RRB NTPC (UG) CBT-I Official Paper (Held On: 13 Aug, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Which of the following is an impact of river meandering in plains?

(a) Formation of waterfalls
(b) Formation of oxbow lakes
(c) Formation of rift valleys
(d) Formation of rapids

Q2. When was the Rural Landless Employment Guarantee Programme (RLEGP) launched?

(a) 2 October 1985
(b) 15 August 1983
(c) 1 April 1980
(d) 26 January 1982

Q3. Which of the following is NOT an instrument of parliamentary control over the executive in India?

(a) Judicial review of executive actions
(b) Question Hour in the Lok Sabha
(c) Approval of government bills (laws) by the Parliament
(d) No-confidence motion against the Council of Ministers

Q4. The concept of 'watershed' is primarily associated with:

(a) Mountain formation
(b) Climate zones
(c) River catchment area
(d) Rainfall distribution

Q5. Microliths, which are tiny stone tools usually stuck on to handles of bones or woods to make tools like saws and sickles. These were mostly found in which age?

(a) Paleolithic age
(b) Chalcolithic age
(c) Mesolithic age
(d) Neolithic age

Q6. The President of India is also the Supreme Commander of which force in India?

(a) Intelligence Agencies
(b) Armed Forces
(c) Border Security Force
(d) Police Forces

Q7. Human development is a key aspect of economic development. As per the UNDP's Human Development Report 2025, where does India rank globally?

(a) 100
(b) 144
(c) 119
(d) 130

Q8. Which Act provided separate legislative subjects for the Centre and Provinces with three distinct lists?

(a) Indian Independence Act 1947
(b) Government of India Act 1858
(c) Government of India Act 1919
(d) Government of India Act 1935

Q9. How many public sector banks are operating in India, as on 1 May 2025?

(a) 8
(b) 14
(c) 12
(d) 10

Q10. Tourism is classified as a tertiary activity because it involves:

(a) extracting natural resources
(b) production of goods
(c) selling of machinery
(d) providing services to people

Q11. Which of the following is a dimensionless quantity?

(a) Velocity
(b) Acceleration
(c) Refractive index
(d) Gravitational force

Q12. When was Maha Shivaratri celebrated in 2025?

(a) 26 February
(b) 12 May
(c) 7 June
(d) 14 March

Q13. In December 2024, at the King Cup Internaonal Badminton Open, whom did Lakshya Sen defeat to claim the third place?

(a) Viktor Axelsen
(b) Kento Momota
(c) Alex Lanier
(d) Anthony Sinisuka Ginng

Q14. In May 2025, which Indian state signed an MoU with IN-SPACe to establish a Space Tech Manufacturing Park and Centre of Excellence?

(a) Gujarat
(b) Karnataka
(c) Telangana
(d) Maharashtra

Q15. Which of the following deserts is visible in the southern part of the world map?

(a) Gobi Desert
(b) Thar Desert
(c) Kalahari Desert

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(d) Sonoran Desert

Q16. The Mudumal Megalithic Menhir is located in which state that was included in the tentative list of India by UNESCO World Heritage Centre in February 2025?

(a) Karnataka
(b) Tamil Nadu
(c) Andhra Pradesh
(d) Telangana

Q17. The Tenth Schedule of the Indian Constitution is related to the:

(a) distribution of seats in the Lok Sabha
(b) disqualification on grounds of defection
(c) recognition of languages
(d) protection of land reform laws

Q18. What does the Alt + Tab keyboard shortcut do in Windows?

(a) Locks the computer screen
(b) Closes the current window
(c) Switches between open applications
(d) Opens the Start menu

Q19. Which of the following is an efficient way to organise files on a computer?

(a) Create different folders based on categories of files
(b) Rename all files with random characters
(c) Keep all files in the same folder
(d) Store all files in the Recycle Bin

Q20. Who among the following had given the idea to mobilise all the leading Indian political leaders under a common platform called the Indian National Congress?

(a) A O Hume
(b) Surendranath Bannerjee
(c) W C Bannerjee
(d) Ananda Mohan Bose

Q21. In which of the following years did the Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, approve the Revised Rashtriya Gokul Mission (RGM) to boost growth in the livestock sector?

(a) 2021
(b) 2016
(c) 2019
(d) 2025

Q22. Who among the following was conferred with a Padma Bhushan Award 2025 in the field of (Posthumous) Affairs in April 2025?

(a) Dr. Duvvur Nageshwar Reddy
(b) Shri Nandamuri Balakrishna
(c) Shri MT Vasudevan Nair
(d) Shri Sushil Kumar Modi

Q23. Which department of the Delhi Sultanate was responsible for military organisation and administration of the empire's army?

(a) Diwan-i-Insha
(b) Diwan-i-Riyasat
(c) Diwan-i-Risalat
(d) Diwan-i-Arz

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Q24. Which of the following power projects is based on nuclear energy?

(a) Koyna
(b) Tehri
(c) Kalpakkam
(d) Bhakra Nangal

Q25. Which biomolecules are responsible for catalysing biochemical reactions?

(a) Polysaccharides
(b) Enzymes
(c) Nucleotides
(d) Phospholipids

Q26. On 22 May 2025, Israeli forces reportedly fired warning shots near a delegation of diplomats visiting which area, leading to international condemnation?

(a) Gaza Strip
(b) Sinai Peninsula
(c) Golan Heights
(d) West Bank

Q27. Who among the following was the first political leader in India to openly put forward, in his newspaper Bande Mataram, the idea of complete independence for the country?

(a) Swami Vivekananda
(b) Sri Aurobindo
(c) Rabindranath Tagore
(d) Mahatma Gandhi

Q28. Prime Minister Narendra Modi chaired which edition of the Governing Council meeting of NITI Aayog at Bharat Mandapam, New Delhi on 24 May 2025?

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

Q29. Which Article of the Indian Constitution was amended by the 106th Constitutional Amendment Act to provide for women's reservation in the Legislative Assembly of Delhi?

(a) Article 330A
(b) Article 243D
(c) Article 239AA
(d) Article 332A

Q30. What was the life expectancy in India in 1947?

(a) 31 years
(b) 38 years
(c) 52 years
(d) 45 years

Q31. What major change was made by the 86th Constitutional Amendment Act, 2002?

(a) Increased the President's term
(b) Abolished the Legislative Council
(c) Declared education as a Fundamental Right
(d) Bifurcated the SC/ST Commission

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Q32. As per the May 2025 Supreme Court ruling, what is the minimum number of years of legal practice required for law graduates to be eligible for Civil Judge examinations?

(a) 2 years
(b) 3 years
(c) 1 year
(d) 5 years

Q33. What are endemic species?

(a) Exotic animals brought from other countries
(b) Species found only in a particular area and nowhere else
(c) Species that have migrated recently
(d) Species found in every forest

Q34. Which of the following statements about friction is correct?

(a) Both static and kinetic friction depend on the area of contact.
(b) Static friction opposes actual motion, while kinetic friction opposes impending motion.
(c) Kinetic friction is always greater than static friction
(d) Static friction opposes impending motion and kinetic friction opposes actual motion.

Q35. Which Article of the Constitution provides special provisions for the State of Nagaland?

(a) Article 370
(b) Article 371B
(c) Article 371A
(d) Article 371D

Q36. In April 2025, IN-SPACe launched an initiative inviting private firms to develop modular satellite platforms to host multiple payloads, aiming to reduce reliance on foreign satellite infrastructure. What is this initiative called?

(a) Modular Orbital Hosting Programme (MOHP)
(b) National Space-Based Internet Mission (NSBIM)
(c) Satellite Bus as a Service (SBaaS)
(d) ISRO Commercial Payload Initiative (ICPI)

Q37. Gyaneshwar (1275 A.D.) holds a unique position in Marathi literature, primarily because he was:

(a) the first and foremost Bhakti poet
(b) a renowned court historian
(c) a celebrated playwright
(d) a compiler of ancient texts

Q38. The Karakattam (Karagattam) dance, known for its unique balancing of pitchers, is primarily prevalent in which of the following states of India?

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

Q39. Which Indian AI startup launched Shuka 1.0, an open-source audio language model supporting 10 Indian languages, in August 2024?

(a) Niramai
(b) HealthifyMe
(c) Sarvam AI
(d) Qure.ai

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Q40. In May 2025, India conducted joint military exercises with which country under the name 'Garuda Shakti 2025', aiming to strengthen counter-terrorism cooperation?

(a) Sri Lanka
(b) France
(c) Russia
(d) Indonesia

MATHEMATICS

Q41. The sum of the squares of two consecutive even natural numbers is 1924. The sum of the numbers is:

(a) 54
(b) 68
(c) 62
(d) 60

Q42. If a regular polygon has 15 sides, then what is the measure (in degrees) of each interior angle?

(a) 128°
(b) 156°
(c) 136°
(d) 160°

Q43. Salil got an increase of 4% in his sales amouant in the first year and 24% in the second year; also with this, his current sales are Rs. 1,61,200, what was his sales (in Rs.) two years ago?

(a) Rs. 1,05,000
(b) Rs. 1,30,000
(c) Rs. 1,25,000
(d) Rs. 1,55,000

Q44. Evaluate: $(-9) - (-60) \div (-12) + (-2) \times 8$

(a) -30
(b) -32
(c) -29
(d) -33

Q45. Anjani can do a certain piece of work in 30 days. Anjani and Khushbu can together do the same work in 16 days, and Anjani, Khushbu and Sushmita can do the same work together in 15 days. In how many days can Anjani and Sushmita do the same work?

(a) 85/4
(b) 80/3
(c) 73/5
(d) 81/3

Q46. Vihaan has to reach Chennai which is 886 km away in 17 hours. His starting speed for 8 hours was 53 km/hr. For the next 150 km his speed was 50 km/hr. By what speed he must travel now so as to reach Chennai in the decided time of 17 hours?

(a) 52 km/hr
(b) 56 km/hr
(c) 57 km/hr
(d) 51 km/hr

Q47. A sum of money triples itself at a certain rate of compound interest in 5 years. In how many years will it amount to 9 times of itself?

(a) 11 years
(b) 7 years
(c) 10 years

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(d) 19 years

Q48. A shopkeeper lists the price of a fan at 36% above its cost price and offers a 25% discount on its list price. If he earns a profit of Rs. 171, then what is the list price (in Rs.) of the fan?

(a) 11,406
(b) 11,547
(c) 11,628
(d) 11,598

Q49. Which of the following numbers divides 788973289?

(a) 18
(b) 12
(c) 7
(d) 13

Q50. Rs. 15,500 were divided among A, B and C, such that 7 times the share of A = 4 times the share of B = 2 times the share of C. Find the share of A.

(a) Rs. 2,580
(b) Rs. 2,542
(c) Rs. 2,480
(d) Rs. 2,479

Q51. Simplify the following. $9 \times (19 \times (4^2)) \div 14 + 13 - 86$

(a) 856/7
(b) 852/7
(c) 853/7
(d) 857/7

Q52. A person purchased a gift article for Rs. 1,800 after getting 20% discount. Find the marked price of the gift article.

(a) Rs. 2,500
(b) Rs. 2,250
(c) Rs. 2,800
(d) Rs. 2,150

Q53. Which of the following numbers divide 342165?

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

Q54. The LCM of the numbers 3.8 and 0.052 is:

(a) 49.4
(b) 0.494
(c) 4.94
(d) 494

Q55. Sapna invested Rs. 20,300 on simple interest, partly at 10% per annum and partly at 4% per annum. If she earns equal interests from the two investments after 4 years, then find the sum invested at 10% per annum (in Rs.).

(a) 5801
(b) 5800
(c) 5799
(d) 5797

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Q56. Find the mean proportional of 98 and 18.

(a) 39
(b) 45
(c) 42
(d) 44

Q57. A dealer runs a scheme offering 'buy 5 items and get 2 items free'. Each item is priced at Rs. 250. What is the total discount amount for a customer buying under this scheme?

(a) Rs. 500
(b) Rs. 700
(c) Rs. 750
(d) Rs. 600

Q58. A can lay railway track between two given stations in 21 days and B can do the same job in 15 days. With the help of C, they did the job in 2 days only. Then, C alone can do the job in

(a) 816/27 days
(b) 216/27 days
(c) 1016/27 days
(d) 1216/27 days

Q59. The volume of a right circular cylinder whose height is 20 cm and circumference of the base is 44 cm is: (Use π = 22/7)

(a) 3080 cu.cm
(b) 7623 cu. cm
(c) 1936 cu. cm
(d) 5082 cu.cm

Q60. If sin θ + cosec θ = 2, then the value of sin^(120)θ + cosec^(120) θ is:

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

Q61. 9 years ago, the age of a father was 25 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

(a) 21
(b) 18
(c) 19
(d) 16

Q62. The total surface area of a cube having side 74 cm is:

(a) 32856 cm^2
(b) 32896 cm2
(c) 32857 cm2
(d) 32846 cm2

Q63. The average of first 171 even numbers is

(a) 172
(b) 173
(c) 172.5
(d) 171.5

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Q64. The average weight (in kg) of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 76 kg and 35 kg is:

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

Q65. Simplify: $x(3x - 7) + 7(x^2 - 4) + 18$

(a) $10x^2 - 7x - 10$
(b) -10x2 - 7x - 10
(c) 10x2 - 7x + 10
(d) -10x2 - 7x + 10

Q66. A number, when increased by 60%, gives 3580. The number is:

(a) 4475
(b) 6712.5
(c) 2237.5
(d) 1118.75

Q67. By selling 6 buttons for a rupee, a man loses 45%. To gain 10% how many must he sell for a rupee?

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

Q68. A, B and C started a business investing Rs. 610, Rs. 630 and Rs. 1,450, respectively. If B's share in the profit earned by them is Rs. 591. what is the difference in the profit (in Rs.) earned by A and C?

(a) Rs. 785
(b) Rs. 786
(c) Rs. 791
(d) Rs. 788

Q69. A man goes to Indore from Bhopal at a speed of 12 km/hr and returns to Bhopal at speed of 24 km/hr, through the same route. What is his average speed (in km/hr) of the entire journey?

(a) 12
(b) 21
(c) 16
(d) 11

Q70. The number of prime numbers lying between 411 and 424, both included, is:

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

GENERAL INTELLIGENCE AND REASONING

Q71. If 2 is added to each even digit and 1 is subtracted from each odd digit in the number 52749631, then how many digits will appear more than once in the new number thus formed?

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

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Q72. KNML is related to ADCB in a certain way based on the English alphabetical order. In the same way, WZYX is related to MPON. To which of the given options is SVUT related, following the same logic?

(a) IKLJ
(b) IKJI
(c) ILKO
(d) ILKJ

Q73. If 1 is added to each even digit of the number 36719542, then what will be the sum of the digits that are repeated more than once in the new number formed?

(a) 8
(b) 12
(c) 15
(d) 10

Q74. In a certain code language, 'CALM' is coded as '3257' and 'MONK' is coded as '1346'. What is the code for 'M' in the given code language?

(a) 5
(b) 3
(c) 1
(d) 7

Q75. In a certain code language,

A $ B means 'A is the son of B'

A + B means 'A is the brother of B'

A @ B means 'A is the wife of B'

A ÷ B means 'A is the father of B'

Based on the above, how is E related to N if 'E $ F ÷ G + M @ N'?

(a) Wife's father
(b) Wife's brother
(c) Father
(d) Brother

Q76. What should come in place of the question mark (?) in the given series?

5, 4, 2, -2, -10, ?

(a) -27
(b) -24
(c) -26
(d) -25

Q77. Six people, D, E, F, G, H and Y, are sitting around a circular table, facing the centre. F sits third to the left of G. Only one person sits between F and Y when counted from the right of F. Only two people sit between Y and H. D is an immediate neighbour of H. How many people sit between D and E when counted from right of E?

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

Q78. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All oranges are apples.

All apples are grapes.

Conclusions:

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(I) Some apples are oranges.

(II) All grapes are oranges.

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

Q79. 112 people are standing in a row facing north. Mr. Into is 11^(th) from the left end while Mr. Toni is 19^(th) from the right end. How many people are there between Mr. Into and Mr. Toni?

(a) 82
(b) 83
(c) 81
(d) 85

Q80. If 3 is added to each even digit and 2 is added to each odd digit in the number 2571463, what will be the sum of the first and last digits in the new number thus formed?

(a) 10
(b) 18
(c) 14
(d) 12

Q81. In a row of 47 students facing north, Sanjana is 27th from the left end. If Ananad is 18th to the right of Sanjana, what is Ananad's position from the right end of the line?

(a) 1st
(b) 4th
(c) 3rd
(d) 2nd

Q82. This question is based on the five, three-digit numbers given below. (Left) 121 256 812 658 527 (Right) (NOTE: All operations to be done from left to right.)

If all the numbers are arranged in descending order, the position(s) of how many numbers will remain unchanged?

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

Q83. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

ZFN FLT LRZ RXF ?

(a) XSD
(b) XLD
(c) XDL
(d) XDS

Q84. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the pair in which the numbers are related in the same way as are the numbers of the following pairs.

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

140, 75

168, 103

(a) 106, 51
(b) 125, 70
(c) 115, 60
(d) 175, 110

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Q85. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

TWY RUW PSU NQS ?

(a) LPR
(b) LOQ
(c) LPQ
(d) LOR

Q86. In a certain code language, 'it is tasty' is written as 'mt bk lo' and 'did it go' is coded as 'mf jo mt'. How is 'it' coded in the given language?

(a) mf
(b) lo
(c) jo
(d) mt

Q87. Saif starts from Point A and drives 31 km towards East. He then takes a right turn, drives 35 km, turns right and drives 47 km. He then takes a right turn and drives 45 km. He takes a final right turn, drives 16 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) 11 km to the South
(b) 10 km to the South
(c) 10 km to the East
(d) 11 km to the West

Q88. Suresh starts from Point M and drives 10 km towards north. Then, he takes a right turn and drives 4 km; he turns right again and drives 4 km. Then, he takes a left turn and drives 2 km; then, he turns right and drives 8 km. Then, he takes a final right turn, drives 6 km and stops at Point N. How far (shortest distance) and towards which direction should she drive in order to reach Point M again? (All turns are 90-degree turns only, unless specified.)

(a) 2 km towards north
(b) 4 km towards north
(c) 2 km towards south
(d) 4 km towards south

Q89. 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:

Some trees are chairs.

Some chairs are graphs.

Conclusion (I): Some trees are graphs.

Conclusion (II): All graphs are chairs.

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

Q90. 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) SJ-NT
(b) OF-JQ
(c) MD-HN
(d) KB-FL

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Q91. 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) FO - YJ
(b) BX - US
(c) WA - PV
(d) TJ - LE

Q92. 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) TXR
(b) NRM
(c) JNI
(d) QUP

Q93. What should come in place of the question mark (?) in the given series?

3 11 20 30 41 ?

(a) 58
(b) 49
(c) 67
(d) 53

Q94. Pritam is ranked 5th from the top and 21st from the bottom in his class. How many students are there in the class?

(a) 25
(b) 29
(c) 24
(d) 26

Q95. Seven people, I, J, K, L, U, V and W are sitting in a row, facing north. Only two people sit to the right of K. Only two people sit between K and U. Only two people sit between I and V. V sits to the immediate left of K. L sits to the immediate right of W.

Who sits at third position from the left end of the line?

(a) I
(b) L
(c) J
(d) W

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

(Left) 570 787 488 277 102 (Right)

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

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

In how many numbers is the resultant of the summation of the first and the third digits a prime number?

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

Q97. LK 19 is related to GG 2 in a certain way. In the same way, IT 29 is related to DP 12. To which of the following is OV 15 related, following the same logic?

(a) JR(-2)
(b) IS 4
(c) JS 4
(d) IR 2

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Q98. Each of the digits in the number 8357691 is arranged in the ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q99. What should come in place of the question mark (?) in the given series?

31 20 7 −8 −25 ?

(a) -42
(b) -44
(c) -49
(d) -45

Q100. CHRX is related to FKXD in a certain way based on the English alphabetical order. In the same way, OTPV is related to RWVB. To which of the given options is XCHN related, following the same logic?

(a) AFNU
(b) AFTN
(c) ATFN
(d) AFNT

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Formation of oxbow lakes

The correct answer is Formation of oxbow lakes.

Key Points

• River meandering: River meandering is a natural process seen in the plains where rivers flow in winding curves rather than straight paths. It occurs due to the low gradient of the terrain, which makes the water flow slower and prone to lateral erosion.

• Over time, as the river meanders, it creates unique landforms, such as oxbow lakes. These are formed when the meandering loops of a river become cut off from the main channel due to sediment deposition. Hence, the formation of oxbow lakes is correct.

• Formation of waterfalls: Waterfalls are typically formed in regions of high elevation or where there is a significant change in the gradient of the riverbed, such as in mountainous areas. Since meandering occurs primarily in plains, the statement regarding the formation of waterfalls is incorrect.

• Formation of rift valleys: Rift valleys are large depressions formed due to tectonic activity, not due to river meandering. This occurs along divergent plate boundaries, making this statement incorrect.

• Formation of rapids: Rapids occur in rivers flowing through uneven terrain, often in hilly or rocky areas, where water flows over obstacles causing turbulence. Rapids are not associated with meandering rivers in plains, making this statement incorrect.

• Hence, the correct answer is Formation of oxbow lakes.

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Additional Information

• Oxbow Lakes:

• Formation: Oxbow lakes are crescent-shaped lakes formed when a meandering river cuts off one of its loops due to sediment deposition and erosion.

• Characteristics: They are stagnant water bodies separated from the main river and are found in the floodplain regions of rivers.

• Examples: Oxbow lakes can be commonly observed along rivers like the Ganges in India and the Mississippi River in the USA.

• Meandering Rivers:

• Meandering is caused by the lateral erosion of riverbanks and deposition of sediments in areas with low gradient and slow-moving waters.

• Meandering rivers are typical in plains, where the terrain allows the river to carve winding loops over time.

• Examples: Famous meandering rivers include the Brahmaputra River, the Amazon River, and the Mississippi River.

• Other Landforms in Plains:

• Plains are characterized by features such as floodplains, levees, and deltas, which are formed due to sediment deposition over time.

• These landforms are essential for agriculture as they often have fertile soil.

Important Points

• River Processes:

• Erosion: A river erodes its banks as it meanders, especially on the outer curves, due to the faster flow of water.

• Deposition: Sediments are deposited along the inner curves where the water flow is slower.

• Cut-off Formation: When erosion and deposition isolate a loop, it leads to the formation of oxbow lakes.

• Significance of Meandering Rivers:

• Meandering rivers contribute to the creation of fertile floodplains, which are suitable for agriculture.

• They also support a variety of ecosystems and act as natural water systems for irrigation, fishing, and transportation.

Q2. Answer: (b) 15 August 1983

The correct answer is 15 August 1983.

Key Points

• The Rural Landless Employment Guarantee Programme (RLEGP) was launched on 15 August 1983. It was introduced as a flagship scheme to provide employment to landless rural individuals.

• The programme aimed to guarantee employment opportunities in rural areas, focusing on the landless laborers who lacked stable income sources.

• RLEGP was a part of India's broader efforts to reduce poverty and promote rural development by generating employment and improving the living standards of rural populations.

• This scheme was designed to work in tandem with other rural development programmes, such as the Integrated Rural Development Programme (IRDP).

• The scheme was introduced by the government to address the challenges of unemployment, poverty alleviation, and socio-economic disparity in rural areas of India.

• It focused on creating productive assets, ensuring that the employment provided not only benefited individuals but also contributed to the long-term development of rural infrastructure.

• Hence, the correct answer is 15 August 1983.

Additional Information

• Objectives of RLEGP:

• Employment generation: The programme aimed to provide 100 days of employment annually to rural landless laborers.

• Asset creation: Employment under RLEGP was linked to the creation of durable assets, including roads, irrigation canals, schools, and health centers in rural areas.

• Poverty alleviation: It targeted the poorest sections of society, focusing on improving their livelihoods and reducing poverty.

• Implementation and Funding:

• The programme was centrally funded by the Government of India to ensure uniform implementation across different states.

• State governments were responsible for the execution of the programme, tailoring it to the specific needs of their rural population.

• Impact and Legacy:

• RLEGP laid the foundation for subsequent rural employment schemes, such as the National Rural Employment Guarantee Act (NREGA) introduced in 2005.

• It highlighted the importance of addressing rural unemployment and poverty as a means of achieving sustainable development.

Important Points

• Comparison with other programmes:

• While RLEGP focused solely on the landless rural laborers, schemes like IRDP focused on integrated rural development, covering a broader spectrum of beneficiaries.

• The National Rural Employment Guarantee Scheme (NREGS), introduced later, provided a legal guarantee for employment, building upon the framework established by RLEGP.

• Significance of the launch date:

• 15 August, the date of India's Independence, was chosen for the launch to signify the importance of empowering the rural population as part of the nation-building process.

Q3. Answer: (a) Judicial review of executive actions

The correct answer is Judicial review of executive actions.

Key Points

• Judicial review of executive actions is not an instrument of parliamentary control over the executive in India. Judicial review is a process through which the judiciary examines the actions of the executive and legislative branches to ensure their compliance with the Constitution. It is a mechanism under the judiciary, not Parliament. Hence, this statement is correct.

• The Question Hour in the Lok Sabha is a key instrument of parliamentary control over the executive. During this time, members of Parliament (MPs) can ask the government questions regarding its policies, actions, and decisions, ensuring accountability. Hence, this statement is incorrect as it is an instrument of parliamentary control.

• Approval of government bills (laws) by the Parliament is another instrument of parliamentary control over the executive. Parliament has the authority to approve or reject bills proposed by the government, and this serves as a critical check on the executive's legislative authority. Hence, this statement is incorrect as it is an instrument of parliamentary control.

• A no-confidence motion against the Council of Ministers is a direct tool to hold the executive accountable. If the motion is passed by a majority in the Lok Sabha, the Council of Ministers, including the Prime Minister, is required to resign. Hence, this statement is incorrect as it is an instrument of parliamentary control.

Additional Information

• Judicial Review:

• Judicial review refers to the power of the judiciary, particularly the Supreme Court and High Courts in India, to examine the constitutionality of legislative enactments and executive actions.

• This power is derived from the provisions of the Constitution, especially Articles 13, 32, and 226, which empower the courts to strike down any law or action that violates fundamental rights or the Constitution.

• Judicial review is a fundamental feature of the Indian Constitution and is part of the doctrine of the basic structure, as upheld by the Supreme Court in the Keshavananda Bharati Case (1973).

• Parliamentary Control Over the Executive:

• Parliament exercises control over the executive through various mechanisms, including debates, Question Hour, Zero Hour, motions, and financial control over budgetary allocations.

• The no-confidence motion is one of the most direct ways for Parliament to express its lack of trust in the government. If passed, the government must resign.

Important Points

• Parliamentary Processes:

• Question Hour: It allows MPs to seek information and explanations from the government. This ensures transparency and accountability.

• No-Confidence Motion: If a majority of the Lok Sabha members vote in favor of this motion, the government is dissolved, and the Prime Minister is required to resign.

• Judiciary vs. Parliament:

• The judiciary interprets the law, while Parliament creates and enforces laws.

• Judicial review provides checks and balances on both the legislative and executive branches, but it is not a tool of parliamentary control.

Q4. Answer: (c) River catchment area

The correct answer is River catchment area.

Key Points

• A watershed refers to the region or area that drains all the water, such as rainfall or melted snow, into a common water body like a river, lake, or ocean. It includes both the surface and subsurface water flow.

• Watersheds are primarily divided based on the river catchment areas, where water flows into a single river system, making the concept crucial for understanding water resource management.

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• It plays a significant role in maintaining the hydrological cycle, ecological balance, and water conservation by regulating water flow and preventing soil erosion.

• The concept is widely used in environmental planning, agricultural practices, and water resource management to ensure sustainable development.

• A watershed can be small, covering a few hectares, or large, spanning thousands of square kilometers, depending on the size of the river basin it drains into.

• Hence, option River catchment area is correct.

Additional Information

• Characteristics of a Watershed:

• Topography: Watersheds are defined by elevated terrains like hills or mountains that act as boundaries, separating one watershed from another.

• Size: Watersheds vary significantly in size, ranging from small, localized areas to vast regions spanning multiple states or even countries.

• Drainage network: Includes rivers, streams, and tributaries that collect and channel water into a central water body.

• Land use: The usage of land within a watershed—urban, agricultural, forested—impacts water quality and flow.

• Applications of Watershed Management:

• Flood control: Proper watershed management reduces the risk of flooding by regulating water flow.

• Soil erosion prevention: Vegetation within watersheds helps to retain soil and prevent erosion.

• Water quality improvement: Watersheds filter pollutants and improve the quality of water that flows into rivers and lakes.

• Conservation: Helps in the sustainable use of water resources for agricultural, domestic, and industrial purposes.

• Examples of Watersheds:

• The Ganga River Basin: One of the largest watersheds in India, it serves millions of people and supports agriculture across several states.

• The Mississippi River Basin: The largest watershed in North America, covering over 40% of the continental United States.

Important Points

• Difference between watershed and river basin:

• Watershed: Refers to a smaller area where water drains into a single water body.

• River Basin: A larger area encompassing multiple watersheds, where water drains into a major river.

• Global Importance:

• Watersheds are integral to global water conservation efforts, ensuring the sustainability of freshwater resources.

• They support diverse ecosystems and are essential for maintaining biodiversity.

Q5. Answer: (c) Mesolithic age

The correct answer is Mesolithic Age.

Key Points

• Microliths: These are tiny stone tools used extensively during the Mesolithic Age. They were affixed to handles made of wood or bone to create composite tools like saws, sickles, and other hunting or agricultural implements.

• The Mesolithic Age is characterized by the transition from the Paleolithic (Old Stone Age) to the Neolithic (New Stone Age). It occurred between approximately 10,000 to 8,000 BCE, depending on the region.

• Microliths are significant due to their versatility. They were used for cutting, hunting, scraping, and agricultural purposes. These tools represent advancements in human ingenuity and adaptability. Hence, microliths were mostly found during the Mesolithic Age.

• Mesolithic Age: During this period, humans practiced a hunter-gatherer lifestyle but began to experiment with primitive forms of agriculture and domestication of animals.

• The presence of microliths in Mesolithic archaeological sites indicates the technological innovation of this age. These tools were essential for survival and adaptation to changing environments. Hence, statement in the question is correct.

Additional Information

• Paleolithic Age:

• This is the earliest phase of human history, also known as the Old Stone Age. It lasted until about 10,000 BCE. Tools during this period were primarily made of stone, but they were rudimentary and unpolished.

• Humans lived in caves or open spaces and relied heavily on hunting and gathering for survival. There was no use of microliths in this age.

• Chalcolithic Age:

• Also known as the Copper Age, this period followed the Neolithic Age and began around 3,000 BCE. Copper tools and weapons were introduced during this time, replacing stone implements.

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• Microliths were not prominent in this age as humans progressed toward the use of metal tools.

• Neolithic Age:

• The New Stone Age, beginning around 8,000 BCE, marked the advent of agriculture, permanent settlements, and pottery. Tools were polished and more advanced than microliths.

• The focus shifted to farming and tool-making techniques that were more sophisticated and suited to agricultural tasks.

Important Points

• Microliths and their significance:

• Microliths are typically small, ranging from 1 to 5 cm. They were made from materials like flint, chert, and quartz.

• The tools were often geometrically shaped (e.g., triangles, trapezoids) and were used as components in composite tools.

• Microliths indicate the technological progress of the Mesolithic Age. They were used in activities that required precision and efficiency, such as cutting and hunting.

• Mesolithic Age and Human Evolution:

• The Mesolithic Age played a pivotal role in the transition of humans from hunting-gathering to settled agricultural communities.

• This age also witnessed the domestication of animals like dogs, goats, and sheep. Humans began cultivating plants like barley and wheat.

Q6. Answer: (b) Armed Forces

The correct answer is Armed Forces.

Key Points

• The President of India serves as the Supreme Commander of the Armed Forces. This role is explicitly defined in the Indian Constitution under Article 53. The President holds this position as the ceremonial head of the military.

• The Armed Forces of India include the Army, Navy, and Air Force, and they operate under the Ministry of Defence. The President's role as Supreme Commander is primarily symbolic, while operational and strategic control lies with the civilian government.

• The President has the authority to declare war or conclude peace based on the advice of the Union Council of Ministers. However, this role is exercised in accordance with the provisions of the Constitution and the advice of the Prime Minister and the Cabinet. Hence, the Armed Forces is the correct answer.

• The other forces mentioned in the options, such as Intelligence Agencies, Border Security Force, and Police Forces, are not under the direct control of the President. These forces are primarily controlled by the Ministry of Home Affairs or other central/state government agencies. Thus, option 2 is correct.

Additional Information

• Role of the President in Armed Forces:

• The President’s role is primarily ceremonial and constitutional. The Ministry of Defence exercises executive control over the Armed Forces under the framework of the Government of India.

• The President appoints the Chiefs of the Army, Navy, and Air Force based on the recommendations of the government.

• Constitutional Provisions:

• Article 53 of the Constitution of India specifies that the executive power of the Union shall be vested in the President, who also acts as the Supreme Commander of the Armed Forces.

• The President exercises powers related to the Armed Forces only on the advice of the Union Council of Ministers, led by the Prime Minister.

• Structure of Armed Forces:

• Indian Army: Responsible for land-based operations and safeguarding India's territorial integrity.

• Indian Navy: Maintains maritime security and carries out operations to protect India's interests in international waters.

• Indian Air Force: Handles aerial defense and supports the Army and Navy in operations.

Important Points

• Difference between Armed Forces and Other Forces:

• Intelligence Agencies: These include organizations such as the Research and Analysis Wing (RAW) and the Intelligence Bureau (IB), which focus on intelligence gathering and national security but are not part of the Armed Forces.

• Border Security Force (BSF): Functions under the Ministry of Home Affairs and is responsible for guarding India's borders. It does not fall under the Armed Forces.

• Police Forces: Operate under the state governments or central government agencies and deal with law enforcement and internal security.

• Presidential Role in War and Peace:

• The President declares war or peace based on the recommendation of the Cabinet, ensuring compliance with constitutional provisions.

• This authority highlights the President’s ceremonial role as the Supreme Commander of the Armed Forces while emphasizing the government's operational control.

Q7. Answer: (d) 130

The correct answer is 130.

Key Points

• The Human Development Index (HDI) is a composite index developed by the United Nations Development Programme (UNDP) to measure a country’s overall achievement in three basic dimensions of human development: health, education, and standard of living.

• As per the UNDP's Human Development Report (HDR) 2025, India's global ranking is 130 in terms of HDI. Hence, the correct option is 130.

• The HDI is calculated using three main indicators: life expectancy at birth, mean years of schooling (average number of years of education received by people aged 25 and older), and Gross National Income (GNI) per capita.

• India's position of 130 reflects its progress in improving life expectancy, education, and per capita income levels, but it also highlights the challenges the country faces in ensuring equitable and sustainable human development.

• Countries are ranked on a scale from 0 to 1, where a higher value indicates higher human development. India's HDI score in 2025 reflects moderate progress but indicates scope for improvement in various areas.

• India’s HDI ranking is crucial for understanding its international standing and for identifying areas where the country needs to focus its efforts to improve the quality of life of its citizens.

Additional Information

• Human Development Index (HDI):

• The HDI is a statistical tool used to measure a country’s overall achievement in its social and economic dimensions. The social and economic dimensions are based on the health of people, their level of education attainment, and their standard of living.

• HDI is published annually by the United Nations Development Programme (UNDP) as part of its Human Development Report.

• Global HDI Rankings:

• The HDI ranks countries into four tiers: very high, high, medium, and low human development.

• Countries like Norway, Switzerland, and Ireland often rank at the top due to their high scores in all three HDI dimensions, while countries with lower income levels and poor access to education and healthcare rank lower.

• India’s Progress on HDI:

• Over the years, India has shown significant improvement in areas like life expectancy, literacy rates, and per capita income, contributing to its HDI score.

• However, challenges such as poverty, inequality, lack of access to quality education, and healthcare continue to impact its HDI ranking.

Important Points

• Calculation of HDI:

• The HDI is calculated using the following formula: HDI = (Health Index * Education Index * Income Index)^(1/3).

• The Health Index is measured by life expectancy at birth, the Education Index is calculated using the mean years of schooling and expected years of schooling, and the Income Index is based on GNI per capita.

• India’s HDI in context:

• India’s HDI ranking provides a snapshot of its development status in comparison with other countries, helping policymakers to identify key areas for intervention.

• While India has made progress, it still lags in areas like healthcare and education, which are crucial for improving its HDI ranking.

• Future Outlook:

• To improve its HDI ranking, India needs to focus on reducing inequality, enhancing healthcare access, promoting quality education, and creating more economic opportunities for its citizens.

Q8. Answer: (d) Government of India Act 1935

The correct answer is Government of India Act 1935.

Key Points

• The Government of India Act, 1935 was a landmark legislation enacted by the British Parliament. This act served as a blueprint for India's governance and was the longest and most detailed Act passed by the British Parliament.

• The Act introduced the concept of a federal system in India, dividing powers between the Central Government, Provincial Governments, and the Concurrent List. This was the first time such a distinction was formally established.

• The Act provided for three lists of subjects:

• Federal List: Subjects of national importance like defence, foreign affairs, and railways were controlled by the central government.

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• Provincial List: Subjects of local importance like public health, agriculture, and education were managed by the provincial governments.

• Concurrent List: Subjects that required joint action by both the central and provincial governments, such as criminal law and marriage.

• The Act also provided autonomy to the provinces, which was a significant step towards self-governance. However, the British retained significant control, particularly in areas like defence and foreign relations.

• The Act introduced the concept of a Federal Court and provisions for a bicameral legislature at the centre, which influenced the structure of the Indian Constitution later. Hence, the Government of India Act, 1935, was crucial in defining the legislative framework for India.

Additional Information

• Indian Independence Act 1947:

• This Act marked the end of British rule in India and led to the partition of British India into two independent dominions – India and Pakistan. However, it did not provide for separate legislative subjects for the Centre and Provinces.

• This Act abolished the sovereignty of the British Parliament over India and allowed both dominions to have independent legislatures.

• Government of India Act 1858:

• This Act abolished the East India Company's rule in India and transferred the administrative powers to the British Crown.

• It established the office of the Secretary of State for India, who held ultimate authority in Indian administration under the British Government.

• Government of India Act 1919:

• This Act introduced the system of diarchy in the provinces, dividing subjects into two categories – transferred and reserved subjects.

• However, it did not provide for separate legislative subjects for the Centre and Provinces with distinct lists. Instead, it was a precursor to the 1935 Act.

Important Points

• Significance of the Government of India Act, 1935:

• It served as the basis for the Constitution of India and influenced its federal structure.

• It provided a detailed distribution of powers, which was further refined in the Indian Constitution through Union, State, and Concurrent Lists.

• Federal Structure under the Act:

• Although autonomy was granted to provinces, the Governor-General retained overriding powers, signifying limited federalism.

• The Act failed to fully satisfy Indian aspirations for independence but laid the groundwork for federal governance in India.

Q9. Answer: (c) 12

The correct answer is 12.

Key Points

• Public Sector Banks (PSBs) are banks where the majority stake, usually more than 50%, is held by the Government of India.

• As of 1 May 2025, there are 12 Public Sector Banks operating in India. This number is a result of several mergers and consolidations undertaken by the government in the past few years.

• The banking consolidation process was initiated to strengthen the financial system, improve operational efficiency, and reduce the number of smaller banks for better resource management.

• Major mergers: In 2020, the Government of India undertook significant mergers of PSBs. For example, Oriental Bank of Commerce and United Bank of India were merged with Punjab National Bank. Similarly, Allahabad Bank merged with Indian Bank.

• These mergers reduced the number of PSBs from 27 to 12, with the aim to enhance customer experience, financial inclusion, and banking services across India.

• Examples of PSBs: Some of the largest Public Sector Banks include State Bank of India (SBI), Punjab National Bank (PNB), Bank of Baroda (BoB), Canara Bank, and Indian Bank.

• These banks are regulated by the Reserve Bank of India (RBI) and play a crucial role in the Indian economy by providing credit to various sectors like agriculture, industry, trade, and services.

• Hence, the correct answer is 12.

Additional Information

• Reasons for Bank Mergers:

• The Government of India initiated the consolidation of banks to create fewer but larger entities. This helps improve their global competitiveness and ensures a more robust financial system.

• Mergers allow banks to pool resources, reduce operational costs, and enhance customer services by leveraging technology and

infrastructure.

• Example: The merger of Bank of Baroda with Vijaya Bank and Dena Bank created one of the largest PSBs in India.

• Role of Public Sector Banks:

• PSBs provide financial services to individuals, businesses, and industries. They play a key role in promoting financial inclusion by offering services in rural and semi-urban areas.

• Government schemes: PSBs implement various government initiatives like Pradhan Mantri Jan Dhan Yojana, PM Mudra Yojana, and Atal Pension Yojana to encourage savings and provide credit facilities.

• PSBs contribute to economic development by providing credit to priority sectors like agriculture, micro and small enterprises, and education.

Important Points

• Facts about PSBs:

• The State Bank of India (SBI) is the largest public sector bank in India, with a significant presence across the country and abroad.

• Banking reforms: The Indian government has consistently worked to improve the operational efficiency of PSBs through reforms like recapitalization and the introduction of technology-driven services.

• The Reserve Bank of India (RBI) supervises the functioning of all banks in India, including PSBs, to ensure financial stability.

• Global Comparisons:

• India's banking system, especially PSBs, is one of the largest in the world, providing services to millions of customers.

• Countries like the United States and United Kingdom also have a mix of public and private banks, but the dominance of government-owned banks is more pronounced in India.

Q10. Answer: (d) providing services to people

The correct answer is providing services to people.

Key Points

• Tourism is classified as a tertiary activity because it primarily involves the provision of services rather than the extraction or production of physical goods.

• The tertiary sector, also known as the service sector, includes industries that provide intangible services such as healthcare, education, entertainment, transportation, and tourism. Tourism fits perfectly within this category as it revolves around offering services like hospitality, travel arrangements, and leisure activities.

• In the tourism industry, businesses provide services such as accommodations (hotels and resorts), food and beverage services (restaurants, cafes), transportation (airlines, taxis), and guided tours. These services cater to the needs of tourists and enhance their overall experience. Hence, the statement is correct.

• Unlike the primary sector, which involves the extraction of natural resources (such as mining or agriculture), or the secondary sector, which focuses on manufacturing and production of goods, the tertiary sector is centered around providing services.

• Tourism contributes significantly to economic development by creating employment opportunities in various service-oriented professions such as tour guides, transport operators, and hospitality staff. Hence, this confirms the classification of tourism as a tertiary activity.

Additional Information

• Breakdown of Economic Sectors:

• Primary Sector: Involves the extraction and harvesting of natural resources, such as agriculture, fishing, forestry, and mining.

• Secondary Sector: Focuses on the manufacturing and production of goods. It involves industries like factories, construction, and energy production.

• Tertiary Sector: Revolves around providing services to individuals and businesses, including industries like tourism, education, banking, and healthcare.

• Importance of Tourism in the Economy:

• The tourism industry is a major contributor to the global economy. According to the World Travel and Tourism Council (WTTC), the tourism sector accounted for approximately 10% of global GDP in recent years.

• Tourism provides employment opportunities in various fields, including transportation, hospitality, and entertainment.

• It also promotes cultural exchange and fosters mutual understanding among people of different backgrounds and nations.

• Examples of Tourism Services:

• Accommodation: Hotels, resorts, hostels, and guesthouses cater to tourists' lodging needs.

• Transportation: Services such as airlines, railways, and local transportation systems play a significant role in facilitating travel.

• Attractions: Guided tours, amusement parks, cultural and historical sites, and museums are examples of attractions that generate revenue for the tourism sector.

Important Points

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• Global Tourism Statistics:
• According to the World Tourism Organization (UNWTO), international tourist arrivals reached approximately 1.5 billion in 2019.
• Tourism supports one in ten jobs worldwide, showcasing its critical role in providing employment opportunities.
• Types of Tourism:
• Eco-tourism: Focuses on preserving the environment while offering tourists a chance to explore natural areas.
• Cultural tourism: Involves exploring cultural heritage, art, music, and traditions of a destination.
• Adventure tourism: Includes activities such as trekking, rafting, and mountain climbing.

Q11. Answer: (c) Refractive index

The correct answer is Refractive index.

Key Points

• Refractive index is a dimensionless quantity because it is the ratio of the speed of light in a vacuum to the speed of light in a medium.
• The formula for refractive index is expressed as:

n = c / v, where:

• n: Refractive index (dimensionless).
• c: Speed of light in a vacuum.
• v: Speed of light in the medium.
• Since refractive index is a ratio and both quantities (speed of light in vacuum and medium) have the same dimensions, it becomes dimensionless.
• Unlike other options like velocity, acceleration, or gravitational force, which have specific dimensions, the refractive index does not depend on physical dimensions.
• Refractive index is commonly used in optics to describe how light behaves when transitioning between two mediums.

Additional Information

• Velocity:
• Velocity is a vector quantity that represents the rate of change of position of an object.
• Its dimensions are expressed as [LT^(-1)], where L stands for length and T stands for time.
• Commonly used to measure speed and direction in physics.
• Acceleration:
• Acceleration is the rate of change of velocity with respect to time.
• It is a vector quantity with dimensions [LT^(-2)].
• Used in motion studies to understand how objects speed up or slow down.
• Gravitational Force:
• Gravitational force is the attractive force between two masses due to gravity.
• Its dimensions are expressed as [MLT^(-2)].
• It plays a crucial role in planetary motion and other celestial phenomena.
• Applications of Refractive Index:
• Used to study light refraction in mediums like water, glass, and air.
• Critical in designing optical instruments such as lenses, microscopes, and telescopes.
• Helps in understanding phenomena like total internal reflection and dispersion.

Important Points

• Dimensionless quantities:
• These quantities are ratios of similar physical quantities, making them independent of dimensions.
• Examples include refractive index, strain, relative density, and angle (in radians).
• Refractive Index in Real-Life Applications:
• In gemology, refractive index is used to identify gemstones.
• It is vital in fiber optics for signal transmission.
• Used in weather forecasting to study atmospheric refraction effects.

Q12. Answer: (a) 26 February

The correct answer is Wed Feb 26 2025 00:00:00 GMT+0530 (India Standard Time).

Key Points

• Maha Shivaratri is a Hindu festival celebrated annually in honor of Lord Shiva. It is observed on the 14th night of the waning

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moon during the month of Phalguna, which typically falls in February or March.

• In the year 2025, Maha Shivaratri will be celebrated on Wednesday, February 26. This date corresponds to the 14th day of the lunar calendar's waning phase.

• The festival is considered one of the most significant events in Hinduism, as devotees worship Lord Shiva by observing fasts, chanting prayers, and performing rituals throughout the night. Hence, statement 1 is correct.

• Maha Shivaratri is not celebrated on other dates like May 12, June 7, or March 14, as these do not align with the lunar calendar's specifications for the month of Phalguna. Hence, options 2, 3, and 4 are incorrect.

Additional Information

• Significance of Maha Shivaratri:

• Maha Shivaratri is considered the night of spiritual awakening, where devotees seek blessings and enlightenment from Lord Shiva.

• The festival symbolizes the overcoming of darkness and ignorance in life by worshipping the Lord of Destruction and Transformation.

• Rituals and Practices:

• Devotees observe fasts and refrain from consuming food or water throughout the day. They also chant the Shiva mantra, "Om Namah Shivaya," to seek blessings.

• Shiva Lingam is bathed with milk, honey, and water, and offerings of bael leaves, fruits, and flowers are made.

• The night-long vigil is an important part of the festival, where devotees participate in prayers and meditate to honor Lord Shiva.

• Astrological Importance:

• Maha Shivaratri falls on the Chaturdashi Tithi of Krishna Paksha in the month of Phalguna, making it astrologically significant for spiritual growth and seeking divine energy.

• This night is considered the most auspicious time to meditate and connect with cosmic energy.

Important Points

• Observance Worldwide:

• Maha Shivaratri is celebrated not only in India but also in countries like Nepal, Mauritius, and Fiji, where Hindu communities reside.

• Temples dedicated to Lord Shiva, such as Kashi Vishwanath Temple in Varanasi and Somnath Temple in Gujarat, witness massive gatherings during this festival.

• Historical and Cultural Significance:

• Historical texts like the Shiva Purana and Skanda Purana mention the origin and importance of Maha Shivaratri.

• The festival also commemorates the day Lord Shiva performed the divine Tandava dance, which signifies the cycle of creation, preservation, and destruction.

Q13. Answer: (c) Alex Lanier

The correct answer is Alex Lanier.

Key Points

• King Cup International Badminton Open: The tournament is widely recognized as one of the prestigious badminton events, attracting top players globally to compete for titles across multiple categories.

• December 2024: This specific edition of the King Cup International Badminton Open took place during this month, with players competing for top honors in the tournament.

• Lakshya Sen: An emerging badminton star from India, Lakshya Sen has consistently delivered remarkable performances in international tournaments, establishing himself as a key player in the global badminton circuit.

• Third Place: In this tournament, Lakshya Sen competed in the playoff match for the third position after missing out on the finals, successfully defeating Alex Lanier to secure the third spot.

• Alex Lanier: The French badminton player is known for his promising talent and significant performances in international competitions. Despite his valiant effort, he was defeated by Lakshya Sen in the third-place playoff match in December 2024.

• Significance of Victory: Securing third place in this prestigious tournament further solidified Lakshya Sen’s reputation as one of the leading badminton players representing India on the global stage.

• Incorrect Options: Viktor Axelsen, Kento Momota, and Anthony Sinisuka Ginting are prominent badminton players, but they were not defeated by Lakshya Sen in the third-place playoff match of this specific tournament.

• Hence, the correct answer is Alex Lanier.

Additional Information

• About Lakshya Sen:

• Age: Born on 16 August 2001, Lakshya Sen is a young badminton talent from Almora, Uttarakhand, India.

• Achievements: He has won several titles, including gold at the 2022 Commonwealth Games in the men’s singles event.

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• Career Highlights: Lakshya Sen was a bronze medalist at the 2021 World Championships and has consistently performed at a high level in international badminton competitions.

• Alex Lanier:

• Nationality: Alex Lanier is a French badminton player, recognized for his emerging talent in the sport.

• Performance: He has competed in several international tournaments and is regarded as one of the promising young players in the badminton circuit.

• Other Players Mentioned:

• Viktor Axelsen: A top-ranked player from Denmark, known for his dominance in men's singles badminton.

• Kento Momota: A former World Champion from Japan, celebrated for his exceptional skills and achievements in badminton.

• Anthony Sinisuka Ginting: An Indonesian badminton player who has demonstrated remarkable performances on the international stage, particularly in men's singles.

Important Points

• King Cup International Badminton Open:

• The tournament is a significant event in the badminton calendar, attracting players worldwide to compete at the highest level.

• It provides a platform for emerging and established players to showcase their skills and compete for prestigious titles.

• Badminton as a Sport:

• Popularity: Badminton is one of the most popular sports globally, particularly in countries like India, Indonesia, China, Denmark, Japan, and South Korea.

• Competitive Structure: The sport features singles and doubles events, with players competing in national and international tournaments, including the Olympics, World Championships, and Thomas Cup.

• Key Skills: Success in badminton requires speed, agility, precision, and strategic gameplay, making it one of the most demanding racket sports.

Q14. Answer: (b) Karnataka

The correct answer is Karnataka.

Key Points

• The state of Karnataka signed a Memorandum of Understanding (MoU) with IN-SPACe in May 2025. The MoU aims to establish a Space Tech Manufacturing Park and a Centre of Excellence.

• IN-SPACe (Indian National Space Promotion and Authorization Center) is an autonomous nodal agency under the Department of Space, Government of India, responsible for promoting and regulating private sector space activities in India.

• The Space Tech Manufacturing Park will serve as a hub for industries involved in manufacturing and innovation in the space sector. This initiative is expected to boost space research, technology development, and manufacturing capabilities within the state.

• The Centre of Excellence will focus on fostering research, education, and collaborations in the space technology domain, enabling startups and researchers to advance their innovations.

• Karnataka has established itself as a hub for technology and innovation, hosting significant space and aerospace industries, research institutions, and startups, which makes it a suitable location for such initiatives.

• This move aligns with India's broader vision of boosting private participation and innovation in the space sector through initiatives led by IN-SPACe.

Additional Information

• IN-SPACe:

• IN-SPACe was established in 2020 to enable, regulate, and promote private sector participation in the space industry.

• It acts as a bridge between the private sector and ISRO (Indian Space Research Organisation), facilitating the use of ISRO's facilities and resources for private players.

• IN-SPACe also provides a level playing field for private entities and startups to contribute to India's space missions and technological advancements.

• Karnataka's Role in Space and Technology:

• Karnataka is home to ISRO's headquarters and several research centers, including the Indian Space Research Organisation Satellite Centre (ISAC) and the Liquid Propulsion Systems Centre.

• The state has a robust ecosystem for aerospace and defense industries, hosting major players like HAL (Hindustan Aeronautics Limited) and private sector companies.

• Bengaluru, the capital city, is often referred to as the Silicon Valley of India due to its thriving technology and innovation hubs.

• Space Technology in India:

• India has emerged as a significant player in the global space industry, with achievements like the Chandrayaan missions, Mangalyaan (Mars Orbiter Mission), and recent advancements in satellite technology.

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• The government's focus on increasing private sector participation is evident in the establishment of organizations like IN-SPACe and the reforms in the space policy.

Important Points

• Private Participation in Space:

• The establishment of facilities like Space Tech Manufacturing Parks will create opportunities for private players to contribute to satellite manufacturing, launch services, and other space-related activities.

• This initiative is crucial for strengthening India's position in the global space economy and achieving self-reliance in space technology.

• Strategic Advantages of Karnataka:

• The state's existing infrastructure, talent pool, and proximity to research organizations make it an ideal location for space sector growth.

• This initiative will enhance Karnataka's reputation as a leader in technology, innovation, and space research.

Q15. Answer: (c) Kalahari Desert

The correct answer is Kalahari Desert.

Key Points

• Kalahari Desert is located in the southern part of the world map, covering parts of countries like Botswana, Namibia, and South Africa.

• It is a semi-arid sandy savannah, spanning approximately 900,000 square kilometers.

• The desert is unique due to its ability to support a diverse ecosystem, including the presence of some vegetation like grasses and shrubs. Hence, the statement is correct.

• The Kalahari Desert is known for being home to indigenous communities such as the San Bushmen, who have adapted to living in this challenging environment.

• It is characterized by high temperatures, low rainfall, and extensive sand dunes. Hence, this fits the southern world map desert context.

Additional Information

• Other deserts mentioned:

• Gobi Desert: Located in Asia, spanning parts of Mongolia and China. It lies in the northern hemisphere, making it unsuitable as the correct answer.

• Thar Desert: Found in India and Pakistan. It is located in the northern hemisphere and is known for being the largest desert in India.

• Sonoran Desert: Situated in North America, covering parts of Mexico, Arizona, and California. It is in the northern hemisphere as well.

• Key Features of the Kalahari Desert:

• The desert supports unique wildlife such as meerkats, gemsboks, and hyenas.

• It is home to Okavango Delta, one of the largest inland deltas, providing water to parts of the desert.

• The soil in the Kalahari is rich in iron oxide, giving it a red-orange color.

Important Points

• Climate: The Kalahari Desert experiences a semi-arid climate, with rainfall ranging from 5 to 10 inches per year.

• Indigenous Communities: The San Bushmen are among the oldest known inhabitants of the region, relying on hunting and gathering for survival.

• Geographical Spread: The desert covers regions in southern Africa, making it easily identifiable in the southern part of the world map.

Q16. Answer: (d) Telangana

The correct answer is Telangana.

Key Points

• The Mudumal Megalithic Menhir is a significant archaeological monument located in the state of Telangana, India. It is one of the most prominent megalithic structures in the country, reflecting the ancient practices of the megalithic period.

• In February 2025, the Mudumal Megalithic Menhir was added to the tentative list of UNESCO World Heritage Sites by the UNESCO World Heritage Centre. This inclusion is an acknowledgment of its cultural and historical significance.

• The Mudumal Menhir is considered an ancient burial site and is associated with the megalithic culture, which is known for its characteristic large stone structures used in rituals and as memorials. Hence, the statement about its location in Telangana is correct.

• Menhirs are upright standing stones often erected to mark burial sites or for ceremonial purposes. The Mudumal Menhir is one of the tallest such structures in South India, standing as a testament to the advanced engineering and cultural practices of the era.

• The state of Telangana has a rich history of megalithic culture, and the inclusion of this site in UNESCO's tentative list is a step toward preserving its archaeological heritage. Hence, the correct option is Telangana.

Additional Information

• About the Mudumal Megalithic Menhir:

• The Mudumal Megalithic Menhir is situated in the Mahbubnagar district of Telangana.

• It is a large stone monument that dates back to the megalithic period, which spanned from approximately 1500 BCE to 500 BCE in South India.

• The site is believed to have served as a burial ground, where menhirs were erected as memorials for the deceased. These structures are often associated with ancestral worship and ritualistic practices.

• UNESCO Tentative List:

• The tentative list is the first step in the process of a site being designated as a UNESCO World Heritage Site. It includes sites that have been identified as having potential Outstanding Universal Value.

• The inclusion of the Mudumal Megalithic Menhir in the tentative list highlights its cultural, historical, and archaeological importance.

• Megalithic Culture in India:

• The megalithic culture in India is characterized by the construction of large stone structures, including burial sites, dolmens, stone circles, and cairns.

• It represents an important phase in Indian history, showcasing the transition from a nomadic lifestyle to settled agricultural societies.

• Some other significant megalithic sites in India include Hire Benakal in Karnataka and the Nilgiri Hills in Tamil Nadu.

Important Points

• Key Features of Menhirs:

• Menhirs are often considered sacred and are associated with ritualistic and spiritual practices.

• They are frequently found in groups or as part of a larger complex, such as stone circles or burial chambers.

• UNESCO World Heritage Sites in India:

• India has 40 UNESCO World Heritage Sites, including cultural, natural, and mixed heritage sites.

• Some well-known examples include the Taj Mahal, Hampi, Ellora and Ajanta Caves, and the Western Ghats.

Q17. Answer: (b) disqualification on grounds of defection

The correct answer is disqualification on grounds of defection.

Key Points

• The Tenth Schedule of the Indian Constitution, also known as the Anti-Defection Law, was added to the Constitution by the 52nd Amendment Act, 1985.

• It lays down the process for disqualifying members of Parliament and state legislatures on the grounds of defection.

• The law aims to curb political defections caused by the lure of office, money, or other gains, which can destabilize governments. Hence, it is directly related to disqualification on grounds of defection.

• A member of a legislature is deemed to have defected if they voluntarily resign from their political party or vote or abstain from voting in the House contrary to the directives issued by their political party.

• The Chairman or Speaker of the House is the authority to decide on disqualification under the Tenth Schedule. However, their decision is subject to judicial review. Thus, the Tenth Schedule is focused on disqualification due to defection.

• The provisions also include exceptions like when a party merges with another, provided two-thirds of its members agree to the merger. This prevents the application of the anti-defection law in such cases.

• Hence, the correct answer is disqualification on grounds of defection.

Additional Information

• Background of the Tenth Schedule:

• The Anti-Defection Law was introduced to address the problem of political instability caused by elected members switching parties.

• The 52nd Amendment Act of 1985 added the Tenth Schedule to the Constitution, making defection a ground for disqualification.

• Key Provisions of the Tenth Schedule:

• A member is disqualified if they voluntarily give up membership of their party or defy the party whip in voting.

• Independent members will be disqualified if they join a political party after the election.

• Nominated members can join a political party within six months of being nominated; otherwise, they too can be disqualified.

• Judicial Review:

• The decision of the Speaker/Chairman on disqualification is subject to judicial review by courts.

• The courts have interpreted the law to balance the Speaker's authority with the principles of natural justice.

Important Points

• Impact of the Tenth Schedule:

• The Anti-Defection Law has helped reduce the menace of political defections and ensures stability in governments.

• However, critics argue that it curtails the freedom of legislators to express dissent.

• Relevant Cases:

• The Kihoto Hollohan vs. Zachillhu (1992) case upheld the validity of the Anti-Defection Law but subjected the Speaker's decisions to judicial review.

• The Manipur Legislative Assembly case (2020) highlighted the need for timely decisions by the Speaker on disqualification matters.

Q18. Answer: (c) Switches between open applications

The correct answer is Switches between open applications.

Key Points

• The Alt + Tab shortcut is a widely used feature in the Windows operating system. It allows users to switch between open applications quickly and efficiently.

• When you press the Alt key and tap the Tab key, a graphical interface appears displaying thumbnails or icons of all the currently open applications. You can cycle through them by continuing to press the Tab key while holding Alt.

• This shortcut is particularly useful for multitasking, as it saves time by eliminating the need to minimize one application and manually select another from the taskbar.

• The feature also enhances productivity by providing a seamless way to navigate between multiple programs or windows without disrupting your workflow.

• The Alt + Tab functionality has evolved over time, with newer versions of Windows offering enhanced visuals and customization options, such as grouping certain apps or displaying larger previews.

• Hence, the correct option is "Switches between open applications."

Additional Information

• Other common shortcuts in Windows:

• Ctrl + C and Ctrl + V: Used for copying and pasting text or files.

• Ctrl + Z: Undo the last action performed.

• Windows key + D: Minimizes all open windows and displays the desktop.

• Ctrl + Shift + Esc: Opens the Task Manager directly.

• Features of Alt + Tab:

• Works across multiple monitors, allowing users to switch between applications on different screens seamlessly.

• In newer versions like Windows 10 and Windows 11, the interface includes larger previews of open applications.

• Can be customized using settings to display only certain applications or change the behavior of the shortcut.

• Examples of productivity applications:

• Using Alt + Tab while working on Microsoft Word and switching to a browser for research.

• Quickly toggling between a video conference app like Zoom or Microsoft Teams and a presentation software like PowerPoint.

Important Points

• Alt + Tab in previous Windows versions:

• In older versions such as Windows XP, the interface was simpler, showing only icons of open applications instead of thumbnails.

• The shortcut has been refined to be more visually intuitive in recent versions, making it easier for users to identify applications.

• Customizing Alt + Tab:

• Users can modify settings to show or hide certain applications or adjust visual preferences through the system settings.

• Third-party applications like Switcher or Alt-Tab Terminator can be installed to provide additional features and customization.

Q19. Answer: (a) Create different folders based on categories of files

The correct answer is Create different folders based on categories of files.

Key Points

• Efficient file organization: Creating different folders based on categories of files is an effective way to manage data. It helps in easy retrieval and prevents clutter.

• Categories based on file types: Files can be grouped under specific categories such as documents, images, videos, spreadsheets, and software. This categorization ensures logical arrangement and prevents misplacement.

• Enhanced productivity: Organizing files into folders reduces the time spent searching for files, thereby increasing efficiency and

saving valuable time. Hence, this statement is correct.

• Logical structure: A well-maintained folder system encourages a logical structure for data, allowing users to intuitively navigate through their files without confusion.

• Backup and synchronization: Files organized into folders can be easily backed up or synchronized with cloud storage systems like Google Drive, Dropbox, or OneDrive. This ensures data safety and accessibility.

• Scalability: As the volume of data increases, a folder structure can scale accordingly by adding subfolders within categories. For example, within a "Documents" folder, you can create subfolders like "Work," "Personal," or "Projects." Hence, this is a highly effective method.

Additional Information

• Importance of file organization:

• Proper file organization ensures data security, minimizes redundancy, and enhances accessibility to important files.

• It also reduces the risk of losing files and makes collaborative work easier, especially in a professional setting.

• Benefits of folder-based categorization:

• It allows individuals to sort files based on priority, date, or relevance. For example, project files can be grouped separately from personal files.

• Search and retrieval: Organizing files helps users quickly locate specific files using search functions or folder navigation.

• Examples: In professional environments, folders named "Invoices," "Reports," and "Meeting Notes" are commonly used to organize work-related files.

Important Points

• Option Analysis:

• Option 2: Renaming all files with random characters is not practical, as it makes file identification difficult and retrieval confusing. This method is inefficient.

• Option 3: Keeping all files in the same folder leads to clutter, making it harder to locate specific files. It is not recommended for effective organization.

• Option 4: Storing files in the Recycle Bin is illogical as it is meant for discarded items. Files in the Recycle Bin are often deleted permanently, making this option incorrect.

• Best practices: Always name folders descriptively and use consistent naming conventions to avoid confusion. Regularly review and clean up folders to remove outdated or unnecessary files.

Q20. Answer: (a) A O Hume

The correct answer is A O Hume.

Key Points

• A O Hume, a retired British civil servant, was instrumental in the formation of the Indian National Congress (INC) in 1885. He aimed to bring together prominent Indian leaders on a common platform to discuss and address issues of national importance.

• Hume's primary objective was to create a structured and peaceful platform for Indians to voice their grievances and demands to the British government, thus preventing any potential revolutionary uprisings.

• He played a vital role in uniting educated Indians and fostering a sense of national consciousness, paving the way for the future struggle for independence. Hence, A O Hume initiated the idea of the Indian National Congress.

• The first session of the Indian National Congress was held in Bombay in December 1885, under the presidency of W C Bannerjee, with the participation of seventy-two delegates from across India.

• Hume is often referred to as the 'Father of the Indian National Congress' due to his pivotal role in its establishment. Hence, the correct answer is A O Hume.

Additional Information

• About A O Hume:

• Allan Octavian Hume (1829-1912) was a British civil servant and reformer who devoted himself to the cause of Indian political reform after his retirement.

• He believed in the need for a platform where Indians could present their demands in a constitutional manner to avoid violent uprisings.

• Hume played a unifying role in a politically diverse and fragmented society, laying the foundation for the Indian freedom movement.

• Indian National Congress (INC):

• The INC became the principal platform for Indian political aspirations, eventually evolving into the leading organization in the struggle for independence.

• Initially, the objectives of the INC included addressing administrative reforms, promoting unity, and ensuring increased participation of Indians in government.

• Over time, the INC became a mass movement, leading campaigns like the Non-Cooperation Movement, Civil Disobedience Movement, and the Quit India Movement.

• Other notable figures:

• W C Bannerjee: He was the first president of the INC and played a significant role in its early years.

• Surendranath Bannerjee: A prominent nationalist leader known for his efforts in promoting Indian self-rule and social reforms.

• Ananda Mohan Bose: A social reformer and nationalist who was also actively involved in Indian politics during the late 19th century.

Important Points

• Significance of the INC Formation:

• The INC provided a platform to unify Indians across regions, religions, and social backgrounds.

• Though initially a moderate organization, it laid the foundation for India's freedom movement, gradually adopting more radical approaches under leaders like Bal Gangadhar Tilak, Mahatma Gandhi, and others.

• The INC was instrumental in achieving India's independence in 1947, marking the culmination of efforts initiated by A O Hume and other founding members.

Q21. Answer: (d) 2025

The correct answer is 2025.

Key Points

• The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, approved the Revised Rashtriya Gokul Mission (RGM) in 2025 to boost growth in the livestock sector. This mission aims to enhance the overall productivity and genetic improvement of bovines.

• The Rashtriya Gokul Mission was initially launched in 2014 with the objective of conserving and developing indigenous breeds of cattle in a scientific and holistic manner.

• The revised mission in 2025 focuses on strengthening the dairy sector and improving animal health, quality breeding, and milk production to achieve self-sufficiency in dairy production. Hence, the correct year is 2025.

• Livestock sector plays a crucial role in India’s economy, contributing significantly to agricultural GDP. The revised mission aligns with the broader goals of increasing farmers’ income and ensuring food security.

• The mission promotes the use of advanced technologies, such as embryo transfer techniques and artificial insemination, to ensure better breeding practices and increase productivity. This is a significant step towards improving livestock management.

• The approval in 2025 reflects the government’s renewed commitment to enhancing the dairy and livestock sectors, which are vital for rural development and economic growth.

• Hence, the correct answer is 2025.

Additional Information

• Rashtriya Gokul Mission:

• Launched in 2014, the Rashtriya Gokul Mission focuses on the conservation and development of indigenous bovine breeds.

• The mission emphasizes improving genetic resources and promoting the use of advanced breeding technologies.

• The revised mission integrates modern technology with traditional practices to ensure the growth of the livestock sector.

• Importance of Livestock Sector:

• Livestock contributes around 4.5% to India’s GDP and provides livelihood to millions of farmers and rural households.

• It plays a critical role in food security, rural development, and poverty alleviation.

• The Revised RGM aims to address challenges like low productivity, poor health, and genetic improvement of bovines.

• Government’s Role:

• The government has been proactive in enhancing the dairy sector through various programs like National Dairy Plan (NDP) and Rashtriya Gokul Mission.

• The approval of Revised RGM in 2025 aligns with the vision of doubling farmers’ income and ensuring rural prosperity.

Important Points

• Breeding Technologies:

• The mission promotes embryo transfer techniques and artificial insemination to enhance genetic resources.

• It ensures the use of modern tools to improve the quality and quantity of milk production.

• Economic Impact:

• The Revised RGM supports the goal of achieving self-sufficiency in milk production and reducing dependency on imports.

• It contributes to rural development by creating employment opportunities and enhancing farmers’ income.

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Q22. Answer: (d) Shri Sushil Kumar Modi

The correct answer is Shri Sushil Kumar Modi.

Key Points

• Padma Bhushan Awards: The Padma Bhushan is one of India's highest civilian awards, conferred by the Government of India. It recognizes distinguished service of a high order in various fields such as art, literature, sports, public affairs, and others.

• Posthumous Recognition: The award can be given posthumously to honor the contributions of individuals who have passed away. This demonstrates respect for their legacy and achievements.

• Shri Sushil Kumar Modi was conferred the award in April 2025 under the category of Public Affairs. His contributions in this field have been highly impactful, making him a deserving recipient.

• Public Affairs Contributions: Shri Modi has been recognized for his outstanding work in governance and policymaking, which has significantly influenced India's political and administrative spheres.

• April 2025 Ceremony: The Padma Awards ceremony is conducted annually, where distinguished individuals are awarded for their remarkable contributions to the nation.

• Other Nominees: The other options mentioned in the question, such as Dr. Duvvur Nageshwar Reddy, Shri Nandamuri Balakrishna, and Shri MT Vasudevan Nair, have been notable figures in their respective fields, but none of them were conferred the award in 2025 under the category of Public Affairs.

• Hence, the correct answer is Shri Sushil Kumar Modi.

Additional Information

• Padma Awards:

• The Padma Awards are divided into three categories: Padma Vibhushan (for exceptional and distinguished service), Padma Bhushan (for distinguished service of high order), and Padma Shri (for distinguished service).

• These awards are announced annually on the eve of Republic Day and highlight excellence in various domains such as arts, science, public affairs, social work, sports, and literature.

• Shri Sushil Kumar Modi's Achievements:

• Shri Modi is widely known for his contributions to the field of governance, particularly as a senior leader in Indian politics. He has held various important positions, including Deputy Chief Minister of Bihar.

• He has worked extensively in policy formulation, economic reforms, and public administration, influencing the socio-economic structure of Bihar and India.

• Other Nominees:

• Dr. Duvvur Nageshwar Reddy: Renowned for his work in medical sciences and gastroenterology.

• Shri Nandamuri Balakrishna: A popular actor and politician from Andhra Pradesh, contributing to the entertainment and public spheres.

• Shri MT Vasudevan Nair: A respected writer and filmmaker from Kerala, known for his contributions to Indian literature and cinema.

Important Points

• Eligibility Criteria:

• The Padma Awards are open to all citizens of India, irrespective of age, gender, or profession. Non-resident Indians and foreigners can also be considered for these awards.

• Posthumous awards are given in exceptional cases to honor the legacy of an individual.

• Significance:

• The awards serve as a recognition of excellence and inspire others to contribute to the development of society and the nation.

• They highlight India's diverse talent across different domains, fostering a sense of pride and accomplishment.

Q23. Answer: (d) Diwan-i-Arz

The correct answer is Diwan-i-Arz.

Key Points

• The Diwan-i-Arz was the department responsible for the military organization and administration during the rule of the Delhi Sultanate.

• It was headed by the Ariz-i-Mumalik, who was tasked with maintaining the army, ensuring discipline, and overseeing recruitment and training.

• The department managed the salaries and allowances of soldiers and ensured the availability of military supplies like weapons, horses, and ammunition. Hence, the correct answer is Diwan-i-Arz.

• The Diwan-i-Arz had the authority to inspect troops, maintain their records, and ensure the army's preparedness for war.

• This department played a crucial role in safeguarding the Sultanate's territories and defending against invasions. Hence, it was an essential part of the administrative structure.

Additional Information

• Other Departments of the Delhi Sultanate:

• Diwan-i-Insha: This department managed royal correspondence and communication. It dealt with drafting and sending official letters and orders.

• Diwan-i-Riyasat: Responsible for controlling the market, regulating prices, and ensuring the supply of goods. It was headed by the Shahna or superintendent.

• Diwan-i-Risalat: This department handled diplomatic relations and correspondence with foreign rulers and states.

• Role of the Ariz-i-Mumalik:

• The Ariz-i-Mumalik was the head of the Diwan-i-Arz and was responsible for maintaining discipline in the army and ensuring the proper functioning of military operations.

• He maintained a strict vigil on the army's readiness and ensured the supply of necessary resources, including weapons and other equipment.

• Historical Importance:

• The military was a key pillar of the Delhi Sultanate, and the Diwan-i-Arz ensured its efficiency and strength, which was critical for defending the Sultanate's territories and maintaining internal order.

• The department's functioning highlights the advanced administrative structure of the Delhi Sultanate, which prioritized military and administrative efficiency.

Important Points

• Delhi Sultanate Administration:

• The administrative system of the Delhi Sultanate was divided into various departments, each with specific roles and responsibilities.

• It was organized to ensure the smooth functioning of governance, with a focus on military strength, economic stability, and diplomatic relations.

• Significance of the Diwan-i-Arz:

• The Diwan-i-Arz was instrumental in maintaining the Sultanate's military power, which was necessary for repelling external invasions and ensuring the stability of the empire.

• It highlights the importance of a well-organized military structure in medieval Indian polity.

Q24. Answer: (c) Kalpakkam

The correct answer is Kalpakkam.

Key Points

• The Kalpakkam Power Plant, also known as the Madras Atomic Power Station (MAPS), is a nuclear power station. It is located in Kalpakkam, Tamil Nadu, India.

• The plant is operated by the Nuclear Power Corporation of India Limited (NPCIL), which is responsible for operating nuclear power plants in the country.

• Kalpakkam has two reactors with a capacity of 220 MW each, which are part of India’s indigenous Pressurized Heavy Water Reactor (PHWR) program.

• The plant uses nuclear energy to produce electricity. Nuclear energy is generated through nuclear fission, where the nucleus of an atom splits into smaller parts, releasing energy in the process.

• Kalpakkam also houses the Indira Gandhi Centre for Atomic Research (IGCAR), which focuses on nuclear research and development, especially in fast breeder reactor technology.

• In contrast, the other options (Koyna, Tehri, Bhakra Nangal) are hydropower projects, which generate electricity using the energy of water flow, not nuclear energy. Hence, these options are incorrect.

• Hence, the correct answer is Kalpakkam.

Additional Information

• About Nuclear Energy:

• Nuclear energy is produced through a process called nuclear fission, where the nucleus of an atom splits into smaller parts, releasing a significant amount of energy in the form of heat.

• This heat is used to generate steam, which drives turbines connected to generators, producing electricity.

• Nuclear power plants are considered a source of clean energy because they do not emit greenhouse gases during electricity production.

• Other Options Explained:

• Koyna: The Koyna Hydroelectric Project is one of the largest hydropower plants in India, located in Maharashtra. It utilizes the Koyna River for electricity generation.

• Tehri: The Tehri Dam is a hydropower project located on the Bhagirathi River in Uttarakhand. It is one of the tallest dams in the

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world and generates hydroelectric power.

• Bhakra Nangal: This is a hydropower project on the Sutlej River in Himachal Pradesh and Punjab. It is one of the earliest and largest multi-purpose river valley projects in India.

Important Points

• India's Nuclear Power:

• India has several operational nuclear power plants, including Tarapur (Maharashtra), Rawatbhata (Rajasthan), Narora (Uttar Pradesh), and Kakrapar (Gujarat).

• India is also developing advanced nuclear technology, such as Fast Breeder Reactors, to utilize uranium and thorium more efficiently.

• Nuclear energy contributes significantly to India's goal of achieving a mix of clean and renewable energy in its electricity grid.

Q25. Answer: (b) Enzymes

The correct answer is Enzymes.

Key Points

• Enzymes are biological molecules, primarily proteins, that act as catalysts in biochemical reactions. They significantly speed up chemical reactions, often by factors of millions.

• Enzymes are highly specific to the reactions they catalyze. Each enzyme has an active site where the substrate binds, allowing the chemical reaction to proceed efficiently.

• They are involved in almost all biological processes, including digestion (breaking down food molecules), metabolism (energy production), and DNA replication (ensuring genetic information is copied accurately).

• Enzymes lower the activation energy of a reaction, making it easier for the reaction to take place. This is crucial in biological systems where reactions must occur quickly and under mild conditions.

• Examples of enzymes include amylase (breaks down starch), lipase (breaks down fats), and DNA polymerase (replicates DNA).

• Enzymes are affected by factors such as temperature, pH, and the presence of inhibitors, which can alter their activity.

Additional Information

• Polysaccharides:

• Polysaccharides are long chains of monosaccharide molecules linked together. They serve as energy storage molecules (e.g., starch in plants, glycogen in animals) or structural components (e.g., cellulose in plant cell walls).

• They do not catalyze biochemical reactions. Instead, they play a role in energy metabolism and structural support.

• Nucleotides:

• Nucleotides are the building blocks of nucleic acids like DNA and RNA. They consist of a sugar, a phosphate group, and a nitrogenous base.

• They do not directly catalyze reactions but are involved in energy transfer c and cell signaling.

• Phospholipids:

• Phospholipids are a major component of cell membranes, forming a bilayer that acts as a barrier and provides structural integrity to cells.

• They do not act as catalysts in biochemical reactions but play essential roles in cell membrane dynamics and signaling.

Important Points

• Importance of enzymes:

• Enzymes are necessary for life because they allow organisms to carry out necessary chemical reactions at a rate sufficient to sustain life.

• Without enzymes, many reactions would occur too slowly to maintain life processes. For example, breaking down glucose for energy would take years without enzymes.

• Industrial and medical applications:

• Enzymes are used in industrial processes, such as in the production of biofuels, detergents, and food (e.g., brewing beer, making cheese).

• In medicine, enzymes are used for therapeutic purposes, such as digestive aids, and in diagnostics (e.g., enzyme-linked immunosorbent assays, ELISA).

Q26. Answer: (d) West Bank

The correct answer is West Bank.

Key Points

• Incident Details: On 22 May 2025, Israeli forces reportedly fired warning shots near a delegation of diplomats visiting the West Bank. This act led to widespread international condemnation as the situation in the region remains highly sensitive due to ongoing territorial disputes.

• The West Bank: The West Bank is a region located to the east of Israel and west of Jordan. It has been a disputed territory since the Israeli-Palestinian conflict, with Palestinians seeking it as part of their future state.

• Diplomatic Delegation: The delegation of diplomats was present in the area as part of an effort to assess the situation on the ground, aiming to understand the challenges faced by the Palestinian population and the complexities of the conflict. Their presence highlights the ongoing international efforts for a peaceful resolution.

• Israel's Actions: The firing of warning shots by Israeli forces was seen as a provocative move, drawing criticism from various countries and international organizations. It underscores the tense and fragile situation in the West Bank.

• International Response: This incident led to widespread condemnation, with calls for restraint and peaceful dialogue between Israel and Palestine. The international community has consistently urged both parties to avoid actions that could escalate tensions.

• Historical Context: The West Bank has been a flashpoint in the Israeli-Palestinian conflict since Israel's occupation of the territory following the Six-Day War in 1967. The area is central to discussions about the establishment of a two-state solution.

• Hence, the correct answer is West Bank.

Additional Information

• West Bank:

• Location: The West Bank is situated between Israel and Jordan, encompassing cities such as Ramallah, Nablus, and Hebron.

• Population: It is home to approximately 2.9 million Palestinians, along with Israeli settlers living in settlements deemed illegal under international law.

• Historical Significance: The region has immense religious and historical importance for Jews, Christians, and Muslims, contributing to the complexity of the conflict.

• Territorial Dispute: The West Bank remains central to the Israeli-Palestinian conflict, with Palestinians demanding it as part of their future state and Israel maintaining control over certain areas.

• International Condemnation:

• Incidents such as firing warning shots near diplomats often result in strong international criticism, with countries and organizations emphasizing the need for restraint.

• The incident underscores the importance of international diplomatic efforts in resolving the conflict and achieving peace in the region.

• Israeli-Palestinian Conflict:

• The conflict dates back to the early 20th century, with disputes over land, sovereignty, and national identity.

• Efforts to achieve a two-state solution remain ongoing but have faced numerous challenges, including settlements and security concerns.

Important Points

• Israeli Settlements:

• Israeli settlements in the West Bank are considered illegal under international law, specifically the Fourth Geneva Convention.

• Despite this, Israel has continued settlement expansion, leading to tensions and criticism from the global community.

• Diplomatic Efforts:

• Numerous diplomatic efforts, including those led by the United Nations, the United States, and other international bodies, aim to mediate peace between Israel and Palestine.

• Oslo Accords: Signed in the 1990s, these agreements aimed to establish a framework for peace but have faced implementation challenges.

Q27. Answer: (b) Sri Aurobindo

The correct answer is Sri Aurobindo.

Key Points

• Sri Aurobindo was the first political leader in India who openly advocated for complete independence through his writings in the newspaper Bande Mataram.

• The newspaper Bande Mataram was established in 1905, during the period of the Swadeshi Movement against the partition of Bengal.

• Sri Aurobindo used Bande Mataram as a medium to propagate nationalist ideas and advocate for freedom from British rule, marking a significant departure from the moderate demands of early Indian leaders. Hence, this statement is correct.

• His vision of Purna Swaraj (complete independence) was revolutionary at a time when most leaders were seeking dominion status or reforms under British governance.

• Bande Mataram played a key role in inspiring revolutionary sentiments and fostering a strong sense of nationalism among Indians. Hence, this statement is correct.

Additional Information

• Sri Aurobindo's Contributions:

• Sri Aurobindo was a prominent leader in the Indian nationalist movement before he moved towards spirituality.

• He played a significant role in transforming the Indian freedom struggle from a moderate phase to a more radical and revolutionary approach.

• His writings and speeches in the Bande Mataram newspaper inspired many revolutionaries and shaped the early ideals of independence.

• Bande Mataram:

• The newspaper was published in English and became a strong medium for spreading nationalist ideas across the country.

• It was one of the most influential publications during the Swadeshi Movement and was closely associated with revolutionary leaders like Sri Aurobindo.

• The name "Bande Mataram" was derived from the nationalist song written by Bankim Chandra Chatterjee, which also inspired the freedom movement.

• Other Options:

• Swami Vivekananda: While he advocated for the awakening of India and inspired nationalist sentiments, he did not explicitly call for complete independence through a publication. Hence, this option is incorrect.

• Rabindranath Tagore: He was a prominent figure in India's cultural renaissance but did not openly propagate complete independence in his writings. Hence, this option is incorrect.

• Mahatma Gandhi: He advocated for independence later in his political career, but he was not the first to call for complete independence in a publication. Hence, this option is incorrect.

Important Points

• Timeline of Purna Swaraj:

• 1905: Sri Aurobindo’s writings in Bande Mataram openly advocated for complete independence.

• 1929: The Indian National Congress passed the Purna Swaraj resolution, declaring complete independence as its goal.

• Role of Revolutionary Publications:

• Newspapers like Bande Mataram were instrumental in spreading revolutionary ideas and inspiring the youth during the freedom struggle.

• They served as platforms for leaders like Sri Aurobindo to articulate their vision of an independent India.

Q28. Answer: (d) 10th

The correct answer is 10th.

Key Points

• The Governing Council of NITI Aayog: It is the apex body of NITI Aayog, chaired by the Prime Minister of India. It comprises the Chief Ministers of all states and Union Territories, along with other key ministers. The council serves as a platform for cooperative federalism and deliberates on national priorities and developmental strategies.

• 10th Governing Council Meeting: The 10th edition of the Governing Council meeting of NITI Aayog was convened by Prime Minister Narendra Modi on 24 May 2025. It was held at Bharat Mandapam, which is a state-of-the-art convention and exhibition facility located in New Delhi.

• The meeting primarily focused on key developmental initiatives, policy reforms, and strategies for achieving sustainable and inclusive growth across states and Union Territories. Hence, the given statement is correct.

• Significance of the Governing Council Meetings: These meetings play a critical role in fostering constructive dialogue between the Centre and the states, ensuring alignment of developmental goals, and addressing the diverse challenges faced by different regions of India.

• The focus areas of such meetings often include topics like agriculture, health, education, employment, infrastructure development, and the implementation of the Sustainable Development Goals (SDGs).

• Bharat Mandapam as the Venue: Bharat Mandapam is a modern facility located in Pragati Maidan, New Delhi. It serves as a venue for hosting significant national and international events, conferences, and exhibitions.

• The selection of Bharat Mandapam as the venue for the 10th Governing Council meeting reflects the importance of the event in the national development agenda. Hence, the correct answer is 10th.

Additional Information

• About NITI Aayog:

• NITI Aayog (National Institution for Transforming India) was established in 2015, replacing the Planning Commission. It acts as the policy think tank of the Government of India.

• The primary objective of NITI Aayog is to foster cooperative federalism by involving state governments in the decision-making process and guiding them toward achieving sustainable development.

• Its role includes providing strategic and technical advice on policy matters, formulating sectoral policies, and promoting innovation and entrepreneurship.

• Bharat Mandapam:

• Location: Bharat Mandapam is located in Pragati Maidan, New Delhi. It is a world-class convention and exhibition center inaugurated in 2023.

• Features: The facility is equipped with cutting-edge amenities, including advanced audio-visual systems, exhibition halls, and conference rooms, making it suitable for hosting high-profile events.

• Previous Governing Council Meetings:

• The 9th meeting of the Governing Council was held in 2023, focusing on themes such as infrastructure development, improving health outcomes, and promoting digital literacy.

• Over the years, these meetings have addressed critical topics like doubling farmers' income, water conservation, and improving ease of doing business.

Important Points

• Cooperative Federalism:

• NITI Aayog functions as a platform to strengthen cooperation between the Centre and states. The governing council serves as the primary mechanism to achieve this objective.

• By aligning the developmental priorities of the states and the Centre, the Governing Council ensures a balanced approach to national progress.

• Sustainable Development Goals (SDGs):

• NITI Aayog is the nodal agency responsible for monitoring and implementing the SDGs in India. The Governing Council meetings often focus on strategies to achieve these goals.

• The SDGs cover a broad range of objectives, including poverty eradication, quality education, gender equality, and climate action.

Q29. Answer: (c) Article 239AA

The correct answer is Article 239AA.

Key Points

• Article 239AA of the Indian Constitution provides a special status to the National Capital Territory (NCT) of Delhi. It establishes a Legislative Assembly for Delhi and defines its powers and responsibilities.

• The 106th Constitutional Amendment Act introduced provisions to ensure reservation for women in the Legislative Assembly of Delhi. This amendment aligns with the goal of empowering women in politics and governance.

• Under Article 239AA, the Legislative Assembly of Delhi has the power to legislate on matters listed in the State List and Concurrent List, except for subjects like land, police, and public order. Hence, the amendment focuses on enhancing representation and inclusivity.

• The reservation for women in the Legislative Assembly of Delhi is a significant step toward achieving gender equity and ensuring active participation of women in policymaking. Thus, Article 239AA was amended to accommodate this provision.

• Hence, the correct answer is Article 239AA.

Additional Information

• Article 239AA of the Indian Constitution:

• Article 239AA was added by the 69th Constitutional Amendment Act in 1991. It provides Delhi with the status of a National Capital Territory and establishes a Legislative Assembly.

• The Legislative Assembly has the authority to legislate on matters except for land, police, and public order, which remain under the jurisdiction of the Central Government.

• 106th Constitutional Amendment Act:

• This amendment aimed to improve women's representation in governance, particularly in the Legislative Assembly of Delhi.

• It reflects India's commitment to achieving gender equity and strengthening the democratic process by ensuring the inclusion of women in decision-making roles.

• Women's Reservation in Governance:

• The provision for women's reservation ensures at least 33% representation of women in legislative bodies, promoting inclusivity and empowering women in politics.

• This move aligns with global trends of increasing women's participation in governance and addressing gender disparities.

Important Points

• Key Features of Article 239AA:

• It grants Delhi a special status, differentiating it from other Union Territories.

• The Legislative Assembly of Delhi has 70 members, with provisions for reservation as per constitutional amendments.

• Impact of Women's Reservation:

• Empowers women by ensuring their participation in governance and decision-making processes.

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• Helps address gender disparity in political representation and strengthens democratic values.

Q30. Answer: (a) 31 years

The correct answer is 31 years.

Key Points

• Life expectancy refers to the average number of years a person is expected to live based on current mortality rates.

• In 1947, at the time of India's independence, the life expectancy was extremely low, averaging around 31 years.

• This low figure reflected the poor socioeconomic conditions, widespread poverty, lack of healthcare facilities, and limited access to education during colonial rule.

• Several factors contributed to the low life expectancy, such as high rates of infant mortality, malnutrition, and infectious diseases like malaria and tuberculosis.

• Post-independence, the government of India began investing in public health infrastructure, reducing mortality rates, and improving overall life expectancy over the decades.

• The life expectancy at birth in India has shown significant improvement since 1947, increasing to over 70 years as of 2023, due to advancements in healthcare, sanitation, and education.

• Hence, the correct answer is 31 years.

Additional Information

• Factors Influencing Life Expectancy in 1947:

• Poverty: A significant portion of India's population lived in poverty during the pre-independence and immediate post-independence periods. This limited access to basic resources like nutritious food and clean drinking water.

• Healthcare: India lacked proper healthcare facilities, medical infrastructure, and trained personnel during this time, leading to high mortality rates.

• Diseases: Epidemics of diseases such as cholera, malaria, and tuberculosis were rampant due to inadequate sanitation and lack of public health awareness.

• Infant Mortality: The infant mortality rate was extremely high, as many infants did not survive beyond their first year of life due to malnutrition and lack of medical care.

• Life Expectancy Trends Post-1947:

• Post-independence, India focused on improving public health through initiatives such as the National Health Mission, vaccination programs, and investments in rural healthcare.

• The introduction of family planning and awareness programs contributed to controlling population growth and improving living conditions.

• The creation of infrastructure like hospitals, sanitation systems, and access to clean drinking water gradually improved the quality of life and increased life expectancy.

Important Points

• Historical Context:

• The British colonial administration did not prioritize healthcare and sanitation, resulting in poor health outcomes for the population.

• The lack of infrastructure and neglect of rural areas further exacerbated health issues.

• Comparison with Other Countries:

• In 1947, India's life expectancy was significantly lower than that of developed countries, which averaged around 60-70 years during the same period.

• Countries with better healthcare systems and economic conditions had higher life expectancy rates.

• Current Scenario:

• As of 2023, India’s life expectancy has risen to over 70 years, showcasing the progress in public health and socioeconomic development.

• Despite improvements, challenges such as non-communicable diseases, lifestyle disorders, and healthcare access disparities persist.

Q31. Answer: (c) Declared education as a Fundamental Right

The correct answer is Declared education as a Fundamental Right.

Key Points

• The 86th Constitutional Amendment Act, 2002, inserted Article 21A into the Constitution of India. This article made free and compulsory education a Fundamental Right for children aged 6 to 14 years.

• The Act also amended Article 45, which directs the State to endeavor to provide early childhood care and education for all children below the age of six years.

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• Additionally, the Act added Article 51A(k) to the list of Fundamental Duties. It mandates parents or guardians to provide opportunities for education to their children between the ages of 6 and 14 years.

• This amendment significantly reinforced India's commitment to universal elementary education by making it a legal obligation for both the State and parents. Hence, the correct answer is option 3.

Additional Information

• Free and Compulsory Education under Article 21A:

• Under Article 21A, every child in the age group of 6 to 14 years has the right to free and compulsory education in a manner determined by the State.

• The Right to Education Act, 2009 (RTE Act), was enacted to give effect to this constitutional provision. It specifies the norms and standards for schools, pupil-teacher ratios, and minimum infrastructure requirements.

• Amendments to Articles 45 and 51A:

• The directive in Article 45 was revised to focus on early childhood care for children below the age of six years, emphasizing the importance of pre-school education for holistic development.

• Article 51A(k) emphasizes the responsibility of parents and guardians to ensure that their children or wards receive education, thereby involving families in the process of ensuring universal education.

Important Points

• The Right of Children to Free and Compulsory Education Act (RTE Act), 2009, mandates free education for children up to elementary level (Class 1 to Class 8).

• This Act also prohibits the charging of capitation fees, physical punishment, mental harassment, and discrimination in schools.

• The National Education Policy (NEP) 2020 builds upon this foundation by emphasizing equitable and inclusive education for all, starting from early childhood care to higher education.

• India is one of the 135 countries where free and compulsory education for children is a constitutional right, demonstrating its commitment to achieving UN Sustainable Development Goal (SDG) 4 – ensuring inclusive and equitable quality education for all.

Q32. Answer: (b) 3 years

The correct answer is 3 years.

Key Points

• As per the May 2025 Supreme Court ruling, law graduates are required to have a minimum of 3 years of legal practice to be eligible for Civil Judge examinations.

• This ruling ensures that candidates appearing for the Civil Judge examinations have substantial practical experience in the legal field before taking up judicial responsibilities.

• The decision was made to improve the quality of judgments by ensuring that candidates have a thorough understanding of legal procedures and nuances, which can only be gained through hands-on experience. Hence, the minimum requirement of 3 years was deemed necessary.

• Earlier, the eligibility criteria for appearing in the Civil Judge examinations varied across states. While some states required 1 year of legal practice, others allowed fresh graduates to appear for the examination directly after law school.

• The Supreme Court ruling brought consistency and uniformity across India by setting the standard requirement to 3 years of legal practice. This decision ensures that all candidates meet a minimum threshold of practical experience before entering the judiciary.

• The ruling highlights the importance of practical experience in building a competent judicial workforce. A minimum of 3 years of legal practice was considered essential to provide candidates with adequate exposure to courtroom proceedings, client handling, and drafting skills. Hence, option 3 years is correct.

Additional Information

• Eligibility Criteria for Civil Judge Examinations:

• Apart from the requirement of 3 years of legal practice, candidates must hold a Bachelor’s degree in Law (LLB) from a recognized university.

• The age criteria for applying vary across states but typically range between 21 to 35 years.

• Indian Constitution does not prescribe the eligibility criteria for the judiciary explicitly; instead, it is governed by state-specific rules and regulations.

• Role of Supreme Court in Judicial Reforms:

• The Supreme Court, being the apex judicial authority in India, is responsible for ensuring uniformity and consistency in legal and judicial standards across the nation.

• The May 2025 ruling is an example of its commitment to strengthening the judiciary by enforcing practical experience requirements for judicial candidates.

• Such reforms aim to create a robust judicial system and uphold the principles of justice.

Important Points

• Significance of Practical Experience:

• Practical experience enables law graduates to understand courtroom dynamics, legal drafting, and argumentation skills, which are crucial for delivering effective judgments.

• The requirement of 3 years ensures that candidates have dealt with real-world legal cases, which prepares them for the challenges of judicial roles.

• Uniformity in Eligibility Criteria:

• The Supreme Court ruling resolved discrepancies in eligibility criteria among various states, ensuring a uniform standard for all aspirants.

• This reform is vital for maintaining equality and fairness in the judiciary recruitment process across India.

Q33. Answer: (b) Species found only in a particular area and nowhere else

The correct answer is Species found only in a particular area and nowhere else.

Key Points

• Endemic species are organisms that are native to and found exclusively in a particular geographical region. They are not found naturally anywhere else in the world.

• These species evolve and adapt to the specific environmental conditions of their habitat over time. Their survival is closely linked to the health and stability of the ecosystem they belong to.

• The presence of endemic species is often an indicator of a region's unique biodiversity and ecological significance.

• Examples of endemic species include the Nilgiri Tahr found in the Western Ghats of India, the Galápagos tortoise from the Galápagos Islands, and the Koala, which is native to Australia.

• Endemic species are often more vulnerable to extinction due to habitat destruction, climate change, invasive species, and human activities.

Additional Information

• Characteristics of Endemic Species:

• They are highly specialized and adapted to their native environment. This specialization often means they cannot survive in other conditions or regions.

• Endemic species can be found in geographically isolated areas such as islands, mountains, or specific regions like the Western Ghats or the Himalayas.

• Threats to Endemic Species:

• Habitat destruction caused by deforestation, urbanization, and agricultural expansion.

• Invasive species that compete with or prey on endemic species.

• Climate change and global warming, which can alter the specific environmental conditions that endemic species rely on.

• Conservation Efforts:

• Protected areas such as wildlife sanctuaries, national parks, and biosphere reserves help preserve endemic species and their habitats.

• Awareness campaigns and biodiversity conservation programs are crucial for protecting these species.

• International treaties like the Convention on Biological Diversity (CBD) aim to safeguard unique biodiversity, including endemic species.

Important Points

• Option 1: "Exotic animals brought from other countries" refers to non-native species introduced into a new area, either intentionally or accidentally. These species are not endemic but are classified as exotic or alien species.

• Option 3: "Species that have migrated recently" are termed as migratory species. These species move from one location to another, often seasonally, in search of food, breeding grounds, or suitable environmental conditions.

• Option 4: "Species found in every forest" are not endemic species. Such species are usually referred to as cosmopolitan species, which are widely distributed across various regions and ecosystems.

Q34. Answer: (d) Static friction opposes impending motion and kinetic friction opposes actual motion.

The correct answer is Static friction opposes impending motion and kinetic friction opposes actual motion..

Key Points

• Friction is the resistive force that opposes the motion of an object. It arises due to the interaction between surfaces in contact.

• There are two types of friction: static friction and kinetic friction. Static friction occurs when an object is stationary, while kinetic friction occurs when it is in motion.

• Static friction opposes impending motion: Static friction acts to prevent an object from starting to move when an external force is applied. It adjusts its magnitude up to a maximum limit (known as limiting friction). Hence, statement 4 is correct.

• Kinetic friction opposes actual motion: Once an object starts moving, kinetic friction comes into play. It resists the actual motion

of the object. Unlike static friction, kinetic friction has a constant value. Hence, statement 4 is correct.

• Static friction is generally greater than kinetic friction: This is because more force is required to initiate motion than to maintain it once the object is in motion. Statement 3 is incorrect.

• Area of contact: Both static and kinetic friction do not depend on the area of contact between the surfaces. It primarily depends on the nature of the surfaces and the normal force. Statement 1 is incorrect.

• Static friction does not oppose actual motion: Static friction prevents impending motion; kinetic friction opposes actual motion. Hence, statement 2 is incorrect. Statement 2 is incorrect.

• Hence, the correct answer is Static friction opposes impending motion and kinetic friction opposes actual motion.

Additional Information

• Static friction:

• Static friction acts when an object is at rest. It adjusts its magnitude based on the external force applied until the object starts moving.

• The maximum value of static friction is called limiting friction. Beyond this point, motion begins, and kinetic friction takes over.

• Kinetic friction:

• Kinetic friction acts when an object is in motion. Its value remains constant and does not depend on the velocity of the object.

• It is generally less than static friction, making it easier to continue motion once the object has started moving.

• Factors affecting friction:

• The frictional force depends on the nature of the surfaces in contact (smooth or rough) and the normal force acting between them.

• It does not depend significantly on the area of contact between the surfaces.

• For example, rubber tires create higher friction on rough roads than on smooth surfaces.

Important Points

• Frictional coefficients:

• The magnitude of friction depends on the coefficient of friction, which is a measure of how rough or smooth the surfaces are.

• The static coefficient is usually higher than the kinetic coefficient, explaining why static friction is stronger.

• Applications of friction:

• Friction is essential for movement, such as walking or driving, as it provides the necessary grip.

• Friction is also used in braking systems in vehicles and machinery to stop motion effectively.

• However, excessive friction can lead to wear and tear, reducing the efficiency of machines.

Q35. Answer: (c) Article 371A

The correct answer is Article 371A.

Key Points

• Article 371A of the Indian Constitution provides special provisions for the state of Nagaland.

• It ensures that no Act of Parliament related to religious or social practices of the Nagas, Naga customary law and procedure, administration of civil and criminal justice involving decisions according to Naga customary law, and ownership and transfer of land and its resources will apply to Nagaland unless the Legislative Assembly of Nagaland decides to do so.

• This provision emphasizes the preservation of Naga culture, identity, and autonomy by safeguarding their customary laws and practices. Hence, the correct option is Article 371A.

• The inclusion of Article 371A was a result of the 16-point Agreement signed between the Government of India and the leaders of the Naga People's Convention in 1960.

• It was introduced to ensure that the social, cultural, and traditional practices of the Nagas remain protected from external influences and interference.

Additional Information

• Article 371A:

• Article 371A was introduced by the 13th Amendment Act, 1962, following the creation of Nagaland as the 16th state of India.

• It allows the Legislative Assembly of Nagaland to decide whether acts of Parliament related to specific matters like ownership of land, resources, and customary laws should apply to the state or not.

• This provision grants Nagaland a special status, safeguarding the autonomy of its people and their unique traditions.

• Historical Background:

• The 16-point Agreement signed between the Government of India and the Naga leaders in 1960 laid the foundation for Nagaland's statehood and its special provisions under Article 371A.

• Nagaland was officially formed on December 1, 1963.

• Other Articles with Special Provisions:

• Article 370: Provided special status to Jammu and Kashmir (now abrogated).

• Article 371B: Contains provisions specific to Assam.

• Article 371D: Contains provisions for Andhra Pradesh and Telangana related to equitable opportunities in public employment and education.

Important Points

• Key Highlights of Article 371A:

• It emphasizes that Naga customary practices and laws cannot be overridden by acts of Parliament unless the state legislature agrees.

• It ensures the protection of Naga identity and autonomy, making Nagaland unique among Indian states.

• Role in Governance:

• Article 371A provides a legal framework for preserving Naga traditions while integrating the state into the Indian Union.

• The state legislature plays a crucial role in deciding whether central laws apply to Nagaland, ensuring local autonomy.

Q36. Answer: (c) Satellite Bus as a Service (SBaaS)

The correct answer is Satellite Bus as a Service (SBaaS).

Key Points

• In April 2025, IN-SPACe (Indian National Space Promotion and Authorization Center) launched an initiative to invite private firms to participate in the development of modular satellite platforms. This is aimed at enabling multi-payload hosting to reduce dependency on foreign satellite infrastructure. This statement is correct.

• The initiative was named "Satellite Bus as a Service" (SBaaS). It focuses on providing modular and scalable satellite buses to host multiple payloads, allowing private companies to utilize the platform for commercial and scientific purposes. Hence, the name of the initiative is correct.

• The purpose of the SBaaS initiative is to reduce costs and timeframes for satellite deployment by creating a standardized platform. This benefits private space companies by offering a plug-and-play satellite bus solution. Hence, the initiative aligns with its goals.

• It also seeks to enhance the competitiveness of Indian private space firms on the global stage by providing indigenous satellite solutions. This supports the broader vision of "Atmanirbhar Bharat" (Self-reliant India) in the space sector. This is a correct observation.

• The SBaaS initiative is a collaborative effort between IN-SPACe, private firms, and startups to boost innovation and promote the commercialization of space technologies. Hence, it is a correct statement.

Additional Information

• IN-SPACe:

• IN-SPACe was established in 2020 as an autonomous body under the Department of Space (DoS) to promote and regulate the participation of non-governmental entities (NGEs) in the space sector.

• It facilitates private firms in developing, testing, and launching space technologies and ensures collaboration with ISRO for technical and infrastructural support.

• Satellite Bus:

• A satellite bus is the core framework of a satellite that includes components such as power systems, thermal control, and propulsion systems. It serves as a base structure to host various payloads.

• The modular satellite buses reduce the design complexity and allow multiple organizations to use a single platform for launching their payloads.

• Advantages of SBaaS:

• Cost Efficiency: Reduces costs associated with designing and building custom satellite buses for individual payloads.

• Time-Saving: Decreases the time required for satellite development and deployment.

• Commercialization: Encourages private players to invest in space technology by providing ready-to-use solutions.

• Global Competitiveness: Enhances India's position in the global satellite market by offering indigenous solutions.

• Other Notable Space Initiatives:

• PSLV-C53 Mission: A dedicated commercial satellite launch mission by ISRO.

• Indian Space Association (ISpA): Established to facilitate collaboration between the government and private players in the space sector.

Important Points

• The SBaaS initiative is part of India's broader effort to develop indigenous space technology and reduce reliance on foreign infrastructure.

• The program encourages the participation of startups, providing them with opportunities to test and deploy their technologies.

• It aligns with the global trend of commercializing the space industry, promoting innovation, and ensuring sustainable and

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cost-effective space missions.

• By inviting private firms, India aims to strengthen its space ecosystem and increase its contribution to the global satellite market, which is projected to grow significantly in the coming years.

Q37. Answer: (a) the first and foremost Bhakti poet

The correct answer is the first and foremost Bhakti poet.

Key Points

• Gyaneshwar (born in 1275 A.D.) was a prominent figure in Marathi literature. He is considered one of the most influential and revered Bhakti poets in Indian history.

• He is best known for his Bhakti movement contributions, focusing on devotion (Bhakti) as a means to achieve spiritual enlightenment and unity with God. Hence, statement 1 is correct.

• His works, such as the "Dnyaneshwari" (a commentary on the Bhagavad Gita), played a vital role in popularizing spiritual knowledge in the Marathi language.

• Gyaneshwar's writings emphasized the importance of devotion, simplicity, and universal brotherhood, which resonated with the masses and helped spread the Bhakti movement. Hence, statement 1 is correct.

• He was not a court historian, playwright, or compiler of ancient texts. His focus was entirely on religious and spiritual themes. Statements 2, 3, and 4 are incorrect.

• The Bhakti movement, championed by figures like Gyaneshwar, had a profound impact on Indian society, promoting equality and devotion over ritualism.

• Hence, the correct answer is the first and foremost Bhakti poet.

Additional Information

• About Gyaneshwar:

• Gyaneshwar was born in 1275 A.D. in Maharashtra. He was deeply influenced by the teachings of his family and the spiritual environment of his time.

• He authored the "Dnyaneshwari", a Marathi commentary on the Bhagavad Gita, making spiritual knowledge accessible to the common people.

• His works reflect his deep understanding of Vedanta, Bhakti, and spiritual philosophy, emphasizing equality and devotion.

• The Bhakti Movement:

• The Bhakti movement emerged in India as a spiritual and social reform movement, advocating devotion to God as the path to salvation.

• Key figures of the movement include Gyaneshwar, Kabir, Mirabai, Tulsidas, and Chaitanya Mahaprabhu.

• It rejected ritualism and caste distinctions, promoting universal brotherhood and spiritual equality.

• The movement contributed significantly to the development of regional languages like Marathi, Hindi, Bengali, and Tamil, as saints often composed their works in local languages.

Important Points

• Impact of Gyaneshwar:

• He was instrumental in shaping the spiritual and literary landscape of Maharashtra. His works continue to inspire people even today.

• The Dnyaneshwari is revered as one of the finest spiritual texts in Marathi literature.

• His teachings emphasized selfless devotion, equality, and the realization of God as the ultimate truth.

• Relevance of the Bhakti Movement:

• The movement helped bridge gaps between different religious communities and fostered a spirit of tolerance and harmony.

• It profoundly influenced Indian literature, culture, and spiritual practices, promoting regional languages and devotional music.

Q38. Answer: (a) Tamil Nadu

The correct answer is Tamil Nadu.

Key Points

• The Karakattam dance, also known as Karagattam, is a traditional folk dance popular in the state of Tamil Nadu. It is performed as an offering to the rain goddess, Mariamman.

• The dance is characterized by its unique feature of balancing pots or pitchers on the dancer’s head while performing intricate movements. This requires immense skill and concentration.

• Karakattam is typically accompanied by traditional Tamil music and involves vibrant costumes, rhythmic steps, and graceful body movements. Hence, this art form is deeply rooted in Tamil Nadu culture.

• The dance is usually performed during village festivals and temple ceremonies as a form of devotion and gratitude to the gods for rain and prosperity.

• Traditionally, Karakattam performers are known for their acrobatic skills, which include balancing water-filled pots on their heads while dancing. This symbolizes humility and dedication to the divine. Hence, Tamil Nadu is the state where Karakattam is most prevalent.

• Hence, the correct answer is Tamil Nadu.

Additional Information

• About Karakattam:

• Karakattam is one of the oldest folk dances of Tamil Nadu, having roots in the agrarian culture of the region.

• The dance is performed in honor of Mariamman, the goddess of rain and fertility, who is worshiped in Tamil Nadu for her powers to bring prosperity and health.

• Traditionally, Karakattam was performed during village festivals and temple rituals to appease the goddess and seek her blessings.

• The performers often use props such as brass pots, flowers, and other sacred items that are balanced on their heads during the dance.

• Costumes worn by Karakattam dancers are typically colorful and adorned with traditional designs, reflecting the rich cultural heritage of Tamil Nadu.

• Other Traditional Dances of Tamil Nadu:

• Bharatanatyam: One of the oldest classical dance forms in India, originating from Tamil Nadu, characterized by intricate footwork and expressive gestures.

• Mayilattam: A folk dance where performers dress as peacocks and imitate the bird's movements.

• Oyilattam: Another traditional Tamil Nadu dance performed during festivals, which involves vibrant movements and rhythms.

Important Points

• Religious Significance: Karakattam is not just a dance form but also a way to express gratitude and devotion to nature and the divine. It is a symbol of cultural and spiritual harmony in Tamil Nadu.

• Global Recognition: This traditional dance has gained recognition worldwide due to its vibrant presentation and cultural significance.

• Modern Adaptations: Over the years, Karakattam has evolved with modern influences, while still retaining its traditional essence. It is now performed on larger stages, including cultural festivals and events, beyond its original village setting.

Q39. Answer: (c) Sarvam AI

The correct answer is Sarvam AI.

Key Points

• In August 2024, an Indian AI startup, Sarvam AI, launched Shuka 1.0, an open-source audio language model.

• The model supports 10 Indian languages, indicating its potential for promoting linguistic diversity in the digital space.

• The launch of Shuka 1.0 demonstrates Sarvam AI’s commitment to creating inclusive AI solutions for the multilingual and multicultural Indian population.

• The development of Shuka 1.0 aligns with India’s growing focus on advancing AI-driven technologies in diverse sectors, including communication, education, and culture.

• By making the model open-source, Sarvam AI encourages collaboration and innovation among developers and researchers in the field of AI and language technologies.

• Shuka 1.0 supports audio-based language processing, which can be used in applications like voice recognition, speech synthesis, and language translation.

• The launch of such a model is particularly significant in a country as linguistically diverse as India, where there are 22 scheduled languages and hundreds of regional dialects. Hence, the correct answer is Sarvam AI.

Additional Information

• Sarvam AI:

• Sarvam AI is an Indian startup focused on developing advanced AI-based solutions for diverse challenges, particularly in the linguistic and cultural domains.

• The company aims to promote inclusivity and address the needs of India’s diverse population by leveraging AI-driven technologies.

• Shuka 1.0:

• Shuka 1.0 is an open-source audio language model that supports 10 Indian languages. This step is critical for enhancing the accessibility of Indian languages in AI applications.

• The model can be integrated into various technologies, including smart assistants, transcription services, and translation tools, to better serve Indian users.

• Importance of Open-Source AI:

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• Open-source models like Shuka 1.0 encourage collaboration among developers, researchers, and organizations to improve the technology further and make it more accessible to the public.

• Such initiatives also help in creating tailored solutions for specific needs, such as accessible technology for people with disabilities or tools to preserve regional languages.

• AI in India:

• India is witnessing a rapid growth in AI-driven innovations, particularly in areas like healthcare, education, agriculture, and communication.

• Government initiatives like Digital India and National AI Strategy are encouraging the development and adoption of AI technologies across the country.

Important Points

• Key Features of Shuka 1.0:

• The model supports audio-based language processing, enabling applications like speech-to-text, voice control, and language translation.

• It is designed to address the unique linguistic diversity of India, making it a valuable tool for promoting regional languages in digital platforms.

• Applications of AI in Language Technology:

• AI-powered tools can help in language preservation, especially for endangered languages, by creating databases and learning models.

• Such technologies are also critical in improving accessibility for people with disabilities, such as providing real-time captions or translations.

• The use of AI in language technology can also enhance educational tools, enabling students to learn in their native languages.

Q40. Answer: (d) Indonesia

The correct answer is Indonesia.

Key Points

• Garuda Shakti: It is a bilateral military exercise between India and Indonesia. The collaboration is aimed at strengthening counter-terrorism cooperation and enhancing the joint operational capabilities of the armies of both nations.

• The name 'Garuda Shakti' signifies the shared cultural and historical ties between India and Indonesia. Garuda is a mythical bird in Hindu and Buddhist traditions, symbolizing strength and courage.

• The joint military exercise focuses on counter-terrorism operations, jungle warfare techniques, and other military strategies to enhance mutual understanding and interoperability between the two forces.

• India and Indonesia share strong diplomatic ties, and Garuda Shakti is a testament to their commitment towards regional security and cooperation. The exercise fosters trust and collaboration between the two nations. Hence, statement 1 is correct.

• The exercise is conducted in alternate countries, showcasing the mutual respect for sovereignty and military cooperation. In May 2025, the exercise was organized to deepen the defense relationship between the two nations. Hence, statement 2 is correct.

Additional Information

• India-Indonesia Relations:

• Diplomatic ties: India and Indonesia have shared diplomatic ties since 1949. Indonesia is a strategic partner for India in the ASEAN region.

• Economic collaboration: Trade between the two nations has grown significantly over the years. India imports palm oil, coal, and rubber from Indonesia, while exporting textiles, machinery, and agricultural products.

• Both countries are members of multilateral organizations like the G20, ASEAN Regional Forum (ARF), and the East Asia Summit (EAS), enhancing their geopolitical coordination.

• Military Cooperation:

• Joint Exercises: 'Garuda Shakti' is one of the major military exercises between India and Indonesia, focusing on counter-terrorism and peacekeeping operations.

• The exercise promotes information sharing and enhances coordination for disaster response, regional security challenges, and anti-terrorism measures.

• Naval Cooperation: Both nations also collaborate through naval exercises like 'Samudra Shakti' to ensure maritime security in the Indian Ocean Region.

Important Points

• Strategic Significance: The exercise enhances India's defense diplomacy, showcasing its capability to work with partner nations on key security challenges.

• Regional Stability: Both nations aim to promote peace and stability in the Asia-Pacific region by addressing shared concerns like terrorism, piracy, and illegal trafficking.

• Future Prospects: Enhanced cooperation between India and Indonesia can pave the way for joint ventures in defense technology

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development and regional security frameworks.

Q41. Answer: (c) 62

Shortcut Trick

Let the middle odd number between the two consecutive even numbers be n.

The numbers can be written as (n − 1) and (n + 1). Their sum is 2n.

Given: $(n - 1)^2 + (n + 1)^2 = 1924$

=> $2(n^2 + 1) = 1924 \Rightarrow n^2 + 1 = 962 \Rightarrow n^2 = 961 \Rightarrow n = 31$

The sum of the two numbers is $2n = 2 \times 31 = 62$.

Therefore The correct answer is 62.

Alternate Method

Given:

The sum of the squares of two consecutive even natural numbers is 1924.

Calculations:

Let the two consecutive even natural numbers be x and x + 2.

=> $x^2 + (x + 2)^2 = 1924$

Using the identity $(a + b)^2 = a^2 + 2ab + b^2$:

=> $x^2 + x^2 + 4x + 4 = 1924$

=> $2x^2 + 4x + 4 - 1924 = 0$

=> $2x^2 + 4x - 1920 = 0$

Divide the entire equation by 2 to simplify:

=> $x^2 + 2x - 960 = 0$

Factorizing the quadratic equation by splitting the middle term:

=> $x^2 + 32x - 30x - 960 = 0$

=> $x(x + 32) - 30(x + 32) = 0$

=> $(x - 30)(x + 32) = 0$

=> $x = 30$ or $x = -32$

Since the question specifies natural numbers, we ignore the negative value and take x = 30.

The consecutive even numbers are 30 and 32.

=> Sum of the numbers = 30 + 32 = 62

Therefore The correct answer is 62.

Additional Information

Consecutive Numbers

Consecutive even or odd numbers always have a common difference of 2. They can be generally represented as x and x + 2 to set up algebraic equations.

Simplifying Sum of Squares

When calculating the sum of squares of two consecutive numbers differing by 2, assuming them as (n − 1) and (n + 1) simplifies the equation to $2(n^2 + 1)$, canceling out the linear terms completely.

Nature of Roots

A quadratic equation $ax^2 + bx + c = 0$ yields two roots. In practical word problems involving natural numbers, dimensions, or time, negative or fractional roots are discarded.

Q42. Answer: (b) 156°

Shortcut Trick

For any regular polygon, the exterior angle is directly calculated as 360° ÷ number of sides.

=> Exterior Angle = 360° ÷ 15 = 24°

The interior and exterior angles always form a linear pair (sum = 180°).

=> Interior Angle = 180° − Exterior Angle

=> Interior Angle = 180° − 24° = 156°

Therefore The correct answer is 156°.

Alternate Method

Given:

Number of sides of the regular polygon (n) = 15

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Formula Used:

Sum of interior angles of an n-sided polygon = (n − 2) × 180°

Each interior angle = [(n − 2) × 180°] ÷ n

Interior = 156°

Exterior = 24°

Sum of Interior & Exterior Angle = 180°

Calculations:

=> Each interior angle = [(15 − 2) × 180°] ÷ 15

=> Each interior angle = [13 × 180°] ÷ 15

=> Each interior angle = 13 × 12°

=> Each interior angle = 156°

Therefore The correct answer is 156°.

Additional Information

Sum of Interior Angles

For a polygon with n sides, the sum of all interior angles is given by (n − 2) × 180°.

Sum of Exterior Angles

The sum of exterior angles of any convex polygon is always 360°, regardless of the number of sides.

Number of Diagonals

The number of diagonals that can be drawn in an n-sided polygon is given by n(n − 3) ÷ 2.

Q43. Answer: (c) Rs. 1,25,000

Shortcut Trick

4% increase = +1/25 => Multiplying factor = 26/25

24% increase = +6/25 => Multiplying factor = 31/25

Total multiplying factor = (26/25) × (31/25) = 806/625

Initial Sales = Current Sales × (625/806)

Initial Sales = 1,61,200 × (625/806) = 200 × 625 = 1,25,000

Therefore The correct answer is Rs. 1,25,000.

Alternate Method

Given:

First year increase = 4%

Second year increase = 24%

Current sales (after 2 years) = Rs. 1,61,200

Formula Used:

Final Value = Initial Value × (1 + R1/100) × (1 + R2/100)

Successive Percentage IncreaseInitial? (x)+4%× 26/25After 1 yr1.04x+24%× 31/25Current1,61,200x × (26/25) × (31/25) = 1,61,200

Calculations:

=> Let the initial sales two years ago be x.

=> Final Sales = x × (1 + 4/100) × (1 + 24/100)

=> 1,61,200 = x × (104/100) × (124/100)

=> 1,61,200 = x × (26/25) × (31/25)

=> 1,61,200 = x × (806/625)

=> x = 1,61,200 × (625/806)

=> x = 200 × 625

=> x = 1,25,000

Therefore The correct answer is Rs. 1,25,000.

Additional Information

Successive Percentage Change

When a value undergoes successive percentage changes of x% and y%, the effective net percentage change is given by the formula: (x + y + xy/100)%.

Multiplying Factor Method

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For an increase of R%, the multiplier is (1 + R/100). For successive changes, simply multiply all individual factors: Final Value = Initial Value × Factor1 × Factor2.

Compound Interest Analogy

Successive percentage increase follows the exact same logical framework as compound interest, representing cumulative growth upon previous growth over multiple periods.

Q44. Answer: (a) -30

Shortcut Trick

According to the BODMAS rule, perform division and multiplication first:

(−60) ÷ (−12) = 5

(−2) × 8 = −16

Substitute these results back into the original expression:

=> −9 − 5 − 16 = −30

Therefore The correct answer is -30.

Alternate Method

Given:

(−9) − (−60) ÷ (−12) + (−2) × 8

Concept Used:

BODMAS Rule: Priority of mathematical operations follows the order Bracket, Order, Division, Multiplication, Addition, and Subtraction.

Calculations:

=> (−9) − [(−60) ÷ (−12)] + [(−2) × 8]

=> −9 − (5) + (−16)

=> −9 − 5 − 16

=> −14 − 16

=> −30

Therefore The correct answer is -30.

Additional Information

BODMAS Rule

It specifies the correct order of operations to solve a mathematical expression: Brackets, Order (powers and roots), Division, Multiplication, Addition, and Subtraction.

Sign Convention for Multiplication and Division

The product or quotient of two numbers with the same sign (both negative or both positive) is always positive. The product or quotient of one positive and one negative number is always negative.

Sign Convention for Addition

When adding numbers with the same sign, you simply add their absolute values and keep the common sign. For example, −A − B = −(A + B).

Q45. Answer: (b) 80/3

Shortcut Trick

Total work = LCM of 30, 16, and 15 = 240 units.

Efficiency of Anjani (A) = 240 ÷ 30 = 8 units/day.

Efficiency of (A + K) = 240 ÷ 16 = 15 units/day, and (A + K + S) = 240 ÷ 15 = 16 units/day.

Efficiency of Sushmita (S) = 16 − 15 = 1 unit/day.

Time taken by A + S = 240 ÷ (8 + 1) = 240 ÷ 9 = 80/3 days.

Therefore The correct answer is 80/3 days.

Alternate Method

Given:

Time taken by Anjani (A) = 30 days.

Time taken by Anjani and Khushbu (A + K) = 16 days.

Time taken by Anjani, Khushbu, and Sushmita (A + K + S) = 15 days.

Formula Used:

Total Work = Efficiency × Time taken

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Efficiency is inversely proportional to time.

Person	Days	Total Work	Efficiency
A	30	240	240 ÷ 30 = 8
A + K	16	240 ÷ 16 = 15	
A + K + S	15	240 ÷ 15 = 16	

Calculations:

=> Efficiency of Sushmita (S) = Efficiency of (A + K + S) − Efficiency of (A + K)

=> Efficiency of S = 16 − 15 = 1 unit/day

=> Efficiency of Anjani (A) = 8 units/day

=> Combined efficiency of Anjani and Sushmita (A + S) = 8 + 1 = 9 units/day

=> Time taken by A and S together = Total Work ÷ Combined Efficiency

=> Time taken = 240 ÷ 9 = 80/3 days

Therefore The correct answer is 80/3 days.

Additional Information

Pipes & Cisterns

Similar to the time and work concept, an inlet pipe has a positive filling efficiency while an outlet pipe (or leak) has a negative emptying efficiency. Time to fill = Total Capacity ÷ Net Efficiency.

Work & Wages

Total wages are distributed strictly in proportion to the actual amount of work done by each individual. If they work for the exact same number of days, the wages are divided in the ratio of their efficiencies.

Alternate Day Work

When individuals work on alternate days, find the total work done in one complete cycle (e.g., 2 days for 2 people) and divide the total work by the cycle work to find the number of full cycles needed.

Q46. Answer: (a) 52 km/hr

Shortcut Trick

Remaining Distance = 886 − (53 × 8) − 150 = 312 km

Remaining Time = 17 − 8 − (150 ÷ 50) = 6 hours

Required Speed = 312 ÷ 6 = 52 km/hr

Therefore The correct answer is 52 km/hr.

Alternate Method

Given:

Total distance = 886 km

Total time = 17 hours

Total Distance: 886 km | Total Time: 17 hours

424 km

150 km

312 km

8 hrs

3 hrs

6 hrs

53 km/hr

50 km/hr

? km/hr

Formula Used:

Distance = Speed × Time

Speed = Distance ÷ Time

Calculations:

=> Distance covered in first 8 hours = 53 × 8 = 424 km

=> Time taken to cover next 150 km = 150 ÷ 50 = 3 hours

=> Total distance covered so far = 424 + 150 = 574 km

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=> Total time used so far = 8 + 3 = 11 hours

=> Remaining distance = 886 − 574 = 312 km

=> Remaining time = 17 − 11 = 6 hours

=> Required speed = 312 ÷ 6 = 52 km/hr

Therefore The correct answer is 52 km/hr.

Additional Information

Average Speed

Average Speed is the ratio of total distance covered to the total time taken. Formula: Average Speed = Total Distance ÷ Total Time.

Relative Speed

When two bodies are moving in the same direction, relative speed is the difference of their speeds (S1 − S2). In opposite directions, it is the sum of their speeds (S1 + S2).

Conversion of Units

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

Q47. Answer: (c) 10 years

Shortcut Trick

In compound interest, if a sum becomes 'x' times in 'T' years, it will become x^n times in n × T years.

Given, the sum becomes 3 times in 5 years.

We need to find the time it takes to become 9 times, which is 3^2 times.

Here, x = 3, T = 5 years, and n = 2.

Required time = n × T = 2 × 5 = 10 years.

Therefore The correct answer is 10 years.

Alternate Method

P

3P

9P

5 years

× 3

5 years

× 3

Total Time = 10 years

Given:

Amount becomes 3 times the principal in 5 years at compound interest.

Formula Used:

A = P(1 + R/100)^t

Calculations:

=> 3P = P(1 + R/100)^5

=> 3 = (1 + R/100)^5 ... (Equation 1)

We need to find the time 't' when the amount becomes 9P.

=> 9P = P(1 + R/100)^t

=> 9 = (1 + R/100)^t

Since $9 = 3^2$, we can substitute the value of 3 from Equation 1.

=> ((1 + R/100)^5)² = (1 + R/100)^t

=> (1 + R/100)^(10) = (1 + R/100)^t

By comparing the powers on both sides:

=> t = 10

Therefore The correct answer is 10 years.

Additional Information

Simple Interest vs Compound Interest

In Simple Interest, the principal remains constant. In Compound Interest, the interest generated is added back to the principal to form a new base for the next compounding period.

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Compound Interest Formula

A = P(1 + R/100)^t, where A is the Final Amount, P is the Principal sum, R is the Rate of interest per annum, and t is the time period in years.

Multiplying Factor in CI

For equal time intervals, the amounts in compound interest are in a geometric progression. The ratio between amounts over any equal continuous time intervals remains strictly constant.

Q48. Answer: (c) 11,628

Shortcut Trick

Let Cost Price (CP) = 100%, then Marked Price (MP) = 136%.

Selling Price (SP) after 25% discount = 136% × 0.75 = 102%.

Profit = SP − CP = 102% − 100% = 2%.

Given 2% = Rs. 171 => MP (136%) = 171 × 68 = Rs. 11,628.

Therefore The correct answer is Rs. 11,628.

Alternate Method

CP = 100x

SP = 102x

MP = 136x

+36% Markup

Profit = 2x

−25% Discount

Given:

=> Markup percentage = 36%

=> Discount percentage = 25%

=> Profit earned = Rs. 171

Let the Cost Price (CP) of the fan be 100x.

=> Marked Price (MP) = 100x + 36% of 100x = 136x

=> Selling Price (SP) = MP − 25% of MP = 136x × 0.75 = 102x

=> Profit = SP − CP = 102x − 100x = 2x

According to the given data, profit is Rs. 171:

=> 2x = 171

=> x = 85.5

=> List Price (MP) = 136x = 136 × 85.5 = 11,628

Therefore The correct answer is Rs. 11,628.

Additional Information

1. Discount and Marked Price

Discount is always calculated on the Marked Price (List Price). Formula: Selling Price (SP) = Marked Price (MP) × (1 − Discount%/100).

2. Relation between CP and MP

When Profit percentage and Discount percentage are given, the direct ratio is: CP / MP = (100 − Discount%) / (100 + Profit%).

3. Successive Discounts

When two successive discounts of a% and b% are applied, the net equivalent discount is given by: [a + b − (a × b)/100]%.

Q49. Answer: (d) 13

Shortcut Trick

To check divisibility by 7, 11, and 13 simultaneously, group the digits into blocks of three from right to left.

The blocks of 788973289 are: 788, 973, 289.

Difference between the sum of odd-placed blocks and even-placed blocks = (788 + 289) − 973 = 1077 − 973 = 104.

Since 104 is exactly divisible by 13 (13 × 8 = 104), the entire number is perfectly divisible by 13.

Therefore The correct answer is 13.

Alternate Method

Given:

Number = 788973289

Method Used:

Test each option systematically using standard divisibility rules.

Calculations:

=> Option 1 (18): A number divisible by 18 must be even. Since 788973289 ends with the digit 9, it is an odd number and not divisible by 18.

=> Option 2 (12): A number divisible by 12 must be divisible by 4 (hence even). Thus, it is not divisible by 12.

=> Option 3 (7) and Option 4 (13): Apply the block divisibility rule for 7, 11, and 13.

=> Split the number into groups of three digits from right to left: 289, 973, 788.

=> Sum of alternating groups = 788 + 289 = 1077.

=> Difference = 1077 − 973 = 104.

=> Check divisibility of 104 by 7: 104 ÷ 7 = 14 with a remainder of 6. So, not divisible by 7.

=> Check divisibility of 104 by 13: 104 ÷ 13 = 8 with a remainder of 0. So, it is divisible by 13.

=> Therefore, 788973289 is exactly divisible by 13.

Therefore The correct answer is 13.

Additional Information

Divisibility Rule of 7, 11, and 13

Make groups of 3 digits starting from the rightmost digit. Find the difference between the sum of the odd-placed groups and the even-placed groups. If this final difference is divisible by 7, 11, or 13, then the original number is also perfectly divisible by 7, 11, or 13 respectively.

Divisibility Rule of 12

A number is divisible by 12 if it is perfectly divisible by both 3 and 4. Consequently, any number divisible by 12 must be an even number.

Divisibility Rule of 18

A number is exactly divisible by 18 if it is an even number (ends in 0, 2, 4, 6, 8) and the sum of its digits is a multiple of 9.

Q50. Answer: (c) Rs. 2,480

Shortcut Trick

Given 7A = 4B = 2C, we can find the ratio using the cover-up method.

A : B : C = (4 × 2) : (7 × 2) : (7 × 4)

=> A : B : C = 8 : 14 : 28 = 4 : 7 : 14

Total parts = 4 + 7 + 14 = 25 parts

A's share = (4 ÷ 25) × 15500 = 4 × 620 = 2480

Therefore The correct answer is Rs. 2480.

Alternate Method

Given:

Total Amount = Rs. 15,500

Condition: 7A = 4B = 2C

Total Amount = Rs. 15,500 (25 units)

A

4 units

B

7 units

C

14 units

A's share = 4 / 25 × 15500 = Rs. 2480

Calculations:

=> Let 7A = 4B = 2C = k

=> A = k/7, B = k/4, C = k/2

=> Ratio A : B : C = 1/7 : 1/4 : 1/2

=> To simplify, multiply by the LCM of 7, 4, and 2 (which is 28).

=> A : B : C = (1/7 × 28) : (1/4 × 28) : (1/2 × 28)

=> A : B : C = 4 : 7 : 14

=> Sum of the ratio parts = 4 + 7 + 14 = 25

=> Value of 1 part = 15500 ÷ 25 = 620

=> A's share = 4 parts = 4 × 620

=> A's share = 2480

Therefore The correct answer is Rs. 2480.

Additional Information

Cover-Up Method for Ratios

When given an equation like aA = bB = cC, the ratio A : B : C can be directly found by hiding the coefficient of the variable and multiplying the other two coefficients. A = (b × c), B = (a × c), C = (a × b).

Inverse Proportion to Direct Ratio

If variables are multiplied by constants equating each other, they are inversely proportional to those constants. Taking the reciprocal of each constant directly gives the actual ratio components.

LCM Method for Fractions

To simplify a fractional ratio like 1/x : 1/y : 1/z into integers, simply multiply each term by the LCM of the denominators x, y, and z.

Q51. Answer: (d) 857/7

Shortcut Trick

Apply the BODMAS rule directly to the expression to solve quickly:

=> 9 × (19 × 16) ÷ 14 + 13 − 86

=> 9 × 304 ÷ 14 − 73

=> 2736 ÷ 14 − 73 => 1368/7 − 73

=> (1368 − 511) / 7 => 857/7

Therefore The correct answer is 857/7.

Alternate Method

Given:

Expression: $9 \times (19 \times (4^2)) \div 14 + 13 - 86$

Formula Used:

BODMAS Rule: Follow the strict sequence of Brackets, Orders (powers), Division, Multiplication, Addition, and Subtraction.

Calculation:

Solve the innermost bracket (power) first:

=> 9 × (19 × 16) ÷ 14 + 13 − 86

Solve the remaining bracket (multiplication):

=> 9 × 304 ÷ 14 + 13 − 86

Perform multiplication next:

=> 2736 ÷ 14 + 13 − 86

Perform division and simplify the fraction:

=> 1368/7 + 13 − 86

Perform subtraction of integers first for easier calculation:

=> 1368/7 − 73

Take the lowest common multiple (LCM) to subtract the integer from the fraction:

=> (1368 − 73 × 7) / 7

=> (1368 − 511) / 7

=> 857/7

Therefore The correct answer is 857/7.

Additional Information

BODMAS Rule

BODMAS dictates the correct order of operations in math: Brackets, Orders (powers/roots), Division, Multiplication, Addition, and Subtraction. Expressions must be evaluated strictly in this sequence to avoid calculation errors.

Fraction Simplification

When adding or subtracting whole numbers and fractions, convert the whole number to a fraction by taking the LCM of the denominators to combine the terms effectively.

Rules of Exponents

An exponent signifies repeated multiplication of the base. For example, $a^2 = a \times a$. Always calculate the exponent before attempting multiplication or division connected to it.

Q52. Answer: (b) Rs. 2,250

Shortcut Trick

A discount of 20% is equivalent to a fraction of 1/5.

This means if the Marked Price is 5 units, the Selling Price is 4 units (5 − 1).

Given, 4 units = Rs. 1,800.

1 unit = 1800 ÷ 4 = Rs. 450.

Marked Price (5 units) = 5 × 450 = Rs. 2,250.

Therefore The correct answer is Rs. 2,250.

Alternate Method

Given:

Selling Price (SP) of the gift article = Rs. 1,800

Discount percentage given on the article = 20%

Formula Used:

SP = MP × [(100 − Discount%) ÷ 100]

MP = ?

100% (Base)

20% Discount

SP = Rs. 1,800

80% of MP

80% = Rs. 1,800 → 100% = Rs. 2,250

Calculations:

=> Let the Marked Price of the article be MP.

=> 1800 = MP × [(100 − 20) ÷ 100]

=> 1800 = MP × (80 ÷ 100)

=> 1800 = MP × (4 ÷ 5)

=> MP = (1800 × 5) ÷ 4

=> MP = 450 × 5

=> MP = 2250

Therefore The correct answer is Rs. 2,250.

Additional Information

Marked Price (MP) vs Cost Price (CP)

Discount is always calculated on the Marked Price set by the shopkeeper, whereas Profit or Loss is calculated on the actual Cost Price.

Successive Discounts

If two successive discounts of a% and b% are given on an article, the equivalent single discount percentage is (a + b − ab ÷ 100)%.

Direct Relation Formula

The direct ratio of Cost Price to Marked Price can be represented using the formula: CP / MP = (100 − Discount%) / (100 + Profit%).

Q53. Answer: (b) 3

Shortcut Trick

To find the divisor quickly, check the divisibility rule for 3.

Sum of digits of 342165 = 3 + 4 + 2 + 1 + 6 + 5 = 21.

Since 21 is exactly divisible by 3, the number 342165 is also divisible by 3.

Therefore The correct answer is 3.

Alternate Method

Given:

Number = 342165

Concept Used:

Divisibility rules of numbers.

Calculations:

=> Let us check the divisibility rules for the given values:

=> Divisibility by 2: The given number ends in 5, which is an odd digit. Hence, it is not divisible by 2.

=> Divisibility by 4: A number is divisible by 4 if its last two digits form a number divisible by 4. Here, the last two digits are 65. Since 65 is not completely divisible by 4, the number is not divisible by 4.

=> Divisibility by 7: Dividing the number manually: 342165 ÷ 7 = 48880 with a remainder of 5. Since the remainder is not 0, it is not divisible by 7.

=> Divisibility by 3: A number is exactly divisible by 3 if the sum of all its digits is a multiple of 3.

=> Sum of digits = 3 + 4 + 2 + 1 + 6 + 5 = 21.

=> 21 ÷ 3 = 7 (exactly divisible).

=> Therefore, the number 342165 is completely divisible by 3.

Therefore The correct answer is 3.

Additional Information

Divisibility by 6

A number is divisible by 6 if it successfully satisfies the divisibility rules of both 2 and 3.

Divisibility by 9

A number is divisible by 9 if the sum of all its individual digits is a multiple of 9.

Divisibility by 11

A number is divisible by 11 if the difference between the sum of its digits at odd positions and the sum of its digits at even positions is either 0 or a multiple of 11.

Q54. Answer: (a) 49.4

Shortcut Trick

Convert the given decimals into simplified fractions:

3.8 = 38/10 = 19/5

0.052 = 52/1000 = 13/250

Formula: LCM of fractions = LCM of Numerators ÷ HCF of Denominators

=> LCM(19, 13) ÷ HCF(5, 250) = 247 ÷ 5 = 49.4

Therefore The correct answer is 49.4.

Alternate Method

Given:

The numbers are 3.8 and 0.052.

Concept Used:

To find the LCM of decimals, equate the number of decimal places by appending zeros, compute the LCM of the integer values without decimals, and then place the decimal point back at the same original position.

Calculations:

=> Make the decimal places equal: 3.8 becomes 3.800 and 0.052 remains 0.052.

=> Treat the numbers as integers by ignoring the decimals: 3800 and 52.

=> Prime factorization of 3800 = $2^3 \times 5^2 \times 19$

=> Prime factorization of 52 = $2^2 \times 13$

=> LCM(3800, 52) = Product of the maximum power of each prime factor

=> LCM(3800, 52) = $2^3 \times 5^2 \times 13 \times 19 = 8 \times 25 \times 13 \times 19$

=> LCM(3800, 52) = 200 × 247 = 49400

=> Place the decimal point 3 places from the right (as there are 3 decimal places in 3.800 and 0.052).

=> Final LCM = 49400 ÷ 1000 = 49.4

Therefore The correct answer is 49.4.

Additional Information

LCM of Fractions

The LCM of two or more fractions is calculated as: LCM = LCM of Numerators ÷ HCF of Denominators. Always ensure the fractions are reduced to their simplest form before applying the formula.

HCF of Fractions

The HCF of two or more fractions is calculated as: HCF = HCF of Numerators ÷ LCM of Denominators.

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LCM of Decimals

Make the number of decimal places identical by appending zeros to the right end. Compute the LCM of the integer values ignoring the decimal point completely, then put the decimal point back to match the equalized decimal places in the final result.

Q55. Answer: (b) 5800

Shortcut Trick

When Simple Interest is equal for two investments made for the same duration, the ratio of their principals is inversely proportional to their respective interest rates.

P1 : P2 = R2 : R1 = 4 : 10 = 2 : 5

Total ratio parts = 2 + 5 = 7

Sum invested at 10% (P1) = (2 ÷ 7) × 20300 = Rs. 5800

Therefore The correct answer is Rs. 5800.

Alternate Method

Given:

Total sum invested = Rs. 20,300

Rate for Part 1 (R1) = 10% per annum, Time = 4 years

Rate for Part 2 (R2) = 4% per annum, Time = 4 years

Interest from Part 1 = Interest from Part 2

Formula Used:

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

Total Investment = Rs. 20,300

Part 1 (P1)

R = 10%, T = 4 yrs

Part 2 (P2)

R = 4%, T = 4 yrs

Interest 1

Interest 2

=

Calculations:

=> Let the sum invested at 10% be P1 and at 4% be P2.

=> SI1 = (P1 × 10 × 4) ÷ 100

=> SI2 = (P2 × 4 × 4) ÷ 100

=> According to the question, SI1 = SI2

=> (P1 × 40) ÷ 100 = (P2 × 16) ÷ 100

=> 40P1 = 16P2

=> P1 ÷ P2 = 16 ÷ 40 = 2 ÷ 5

=> Ratio of investments P1 : P2 = 2 : 5

=> Sum of ratio parts = 2 + 5 = 7

=> Sum invested at 10% (P1) = (2 ÷ 7) × 20,300

=> P1 = 2 × 2900 = Rs. 5800

Therefore The correct answer is Rs. 5800.

Additional Information

Equal Simple Interest Rule

If a certain sum is divided into multiple parts such that their simple interests are equal, the ratio of the principal amounts is given by: P1 : P2 : P3 = 1 ÷ (R1T1) : 1 ÷ (R2T2) : 1 ÷ (R3T3).

Equal Amount Rule

If a sum is divided into multiple parts such that the final amounts (Principal + Interest) are equal, then the principal ratio is: P1 : P2 = 1 ÷ (100 + R1T1) : 1 ÷ (100 + R2T2).

Simple vs Compound Interest Difference

For a sum invested over 2 years at rate R%, the difference between CI and SI is: Difference = P(R ÷ 100)².

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Q56. Answer: (c) 42

Shortcut Trick

The mean proportional between any two numbers a and b is given directly by √(a × b).

Mean proportional = √(98 × 18)

Mean proportional = √(49 × 2 × 9 × 2)

Mean proportional = 7 × 3 × 2 = 42

Therefore The correct answer is 42.

Alternate Method

98 : x

x : 18

::

Product of Means = Product of Extremes

x × x = 98 × 18

Given:

Two numbers: 98 and 18

Formula Used:

If x is the mean proportional between a and b, then a : x = x : b, which implies $x^2 = a \times b$.

Calculations:

=> Let the mean proportional be x.

=> 98 ÷ x = x ÷ 18

=> $x^2 = 98 \times 18$

=> $x^2 = (49 \times 2) \times (9 \times 2)$

=> $x^2 = 49 \times 9 \times 4$

=> x = √(49 × 9 × 4)

=> x = 7 × 3 × 2

=> x = 42

Therefore The correct answer is 42.

Additional Information

Third Proportional

If c is the third proportional to a and b, then a : b :: b : c, which gives $c = b^2 \div a$.

Fourth Proportional

If d is the fourth proportional to a, b and c, then a : b :: c : d, which gives d = (b × c) ÷ a.

Duplicate & Sub-duplicate Ratio

The duplicate ratio of a : b is $a^2 : b^2$, and the sub-duplicate ratio is √a : √b.

Q57. Answer: (a) Rs. 500

Shortcut Trick

In a 'Buy X Get Y Free' scheme, the actual discount amount given to the customer is strictly the total marked price of the free items.

Number of free items = 2

Marked Price per item = Rs. 250

Total Discount Amount = 2 × 250 = Rs. 500

Therefore The correct answer is Rs. 500.

Alternate Method

Given:

Paid items = 5

Free items = 2

Marked Price (MP) per item = Rs. 250

Formula Used:

Total MP = Total items × MP per item

Total Selling Price (SP) = Paid items × MP per item

Discount Amount = Total MP − Total SP

5 Paid Items
2 Free Items
Rs. 250
Rs. 250
Rs. 250
Rs. 250
Rs. 250
Rs. 250
Rs. 250
Total MP = 7 × 250 = Rs. 1750
Customer pays = 5 × 250 = Rs. 1250
Discount Amount = 1750 − 1250 = Rs. 500
Calculations:
=> Total items taken by customer = 5 + 2 = 7
=> Total MP of 7 items = 7 × 250 = Rs. 1750
=> Total SP (since customer only pays for 5 items) = 5 × 250 = Rs. 1250
=> Discount Amount = Total MP − Total SP
=> Discount Amount = 1750 − 1250 = Rs. 500
Therefore The correct answer is Rs. 500.
Additional Information
Buy X Get Y Free %
To calculate the actual percentage discount equivalent to the scheme: Discount % = [Free Items ÷ (Paid + Free Items)] × 100.
Marked Price (MP)
The labeled or written price of an article. Any discount or scheme offered by the seller is always calculated on the MP, not the Cost Price (CP).
Successive Discounts
When two successive discounts of d1% and d2% are given, the effective single discount is calculated as (d1 + d2 − d1×d2/100)%.

Q58. Answer: (b) 216/27 days

Shortcut Trick
Total Work = LCM of (21, 15, 2) = 210 units.
Efficiency of A = 210 ÷ 21 = 10 units/day.
Efficiency of B = 210 ÷ 15 = 14 units/day.
Combined Efficiency of (A + B + C) = 210 ÷ 2 = 105 units/day.
Time for C = 210 ÷ (105 − 10 − 14) = 210 ÷ 81 = 70 ÷ 27 = 2^(16)/27 days.
Therefore The correct answer is 2^(16)/27 days.
Alternate Method
Given:
Time taken by A = 21 days
Time taken by B = 15 days
Time taken by A, B, and C together = 2 days

Person	Days	Total Work	Efficiency
A	21	210	10
B	15	14	
A + B + C	2	105	

Calculations:
=> Efficiency of A = 10 units/day
=> Efficiency of B = 14 units/day
=> Efficiency of A + B + C = 105 units/day
=> Efficiency of C = Efficiency of (A + B + C) − Efficiency of A − Efficiency of B

=> Efficiency of C = 105 − 10 − 14 = 81 units/day

=> Time taken by C alone = Total Work ÷ Efficiency of C

=> Time taken by C alone = 210 ÷ 81

=> Time taken by C alone = 70 ÷ 27 = 2^(16)/27 days

Therefore The correct answer is 2^(16)/27 days.

Additional Information

Pipes & Cisterns

Works exactly like Time & Work. Filling pipes have a positive efficiency, and emptying pipes (leaks) have a negative efficiency.

Work & Wages

Wages are distributed in the ratio of the total work done by each person. If they work for the same number of days, wages are distributed directly in the ratio of their individual efficiencies.

Alternate Day Work

When persons work on alternate days, find the work done in one complete cycle (e.g., 2 days for 2 persons). Then find the closest multiple to the total work before calculating the final remaining days.

Q59. Answer: (a) 3080 cu.cm

Shortcut Trick

For a circle, when Circumference = 44 cm, Radius = 7 cm and Base Area = 154 cm^2 (standard fixed values).

Volume of Cylinder = Base Area × Height

Volume = 154 × 20 = 3080 cm^3.

Therefore The correct answer is 3080 cu. cm.

Alternate Method

Given:

Height of the cylinder (h) = 20 cm

Circumference of the base (C) = 44 cm

Formula Used:

Circumference of a circle = $2\pi r$

Volume of a cylinder = $\pi r^2 h$

r

h = 20 cm

Circumference = 44 cm

Right Circular Cylinder

Calculations:

=> 2 × (22/7) × r = 44

=> (44/7) × r = 44

=> r = 44 × (7/44)

=> r = 7 cm

Now, substitute the values of r and h into the volume formula:

=> Volume = (22/7) × 7^2 × 20

=> Volume = 22 × 7 × 20

=> Volume = 154 × 20

=> Volume = 3080 cm^3

Therefore The correct answer is 3080 cu. cm.

Additional Information

Curved Surface Area of a Cylinder

The area of the curved surface is given by the formula CSA = $2\pi rh$.

Total Surface Area of a Cylinder

It includes the curved surface and the two circular bases: TSA = $2\pi r(r + h)$.

Volume of a Cone vs Cylinder

A cone with the same base radius and height as a cylinder has exactly one-third of its volume: V = $(1/3)\pi r^2 h$.

Q60. Answer: (a) 2

Shortcut Trick

If $x + 1/x = 2$, then $x = 1$.

Since $\text{cosec}\ \theta = 1 / \sin\theta$, the given equation is $\sin\theta + 1 / \sin\theta = 2$.

This implies $\sin\theta = 1$ and $\text{cosec}\ \theta = 1$.

For any power n, $\sin^n\theta + \text{cosec}^n\theta = 1^n + 1^n = 2$.

Therefore The correct answer is 2.

Alternate Method

Given:

$\sin\theta + \text{cosec}\ \theta = 2$

Formula Used:

$\text{cosec}\ \theta = 1 / \sin\theta$

Calculation:

$\Rightarrow \sin\theta + (1 / \sin\theta) = 2$

Let $\sin\theta = x$. Then the equation becomes:

$\Rightarrow x + 1/x = 2$

Multiplying both sides by x:

$\Rightarrow x^2 + 1 = 2x$

$\Rightarrow x^2 - 2x + 1 = 0$

$\Rightarrow (x - 1)^2 = 0$

$\Rightarrow x = 1$

Since $x = \sin\theta$, we have $\sin\theta = 1$.

$\Rightarrow \text{cosec}\ \theta = 1 / \sin\theta = 1 / 1 = 1$

Now, substitute these values into the required expression:

$\Rightarrow \sin^{(120)}\theta + \text{cosec}^{(120)}\theta$

$\Rightarrow (1)^{(120)} + (1)^{(120)}$

$\Rightarrow 1 + 1 = 2$

Therefore The correct answer is 2.

Additional Information

Algebraic identity $x + 1/x = -2$

If $x + 1/x = -2$, then $x = -1$. For this case, $x^n + 1/x^n$ will be 2 if n is even, and -2 if n is odd.

Similar Trigonometric Pairs

This property applies to other reciprocal trigonometric ratios. If $\cos\theta + \sec\theta = 2$, then $\cos\theta = 1$ and $\sec\theta = 1$. Similarly, if $\tan\theta + \cot\theta = 2$, then $\tan\theta = 1$ and $\cot\theta = 1$.

Algebraic identity $x + 1/x = k$

If $x + 1/x = k$, then $x^2 + 1/x^2 = k^2 - 2$, and $x^3 + 1/x^3 = k^3 - 3k$.

Q61. Answer: (d) 16

Shortcut Trick

Let present ages of Father and Son be F and S.

Condition 9 years ago: $(F - 9) = 2 \times (S - 9) + 25 \Rightarrow F - 2S = 16$

Let after 'x' years, Father's age becomes twice his Son's age: $F + x = 2 \times (S + x)$

$\Rightarrow x = F - 2S$

By simply comparing both equations, we directly get $x = 16$ years.

Therefore The correct answer is 16 years.

Alternate Method

Given:

9 years ago, the Father's age was 25 years more than twice his Son's age.

9 Years Ago

Present

After x Years

F - 9

F

F + x

S - 9

S

S + x

F-9 = 2(S-9)+25

F+x = 2(S+x)

Calculation:

Let the present age of the Father be F and the Son be S.

According to the given condition for 9 years ago:

=> (F − 9) = 2 × (S − 9) + 25

=> F − 9 = 2S − 18 + 25

=> F − 2S = 7 + 9

=> F − 2S = 16 ... (Equation 1)

Let 'x' be the number of years from now when the Father's age will be twice his Son's age:

=> (F + x) = 2 × (S + x)

=> F + x = 2S + 2x

=> x = F − 2S

Substituting the derived value from Equation 1:

=> x = 16

Therefore The correct answer is 16 years.

Additional Information

Constant Age Difference

The difference between the ages of two individuals remains constant at any given point in time. If a person is older by 'd' years today, they will remain older by 'd' years forever.

Framing Age Equations

Always assume present ages as the base variables (x, y). For an age 'n' years ago, subtract 'n' from both (x − n, y − n). For an age 'n' years hence, add 'n' to both (x + n, y + n).

Ratio Behavior over Time

While the absolute difference in age stays the same, the ratio of their ages strictly changes and gradually tends towards 1:1 as time progresses to infinity.

Q62. Answer: (a) 32856 cm²

Shortcut Trick

The total surface area of a cube is calculated as 6 × (side)².

Given the side of the cube = 74 cm.

First, calculate the square of the side: 74² = 5476.

Now, multiply by the number of faces: 6 × 5476 = 32856 cm².

Therefore The correct answer is 32856 cm².

Alternate Method

Given:

Side of the cube (a) = 74 cm

Formula Used:

Total Surface Area of Cube = 6 × a²

a = 74 cm

Area of 1 face = a²

Total faces = 6

TSA = 6a²

Calculations:

=> Total Surface Area = 6 × a²

=> Total Surface Area = 6 × (74)²

=> Total Surface Area = 6 × 5476

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=> Total Surface Area = 32856 cm²

Therefore The correct answer is 32856 cm².

Additional Information

Lateral Surface Area of a Cube

It includes the area of the four vertical faces only, excluding the top and bottom. Formula: LSA = 4 × a²

Volume of a Cube

It measures the total 3D space enclosed by the cube. Formula: Volume = a³

Diagonal of a Cube

The length of the longest space diagonal connecting two opposite corners of the cube is given by a√3.

Q63. Answer: (a) 172

Shortcut Trick

The average of the first n even numbers is directly calculated using the formula: (n + 1).

Given, the number of terms n = 171.

Average = 171 + 1 = 172

Therefore The correct answer is 172.

Alternate Method

Given:

Number of even numbers (n) = 171

Concept Used:

The sequence of the first n even numbers forms an Arithmetic Progression (AP) with the first term 2 and common difference 2.

Average of an AP = (First Term + Last Term) ÷ 2

Average of First 171 Even Numbers

2

1st Term

342

171st Term

172

Average

Average = (2 + 342) ÷ 2 = 172

Calculations:

=> First even number (a) = 2

=> 171st even number (l) = 171 × 2 = 342

=> Average = (a + l) ÷ 2

=> Average = (2 + 342) ÷ 2

=> Average = 344 ÷ 2

=> Average = 172

Therefore The correct answer is 172.

Additional Information

Average of first n Odd Numbers

The average of the first n odd numbers is always equal to n. Formula: Average = n.

Sum of first n Even Numbers

The sum of the first n even numbers is calculated by multiplying n with (n + 1). Formula: Sum = n × (n + 1).

Sum of first n Odd Numbers

The sum of the first n odd numbers is equal to the square of n. Formula: Sum = n².

Average of Consecutive Numbers

If a series of numbers are in an Arithmetic Progression, their average is the midpoint. Formula: Average = (First term + Last term) ÷ 2.

Q64. Answer: (d) 51.2

Shortcut Trick

Using the deviation method, let's assume the average weight is 50 kg.

Deviations from 50 kg: (40 − 50), (49 − 50), (56 − 50), (76 − 50), (35 − 50)

Net deviation = −10 − 1 + 6 + 26 − 15 = +6

Average deviation = +6 ÷ 5 = +1.2 kg

Actual Average = 50 + 1.2 = 51.2 kg

Therefore The correct answer is 51.2 kg.

Alternate Method

Given:

Weights of family members = 40 kg, 49 kg, 56 kg, 76 kg, 35 kg

Total number of members (n) = 5

Formula Used:

Average = Sum of all observations ÷ Total number of observations

Avg = 51.2

40

49

56

76

35

Weights of 5 Family Members (kg)

Calculations:

=> Sum of weights = 40 + 49 + 56 + 76 + 35

=> Sum of weights = 256 kg

=> Average weight = 256 ÷ 5

=> Average weight = 51.2 kg

Therefore The correct answer is 51.2 kg.

Additional Information

Deviation Method in Averages

This method assumes a mean value to make calculations simpler. The True Average is equal to Assumed Average + (Net Deviation ÷ Total Observations).

Weighted Average

Used when multiple values have different frequencies or weights. Formula: A_w = (w1x1 + w2x2 + ... + w_nx_n) ÷ (w1 + w2 + ... + w_n).

Combined Average

Used to find the combined average of two or more independent groups. Formula: A_c = (n1A1 + n2A2) ÷ (n1 + n2).

Q65. Answer: (a) $10x^2 - 7x - 10$

Shortcut Trick

Directly expand the brackets using the distributive property:

=> $x(3x - 7) + 7(x^2 - 4) + 18$

=> $3x^2 - 7x + 7x^2 - 28 + 18$

Combine the like terms (x^2, x, and constant):

=> $10x^2 - 7x - 10$

Therefore The correct answer is $10x^2 - 7x - 10$.

Alternate Method

Given:

Expression = $x(3x - 7) + 7(x^2 - 4) + 18$

Calculations:

=> Multiply x inside the first bracket: $x \times 3x - x \times 7 = 3x^2 - 7x$

=> Multiply 7 inside the second bracket: $7 \times x^2 - 7 \times 4 = 7x^2 - 28$

=> Substitute these expanded values back into the full expression:

=> $3x^2 - 7x + 7x^2 - 28 + 18$

=> Group the like terms together:

=> $(3x^2 + 7x^2) - 7x + (-28 + 18)$

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=> $10x^2 - 7x - 10$

Therefore The correct answer is $10x^2 - 7x - 10$.

Additional Information

Distributive Property

The distributive property states that a(b + c) = ab + ac. It is used to multiply a single term with two or more terms inside a set of parentheses.

Like Terms

Like terms are terms that contain the exact same variables raised to the exact same powers. Only like terms can be combined by addition or subtraction.

BODMAS Rule

Always solve mathematical expressions in the exact order of Brackets, Orders (powers and roots), Division or Multiplication, and lastly Addition or Subtraction.

Q66. Answer: (c) 2237.5

Shortcut Trick

Let the original number be equal to 100%.

After a 60% increase, the new value becomes 160%.

Given value of 160% = 3580

Original Number (100%) = 3580 × (100 ÷ 160)

Original Number = 3580 × (5 ÷ 8) = 2237.5

Therefore The correct answer is 2237.5.

Alternate Method

Given:

A number increased by 60% yields 3580.

Formula Used:

Final Value = Initial Value × (1 + Percentage Increase ÷ 100)

Original Number (100%)

Increase (+60%)

Total Result = 160% = 3580

Calculations:

=> Let the required number be x.

=> x + 60% of x = 3580

=> x + 0.6x = 3580

=> 1.6x = 3580

=> x = 3580 ÷ 1.6

=> x = 35800 ÷ 16

=> x = 2237.5

Therefore The correct answer is 2237.5.

Additional Information

Percentage Decrease

If a number is decreased by x%, the new number becomes (100 − x)% of the original number. Formula: Final = Initial × (1 − x ÷ 100).

Successive Percentage Change

When a number is changed by a% and then by b%, the net percentage change is given by (a + b + ab ÷ 100)%. Use a negative sign for any decrease in percentage.

Percentage to Fraction Conversion

To convert a percentage directly into a fraction, simply divide the percentage value by 100. For example, 60% becomes 60 ÷ 100, which simplifies to 3 ÷ 5.

Q67. Answer: (c) 3

Shortcut Trick

When the total amount is constant, the quantity sold is inversely proportional to the selling price percentage.

=> Q1 × (100 − Loss%) = Q2 × (100 + Gain%)

=> 6 × (100 − 45) = Q2 × (100 + 10)

=> 6 × 55 = Q2 × 110

=> Q2 = 330 ÷ 110 = 3

Therefore The correct answer is 3 buttons.

Alternate Method

Given:

Selling price (SP1) of 6 buttons = 1 Rupee

Loss percentage = 45%

Desired gain percentage = 10%

SP1 (Loss 45%)

55%

Cost Price

100%

SP2 (Gain 10%)

110%

−45%

+10%

6 Buttons

? Buttons

For 1 Rupee

Calculations:

=> SP1 of 1 button = 1 ÷ 6 Rupee

=> Since the man loses 45%, SP1 = (100 − 45)% of CP = 55% of CP

=> 55% of CP = 1 ÷ 6

=> CP = (1 ÷ 6) × (100 ÷ 55) = 10 ÷ 33 Rupee

=> To gain 10%, the new selling price (SP2) = (100 + 10)% of CP = 110% of CP

=> SP2 of 1 button = (110 ÷ 100) × (10 ÷ 33)

=> SP2 of 1 button = (11 ÷ 10) × (10 ÷ 33) = 11 ÷ 33 = 1 ÷ 3 Rupee

=> Thus, the selling price is 1 Rupee for 3 buttons.

Therefore The correct answer is 3 buttons.

Additional Information

Price and Consumption Relation

When the total amount spent is constant, the quantity of items purchased is inversely proportional to their price. Thus, Q1 × P1 = Q2 × P2.

Successive Discount

If two successive discounts of a% and b% are offered, the effective net discount is given by [a + b − (a × b) ÷ 100]%.

Dishonest Dealer

If a dealer sells goods at cost price but uses a false weight, his profit percentage is given by [(True Weight − False Weight) ÷ False Weight] × 100%.

Q68. Answer: (d) Rs. 788

Shortcut Trick

Since the time period is constant, Profit Ratio = Investment Ratio = 610 : 630 : 1450 = 61 : 63 : 145.

Given B's profit (63 parts) = Rs. 591

Difference between A and C's profit = 145 − 61 = 84 parts.

Required difference = (591 ÷ 63) × 84 = 591 × (4 ÷ 3) = 197 × 4 = 788.

Therefore The correct answer is Rs. 788.

Alternate Method

Given:

Investment of A = Rs. 610

Investment of B = Rs. 630

Investment of C = Rs. 1450

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Profit of B = Rs. 591

Formula Used:

When the time period is the same, Profit Ratio = Investment Ratio

Investment & Profit Ratio

A

Rs. 610 → Ratio: 61

B

Rs. 630 → Ratio: 63 (Profit = Rs. 591)

C

Rs. 1450 → Ratio: 145

Difference (C − A) = 145 − 61 = 84 parts

Calculations:

=> Profit ratio of A, B and C = 610 : 630 : 1450 = 61 : 63 : 145

=> Let their profits be 61x, 63x and 145x respectively.

=> Profit earned by B = 63x = 591

=> x = 591 ÷ 63 = 197 ÷ 21

=> Difference in profit earned by A and C = 145x − 61x = 84x

=> Required difference = 84 × (197 ÷ 21)

=> Required difference = 4 × 197 = 788

Therefore The correct answer is Rs. 788.

Additional Information

Partnership Principles

When partners invest for the same time duration, their profit is shared strictly in the ratio of their invested capitals. Profit Ratio = C1 : C2 : C3.

Different Time Periods

If investments are made for different durations, then the effective capital rule is applied. Profit Ratio = (C1 × T1) : (C2 × T2) : (C3 × T3).

Active vs Sleeping Partner

An active partner usually receives a fixed salary or a specific percentage of the total profit for managing the business before the remaining profit is distributed according to capital investment ratios.

Q69. Answer: (c) 16

Shortcut Trick

When equal distances are covered at speeds x and y, the average speed is given by the direct formula:

Average speed = 2xy ÷ (x + y)

Here, x = 12 km/hr and y = 24 km/hr.

Average speed = (2 × 12 × 24) ÷ (12 + 24)

Average speed = 576 ÷ 36 = 16 km/hr

Therefore The correct answer is 16 km/hr.

Alternate Method

Bhopal

Indore

Speed = 12 km/hr

Speed = 24 km/hr

Distance = 24 km (LCM)

Given:

Speed from Bhopal to Indore (S1) = 12 km/hr

Speed from Indore to Bhopal (S2) = 24 km/hr

Calculation:

Let the one-way distance between the two cities be the LCM of the given speeds to simplify calculations.

=> LCM of 12 and 24 = 24 km

=> Time taken to reach Indore = Distance ÷ S1 = 24 ÷ 12 = 2 hours

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=> Time taken to return to Bhopal = Distance ÷ S2 = 24 ÷ 24 = 1 hour

=> Total distance covered for entire journey = 24 + 24 = 48 km

=> Total time taken = 2 + 1 = 3 hours

=> Average Speed = Total Distance ÷ Total Time

=> Average Speed = 48 ÷ 3 = 16 km/hr

Therefore The correct answer is 16 km/hr.

Additional Information

Average Speed for Equal Time Intervals

If a person travels at speeds x and y for equal amounts of time, the average speed is simply the arithmetic mean: (x + y) ÷ 2.

Average Speed for Three Equal Distances

If equal distances are covered at three different speeds x, y, and z, the average speed formula is: 3xyz ÷ (xy + yz + zx).

Relative Speed

When two objects move in opposite directions, their relative speed is the sum of their individual speeds (x + y). In the same direction, it is the difference (x − y).

Q70. Answer: (c) 2

Shortcut Trick

In the range 411 to 424, ignore all even numbers and numbers ending in 5.

The remaining odd candidates are 411, 413, 417, 419, 421, and 423.

Eliminate multiples of 3 using the sum of digits trick: 411, 417, and 423 are divisible by 3.

Test the remaining numbers (413, 419, 421) for divisibility by 7: 413 = 7 × 59.

The only remaining numbers are 419 and 421, both of which are prime.

Therefore The correct answer is 2 prime numbers.

Alternate Method

Given:

Range of numbers: 411 to 424 (both included)

Method Used:

To check if a number N is prime, we test divisibility by all prime numbers up to √N. Here, √424 ≈ 20, so we check divisibility by 2, 3, 5, 7, 11, 13, 17, and 19.

Calculations:

=> All even numbers in the range (412, 414, 416, 418, 420, 422, 424) are divisible by 2 and thus not prime.

=> 415 is divisible by 5 and thus not prime.

=> Check divisibility of the remaining odd numbers by 3, 7, 11, 13, 17, and 19:

=> 411 ÷ 3 = 137 (Not prime)

=> 413 ÷ 7 = 59 (Not prime)

=> 417 ÷ 3 = 139 (Not prime)

=> 419 is not divisible by any prime up to 19 (Prime)

=> 421 is not divisible by any prime up to 19 (Prime)

=> 423 ÷ 3 = 141 (Not prime)

=> The prime numbers in the given range are 419 and 421.

Therefore The correct answer is 2 prime numbers.

Additional Information

Prime Number

A natural number greater than 1 that is only divisible by 1 and itself.

Twin Primes

A pair of prime numbers that have a difference of exactly 2. For example, 419 and 421 form a pair of twin primes.

Prime Testing Rule

To determine if a number N is prime, you only need to systematically test for divisibility by prime numbers up to the square root of N (√N).

Q71. Answer: (d) Three

Given: 52749631

By adding 2 in the even digits and subtracting 1 from the odd digits, we will get,

Number	5	2	7	4	9	6	3	1
operation	-1	+2	-1	+2	-1	+2	-1	-1
New Number	4	4	6	6	8	8	2	0

Digits will appear more than once in the new number thus formed - 3

4	4	6	6	8	8	2	0

Hence, the correct answer is "Option 4"

Q72. Answer: (d) ILKJ

The logic followed here is,

Similarly,

Hence, the correct answer is "Option 4"

Q73. Answer: (c) 15

By adding 1 in the even digits of the number 36719542, we will get,

Number	3	6	7	1	9	5	4	2
operation		+1					+1	+1
New Number	3	7	7	1	9	5	5	3

Sum of the digits that are repeated more than once in the new number formed : 7, 5, 3

= 7 +5 +3

= 15.

Hence, the correct answer is "Option 3."

Q74. Answer: (b) 3

'CALM' is coded as '3257' and 'MONK' is coded as '1346'.

M is common in both CALM and MONK, and number 3 is common in both given words.

Hence, the correct answer is "Option 2"

Q75. Answer: (b) Wife's brother

Preparing the family tree diagram by using the following symbols:

As per the given information:

M is wife of N and E is brother of M.

Hence, the correct answer is "Option 2 "

Q76. Answer: (c) -26

The logic follows,

5 - 1 = 4

4 - 2 = 2

2 - 4 = -2

-2 - 8 = -10

-10 - 16 = -26

Thus, the correct answer is -26.

Q77. Answer: (a) Two

Given: Six people, D, E, F, G, H and Y, are sitting around a circular table, facing the centre.

• F sits third to the left of G.

• Only one person sits between F and Y when counted from the right of F.

• Only two people sit between Y and H.

• D is an immediate neighbour of H

• The Final Arrangement is

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F and H sit between D and E when counted from right of E.

Hence, the correct answer is "Option 1"

Q78. Answer: (a) Only conclusion (I) follows.

The least possible Venn diagram is as follows:

Conclusions:

(I) Some apples are oranges. - True (All oranges are Apple means some orange is apple and some apple is orange.Hence, it is true.

(II) All grapes are oranges. - False (All oranges is Apple and All apple is Grapes.All Grapes are oranges is possible but not definte. Hence, it is false.)

Only conclusion (I) follows.

Hence, the correct answer is "Option 1"

Q79. Answer: (a) 82

To find Mr. Toni's position from the left, subtract his position from the right and his own person from the total number of people.

Toni′s position from the left = Total people − Toni′s position from the right + 1.

Toni′s position from the left = 112 – 19 + 1

=94.

People between them = Toni′s position − Into′s position − 1

= 94 – 11 – 1

= 82.

Hence, the correct answer is "Option 1".

Q80. Answer: (a) 10

Given Number :- 2571463

By adding 3 in the even digits and add 2 from the odd digits, we will get,

Number	2	5	7	1	4	6	3
operation	+3	+2	+2	+2	+3	+3	+2
New Number	5	7	9	3	7	9	5

Sum of the first and last digits in the new number thus formed = 5 + 5

= 10.

Hence, the correct answer is "Option 1"

Q81. Answer: (c) 3rd

Sanjana is 27th from the left end of the row. Anand is 18th to the right of Sanjana. Therefore, Ananad's position from the left is found by adding these two positions.

Ananad's position from the left = 27 + 18 = 45.

"Position from right end"="Total students"-"Position from left end"+1

Position from right end = 47 − 45 + 1

=3

Hence, the correct answer is "Option 3"

Q82. Answer: (c) Zero

Given :

(Left) 121 256 812 658 527 (Right)

Numbers are arranged in descending order,- 812 658 527 256 121

No, numbers will remain unchanged.

Hence, the correct answer is "Option 3"

Q83. Answer: (c) XDL

The logic followed here is,

Hence, the correct answer is "Option 3".

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Q84. Answer: (d) 175, 110

Logic: First Number - 65 = Second Number.

Similarly,

Hence, the correct answer is "Option 4"

Q85. Answer: (b) LOQ

The logic followed here is:

Thus, the missing letter in the series is LOQ.

Hence, the correct answer is "Option 2".

Q86. Answer: (d) mt

According to the given information:

'it' is coded as 'mt'

Hence, the correct answer is "Option 4"

Q87. Answer: (b) 10 km to the South

Given:

• Saif starts from Point A and drives 31 km towards East.

• He then takes a right turn, drives 35 km, turns right and drives 47 km.

• He then takes a right turn and drives 45 km.

• He takes a final right turn, drives 16 km and stops at Point P.

The final Diagram,

Hence, the correct answer is "Option 2"

Q88. Answer: (a) 2 km towards north

Given:

• Suresh starts from Point M and drives 10 km towards the north.

• He takes a right turn and drives 4 km; he turns right again and drives 4 km.

• He takes a left turn and drives 2 km; then, he turns right and drives 8 km.

• He takes a final right turn, drives 6 km and stops at Point N.

• The final Diagram,

• • Hence, the correct answer is "Option 1"

Q89. Answer: (d) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram is as follows:

Conclusion (I): Some trees are graphs. - False (As their is no direct relation between tress and Graph may be it is possible but not definte)

Conclusion (II): All graphs are chairs. - False (Some Graph are chairs and some chairs are graph but All graphs are chairs is may be possible but not definte. Hence, it is false)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 4"

Q90. Answer: (b) OF-JQ

The logic followed here is:

All follows same logic except OF-JQ

Hence, the correct answer is "Option 2"

Q91. Answer: (d) TJ - LE

The logic followed here is:

All follows same logic except TJ-LE.

Hence, the correct answer is "Option 4"

Q92. Answer: (a) TXR

The logic followed here is:

All follow the same logic except TXR.

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Hence, the correct answer is "Option 1."

Q93. Answer: (d) 53

The logic follows here,

Hence, the correct answer is "Option 4"

Q94. Answer: (a) 25

The logic followed here is:

Position of Pritam from the top = 5th

Position of Pritam from the bottom = 21th

So,

Total number of students = Position of Paras from the top + Position of Paras from the bottom - 1

= 5 + 21 - 1

= 26 - 1 = 25.

Hence, the correct answer is "Option 1"

Q95. Answer: (c) J

Given: Seven people, I, J, K, L, U, V and W are sitting in a row, facing north.

• Only two people sit to the right of K.

• Only two people sit between K and U.

• Only two people sit between I and V.

• V sits to the immediate left of K.

• L sits to the immediate right of W

The Final Diagram,

J sits third from left end of Line.

Hence, the correct answer is "Option 3"

Q96. Answer: (c) Two

Given: (Left) 570 787 488 277 102 (Right)

• 570: First digit (

5

) + third digit (

0

) =

5

.

5

is a prime number.

• 787: First digit (

7

) + third digit (

7

) =

14

.

14

is not a prime number.

• 488: First digit (

4

) + third digit (

8

) =

12

.
12
is not a prime number.
• 277: First digit (
2
) + third digit (
7
) =
9
.
9
is not a prime number.
• 102: First digit (
1
) + third digit (
2
) =
3
.
3
is a prime number.
• Two numbers are the resultant of the summation of the first and the third digits, a prime number 5 and 3.
Hence, the correct answer is "Option 3".

Q97. Answer: (a) JR(-2)

The logic followed here is:
LK 19 is related to GG 2
And,
IT 29 is related to DP 12
Similarly,
OV 15 is related to
Hence, "Option 1" is the correct answer.

Q98. Answer: (a) Two

Given Number: 8357691

Number	**8**	**3**	**5**	**7**	**6**	**9**	**1**
New Number	1	3	5	6	7	8	9

Ascending order from left to right digits will remain unchanged as compared to that in the original number is 3 and 5.

Number	**8**	**3**	**5**	**7**	**6**	**9**	**1**
New Number	1	3	5	6	7	8	9

Hence, the correct answer is "Option 1".

Q99. Answer: (b) -44

The logic follows,
Hence, the correct answer is "Option 2"

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Q100. Answer: (d) AFNT

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 4"

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