohibiting the sale or consumption of tobacco and other harmful substances within a specified radius of schools and colleges.

• Awareness campaigns: As part of the program, workshops and seminars were organized for students, parents, and teachers to educate them on the long-term impacts of substance abuse.

• The Ministry ensured that educational institutions actively participated in the drive by introducing policies and monitoring mechanisms to prevent substance abuse.

• Legal support: The enforcement drive was backed by existing laws and regulations, such as the Cigarettes and Other Tobacco Products Act (COTPA), 2003, which prohibits the sale of tobacco products near educational institutions.

• Hence, the correct answer is Making educational institutions free from tobacco and substance.

Additional Information

• Cigarettes and Other Tobacco Products Act (COTPA), 2003:

• COTPA prohibits the sale of tobacco products within a 100-meter radius of educational institutions. This act is crucial for protecting students from exposure to harmful substances.

• It mandates strict penalties for violations, including fines and legal action against offenders. It also requires educational institutions to display anti-tobacco signage as part of compliance measures.

• Impact of Tobacco and Substance Abuse:

• Substance abuse, especially among young individuals, leads to serious health problems, including respiratory issues, cardiovascular diseases, and mental health disorders.

• It adversely affects academic performance and social behavior, leading to long-term consequences in personal and professional life.

• • Global statistics: According to the World Health Organization (WHO), tobacco kills more than 8 million people annually, with many starting its use during adolescence.

• Government Initiatives to Prevent Substance Abuse:

• The Ministry of Health and Family Welfare, along with the Ministry of Education, often conducts nationwide campaigns to create awareness about the dangers of substance abuse.

• Programs like National Drug De-addiction Programme focus on providing counseling and rehabilitation services to students and young individuals.

• Awareness drives: Schools and colleges conduct regular workshops, street plays, and interactive sessions to educate students

and parents about substance abuse.

Important Points

• Key Legal and Social Considerations:

• Schools and colleges are legally required to enforce a tobacco-free policy as per government directives, ensuring compliance with the law.

• The Ministry of Education collaborates with local authorities to monitor and enforce rules, ensuring that no illegal sale or consumption takes place near educational institutions.

• Effective Implementation:

• The success of such drives depends on active participation from educational administrators, parents, and students. Awareness and education play a crucial role in ensuring compliance and preventing substance abuse.

• Monitoring mechanisms like CCTV cameras and regular inspections help in identifying and curbing violations effectively.

• Collaboration with NGOs: Many non-governmental organizations actively support the government by conducting anti-substance campaigns and providing counseling services for affected individuals.

Q35. Answer: (a) Maruti Udyog Limited

The correct answer is Maruti Udyog Limited.

Key Points

• Maruti Udyog Limited, now known as Maruti Suzuki India Limited, was a leading automobile manufacturer in India.

• The company was established in 1981 as a joint venture between the Government of India and Suzuki Motor Corporation of Japan.

• Under the Government of India's disinvestment policy, the majority of the government's stake in Maruti Udyog Limited was sold to Suzuki during the early 2000s.

• The disinvestment process was initiated to reduce government involvement in non-strategic sectors, promote private sector efficiency, and generate revenue.

• This move marked a significant step in India's economic liberalization and privatization efforts. Maruti Udyog Limited became a wholly owned subsidiary of Suzuki Motor Corporation.

• The privatization of Maruti Udyog Limited boosted its performance and allowed it to become the leading automobile manufacturer in India.

• Other entities mentioned in the options—like ISRO, BSNL, and LIC—are either government organizations or undertakings that were not privatized during the 2000s. Hence, the correct answer is Maruti Udyog Limited.

Additional Information

• Maruti Udyog Limited (Maruti Suzuki India Limited):

• Founded in 1981, Maruti Udyog Limited initially focused on producing affordable cars for Indian consumers.

• The government held a 74% stake initially, which was gradually sold to Suzuki Motor Corporation, leading to complete privatization.

• Maruti Suzuki is known for introducing affordable and fuel-efficient vehicles, such as the Maruti 800, which revolutionized the automobile market in India.

• Disinvestment Policy:

• The Government of India initiated the disinvestment policy in the early 1990s to reduce its participation in the public sector and promote private sector involvement.

• Disinvestment was seen as a way to improve efficiency, reduce the fiscal deficit, and attract foreign investments.

• Under this policy, various public sector undertakings were either partially or wholly privatized, depending on their strategic importance.

• Other Options:

• ISRO: The Indian Space Research Organisation is a government agency responsible for space research and exploration. It has not been privatized.

• BSNL: Bharat Sanchar Nigam Limited is a state-owned telecommunications company that remains under government ownership.

• LIC: The Life Insurance Corporation of India is a government-owned insurance corporation and has not been privatized.

Important Points

• Importance of Disinvestment:

• Disinvestment helps in reducing the financial burden on the government and improves operational efficiency by involving the private sector.

• It also encourages competition, boosts growth, and facilitates technological advancements.

• Other Significant Disinvestments:

• Besides Maruti Udyog Limited, notable disinvestments include Hindustan Zinc, Bharat Aluminium Company (BALCO), and VSNL during the same era.

Q36. Answer: (d) The file's name changes, but its content remains the same.

The correct answer is Option 4: The file's name changes, but its content remains the same.

Key Points

• When a file is renamed in MS Windows, only its name is changed. The actual content of the file remains intact and unaltered.

• Renaming a file does not create a new file or delete the original file. The file retains its original file format and location. Hence, statement 3 is incorrect.

• The file format of the renamed file remains unchanged. For instance, if a file is a '.docx' document, renaming it does not convert it into another format like '.pdf'. Hence, statement 1 is incorrect.

• Renaming a file does not involve moving it to a different location or directory unless explicitly done. The file remains in its original folder. Hence, statement 2 is incorrect.

• The process of renaming is a simple administrative operation that changes the file name without altering the file's properties or contents. Hence, statement 4 is correct.

Additional Information

• Renaming Files in MS Windows:

• Renaming a file in MS Windows is performed through the context menu or by selecting the file and pressing the F2 key.

• The new name is saved in the file system, but the file’s metadata, such as the creation date, size, and file type, remains unchanged.

• The file's content remains unaltered regardless of the new name given to it. This is because only the name stored in the directory structure is updated.

• File Formats:

• Renaming does not change the file format. A file's format is determined by its internal structure and not its name extension.

• Example: Changing the name of a '.txt' file to '.docx' does not convert it into a Word document. The file remains a text file internally.

• File Location:

• Renaming a file does not move it to another folder or drive. It stays in its original location unless explicitly moved or copied.

Important Points

• Renaming Process:

• Renaming a file updates the file name in the system's directory structure but does not modify the file's content.

• The process is reversible. The file can be renamed back to its original name or any other name.

• Limitations:

• Renaming a file to a name with an unsupported extension may cause issues when attempting to open or use the file.

• Certain system files or files in use may have restrictions that prevent renaming.

Q37. Answer: (b) Operation Abhyaas

The correct answer is Operation Abhyaas.

Key Points

• Operation Abhyaas was a nationwide civil defence exercise conducted on May 7, 2025 by the Ministry of Home Affairs and the National Disaster Management Authority (NDMA).

• The exercise covered 244 districts across India, demonstrating its extensive reach and the government’s commitment to enhancing emergency preparedness.

• The objective of Operation Abhyaas was to evaluate and strengthen the emergency response capabilities and coordination among various stakeholders, including local authorities, civil defence volunteers, and disaster management teams.

• The exercise focused on disaster management scenarios such as earthquakes, floods, and industrial hazards, emphasizing the importance of preparedness in handling diverse emergencies.

• It also aimed at raising awareness among the public regarding the significance of disaster preparedness and response mechanisms in their communities.

• The simulation exercises involved mock drills, training sessions, and coordination activities to test the efficiency and readiness of disaster response teams.

• The involvement of district administrations ensured that local-level response mechanisms were effectively tested and improved. Hence, the correct answer is Operation Abhyaas.

Additional Information

• Disaster Management in India:

• Disaster management in India is governed by the Disaster Management Act, 2005. It establishes the National Disaster Management Authority (NDMA), which is responsible for formulating policies and ensuring their implementation.

• The NDMA focuses on mitigation strategies, preparedness, and response plans for various types of disasters, including natural disasters such as floods, cyclones, and earthquakes, as well as man-made disasters like industrial accidents.

• Features of Nationwide Civil Defence Exercises:

• Such exercises involve multi-agency coordination, including local administration, police, fire departments, and health services.

• They are designed to test the efficiency of disaster response teams, identify gaps in preparedness, and improve overall response mechanisms.

• Example: Mock drills in schools and hospitals are often conducted to ensure safety during emergencies.

• Role of Civil Defence Volunteers:

• Civil defence volunteers play a critical role in raising awareness, assisting in emergency response, and conducting evacuation drills.

• They act as a bridge between the authorities and the community, ensuring effective communication and coordination during disasters.

Important Points

• Key Objectives of Disaster Management Exercises:

• To ensure quick and effective response during emergencies by testing existing protocols and identifying areas for improvement.

• To foster coordination and communication among various agencies, including government departments, non-government organizations, and community groups.

• Examples of Other Civil Defence Operations:

• Operation Suraksha: Aimed at improving security and safety measures during public gatherings.

• Operation Raksha: Focused on disaster preparedness for coastal regions prone to cyclones.

• Operation Trinetra: Focused on industrial disaster management and chemical hazard response.

Q38. Answer: (b) Meluri

The correct answer is /Meluri.

Key Points

• Chief Minister Neiphiu Rio officially inaugurated Meluri District as the 17th district of Nagaland at a function held at the public ground, Meluri.

• Meluri was notified as the 17th district on November 2, 2024.

• Meluri's administrative center was established 67 years ago, with a Chairman Bench Court set up in 1958.

• Chief Minister Rio called Meluri the "Land of Fortunes" emphasizing the district’s natural and cultural wealth.

• Prominent landmarks in Meluri include Shiloi Lake, Tizu River (connects to the Chindwin River), and the Trade Centre at Avakhung.

• The event included the unveiling of a monolith marking the inauguration and the opening of the Multidiscipline Sports Stadium.

Additional Information

• Cultural Significance:

• Meluri has a rich cultural heritage reflected in its diverse cultural troupes and organizations like the Lozaphuhu Cultural troupe, Meluri Area Public Organisation.

• The newly formed district promotes unity among the Chakhesang and Pochury tribes and the broader Naga community.

• Administrative Development:

• The creation of Meluri District is aimed at improving administrative efficiency and fostering development in the region.

• Deputy Commissioner of Meluri highlighted the district’s profile, emphasizing its strategic importance and development potential.

Q39. Answer: (b) National School of Drama

The correct answer is National School of Drama.

Key Points

• Bharat Rang Mahotsav (BRM) is an annual International Theatre Festival organized by the National School of Drama (NSD).

• This prestigious event showcases the rich diversity of Indian and international theatre, bringing together artists, performers, and enthusiasts from around the globe.

• The National School of Drama, headquartered in New Delhi, is one of India's foremost institutions for theatre training and promotion.

• Established in 1959 by the Sangeet Natak Akademi, the NSD is now an autonomous organization under the Ministry of Culture, Government of India.

• The festival aims to promote cultural exchange, foster creativity, and serve as a platform for emerging and established theatre practitioners.

• The event held in Bengaluru from 1 February 2025 to 8 February 2025 continued this tradition, featuring diverse performances and workshops.

• The festival is known for its inclusivity, presenting plays in various languages and styles, from traditional to contemporary theatre.

• Hence, the correct answer is National School of Drama.

Additional Information

• National School of Drama (NSD):

• The NSD was established in 1959 under the auspices of the Sangeet Natak Akademi, later becoming an autonomous organization in 1975.

• It offers a comprehensive three-year diploma course in dramatic arts, focusing on acting, directing, stagecraft, and theatre history.

• The NSD has played a pivotal role in nurturing some of India's finest theatre personalities, including Naseeruddin Shah, Om Puri, Irfan Khan, and Pankaj Kapoor.

• Bharat Rang Mahotsav (BRM):

• The festival started in 1999 to commemorate the golden jubilee of India's Independence.

• Over the years, it has grown into one of the largest theatre festivals in Asia, showcasing performances from India and abroad.

• BRM includes workshops, seminars, and discussions on theatre practices, offering learning opportunities for enthusiasts and professionals alike.

• Key Features of BRM:

• Focus on diversity: The festival presents plays in different languages, themes, and styles, celebrating India's cultural heritage.

• International participation: Theatre groups from countries like Germany, France, Japan, and the USA regularly perform, fostering global cultural exchange.

• Community engagement: The event promotes theatre as a tool for social change and community development.

Important Points

• Sangeet Natak Akademi:

• It is India’s national academy for music, dance, and drama, established in 1952.

• While the NSD was initially established under its aegis, it later became an autonomous institution.

• Indian Council for Cultural Relations (ICCR):

• Founded in 1950, ICCR promotes cultural exchange between India and other countries.

• It organizes exhibitions, festivals, and scholarships but does not focus exclusively on theatre.

• Kalidasa Kalakendram:

• Kalidasa Kalakendram is a prominent theatre group based in Kerala, known for its contributions to classical and contemporary theatre.

• It does not organize national or international festivals like BRM.

Q40. Answer: (d) Mahatma Gandhi

The correct answer is Mahatma Gandhi.

Key Points

• Mahatma Gandhi formed the Satyagraha Sabha on 24 February 1919 in Bombay to protest against the Rowlatt Bills.

• The Rowlatt Bills were officially known as the Anarchical and Revolutionary Crimes Act of 1919, which gave the British government sweeping powers to suppress political activities and detain people without trial. Gandhi strongly opposed this act.

• The Satyagraha Sabha was formed as a platform to organize nonviolent protests and mobilize public opinion against the draconian laws imposed under the Rowlatt Act. Hence, Mahatma Gandhi’s formation of the Sabha is correct.

• Mahatma Gandhi called for nationwide protests, including (strikes) and nonviolent resistance, and the Sabha became a pivotal institution for promoting Satyagraha as a form of peaceful protest.

• The movement initiated by Gandhi reflected his philosophy of truth and nonviolence and marked the beginning of a new phase in India’s freedom struggle. Hence, the correct answer is Mahatma Gandhi.

Additional Information

• Rowlatt Act of 1919:

• The Rowlatt Act was passed by the British government to curb revolutionary activities in India. It allowed imprisonment without trial, search without a warrant, and detention based on mere suspicion.

• The Act faced widespread opposition across the country because it violated basic civil liberties and was seen as an extension of oppressive colonial policies.

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• Mahatma Gandhi’s Philosophy of Satyagraha:

• Satyagraha, meaning "truth-force," was a method of nonviolent resistance developed by Mahatma Gandhi. It emphasized peaceful protests, truth, and self-discipline as tools to achieve political and social goals.

• Gandhi used Satyagraha in various movements, such as the Champaran Satyagraha, Kheda Satyagraha, and later, during the Salt March and Quit India Movement.

• Impact of Satyagraha Sabha:

• The Sabha acted as a rallying point for Indians to oppose the Rowlatt Act through nonviolent means. It laid the foundation for Gandhi’s leadership in the Indian freedom struggle.

• The protests organized under the Sabha eventually led to widespread agitation, culminating in events like the Jallianwala Bagh massacre in April 1919.

Important Points

• Key Figures in the Indian Freedom Struggle:

• Motilal Nehru: An important leader in the Indian National Movement, he played a significant role in the Swaraj Party and later supported Gandhi's non-cooperation movement. He did not form the Satyagraha Sabha; thus, this option is incorrect.

• Maulana Abul Kalam Azad: Known for his contributions to India's education system and his leadership in the Congress Party, Azad was not directly associated with the formation of the Satyagraha Sabha. Therefore, this option is incorrect.

• Sardar Vallabhbhai Patel: A key leader in India's freedom struggle and the first Deputy Prime Minister of India, Patel did not form the Satyagraha Sabha. Hence, this option is incorrect.

• Historical Context:

• The formation of the Sabha marked a turning point in Gandhi’s leadership, uniting various sections of Indian society against British rule.

• The Rowlatt Act and subsequent protests highlighted the growing dissatisfaction with British colonial rule and became a precursor to larger movements like the Non-Cooperation Movement of 1920.

Q41. Answer: (d) 3

Shortcut Trick

List the odd numbers in the given range, excluding those ending in 5: 477, 479, 481, 483, 487, 489, 491.

Eliminate multiples of 3 by checking the sum of digits: 477, 483, and 489 are eliminated.

Remaining numbers to check: 479, 481, 487, 491.

Check divisibility for 481: 481 = 13 × 37, so it is not prime.

The remaining numbers 479, 487, and 491 are not divisible by any prime up to √500 ≈ 22, hence they are prime.

Therefore The correct answer is 3.

Alternate Method

Given:

The numbers lie between 476 and 491 (both included).

Concept Used:

A prime number is a natural number greater than 1 that has exactly two distinct positive divisors: 1 and itself.

To check if a number N is prime, we only need to test divisibility by prime numbers up to √N.

Calculation:

=> The numbers between 476 and 491 are: 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491.

=> First, exclude all even numbers and numbers ending in 5, as they cannot be prime.

=> The potential prime numbers left are: 477, 479, 481, 483, 487, 489, 491.

=> Check 477: 4 + 7 + 7 = 18 (Divisible by 3) → Not prime.

=> Check 479: √479 ≈ 21.8. Prime numbers to check ≤ 21 are 2, 3, 5, 7, 11, 13, 17, 19. It is not divisible by any of these → Prime.

=> Check 481: 481 ÷ 13 = 37. It is exactly divisible by 13 → Not prime.

=> Check 483: 4 + 8 + 3 = 15 (Divisible by 3) → Not prime.

=> Check 487: √487 ≈ 22. Not divisible by any prime number ≤ 19 → Prime.

=> Check 489: 4 + 8 + 9 = 21 (Divisible by 3) → Not prime.

=> Check 491: √491 ≈ 22.1. Not divisible by any prime number ≤ 19 → Prime.

=> The prime numbers between 476 and 491 are 479, 487, and 491.

=> Total count of prime numbers = 3.

Therefore The correct answer is 3.

Additional Information

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How to Check for Primality

To check if a number N is prime, calculate the approximate square root of N. Divide N by all prime numbers less than or equal to √N. If none divide N exactly, it is guaranteed to be a prime number.

Divisibility Rule for 3 and 9

A number is divisible by 3 (or 9) if the sum of its digits is divisible by 3 (or 9). This rule is incredibly useful for quickly eliminating large composite numbers during prime number checks.

Co-Prime Numbers

Two numbers are said to be co-prime (or relatively prime) if they do not have any common prime factor other than 1. Their Highest Common Factor (HCF) is always 1.

Q42. Answer: (a) 255 km/hr

Shortcut Trick

Since distance is constant, Speed and Time are inversely proportional.

S1 × T1 = S2 × T2

=> 75 × 17 = S2 × 5

=> S2 = (75 × 17) ÷ 5

=> S2 = 15 × 17 = 255 km/hr

Therefore The correct answer is 255 km/hr.

Alternate Method

Total Distance (D) is Constant

Case 1: Speed = 75 km/hr | Time = 17 hrs

Case 2: Speed = ? | Time = 5 hrs

Given:

Initial Speed (S1) = 75 km/hr

Initial Time (T1) = 17 hours

New Time (T2) = 5 hours

Formula Used:

Distance = Speed × Time

Calculation:

=> Total Distance = 75 × 17

=> Total Distance = 1275 km

Now, to cover the same distance in 5 hours:

=> New Speed (S2) = Total Distance ÷ New Time

=> S2 = 1275 ÷ 5

=> S2 = 255 km/hr

Therefore The correct answer is 255 km/hr.

Additional Information

Proportionality Rule

If Distance is constant, Speed and Time are inversely proportional (S prop. to 1 / T). Therefore, the ratio of speeds is the inverse of the ratio of times taken.

Average Speed

When traveling equal distances at two different speeds S1 and S2, the average speed is given by (2 × S1 × S2) ÷ (S1 + S2).

Relative Speed

When two objects move in opposite directions, their relative speed is S1 + S2. When moving in the same direction, it is |S1 − S2|.

Q43. Answer: (d) 48^(-42)

Shortcut Trick

Using the combined exponent rule: a^m ÷ a^n × a^p = a^(m − n + p)

Given expression: 48^(−17) ÷ 48^{12} × 48^(−13)

=> Combine the powers since the base (48) is common: −17 − 12 + (−13)

=> 48^(−42)

Therefore The correct answer is 48^(-42).

Alternate Method

Given:

Expression = 48^(−17) ÷ 48¹² × 48^(−13)

Formulas Used:

a^m ÷ aⁿ = a^(m − n)

a^m × aⁿ = a^(m + n)

Calculation:

According to BODMAS, multiplication and division have the same priority. We evaluate from left to right.

=> (48^(−17) ÷ 48¹²) × 48^(−13)

=> 48^((−17 − 12)) × 48^(−13)

=> 48^(−29) × 48^(−13)

Now apply the multiplication rule:

=> 48^((−29 + (−13)))

=> 48^((−29 − 13))

=> 48^(−42)

Therefore The correct answer is 48^(-42).

Additional Information

Law of Product and Quotient

When multiplying numbers with the same base, add their exponents: a^m × aⁿ = a^(m + n). When dividing, subtract their exponents: a^m ÷ aⁿ = a^(m − n).

Power of a Power Rule

To raise a power to another power, multiply the exponents together: (a^m)ⁿ = a^(m × n).

Negative Exponent Rule

A negative exponent means division. Move the term with the negative exponent to the denominator to make it positive: a^(−n) = 1 ÷ aⁿ.

Zero Exponent Rule

Any non-zero base raised to the power of zero is always equal to 1: a^0 = 1 (where a ≠ 0).

Q44. Answer: (a) Rs. 603

Shortcut Trick

Since the time period is identical, the Profit Ratio equals the Capital Ratio.

Ratio = 1090 : 1170 : 1340 = 109 : 117 : 134

Total ratio parts = 109 + 117 + 134 = 360

Value of 360 parts = Rs. 1620 => 1 part = 1620 ÷ 360 = Rs. 4.5

Rohan's share = 134 parts × 4.5 = Rs. 603

Therefore The correct answer is Rs. 603.

Alternate Method

Given:

Sneha's investment = Rs. 1,090

Yash's investment = Rs. 1,170

Rohan's investment = Rs. 1,340

Total Profit = Rs. 1,620

Formula Used:

When the duration of investment is the same for all partners, their profits are shared directly in the ratio of their investments.

Total Profit = Rs. 1620 | Total Parts = 360

Rs. 1090

Rs. 1170

Rs. 1340

109x

117x

134x

Sneha

Yash

Rohan

Calculations:

=> Profit Ratio (Sneha : Yash : Rohan) = 1090 : 1170 : 1340

=> Simplified Ratio = 109 : 117 : 134

=> Sum of ratio parts = 109 + 117 + 134 = 360 parts

=> Rohan's share = (Rohan's ratio part ÷ Total ratio parts) × Total Profit

=> Rohan's share = (134 ÷ 360) × 1620

=> Rohan's share = 134 × 4.5

=> Rohan's share = Rs. 603

Therefore The correct answer is Rs. 603.

Additional Information

Simple Partnership

When all partners invest their capitals for the exact same duration, the profit is divided purely in the ratio of their invested amounts.

Compound Partnership

When partners invest for varying durations, the profit ratio is calculated as Capital1 × Time1 : Capital2 × Time2.

Active and Sleeping Partners

An active partner usually receives a distinct salary or commission for managing operations, which is deducted from the total profit before the remainder is split according to investment shares.

Q45. Answer: (c) 41

Shortcut Trick

Divisibility rule for 41: Subtract 4 × (last digit) from the remaining truncated number.

58740 − (7 × 4) = 58712

5871 − (2 × 4) = 5863

586 − (3 × 4) = 574

57 − (4 × 4) = 41 (which is clearly divisible by 41)

Therefore The correct answer is 41.

Alternate Method

Given number = 587407

We check the divisibility by dividing the number directly by the given options.

=> Option 1: 34 is an even number, so it cannot completely divide an odd number like 587407.

=> Option 2: 587407 ÷ 43 = 13660 with a remainder of 27.

=> Option 3: 587407 ÷ 41 = 14327 with a remainder of 0.

=> Option 4: 587407 ÷ 47 = 12498 with a remainder of 1.

=> Since division by 41 leaves no remainder, the given number is perfectly divisible by 41.

Therefore The correct answer is 41.

Additional Information

Divisibility Rule of 43

Add 13 times the last digit to the remaining truncated number. Repeat the process until a smaller manageable number is obtained.

Divisibility Rule of 47

Subtract 14 times the last digit from the remaining truncated number. Repeat the process until a smaller manageable number is obtained.

Divisibility Rule of 37

Subtract 11 times the last digit from the remaining truncated number. Repeat the process until a smaller manageable number is obtained.

Q46. Answer: (c) Rs. 5,000

Shortcut Trick

Single discount = 40%, and successive discounts 15%, 20% = 15 + 20 − (15 × 20) ÷ 100 = 32%

Difference in discount percentage = 40% − 32% = 8%

8% of Marked Price = Rs. 400

Marked Price = 400 × (100 ÷ 8) = Rs. 5,000

Therefore The correct answer is Rs. 5,000.

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Alternate Method

Given:

Single discount = 40%

Two successive discounts = 15% and 20%

Difference in selling prices = Rs. 400

Formula Used:

Equivalent discount for x% and y% = x + y − (x × y) ÷ 100

Marked Price (MP) = 100%

SP1 (60%)

Discount 1 (40%)

SP2 (68%)

Discount 2 (32%)

8% = Rs. 400

100% = Rs. 5,000

Calculations:

=> Equivalent discount for 15% and 20% = 15 + 20 − (15 × 20) ÷ 100

=> Equivalent discount = 35 − 3 = 32%

=> Difference between discounts = 40% − 32% = 8%

=> We know that difference in selling prices is exactly the difference in discounts computed on the MP.

=> 8% of MP = Rs. 400

=> MP = 400 × (100 ÷ 8)

=> MP = Rs. 5,000

Therefore The correct answer is Rs. 5,000.

Additional Information

Successive Discounts

When two discounts x% and y% are given successively, the effective discount is calculated as: [x + y − (x × y) ÷ 100]%.

Marked Price vs Selling Price

Selling Price (SP) is always calculated on the Marked Price (MP) after applying the discount. Formula: SP = MP × (100 − Discount%) ÷ 100.

Three Successive Discounts

For three successive discounts x%, y%, and z%, first find the equivalent of x% and y%, then use that result with z% to find the final equivalent discount.

Q47. Answer: (d) 197.82 cm3

Shortcut Trick

Volume of a Cylinder = $\pi r^2 h$

Direct substitution: $V = 3.14 \times 3^2 \times 7$

$V = 3.14 \times 9 \times 7 = 3.14 \times 63$

$V = 197.82\ cm^3$

Therefore The correct answer is $197.82\ cm^3$.

Alternate Method

Given:

Height of the cylinder (h) = 7 cm

Radius of the cylinder (r) = 3 cm

Value of π = 3.14

Formula Used:

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

r = 3 cm

h = 7 cm

Volume = π × r × r × h

Calculations:

=> Volume = $3.14 \times (3)^2 \times 7$

=> Volume = 3.14 × 9 × 7

=> Volume = 3.14 × 63

=> Volume = 197.82 cm^3

Therefore The correct answer is 197.82 cm^3.

Additional Information

Curved Surface Area of a Cylinder

The lateral or curved surface area is calculated using the formula CSA = 2πrh.

Total Surface Area of a Cylinder

The total area including both circular bases is calculated as TSA = 2πr(r + h).

Volume of a Cone

A cone with the same base radius and height has exactly one-third the volume of the cylinder: V = (1/3)πr²h.

Q48. Answer: (d) 3

Shortcut Trick

For a fixed amount, the quantity sold is inversely proportional to the selling price percentage.

Formula: Q1 × SP1% = Q2 × SP2%

=> 6 × (100 − 30) = Q2 × (100 + 40)

=> 6 × 70 = Q2 × 140

=> 420 = 140 × Q2 => Q2 = 3

Therefore The correct answer is 3 articles.

Alternate Method

SP1 = 70%

6 articles

CP = 100%

SP2 = 140%

? articles

× 2 (Price multiplier)

÷ 2 (Quantity multiplier)

Given:

Selling Price (SP1) of 6 articles = Rs. 1

=> SP1 per article = Rs. 1/6

Loss percentage = 30%

=> SP1 = (100 − 30)% of CP = 70% of CP

=> 70% of CP = 1/6

=> CP = (1/6) × (100/70) = Rs. 5/21

To find SP for 40% gain:

=> New SP (SP2) = (100 + 40)% of CP = 140% of CP

=> SP2 = 140% × (5/21)

=> SP2 = (140/100) × (5/21) = (7/5) × (5/21) = Rs. 1/3

Since the new selling price is Rs. 1/3 per article,

=> Number of articles to be sold for Rs. 1 = 1 ÷ (1/3) = 3

Therefore The correct answer is 3 articles.

Additional Information

Price and Quantity Relationship

When the total expenditure or selling amount remains constant, the price per item is inversely proportional to the quantity of items (Price × Quantity = Constant).

Basic Profit and Loss Rules

Profit occurs when SP > CP (Profit = SP − CP) and Loss occurs when CP > SP (Loss = CP − SP). Both profit and loss percentages are always calculated on the Cost Price (CP).

Selling Price Formula

SP can be directly found from CP using the multiplier: SP = CP × (100 + Profit%) ÷ 100 or SP = CP × (100 − Loss%) ÷ 100.

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Q49. Answer: (c) 11

Shortcut Trick

The mode of a data set is simply the number that occurs most often.

Looking at the given marks: 19, 14, 11, 20, 18, 17, 14, 10, 11, 11.

The number 11 is repeated 3 times, while 14 is repeated twice and all other numbers appear only once.

Thus, 11 has the highest frequency in the given set.

Therefore The correct answer is 11.

Alternate Method

Given:

The marks scored by 10 students: 19, 14, 11, 20, 18, 17, 14, 10, 11, 11

Concept Used:

The mode is the specific value that appears most frequently in a given set of data observations.

1

2

3

10

11

14

17

18

19

20

Frequency Chart of Marks

Highest

Calculations:

=> Let us arrange the given marks in ascending order to count the occurrences systematically.

=> Ascending order: 10, 11, 11, 11, 14, 14, 17, 18, 19, 20

=> From the arranged data, we can observe the frequency of each distinct mark:

=> 10 → appears 1 time

=> 11 → appears 3 times

=> 14 → appears 2 times

=> 17, 18, 19, 20 → appear 1 time each

=> The mark 11 has the highest frequency of 3 among all the numbers.

=> Therefore, 11 is the true mode of the given set of marks.

Therefore The correct answer is 11.

Additional Information

Mean

The mean is the basic arithmetic average of all the numbers in a data set. Formula: Sum of all observations ÷ Total number of observations.

Median

The middle value when data is sorted in order. If the number of observations (n) is odd, it is the ((n+1)÷2)^(th) term. If even, it is the exact average of the (n÷2)^(th) and (n÷2 + 1)^(th) terms.

Empirical Relationship

For moderately skewed normal distributions, the Mean, Median, and Mode are fundamentally connected by the relation: Mode ≈ 3 × Median − 2 × Mean.

Range

The total overall difference between the absolute maximum and minimum values in a statistical data set. Formula: Range = Maximum value − Minimum value.

Q50. Answer: (d) Rs. 1,08,000

Shortcut Trick

Net percentage increase = 4 + 25 + (4 × 25)/100 = 30%.

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This means the current sales are 130% of the initial sales.

Initial sales = Current sales × (100 ÷ 130)

Initial sales = 140400 × (10 ÷ 13) = 108000

Therefore The correct answer is Rs. 1,08,000.

Alternate Method

Given:

Current sales = Rs. 1,40,400

First year increase = 4%

Second year increase = 25%

Formula Used:

Final Value = Initial Value × (1 + R1/100) × (1 + R2/100)

Initial (x)

Year 1

Rs. 1,40,400

+4%

+25%

× 1.04

× 1.25

Successive Percentage Change

Calculations:

=> Let the sales two years ago be x.

=> x × (1 + 4/100) × (1 + 25/100) = 1,40,400

=> x × (104/100) × (125/100) = 1,40,400

=> x × (26/25) × (5/4) = 1,40,400

=> x × (130/100) = 1,40,400

=> x × 1.3 = 1,40,400

=> x = 1,40,400 ÷ 1.3

=> x = 1,08,000

Therefore The correct answer is Rs. 1,08,000.

Additional Information

Successive Percentage Change

When a value is increased successively by a% and b%, the net percentage change is given by the formula: Net Change = a + b + (a × b)/100.

Multiplier Method

To increase a number by r%, multiply it directly by its multiplier (1 + r/100). For successive changes across multiple periods, simply multiply all factors sequentially.

Reversing a Percentage Increase

If the final value is known after a total r% increase, the initial value can be found by multiplying the final value by 100 ÷ (100 + r).

Q51. Answer: (a) 46 : 75

Shortcut Trick

Compare to 1/2 (or 50%): 34/77 and 39/89 are less than 1/2, so eliminate them directly.

The remaining fractions 46/75 and 36/69 (simplified to 12/23) are both greater than 1/2.

Cross multiply the remaining fractions: 46/75 and 12/23.

46 × 23 = 1058 and 75 × 12 = 900.

Since 1058 > 900, 46/75 is the greatest ratio.

Therefore The correct answer is 46 : 75.

Alternate Method

Given:

Four ratios: 46 : 75, 34 : 77, 39 : 89, 36 : 69

Method Used:

Convert each ratio into a percentage by multiplying by 100 to easily compare them on a uniform scale.

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46 : 75

34 : 77

39 : 89

36 : 69

61.33%

44.16%

43.82%

52.17%

Visual Comparison of Ratios as Percentages

Calculations:

=> 1st ratio = (46 ÷ 75) × 100 = 61.33%

=> 2nd ratio = (34 ÷ 77) × 100 ≈ 44.16%

=> 3rd ratio = (39 ÷ 89) × 100 ≈ 43.82%

=> 4th ratio = (36 ÷ 69) × 100 ≈ 52.17%

=> Comparing all percentages: 61.33% > 52.17% > 44.16% > 43.82%

=> The greatest percentage is 61.33%, which corresponds to the first ratio.

Therefore The correct answer is 46 : 75.

Additional Information

Cross Multiplication Method

To compare two fractions a/b and c/d, compute the cross products a × d and b × c. If ad > bc, then a/b > c/d.

Percentage Method

Converting ratios into percentages (by multiplying the fraction by 100) provides a uniform scale to compare multiple values effortlessly.

Denominator Equalization

Another fundamental way to compare fractions or ratios is by calculating the LCM of their denominators and expressing each fraction with this common base.

Q52. Answer: (b) 60°

Shortcut Trick

Break 7 cos2 θ into 3 cos2 θ + 4 cos2 θ to simplify the equation instantly.

=> 3(sin2 θ + cos2 θ) + 4 cos2 θ = 4

Since sin2 θ + cos2 θ = 1, the equation becomes:

=> 3(1) + 4 cos2 θ = 4 => 4 cos2 θ = 1

=> cos θ = 1/2. Since 0° < θ < 90°, θ must be 60°.

Therefore The correct answer is 60°.

Alternate Method

Given:

3 sin2 θ + 7 cos2 θ = 4

0° < θ < 90°

Formula Used:

sin2 θ + cos2 θ = 1

sin2 θ = 1 − cos2 θ

60°

Base = 1

Perp = √3

Hyp = 2

cos θ = 1/2 => θ = 60°

Calculations:

=> 3 sin2 θ + 7 cos2 θ = 4

Substituting sin2 θ = 1 − cos2 θ into the main equation:

=> 3(1 − cos2 θ) + 7 cos2 θ = 4

=> 3 − 3 cos2 θ + 7 cos2 θ = 4

=> 3 + 4 cos2 θ = 4
=> 4 cos2 θ = 4 − 3
=> 4 cos2 θ = 1
=> cos2 θ = 1/4
=> cos θ = 1/2 (Taking the positive root since 0° < θ < 90°)
We know that cos 60° = 1/2.
=> θ = 60°
Therefore The correct answer is 60°.
Additional Information
Trigonometric Identities
The fundamental Pythagorean identities are: sin2 θ + cos2 θ = 1, 1 + tan2 θ = sec2 θ, and 1 + cot2 θ = cosec2 θ.
Trigonometric Values at 60°
For the standard angle 60°: sin 60° = √3/2, cos 60° = 1/2, and tan 60° = √3.
Quadrant Rule (ASTC)
In the first quadrant (angles between 0° and 90°), all trigonometric ratios yield positive values.

Q53. Answer: (b) 20% gain

Shortcut Trick
Given: 20 × SP = 24 × CP => SP / CP = 24 / 20 = 6 / 5
Profit = SP − CP = 6 − 5 = 1 unit
Gain % = (1 / 5) × 100 = 20%
Therefore The correct answer is 20% gain.
Alternate Method
Given:
Selling price of 20 books = Cost price of 24 books
Formula Used:
Profit % = (Profit ÷ Cost Price) × 100
Profit Calculation using Unitary Method
CP of 20 books = Rs. 20
SP of 20 books = Rs. 24
Profit (Rs. 4)
Calculations:
Let the cost price of 1 book be Rs. 1.
=> Cost price of 20 books = 20 × 1 = Rs. 20
=> Selling price of 20 books = Cost price of 24 books = 24 × 1 = Rs. 24
=> Since Selling Price > Cost Price, a profit is made.
=> Profit earned on selling 20 books = SP − CP = 24 − 20 = Rs. 4
=> Gain % = (Profit ÷ CP) × 100
=> Gain % = (4 ÷ 20) × 100 = 20%
Therefore The correct answer is 20% gain.
Additional Information
Profit and Loss Basics
Profit occurs when the Selling Price (SP) is greater than the Cost Price (CP). Profit = SP − CP.
Profit Percentage Formula
Profit % is always calculated on the Cost Price unless stated otherwise. Formula: Profit % = (Profit ÷ CP) × 100.
Dishonest Dealer Concept
When a dealer uses a false weight, Profit % = (Error ÷ True Value − Error) × 100.

Q54. Answer: (c) 84/5 days

Shortcut Trick
Total Work = LCM(22, 11, 4) = 44 units
Efficiency: A = 44 ÷ 22 = 2, B = 44 ÷ 11 = 4, A+B+C = 44 ÷ 4 = 11

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Efficiency of C = 11 − (2 + 4) = 5 units/day

Time taken by C = 44 ÷ 5 = 8 ^4/5 days

Therefore The correct answer is 8 ^4/5 days.

Alternate Method

Given:

Time taken by A alone = 22 days

Time taken by B alone = 11 days

Time taken by A, B and C together = 4 days

Person	Days	Total Work	Efficiency
A	22	44	44 ÷ 22 = 2
B	11	44 ÷ 11 = 4	
A + B + C	4	44 ÷ 4 = 11	

Calculations:

=> Combined efficiency of A, B and C = 11

=> Efficiency of A + Efficiency of B + Efficiency of C = 11

=> 2 + 4 + Efficiency of C = 11

=> 6 + Efficiency of C = 11

=> Efficiency of C = 11 − 6 = 5 units/day

=> Time taken by C alone = Total Work ÷ Efficiency of C

=> Time taken by C alone = 44 ÷ 5

=> Time taken by C alone = 8 ^4/5 days

Therefore The correct answer is 8 ^4/5 days.

Additional Information

Work & Wages

Wages are distributed in direct proportion to the work done by each person. If all people work for the exact same number of days, the wages will be distributed in the ratio of their efficiencies.

Pipes & Cisterns

It operates on the same logic as Time and Work. An inlet pipe is considered positive work as it fills the tank, whereas an outlet pipe (or leak) is treated as negative efficiency since it empties the tank.

Alternate Day Work

When individuals work on alternate days, find the total work and combine their efficiencies for one complete cycle (e.g., A works day 1, B works day 2), then scale this cycle up to approach the total work.

Q55. Answer: (b) 528

Shortcut Trick

The largest circle inscribed completely inside a rectangle has its diameter equal to the shorter side (breadth) of the rectangle.

Diameter of circle (d) = Breadth of rectangle = 168 m

Circumference = π × d = 22/7 × 168

=> Circumference = 22 × 24 = 528 m

Therefore The correct answer is 528 m.

Alternate Method

Given:

Length of the rectangle (l) = 249 m

Breadth of the rectangle (b) = 168 m

d = 168 m

Length = 249 m

168 m

Formula Used:

Circumference of a circle = 2 × π × r

Calculations:

=> To fit completely inside the rectangle without crossing the boundaries, the circle's diameter cannot exceed the rectangle's

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smallest dimension.

=> Maximum possible diameter (d) = Breadth = 168 m

=> Radius (r) = 168 ÷ 2 = 84 m

=> Circumference = 2 × (22/7) × 84

=> Circumference = 2 × 22 × 12

=> Circumference = 44 × 12 = 528 m

Therefore The correct answer is 528 m.

Additional Information

Largest Circle in a Rectangle

The maximum diameter is always bounded by the shorter side of the rectangle. Diameter = breadth.

Largest Square in a Circle

When a square is perfectly inscribed inside a circle, the diagonal of the square is equal to the diameter of the circle. Side of square = d ÷ √2.

Circumcircle of a Rectangle

For a circle circumscribing a rectangle (touching all four corners), the diagonal of the rectangle serves as the diameter of the circle. Diameter = √(l² + b²).

Q56. Answer: (a) 88°

Shortcut Trick

In right-angled triangle BDC, angle C = 90° − angle DBC = 90° − 76° = 14°.

In triangle AEC, the exterior angle at vertex E is equal to the sum of its two interior opposite angles.

=> angle AEB = angle CAE + angle C

=> angle AEB = 74° + 14° = 88°.

Therefore The correct answer is 88°.

Alternate Method

A

B

C

D

E

76°

74°

14°

88°

Given:

BD perpendicular to AC at point D, implying angle BDC = 90°

angle DBC = 76°

angle CAE = 74°

Calculations:

Consider the right-angled triangle BDC formed by altitude BD:

=> angle C + angle DBC + angle BDC = 180°

=> angle C + 76° + 90° = 180°

=> angle C = 180° − 166°

=> angle C = 14°

Now, observe the triangle AEC. The point E lies on the segment BC. Hence, the angle angle AEB forms an exterior angle to triangle AEC at vertex E.

According to the Exterior Angle Theorem, an exterior angle is strictly equal to the sum of the two opposite interior angles of the triangle:

=> angle AEB = angle CAE + angle ACE

=> angle AEB = 74° + angle C

=> angle AEB = 74° + 14°

=> angle AEB = 88°

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Therefore The correct answer is 88°.

Additional Information

Exterior Angle Theorem

The measure of an exterior angle of a triangle equals the sum of the measures of its two remote interior angles. Formula: angle Exterior = angle Opposite1 + angle Opposite2

Triangle Angle Sum Property

The total measure of the internal angles of any valid triangle is strictly 180°. In right-angled triangles, the two non-right (acute) angles must complement each other (sum to exactly 90°).

Linear Pair Axiom

When two adjacent angles form a straight continuous line, they are called a linear pair and are supplementary. Therefore, their sum is always equal to 180°.

Q57. Answer: (b) 63

Shortcut Trick

Use option verification for the fastest result.

Test Option 2: Let Q's present age = 63 years.

From statement 1: 4P = 63 + 41 = 104 => P = 26 years.

Ages after 10 years: Q = 73 years, P = 36 years.

Check statement 2: 3 × 73 = 219 and (7 × 36) − 33 = 252 − 33 = 219. (Condition satisfies)

Therefore The correct answer is 63 years.

Alternate Method

Present Ages

P

Q

After 10 Years

P + 10

Q + 10

+10 years

Eq 1: 4P − Q = 41

Eq 2: 3(Q + 10) = 7(P + 10) − 33

Given:

=> Present age condition: 4P − Q = 41 ... (Equation 1)

=> Future age condition: 3(Q + 10) = 7(P + 10) − 33 ... (Equation 2)

Calculations:

=> From Equation 1, we get: Q = 4P − 41

=> Expanding Equation 2:

=> 3Q + 30 = 7P + 70 − 33

=> 3Q + 30 = 7P + 37

=> 3Q = 7P + 7

=> Substitute Q = 4P − 41 into the simplified Equation 2:

=> 3(4P − 41) = 7P + 7

=> 12P − 123 = 7P + 7

=> 12P − 7P = 123 + 7

=> 5P = 130

=> P = 26 years

=> Now, substitute P = 26 into Equation 1:

=> Q = 4(26) − 41

=> Q = 104 − 41 = 63 years

Therefore The correct answer is 63 years.

Additional Information

Difference of Ages

The age difference between two individuals always remains constant regardless of the time period (past, present, or future).

Ratio of Ages

If the current age ratio is a : b, their ages are taken as ax and bx. After n years, their ages become (ax + n) and (bx + n).

Average Age Property

If the average age of n people is A, then after k years, the new average age of the same group will naturally become A + k.

Q58. Answer: (b) Rs. 5,000

Shortcut Trick

Under a 'Buy 4 Get 2 Free' scheme, the customer takes home exactly 6 shirts but only pays the price of 4 shirts.

Total amount to pay for 6 shirts = Price of 4 shirts

=> Amount to pay = 4 × Rs. 1,250 = Rs. 5,000

Therefore The correct answer is Rs. 5,000.

Alternate Method

Given:

Marked price of a shirt = Rs. 1,250

Scheme offered = 'buy four get two free'

Total shirts required by customer = 6

Buy 4 Get 2 Free Scheme

Rs. 1250

Rs. 1250

Rs. 1250

Rs. 1250

FREE

FREE

Paid (4 Shirts) = Rs. 5000

Free (2 Shirts)

Calculations:

=> In a 'buy 4 get 2 free' scheme, the customer gets a total of 6 shirts (4 paid + 2 free).

=> Since the customer takes home exactly 6 shirts, they only have to pay for the 4 shirts.

=> Total amount to be paid = Number of paid shirts × Marked price of one shirt

=> Total amount to be paid = 4 × 1250

=> Total amount to be paid = Rs. 5,000

Therefore The correct answer is Rs. 5,000.

Additional Information

Buy X Get Y Free Concept

The effective discount percentage in such promotional schemes is calculated as: Discount % = (Free Items ÷ Total Items) × 100.

Marked Price and Selling Price

Selling Price (SP) = Marked Price (MP) × (1 − Discount/100). The discount is always offered on the marked price of the article.

Successive Discounts

When two consecutive discounts of a% and b% are applied on an item, the single equivalent discount = (a + b − (a × b)/100)%.

Q59. Answer: (b) 18 hours

Shortcut Trick

Time for P to fill the tank = 14 × 9/7 = 18 hours.

Time for Q to fill the tank = 20 × 9/5 = 36 hours.

Work done by P and Q in 2 hours = 2 × (1/18 + 1/36) = 1/6 of the tank.

R empties 1/6 of the tank in 6 hours, so R's total time to empty the tank = 36 hours.

Combined efficiency of P, Q, and R = 1/18 + 1/36 − 1/36 = 1/18 per hour.

Therefore The correct answer is 18 hours.

Alternate Method

Given:

Time for pipe P to fill 7/9 part = 14 hours.

Time for pipe Q to fill 5/9 part = 20 hours.

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Time for pipe R to empty the filled part = 6 hours.

Formula Used:

Total Work = Efficiency × Time

Calculations:

=> Time for P to fill the complete tank = 14 × 9/7 = 18 hours.

=> Time for Q to fill the complete tank = 20 × 9/5 = 36 hours.

=> Part of the tank filled by P in 1 hour = 1/18

=> Part of the tank filled by Q in 1 hour = 1/36

=> Part of the tank filled by P and Q in 2 hours = 2 × (1/18 + 1/36) = 2 × (3/36) = 1/6.

=> Pipe R empties this 1/6 filled part in 6 hours.

=> Time taken by R to empty the complete tank = 6 × 6 = 36 hours.

=> Let Total Work = LCM of (18, 36, 36) = 36 units.

Pipe	Hours	Total Work	Efficiency
P	18	36	36 ÷ 18 = +2
Q	36	36 ÷ 36 = +1	
R	36	36 ÷ 36 = −1	

=> Combined efficiency of P, Q, and R = 2 + 1 − 1 = 2 units/hr.

=> Time taken by P, Q, and R together to fill the tank = Total Work ÷ Combined Efficiency

=> Time = 36 ÷ 2 = 18 hours.

Therefore The correct answer is 18 hours.

Additional Information

Pipes & Cisterns Concept

If a pipe fills a tank in x hours, its efficiency is positive (1/x). If a pipe empties the tank in y hours, its efficiency is taken as negative (−1/y).

Combined Work Rule

When multiple pipes are opened simultaneously, their combined efficiency is simply the algebraic sum of their individual efficiencies.

Fractional Work

If a/b part of a task is completed in D days (or hours), then the entire task will be completed in D × (b/a) days.

Q60. Answer: (a) 1900

Shortcut Trick

Let the original number be 100%.

After a 70% increase, the new number becomes 100% + 70% = 170%.

Given that 170% = 3230.

So, 1% = 3230 ÷ 170 = 19.

Original number (100%) = 19 × 100 = 1900.

Therefore The correct answer is 1900.

Alternate Method

Given:

Resulting number = 3230

Percentage increase = 70%

Formula Used:

Final Value = Initial Value × (1 + Percentage Increase ÷ 100)

100% (Original)

+70% Increase

Total: 170% = 3230

Calculations:

Let the original number be x.

=> Final Value = x × (1 + 70 ÷ 100)

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=> 3230 = x × (1 + 0.70)

=> 3230 = x × 1.70

=> x = 3230 ÷ 1.70

=> x = 32300 ÷ 17

=> x = 1900

Therefore The correct answer is 1900.

Additional Information

Percentage Decrease

If a number is decreased by R%, the final value is calculated as Initial Value × (1 − R ÷ 100).

Successive Percentage Change

If a number undergoes successive percentage changes of A% and B%, the effective overall percentage change is given by A + B + (A × B) ÷ 100.

Base for Percentage

Percentage change is always calculated on the initial value (the base) unless a different base is explicitly mentioned in the problem.

Q61. Answer: (c) 9.65

Shortcut Trick

For decimal square roots, halve the number of decimal places directly.

=> √144 = 12

=> √0.0225 = 0.15 (4 decimal places → 2 decimal places)

=> √6.25 = 2.5 (2 decimal places → 1 decimal place)

=> 12 + 0.15 − 2.5 = 12.15 − 2.5 = 9.65

Therefore The correct answer is 9.65.

Alternate Method

Given:

√144 + √0.0225 − √6.25

Calculation:

=> Convert the decimals to fractions to avoid errors while finding square roots:

=> √144 + √(225/10000) − √(625/100)

=> 12 + (15/100) − (25/10)

=> 12 + 0.15 − 2.5

=> 12.15 − 2.5

=> 9.65

Therefore The correct answer is 9.65.

Additional Information

Square Roots of Decimals

When finding the square root of a decimal number, the number of decimal places in the square root is exactly half the number of decimal places in the original perfect square number (e.g., √0.0001 = 0.01).

BODMAS Rule

Always follow the correct order of operations: Brackets, Orders (roots/powers), Division/Multiplication, and Addition/Subtraction when simplifying basic mathematical expressions.

Common Squares

Memorizing common squares up to 30 helps in faster calculation: $12^2 = 144$, $15^2 = 225$, $25^2 = 625$.

Q62. Answer: (d) 58

Shortcut Trick

Let the two consecutive even numbers be (x − 1) and (x + 1), where x is the odd number exactly between them.

Sum of their squares: $(x - 1)^2 + (x + 1)^2 = 1684$

=> $2(x^2 + 1) = 1684$

=> $x^2 + 1 = 842$ => $x^2 = 841$ => x = 29

The numbers are 29 − 1 = 28 and 29 + 1 = 30. Their sum is 28 + 30 = 58.

Therefore The correct answer is 58.

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Alternate Method

Given:

The sum of the squares of two consecutive even natural numbers is 1684.

Method Used:

Let the two consecutive even natural numbers be x and (x + 2).

Calculations:

=> $x^2 + (x + 2)^2 = 1684$

=> $x^2 + x^2 + 4x + 4 = 1684$

=> $2x^2 + 4x - 1680 = 0$

=> $x^2 + 2x - 840 = 0$

=> $x^2 + 30x - 28x - 840 = 0$

=> $x(x + 30) - 28(x + 30) = 0$

=> $(x - 28)(x + 30) = 0$

=> x = 28 (ignoring the negative value −30 as x must be a natural number)

=> The second consecutive even number = 28 + 2 = 30

=> Sum of the numbers = 28 + 30 = 58

Therefore The correct answer is 58.

Additional Information

Consecutive Numbers

Consecutive even or odd numbers always have a difference of 2. They are commonly represented algebraically as x, x + 2, x + 4, etc.

Quadratic Equations

For a standard quadratic equation $ax^2 + bx + c = 0$, the nature of roots is determined by the discriminant ($b^2 - 4ac$). The sum of roots is $-b \div a$ and the product of roots is $c \div a$.

Algebraic Identities

A highly useful identity for solving consecutive number differences symmetrically is: $(a - b)^2 + (a + b)^2 = 2(a^2 + b^2)$.

Q63. Answer: (a) 9,372

Shortcut Trick

When Simple Interest and Time are equal for two investments, the principal is inversely proportional to the rate of interest.

Ratio of investments = P1 : P2 = R2 : R1 = 11 : 14

Total ratio parts = 11 + 14 = 25 parts

25 parts = Rs. 21,300 => 1 part = 21300 ÷ 25 = Rs. 852

Sum invested at 14% (P1) = 11 parts = 11 × 852 = 9372

Therefore The correct answer is Rs. 9,372.

Alternate Method

Given:

Total investment = Rs. 21,300

Rate 1 (R1) = 14% p.a., Time 1 (T1) = 3 years

Rate 2 (R2) = 11% p.a., Time 2 (T2) = 3 years

Simple Interest 1 (SI1) = Simple Interest 2 (SI2)

Formula Used:

SI = P × R × T ÷ 100

Total = Rs. 21,300

Part 1 (x)

14% p.a. | 3 Years

Part 2 (21300 − x)

11% p.a. | 3 Years

SI1 = SI2

Calculations:

Let the sum invested at 14% p.a. be x.

Then the sum invested at 11% p.a. will be (21300 − x).

According to the condition that the interest from both investments is equal:

=> (x × 14 × 3) ÷ 100 = ((21300 − x) × 11 × 3) ÷ 100

Canceling out 3 and 100 from both sides:

=> 14x = 11 × (21300 − x)

=> 14x = 234300 − 11x

=> 14x + 11x = 234300

=> 25x = 234300

=> x = 234300 ÷ 25

=> x = 9372

Therefore The correct answer is Rs. 9,372.

Additional Information

Equal Simple Interest Rule

When a total sum is divided into multiple parts such that their Simple Interests are strictly equal, the ratio of the invested parts is P1 : P2 : P3 = (1 ÷ R1T1) : (1 ÷ R2T2) : (1 ÷ R3T3).

Equal Amount Rule

If the final amounts (Principal + SI) obtained from multiple parts are equal, the ratio of the invested parts is P1 : P2 = 1 ÷ (100 + R1T1) : 1 ÷ (100 + R2T2).

Difference between SI and CI

For 2 years, the absolute difference between CI and SI on a certain principal sum is given by D = P(R ÷ 100)². For 3 years, the difference formula extends to D = P(R ÷ 100)² × ((300 + R) ÷ 100).

Q64. Answer: (d) 162

Shortcut Trick

The average of the first 'n' even numbers is directly given by the formula (n + 1).

Here, the number of terms n = 161.

=> Average = 161 + 1 = 162

Therefore The correct answer is 162.

Alternate Method

Given:

Number of terms (n) = 161

First even number (a) = 2

The 161st even number (l) = 161 × 2 = 322

First 161 Even Numbers in Arithmetic Progression

2

4

6

...

162

...

318

320

322

Average = Central Value = 162

Formula Used:

In an Arithmetic Progression, Average = (First term + Last term) ÷ 2

Calculations:

=> Average = (2 + 322) ÷ 2

=> Average = 324 ÷ 2

=> Average = 162

Therefore The correct answer is 162.

Additional Information

Average of First 'n' Natural Numbers

The average of the first n natural numbers is given by (n + 1) ÷ 2.

Average of First 'n' Odd Numbers

The average of the first n consecutive odd numbers is strictly equal to n.

Average in an Arithmetic Progression

If the given terms are in A.P., their average is strictly the central value, which equals the average of the first and the last term.

Q65. Answer: (c) Rs. 91,200

Shortcut Trick

Profit of M = (6915 + 461) ÷ 2 = Rs. 3688 and Profit of N = 6915 − 3688 = Rs. 3227.

Profit ratio (M : N) = 3688 : 3227 = 8 : 7.

Capital ratio = (Profit of M ÷ Time of M) : (Profit of N ÷ Time of N) = (8 ÷ 2) : (7 ÷ 3) = 12 : 7.

Difference in capital ratio = 12 − 7 = 5 units = Rs. 38,000 => 1 unit = Rs. 7,600.

Capital contributed by M = 12 units = 12 × 7600 = Rs. 91,200.

Therefore The correct answer is Rs. 91,200.

Alternate Method

Given:

Total profit = Rs. 6,915

M's profit − N's profit = Rs. 461

Time period of M = 2 months, Time period of N = 3 months

M's capital is Rs. 38,000 more than N's capital.

Formula Used:

Profit Ratio = (Capital of A × Time of A) : (Capital of B × Time of B)

Partner M

Time = 2 months

Capital = x + 38000

Profit = Rs. 3688

Partner N

Time = 3 months

Capital = x

Profit = Rs. 3227

Capital × Time prop. to Profit

Calculation:

=> Let M's profit be P_m and N's profit be P_n.

=> P_m + P_n = 6915

=> P_m − P_n = 461

=> Adding both equations: 2P_m = 7376 => P_m = 3688

=> P_n = 6915 − 3688 = 3227

=> Ratio of their profits = 3688 : 3227

=> Dividing by their common factor (461): Profit ratio = 8 : 7

=> Let N's capital be x. Then M's capital will be (x + 38000).

=> [2 × (x + 38000)] ÷ (3 × x) = 8 ÷ 7

=> 14 × (x + 38000) = 24x

=> 14x + 532000 = 24x

=> 10x = 532000

=> x = 53200

=> M's capital = x + 38000 = 53200 + 38000 = 91200

Therefore The correct answer is Rs. 91,200.

Additional Information

Simple vs Compound Partnership

In simple partnership, capitals are invested for the same time period, so profit is distributed strictly in the ratio of their investments. In compound partnership, investments are made for different time periods, so profit ratio = (C1 × T1) : (C2 × T2).

Working vs Sleeping Partner

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A working partner manages the business and usually receives a fixed salary or percentage of the profit before the remaining profit is distributed. A sleeping partner only invests capital and receives a share from the distributable profit based on their investment ratio.

Finding Capital from Profit and Time

If the profit ratio and time ratio of partners are given, the ratio of their invested capitals can be found by directly dividing the profit ratio by the time ratio: Capital Ratio = (P1 ÷ T1) : (P2 ÷ T2).

Q66. Answer: (c) 7x2 - 8x - 3

Shortcut Trick

Directly multiply the terms and combine them mentally.

For x^2 terms: $x(2x) + 5(x^2) = 2x^2 + 5x^2 = 7x^2$

For x terms: $x(-8) = -8x$

For constant terms: $5(-3) + 12 = -15 + 12 = -3$

Combine all parts to get the final expression: $7x^2 - 8x - 3$.

Therefore The correct answer is $7x^2 - 8x - 3$.

Alternate Method

Given:

$x(2x - 8) + 5(x^2 - 3) + 12$

Calculations:

=> Expand the first term using the distributive property:

=> $x \times 2x - x \times 8 = 2x^2 - 8x$

=> Expand the second term:

=> $5 \times x^2 - 5 \times 3 = 5x^2 - 15$

=> Substitute these expanded forms back into the given expression:

=> $(2x^2 - 8x) + (5x^2 - 15) + 12$

=> Group the like terms together:

=> $(2x^2 + 5x^2) - 8x + (-15 + 12)$

=> Add the coefficients of the grouped terms to simplify:

=> $7x^2 - 8x - 3$

Therefore The correct answer is $7x^2 - 8x - 3$.

Additional Information

Distributive Property

Multiplying a sum by a number is exactly the same as multiplying each addend by the number and then adding the products: a(b + c) = ab + ac.

Combining Like Terms

In algebraic simplification, terms with the same variables and powers are grouped, and their coefficients are added or subtracted together.

BODMAS Rule

This rule determines the correct order of operations in calculations: Brackets, Orders, Division, Multiplication, Addition, and Subtraction.

Q67. Answer: (d) Rs. 45

Shortcut Trick

Total time in days = 3 (Feb) + 31 (Mar) + 27 (Apr) = 61 days.

Since 2024 is a leap year (366 days), Time (T) in years = 61 ÷ 366 = 1/6 year.

SI = (P × R × T) ÷ 100

SI = (4000 × 6.75 × 1/6) ÷ 100

SI = 270 ÷ 6 = 45

Therefore The correct answer is Rs. 45.

Alternate Method

Given:

Principal (P) = Rs. 4,000

Rate of Interest (R) = 6.75% per annum

Deposited on = 26 February 2024

Withdrawn on = 27 April 2024

Formula Used:

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

26 Feb 2024

Deposit

Rs. 4,000

27 Apr 2024

Withdrawal

Rs. 4,045

T = 61 Days

Rate = 6.75% p.a.

Simple Interest = Rs. 45

Calculations:

=> The year 2024 is divisible by 4, meaning it is a leap year, so February has 29 days.

=> While calculating interest duration, the day of deposit is generally excluded, but the day of withdrawal is included.

=> Number of days in February = 29 − 26 = 3 days

=> Number of days in March = 31 days

=> Number of days in April = 27 days

=> Total Time (T) = 3 + 31 + 27 = 61 days

=> Since 2024 is a leap year, total days in the year = 366 days.

=> Time (T) in years = 61 ÷ 366 = 1/6 year

=> SI = (4000 × 6.75 × (1/6)) ÷ 100

=> SI = 40 × 6.75 × (1/6)

=> SI = 270 ÷ 6

=> SI = 45

Therefore The correct answer is Rs. 45.

Additional Information

Leap Year Condition

A year divisible by 4 (and by 400 if it is a century year) is a leap year and consists of 366 days. February has 29 days in a leap year.

Counting Days for Interest

When computing simple interest between two dates, only one of the dates (either the deposit date or the withdrawal date) is counted to determine the duration.

Simple vs Compound Interest

Simple Interest (SI) is calculated uniformly only on the base principal amount, whereas Compound Interest (CI) is computed on both the principal and the continuously accumulated interest.

Q68. Answer: (d) 249

Shortcut Trick

LCM = HCF × a × b (where a, b are co-prime factors).

498 = 83 × a × b => a × b = 6.

First number = 166 = 83 × 2 => a = 2.

Thus, b = 6 ÷ 2 = 3.

Second number = HCF × b = 83 × 3 = 249.

Therefore The correct answer is 249.

Alternate Method

Given:

HCF = 83

LCM = 498

One number (N1) = 166

Formula Used:

Product of two numbers = HCF × LCM

N1 × N2 = HCF × LCM

Calculation:

=> 166 × N2 = 83 × 498

=> N2 = (83 × 498) ÷ 166

=> N2 = 498 ÷ 2

=> N2 = 249

Therefore The correct answer is 249.

Additional Information

Product of Two Numbers Rule

For any two positive integers, the product of the numbers is strictly equal to the product of their Highest Common Factor (HCF) and Least Common Multiple (LCM). This rule applies only to exactly two numbers, not three or more.

Co-prime Factors Property

If two numbers are represented as HCF × x and HCF × y, then x and y must be co-prime to each other. Their LCM is obtained directly using the formula: LCM = HCF × x × y.

HCF and LCM Dependency

The HCF of a set of numbers is always a perfect divisor of their LCM. If the given LCM is not perfectly divisible by the given HCF, no such numbers can mathematically exist.

Q69. Answer: (c) 27.91

Shortcut Trick

Average speed is calculated as the ratio of total distance to total time.

Total Distance = 200 + 210 + 204 = 614 km

Total Time = (200 ÷ 25) + (210 ÷ 21) + (204 ÷ 51) = 8 + 10 + 4 = 22 hours

Average Speed = 614 ÷ 22 = 27.909... ≈ 27.91 km/hr

Therefore The correct answer is 27.91 km/hr.

Alternate Method

Given:

D1 = 200 km, S1 = 25 km/hr

D2 = 210 km, S2 = 21 km/hr

D3 = 204 km, S3 = 51 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Time = Distance ÷ Speed

200 km

210 km

204 km

25 km/hr

21 km/hr

51 km/hr

8 hr

10 hr

4 hr

Total Distance = 614 km

Calculations:

=> Total Distance = 200 + 210 + 204 = 614 km

=> T1 = 200 ÷ 25 = 8 hours

=> T2 = 210 ÷ 21 = 10 hours

=> T3 = 204 ÷ 51 = 4 hours

=> Total Time = 8 + 10 + 4 = 22 hours

=> Average Speed = Total Distance ÷ Total Time

=> Average Speed = 614 ÷ 22

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=> Average Speed = 307 ÷ 11

=> Average Speed = 27.909... ≈ 27.91 km/hr

Therefore The correct answer is 27.91 km/hr.

Additional Information

Average Speed for Two Equal Distances

If a person travels two equal distances at speeds x and y, the average speed is directly given by (2 × x × y) ÷ (x + y).

Average Speed for Three Equal Distances

If a person travels three equal distances at speeds x, y, and z, the average speed is directly given by (3 × x × y × z) ÷ (x×y + y×z + z×x).

Unit Conversion

To convert km/hr to m/s, multiply the given speed by 5 ÷ 18. To convert m/s to km/hr, multiply by 18 ÷ 5.

Q70. Answer: (a) 0

Shortcut Trick

Between 468 and 476, ignore even numbers and multiples of 5.

Possible prime candidates are 469, 471, and 473.

469 = 7 × 67, 471 is divisible by 3 (sum of digits = 12), and 473 is divisible by 11 (4 − 7 + 3 = 0).

Since all candidates are composite, there are no prime numbers.

Therefore The correct answer is 0.

Alternate Method

Given:

Range of numbers: 468 to 476 (both included).

Method Used:

List the numbers and eliminate composite numbers using basic divisibility rules.

Calculations:

=> The numbers are: 468, 469, 470, 471, 472, 473, 474, 475, 476.

=> Eliminate all even numbers (divisible by 2): 468, 470, 472, 474, 476.

=> Eliminate numbers ending in 5 (divisible by 5): 475.

=> The remaining numbers to check are 469, 471, and 473.

=> For 469: It is divisible by 7 (469 = 7 × 67).

=> For 471: The sum of digits is 4 + 7 + 1 = 12. Since 12 is divisible by 3, 471 is divisible by 3.

=> For 473: The difference of alternate digits sum is (4 + 3) − 7 = 0. So, it is divisible by 11 (473 = 11 × 43).

=> Thus, none of the numbers between 468 and 476 are prime.

Therefore The correct answer is 0.

Additional Information

Prime Numbers

A prime number is a natural number greater than 1 that has exactly two distinct positive divisors: 1 and itself.

Divisibility Rule of 3

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

Divisibility Rule of 11

A number is divisible by 11 if the difference between the sum of digits at odd places and the sum of digits at even places is either 0 or a multiple of 11.

Checking Primality up to N

To check if a number N is prime, you only need to test divisibility by prime numbers up to √N.

Q71. Answer: (c) 2

BODMAS Table:

• The equation becomes:

• 18 ÷ 3 − 8 × 2 + 12 = ?

• 6 − 8 × 2 + 12 = ?

• 6 - 16 + 12 = ?

• 18 - 16 = 2

Hence, the correct answer is "Option 3"

Q72. Answer: (c) Mother's mother's brother

Preparing the family tree diagram by using the following symbols:

As per the given information:

W $ A = C @ D * R

W is related to R Mother's mother's brother.

Hence, the correct answer is "Option 3".

Q73. Answer: (d) 2

The code for each letter is shown below:

Hence, the correct answer is "Option 4 "

Q74. Answer: (b) H

Given: Seven boxes G, H, I, K, L, M and S are kept one over the other but not necessarily in the same order.

• Only four boxes are kept between I and K.

• Only S is kept above I.

• Only two boxes are kept between M and G.

• H is kept immediately above L.

• G is not kept immediately above H.

The final arrangement is

• | S |

I
M
H
L
G
K

• H is kept fourth from the top

• Hence, the correct answer is "Option 2"

Q75. Answer: (c) R

Given : L, M, N, O, Q, R, and S are sitting around a circular table facing the center of the table.

• R sits third to the left of O. Only one person sits between O and S when counted from the left of S.

• Only two people sit between Q and L when counted from the right of L.

• N is an immediate neighbour of Q.

• The final arrangement is

• • Hence, the correct answer is "Option 3"

Q76. Answer: (b) LOR

The logic followed here is

Hence, the correct answer is "Option 2"

Q77. Answer: (c) CAL : GVP

The logic followed here is

Similarly,

Hence, the correct answer is "Option 3"

Q78. Answer: (d) 4

Th code given below :

Hence, the correct answer is "Option 4"

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Q79. Answer: (c) 8

The new number formed by arranging the digits of 95423671 in ascending order is 12345679.

Third from the left and fourth from the right - 1 2 3 4 5 6 7 9.

Sum = 3 +5 = 8.

Hence, the correct answer is "Option 3"

Q80. Answer: (c) CF-HB

The logic followed here is:

Except for CF-HB, all follow the same logic.

Hence, the correct answer is "Option 3."

Q81. Answer: (c) 567

The logic follows here,

Hence, the correct answer is "Option 3"

Q82. Answer: (b) Two

Given :Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order.

• Only C is kept above D.

• Only two boxes are kept between D and E.

• Only A is kept below B.

• F is not kept immediately above E.

The final arrangement is

C
D
F
G
E
B
A

Hence, the correct answer is "Option 2"

Q83. Answer: (d) 20

BODMAS Table:

If '+' and '–' are interchanged and '×' and '÷' are interchanged then new equation

• 7 × 4 − 20 + 72 ÷ 6 = ?

• 7 × 4 − 20 + 72 ÷ 6 = ?

• 7 × 4 − 20 + 12 = ?

• 28 - 20 + 12 = ?

= 20

Hence, the correct answer is "Option 4"

Q84. Answer: (c) J50I

The logic follows here,

Hence, the correct answer is "Option 3"

Q85. Answer: (d) Two

Given :Seven people G, H, I, K, L, M and S are sitting in a row, facing north.

• Only three people sit between I and S. M sits to the immediate left of S.

• No one sits to the right of H.

• Only two people sit between H and M.

• K sits to the immediate right of L

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Hence, the correct answer is "Option 4"

Q86. Answer: (b) SNU

The logic follows here,

All follow the same process except SNU.

Hence, the correct answer is "Option 2"

Q87. Answer: (d) QVNT

The logic follows here,

Hence, the correct answer is "Option 4"

Q88. Answer: (c) 25

The logic followed here is,

Hence, the correct answer is "Option 3"

Q89. Answer: (d) One

Given: Seven boxes, C, D, E, M, N, O, and P, are kept one over the other but not necessarily in the same order.

• Only D is kept above C.

• Only E is kept between C and M.

• Only P is kept below N.

• The number of boxeskept between O and P is N.

• The final arrangement is

D
C
E
M
O
N
P

Hence, the correct answer is "Option 4"

Q90. Answer: (c) 1 km to west

Given :

• Laxman starts from Point A and drives 7 km towards south.

• He then takes a right turn, drives 8 km, turns right and drives 9 km.

• He then takes a right turn and drives 9 km.

• He takes a final right turn, drives 2 km and stops at Point P

Hence, the correct answer is "Option 3 "

Q91. Answer: (d) TW 14

The logic followed here is:

Hence, the correct answer is "Option 4"

Q92. Answer: (c) Neither conclusion (I) nor (II) follows.

The least possible diagram for the given statements is as follows:

Conclusion (I): Some crickets are spoons. - False (There is no direct relation between cricket and spoons may be it is possible but not definite)

Conclusion (II): All spoons are crickets.- False (There is no direct relation between cricket and spoons may be it is possible but not definite)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 3 "

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Q93. Answer: (b) Neither conclusion (I) nor (II) follows.

The least possible diagram for the given statements is as follows:

(I) Some homestays are palaces. - False (Their is no direct relation between Homestays and Palaces may be it possible but not definite.)

(II) All palaces are resorts. - False (Their is no direct relation between Palaces and resorts may be it possible but not definite.)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 2"

Q94. Answer: (b) 88

If '+' and '−' are interchanged and '×' and '÷' are interchanged

32 − 8 ÷ 2 − 12 × 5 = ?

32 − 4 − 12 × 5 = ?

32 - 4 - 60 = ?

88.

Hence, the correct answer is "Option 2"

Q95. Answer: (a) YEI

The logic followed here is:

• YEI: Y = 25, E = 5, I = 9

• BIL: B = 2, I = 9, L = 12

• PWZ: P = 16, W = 23, Z = 26

• OVY: O = 15, V = 22, Y = 25

Hence, the correct answer is "Option 1"

Q96. Answer: (c) Three

The five numbers are: 475, 648, 857, 591, and 362.

Following the instruction to add 1 to the third digit of every number:

1. 475 becomes 476. The third digit is now 6, which is an even number.

2. 648 becomes 649. The third digit is now 9, which is an odd number.

3. 857 becomes 858. The third digit is now 8, which is an even number.

4. 591 becomes 592. The third digit is now 2, which is an even number.

5. 362 becomes 363. The third digit is now 3, which is an odd number.

A number is even if its last (third) digit is even. The numbers with an even third digit are 476, 858, and 592.

Hence, the correct answer is "Option 3"

Q97. Answer: (c) 36

The logic follows here,

Hence, the correct answer is "Option 3 "

Q98. Answer: (d) 2

Given :- (Left) @ 3 5 1 7 % @ 2 © 1 © © 4 4 9 & © 1 © £ 5 5 (Right)

Numbers are there, each of which is immediately preceded by a number and also immediately followed by a symbol

Number - Number - Symbol

(Left) @ 3 5 1 7 % @ 2 © 1 © © 4 4 9 & © 1 © £ 5 5 (Right)

Hence, the correct answer is "Option 4"

Q99. Answer: (b) 30, 84

Logic : Second number = (3 × First number) – 6

Given →

24, 66

66 = (3 × 24) – 6

18, 48

48 = (3 × 18) – 6

Similarly,

30, 84

84 = (3 × 30) – 6

Hence, the correct answer is "Option 2."

Q100. Answer: (c) 4 km towards north

Given :

• Tirtha starts from Point Y and drives 23 km towards north.

• He then takes a right turn, drives 12 km.

• He then turns right and drives 27 km.

• He takes a final right turn, drives 12 km and stops at Point Z

• Hence, the correct answer is "Option 3"

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