RRB NTPC (UG) CBT-I Official Paper (Held On: 18 Aug, 2025 Shift 1) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Who is the chief judge of the Supreme Court of India, as of May 2025?

(a) DY Chandrachud
(b) Bhushan R Gavai
(c) Sharad Arvind Bobde
(d) NV Ramana

Q2. Simone Biles, the winner of the 2025 Laureus World Sportswoman of the Year award, is associated with the sport of _____.

(a) track and field
(b) tennis
(c) gymnastics
(d) swimming

Q3. In the Great Indian Plains of India, which kind of soil is found on a large scale?

(a) Laterite soil
(b) Black soil
(c) Alluvial soil
(d) Red soil

Q4. Consider the following vitamins.

1. Vitamin A
2. Vitamin B6
3. Vitamin C
4. Vitamin D

Which of them is/are fat-soluble?

(a) Only 1 and 2
(b) Only 1 and 4
(c) Only 1, 2 and 3
(d) Only 2 and 3

Q5. In 2025, which of the following disputes between two countries escalated due to increased military activities near the Line of Actual Control (LAC)?

(a) India–Sri Lanka dispute over Katchatheevu Island
(b) India–China dispute in Eastern Ladakh
(c) India–Nepal dispute over Kalapani
(d) India–Pakistan dispute over Siachen

Q6. Which of the following steps correctly describes how to move a file or folder using the Cut and Paste method?

(a) Select file → Press Ctrl + C → Go to new location → Press Delete
(b) Select file → Right-click → Copy → Go to new location → Right-click → Paste
(c) Select file → Edit → Cut or Ctrl + X → Go to new location → Edit → Paste or Ctrl + V
(d) Open file → Click Close → Open Recycle Bin

Q7. The governor of a province (bhukti) in the Pala and Pratihara empire was called:

(a) Rashtrapati
(b) Uparika
(c) Visayapati
(d) Koshtapala

Q8. Which body recommends the distribution of tax revenue between the Centre and States?

(a) Comptroller and Auditor General
(b) Finance Commission
(c) Supreme Court
(d) NITI Aayog

Q9. Which of the following was among the first financial institutions in India to receive an 'in principle' approval from the Reserve Bank of India (RBI) to set up a bank in the private sector?

(a) IndusInd Bank Limited
(b) Axis Bank Limited
(c) Kotak Mahindra Bank Limited
(d) HDFC Limited

Q10. Women play a significant role in rural livelihoods and household management. What is the minimum percentage of seats reserved for women in Panchayati Raj Institutions?

(a) 43%
(b) 33%
(c) 50%
(d) 25%

Q11. What is the main content of the four Vedas composed during the Early Vedic period?

(a) War strategies
(b) Agricultural manuals
(c) Laws and rituals
(d) Prayers and hymns

Q12. Which of the following is the official language of the state of Manipur?

(a) Khasi
(b) Mizo
(c) Bodo
(d) Meitei

Q13. Which Article of the Constitution mandates the establishment of the National Commission for Scheduled Castes?

(a) Article 340
(b) Article 338
(c) Article 342
(d) Article 335

Q14. What is the main advantage of road transport over railways?

(a) Door-to-door service
(b) Suitable for long distances
(c) Cheaper and faster than railway transport over long distances
(d) Environment-friendly

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Q15. Who among the following created history by scoring 9000 runs in T20 in May 2025?

(a) Virat Kohli
(b) KL Rahul
(c) Rohit Sharma
(d) Tilak Verma

Q16. The Faraizi Movement's no-tax campaign primarily targeted the _____.

(a) Indigo planters and zamindars
(b) British Army
(c) Mughal officials
(d) Local tribal rulers

Q17. In which of the following sections of Akbarnama does Abul Fazal discuss Akbar's administration, household, army, revenue and geography of his empire?

(a) only in the first section
(b) in both the second and third sections
(c) only in the third section
(d) in both the first and second sections

Q18. Who is best known for being associated with the theory of quantum mechanics, published in 1925?

(a) Werner Heisenberg
(b) Wolfgang Pauli
(c) Heinrich Rudolf Hertz
(d) Ernest Rutherford

Q19. Which of the following agencies launched the ‘Medical Innovations Patent Mitra’ in 2025?

(a) NITI Aayog
(b) DST
(c) AIIMS New Delhi
(d) ICMR

Q20. What was the name of the legend who spearheaded the Munda Rebellion?

(a) Nirmal Munda
(b) Prakash Munda
(c) Kariya Munda
(d) Birsa Munda

Q21. The Constitution (One Hundred and Twenty-Ninth Amendment) Bill, introduced in the Lok Sabha on 17 December 2024, seeks to empower:

(a) the Parliament to make laws to deal with anti-national activities
(b) the State to make any special provision for the advancement of the economically weaker section (EWS) of citizens
(c) the President to declare different proclamations of national emergency on different grounds simultaneously
(d) the Election Commission to conduct elections for Lok Sabha and all State Assemblies at the same time

Q22. How many new judges were sworn-in to the Supreme Court of India on 30 May 2025?

(a) four
(b) three
(c) two
(d) six

Q23. Where was the third Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons (TPNW) held in 2025?

(a) Geneva
(b) Vienna
(c) Brussels

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(d) New York City

Q24. In which year were the Indian Civil Service (ICS) and Indian Police (IP) replaced by the Indian Administrative Service (IAS) and Indian Police Service (IPS), later recognised as All-India Services?

(a) 1947
(b) 1945
(c) 1946
(d) 1950

Q25. Which of the following pigments is present in vegetables like spinach, giving it the characteristic green colour?

(a) Anthocyanin
(b) Chlorophyll
(c) Xanthophyll
(d) Lutein

Q26. Which organisation successfully developed an indigenous nanoporous multilayered polymeric membrane for high pressure seawater desalination in May 2025?

(a) Defence Research & Development Organisation (DRDO)
(b) Council of Scientific and Industrial Research (CSIR)
(c) Indian Space Research Organisation (ISRO)
(d) Bhabha Atomic Research Centre (BARC)

Q27. Which Article empowers the High Courts to issue writs for the enforcement of Legal and Fundamental Rights?

(a) Article 324
(b) Article 124
(c) Article 226
(d) Article 136

Q28. In 2025 news, Guillain-Barré Syndrome (GBS) primarily impacts which part of the human body system?

(a) Peripheral nervous system
(b) Immune system
(c) Circulatory system
(d) Digestive system

Q29. Which type of unemployment is most prevalent in Indian agriculture during the nonsowing season?

(a) Cyclical Unemployment
(b) Seasonal Unemployment
(c) Disguised Unemployment
(d) Structural Unemployment

Q30. In which of the following years was Indian Universities Act enacted to impose stiff control over Indian Universities?

(a) 1886
(b) 1904
(c) 1893
(d) 1900

Q31. Wildlife sanctuaries in India are primarily established for:

(a) urban development
(b) protecting endangered species
(c) generating forest revenue
(d) promoting eco-tourism

Q32. An economist and a renowned literary personality with a vast reader base in India and abroad, Prof. Arunoday Saha, who was honoured with Padma Shri in 2025, belongs to which Indian state?

(a) West Bengal
(b) Odisha

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(c) Tripura
(d) Mizoram

Q33. Who among the following is regarded as the father of modern Hindi literature and theatre?
(a) Bharatendu Harishchandra
(b) Jaishankar Prasad
(c) Mahavir Prasad Dwivedi
(d) Premchand

Q34. Which one of the following hypotheses/theories explains the formation of the solar system from a rotating cloud of gas and dust?
(a) Big Bang Theory
(b) Nebular Hypothesis
(c) Continental Drift Theory
(d) Plate Tectonics Theory

Q35. Which of the following leaders co-chaired the AI Action Summit in Paris with Indian Prime Minister Narendra Modi?
(a) Mark Rutte
(b) Joe Biden
(c) Emmanuel Macron
(d) Valdamir Putin

Q36. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) provides legal assurance of wage employment in rural areas. Under MGNREGA, how many days of guaranteed wage employment per year is a rural household entitled to?
(a) 150 days
(b) 50 days
(c) 100 days
(d) 200 days

Q37. Which Constitutional Amendment Act restored the Parliament's power to amend Fundamental Rights?
(a) 44th Amendment Act, 1978
(b) 24th Amendment Act, 1971
(c) 52nd Amendment Act, 1985
(d) 42nd Amendment Act, 1976

Q38. What is the function of device drivers in an operating system?
(a) To create new user accounts
(b) To manage communication between OS and hardware
(c) To install software updates
(d) To clean temporary files

Q39. What significant milestone did India achieve in satellite communication (satcom) as of 21 May 2025?
(a) Launched the world's first 7G satellite
(b) Initiated the fastest global rollout of satellite-based communication services
(c) Completed the construction of a national space station
(d) Banned all foreign satellite communication providers

Q40. Which mountain range forms the eastern boundary of the Deccan Plateau?
(a) Satpura Range
(b) Vindhya Range
(c) Western Ghats
(d) Eastern Ghats

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MATHEMATICS

Q41. The LCM of the numbers 6.3 and 0.07 is:

(a) 0.063
(b) 0.63
(c) 63
(d) 6.3

Q42. Sapna invested Rs. 20,900 on simple interest, partly at 10% per annum and partly at 9% per annum. If she earns equal interests from the two investments after 8 years, then find the sum invested at 10% per annum (in Rs.).

(a) 9,897
(b) 9,902
(c) 9,901
(d) 9,900

Q43. By how much is 65% of 65 greater than frac25 of 55?

(a) 14.25
(b) 18.25
(c) 17.25
(d) 20.25

Q44. The number 648679059 is divisible by which of the following?

(a) 10
(b) 11
(c) 3
(d) 8

Q45. Find the value of: 57^(−9) ÷ 57^4× 57^(−10)

(a) 57^(-33)
(b) 57^(-25)
(c) 57^(-23)
(d) 57^(-18)

Q46. A balloon's radius increases to 5 times itself when the air is pumped in it. Find the ratio in the surface areas of the balloon after pumping the air to that before pumping the air.

(a) 10:1
(b) 5:1
(c) 25:1
(d) 1:5

Q47. If the third proportional of 60 and 30 is x, then what is the value of x?

(a) 18
(b) 16
(c) 15
(d) 13

Q48. The average of first 156 even numbers is

(a) 158
(b) 156.5
(c) 157.5
(d) 157

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Q49. A shopkeeper lists the price of a fan at 25% above its cost price and offers a 16% discount on its list price. If he earns a profit of Rs. 64, then what is the list price (in Rs.) of the fan?

(a) 1,354
(b) 1,600
(c) 1,701
(d) 1,419

Q50. The sum of the squares of two consecutive even natural numbers is 2452. The sum of the numbers is:

(a) 70
(b) 54
(c) 46
(d) 52

Q51. Given that 132^(0.14) = x, 132^(0.26)= y and x^z = y^2, then the value of z is close to:

(a) 5.03
(b) 4.84
(c) 2.37
(d) 3.71

Q52. M and N start a business. M invests Rs. 49,000 more than N for 6 months and N invests for 7 months. M's share is Rs. 207 more than that of N, out of a total profit of Rs. 3,519. Find the capital contributed by M.

(a) Rs. 2,05,873
(b) Rs. 2,05,777
(c) Rs. 2,05,800
(d) Rs. 2,05,705

Q53. If K X (sin A - $2\sin^3$ A)/($2\cos^3$ A - cos A) = 1, then the value of K is:

(a) cotA
(b) cosecA
(c) tanA
(d) 1

Q54. A man makes a monthly payment equal to 33% of his monthly salary towards debt repayment. He spends 25% of the remaining salary and saves Rs. 402. His monthly salary (in Rs.) is:

(a) 734
(b) 771
(c) 707
(d) 800

Q55. Tiger and Disha have to travel from Delhi to Kanpur in their respective cars. Tiger is driving at 100 km/hr while Disha is driving at 35 km/hr. Find the time taken by Disha to reach Kanpur if Tiger takes 14 hours.

(a) 36 hours
(b) 47 hours
(c) 40 hours
(d) 45 hours

Q56. A company earns a profit (in Rs.) that is distributed among the company's three partners in the ratio of 13 : 3 : 9. If the difference between the smallest and the largest shares is Rs. 36,846, the total profit (in Rs.) of the company is:

(a) 92,051
(b) 92,110
(c) 92,167
(d) 92,115

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Q57. The number 267533 is divisible by which of the following?

(a) 5
(b) 7
(c) 6
(d) 12

Q58. ABCD is a quadrilateral whose sides are equal and angle angle ABC = 90°. If the opposite sides are parallel and opposite angles are equal, then ABCD is a

(a) rectangle
(b) square
(c) rhombus
(d) kite

Q59. A wholesaler offers a trade discount of 15% on a product with a marked price of Rs. 12,000. After the trade discount, a scheme discount of 10% is applied on the reduced price. What is the final price the customer has to pay?

(a) Rs. 9,520
(b) Rs. 8,40
(c) Rs. 9,180
(d) Rs. 8,750

Q60. The average weight (in kg) of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 74 kg and 37 kg is:

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

Q61. Veer bought some pens at the rate of Rs. 180/dozen. He sold them for Rs. 22 each. His profit percentage is _____% (rounded off to two decimal places).

(a) 46.67
(b) 44.67
(c) 50.67
(d) 48.67

Q62. A can do a work in 16 days and B can do the same work in 22 days. If they work on it together for 2 days, then what fraction of the work is left?

(a) 73/88
(b) 69/88
(c) 71/88
(d) 79/88

Q63. A sum of Rs. 625 is invested in a bank at 16% interest per annum compounded annually. On maturity, the amount payable becomes Rs. 841. Find the time period of the investment.

(a) 1.5 years
(b) 2.5 years
(c) 2 years
(d) 1 year

Q64. Find the difference between a single discount of 20% and two successive discounts of 10% and 10% on a gift of Rs. 600.

(a) Rs. 5
(b) Rs. 1
(c) Rs. 3
(d) Rs. 6

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Q65. Pipe P can fill 4/9 part of a tank in 20 hours, and pipe Q can fill 2/9 of the same tank in 30 hours. Both P and Q were kept open for 3 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 4 hours. Pipes P, Q and R together can fill the empty tank in:

(a) 117 hours
(b) 135 hours
(c) 115 hours
(d) 147 hours

Q66. The value of 3/2 + (1/(1 + 5/8)) - 4/3 is

(a) (52)/(79)
(b) (54)/(85)
(c) (61)/(78)
(d) (68)/(71)

Q67. Five solid cubes, each of volume 15625 cm3, are joined end to end to form a cuboid. What is the lateral surface area (in cm2) of the cuboid?

(a) 7593
(b) 7500
(c) 7591
(d) 7280

Q68. In covering a distance of 112 km, Salaj takes 3 hours more than Kevin. If Salaj doubles his speed, then he would take 5 hours less than Kevin. Salaj's speed is:

(a) 5 km/hr
(b) 7 km/hr
(c) 10 km/hr
(d) 6 km/hr

Q69. Simplify: $3((6/3)x^2 - 22x + 14) - 6(x^2 + 6x - 15)$

(a) 102x - 132
(b) -102x + 132
(c) -102x - 132
(d) 102x + 132

Q70. If 3 times Mary's present age is 29 years more than 5 times Diya's present age, and 2 times Diya's present age is 9 years less than Mary's present age, then what is the difference (in years) between the ages of Mary and Diya?

(a) 11
(b) 9
(c) 7
(d) 8

GENERAL INTELLIGENCE AND REASONING

Q71. Select the pair that follows the same pattern as that followed by the two set of pairs given below. Both pairs follow the same pattern.

PFI : NGE

GKJ : ELF

(a) EEI : CGE
(b) IDO : GEK
(c) NCH : LDE
(d) RNQ : PON

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Q72. 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) JCH
(b) UNR
(c) NGL
(d) QJO

Q73. Aditya ranked 34t^h from the top and 44^(th) from the bottom in his class. How many students are there in his class?

(a) 76
(b) 78
(c) 77
(d) 79

Q74. What should come in place of the question mark (?) in the given series?

451 450 442 415 351 ?

(a) 226
(b) 228
(c) 236
(d) 232

Q75. Pratik ranked 14^(th) from the bottom and 27^(th) from the top in his class. How many students are there in his class?

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

Q76. 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) GNJ
(b) DKG
(c) RYV
(d) AHD

Q77. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

YCS KOE WAQ IMC ?

(a) YUO
(b) YOU
(c) UYO
(d) UOY

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 conclusions logically follow(s) from the statements.

Statements: Some trees are chisels. Some chisels are graphs.

Conclusions (I): Some trees are graphs.

Conclusions (II): All graphs are chisels.

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

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Q79. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

17 ÷ 44 × 4 + 6 − 4 = ?

(a) 4
(b) 17
(c) 9
(d) 24

Q80. Six passengers L, M, N, P, Q and R are sitting on a bench in a straight line. They all are facing towards the north. M is sitting immediately between L and R. Q is sitting at the extreme right end of line. M is sitting second to the left of Q. R is sitting to the immediate left of Q. P is not an immediate neighbour of L. Who is sitting to the immediate left of L?

(a) N
(b) R
(c) P
(d) M

Q81. A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table. Only two people sit between K and J when counted from the right of K. Only three people sit between D and B when counted from the right of B. J sits to the immediate right of B. A sits to the immediate right of L.

Who sits fourth to the right of C?

(a) J
(b) A
(c) D
(d) L

Q82. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

CORD - RCOD - DROC

KIND - NKID - DNIK

(a) TEAR - TAER - RAET
(b) WANT - NWAT - TNAW
(c) BEAT - EBAT - TEAB
(d) SLAP - ASLP - LAPS

Q83. This question is based on the five, three-digit numbers given below.

(Left) 218 168 879 953 622 (Right)

(Example: 697 – First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.)

If all the numbers are arranged in descending order, which of the following will be the second digit of the fourth number from the left after the arrangement?

(a) 1
(b) 8
(c) 9
(d) 2

Q84. Seven boxes F, G, H, I, K, L and O are kept one over the other but not necessarily in the same order.

Only G is kept above I. Only two boxes are kept between I and O. Only L is kept below F. H is not kept immediately above O.

How many boxes are kept between K and L?

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

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

4 ÷ 13 + 96 × 8 − 14 = ?

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

Q86. 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:

Some fuses are wires.

No wire is a battery.

Conclusions:

(I) Some fuses are batteries.

(II) Some wires are fuses.

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

Q87. Each of the digits in the number 8453126 is arranged in 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) Three
(b) None
(c) One
(d) Two

Q88. If 'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−', then what will come in place of the question mark (?) in the following equation?

56 D 23 C 69 B 2 D 79 C 36 B 9 A 3 = ?

(a) 200
(b) 314
(c) 223
(d) 150

Q89. What should come in place of the question mark (?) in the given series?

28 29 31 35 43 ?

(a) 58
(b) 59
(c) 56
(d) 57

Q90. 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.)

541, 448

362, 269

(a) 642, 546
(b) 564, 469
(c) 470, 374

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(d) 459, 366

Q91. Pavan starts from Point Y and drives 39 km towards the north. He then takes a right turn and drives 79 km, then turns right and drives 48 km. He then takes a right turn and drives 43 km. He takes a right turn and drives 73 km. He then turns left, drives 36 km and stops at Point Z. How far (shortest distance) and in which direction should he drive in order to reach Point Y again? (All turns are 90-degree turns only unless specified.)

(a) 64 km towards the south
(b) 57 km towards the west
(c) 72 km towards the north
(d) 74 km towards the east

Q92. Jack starts from Point A and drives 5 km towards South. He then takes a left turn, drives 7 km, turns left and drives 3 km. He then takes a left turn and drives 2 km. He takes a final right turn, drives 2 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 7 km towards South
(b) 7 km towards West
(c) 5 km towards East
(d) 5 km towards West

Q93. In a certain code language, 'CAKE' is coded as '7209' and 'ACHE' is coded as '0295'. What is the code for 'H' in the given code language ?

(a) 0
(b) 9
(c) 2
(d) 5

Q94. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

ATE VOZ QJU LEP ?

(a) GZK
(b) GZL
(c) HZK
(d) GYK

Q95. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

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

If all the symbols are dropped from the series, which of the following will be seventh from the right?

(a) 4
(b) 8
(c) 9
(d) 5

Q96. In a certain code language, 'WINE' is coded as '4512' and 'NETI' is coded as '5624'. What is the code for 'T' in the given code language?

(a) 6
(b) 4
(c) 5
(d) 2

Q97. EJRX is related to HLUZ in a certain way based on the English alphabetical order. In the same way, QRDF is related to TTGH. To which of the following options is ZXML related, following the same logic?

(a) CPNG
(b) CZNP
(c) CZPN

(d) CGNH

Q98. 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 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) MI-PL
(b) RN-UQ
(c) FB-ID
(d) IE-LH

Q99. S is the daughter of M. M is the wife of A. A is the father of R. R is the brother of T. How is S related to T?

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

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

3 5 9 23 39 ?

(a) 65
(b) 64
(c) 66
(d) 68

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Bhushan R Gavai

The correct answer is Bhushan R Gavai.

Key Points

• Bhushan R Gavai is the current Chief Justice of India (CJI) as of May 2025. He succeeded Dhananjaya Y. Chandrachud, whose tenure as the CJI ended in November 2024.

• Justice Gavai is the 52nd Chief Justice of India. He took the oath of office on 29th November 2024.

• He was appointed as per the seniority convention in the Supreme Court, which is a widely followed practice in the Indian judiciary for appointing the CJI.

• Before becoming the Chief Justice of India, Justice Gavai served as a Judge of the Supreme Court, where he delivered notable judgments in constitutional, civil, and criminal matters.

• Justice Gavai is known for his vast experience and commitment to upholding the principles of the Indian Constitution. He is one of the few CJIs from the Scheduled Caste (SC) community, which highlights the inclusivity of the Indian judiciary.

Additional Information

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• Role of the Chief Justice of India (CJI):

• The CJI is the head of the judiciary system in India and the Supreme Court, which is the highest judicial forum and final court of appeal under the Constitution.

• The CJI is responsible for the allocation of cases and the constitution of benches to hear them.

• He/she also advises the President of India on judicial appointments, including the appointment of other Supreme Court judges.

• Appointment Process of the Chief Justice of India:

• The President of India appoints the CJI based on seniority among the judges of the Supreme Court.

• The process follows the convention of seniority, wherein the longest-serving judge of the Supreme Court is appointed as the CJI.

• Tenure of Justice Bhushan R Gavai:

• Justice Gavai's tenure as the CJI is expected to last until November 2025, based on the mandatory retirement age of 65 for Supreme Court judges.

• He will oversee important decisions and reforms within the judiciary during this period.

• Notable Contributions of Justice Gavai:

• Justice Gavai has delivered several landmark judgments during his tenure as a judge in the Supreme Court.

• He is recognized for his commitment to social justice and ensuring inclusivity in the judiciary.

Important Points

• Previous Chief Justices:

• Dhananjaya Y. Chandrachud: Served as the 50th CJI from November 2022 to November 2024.

• Sharad Arvind Bobde: Served as the 47th CJI from November 2019 to April 2021.

• N.V. Ramana: Served as the 48th CJI from April 2021 to August 2022.

• Judiciary in India:

• The Indian judiciary is an independent system, with the Supreme Court being the apex court, followed by High Courts and subordinate courts.

• The judiciary ensures the enforcement of laws and resolves disputes while safeguarding the Constitution of India.

• Constitutional Provisions:

• Article 124: Deals with the establishment and composition of the Supreme Court, including the appointment of the CJI and other judges.

• Article 50: Ensures the separation of the judiciary from the executive in public services.

Q2. Answer: (c) gymnastics

The correct answer is gymnastics.

Key Points

• Simone Biles, a world-renowned athlete, is associated with the sport of gymnastics. She is considered one of the greatest gymnasts of all time due to her extraordinary performance in international competitions.

• She has won multiple Olympic gold medals, including her stellar performance at the 2016 Summer Olympics in Rio de Janeiro, where she won four gold medals and one bronze medal.

• Simone Biles is celebrated for her groundbreaking routines and skills, such as her ability to execute complex moves like the Biles II on floor exercise, which is named after her.

• Her consistency and dominance in gymnastics earned her the 2025 Laureus World Sportswoman of the Year award, a prestigious accolade recognizing exceptional achievements in sports.

• Biles has also been instrumental in inspiring young athletes globally and has become a symbol of resilience and excellence in sports.

Additional Information

• Gymnastics:

• Gymnastics is a sport that involves physical exercises requiring strength, flexibility, balance, and coordination. It includes disciplines like artistic gymnastics, rhythmic gymnastics, trampoline, and acrobatics.

• Artistic gymnastics is the most popular form and features events like vault, uneven bars, balance beam, and floor exercise for women, and pommel horse, rings, vault, parallel bars, horizontal bar, and floor exercise for men.

• The sport is governed internationally by the International Gymnastics Federation (FIG), which sets rules and oversees competitions.

• Gymnastics has been part of the Olympic Games since its inception in 1896, and it continues to be a cornerstone event at the Games.

• Notable gymnasts apart from Simone Biles include Nadia Comaneci, who achieved the first perfect score at the Olympics, and Larisa Latynina, who holds the record for the most Olympic medals in gymnastics.

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• Laureus World Sports Awards:

• The Laureus World Sports Awards are annual awards honoring outstanding sports achievements across various categories. They are often referred to as the "Oscars of sports."

• Established in 2000, the awards recognize athletes, teams, and inspirational moments in sports. Categories include Sportsman of the Year, Sportswoman of the Year, Team of the Year, and Breakthrough of the Year.

• Simone Biles has been a frequent nominee and recipient of the Laureus Sportswoman of the Year award due to her consistent brilliance in gymnastics.

• The awards are decided by the Laureus World Sports Academy, a jury comprising legendary athletes.

• They aim to celebrate sports as a unifying force that transcends cultural and geographical barriers.

• Simone Biles' Achievements:

• Biles has won a total of 32 Olympic and World Championship medals, making her the most decorated gymnast in history.

• She has revolutionized gymnastics by introducing moves that require exceptional skill and athleticism, such as the Yurchenko double pike vault.

• Her mental health advocacy during the Tokyo 2020 Olympics brought global attention to the importance of mental well-being in sports.

• She has received numerous honors, including being named Time magazine's 100 Most Influential People in multiple years.

• Simone Biles continues to inspire future generations to pursue excellence both in sports and in life.

• Other Sports Mentioned in the Options:

• Track and Field: Focuses on athletic events such as running, jumping, and throwing. Famous athletes include Usain Bolt and Florence Griffith-Joyner.

• Tennis: A racquet sport played individually or in doubles. Renowned players include Roger Federer, Serena Williams, and Rafael Nadal.

• Swimming: A water-based sport with events like freestyle, butterfly, and backstroke. Famous swimmers include Michael Phelps and Katie Ledecky.

• These sports are distinct from gymnastics and require different skill sets and training methods.

Important Points

• Simone Biles is widely recognized as a role model for perseverance, excellence, and mental health advocacy.

• Her contributions to gymnastics have elevated the sport's global profile and inspired countless aspiring athletes.

• Understanding the achievements of athletes like Biles helps appreciate the dedication and hard work required in competitive sports.

• Gymnastics continues to evolve with new techniques and skills introduced by athletes like Simone Biles.

Q3. Answer: (c) Alluvial soil

The correct answer is Alluvial soil.

Key Points

• Alluvial soil is the most widespread and extensively found soil in the Great Indian Plains of India, covering about 40% of the total land area.

• This soil is formed by the deposition of silt, sand, and clay brought down by rivers such as the Ganga, Yamuna, Brahmaputra, and their tributaries.

• The Great Indian Plains, located in the northern part of India, primarily consist of alluvial deposits due to the perennial flow of rivers originating from the Himalayas.

• It is highly fertile and suitable for the cultivation of a variety of crops such as rice, wheat, sugarcane, and pulses, making it the backbone of Indian agriculture.

• Alluvial soil is divided into two types: khadar (new alluvium, deposited annually by floods) and bangar (old alluvium, found above the flood levels).

Additional Information

• Laterite soil:

• It is found in areas with high temperatures and heavy rainfall, such as the Western Ghats, parts of Odisha, Chhattisgarh, and Tamil Nadu.

• Laterite soil is rich in iron and aluminum but poor in organic matter and nitrogen content, making it less fertile.

• It is suitable for crops like cashew nuts, coffee, and tea.

• Black soil:

• Also known as Regur soil or cotton soil, it is primarily found in the Deccan Plateau region, including states like Maharashtra, Gujarat, Madhya Pradesh, and Andhra Pradesh.

• Black soil is rich in calcium carbonate, magnesium, and potash but poor in nitrogen and phosphorus.

• It is ideal for the cultivation of cotton, groundnut, and sugarcane.

• Red soil:

• Red soil is rich in iron oxide, giving it its characteristic red color, and is mainly found in parts of Odisha, Karnataka, Tamil Nadu, and Chhattisgarh.

• It is less fertile due to the absence of organic matter but can support crops like millets, pulses, and oilseeds.

• Importance of Alluvial Soil in Indian Agriculture:

• The alluvial soil in the Great Indian Plains supports the cultivation of major food crops, contributing to India's status as an agricultural economy.

• The presence of perennial rivers ensures a continuous supply of water, aiding irrigation and soil enrichment.

• This soil is responsible for the high productivity of states like Punjab, Haryana, Uttar Pradesh, and Bihar.

Q4. Answer: (b) Only 1 and 4

The correct answer is Only 1 and 4.

Key Points

• Vitamin A: It is a fat-soluble vitamin that is stored in the liver. It plays a critical role in vision, immune function, and reproduction. Hence, it is fat-soluble.

• Vitamin B6: This vitamin is water-soluble, meaning it dissolves in water and is not stored in the body. It is involved in amino acid metabolism and neurotransmitter synthesis. Hence, it is not fat-soluble.

• Vitamin C: Like Vitamin B6, Vitamin C is also water-soluble. It is vital for tissue repair, enzymatic production, and immune function. Hence, it is not fat-soluble.

• Vitamin D: Vitamin D is a fat-soluble vitamin stored in the body's fat tissues. It helps in calcium absorption and bone health. Hence, it is fat-soluble.

• Therefore, the correct answer includes Vitamin A and Vitamin D.

Additional Information

• Fat-Soluble Vitamins:

• These vitamins include Vitamin A, D, E, and K.

• They are absorbed along with dietary fats in the intestine and are stored in the liver and fat tissues for future use.

• Excessive intake can lead to toxicity because they are not excreted readily.

• Water-Soluble Vitamins:

• These include Vitamin B-complex (e.g., B6, B12, etc.) and Vitamin C.

• They dissolve in water and are generally not stored in the body; hence, they need to be consumed regularly.

• Excess amounts are usually excreted through urine, reducing the risk of toxicity.

• Vitamin A:

• Found in foods such as carrots, sweet potatoes, spinach, and liver.

• Deficiency can lead to night blindness and immune system issues.

• Vitamin D:

• Produced in the skin upon exposure to sunlight and found in foods such as fish, eggs, and fortified milk.

• Deficiency leads to rickets in children and osteomalacia in adults.

Important Points

• Functions of Fat-Soluble Vitamins:

• Vitamin A: Essential for vision, immune system, and reproduction.

• Vitamin D: Regulates calcium and phosphate levels in the body for healthy bones and teeth.

• Vitamin E: Acts as an antioxidant protecting cells from damage.

• Vitamin K: Plays a vital role in blood clotting and bone metabolism.

• Functions of Water-Soluble Vitamins:

• Vitamin C: Important for collagen synthesis, wound healing, and immune support.

• Vitamin B-complex: Involved in energy production, red blood cell formation, and maintaining the nervous system.

• Dietary Recommendations: A balanced diet with a variety of foods ensures adequate intake of both fat-soluble and water-soluble vitamins.

• Toxicity Risks: Overconsumption of fat-soluble vitamins can lead to hypervitaminosis, whereas water-soluble vitamins are generally safer due to excretion.

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Q5. Answer: (b) India–China dispute in Eastern Ladakh

The correct answer is India–China dispute in Eastern Ladakh.

Key Points

• The India–China dispute in Eastern Ladakh escalated significantly in recent years due to tensions near the Line of Actual Control (LAC). This region includes areas such as Pangong Lake, Galwan Valley, and Hot Springs.

• The confrontation between the two countries intensified in May 2020, leading to military clashes in the Galwan Valley in June 2020, which resulted in casualties on both sides.

• China's infrastructure development and deployment of troops in the region have been key factors contributing to the escalations. Reports indicate the construction of roads, bridges, and military camps along the disputed borders.

• India has responded by increasing its military presence, modernizing its infrastructure, and reinforcing its positions along the LAC to counter China's advances.

• Several rounds of diplomatic and military-level talks have been held to resolve the conflict, but a permanent solution has yet to be achieved due to differing interpretations of the LAC.

Additional Information

• The Line of Actual Control (LAC):

• The LAC is the de facto border between India and China, stretching over 3,488 km. It is divided into three sectors: Western, Central, and Eastern.

• The Western Sector (Ladakh) has been a major flashpoint due to disputes over the Aksai Chin region, which is controlled by China but claimed by India.

• Previous Disputes:

• India and China have a long history of border disputes, dating back to the 1962 Sino-Indian War, where China gained control over Aksai Chin.

• Other significant clashes include the Doklam standoff in 2017, near the India-Bhutan-China trijunction.

• Efforts for Resolution:

• India and China have conducted several rounds of military and diplomatic talks, including the Working Mechanism for Consultation and Coordination (WMCC) and Corps Commander-level meetings.

• Despite partial disengagement in certain areas, tensions remain high, and both sides continue to develop infrastructure and strengthen military capabilities.

• India's Strategic Response:

• India has focused on improving infrastructure in border areas, including roads, tunnels, and airbases to facilitate troop movement and logistics.

• The deployment of advanced weaponry and technologies such as drones, fighter jets, and surveillance equipment has enhanced India's preparedness along the LAC.

Important Points

• Galwan Valley Clash:

• In June 2020, a violent face-off occurred in the Galwan Valley, resulting in the deaths of 20 Indian soldiers and an unspecified number of Chinese troops.

• This was the first deadly clash between the two nations since 1975.

• China's Strategy:

• China has been accused of pursuing a policy of "salami slicing" – gradually encroaching on disputed territories to gain strategic advantage.

• Its Belt and Road Initiative (BRI) and related projects have also raised concerns about its intentions in the region.

• India's Strategic Partnerships:

• To counter China's aggression, India has strengthened ties with nations like the United States, Japan, and Australia, forming the Quad alliance.

• India has also enhanced defense cooperation with Russia and other allies to modernize its armed forces.

Q6. Answer: (c) Select file → Edit → Cut or Ctrl + X → Go to new location → Edit → Paste or Ctrl + V

The correct answer is 3) Select file → Edit → Cut or Ctrl + X → Go to new location → Edit → Paste or Ctrl + V.

Key Points

• Cut and Paste method is a process used to move files or folders from one location to another within a computer system.

• The steps involved in the correct method are:

• Select the file or folder that needs to be moved.

• Use the Edit menu or press Ctrl + X (shortcut for Cut) to remove the file or folder from its current location temporarily.

• Navigate to the new location where the file or folder is to be moved.

• Paste the file or folder in the new location using the Edit menu or pressing Ctrl + V (shortcut for Paste).

• This method ensures the file is moved (not copied) from the original location to the new one.

• Using Ctrl + X (Cut) removes the file from the original location, while Ctrl + V (Paste) places it in the new location.

• This process is commonly used when reorganizing files and folders on your computer to ensure proper organization and better accessibility.

Additional Information

• Difference between Cut and Copy:

• Cut: Removes the selected file or folder from its original location and places it temporarily in the clipboard. It will no longer exist in the original location once pasted.

• Copy: Creates a duplicate of the selected file or folder while leaving the original intact.

• Keyboard Shortcuts:

• Ctrl + X: Shortcut for Cut.

• Ctrl + V: Shortcut for Paste.

• Ctrl + C: Shortcut for Copy (not relevant for moving files).

• Common Mistakes:

• Using Ctrl + C (Copy) instead of Ctrl + X (Cut) when intending to move a file.

• Forgetting to paste the file after cutting it, leaving it temporarily in the clipboard and potentially losing track of it.

• Uses of Cut and Paste:

• Reorganizing files and folders for better accessibility and management.

• Efficiently moving data between different drives or folders.

• Applications:

• Used in document management systems, file explorers, and other software where file and folder organization is critical.

• Beneficial in multitasking environments to transfer data between applications.

Important Points

• File Movement vs. File Deletion: Unlike deleting a file, moving it retains the data but changes its location.

• Clipboard Functionality: The clipboard temporarily holds the data during the Cut operation until it is pasted in a new location.

• Software Compatibility: The Cut and Paste method is supported across most major operating systems, including Windows, macOS, and Linux.

Q7. Answer: (b) Uparika

The correct answer is Uparika.

Key Points

• The term Uparika was used to designate the governor of a province (bhukti) during the Pala and Pratihara empire.

• In ancient India, provinces or large administrative units were known as bhuktis, and the Uparika was responsible for overseeing the administration within these provinces.

• The Uparika was generally appointed by the central authority, such as the king or emperor, to ensure proper governance and collection of revenue in the bhukti.

• During the reign of the Pala dynasty, the administrative structure was highly centralized, and the Uparika played a crucial role in maintaining order and implementing policies at the provincial level.

• The Pratihara empire, known for its vast territorial expanse, required efficient provincial governance, which was carried out by officials like the Uparika.

Additional Information

• Administrative Structure in the Pala and Pratihara Empires:

• The Pala empire (8th to 12th century CE) was known for its centralized administrative system, with the king at the apex and officials like Uparika managing provinces.

• The Pratihara empire (8th to 11th century CE) had a similar structure, with provinces being governed by Uparikas to ensure smooth administration.

• Both empires employed a system of revenue collection, and the Uparikas played a key role in ensuring the proper functioning of this system at the provincial level.

• Functions of Uparika:

• Uparika was tasked with maintaining law and order within the province.

• He ensured the efficient collection of taxes and revenues from the bhukti and its smaller administrative units, known as visayas.

• He implemented the policies and orders issued by the central government or the king.

• Uparika also oversaw judicial functions and resolved disputes at the provincial level.

• Other Administrative Titles:

• Rashtrapati: This term referred to the head of a Rashtra (a larger administrative unit), but it was not used for provincial governors in the Pala and Pratihara empires.

• Visayapati: This title was given to the official in charge of a visaya (district or smaller administrative unit).

• Koshtapala: This term was associated with treasury officials and not the provincial governors.

• Historical Context:

• The Pala dynasty ruled over regions of Bengal, Bihar, and Odisha, while the Pratiharas controlled much of northern India during their reign.

• Effective provincial administration was vital for maintaining the vast territories under these empires, and the Uparikas played a significant role in this regard.

• These administrative practices set the groundwork for later governance systems in medieval India.

Important Points

• Bhukti: Refers to a province or large territorial division within the empire, governed by the Uparika.

• Visayas: Smaller administrative units within a Bhukti, managed by Visayapatis under the supervision of the Uparika.

• Revenue Collection: The Uparika ensured the efficient collection of taxes, which were vital for the empire's economy and governance.

• Centralized Administration: Both the Pala and Pratihara empires relied on centralized governance, with provincial governors ensuring the implementation of policies.

• Judicial Responsibilities: The Uparika also played a role in resolving disputes and maintaining justice within the province.

Q8. Answer: (b) Finance Commission

The correct answer is Finance Commission.

Key Points

• The Finance Commission is a constitutional body established under Article 280 of the Indian Constitution.

• Its primary role is to recommend the distribution of tax revenues between the Centre and the States and among the States themselves.

• The President of India constitutes the Finance Commission every five years or earlier if deemed necessary, to ensure equitable distribution of financial resources.

• The recommendations made by the Finance Commission aim to balance the fiscal needs of the Centre and States in line with their responsibilities.

• The 15th Finance Commission, chaired by N.K. Singh, was set up in 2017 and its recommendations cover the period from 2021 to 2026.

Additional Information

• Other Constitutional Bodies Related to Finance:

• Comptroller and Auditor General (CAG): Established under Article 148, the CAG audits the accounts of the Union and State governments and ensures financial accountability.

• NITI Aayog: While not a constitutional body, it replaced the Planning Commission in 2015 and acts as a policy think-tank for the Government of India.

• Role of Finance Commission:

• It determines the share of taxes to be allocated to the States from the divisible pool of central taxes.

• The Commission also decides grants-in-aid to States from the Consolidated Fund of India.

• It provides a framework for fiscal consolidation and debt management for both the Centre and States.

• Historical Background:

• The first Finance Commission was established in 1951 under the chairmanship of K.C. Neogy.

• To date, 15 Finance Commissions have been set up, with each contributing significantly to India's fiscal federalism.

• Important Articles:

• Article 275: Provides for grants-in-aid to States in need of financial assistance.

• Article 280: Establishes the Finance Commission and its mandate.

• Other Relevant Features:

• The Finance Commission considers factors like population, income, and area of States while recommending tax distribution.

• Its recommendations are advisory and not binding on the government, but they carry significant weight in fiscal planning.

Important Points

• The Finance Commission ensures fiscal federalism by balancing the financial needs of the Centre and States.

• The Union Budget and State Budgets are influenced by its recommendations.

• The GST Council, established under Article 279A, works in tandem with the Finance Commission to manage the Goods and Services Tax (GST) framework.

• While the Finance Commission focuses on tax distribution, the Planning Commission (now replaced by NITI Aayog) historically focused on planning and allocation of Plan grants.

• The Finance Commission also takes into account the States' performance in sectors like health, education, and social welfare while making recommendations.

Q9. Answer: (d) HDFC Limited

The correct answer is HDFC Limited.

Key Points

• HDFC Limited was among the first financial institutions in India to receive the 'in principle' approval from the Reserve Bank of India (RBI) to set up a private bank.

• It was granted this approval under the 1993 guidelines issued by the RBI for the establishment of private sector banks.

• HDFC Bank, a subsidiary of HDFC Limited, was incorporated in August 1994 and commenced operations as a commercial bank in January 1995.

• HDFC Bank is known for its robust digital infrastructure, providing services like retail banking, wholesale banking, and treasury operations.

• Its establishment marked a significant step in the liberalization of India's banking sector, allowing private entities to contribute to financial growth.

Additional Information

• Reserve Bank of India Guidelines for Private Sector Banks:

• In 1993, the RBI released guidelines allowing private entities to establish banks in India to foster competition and improve efficiency in the banking sector.

• These guidelines aimed to increase financial inclusion and provide better banking services to the unbanked population.

• Key Features of HDFC Bank:

• HDFC Bank specializes in retail banking, offering products such as savings accounts, loans, and credit cards.

• It is also known for its advanced digital banking services, including mobile banking and net banking platforms.

• As of 2023, HDFC Bank is one of India's largest private banks in terms of market capitalization and customer base.

• Other Banks Receiving Approval:

• IndusInd Bank Limited: Established in 1994, it was also among the first private banks approved under the 1993 guidelines.

• Axis Bank: Formerly known as UTI Bank, it began operations in 1993.

• Kotak Mahindra Bank: Received its banking license in 2003, becoming India's first non-banking finance company (NBFC) to transform into a bank.

• Impact of Private Sector Banks:

• Private banks have introduced modern banking practices, such as ATMs, digital payments, and personalized financial products.

• They have significantly contributed to India's economic growth by increasing access to credit and promoting entrepreneurship.

Important Points

• Development of India's Banking Sector:

• The introduction of private banks was a part of the liberalization policies initiated in the 1990s.

• This allowed the banking sector to expand and cater to the growing needs of India's economy.

• Private banks have played a pivotal role in financial innovation and technology adoption.

Q10. Answer: (b) 33%

The correct answer is 0.33.

Key Points

• Women play a significant role in rural livelihoods and household management, contributing substantially to the economic and social fabric of rural areas.

• In India, Article 243D of the Constitution mandates that at least one-third (33%) of seats in Panchayati Raj Institutions (PRIs) be reserved for women.

• This reservation is aimed at empowering women and increasing their participation in local governance and decision-making processes.

• The reservation applies to seats at all levels of PRIs, including Gram Panchayat, Block Panchayat, and District Panchayat, ensuring representation across the governance hierarchy.

• Several states, such as Bihar and Rajasthan, have gone beyond the constitutional mandate, reserving 50% of seats for women

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in Panchayati Raj Institutions.

Additional Information

• Panchayati Raj Institutions (PRIs):

• PRIs are a system of rural local governance in India, established under the 73rd Constitutional Amendment Act of 1992.

• They consist of three tiers: Gram Panchayat at the village level, Panchayat Samiti at the block level, and Zila Parishad at the district level.

• PRIs aim to decentralize power and bring governance closer to the people, promoting participatory democracy.

• Empowerment of Women:

• The reservation of seats for women in PRIs is a crucial step towards achieving gender equality in governance.

• It helps women gain experience in leadership roles, enhancing their confidence and decision-making abilities.

• Studies have shown that women leaders in PRIs often prioritize issues like education, healthcare, and sanitation, leading to improved outcomes in these areas.

• State Initiatives:

• States like Kerala and Karnataka have implemented innovative programs to train women elected representatives in PRIs.

• These initiatives aim to enhance the capacity of women leaders, enabling them to effectively perform their duties and address community needs.

• Challenges in Implementation:

• Despite the reservation, women in PRIs often face challenges such as patriarchal attitudes, lack of training, and limited access to resources.

• Efforts are needed to address these barriers and ensure that women can fully participate and lead in local governance.

Important Points

• 73rd Constitutional Amendment Act:

• Introduced in 1992, this act laid the foundation for the Panchayati Raj system in India.

• It added Part IX to the Constitution and provided for the establishment of Gram Sabha and PRIs.

• It also introduced the concept of reservation for Scheduled Castes (SCs), Scheduled Tribes (STs), and women in PRIs.

• Significance of Women's Reservation:

• Women's representation in PRIs plays a critical role in addressing gender disparities and ensuring inclusive governance.

• It also serves as a platform for women to voice their concerns and contribute to community development.

• Global Perspective:

• India's efforts to ensure women's representation in local governance align with global goals like the UN Sustainable Development Goals (SDGs), particularly Goal 5 on achieving gender equality.

• Countries like Rwanda have also implemented gender quotas in governance, with women holding over 60% of parliamentary seats.

Q11. Answer: (d) Prayers and hymns

The correct answer is Prayers and hymns.

Key Points

• The four Vedas, namely Rigveda, Yajurveda, Samaveda, and Atharvaveda, are the earliest known scriptures of Hinduism and are primarily composed of prayers and hymns.

• Rigveda, the oldest of the Vedas, contains a collection of 1028 hymns, mainly dedicated to various deities such as Agni, Indra, and Varuna.

• The Samaveda is essentially a compilation of melodies and chants, focusing on the musical rendition of hymns from the Rigveda.

• Yajurveda includes hymns and verses that are recited during sacrificial rituals, providing instructions on how to perform these ceremonies.

• The Atharvaveda contains hymns, chants, and incantations for various purposes, including healing, prosperity, and warding off evil forces.

Additional Information

• Importance of Vedic Literature:

• The Vedas are considered the foundation of Hindu philosophy and spirituality.

• They are written in Sanskrit and are classified as shruti literature, meaning "that which is heard" or divine revelation.

• Each Veda is divided into four parts: Samhitas (hymns), Brahmanas (rituals), Aranyakas (theological discussions), and Upanishads (philosophical teachings).

• Characteristics of Each Veda:

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• Rigveda: Focuses on hymns and praises of nature and deities. It is the oldest Veda, composed around 1500–1200 BCE.
• Yajurveda: Provides procedural details for rituals and sacrifices, emphasizing the technical aspects of ceremonies.
• Samaveda: Known as the Veda of melodies, it includes chants that are sung during sacrifices and rituals.
• Atharvaveda: Covers a wide range of topics, including healing, magic, and everyday life practices.
• Comparison of Options:
• War strategies: The Vedas do not focus on war strategies; they are primarily spiritual and philosophical texts.
• Agricultural manuals: Agriculture is not a central theme of the Vedas; it is mentioned in passing but not elaborated upon.
• Laws and rituals: While the Vedas include rituals, they are not codified laws but rather guidelines for spiritual practices.
• Prayers and hymns: This is the main content of the Vedas, as they consist of hymns dedicated to deities and prayers for prosperity, health, and spiritual growth.
• Historical Context:
• The Vedas were composed during the Early Vedic period, approximately between 1500 BCE and 500 BCE.
• They were transmitted orally for generations before being written down.

Important Points

• Preservation: The Vedas are preserved through oral traditions known as Vedic chanting, which follows strict guidelines to maintain accuracy and pronunciation.
• Influence: The Vedas have profoundly influenced Indian culture, philosophy, and spirituality, forming the basis of many later texts like the Upanishads, Puranas, and Epics (Mahabharata and Ramayana).
• Modern Relevance: The hymns and philosophies in the Vedas continue to be studied and practiced in various forms, highlighting their timeless significance.

Q12. Answer: (d) Meitei

The correct answer is Meitei.

Key Points

• Meitei is the official language of the state of Manipur. It is also referred to as Manipuri and is spoken by the majority of the population in the state.
• Meitei is one of the 22 scheduled languages recognized by the Constitution of India under the Eighth Schedule.
• The language belongs to the Tibeto-Burman family of languages and has a rich tradition of literature, culture, and history.
• In 1992, Manipuri was officially included in the Eighth Schedule of the Constitution, elevating its status to a scheduled language.
• Meitei is used for administrative purposes, education, and communication in Manipur, alongside English.

Additional Information

• Khasi:
• Khasi is a language spoken predominantly in the state of Meghalaya by the Khasi tribe.
• It is classified under the Austroasiatic language family and is one of the prominent tribal languages of Northeast India.
• Khasi is not an official language of Manipur.
• Mizo:
• Mizo is the native language of the Mizoram state and is spoken by the Mizo community.
• It belongs to the Tibeto-Burman language family, similar to Meitei.
• Mizo is not recognized as the official language of Manipur.
• Bodo:
• Bodo is a language spoken by the Bodo people in Assam and other parts of Northeast India.
• It is one of the 22 scheduled languages of India and belongs to the Tibeto-Burman language family.
• Bodo is not the official language of Manipur.
• Meitei/Manipuri:
• Meitei is the predominant language of Manipur and is widely spoken across the state.
• It has a unique script called Meitei Mayek and a rich literary heritage.
• The language is used in official communication, education, and cultural activities in Manipur.
• It is recognized as a scheduled language of India, providing it constitutional protection and support.

Important Points

• Scheduled Languages:
• India recognizes 22 scheduled languages under the Eighth Schedule of the Constitution.
• The inclusion of a language as a scheduled language ensures its development, preservation, and promotion.
• Meitei/Manipuri was added to the Eighth Schedule in 1992, ensuring its recognition at the national level.

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• Cultural Significance of Meitei:

• Meitei serves as a unifying language for various ethnic communities in Manipur.

• It plays a key role in preserving the identity, heritage, and traditions of the Meitei community.

• The language is integral to Manipur's folk songs, dances, and traditional storytelling.

Q13. Answer: (b) Article 338

The correct answer is Article 338.

Key Points

• Article 338 of the Indian Constitution provides for the establishment of the National Commission for Scheduled Castes (NCSC).

• The Commission was created to promote and safeguard the interests of the Scheduled Castes (SCs) in India.

• The 89th Amendment Act of 2003 bifurcated the earlier combined National Commission for Scheduled Castes and Scheduled Tribes into two separate bodies – the National Commission for Scheduled Castes (NCSC) and the National Commission for Scheduled Tribes (NCST).

• The primary functions of the NCSC include investigating and monitoring matters related to the safeguards provided to Scheduled Castes under the Constitution or other laws and evaluating their implementation.

• The Commission also participates in the planning process of socio-economic development for SCs and advises on measures to be taken for their development and protection.

Additional Information

• Article 340:

• This article deals with the appointment of a commission to investigate the conditions of socially and educationally backward classes and recommend measures for their upliftment.

• An example is the First Backward Classes Commission (Kaka Kalelkar Commission) established in 1953.

• Article 342:

• This article provides for the identification of Scheduled Tribes (STs) in various states and union territories through a Presidential notification.

• It enables the government to specify the tribal communities considered eligible for special provisions.

• Article 335:

• This article specifies that the claims of Scheduled Castes and Scheduled Tribes shall be taken into consideration in the making of appointments to services and posts in connection with the affairs of the Union or a state, consistent with the maintenance of efficiency.

• It highlights the principle of reservation in public sector employment for SCs and STs.

• Role and Composition of NCSC:

• The NCSC consists of a Chairperson, Vice-Chairperson, and three other members appointed by the President of India.

• The Commission has the power of a civil court to investigate complaints, summon witnesses, and demand documents related to its work.

• It submits annual reports to the President, which are then placed before Parliament along with a memorandum explaining the action taken.

Important Points

• The National Commission for Scheduled Castes (NCSC) was established to safeguard the provisions under Part XVI of the Indian Constitution, which addresses the special provisions for Scheduled Castes and Scheduled Tribes.

• The NCSC also monitors the implementation of various central and state-level schemes aimed at the development of Scheduled Castes.

• The Commission has the authority to look into complaints regarding the deprivation of rights and safeguards of Scheduled Castes, ensuring their welfare and protection.

• The establishment of such commissions ensures the accountability of the government in promoting the socio-economic development of weaker sections of the society.

Q14. Answer: (a) Door-to-door service

The correct answer is Door-to-door service.

Key Points

• Road transport provides door-to-door service, which is its primary advantage over railways. This means goods and passengers can be directly picked up from their location and delivered to their destination without the need for intermediate transfers.

• Unlike railways that require goods to be transported to and from railway stations, road transport can directly reach areas where railways or other forms of transport may not be accessible.

• Road transport is highly flexible, as it allows routes and schedules to be altered quickly based on the needs of the user. This is in

stark contrast to the fixed routes and schedules of railways.

• It is particularly suitable for short distances and transporting small quantities of goods. The ability to navigate narrow roads and reach remote locations makes road transport ideal for localized distribution.

• Although road transport is not as cost-effective as railways for long distances, it excels in providing last-mile connectivity, which railways cannot offer efficiently.

Additional Information

• Advantages of Road Transport:

• Accessibility: It can reach remote and rural areas, which are often inaccessible by railways or airways.

• Cost-effectiveness: For short distances, road transport is usually more economical compared to other modes.

• Flexibility: Road transport provides flexibility in terms of route, timing, and door-to-door delivery, making it convenient for personalized services.

• Quick and direct: Unlike railways, road transport does not require loading and unloading at intermediate points, reducing transit time and damage to goods.

• Limitations of Railways:

• Fixed routes: Railways operate on fixed tracks, which limits their reach to certain geographical areas.

• Loading and unloading: Goods often need to be transported to and from railway stations, increasing transit time and costs.

• Cost: Railways are more cost-effective over long distances, but for shorter routes, road transport is more economical and practical.

• Schedule dependency: Railways operate on fixed schedules, which may not always align with the immediate needs of the users.

• Environmental Considerations:

• Road transport is generally less environmentally friendly compared to railways due to higher fuel consumption and emissions.

• Electric trains and other eco-friendly rail options are becoming more popular to address environmental concerns.

• Comparison of Road Transport and Railways:

• Road Transport: Offers flexibility, door-to-door service, and is better for short distances.

• Railways: More economical and efficient for long distances, especially for bulk goods and passengers.

Important Points

• Statistics:

• In India, road transport handles nearly 65% of freight and 90% of passenger traffic, demonstrating its importance in the transportation sector.

• Railways account for about 30% of freight movement and 10% of passenger traffic in India.

• Government Initiatives:

• The Indian government has launched several schemes to improve road infrastructure, such as the Bharatmala Pariyojana, which aims to develop a robust road network across the country.

• Efforts are also being made to expand and modernize the railway network through initiatives like Dedicated Freight Corridors and high-speed rail projects.

Q15. Answer: (a) Virat Kohli

The correct answer is Virat Kohli.

Key Points

• Virat Kohli created history by becoming the first cricketer to score 9000 runs in T20 cricket in May 2025, setting a new benchmark for excellence in the shortest format of the game.

• Kohli's achievement is a testament to his consistency, adaptability, and proficiency across various formats of cricket, and his ability to excel under pressure in diverse conditions.

• The milestone was achieved during a domestic T20 league match, where Kohli showcased his trademark batting prowess and resilience.

• Virat Kohli is widely regarded as one of the greatest batsmen in cricket history, with numerous records in all formats, including his ability to chase targets successfully in limited-overs cricket.

• Kohli's achievement further solidifies his position as a modern-day cricket legend and serves as an inspiration for aspiring cricketers worldwide.

Additional Information

• Virat Kohli:

• Born on 5th November 1988 in Delhi, India, Kohli is known for his aggressive batting style and leadership qualities.

• He has been a pivotal player for the Indian cricket team across all formats and captained the team in Test, ODI, and T20 cricket.

• Kohli is the fastest player to reach milestones such as 8000, 9000, and 10,000 runs in ODIs, showcasing his dominance in

international cricket.

• T20 Cricket:

• T20 cricket is a format where each team bats for a maximum of 20 overs, emphasizing quick runs and dynamic gameplay.

• The format was introduced in 2003 and has gained massive popularity worldwide due to its fast-paced nature and entertainment value.

• Major T20 leagues like the Indian Premier League (IPL), Big Bash League, and CPL have played a significant role in the development of the format.

• KL Rahul:

• Another prominent Indian cricketer, KL Rahul, is known for his versatility and has been a key player in T20 leagues and international matches.

• Rahul has made significant contributions to Indian cricket, but he is yet to reach the milestone of 9000 runs in T20 cricket.

• Rohit Sharma:

• Rohit Sharma, the Indian cricket team's former captain in limited-overs formats, is famous for his ability to score big hundreds in ODIs and T20s.

• While Rohit is among the leading run-scorers in T20 cricket, he has not achieved the 9000-run mark yet.

• Tilak Verma:

• Tilak Verma is a young and promising cricketer who has shown great potential in domestic cricket and IPL.

• Despite his talent, Verma is at the beginning of his career and far from reaching the milestone of 9000 runs in T20 cricket.

Important Points

• Virat Kohli’s Records:

• Kohli holds the record for the most centuries in chasing in ODIs, making him one of the best finishers in the game.

• He is the fastest player to reach 23,000 runs in international cricket across all formats.

• Kohli has won multiple ICC awards, including the ICC Cricketer of the Year and ICC ODI Player of the Year.

• Impact of T20 Cricket:

• T20 cricket has revolutionized the game, introducing new strategies, aggressive batting, and innovative bowling techniques.

• Players like Kohli, Chris Gayle, and AB de Villiers have set benchmarks in the format, inspiring future generations.

Q16. Answer: (a) Indigo planters and zamindars

The correct answer is Indigo planters and zamindars.

Key Points

• The Faraizi Movement was initiated by Haji Shariatullah in the early 19th century in Bengal with the aim of purifying Islam and fighting socio-economic oppression.

• One of the core aspects of the movement was the no-tax campaign, targeting the oppressive practices of Indigo planters and zamindars who exploited peasants.

• The Indigo planters were mostly European landlords who forced peasants to grow indigo under exploitative terms, often leading to financial ruin for the farmers.

• Zamindars were local landlords who collected exorbitant taxes from peasants, often pushing them into extreme poverty.

• The movement aimed to protect peasants from these exploitative practices and assert their rights, under the guidance of Islamic principles.

• The correct target of the campaign was Indigo planters and zamindars, making this option correct.

Additional Information

• Faraizi Movement:

• Founded by Haji Shariatullah in Bengal during the early 19th century (around 1819).

• The movement derived its name from “Farz,” which means obligatory duties in Islam. It advocated for the observance of Islamic principles and practices.

• It addressed both religious and socio-economic oppression, focusing on the plight of peasants and their exploitation by landlords and planters.

• The movement gained significant support among the Muslim peasantry in Bengal, who were economically and socially oppressed.

• Indigo Planters:

• Indigo cultivation in Bengal was introduced by the British during the colonial era.

• Planters forced farmers to grow indigo under exploitative contracts, often leading to financial hardships for the peasants.

• The cultivation of indigo was labor-intensive and reduced soil fertility, further worsening the conditions of the farmers.

• The exploitation of indigo farmers led to the historic Indigo Revolt in 1859, which was one of the first organized peasant

movements in India.

• Zamindari System:

• The Zamindari system was introduced by the British in Bengal through the Permanent Settlement Act of 1793.

• Zamindars were given the role of collecting taxes from peasants on behalf of the British government.

• Many zamindars exploited peasants by collecting exorbitant taxes and seizing their lands in case of non-payment.

• The oppressive practices of zamindars were a major cause of rural poverty and led to widespread resentment among farmers.

• Legacy of the Faraizi Movement:

• It played a crucial role in raising awareness about the rights of peasants and resisting exploitation.

• The movement influenced later peasant uprisings such as the Indigo Revolt and other agrarian movements in colonial India.

• It also contributed to the socio-religious reform efforts among Muslims in Bengal.

Important Points

• The Indigo Revolt of 1859 was a direct consequence of the exploitation of peasants by indigo planters and was a significant event in India's struggle against colonial oppression.

• The movement under Haji Shariatullah also contributed to the development of Islamic reform movements in India, emphasizing the importance of socio-economic equality.

• The Faraizi Movement was not limited to religious reforms but also addressed the socio-political challenges faced by the Muslim peasantry in Bengal.

• Similar peasant movements during colonial times include the Pagal Panthis in Bengal and the Deccan Riots in Maharashtra.

• The role of religious leaders like Haji Shariatullah highlights how socio-economic struggles were often intertwined with religious reform during colonial India.

Q17. Answer: (c) only in the third section

The correct answer is only in the third section.

Key Points

• Akbarnama: Written by Abul Fazl, Akbarnama is a historic document chronicling the reign of Mughal Emperor Akbar. It is divided into three sections or volumes.

• The third section of Akbarnama, also known as Ain-i-Akbari, extensively describes Akbar's administration, including his household, army, revenue system, and the geography of his empire.

• The Ain-i-Akbari contains detailed information about Akbar's centralized administration, military organization, and governance strategies.

• The first section focuses on the genealogy and history of Akbar's ancestors, providing a historical background of the Mughal dynasty. It does not include administrative details. Hence, this statement is incorrect.

• The second section narrates Akbar's reign, detailing his conquests and campaigns but does not delve into administrative topics. Hence, this statement is incorrect.

• Therefore, the third section is the only part of Akbarnama that discusses Akbar's administration, household, army, revenue, and geography.

Additional Information

• Structure of Akbarnama:

• The First Section: It narrates the genealogy of Akbar, describing his ancestors and their achievements, and provides a historical backdrop to the Mughal Empire.

• The Second Section: Focuses on significant events during Akbar's reign, such as conquests, campaigns, and efforts to expand the empire.

• The Third Section (Ain-i-Akbari): Extensively details Akbar's administrative framework, revenue policies, military organization, and socio-economic conditions of the empire.

• Features of Ain-i-Akbari:

• Describes Akbar's administrative divisions, including provinces (subahs), districts, and villages.

• Details Akbar's revenue system, including land measurement, taxation policies, and agricultural land categorization.

• Explains the Mansabdari system, military hierarchy, and recruitment policies.

• Provides insights into the socio-cultural environment, royal household operations, and religious practices during Akbar's reign.

• Importance of Akbarnama:

• Akbarnama serves as a crucial historical source for understanding the Mughal Empire's governance, military strategies, and socio-economic conditions.

• Reflects Akbar's visionary leadership and policies of religious tolerance and cultural integration.

• Highlights Akbar's emphasis on a centralized administration and efforts to enhance the welfare of his subjects.

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• About Abul Fazl:

• Abul Fazl, a court historian, was one of the Navaratnas (Nine Jewels) in Akbar's court.

• He played a significant role in shaping Akbar's governance policies and documenting his reign through the Akbarnama.

Important Points

• Chronology and Historical Context:

• The Akbarnama was written during Akbar's reign, emphasizing the importance of documenting history contemporaneously.

• It provides insights into how historical records were meticulously maintained in the Mughal era.

• Relevance in Modern Times:

• The Akbarnama is frequently referenced in academic studies related to medieval Indian history.

• It serves as an inspiration for modern governance and administration due to its detailed description of Akbar's visionary policies.

Q18. Answer: (a) Werner Heisenberg

The correct answer is Werner Heisenberg.

Key Points

• Werner Heisenberg is best known for his contribution to the development of quantum mechanics, which he published in 1925.

• Heisenberg formulated the Matrix Mechanics representation of quantum mechanics, which became one of the foundational frameworks for understanding quantum physics.

• His work laid the groundwork for the Uncertainty Principle, a fundamental concept in quantum mechanics that describes the limitations of measuring certain pairs of variables simultaneously.

• Heisenberg's contributions earned him the Nobel Prize in Physics in 1932 for the creation of quantum mechanics.

• Quantum mechanics revolutionized science by providing a deeper understanding of atomic and subatomic particles and their interactions. Hence, the correct answer is Werner Heisenberg.

Additional Information

• Quantum Mechanics:

• Quantum mechanics is a fundamental branch of physics that deals with the behavior of particles at atomic and subatomic levels.

• It describes phenomena that cannot be explained by classical physics, such as the behavior of electrons in an atom or photons of light.

• Key principles include the wave-particle duality, superposition, and entanglement.

• Werner Heisenberg's Uncertainty Principle:

• The Uncertainty Principle states that it is impossible to simultaneously measure both the position and momentum of a particle with perfect accuracy.

• This principle highlights the inherent limitations in observing particles at quantum levels.

• It has significant implications for fields like quantum computing, cryptography, and particle physics.

• Other Contributors to Quantum Mechanics:

• Wolfgang Pauli: Known for the Pauli Exclusion Principle, which states that no two fermions can occupy the same quantum state simultaneously.

• Heinrich Rudolf Hertz: Known for discovering electromagnetic waves but not directly related to the theory of quantum mechanics.

• Ernest Rutherford: Famous for his gold foil experiment and contributions to nuclear physics, but not associated with the development of quantum mechanics.

• Applications of Quantum Mechanics:

• Quantum mechanics is used in technologies like semiconductor devices, quantum computing, and medical imaging such as MRI.

• It also plays a crucial role in understanding chemical bonding, molecular structures, and the behavior of materials.

Q19. Answer: (d) ICMR

The correct answer is ICMR.

Key Points

• Indian Council of Medical Research (ICMR) launched the 'Medical Innovations Patent Mitra' initiative in 2025 to support medical innovators in securing patents for their inventions.

• The initiative aims to promote innovation in healthcare and support researchers in developing new medical technologies for affordable and accessible healthcare solutions.

• The program provides legal and technical assistance for filing patents to protect the intellectual property rights of medical innovators.

• The initiative is expected to foster a culture of innovation and entrepreneurship in the medical research domain in India.

• ICMR has been actively involved in advancing medical research and innovation to improve public health outcomes in India.

Additional Information

• Indian Council of Medical Research (ICMR):

• Founded in 1911, ICMR is one of the oldest and most prestigious medical research organizations in the world.

• It operates under the Ministry of Health and Family Welfare and is headquartered in New Delhi, India.

• ICMR focuses on promoting and conducting biomedical research to address health challenges in India.

• ICMR has played a crucial role in addressing major health issues such as malaria, tuberculosis, HIV/AIDS, and non-communicable diseases.

• Patent Filing in India:

• Patents are legal rights granted to inventors to protect their inventions from unauthorized use.

• In India, patents are governed by the Indian Patent Act, 1970, which was amended in 2005 to comply with international standards.

• The process of patent filing involves submission of detailed technical and legal documentation to the Indian Patent Office.

• Securing patents is essential for fostering innovation and protecting intellectual property in medical research.

• Importance of Medical Innovations:

• Medical innovations play a significant role in improving healthcare outcomes and addressing critical health challenges.

• They include advancements in medical devices, diagnostic tools, pharmaceuticals, and treatment protocols.

• Promoting innovation in healthcare can lead to cost-effective solutions and enhance accessibility for underserved populations.

• Support for Innovators:

• Initiatives like 'Medical Innovations Patent Mitra' provide financial, technical, and legal assistance to researchers and entrepreneurs in the healthcare sector.

• Such programs encourage startups and small-scale innovators to contribute to the healthcare ecosystem.

• They help bridge the gap between research and commercialization of medical technologies.

Q20. Answer: (d) Birsa Munda

The correct answer is Birsa Munda.

Key Points

• Birsa Munda was a tribal freedom fighter and religious leader from the Munda tribe in present-day Jharkhand, India.

• He spearheaded the Munda Rebellion, also known as the Ulgulan (The Great Rebellion), against British colonial rule and the feudal system in the Chotanagpur region during the late 19th century.

• The rebellion, led by Birsa Munda, aimed to establish the rights of the tribal community over their land and resources, which were being exploited by landlords and British officials.

• Birsa Munda is regarded as a symbol of tribal identity and resistance. He also propagated the idea of religious and social reform among the tribal people, opposing superstition and encouraging unity.

• The Indian government honors his legacy by celebrating his birth anniversary, 15th November, as Janjatiya Gaurav Divas (Tribal Pride Day).

Additional Information

• Munda Rebellion:

• The Munda Rebellion (1899-1900) was primarily against the exploitative zamindari system, which deprived the tribal people of their land ownership.

• Birsa Munda's slogan "Abua Raj seter jana, maharani raj tundu jana" (Let the kingdom of the queen end and our kingdom be established) became a rallying cry for the movement.

• Birsa's Vision:

• He envisioned a self-rule for the tribal people and fought for their land rights.

• Birsa also emphasized the importance of social reforms, advocating against superstitions and practices like witchcraft.

• Legacy:

• Birsa Munda passed away at the young age of 25 years on 9th June 1900, but his contributions to India's freedom struggle remain significant.

• Several institutions, universities, and government programs are named after him to honor his contributions, including the Birsa Institute of Technology and Birsa Agricultural University.

• Other Tribal Leaders:

• Nirmal Munda: Known for leading the Tangarpada Movement in Odisha against British exploitation.

• Kariya Munda: A prominent political leader from the tribal community and a former deputy speaker of the Lok Sabha.

Q21. Answer: (d) the Election Commission to conduct elections for Lok Sabha and all State Assemblies at the same time

The correct answer is the Election Commission to conduct elections for Lok Sabha and all State Assemblies at the same time

Key Points

• Purpose: Enables simultaneous elections to the Lok Sabha and all State Legislative Assemblies.

• Empowering Authority: Election Commission of India (ECI) is authorized to synchronize elections.

• Reason: Reduces frequent elections, administrative costs, and political disruptions, supporting the “One Nation, One Election” concept.

• Scope: Applies to all States and Union Territories with Legislative Assemblies.

Additional Information

• 103rd Constitutional Amendment:

• The 103rd Amendment to the Constitution introduced a 10% reservation for economically weaker sections (EWS) of the general category in government jobs and educational institutions.

• This reservation was applicable to individuals who did not fall under the SC, ST, or OBC categories and met the prescribed income and asset criteria.

• It added two new clauses in Article 15(6) and Article 16(6) to provide reservation for EWS categories.

• Economically Weaker Sections (EWS) Criteria:

• Individuals with a family income of less than Rs. 8 lakh per annum are considered EWS.

• Exclusions include those owning agricultural land of more than 5 acres, a residential flat of more than 1000 sq. ft, or a residential plot of specific dimensions as per criteria.

• Reservation Policy in India:

• India follows a reservation system to ensure social justice for marginalized communities such as SCs, STs, and OBCs.

• The EWS reservation is a significant step towards addressing economic disparities beyond caste-based considerations.

• Articles Related to Reservation in India:

• Article 15: Prohibits discrimination on grounds of religion, race, caste, sex, or place of birth.

• Article 16: Provides for equality of opportunity in matters of public employment.

• The 103rd Amendment added the sub-clauses (6) to both of these articles to accommodate EWS reservation.

Important Points

• Implementation of EWS Reservation:

• The reservation for EWS is applicable in central government jobs and admission to educational institutions.

• Many states have adopted the EWS reservation policy in their respective jurisdictions as well.

• Supreme Court Verdict:

• The Supreme Court upheld the constitutional validity of the 103rd Amendment in November 2022, ensuring the continuity of EWS reservations.

• The court ruled that the amendment does not violate the basic structure of the Constitution.

• Global Context:

• Many countries have affirmative action policies for economically or socially disadvantaged groups, such as the United States and South Africa.

• India's EWS reservation is considered a pioneering step in addressing economic inequality through affirmative action.

Q22. Answer: (c) two

The correct answer is two.

Key Points

• On 30 May 2025, two new judges were sworn-in to the Supreme Court of India. This addition was aimed at maintaining efficiency in the apex court's functioning and addressing the backlog of cases.

• The Supreme Court of India is the highest judicial authority in the country, consisting of the Chief Justice of India and other judges appointed by the President of India as per Article 124 of the Constitution.

• Judges of the Supreme Court are appointed based on their qualifications, experience, and recommendations from the Collegium system.

• The swearing-in of new judges is an important event as it strengthens the judiciary and ensures timely justice delivery.

• The appointment of judges is crucial for maintaining the balance and independence of the judiciary, which is one of the pillars of democracy in India.

Additional Information

• Supreme Court Composition:

• The Supreme Court can have a maximum strength of 34 judges, including the Chief Justice of India, as per the Supreme Court

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(Number of Judges) Amendment Act, 2019.

• Judges are appointed by the President based on recommendations of the Collegium system, comprising senior judges of the Supreme Court.

• Collegium System:

• The Collegium system is responsible for the appointment and transfer of judges in the higher judiciary. It comprises the Chief Justice of India and four senior-most judges of the Supreme Court.

• This system ensures transparency and independence in the selection process.

• Qualifications for Supreme Court Judges:

• A judge must be a citizen of India and have served as a High Court judge for at least five years or been an advocate in a High Court for ten years.

• Alternatively, the person must be considered a distinguished jurist by the President of India.

• Judicial Backlog:

• The addition of judges to the Supreme Court is essential to address the backlog of pending cases. As of recent statistics, the court handles thousands of cases annually.

• The appointment of judges helps in streamlining case management and ensuring speedy justice.

• Role of Supreme Court:

• The Supreme Court is tasked with upholding the Constitution of India, resolving disputes between states, and protecting fundamental rights of citizens.

• It acts as the guardian of the Constitution and ensures the rule of law in the country.

Q23. Answer: (d) New York City

The correct answer is New York City.

Key Points

• The third Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons (TPNW) was held in New York City in 2025.

• The Treaty on the Prohibition of Nuclear Weapons (TPNW) is the first legally binding international agreement to comprehensively prohibit nuclear weapons with the ultimate goal of their total elimination.

• The TPNW was adopted on 7 July 2017, and it entered into force on 22 January 2021.

• This treaty prohibits nations from developing, testing, producing, acquiring, possessing, stockpiling, using, or threatening to use nuclear weapons, as well as assisting or encouraging such acts.

• The meeting aimed to review the progress of the TPNW and to discuss measures for advancing nuclear disarmament worldwide.

Additional Information

• About the Treaty on the Prohibition of Nuclear Weapons (TPNW):

• Also known as the Nuclear Weapon Ban Treaty, it is an international treaty that seeks to ban nuclear weapons entirely.

• The treaty was negotiated at a United Nations conference in New York and was adopted by 122 nations.

• It complements other disarmament agreements like the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

• Key Objectives of TPNW:

• Eliminate nuclear weapons globally to ensure peace and security.

• Promote humanitarian assistance and environmental remediation for victims of nuclear testing and use.

• Establish a framework for verification and enforcement of nuclear disarmament commitments.

• Participating Nations:

• As of October 2023, 92 countries have signed the treaty, and 69 have ratified it.

• Notably, most nuclear-armed states and NATO members have not joined the treaty.

• Global Impact:

• The treaty has raised awareness about the humanitarian consequences of nuclear weapons and the need for disarmament.

• It has been a significant step in building global consensus against the use and possession of nuclear arms.

Q24. Answer: (a) 1947

The correct answer is 1947.

Key Points

• The Indian Civil Service (ICS) and Indian Police (IP) were replaced by the Indian Administrative Service (IAS) and Indian Police Service (IPS) in the year 1947.

• The transition marked the establishment of the All-India Services, which aimed to maintain a unified administrative structure post-independence.

• The All-India Services, including IAS and IPS, are governed by the provisions of Article 312 of the Indian Constitution.
• IAS officers are responsible for administrative roles and policy formulation, while IPS officers oversee law enforcement and public safety.
• This change symbolized the restructuring of administrative systems to align with the goals of a sovereign and democratic India.

Additional Information

• Indian Civil Service (ICS):
• The ICS was established during British rule in India and was considered the backbone of colonial administration.
• It primarily consisted of British officers, though Indians were allowed to join after 1922.
• Indian Police (IP):
• Similar to the ICS, the IP was the police force under British rule, tasked with maintaining law and order.
• Only a few Indian officers were recruited into the IP during colonial rule.
• Indian Administrative Service (IAS):
• The IAS was established post-independence to replace the ICS and form a national administrative cadre.
• IAS officers are responsible for policy implementation, public administration, and governance across India.
• Indian Police Service (IPS):
• The IPS replaced the colonial Indian Police in 1947 to form a more democratic and efficient policing system.
• IPS officers are responsible for maintaining law and order, crime prevention, and implementing police reforms.
• All-India Services:
• The All-India Services consist of the IAS, IPS, and Indian Forest Service (IFS).
• The officers of these services hold positions both at the central and state levels, ensuring administrative continuity across the country.
• They are appointed by the President of India and serve under the central and state governments.

Q25. Answer: (b) Chlorophyll

The correct answer is Chlorophyll.

Key Points

• Chlorophyll is the primary pigment responsible for the green color in plants, including vegetables like spinach.
• It plays a crucial role in the photosynthesis process, helping plants convert sunlight into energy.
• Chlorophyll absorbs light most efficiently in the blue and red wavelengths, reflecting green light, which gives plants their green appearance.
• It is present in the chloroplasts of plant cells, specifically within the thylakoid membranes.
• The presence of chlorophyll is a vital indicator of the plant's health and ability to perform photosynthesis efficiently.

Additional Information

• Anthocyanin:
• It is a pigment responsible for red, purple, and blue colors in fruits, flowers, and leaves.
• Anthocyanin is not responsible for the green color of vegetables.
• Xanthophyll:
• It is a yellow pigment found in plants, contributing to the yellow coloration of leaves and fruits.
• It is a type of carotenoid but does not produce green color.
• Lutein:
• Lutein is another yellow pigment that plays a role in protecting plant tissues from damage caused by sunlight.
• While present in spinach, it does not contribute to the green color.
• Role of Chlorophyll in Photosynthesis:
• Chlorophyll is essential for capturing light energy to synthesize glucose from carbon dioxide and water.
• This process releases oxygen as a by-product, which is critical for the survival of most living organisms.
• Health Benefits of Chlorophyll:
• Chlorophyll is rich in antioxidants and offers numerous health benefits, such as detoxification and promoting healthy skin.
• Vegetables like spinach, which are abundant in chlorophyll, are recommended for a balanced diet.

Q26. Answer: (a) Defence Research & Development Organisation (DRDO)

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

Key Points

• The Defence Research & Development Organisation (DRDO) successfully developed an indigenous nanoporous multilayered

polymeric membrane for high-pressure seawater desalination in May 2025.

• This innovative membrane technology is crucial for addressing water scarcity through efficient seawater desalination.

• The membrane technology is designed to handle high-pressure environments, making it suitable for industrial and defense applications.

• The initiative underscores DRDO's commitment to fostering self-reliance in critical technologies and supporting India's Make in India mission.

• DRDO's achievement represents a significant step forward in the development of advanced materials for strategic and civilian purposes.

Additional Information

• Defence Research & Development Organisation (DRDO):

• The DRDO is India's premier agency for research and development in defense and strategic technologies.

• Established in 1958, its headquarters are located in New Delhi.

• DRDO is known for developing cutting-edge technologies such as missile systems, radar systems, and advanced materials for various applications.

• Nanoporous Multilayered Polymeric Membrane:

• These membranes are engineered with nanoporous structures that enable the separation of salt and impurities from seawater.

• The multilayer design enhances durability and efficiency, allowing it to function under high-pressure conditions.

• Such membranes are essential for reverse osmosis processes in desalination plants.

• Applications of Membrane Technology:

• The technology is used in the production of safe drinking water from seawater, addressing global water scarcity issues.

• It is applicable in defense operations where access to clean water in remote locations is crucial.

• Industries such as pharmaceuticals and food processing also utilize membrane technology for purification processes.

• Make in India Initiative:

• The development of indigenous technologies aligns with India's Make in India campaign, which aims to boost local manufacturing and reduce dependency on imports.

• DRDO's focus on developing such technologies contributes to strengthening India's strategic autonomy.

Important Points

• Reverse Osmosis (RO) Technology:

• RO technology is widely used for water purification by removing contaminants and salts from seawater or brackish water.

• It utilizes membranes that allow water molecules to pass through while blocking larger particles and impurities.

• Water Scarcity in India:

• India faces significant challenges in ensuring access to clean water, especially in coastal areas where seawater desalination could be a viable solution.

• Innovative technologies like nanoporous membranes play a crucial role in mitigating these challenges and ensuring water security.

Q27. Answer: (c) Article 226

The correct answer is Article 226.

Key Points

• Article 226 of the Constitution of India empowers the High Courts to issue writs for the enforcement of Legal and Fundamental Rights.

• This Article provides the High Courts with jurisdiction to issue writs like habeas corpus, mandamus, prohibition, quo warranto, and certiorari, for enforcing rights.

• The scope of Article 226 is broader than Article 32, as it allows High Courts to issue writs not only for the enforcement of Fundamental Rights but also for other legal rights. Hence, the correct answer is Article 226.

• The High Courts have the authority to exercise this power within their territorial jurisdiction or in relation to the territories for which they are established.

• Article 226 plays a significant role in ensuring justice and protecting the rights of individuals, making High Courts pivotal in upholding the rule of law.

Additional Information

• Article 32:

• Article 32 of the Constitution grants the right to approach the Supreme Court directly for the enforcement of Fundamental Rights.

• It is considered the "Heart and Soul of the Constitution" as described by Dr. B.R. Ambedkar.

• Unlike Article 226, it is limited to the enforcement of Fundamental Rights only.

• Types of Writs:
• Habeas Corpus: To ensure that no individual is unlawfully detained.
• Mandamus: To compel a public authority to perform its duty.
• Prohibition: To prevent lower courts from exceeding their jurisdiction.
• Certiorari: To quash the order of a lower court or tribunal.
• Quo Warranto: To challenge the legality of a person holding a public office.
• Comparison of Articles 226 and 32:
• While Article 32 gives power exclusively to the Supreme Court, Article 226 extends the power to High Courts.
• Article 226 covers both Fundamental and other legal rights, while Article 32 is restricted to Fundamental Rights.
• Judicial Review:
• Article 226 plays a crucial role in Judicial Review, which is the power of courts to assess the constitutionality of legislative and executive actions.
• Judicial Review ensures checks and balances and prevents arbitrary actions by the government.
• Other Relevant Articles:
• Article 124: Relates to the establishment and powers of the Supreme Court.
• Article 324: Deals with powers and functions of the Election Commission.
• Article 136: Grants the Supreme Court discretionary power to entertain appeals.

Q28. Answer: (a) Peripheral nervous system

The correct answer is Peripheral nervous system.

Key Points

• Guillain-Barré Syndrome (GBS) primarily affects the Peripheral Nervous System, which is responsible for transmitting signals between the brain, spinal cord, and the rest of the body.
• GBS is an autoimmune disorder where the body's immune system mistakenly attacks the peripheral nerves, leading to symptoms like weakness, tingling, and, in severe cases, paralysis.
• The condition often follows a viral or bacterial infection, such as respiratory infections, gastrointestinal infections, or rarely vaccinations. It is associated with pathogens like Campylobacter jejuni.
• Symptoms usually begin in the hands and feet and progress upwards, impacting motor and sensory functions. Early detection and treatment are crucial for recovery.
• GBS treatment includes plasmapheresis (plasma exchange) or intravenous immunoglobulin (IVIG), which help reduce the immune system's attack on the nerves.

Additional Information

• Peripheral Nervous System:
• The peripheral nervous system consists of nerves outside the brain and spinal cord, including motor and sensory nerves.
• It is divided into the somatic (voluntary control of muscles) and autonomic (involuntary control of functions like heartbeat) systems.
• Damage to peripheral nerves can cause symptoms like numbness, tingling, muscle weakness, or paralysis.
• Autoimmune Disorders:
• Autoimmune diseases occur when the immune system attacks the body's own cells, mistaking them for harmful pathogens.
• Examples include rheumatoid arthritis, multiple sclerosis, and Guillain-Barré Syndrome.
• GBS specifically targets the myelin sheath or axons of peripheral nerves, disrupting signal transmission.
• Causes of GBS:
• GBS often occurs after infections like Campylobacter jejuni, influenza, or Zika virus. Rarely, it can follow vaccination.
• The exact cause remains unknown, but it involves an abnormal immune response triggered by infection.
• Treatment:
• Plasmapheresis: Removes antibodies from the blood that are attacking nerves.
• Intravenous Immunoglobulin (IVIG): Neutralizes harmful antibodies and reduces inflammation.
• Physiotherapy is often used to help regain strength and mobility.
• Prognosis:
• Most patients recover fully, but recovery may take weeks to months.
• Severe cases may lead to long-term nerve damage or complications, emphasizing the importance of early medical intervention.

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Q29. Answer: (b) Seasonal Unemployment

The correct answer is Seasonal Unemployment.

Key Points

• Seasonal Unemployment refers to a situation where workers are unemployed during certain seasons of the year, typically due to the nature of their occupation.

• In Indian agriculture, seasonal unemployment is most prevalent because farming activities are largely dependent on sowing and harvesting seasons.

• During the non-sowing season, agricultural workers often do not have alternative employment opportunities, leading to temporary unemployment.

• It is common in agrarian economies like India, where a significant portion of the workforce is engaged in agriculture and allied activities.

• This type of unemployment highlights the need for diversifying rural employment opportunities to reduce reliance on seasonal agriculture.

Additional Information

• Disguised Unemployment:

• It occurs when more people are employed in an activity than required, leading to lower productivity.

• In Indian agriculture, disguised unemployment is common, especially in small farms where excess labor exists.

• It is different from seasonal unemployment as it exists throughout the year.

• Cyclical Unemployment:

• It is caused by fluctuations in the economy, such as recessions or economic downturns.

• It is generally not applicable to Indian agriculture, as farming is not directly impacted by economic cycles.

• Structural Unemployment:

• This occurs due to a mismatch between skills possessed by workers and the requirements of available jobs.

• In agriculture, structural unemployment is less common but can arise due to technological advancements reducing the need for manual labor.

• Government Measures:

• Programs like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) aim to reduce seasonal unemployment by providing guaranteed employment during the off-season.

• The government has also promoted agro-based industries and skill development initiatives to diversify rural employment opportunities.

Q30. Answer: (b) 1904

The correct answer is 1904.

Key Points

• The Indian Universities Act was enacted in 1904 under the viceroyalty of Lord Curzon to regulate and control the activities of universities in India.

• The act aimed to impose stricter control over universities and introduced reforms to improve the quality of higher education in India.

• The act increased government oversight in universities and introduced measures such as more stringent regulations on affiliated colleges and the appointment of university councils.

• It provided for the establishment of teaching universities such as the University of Punjab and reorganized the existing universities for better administration.

• The act also emphasized improving the standard of education, enhancing research facilities, and bringing uniformity in the functioning of universities.

Additional Information

• Lord Curzon's Educational Reforms:

• Lord Curzon was the Viceroy of India from 1899 to 1905, and he introduced significant reforms in education during his tenure.

• The Indian Universities Act of 1904 was part of his larger agenda to improve the quality of education in India and establish centralized control.

• He believed that the universities were becoming breeding grounds for political agitation, and stricter control was needed to curb these activities.

• Key Features of the Indian Universities Act, 1904:

• The act increased government control over universities, including the appointment of members to university councils by the government.

• Universities were required to seek government approval for their statutes, regulations, and ordinances.

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• It introduced the provision for periodic inspection of universities by government officials.

• The act restricted the number of colleges that could be affiliated with a university to ensure better supervision and quality control.

• Impact of the Act:

• The act faced criticism from Indian leaders and intellectuals as it was seen as an attempt to curtail academic freedom and impose colonial control over education.

• It led to resentment among Indian students and educators and contributed to the growing nationalist sentiment against British rule.

• Despite the opposition, the act did bring some structural improvements in the functioning of universities and laid the foundation for modern higher education in India.

• Other Significant Education Reforms Under British Rule:

• Wood's Despatch (1854): Introduced the policy of promoting education in English and vernacular languages, focusing on higher education and teacher training.

• Hunter Commission (1882): Recommended measures to improve primary and secondary education and emphasized the need for female education.

• Saddler Commission (1917-19): Reviewed the state of university education in India and recommended reforms to make it more effective.

Q31. Answer: (b) protecting endangered species

The correct answer is Protecting Endangered Species.

Key Points

• Wildlife sanctuaries in India are primarily established to protect endangered species and preserve their natural habitats.

• These areas are designated to conserve flora and fauna, ensuring the survival of species that are under threat due to habitat destruction, poaching, or environmental changes.

• Human activities like urban development, industrialization, and deforestation have led to a decline in wildlife habitats, making sanctuaries a crucial step toward biodiversity conservation.

• In wildlife sanctuaries, activities like hunting, poaching, or tree felling are strictly prohibited to safeguard the ecosystem.

• Examples of prominent wildlife sanctuaries in India include Ranthambore Wildlife Sanctuary (Rajasthan), Kaziranga National Park (Assam), and Periyar Wildlife Sanctuary (Kerala).

Additional Information

• Difference Between National Parks and Wildlife Sanctuaries:

• National Parks have stricter regulations compared to Wildlife Sanctuaries. Human activities like grazing and timber collection are prohibited in National Parks.

• Wildlife Sanctuaries allow some controlled human activities, like grazing, depending on the regulations.

• Importance of Wildlife Sanctuaries:

• They act as natural habitats for endangered species, ensuring their survival and reproduction.

• They contribute to maintaining the ecological balance and act as natural carbon sinks.

• These areas support eco-tourism, which helps generate revenue while raising awareness about conservation efforts.

• Challenges Faced by Wildlife Sanctuaries:

• Encroachments and illegal activities like poaching threaten the flora and fauna in these protected areas.

• Climate change leads to habitat destruction, forcing animals to migrate or face extinction.

• Human-animal conflicts arise as a result of habitat overlap due to encroachment.

• Efforts by the Indian Government:

• India has established over 500 Wildlife Sanctuaries, covering a significant portion of the country's landmass.

• The Wildlife Protection Act, 1972, provides the legal framework for the protection of wildlife and their habitats.

• Initiatives like Project Tiger (launched in 1973) and Project Elephant aim to conserve specific species and their habitats.

• International Conservation Efforts:

• The Convention on Biological Diversity (CBD) and the World Wildlife Fund (WWF) play pivotal roles in global wildlife conservation.

• India is also a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which ensures that international trade in wildlife does not threaten their survival.

Q32. Answer: (c) Tripura

The correct answer is Tripura.

Key Points

• Prof. Arunoday Saha is an acclaimed economist and literary figure with a vast reader base both in India and abroad.
• He was recognized for his contributions and achievements by being honored with the prestigious Padma Shri award in 2025.
• Prof. Arunoday Saha belongs to the state of Tripura, which is located in northeastern India.
• Tripura is known for its rich cultural heritage and has produced many notable personalities in various fields, including literature and economics.
• The Padma Shri award is one of the highest civilian honors in India, given for distinguished contributions in various disciplines, including arts, literature, science, and social services.

Additional Information

• Tripura:
• Tripura is one of the seven northeastern states of India, bordered by Bangladesh to the north, south, and west.
• It is known for its cultural diversity, tribal communities, and historical significance.
• The state capital is Agartala, and the official languages are Bengali and Kokborok.
• Tripura has a rich literary tradition and has produced many renowned writers and scholars.
• Padma Shri Award:
• The Padma Shri is the fourth highest civilian award in India, established in 1954.
• It is awarded by the Government of India for contributions in various fields, such as arts, education, literature, science, sports, social work, and public affairs.
• Recipients are selected based on their exemplary achievements and contributions to society.
• The awards are announced annually on Republic Day and presented by the President of India.
• Literary Contributions of Tripura:
• Tripura has a strong tradition of literature, poetry, and storytelling, often reflecting the state's rich heritage and tribal culture.
• Several writers and poets from Tripura have gained national and international recognition for their works.
• The state promotes literary festivals and events to celebrate its cultural richness.
• Economists Honored with Padma Shri:
• Economists are recognized with the Padma Shri for their contributions to policy-making, research, and education.
• Many economists who have received this honor have significantly impacted India's development and economic strategies.
• Prof. Arunoday Saha's recognition highlights his exceptional contributions to economic studies and literature.

Q33. Answer: (a) Bharatendu Harishchandra

The correct answer is Bharatendu Harishchandra.

Key Points

• Bharatendu Harishchandra (1850–1885) is regarded as the father of modern Hindi literature and theatre. He played a significant role in the development of Hindi prose and drama during the 19th century.
• Bharatendu Harishchandra is credited with pioneering modern Hindi writing, making significant contributions to Hindi journalism, poetry, and drama.
• He emphasized the use of Hindi as a medium for literature and communication, promoting its growth during the colonial era.
• His works include dramas, essays, and poems that reflect social issues, patriotism, and cultural revival. Some of his notable works include "Vaidika Himsa-Himsa Na Bhavati," "Bharat Durdasha," and "Andher Nagari."
• His efforts in promoting Hindi and creating literature that resonated with the common people earned him the title of "Bharatendu" (Moon of India).

Additional Information

• Jaishankar Prasad:
• Jaishankar Prasad (1889–1937) was a prominent Hindi poet, novelist, and dramatist of the Chhayavad era of Hindi literature.
• He is best known for his poetry collections like "Kamayani" and plays such as "Skanda Gupta." His works focus on philosophical and spiritual themes.
• Although he was a significant literary figure, he is not regarded as the father of modern Hindi literature and theatre.
• Mahavir Prasad Dwivedi:
• Mahavir Prasad Dwivedi (1864–1938) was an influential Hindi writer and editor of the magazine "Saraswati."
• He is credited with shaping modern Hindi prose and promoting the use of Hindi as a literary language.
• Despite his contributions, he is not considered the father of modern Hindi literature and theatre.
• Premchand:
• Premchand (1880–1936) is one of the most celebrated Hindi and Urdu writers known for his realistic novels and short stories.
• His notable works include "Godaan," "Nirmala," and "Sevasadan," which depict social issues and the struggles of the common

man.

• While he is a prominent figure in Hindi literature, his contributions are distinct from Bharatendu Harishchandra's pioneering works in modern Hindi theatre and literature.

• Impact of Bharatendu Harishchandra:

• He laid the foundation of modern Hindi literature and inspired generations of writers to use Hindi for literary expression.

• His works addressed social issues, cultural revival, and patriotism, which made him a central figure in the Hindi literary renaissance.

• His legacy continues to influence Hindi literature and theatre, and he is remembered as a visionary who shaped modern Hindi writing.

Q34. Answer: (b) Nebular Hypothesis

The correct answer is Nebular Hypothesis.

Key Points

• The Nebular Hypothesis explains the formation of the solar system from a rotating cloud of gas and dust, also known as a nebula.

• This hypothesis was first proposed by the German philosopher Immanuel Kant in 1755 and later expanded upon by the French mathematician Pierre-Simon Laplace in 1796.

• According to this theory, the solar system began as a giant rotating cloud of interstellar gas and dust, which began to collapse under its own gravity.

• As the cloud contracted, it spun faster, forming a flattened disk with the Sun forming at its center and the planets forming from the remaining matter in the disk.

• This hypothesis remains one of the most widely accepted explanations for the formation of the solar system.

Additional Information

• Big Bang Theory:

• The Big Bang Theory describes the origin of the universe, not the formation of the solar system.

• It proposes that the universe began as a singularity approximately 13.8 billion years ago and has been expanding ever since.

• Continental Drift Theory:

• This theory, proposed by Alfred Wegener in 1912, explains the movement of Earth's continental plates over geological time.

• It is unrelated to the formation of the solar system and instead pertains to the Earth's lithosphere.

• Plate Tectonics Theory:

• Plate Tectonics Theory explains the movement of Earth's lithospheric plates and the resulting geological phenomena, such as earthquakes and volcanic activity.

• It is distinct from the Nebular Hypothesis and is focused on the geological processes of Earth.

• Formation of Planets:

• According to the Nebular Hypothesis, planets formed through a process called accretion, where dust and gas particles collided and stuck together to form larger bodies.

• The inner planets (Mercury, Venus, Earth, and Mars) are rocky due to high temperatures near the Sun, while the outer planets (Jupiter, Saturn, Uranus, and Neptune) are gaseous and icy.

• Modern Support:

• Modern observations, such as the discovery of protoplanetary disks around young stars and the study of meteorites, provide strong evidence for the Nebular Hypothesis.

• Space missions like NASA's Kepler and James Webb Space Telescope have further validated elements of this theory.

Q35. Answer: (c) Emmanuel Macron

The correct answer is Emmanuel Macron.

Key Points

• Emmanuel Macron, the President of France, co-chaired the AI Action Summit held in Paris alongside Indian Prime Minister Narendra Modi.

• The summit focused on global cooperation to develop ethical and inclusive artificial intelligence technologies.

• Paris was chosen as the venue due to its significant contributions to technological innovation and its leadership in promoting sustainable AI development.

• The collaboration between India and France in the field of AI aims to enhance international understanding and create solutions for global challenges.

• This summit was part of broader efforts by both nations to strengthen their strategic partnership in science, technology, and innovation.

Additional Information

• India-France Relations in Technology:

• India and France have longstanding ties in areas such as space exploration, nuclear energy, and defense technology.

• Both countries aim to collaborate in emerging fields such as artificial intelligence, cybersecurity, and green technologies.

• France has been a key partner in India's Digital India initiative, contributing to the development of smart cities and digital infrastructure.

• Artificial Intelligence Action Summit:

• The summit was designed to address pressing issues such as AI ethics, governance, and international regulation.

• It emphasized the importance of transparency and accountability in AI development to mitigate risks like bias and data misuse.

• Participating nations discussed strategies for using AI in areas such as healthcare, climate change, and education.

• Global AI Trends:

• AI has become a transformative force in industries such as healthcare, transportation, education, and finance.

• Countries around the world are investing heavily in AI research and development to stay competitive in the global technology race.

• International organizations like UNESCO have initiated discussions on creating frameworks for the responsible use of AI.

• India's AI Initiatives:

• The Indian government has launched the National AI Strategy to leverage AI for inclusive growth.

• India's IT sector is actively exploring AI applications to improve efficiency and innovation.

• Key areas of focus include agriculture, healthcare, education, and smart cities.

Q36. Answer: (c) 100 days

The correct answer is 100 days.

Key Points

• The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) was enacted in 2005 to provide legal assurance of wage employment to rural households in India.

• Under the provisions of MGNREGA, each rural household is entitled to 100 days of guaranteed wage employment per year.

• The scheme aims to enhance livelihood security by offering unskilled manual work to rural households.

• MGNREGA mandates that the work provided should be within 5 kilometers of the worker's residence, and if the distance exceeds this limit, additional wages for travel must be paid.

• The Act also emphasizes gender equality by ensuring equal wages for men and women and promoting women's participation in the workforce.

• MGNREGA is implemented by local authorities, including Gram Panchayats, and focuses on creating durable assets such as roads, ponds, and canals in rural areas.

Additional Information

• Objectives of MGNREGA:

• To provide social protection for the most vulnerable sections of society.

• To create durable rural assets and strengthen the rural economy.

• To reduce urban migration by improving employment opportunities in rural areas.

• To promote decentralized planning and governance through Gram Sabhas and Panchayati Raj Institutions.

• Features of MGNREGA:

• MGNREGA guarantees universal access to employment for rural households, irrespective of caste, gender, or community.

• Any adult member of a rural household willing to do unskilled manual labor can apply for work under this scheme.

• Employment must be provided within 15 days of application, failing which unemployment allowance is payable.

• The scheme focuses on sustainable development and natural resource management, such as water conservation, afforestation, and soil erosion prevention.

• Funding and Implementation:

• MGNREGA is a centrally sponsored scheme, with funding shared between the Central and State Governments.

• The Central Government bears 100% of the cost for unskilled labor, 75% of the material costs, and 100% of administrative expenses.

• State Governments are responsible for unemployment allowances in case employment is not provided within the stipulated timeframe.

• Impact of MGNREGA:

• MGNREGA has significantly contributed to poverty alleviation by offering a steady income to rural households.

• It has enhanced women's empowerment by increasing their participation in the workforce and improving their financial independence.

• The program has facilitated asset creation, including infrastructure development and environmental conservation in rural areas.

• MGNREGA has also strengthened democratic processes by encouraging community participation in planning and implementation.

Important Points

• Challenges in Implementation:

• Delayed payment of wages has been a major issue, affecting worker morale and participation.

• Corruption and misuse of funds in certain areas have hindered the effective implementation of the scheme.

• Insufficient capacity building and awareness among rural communities have limited their participation and benefits.

• In some regions, political interference and lack of accountability have affected the transparency of operations.

• Notable Achievements:

• MGNREGA has been instrumental in reducing rural unemployment and providing a social safety net to vulnerable communities.

• It has led to improved infrastructure development and environmental sustainability in rural areas.

• The program has enhanced livelihood security and minimized distress migration.

• Its focus on gender equality has empowered women and improved their socio-economic status.

Q37. Answer: (b) 24th Amendment Act, 1971

The correct answer is 24th Amendment Act, 1971.

Key Points

• The 24th Amendment Act, 1971 was enacted to restore the Parliament's authority to amend the Fundamental Rights, following the ruling in the Kesavananda Bharati Case (1973).

• It was introduced as a response to the Supreme Court judgment in Golaknath Case (1967), which restricted the Parliament's ability to amend Fundamental Rights.

• The Amendment added a new clause (4) to Article 13, explicitly stating that a Constitutional amendment cannot be challenged as violating Fundamental Rights.

• It also amended Article 368, explicitly stating that the Parliament has the power to amend the Constitution, including Fundamental Rights.

• The 24th Amendment empowered the President to give his assent to Constitutional Amendment Bills, making it mandatory.

• Hence, the correct answer is 24th Amendment Act, 1971.

Additional Information

• Background of Golaknath Case (1967):

• The Supreme Court ruled that the Parliament cannot amend Fundamental Rights under Article 368.

• This judgment created a conflict between the judiciary and legislature, limiting the Parliament's power.

• Kesavananda Bharati Case (1973):

• This landmark judgment introduced the concept of the Basic Structure Doctrine, ensuring that certain features of the Constitution cannot be amended.

• The Court upheld the validity of the 24th Amendment, allowing Parliament to amend Fundamental Rights but subject to the Basic Structure Doctrine.

• Provisions of Article 368:

• It outlines the procedure for amending the Constitution.

• After the 24th Amendment, it explicitly states that the Parliament can amend any part of the Constitution, including Fundamental Rights.

• Importance of the 24th Amendment:

• It resolved the conflict between the judiciary and legislature regarding Constitutional amendments.

• It strengthened the Parliament's position in the legislative process by restoring its power to amend Fundamental Rights.

• Impact on Indian Democracy:

• The amendment ensured a balance between the powers of the legislature and judiciary.

• It contributed to the dynamic evolution of the Indian Constitution.

Important Points

• 44th Amendment Act, 1978:

• This Amendment aimed to restore the provisions of the Constitution that had been altered during the Emergency (1975-77).

• It made significant changes to Fundamental Rights, particularly regarding the right to property and the emergency provisions.

• 42nd Amendment Act, 1976:

• Known as the "Mini Constitution," it brought extensive changes to the Constitution, including the addition of the terms "Socialist," "Secular," and "Integrity" to the Preamble.

• It curtailed judicial review and enhanced the powers of the Parliament.

• 52nd Amendment Act, 1985:

• It introduced the Anti-Defection Law to prevent political defections and ensure stability in governments.

• It added the Tenth Schedule to the Constitution.

Q38. Answer: (b) To manage communication between OS and hardware

The correct answer is To manage communication between OS and hardware.

Key Points

• Device Drivers act as a crucial software component that facilitates communication between an operating system (OS) and hardware devices like printers, keyboards, or storage drives.

• The primary function of device drivers is to translate high-level commands from the OS into low-level hardware-specific instructions that the device can understand and execute.

• Drivers work as intermediaries that allow the OS to access and control hardware resources without needing to know the hardware's intricate details.

• Examples of device drivers include printer drivers, graphics card drivers, sound card drivers, and network drivers, which ensure proper functioning of their respective devices.

• Without device drivers, the operating system would not be able to interact with hardware devices, rendering them non-functional. Thus, the correct answer is the second option.

Additional Information

• Types of Device Drivers:

• Kernel-mode drivers: These drivers operate in the kernel space of the operating system and have unrestricted access to hardware resources. Examples include drivers for storage devices and network adapters.

• User-mode drivers: These run in user space and interact with devices that do not require direct hardware access, such as printers and scanners.

• Importance of Device Drivers:

• They ensure compatibility between the OS and various hardware components, regardless of their manufacturers.

• They enable hardware upgrades without necessitating changes in the operating system.

• They allow seamless operation of peripherals and improve system performance.

• Examples of Device Driver Applications:

• Graphics Driver: Allows the OS to communicate with the GPU for rendering visuals.

• Audio Driver: Facilitates sound output by managing communication between the sound card and the OS.

• Network Driver: Enables internet or LAN connectivity by controlling network adapters.

• Updates and Maintenance:

• Regular updates ensure device drivers remain compatible with the latest OS versions and fix bugs or vulnerabilities.

• Manufacturers often release driver updates to enhance performance and ensure better hardware utilization.

• Device Driver Examples:

• Windows OS uses drivers such as Microsoft Basic Display Adapter or Realtek Audio Driver.

• In Linux, device drivers are often integrated into the kernel, such as those for USB devices or network interfaces.

Q39. Answer: (b) Initiated the fastest global rollout of satellite-based communication services

The correct answer is Initiated the fastest global rollout of satellite-based communication services.

Key Points

• On 21 May 2025, India achieved a significant milestone in satellite communication by initiating the fastest global rollout of satellite-based communication services.

• This milestone is a testament to India's advancements in the field of satellite technology, ensuring seamless and high-speed connectivity even in remote and inaccessible areas.

• The initiative aligns with India's vision of providing universal access to modern communication services, bridging the digital divide across the nation.

• Unlike other satellite communication milestones, such as launching advanced satellites or building space stations, this achievement focuses on the rapid implementation and operationalization of satellite-based communication systems globally.

• This rollout integrates cutting-edge technologies, making India a leader in satellite communication innovation and positioning itself as a global hub for satellite-based services.

Additional Information

• Satellite Communication:

• Satellite communication refers to the use of satellites to transmit data across vast distances, ensuring connectivity in regions where traditional network infrastructure is not feasible.

• India's satellite communication systems are managed by ISRO (Indian Space Research Organisation), which has pioneered advancements in space technology.

• These systems are vital for applications such as telecommunication, broadcasting, navigation, and disaster management.

• Digital India Initiative:

• The rollout of satellite-based communication services aligns with the Digital India initiative, which aims to transform India into a digitally empowered society and knowledge economy.

• This initiative emphasizes enhancing internet connectivity and providing access to online services across the country.

• Global Trends in Satellite Communication:

• Globally, satellite communication is gaining traction for connecting rural and underserved regions. Companies like SpaceX's Starlink and Amazon Kuiper are also major players in this domain.

• India's rapid rollout places it in competition with these global giants, showcasing its capability in deploying efficient satellite systems.

• Benefits of Satellite Communication:

• Satellite communication provides high-speed internet and reliable connectivity, especially in geographically challenging terrains.

• It plays a crucial role in disaster management, enabling real-time communication during emergencies.

• Its applications extend to sectors like agriculture, education, healthcare, and transportation, facilitating technological advancements.

Important Points

• ISRO's Role:

• ISRO, as India's premier space agency, has been instrumental in developing and deploying satellite-based communication systems.

• Its achievements include launching satellites like GSAT series for communication and NavIC for navigation.

• Policy Framework:

• India's satellite communication rollout is supported by policies promoting public-private partnerships and encouraging technological innovation.

• These policies aim to enhance the accessibility and affordability of satellite-based services, ensuring their integration into mainstream communication systems.

• Future Prospects:

• India's success in this domain opens avenues for collaboration with global players, boosting technological exchange and economic growth.

• The advancements in satellite communication will further contribute to India's aspirations of becoming a space superpower.

Q40. Answer: (d) Eastern Ghats

The correct answer is Eastern Ghats.

Key Points

• The Eastern Ghats form the eastern boundary of the Deccan Plateau, running parallel to the eastern coastal plains of India.

• The mountain range stretches from the state of Odisha in the north to Tamil Nadu in the south, passing through Andhra Pradesh.

• The highest peak in the Eastern Ghats is Arma Konda, located in Andhra Pradesh, with an elevation of 1,680 meters (5,512 ft).

• Unlike the Western Ghats, the Eastern Ghats are discontinuous and fragmented, primarily due to rivers like the Godavari, Mahanadi, and Krishna cutting across the range.

• The Eastern Ghats are known for their unique biodiversity and are home to several wildlife sanctuaries, including the Simlipal National Park in Odisha and Seshachalam Hills in Andhra Pradesh.

Additional Information

• Satpura Range:

• The Satpura Range is a series of hills in central India that runs parallel to the Vindhya Range.

• It is located to the north of the Deccan Plateau, separating it from the Indo-Gangetic Plain.

• The highest peak of the Satpura Range is Dhupgarh, with an elevation of 1,350 meters (4,429 ft).

• Vindhya Range:

• The Vindhya Range runs across central India, separating the Indo-Gangetic Plains from the Deccan Plateau.

• The range is historically significant as it has acted as a cultural and geographical boundary between North and South India.

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• The highest point of the Vindhya Range is Sad-Bhawna Shikhar, with an elevation of around 752 meters (2,467 ft).
• Western Ghats:
• The Western Ghats, also known as the Sahyadri Hills, form the western boundary of the Deccan Plateau.
• This range stretches parallel to the western coast of India, covering states like Maharashtra, Goa, Karnataka, and Kerala.
• The highest peak in the Western Ghats is Anamudi, located in Kerala, with an elevation of 2,695 meters (8,842 ft).
• Eastern Ghats:
• The Eastern Ghats are older than the Western Ghats and are composed primarily of ancient rocks like charnockites and granites.
• Key rivers like the Godavari, Krishna, Kaveri, and Mahanadi pass through these ranges, forming fertile deltas at their mouths.
• The Eastern Ghats are home to several tribes and support a variety of flora and fauna, including endangered species like the Indian Pangolin.

Q41. Answer: (d) 6.3

Shortcut Trick
Convert the given decimals into fractions: 6.3 = 63/10 and 0.07 = 7/100.
LCM of fractions = LCM of Numerators ÷ HCF of Denominators.
LCM of 63 and 7 = 63.
HCF of 10 and 100 = 10.
LCM of given fractions = 63 ÷ 10 = 6.3.
Therefore The correct answer is 6.3.
Alternate Method
Given:
The numbers are 6.3 and 0.07
Method Used:
Convert the given decimals to like decimals, treat them as integers to calculate the LCM, and then restore the decimal point.
Calculations:
=> Convert into like decimals (same number of decimal digits): 6.30 and 0.07
=> Remove the decimals to get integer values: 630 and 7
=> Now, find the LCM of 630 and 7
=> Since 630 is perfectly divisible by 7 (7 × 90 = 630), the LCM of 630 and 7 is 630.
=> Restore the decimal point after two places from the right (as per the like decimals): 6.30 = 6.3
Therefore The correct answer is 6.3.
Additional Information
HCF of Fractions
HCF of fractions = HCF of numerators ÷ LCM of denominators.
LCM of Fractions
LCM of fractions = LCM of numerators ÷ HCF of denominators.
Relationship between LCM and HCF
For any two numbers A and B: LCM × HCF = A × B.

Q42. Answer: (d) 9,900

Shortcut Trick
When simple interests are equal for the same time period, the investments are in the inverse ratio of their rates.
Ratio of investments = P1 : P2 = R2 : R1
=> P1 : P2 = 9 : 10
Total ratio parts = 9 + 10 = 19
Sum invested at 10% (P1) = (9 ÷ 19) × 20900 = 9900
Therefore The correct answer is Rs. 9,900.
Alternate Method
Given:
Total investment = Rs. 20,900
Rate 1 (R1) = 10% per annum
Rate 2 (R2) = 9% per annum

Time (T) = 8 years

Formula Used:

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

Total: Rs. 20,900

Part 1 at 10%

Ratio: 9

Part 2 at 9%

Ratio: 10

Condition: Interest 1 = Interest 2

Calculation:

Let the sum invested at 10% be x and the sum invested at 9% be (20900 − x).

According to the question, the simple interest from both investments is equal after 8 years:

=> (x × 10 × 8) ÷ 100 = ((20900 − x) × 9 × 8) ÷ 100

=> 80x = 72(20900 − x)

=> 10x = 9(20900 − x)

=> 10x = 188100 − 9x

=> 10x + 9x = 188100

=> 19x = 188100

=> x = 188100 ÷ 19

=> x = 9900

Therefore The correct answer is Rs. 9,900.

Additional Information

When Simple Interests are equal:

If parts P1, P2, P3 are invested at rates R1, R2, R3 for times T1, T2, T3 such that their simple interests are equal, then P1 : P2 : P3 = 1 ÷ (R1 × T1) : 1 ÷ (R2 × T2) : 1 ÷ (R3 × T3).

When Amounts are equal:

If the final amounts received from the investments are equal, then P1 : P2 : P3 = 1 ÷ (100 + R1 × T1) : 1 ÷ (100 + R2 × T2) : 1 ÷ (100 + R3 × T3).

Simple Interest vs Compound Interest:

For the first year, simple interest and compound interest on a given sum at the same rate are always equal when compounded annually. From the second year onwards, compound interest generates interest on previously earned interest.

Q43. Answer: (d) 20.25

Shortcut Trick

65% of 65 = 65^2 ÷ 100 = 4225 ÷ 100 = 42.25

2/5 of 55 = 2 × 11 = 22

Difference = 42.25 − 22 = 20.25

Therefore The correct answer is 20.25.

Alternate Method

Given:

First value = 65% of 65

Second value = 2/5 of 55

Calculation:

=> First value = (65 ÷ 100) × 65 = 4225 ÷ 100 = 42.25

=> Second value = (2 ÷ 5) × 55 = 2 × 11 = 22

=> Required difference = First value − Second value

=> Required difference = 42.25 − 22 = 20.25

Therefore The correct answer is 20.25.

Additional Information

Squaring numbers ending in 5

To find the square of a number ending in 5 (like N5), multiply N by (N+1) and append 25 at the end. For example, 65^2 → 6 × 7 = 42, so 4225.

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Percentage to Fraction Conversion

To convert a percentage to a fraction, divide the value by 100 and simplify. For example, 65% = 65 ÷ 100 = 13/20.

BODMAS Rule

When simplifying arithmetic expressions, follow the order: Brackets, Of, Division, Multiplication, Addition, and Subtraction.

Q44. Answer: (c) 3

Shortcut Trick

To check divisibility by 3, simply calculate the sum of all digits of the given number.

Sum of digits = 6 + 4 + 8 + 6 + 7 + 9 + 0 + 5 + 9 = 54

Since 54 is a multiple of 3 (54 ÷ 3 = 18), the entire number is perfectly divisible by 3.

Therefore The correct answer is 3.

Alternate Method

Given:

Number = 648679059

Concept Used:

Check standard divisibility rules for each given option (10, 11, 3, 8) systematically to find the correct match.

Calculations:

=> Divisibility by 10: The last digit must be 0. Here, the last digit is 9, so it is not divisible by 10.

=> Divisibility by 11: The difference between the sum of digits at odd places and even places must be 0 or a multiple of 11.

=> Sum of digits at odd places = 6 + 8 + 7 + 0 + 9 = 30

=> Sum of digits at even places = 4 + 6 + 9 + 5 = 24

=> Difference = 30 − 24 = 6. Since 6 is not a multiple of 11, it is not divisible by 11.

=> Divisibility by 8: The number formed by the last three digits must be divisible by 8.

=> The last three digits form 059, which is not divisible by 8.

=> Divisibility by 3: The sum of all digits must be divisible by 3.

=> Sum = 6 + 4 + 8 + 6 + 7 + 9 + 0 + 5 + 9 = 54

=> 54 is completely divisible by 3, confirming the whole number is divisible by 3.

Therefore The correct answer is 3.

Additional Information

Divisibility by 4 & 8

A number is divisible by 4 if the number formed by its last two digits is divisible by 4. It is divisible by 8 if its last three digits are divisible by 8.

Divisibility by 9

Similar to the rule for 3, a number is completely divisible by 9 if the sum of all its digits is a multiple of 9.

Divisibility by 6

A number must be divisible by both 2 (ending in an even digit) and 3 (sum of digits is a multiple of 3) to be perfectly divisible by 6.

Q45. Answer: (c) 57^(-23)

Shortcut Trick

For operations on the same base, combine the exponents directly using the laws of indices from left to right.

Exponents are subtracted for division and added for multiplication.

Given expression: 57^(−9) ÷ 57^4 × 57^(−10)

=> 57^(−9 − 4 + (−10))

=> 57^(−23)

Therefore The correct answer is 57^(−23).

Alternate Method

Given:

57^(−9) ÷ 57^4 × 57^(−10)

Formula Used:

Law of Division: a^m ÷ a^n = a^(m − n)

Law of Multiplication: a^m × a^n = a^(m + n)

Calculation:

=> According to the order of operations, evaluate division and multiplication from left to right.
=> Apply the division rule to the first two terms:
=> (57^(−9) ÷ 57^4) × 57^(−10)
=> 57^(−9 − 4) × 57^(−10)
=> 57^(−13) × 57^(−10)
=> Now, apply the multiplication rule to the remaining expression:
=> 57^(−13 + (−10))
=> 57^(−13 − 10)
=> 57^(−23)
Therefore The correct answer is 57^(−23).
Additional Information
Law of Multiplication
When multiplying terms with the same base, add their exponents: a^m × a^n = a^(m+n).
Law of Division
When dividing terms with the same base, subtract the exponent of the divisor from the dividend's exponent: a^m ÷ a^n = a^(m−n).
Power of a Power Rule
When raising a power to another power, multiply the exponents: $(a^m)^n$ = a^(m×n).
Negative Exponent Rule
A negative exponent indicates the reciprocal of the base raised to the positive power: a^(−m) = 1 ÷ a^m.

Q46. Answer: (c) 25:1

Shortcut Trick
For any 3D spherical object, the surface area is directly proportional to the square of its radius (Area prop. to r^2).
Given the balloon's radius becomes 5 times its original size.
Ratio of surface areas = $(\text{New Radius})^2$: $(\text{Old Radius})^2$
=> Ratio = 5^2 : 1^2 = 25 : 1
Therefore The correct answer is 25:1.
Alternate Method
Given:
=> Initial radius of the balloon = r
=> Final radius of the balloon after pumping air = 5r
Formula Used:
=> Surface Area of a sphere = $4\pi r^2$
r
Before Pumping
Area = S1
5r
After Pumping
Area = S2
Calculations:
=> Initial surface area (S1) = $4\pi r^2$
=> Final surface area (S2) = $4\pi(5r)^2$
=> S2 = $4\pi(25r^2)$ = $100\pi r^2$
Ratio of final surface area to initial surface area:
=> Ratio = S2 : S1
=> Ratio = $100\pi r^2$: $4\pi r^2$
=> Ratio = 25 : 1
Therefore The correct answer is 25:1.
Additional Information
Volume of a Sphere
The volume of a sphere is given by $V = (4/3)\pi r^3$. If the radius is increased by 5 times, the new volume will become 5^3 = 125 times the original volume.

Surface Area of Hemisphere

For a hemisphere of radius r, the curved surface area (CSA) is $2\pi r^2$ and the total surface area (TSA) is $3\pi r^2$.

Concept of Similarity in 3D Shapes

For any two similar 3D objects with a scale factor of k (ratio of corresponding sides), the ratio of their surface areas is k^2, and the ratio of their volumes is k^3.

Q47. Answer: (c) 15

Shortcut Trick

The third proportional 'c' to two numbers 'a' and 'b' is calculated using the relation $c = b^2 \div a$.

Substitute the given values a = 60 and b = 30.

$x = (30 \times 30) \div 60$

$x = 900 \div 60 = 15$

Therefore The correct answer is 15.

Alternate Method

Ratio and Proportion Scale

60

30

x = 15

× 0.5

× 0.5

Continued Proportion: 60 : 30 :: 30 : x

Given:

=> First term (a) = 60

=> Second term (b) = 30

=> Third proportional (c) = x

Formula Used:

=> If three quantities a, b, and c are in continued proportion, then a : b :: b : c

=> Product of Extremes = Product of Means => $a \times c = b^2$

Calculations:

=> 60 : 30 = 30 : x

=> $60 \times x = 30 \times 30$

=> $60x = 900$

=> $x = 900 \div 60$

=> x = 15

Therefore The correct answer is 15.

Additional Information

Mean Proportional

The mean proportional between two quantities a and b is given by $\sqrt{(a \times b)}$.

Fourth Proportional

If four numbers a, b, c, and d are in proportion (a : b = c : d), then d is known as the fourth proportional, evaluated as $d = (b \times c) \div a$.

Compound Ratio

For any two ratios a : b and c : d, their compound ratio is obtained by multiplying the antecedents and consequents respectively, given by $(a \times c) : (b \times d)$.

Continued Proportion

Three non-zero numbers a, b, and c are said to be in continued proportion if the ratio of the first to the second is equal to the ratio of the second to the third (a : b = b : c).

Q48. Answer: (d) 157

Shortcut Trick

The average of the first n even numbers is directly given by the formula (n + 1).

Given the number of terms, n = 156.

=> Average = 156 + 1 = 157

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Therefore The correct answer is 157.

Alternate Method

2

4

6

...

312

Average = 157

Arithmetic Progression of First 156 Even Numbers

Given:

First even number (a) = 2

Total numbers (n) = 156

Common difference (d) = 2

Formula Used:

Last term (L) = a + (n − 1) × d

Average of an arithmetic progression = (First term + Last term) ÷ 2

Calculations:

=> Last term = 2 + (156 − 1) × 2

=> Last term = 2 + 155 × 2

=> Last term = 2 + 310 = 312

=> Average = (2 + 312) ÷ 2

=> Average = 314 ÷ 2

=> Average = 157

Therefore The correct answer is 157.

Additional Information

Average of First n Odd Numbers

The sum of the first n odd numbers is always n^2, which means their average is simply equal to n.

Average of First n Natural Numbers

The sum of the first n consecutive natural numbers is calculated as n(n + 1) ÷ 2. Therefore, their average is (n + 1) ÷ 2.

Average of an Arithmetic Progression

For any sequence of numbers with a constant difference (like consecutive integers, evens, or odds), the average strictly falls in the exact center and is equal to (First term + Last term) ÷ 2.

Q49. Answer: (b) 1,600

Shortcut Trick

Let Cost Price (CP) = 100 units

Marked Price (MP) = 100 + 25% = 125 units

Selling Price (SP) = 125 − (16% of 125) = 105 units

Profit = SP − CP = 105 − 100 = 5 units

Given 5 units = Rs. 64 => 125 units = 25 × 64 = Rs. 1600

Therefore The correct answer is Rs. 1600.

Alternate Method

Given:

Markup = 25%

Discount = 16%

Profit = Rs. 64

Formula Used:

MP = CP × (1 + Markup% ÷ 100)

SP = MP × (1 − Discount% ÷ 100)

Profit = SP − CP

CP = 100x

MP = 125x

SP = 105x
+25% Markup
-16% Discount
Profit = 5x (Rs. 64)
5x = Rs. 64 → 125x = 25 × 64 = Rs. 1600
Calculations:
=> Let Cost Price (CP) = 100x
=> Marked Price (MP) = 100x + (25% of 100x) = 125x
=> Discount = 16% of 125x = 20x
=> Selling Price (SP) = 125x − 20x = 105x
=> Profit = SP − CP = 105x − 100x = 5x
=> Given Profit = Rs. 64
=> 5x = Rs. 64
=> x = 64 ÷ 5 = 12.8
=> List Price (MP) = 125 × 12.8 = Rs. 1600
Therefore The correct answer is Rs. 1600.
Additional Information
Effective Discount Formula
For two successive discounts of a% and b%, the effective single discount is (a + b − ab ÷ 100)%.
Direct Relation between CP and MP
The ratio of Cost Price to Marked Price is directly given by: CP/MP = (100 − Discount%) ÷ (100 + Profit%).
Markup Percentage
Markup is always calculated on the Cost Price: Markup% = (MP − CP) ÷ CP × 100.

Q50. Answer: (a) 70

Shortcut Trick
Let the sum of the two consecutive even numbers be S.
The numbers can be symmetrically represented as (S/2 − 1) and (S/2 + 1).
Sum of their squares = $(S/2 - 1)^2 + (S/2 + 1)^2 = S^2/2 + 2$
Given, $S^2/2 + 2 = 2452$ => $S^2/2 = 2450$
=> $S^2 = 4900$ => S = 70
Therefore The correct answer is 70.
Alternate Method
Given:
The sum of the squares of two consecutive even natural numbers is 2452.
Formula Used:
$(a + b)^2 = a^2 + 2ab + b^2$
Calculation:
Let the two consecutive even natural numbers be x and (x + 2).
=> $x^2 + (x + 2)^2 = 2452$
=> $x^2 + (x^2 + 4x + 4) = 2452$
=> $2x^2 + 4x - 2448 = 0$
Dividing the entire equation by 2:
=> $x^2 + 2x - 1224 = 0$
Splitting the middle term to factorise:
=> $x^2 + 36x - 34x - 1224 = 0$
=> $x(x + 36) - 34(x + 36) = 0$
=> $(x - 34)(x + 36) = 0$
=> x = 34 or x = −36
Since the numbers are natural numbers, we discard the negative value. So, x = 34.
The two consecutive even numbers are 34 and 36.
Sum of the numbers = 34 + 36 = 70

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Therefore The correct answer is 70.

Additional Information

Consecutive Even Numbers

Even numbers that follow each other in order have a constant difference of 2. They can be generally represented as 2n, 2n+2, 2n+4, etc., where n is an integer.

Key Algebraic Identity

The sum of squares of two variables can be related using the identity: $(a - b)^2 + (a + b)^2 = 2(a^2 + b^2)$. This is highly useful for simplifying symmetric expressions quickly without forming large quadratics.

Quadratic Equation Roots

For a standard quadratic equation $ax^2 + bx + c = 0$, the nature of roots is determined by the discriminant ($D = b^2 - 4ac$). Sum of the roots is given by $-b/a$ and the product of roots is given by c/a.

Q51. Answer: (d) 3.71

Shortcut Trick

Equating powers directly since the bases are identical in $x^z = y^2$:

=> $0.14 \times z = 0.26 \times 2$

=> $0.14z = 0.52$

=> $z = 52 \div 14 \approx 3.71$

Therefore The correct answer is 3.71.

Alternate Method

Given:

$x = 132^{0.14}$

$y = 132^{0.26}$

$x^z = y^2$

Formula Used:

$(a^m)^n = a^{mn}$

If $a^m = a^n$, then $m = n$ (where $a > 0$ and $a \neq 1$)

Calculations:

=> Substitute the given values of x and y in the equation $x^z = y^2$:

=> $(132^{0.14})^z = (132^{0.26})^2$

=> Applying the power of a power rule to multiply the exponents:

=> $132^{0.14z} = 132^{(0.26 \times 2)}$

=> $132^{0.14z} = 132^{0.52}$

=> Comparing the exponents since the bases are identical:

=> $0.14z = 0.52$

=> $z = 0.52 \div 0.14$

=> $z = 52 \div 14$

=> $z = 26 \div 7$

=> $z \approx 3.714$

Therefore The correct answer is 3.71.

Additional Information

Product Rule of Exponents

When multiplying expressions with identical bases, you must add the powers: $a^m \times a^n = a^{m+n}$

Quotient Rule of Exponents

When dividing expressions with identical bases, you must subtract the powers: $a^m \div a^n = a^{m-n}$

Power of a Power Rule

When raising an exponential expression to another power, simply multiply the exponents: $(a^m)^n = a^{m \times n}$

Equating Exponents

If two exponential terms with the exact same base are mathematically equal, their exponents will be equal: If $a^x = a^y$, then $x = y$.

Q52. Answer: (c) Rs. 2,05,800

Shortcut Trick

M's profit = (3519 + 207) ÷ 2 = Rs. 1863, N's profit = (3519 − 207) ÷ 2 = Rs. 1656.

Profit ratio of M to N = 1863 : 1656 = 9 : 8.

Investment ratio = (Profit ratio) ÷ (Time ratio) = (9 ÷ 6) : (8 ÷ 7) = 3/2 : 8/7 = 21 : 16.

Difference in investment = 21 − 16 = 5 parts = Rs. 49,000 => 1 part = Rs. 9,800.

M's investment = 21 parts = 21 × 9800 = Rs. 2,05,800.

Therefore The correct answer is Rs. 2,05,800.

Alternate Method

Given:

Difference in profit = Rs. 207

Total profit = Rs. 3,519

Time for M = 6 months, Time for N = 7 months

Difference in investment = Rs. 49,000

Formula Used:

Profit Ratio = (Capital of A × Time of A) : (Capital of B × Time of B)

Partner M

Partner N

Capital: Rs. (x + 49000)

Time: 6 months

Profit: 9 parts

Capital: Rs. x

Time: 7 months

Profit: 8 parts

Investment Ratio = 21 : 16

Calculations:

=> Let N's profit be Rs. y. Then M's profit = Rs. (y + 207).

=> y + (y + 207) = 3519 => 2y = 3312 => y = 1656.

=> M's profit = 1656 + 207 = 1863.

=> Ratio of profits of M and N = 1863 : 1656 = 9 : 8.

=> Let N's investment be Rs. x. Then M's investment = Rs. (x + 49000).

=> According to the partnership formula:

=> [6 × (x + 49000)] ÷ (7 × x) = 9 ÷ 8

=> 48 × (x + 49000) = 63x

=> 16x + 784000 = 21x

=> 5x = 784000 => x = 156800.

=> N's capital = Rs. 156,800.

=> M's capital = 156800 + 49000 = 205800.

Therefore The correct answer is Rs. 2,05,800.

Additional Information

Partnership Principle

The ratio of the profits distributed between partners is equal to the ratio of the products of their capitals and the respective time periods for which they are invested. Formula: P1 : P2 = (C1 × T1) : (C2 × T2).

Sleeping Partner

A partner who invests capital but does not actively manage the business is a sleeping partner. Their profit share is strictly based on their investment and time, without any additional managing allowance.

Finding Individual Values from Sum & Difference

If sum = S and difference = D, the larger value is (S + D) ÷ 2 and the smaller value is (S − D) ÷ 2. This is useful for finding individual profits quickly without algebraic substitution.

Q53. Answer: (a) cotA

Shortcut Trick

$K \times [\sin A(1 - 2\sin^2 A)] / [\cos A(2\cos^2 A - 1)] = 1$

Since $1 - 2\sin^2 A$ and $2\cos^2 A - 1$ both equal $\cos 2A$, they cancel out.

$K \times (\sin A / \cos A) = 1 \Rightarrow K \times \tan A = 1$

K = 1 / tan A = cotA
Therefore The correct answer is cotA.
Alternate Method
Given:
K × [(sin A − 2sin³ A) / (2cos³ A − cos A)] = 1
Formula Used:
cos 2A = 1 − 2sin² A
cos 2A = 2cos² A − 1
tan A = sin A / cos A
Calculations:
=> K × [(sin A − 2sin³ A) / (2cos³ A − cos A)] = 1
=> K × [sin A(1 − 2sin² A)] / [cos A(2cos² A − 1)] = 1
=> K × (sin A × cos 2A) / (cos A × cos 2A) = 1
=> K × (sin A / cos A) = 1
=> K × tan A = 1
=> K = 1 / tan A
=> K = cotA
Therefore The correct answer is cotA.
Additional Information
Double Angle Formulas
cos 2A = cos² A − sin² A = 2cos² A − 1 = 1 − 2sin² A
sin 2A = 2sin A × cos A
Pythagorean Identities
sin² A + cos² A = 1
1 + tan² A = sec² A
1 + cot² A = cosec² A

Q54. Answer: (d) 800

Shortcut Trick
Let the total monthly salary be 100 units.
Remaining salary after paying 33% debt = 100 − 33 = 67 units.
He spends 25% of the remaining, so he saves (100 − 25)% = 75% of it.
Savings = 75% of 67 units = (3 / 4) × 67 = 50.25 units.
Given 50.25 units → Rs. 402 => 1 unit = 402 ÷ 50.25 = 8.
Therefore The correct answer is Rs. 800.
Alternate Method
Given:
Debt payment = 33% of the monthly salary
Spending = 25% of the remaining salary
Total Savings = Rs. 402
Formula Used:
Savings = Total Salary × (100 − %Debt) / 100 × (100 − %Spend) / 100
Total Monthly Salary (100%)
Debt (33%)
Remaining Salary (67%)
Spend(25%)
Savings: Rs. 402 (75%)
75% of 67% = Rs. 402
Calculations:
=> Let the total monthly salary be S.
=> Remaining salary after debt = (100 − 33)% of S = 67% of S
=> Savings = (100 − 25)% of Remaining Salary = 75% of (67% of S)

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=> (75 / 100) × (67 / 100) × S = 402

=> (3 / 4) × (67 / 100) × S = 402

=> (201 / 400) × S = 402

=> S = 402 × (400 / 201)

=> S = 2 × 400

=> S = 800

Therefore The correct answer is Rs. 800.

Additional Information

Successive Percentage Application

When a value undergoes multiple percentage reductions in succession, apply the changes sequentially. Final Value = Initial Value × (1 − P1/100) × (1 − P2/100).

Income, Expenditure & Savings

The foundational rule of personal finance mathematical problems is: Income = Expenditure + Savings. If you spend x% of your income, you automatically save (100 − x)% of it.

Base Shifting in Percentages

Pay close attention to the phrasing -of the remaining-. It changes the calculation base from the original total to the newly calculated remainder, requiring successive fractional multiplication.

Q55. Answer: (c) 40 hours

Shortcut Trick

When the distance is constant, speed is inversely proportional to time.

Ratio of speeds (Tiger : Disha) = 100 : 35 = 20 : 7

Ratio of time taken = 7 : 20

Tiger's time = 7 units = 14 hours => 1 unit = 2 hours

Disha's time = 20 units = 20 × 2 = 40 hours

Therefore The correct answer is 40 hours.

Alternate Method

Given:

Tiger's speed = 100 km/hr

Disha's speed = 35 km/hr

Time taken by Tiger = 14 hours

Formula Used:

Distance = Speed × Time

Time = Distance ÷ Speed

Delhi

Kanpur

Distance = 1400 km

Tiger: 100 km/hr × 14 hr

Disha: 35 km/hr × T hr

Calculations:

=> Total Distance = Tiger's speed × Tiger's time

=> Distance = 100 × 14 = 1400 km

=> Time taken by Disha = Total Distance ÷ Disha's speed

=> Time taken by Disha = 1400 ÷ 35

=> Time taken by Disha = 40 hours

Therefore The correct answer is 40 hours.

Additional Information

Speed, Time & Distance Relationship

Distance = Speed × Time. For a constant distance, Speed and Time are inversely proportional to each other.

Relative Speed

When two bodies move in the same direction, Relative Speed = S1 − S2. In opposite directions, Relative Speed = S1 + S2.

Average Speed

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Average Speed = Total Distance ÷ Total Time. If two equal distances are covered at speeds a and b, Average Speed = (2ab) ÷ (a + b).

Q56. Answer: (d) 92,115

Shortcut Trick

Difference in ratio parts between largest and smallest share = 13 − 3 = 10 units.

Total profit in ratio parts = 13 + 3 + 9 = 25 units.

Value of 10 units = Rs. 36,846 => 1 unit = Rs. 3,684.6

Total profit = 25 × 3,684.6 = Rs. 92,115

Therefore The correct answer is Rs. 92,115.

Alternate Method

A (13x)

B (3x)

C (9x)

Largest

Smallest

Diff = 10x

Rs. 36,846

Given:

Ratio of profit shares of the three partners = 13 : 3 : 9

Difference between the largest and smallest shares = Rs. 36,846

Calculations:

=> Let the profit shares of the three partners be 13x, 3x, and 9x respectively.

=> Largest share = 13x

=> Smallest share = 3x

=> Difference between the largest and smallest share = 13x − 3x = 10x

=> 10x = 36,846

=> x = 36,846 ÷ 10 = 3,684.6

=> Total profit of the company = 13x + 3x + 9x = 25x

=> Total profit = 25 × 3,684.6 = 92,115

Therefore The correct answer is Rs. 92,115.

Additional Information

Partnership Profit Sharing

In a partnership, the profit is distributed among partners in proportion to the product of their invested capital and the time period of investment (Profit Ratio = Capital × Time).

Ratio Multiplier Property

If quantities A, B, and C are in the ratio a : b : c, their exact values can be written as ax, bx, and cx, where x is a common multiplier. Sum of quantities = (a + b + c)x.

Active and Sleeping Partners

An active partner manages the business and usually receives a salary or fixed percentage of profit. A sleeping partner only invests capital. The remaining profit is then shared based on their capital ratio.

Q57. Answer: (b) 7

Shortcut Trick

The number 267533 ends in an odd digit (3).

Thus, it cannot be divided by even numbers (eliminating 6 and 12).

It does not end in 0 or 5, so it is not divisible by 5.

By elimination, it must be divisible by 7.

Check: Difference of 3-digit blocks 533 − 267 = 266, which is completely divisible by 7.

Therefore The correct answer is 7.

Alternate Method

Given:

Number = 267533

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Concept Used:

Divisibility rules of numbers 5, 6, 7 and 12.

Calculation:

=> Let's check the given options one by one.

=> Divisibility by 5: A number is divisible by 5 if its last digit is 0 or 5.

=> Here, the unit digit is 3. So, 267533 is not divisible by 5.

=> Divisibility by 6 & 12: Even numbers only divide even numbers.

=> Since 267533 is an odd number, it cannot be divided by 6 or 12.

=> Divisibility by 7: Let's divide 267533 by 7 directly.

=> 267533 ÷ 7 = 38219

=> Since the quotient is a whole number with no remainder, 267533 is perfectly divisible by 7.

Therefore The correct answer is 7.

Additional Information

Divisibility Rule of 7 (Seed Method)

Subtract 2 × the last digit from the remaining truncated number. If the result is a multiple of 7, the original number is divisible by 7.

Block Method for Divisibility by 7, 11, and 13

Group the number into blocks of 3 digits starting from the right. Find the alternating difference between the blocks. If the result is divisible by 7, 11, or 13, the entire number is divisible by that respective prime.

Divisibility Rule of 12

A number is divisible by 12 only if it satisfies the divisibility conditions of both its co-prime factors, 3 and 4.

Q58. Answer: (b) square

Shortcut Trick

A quadrilateral having all four sides equal is either a rhombus or a square.

If any one angle of a rhombus is 90°, all its interior angles become 90°.

A quadrilateral with all equal sides and all angles equal to 90° is geometrically a square.

Therefore The correct answer is square.

Alternate Method

Given:

All sides are equal: AB = BC = CD = DA

Opposite sides are parallel: AB || DC and AD || BC

Opposite angles are equal: angle ABC = angle ADC and angle BAD = angle BCD

angle ABC = 90°

A

B

C

D

90°

Calculations:

=> Since opposite sides are parallel, ABCD is a parallelogram.

=> In a parallelogram, the sum of any two adjacent interior angles is 180°.

=> angle ABC + angle BCD = 180°

=> 90° + angle BCD = 180°

=> angle BCD = 180° − 90° = 90°

=> Since opposite angles are equal, angle ADC = angle ABC = 90° and angle BAD = angle BCD = 90°.

=> All interior angles of ABCD are 90°.

=> A quadrilateral with all sides equal and all angles measuring 90° is a square.

Therefore The correct answer is square.

Additional Information

Parallelogram

A quadrilateral in which opposite sides are parallel and equal. Opposite angles are equal, and the diagonals bisect each other.

Rhombus

A type of parallelogram having all four sides equal. Its diagonals bisect each other at right angles (90°).

Rectangle

A parallelogram with all interior angles equal to 90°. The diagonals of a rectangle are equal in length and bisect each other.

Kite

A quadrilateral where two distinct pairs of adjacent sides are equal. Only one pair of opposite angles is equal, and its diagonals intersect at 90°.

Q59. Answer: (c) Rs. 9,180

Shortcut Trick

Final Price = Marked Price × (100 − D1)% × (100 − D2)%

Final Price = 12000 × (100 − 15)% × (100 − 10)%

Final Price = 12000 × 0.85 × 0.90

Final Price = 10200 × 0.90 = Rs. 9,180

Therefore The correct answer is Rs. 9,180.

Alternate Method

Given:

Marked Price (MP) = Rs. 12,000

Trade discount = 15%

Scheme discount = 10%

Rs. 12000

Marked Price

−15%

Rs. 10200

−10%

Rs. 9180

Final Price

Calculations:

=> Price after 15% trade discount = MP − (15% of MP)

=> Reduced Price = 12000 − (15 ÷ 100 × 12000)

=> Reduced Price = 12000 − 1800 = Rs. 10,200

=> Final price after 10% scheme discount = Reduced Price − (10% of Reduced Price)

=> Final Price = 10200 − (10 ÷ 100 × 10200)

=> Final Price = 10200 − 1020 = Rs. 9,180

Therefore The correct answer is Rs. 9,180.

Additional Information

Successive Discount

When two discounts D1% and D2% are applied one after the other, the single equivalent discount percentage is given by: (D1 + D2 − D1×D2 ÷ 100)%.

Marked Price vs Selling Price

Discounts are always calculated on the Marked Price (MP) unless specified otherwise. Final Selling Price (SP) = Marked Price − Total Discount Amount.

Q60. Answer: (d) 51.2

Shortcut Trick

Let the assumed average be 50 kg.

Net deviation from 50 = (−10) + (−1) + (+6) + (+24) + (−13) = +6 kg

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 the five family members = 40 kg, 49 kg, 56 kg, 74 kg, and 37 kg

Number of members = 5

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Formula Used:

Average = Sum of all observations ÷ Total number of observations

40

49

56

74

37

M1

M2

M3

M4

M5

Avg = 51.2

Calculations:

=> Sum of all weights = 40 + 49 + 56 + 74 + 37

=> Sum of all weights = 256 kg

=> Average = 256 ÷ 5

=> Average = 51.2 kg

Therefore The correct answer is 51.2 kg.

Additional Information

Weighted Average

Used when different groups have different averages and quantities. Formula: A_w = (n1A1 + n2A2) ÷ (n1 + n2).

Deviation Method for Averages

A rapid calculation technique where an assumed mean is chosen, and net deviations are added or subtracted from it to efficiently determine the actual average.

Combined Average

The overall average when combining multiple sets of data together. The final average always lies between the smallest and largest individual group averages.

Q61. Answer: (a) 46.67

Shortcut Trick

CP of 1 pen = 180 ÷ 12 = Rs. 15

SP of 1 pen = Rs. 22

Profit = 22 − 15 = Rs. 7

Profit % = (7 ÷ 15) × 100 = 140 ÷ 3 = 46.66...% ≈ 46.67%

Therefore The correct answer is 46.67%.

Alternate Method

Given:

Cost price of 1 dozen pens (12 pens) = Rs. 180

Selling price of 1 pen = Rs. 22

Formula Used:

Profit = SP − CP

Profit % = (Profit ÷ CP) × 100

CP Rs. 15 SP Rs. 22 Profit = Rs. 7 + 46.67%

Calculations:

=> Cost price of 1 pen = 180 ÷ 12 = Rs. 15

=> Selling price of 1 pen = Rs. 22

=> Profit = 22 − 15 = Rs. 7

=> Profit % = (7 ÷ 15) × 100

=> Profit % = 700 ÷ 15

=> Profit % = 140 ÷ 3

=> Profit % = 46.66...% ≈ 46.67%

Therefore The correct answer is 46.67%.

Additional Information

Loss Percentage

When Cost Price (CP) is greater than Selling Price (SP), Loss % = [(CP − SP) ÷ CP] × 100.

Marked Price & Discount

Discount is always calculated on the Marked Price (MP). SP = MP − Discount. Discount % = (Discount ÷ MP) × 100.

Dishonest Dealer

If a dealer claims to sell goods at CP but uses false weight, Profit % = [(True Weight − False Weight) ÷ False Weight] × 100.

Q62. Answer: (b) 69/88

Shortcut Trick

Total work = LCM(16, 22) = 176 units.

Efficiency of A = 11 units/day, and Efficiency of B = 8 units/day.

Work done together in 2 days = (11 + 8) × 2 = 38 units.

Remaining work = 176 − 38 = 138 units.

Fraction of work left = 138 ÷ 176 = 69/88.

Therefore The correct answer is 69/88.

Alternate Method

Given:

Time taken by A = 16 days

Time taken by B = 22 days

Person	Days	Total Work	Efficiency
A	16	176	11
B	22	8	

Calculations:

=> Total efficiency of A and B = 11 + 8 = 19 units/day

=> Work done by A and B together in 2 days = 19 × 2 = 38 units

=> Remaining work = Total work − Work done

=> Remaining work = 176 − 38 = 138 units

=> Fraction of work left = Remaining work ÷ Total work

=> Fraction of work left = 138 ÷ 176 = 69/88

Therefore The correct answer is 69/88.

Additional Information

Total Work Rule

Total Work is equal to the product of Number of Days and Efficiency. It is generally assumed to be the LCM of the given time periods for easier calculation.

Work and Efficiency Relation

Efficiency is inversely proportional to the time taken. If a person is more efficient, they will take less time to complete the same amount of work.

Pipes & Cisterns Analogy

The concept of time and work directly applies to pipes and tanks. Inlet pipes have a positive efficiency (adding work), while outlet pipes have a negative efficiency (destroying work).

Q63. Answer: (c) 2 years

Shortcut Trick

Multiplying factor for 1 year at 16% = 1 + 16/100 = 116/100 = 29/25

Ratio of final Amount to Principal = 841 / 625

We can observe that 841 / 625 = $(29 / 25)^2$

Since the ratio is exactly the square of the 1-year multiplying factor, the time required is 2 years.

Therefore The correct answer is 2 years.

Alternate Method

Given:
Principal (P) = Rs. 625
Amount (A) = Rs. 841
Rate of Interest (R) = 16% per annum compounded annually
Formula Used:
$A = P(1 + R/100)^n$
Principal (P)
Rs. 625
Amount (A)
Rs. 841
Rate (R) = 16%
Time = n years
$A = P \times (1 + 16/100)^n$
Calculation:
$\Rightarrow 841 = 625(1 + 16/100)^n$
$\Rightarrow 841 / 625 = (1 + 4/25)^n$
$\Rightarrow 841 / 625 = (29/25)^n$
$\Rightarrow (29/25)^2 = (29/25)^n$
$\Rightarrow n = 2$
Therefore The correct answer is 2 years.
Additional Information
Half-Yearly Compounding
If interest is compounded half-yearly, the rate becomes R/2 and the time period becomes 2n.
Effective Rate of Interest
For 2 years, the effective compound interest rate can be directly calculated as: $R + R + (R \times R)/100 = 2R + R^2/100$.
Difference Between CI and SI
The difference between compound interest and simple interest for 2 years is given by the formula: $D = P(R/100)^2$.

Q64. Answer: (d) Rs. 6

Shortcut Trick
Difference between a single discount of 2x% and two successive discounts of x% each is directly given by $(x^2 \div 100)\%$.
Here, the single discount is 20% and the successive discounts are 10% and 10%, so x = 10.
Difference in discount % = $(10^2 \div 100)\% = 1\%$.
Difference in value = 1% of Rs. 600 = Rs. 6.
Therefore The correct answer is Rs. 6.
Alternate Method
Given:
=> Gift value (Marked Price) = Rs. 600
=> Single discount = 20%
=> Two successive discounts = 10% and 10%
MP: Rs. 600
Single Discount: 20%
Disc = Rs. 120
Successive: 10% & 10%
Disc = Rs. 114
Diff = Rs. 6
Formula Used:
=> Effective discount for successive x% and y% = $[x + y - (x \times y) \div 100]\%$
Calculations:
=> Case 1: Single discount = 20%
=> Case 2: Effective discount for 10% and 10% = $10 + 10 - (10 \times 10) \div 100$
=> Effective discount = $20 - 1 = 19\%$

=> Difference in discount percentages = 20% − 19% = 1%

=> Difference in discount amount = 1% of Rs. 600

=> Difference = (1 ÷ 100) × 600 = Rs. 6

Therefore The correct answer is Rs. 6.

Additional Information

Successive Discounts

When multiple discounts are applied one after the other, the overall effective discount is calculated using the formula: Effective % = x + y − (x × y) ÷ 100.

Marked Price & Selling Price

Discount is always calculated on the Marked Price (MP). The Selling Price (SP) is obtained by subtracting the discount from the MP: SP = MP × (100 − Discount%) ÷ 100.

Single vs Successive Disadvantage

For a buyer, a single flat discount is always better than successive discounts adding up to the same total numerical percentage, as successive discounts reduce the base value incrementally.

Q65. Answer: (b) 135 hours

Shortcut Trick

Full tank time: P = 20 × (9 ÷ 4) = 45 hr, Q = 30 × (9 ÷ 2) = 135 hr.

Let total capacity = LCM(45, 135) = 135 units. Efficiency P = 3, Q = 1.

Work done by P and Q in 3 hr = 3 × (3 + 1) = 12 units.

R empties 12 units in 4 hr → R efficiency = −12 ÷ 4 = −3.

Total time for P + Q + R = Total capacity ÷ Combined efficiency = 135 ÷ (3 + 1 − 3) = 135 hr.

Therefore The correct answer is 135 hours.

Alternate Method

Given:

=> Pipe P fills 4/9 part in 20 hours.

=> Pipe Q fills 2/9 part in 30 hours.

=> Pipes P and Q are opened for 3 hours.

=> Pipe R empties the filled part in 4 hours.

Calculations:

=> Time for Pipe P to fill the full tank = 20 × (9 ÷ 4) = 45 hours.

=> Time for Pipe Q to fill the full tank = 30 × (9 ÷ 2) = 135 hours.

=> Let total work be the LCM of 45 and 135, which is 135 units.

Pipe	Hours	Total Work	Efficiency
P	45	135	3
Q	135	1	

=> Efficiency of P and Q together = 3 + 1 = 4 units/hour.

=> Work completed by P and Q in 3 hours = 4 × 3 = 12 units.

=> Pipe R empties these 12 units in 4 hours.

=> Efficiency of Pipe R = −12 ÷ 4 = −3 units/hour.

=> Combined efficiency of P, Q, and R together = 3 + 1 − 3 = 1 unit/hour.

=> Time taken by P, Q, and R to fill the tank = Total Work ÷ Combined Efficiency = 135 ÷ 1 = 135 hours.

Therefore The correct answer is 135 hours.

Additional Information

Fractional Work to Total Time

If a pipe completes a/b part of a tank in t hours, the time required to complete the full tank is given by t × (b ÷ a) hours.

Pipes and Cisterns Efficiency

Inlet pipes add water to the tank, so their efficiency is considered positive (+). Outlet or emptying pipes remove water, so their efficiency is taken as negative (−).

Combined Operating Time

When multiple pipes are opened together, the combined efficiency is the algebraic sum of their individual efficiencies. Total time =

Total Capacity ÷ Combined Efficiency.

Q66. Answer: (c) (61)/(78)

Shortcut Trick

Solve the lower fraction first: 1 + 5/8 = 13/8.

The reciprocal of the lower fraction gives the middle term: 8/13.

Substitute to get the simplified expression: 3/2 + 8/13 − 4/3.

Find the LCM of 2, 13, and 3, which is 78.

Calculate: (117 + 48 − 104) / 78 = 61/78.

Therefore The correct answer is 61/78.

Alternate Method

Given:

Expression: 3/2 + 1 / (1 + 5/8) − 4/3

Calculations:

=> First, simplify the nested fraction in the denominator of the middle term.

=> 1 + 5/8 = (8 + 5) / 8 = 13/8

=> Substitute this back into the main expression:

=> 3/2 + 1 / (13/8) − 4/3

=> The reciprocal of 13/8 is 8/13, so the expression becomes:

=> 3/2 + 8/13 − 4/3

=> The denominators are 2, 13, and 3. Their LCM is 2 × 13 × 3 = 78.

=> Convert each fraction to have the common denominator 78:

=> (3 × 39) / 78 + (8 × 6) / 78 − (4 × 26) / 78

=> 117/78 + 48/78 − 104/78

=> (117 + 48 − 104) / 78

=> (165 − 104) / 78

=> 61/78

Therefore The correct answer is 61/78.

Additional Information

BODMAS Rule

Always follow the standard order of operations: Brackets, Orders, Division, Multiplication, Addition, and Subtraction. Nested parts inside complex fractions act as implicit brackets and must be evaluated first.

Continued Fractions

A continued fraction is systematically solved from bottom to top. Simplify the lowest expression first, take its reciprocal if divided into 1, and then proceed upwards to the next operation.

LCM in Fraction Addition and Subtraction

Fractions with different denominators cannot be added or subtracted directly. They must be converted to equivalent fractions with a common denominator, typically finding the LCM of the original denominators before operating on the numerators.

Q67. Answer: (b) 7500

Shortcut Trick

Volume of one cube = 15625 cm^3 => Side of cube (a) = √[3]{15625} = 25 cm.

When 5 cubes are joined in a row end to end, the resulting cuboid has exactly 12 visible lateral faces (5 front, 5 back, 1 left, 1 right).

Lateral Surface Area = 12 × a^2

=> 12 × $(25)^2$ = 12 × 625 = 7500 cm^2

Therefore The correct answer is 7500 cm^2.

Alternate Method

Given:

Volume of each solid cube = 15625 cm^3

Number of cubes joined = 5

Formula Used:

Volume of a cube = a^3 (where a is the side length)

Lateral Surface Area of a cuboid = 2 × h × (l + b)

5 Solid Cubes Form a Cuboid

Lateral Surface Area = Area of 4 vertical faces

a

a

a

a

a

L = 125 cm

H = 25 cm

B = 25 cm

Calculations:

=> Let the side of each cube be a.

=> $a^3 = 15625$

=> $a = \sqrt{15625} = 25$ cm

When 5 such cubes are joined end to end, the dimensions of the newly formed cuboid become:

=> Length (l) = 5 × a = 5 × 25 = 125 cm

=> Breadth (b) = a = 25 cm

=> Height (h) = a = 25 cm

=> Lateral Surface Area = 2 × h × (l + b)

=> LSA = 2 × 25 × (125 + 25)

=> LSA = 50 × 150 = 7500 cm^2

Therefore The correct answer is 7500 cm^2.

Additional Information

Total Surface Area of Cuboid

The total surface area includes all 6 faces of the cuboid. Formula: TSA = 2(lb + bh + hl).

Lateral Surface Area Concept

Lateral Surface Area only calculates the area of the vertical bounding faces. It strictly excludes the top and the bottom faces. Formula: LSA = 2h(l + b).

Joining Cubes End to End

When 'n' equivalent cubes of edge length 'a' are joined end to end in a single straight row, only the length is extended to n × a. The breadth and height remain equal to the original cube edge 'a'.

Q68. Answer: (b) 7 km/hr

Shortcut Trick

When distance is constant, speed and time are inversely proportional.

If Salaj doubles his speed, his new time becomes half of his original time.

Total reduction in time = (3 hours more) + (5 hours less) = 8 hours.

If Original Time is T, then T/2 = 8 hours => T = 16 hours.

Salaj's Speed = Distance ÷ Time = 112 ÷ 16 = 7 km/hr.

Therefore The correct answer is 7 km/hr.

Alternate Method

Given:

Total Distance = 112 km

Let Salaj's time be T_s and Kevin's time be T_k.

Kevin's Time (t)

Original (t + 3)

New (t − 5)

Total Gap = 8 hours

Time Difference = T / 2 = 8 hrs → T = 16 hrs

Calculations:

=> Salaj takes 3 hours more than Kevin initially:

=> T_s = T_k + 3 ... (Equation 1)

=> When Salaj doubles his speed, his new time becomes T_s / 2.

=> He now takes 5 hours less than Kevin:

=> T_s / 2 = T_k − 5 ... (Equation 2)

=> Subtracting Equation 2 from Equation 1:

=> T_s − T_s / 2 = (T_k + 3) − (T_k − 5)

=> T_s / 2 = 3 + 5

=> T_s / 2 = 8

=> T_s = 16 hours

=> Salaj's original speed = Distance ÷ Time

=> Salaj's speed = 112 ÷ 16 = 7 km/hr

Therefore The correct answer is 7 km/hr.

Additional Information

Inverse Proportionality

When distance is constant, Speed and Time are inversely proportional (S1 ÷ S2 = T2 ÷ T1). Therefore, if speed is doubled, the time taken exactly becomes half.

Relative Speed

Relative speed is the sum of individual speeds when moving in opposite directions, and the absolute difference when moving in the same direction.

Average Speed

Average Speed = Total Distance ÷ Total Time. If two equal distances are covered at speeds a and b, then Average Speed = (2 × a × b) ÷ (a + b).

Q69. Answer: (b) -102x + 132

Shortcut Trick

Simplify fractions and expand the terms directly using mental math.

=> $3(2x^2 − 22x + 14) − 6(x^2 + 6x − 15)$

=> $6x^2 − 66x + 42 − 6x^2 − 36x + 90$

Cancel out the $6x^2$ terms and add the remaining terms:

=> $−102x + 132$

Therefore The correct answer is $−102x + 132$.

Alternate Method

Given:

$3((6 ÷ 3)x^2 − 22x + 14) − 6(x^2 + 6x − 15)$

Calculations:

=> First, simplify the fraction inside the brackets: 6 ÷ 3 = 2

=> Substitute this back into the expression:

=> $3(2x^2 − 22x + 14) − 6(x^2 + 6x − 15)$

=> Distribute 3 to each term in the first bracket:

=> $(3 × 2x^2) − (3 × 22x) + (3 × 14) = 6x^2 − 66x + 42$

=> Distribute −6 to each term in the second bracket:

=> $(−6 × x^2) − (6 × 6x) − (−6 × −15) = −6x^2 − 36x + 90$

=> Write the complete expanded expression:

=> $6x^2 − 66x + 42 − 6x^2 − 36x + 90$

=> Group the like terms together (x^2 terms, x terms, and constants):

=> $(6x^2 − 6x^2) + (−66x − 36x) + (42 + 90)$

=> 0 − 102x + 132

=> −102x + 132

Therefore The correct answer is $−102x + 132$.

Additional Information

BODMAS Rule

Always simplify operations inside brackets first. Then proceed with multiplication and division, followed by addition and

subtraction.

Distributive Property

When multiplying a number by a bracketed polynomial, multiply the outer number by each individual term inside the bracket: a(b + c) = ab + ac.

Combining Like Terms

In algebra, only terms with the exact same variables and exponents can be added or subtracted together.

Q70. Answer: (a) 11

Shortcut Trick

Let Mary's age = M and Diya's age = D.

Given: 3M − 5D = 29 and M − 2D = 9.

Multiply the second equation by 3 to equate M: 3M − 6D = 27.

Subtract from the first: (3M − 5D) − (3M − 6D) = 29 − 27 => D = 2.

Substitute D = 2 in M = 2D + 9 => M = 13.

Therefore The correct answer is 11 years.

Alternate Method

Mary

13 years

Diya

2 yrs

Difference = 11 years

Given:

Let Mary's present age = M

Let Diya's present age = D

Equation 1: 3M = 5D + 29

Equation 2: 2D = M − 9 => M = 2D + 9

Calculations:

=> Substitute M in Equation 1: 3 × (2D + 9) = 5D + 29

=> 6D + 27 = 5D + 29

=> 6D − 5D = 29 − 27

=> D = 2

=> Substitute D back in Equation 2: M = 2 × 2 + 9

=> M = 4 + 9 = 13

=> Difference in their ages = M − D = 13 − 2 = 11

Therefore The correct answer is 11 years.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by = c can be solved using substitution or elimination methods. In age-related problems, forming these equations correctly is the key step.

Age Problems Logic

The difference between the ages of two people always remains constant over time, regardless of how many years pass in the future or in the past.

Ratio Method for Ages

If the ratio of ages of two people is a:b, their ages can be assumed as ax and bx. After n years, their ages become (ax + n) and (bx + n).

Q71. Answer: (b) IDO : GEK

The logic followed here is,

Similarly,

Hence, the correct answer is "Option 2"

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Q72. Answer: (b) UNR

The logic followed here is:

Hence, the correct answer is "Option 2"

Q73. Answer: (c) 77

Rank from top: 34

Rank from bottom: 44

Total students: (Rank from top + Rank from bottom) - 1

= (34 + 44) - 1

= 78 - 1

=77

Hence, the correct answer is "Option 3"

Q74. Answer: (a) 226

The logic follows here,

Hence, the correct answer is "Option 1"

Q75. Answer: (d) 40

Given : Pratik ranked 14th from the bottom and 27th from the top in his class

Total students: (Rank from top + Rank from bottom) - 1

= (14 + 27) - 1

= 41 - 1

=40.

Hence, the correct answer is "Option 4"

Q76. Answer: (c) RYV

The logic followed here is,

Hence, the correct answer is "Option 3"

Q77. Answer: (c) UYO

The logic followed here is,

Hence, the correct answer is "Option 3"

Q78. Answer: (a) Neither conclusion (I) nor (II) follows.

The least possible diagram for the given statements is as follows:

Conclusions (I): Some trees are graphs.- False (As their is no direct relation between trees and graph may be it is possible but not definite. Hence, it is false)

Conclusions (II): All graphs are chisels. - False (Some chisels are graphs and some graph are chisels but all graphs are chisels is may be possible but not definite. Hence, it is false).

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 1"

Q79. Answer: (a) 4

According to the given question,

• means −, − means ×, × means ÷ and ÷ means +,

17 + 44 ÷ 4 - 6 × 4 = ?

17 + 11 - 24 = ?

28 - 24 = 4.

Hence, the correct answer is "Option 1"

Q80. Answer: (a) N

Given: Six passengers L, M, N, P, Q and R are sitting on a bench in a straight line. They all are facing towards the north.

• M is sitting immediately between L and R.

• Q is sitting at the extreme right end of line.

• M is sitting second to the left of Q.

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• R is sitting to the immediate left of Q.
• P is not an immediate neighbour of L
The Final Arrangement is
N sits immediate left of L.
Hence, the correct answer is "Option 1"

Q81. Answer: (b) A

Given: A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table.
• Only two people sit between K and J when counted from the right of K.
• Only three people sit between D and B when counted from the right of B.
• J sits to the immediate right of B.
• A sits to the immediate right of L.
The final arrangement is:
Hence, the correct answer is "Option 2"

Q82. Answer: (b) WANT - NWAT - TNAW

The logic follows here,
Similarly,
Hence, the correct answer is "Option 2"

Q83. Answer: (a) 1

Given: (Left) 218 168 879 953 622 (Right)
Arranged in descending order: (Left) 953 879 622 218 168 (Right)
Second digit of the fourth number from the left : (Left) 953 879 622 218 168 (Right)
Hence, the correct answer is "Option 1"

Q84. Answer: (b) Two

Given: Seven boxes F, G, H, I, K, L and O are kept one over the other but not necessarily in the same order.
• Only G is kept above I.
• Only two boxes are kept between I and O.
• Only L is kept below F.
• H is not kept immediately above O.
The Final Arrangement is

G
I
H
K
O
F
L

Hence, the correct answer is "Option 2"

Q85. Answer: (d) 54

Given :4 ÷ 13 + 96 × 8 − 14 = ?
According to the given question,
'+' and '−' are interchanged and '×' and '÷' are interchanged
4 × 13 - 96 ÷ 8 +14 = ?
4 × 13 - 12 + 14 = ?
52 - 12 +14 = ?
40 + 14 = 54.
Hence, the correct answer is "Option 4"

Q86. Answer: (a) Only conclusion (II) follows.

The least possible Venn diagram is:

Conclusions:

(I) Some fuses are batteries. - False (Their is no direct relation between between fuses and batteries may be it is possible but not definite; hence, it is false.)

(II) Some wires are fuses. - True (Some fuses are wires means Some wires are fuses, is true.)

Hence, the correct answer is "Option 1".

Q87. Answer: (b) None

Given number 8453126

Arranged in ascending order from left to right :

Hence, the correct answer is "Option 2"

Q88. Answer: (a) 200

Given :56 D 23 C 69 B 2 D 79 C 36 B 9 A 3 = ?

BODMAS Table:

'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−',

56 − 23 + 69 × 2 − 79 + 36 × 9 ÷ 3 = ?

56 − 23 + 69 × 2 − 79 + 36 × 3 = ?

56 − 23 + 138 − 79 + 108 = ?

56 − 23 + 138 − 79 + 108 = ?

302 - 102 = ?

200.

Hence, the correct answer is "Option 1"

Q89. Answer: (b) 59

The logic follows here,

Hence, the correct answer is "Option 2"

Q90. Answer: (d) 459, 366

Logic: (First Number - 93 = Second Number)

Similarly,

Hence, the correct answer is "Option 4"

Q91. Answer: (a) 64 km towards the south

• Pavan starts from Point Y and drives 39 km towards the north.

• He then takes a right turn and drives 79 km, then turns right and drives 48 km.

• He then takes a right turn and drives 43 km.

• He takes a right turn and drives 73 km.

• He then turns left, drives 36 km and stops at Point Z

The Final Diagram,

Hence, the correct answer is "Option 1"

Q92. Answer: (d) 5 km towards West

• Jack starts from Point A and drives 5 km towards South.

• He then takes a left turn, drives 7 km, turns left and drives 3 km.

• He then takes a left turn and drives 2 km.

• He takes a final right turn, drives 2 km and stops at Point P.

The Final Diagram,

Hence, the correct answer is "Option 4"

Q93. Answer: (d) 5

'CAKE' is coded as '7209'

'ACHE' is coded as '0295'.

The code for H is 5.

Hence, the correct answer is "Option 4"

Q94. Answer: (a) GZK

The logic followed here is,

Hence, the correct answer is "Option 1"

Q95. Answer: (b) 8

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

Now,

Symbols are dropped from the series : (Left) 6 4 8 9 5 1 3 2 7 (Right)

So, seventh from the right : (Left) 6 4 8 9 5 1 3 2 7 (Right)

Hence, the correct answer is "Option 2"

Q96. Answer: (a) 6

'WINE' is coded as '4512' and 'NETI' is coded as '5624.

'WINE' - '4512'

'NETI' - '5624.

code for 'T' is 6.

Hence, the correct answer is "Option 1"

Q97. Answer: (c) CZPN

The logic followed here is

Hence, the correct answer is "Option 3"

Q98. Answer: (c) FB-ID

The logic followed here is

Hence, the correct answer is "Option 3"

Q99. Answer: (c) Sister

According to the given conditions, the family tree will be:

Hence, the correct answer is "Option 3"

Q100. Answer: (a) 65

The logic follows here,

Hence, the correct answer is "Option 1"

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