RRB NTPC (UG) CBT-I Official Paper (Held On: 02 Sept, 2025 Shift 3) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Which State launched India' first PPP green waste processing plant?

(a) Chhattisgarh
(b) Madhya Pradesh
(c) Kerala
(d) Telangana

Q2. This freedom fighter proclaimed himself the Peshwa during the Revolt of 1857 and gathered armed forces and expelled the British garrison from the city. He was the adopted son of the late Peshwa Baji Rao. The leader in question is:

(a) Kunwar Singh
(b) Mangal Pandey
(c) Tantia Tope
(d) Nana Saheb

Q3. What is the actual mainland distance of India from east to west?

(a) 2933 km
(b) 3143 km
(c) 3214 km
(d) 3014 km

Q4. On which day in 2025 did India and Pakistan agree to a US-brokered ceasefire with immediate effect?

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

Q5. Which of the following devices performs optical character recognition (OCR)?

(a) OMR Scanner
(b) Flatbed Scanner
(c) Barcode Reader
(d) OCR Scanner

Q6. Which Article deals with the constitution of Municipalities?

(a) Article 243Q
(b) Article 243W
(c) Article 243Z
(d) Article 243P

Q7. The Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA) provides a legal guarantee for how many days of employment per year to every rural household in India?

(a) 100 days
(b) 159 days
(c) 180 days
(d) 135 days

Q8. Which Constitutional Amendment Act added the Ninth Schedule to the Constitution of India?

(a) First Amendment Act, 1951
(b) Seventeenth Amendment Act, 1964
(c) Twenty-ninth Amendment Act, 1972
(d) Fourth Amendment Act, 1955

Q9. In May 2025, which Indian company emerged as the lowest bidder for the Indian Navy's Next Generation Corvettes (NGC) project, valued at over Rs. 25,000 crore?

(a) Hindustan Shipyard Limited
(b) Cochin Shipyard Limited
(c) Garden Reach Shipbuilders & Engineers
(d) Mazagon Dock Shipbuilders Limited

Q10. What is the function of a diathermic wall in a thermodynamic system?

(a) It allows the flow of only work.
(b) It prevents the exchange of both matter and energy.
(c) It allows the exchange of matter only.
(d) It allows the flow of heat between systems.

Q11. To be eligible for membership of a State Legislature, a candidate must meet which of the following qualifications as laid down in the Representation of the People Act, 1951?

(a) Be an elector (voter) in any State assembly constituency
(b) Pay income tax in the State
(c) Have at least a graduate degree
(d) Be a permanent resident of the State for 15 years

Q12. Who received the Best Actress award at the 25th IIFA Awards in 2025?

(a) Nitanshi Goel
(b) Neha Dixit
(c) Manisha Kulsherstha
(d) Subhashree Ganguly

Q13. Which of the following, set up in June 1986, is responsible for the management of civil aerodromes and civil enclaves as well as for maintenance and operation of aeronautical communication systems at all the airports?

(a) Delhi International Airport Limited
(b) Airports Authority of India
(c) Airports Council International
(d) National Airports Authority

Q14. Abu'l Fazl was the court historian of which of the following rulers?

(a) Akbar
(b) Babar
(c) Alauddin Khilji
(d) Aurangzeb

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Q15. Kathak is a classical dance form from which of the following regions of India?

(a) Western India
(b) South India
(c) North India
(d) Eastern India

Q16. The increase in Earth's average temperature due to trapped gases is called:

(a) Greenhouse effect
(b) Ocean acidification
(c) Ozone depletion
(d) Climate Change

Q17. In which of the following budget sessions was the Mission Antyodaya, a convergence and accountability framework aiming to bring optimum use and management of resources, adopted?

(a) Union Budget 2018-19
(b) Union Budget 2016-17
(c) Union Budget 2017-18
(d) Union Budget 2015-16

Q18. Which of the following organisations released the World Social Protection Report (WSPR) 2024-2025?

(a) United Nation Security Council
(b) World Health Organization
(c) International Monetary Fund
(d) International Labour Organization

Q19. Lahaulas and Pangwala are major tribes found in which Indian state?

(a) Himachal Pradesh
(b) Goa
(c) Jharkhand
(d) Assam

Q20. Which law allowed inter-caste and inter-religious marriages during the British period in India?

(a) Widow Remarriage Act
(b) Act of 1872
(c) Sarda Act
(d) Act of Settlement

Q21. Which Indian startup successfully tested the country's first electric motor-driven semicryogenic rocket engine in May 2025?

(a) Skyroot Aerospace
(b) Bellatrix Aerospace
(c) Pixxel
(d) Agnikul Cosmos

Q22. In April 2025, India signed a $7.4 billion deal to purchase 26 Rafale fighter jets with which of the following countries?

(a) Russia
(b) United States
(c) France
(d) Israel

Q23. The commercialisation of agriculture under the British transformed the rural economy. What did 'commercialisation of agriculture' in British India lead to?

(a) Elimination of rural debt
(b) Growth of self-sufficient villages
(c) Rise in food grain production

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(d) Increased production of cash crops

Q24. Industrially, which acid is mainly produced by the carbonylation of methanol using carbon monoxide?

(a) Nitric acid
(b) Citric acid
(c) Acetic acid
(d) Hydrochloric acid

Q25. What is the function of the Taskbar in the Windows operating system?

(a) Displays currently running applications and allows switching between them
(b) Stores deleted files temporarily
(c) Opens the file manager window
(d) Shuts down the computer immediately

Q26. What was the main source of revenue for the Pallava empire, used for maintaining their army and administrative expenses?

(a) Trade tax
(b) Toll tax
(c) Salt tax
(d) Land tax

Q27. Which of the following Articles of the Indian Constitution empowers Parliament to make laws relating to the acquisition and termination of the Indian Citizenship?

(a) Article 12
(b) Article 10
(c) Article 7
(d) Article 11

Q28. Where was the 29th World Gas Conference (WGC), known as the 'Olympics' of the global gas industry, held for the first time in its nearly 100-year history in May 2025?

(a) Beijing, China
(b) Dubai, UAE
(c) Tokyo, Japan
(d) Paris, France

Q29. Which of the following developments followed the MoU signed between GRSE and Norway's Kongsberg at Nor-Shipping 2025?

(a) India will jointly operate a Polar Research Vessel with Norway.
(b) India will purchase its first Polar Research Vessel from Norway
(c) India will fund Norway's Polar Research under a new agreement.
(d) India will begin building its first indigenously made Polar Vessel.

Q30. Who took charge as the Controller General of Defence Accounts (CGDA) on 1 March 2025?

(a) Dr. Mayank Sharma
(b) Ajay Kumar
(c) Shailendra Nath Gupta
(d) Alok Joshi

Q31. In the case of Vihaan Kumar vs. State of Haryana, what constitutional violation led the Supreme Court to declare the arrest illegal?

(a) Violation of Article 21 (Right to Life and Personal Liberty)
(b) Violation of Article 14 (Right to Equality)
(c) Violation of Article 19(1)(a) (Freedom of Speech)
(d) Violation of Article 22(1) (Failure to inform grounds of arrest)

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Q32. How does the growth of tertiary activities reflect economic development in India?

(a) It highlights a fall in manufacturing employment.
(b) It indicates a slowdown in overall income generation.
(c) It shows a shift back to farm-based occupations
(d) It reflects improved services, urban growth and rising demand.

Q33. Which international summit on artificial intelligence was held in Bengaluru in 2025, highlighting the importance of ethical and inclusive AI collaboration between India and France?

(a) Indo-European AI Partnership Meet
(b) Global AI Ethics Forum
(c) La French Tech India AI Summit
(d) India-US AI Conference

Q34. Which thermodynamic quantity helps determine the spontaneity of a chemical reaction?

(a) Enthalpy
(b) Entropy
(c) Gibbs free energy
(d) Internal free energy

Q35. Who is responsible for implementing the RTI Act in public departments?

(a) Director General
(b) District Magistrate
(c) Central Vigilance Officer
(d) Central Public Information Officer

Q36. Which of the following names is associated with the Faraizi Movement?

(a) Haji Shariatullah
(b) Muhammad Barkathulla
(c) Hakim Ajmal Khan
(d) Nawab Salimullah

Q37. The McMahon Line is the boundary between India and which country?

(a) Pakistan
(b) Myanmar
(c) Afghanistan
(d) China

Q38. In May 2025, the Khelo India Multipurpose Hall in Arunachal Pradesh was officially opened in which district by Union Minister Dr. Mansukh Mandaviya?

(a) Kamle
(b) Lower Subansiri
(c) West Kameng
(d) Tawang

Q39. What is the name given to a saucer-shaped intrusive igneous body that is concave to the sky?

(a) Lapolith
(b) Sill
(c) Phacolith
(d) Batholith

Q40. How many medals were won by the Indian team in Archery World Cup Stage 2 at Shanghai, China in May 2025?

(a) 5
(b) 7
(c) 6
(d) 3

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MATHEMATICS

Q41. The value of 3/4+(1/(1+5/9))-2/3 is

(a) 61/84
(b) 60/83
(c) 57/77
(d) 63/92

Q42. A shopkeeper lists the price of a fan at 34% above its cost price and offers a 25% discount on its list price. If he earns a profit of Rs. 177, then what is the list price (in Rs.) of the fan?

(a) 47,209
(b) 47,148
(c) 47,436
(d) 47,300

Q43. Find the HCF of 120, 144 and 168.

(a) 48
(b) 12
(c) 36
(d) 24

Q44. A number when increased by 100% gives 2750. The number is:

(a) 687.5
(b) 2750
(c) 1375
(d) 4125

Q45. Eight times the present age of P exceeds the present age of Q by 46 years. After 10 years, three times Q's age will be 12 years less than eight times P's age at that time. What is the present age (in years) of Q?

(a) 49
(b) 37
(c) 42
(d) 43

Q46. The number of prime numbers lying between 317 and 322, both included, is:

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

Q47. Ashok bought some pencils at the rate of Rs. 180 a dozen. He sold them for Rs. 16 each. His profit percentage is _____%.

(a) 6.67
(b) 10.67
(c) 8.67
(d) 4.67

Q48. Simplify the following.

$1 \times (5 \times (3^2)) \div 17 + 44 - 78$

(a) -533/17
(b) -534/17
(c) -535/17
(d) -538/17

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Q49. A shopkeeper marks a mobile phone for Rs. 15,000 but allows a discount of 10%. What amount does the customer actually pay?

(a) Rs. 13,800
(b) Rs. 13,500
(c) Rs. 14,000
(d) Rs. 14,500

Q50. Pipe A can fill a tank in 12 hours, pipe B can fill the same tank in 25 hours and pipe C can fill the same tank in 10 hours. The time taken by them to fill the same tank if they operate together is::

(a) 932/67 hours
(b) 1232/67 hours
(c) 432/67 hours
(d) 1332/67 hours

Q51. Find the value of x satisfying: $4(4x^2 - 5) - 4(4x^2 + 6x - 4) = 15$

(a) -11/24
(b) -17/24
(c) -19/24
(d) -23/24

Q52. A man goes to Indore from Bhopal at a speed of 20 km/hr and returns to Bhopal at speed of 30 km/hr, through the same route. What is his average speed (in km/hr) of the entire journey?

(a) 24
(b) 29
(c) 20
(d) 28

Q53. A sum of money triples itself at a certain rate of compound interest in 15 years. In how many years will it amount to 81 times of itself?

(a) 61 years
(b) 60 years
(c) 56 years
(d) 51 years

Q54. Evaluate: $16 + 12 \div 6 - 2 \times 3$

(a) 12
(b) 14
(c) 15
(d) 11

Q55. The area of one side of a rectangular box is 45 cm^2, and the area of another adjacent side is 24 cm2. If the area of the top surface (third side) is 30 cm^2, find the volume of the box.

(a) 540 cm^3
(b) 270 cm3
(c) 60 cm3
(d) 180 cm3

Q56. A person pays 20% of his monthly salary as monthly payment to repay a loan. He spends 25% of the remaining salary and saves Rs. 780. Find his monthly salary.

(a) 1388
(b) 1300
(c) 1383
(d) 1366

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Q57. In covering a distance of 198 km, Amit takes 4 hours more than Vinay. If Amit doubles his speed, then he would take 5 hours less than Vinay. Amit's speed is:

(a) 20 km/hr
(b) 10 km/hr
(c) 11 km/hr
(d) 12 km/hr

Q58. The marked price of an article is Rs. 2,500. A shopkeeper gives three successive discounts of 25%, 20% and K%, and sells the article at Rs. 1,380. Find the value of K.

(a) 7
(b) 7.6
(c) 6.5
(d) 8

Q59. A kite is flying at the height of 353.55 m above the ground. It is attached to a string inclined at an angle of 45° to the horizontal. What is the approximate length of the string?

(a) 300 m
(b) 250 m
(c) 500 m
(d) 375 m

Q60. What is the median of the following data?

49, 96, 59, 54, 97, 30, 44, 46, 36, 55, 23

(a) 49
(b) 49.5
(c) 50
(d) 48.5

Q61. Pipe P can fill 2/9 part of a tank in 28 hours, and pipe Q can fill 2/7 part of the same tank in 12 hours. Both P and Q were kept open for 6 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 8 hours. Pipes P, Q and R together can fill the empty tank in:

(a) 117 hours
(b) 137 hours
(c) 126 hours
(d) 145 hours

Q62. The ratio of an interior angle to its corresponding exterior angle in a regular polygon is 3 : 2. Determine the number of sides of the polygon.

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

Q63. The HCF and the LCM of two numbers are 29 and 174, respectively. If one of the numbers is 58, find the other one.

(a) 116
(b) 174
(c) 145
(d) 87

Q64. Rs. 32,100 were divided among A, B and C, such that 2 times of A = 7 times of B = 4 times of C. Find the share of A.

(a) Rs. 17,976
(b) Rs. 17,815
(c) Rs. 18,091
(d) Rs. 17,847

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Q65. The average of first 151 odd natural numbers, is:

(a) 151
(b) 151.5
(c) 152
(d) 150.5

Q66. Sapna invested Rs. 22,800 on simple interest, partly at 6% per annum and partly at 4% per annum. If she earns equal interests from the two investments after 8 years, then find the sum invested at 6% per annum (in Rs.).

(a) 9,123
(b) 9,120
(c) 9,117
(d) 9,122

Q67. P, Q and R invest sum in the ratio of 2 : 22 : 70, respectively. If they earned a total profit of Rs. 4,700 at the end of the year, then what is the difference between share of Q and R?

(a) Rs. 2,447
(b) Rs. 2,430
(c) Rs. 2,306
(d) Rs. 2,400

Q68. Which of the following ratios is the greatest?

(a) 30 : 53
(b) 48 : 55
(c) 22 : 51
(d) 40 : 90

Q69. Find the surface area of the cuboid with dimensions 3 cm, 5 cm and 8 cm.

(a) 79 square cm.
(b) 158 square cm.
(c) 60 square cm.
(d) 120 square cm.

Q70. The product of two consecutive natural numbers is 90. The greater of the two numbers is:

(a) 6
(b) 10
(c) 11
(d) 21

GENERAL INTELLIGENCE AND REASONING

Q71. In the following number-pairs, the second number is obtained by applying certain mathematical operation(s) to the first number. Select the number-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 their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

45, 165

24, 144

(a) 42, 172
(b) 18, 142
(c) 38, 158
(d) 21, 131

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Q72. SPLT is related to QNJR in a certain way based on the English alphabetical order. In the same way, OLHP is related to MJFN. To which of the given options is KHDL related, following the same logic?

(a) IFBJ
(b) IFJB
(c) FIJB
(d) FIBJ

Q73. What will come in the place of the question mark (?) in the following equation, if '+' and '÷' are interchanged, and '−' and '×' are interchanged?

6 − 4 × 85 + 5 ÷ 22 = ?

(a) 29
(b) 22
(c) 42
(d) 36

Q74. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

LIG 1, NKI 4, ?, ROM 16, TQO 25

(a) PMK 9
(b) QNL 9
(c) PNL 9
(d) QNK 12

Q75. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

ZMB JXN TIZ DTL ?

(a) NEY
(b) NXE
(c) NEX
(d) NYE

Q76. S is the father of Y. Y is the brother of R. R is the wife of U. U is the son of P. How is S related to P?

(a) father of son's wife
(b) son's wife's sister
(c) brother of son's wife
(d) mother of son's wife

Q77. What should come in place of the question mark (?) in the given series?

9 15 47 91 275 ?

(a) 547
(b) 574
(c) 505
(d) 550

Q78. 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) RM-VP
(b) AV-DY
(c) GB-JE
(d) OJ-RM

Q79. 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) SOJD

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(b) GCXR
(c) AWRL
(d) QNHB

Q80. Refer to the following number, symbol series and answer the question. Counting to be done from left to right only.

(Left) 7 # * © & 8 4 & 6 1 5 9 € 8 $ * 6 6 8 5 7 7 (Right)

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

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

Q81. Town A is to the west of Town B. Town C is to the south of Town A. Town D is to the east of Town C. Town E is to the west of Town A. What is the position of Town E with respect to Town C?

(a) Northeast
(b) Northwest
(c) East
(d) South

Q82. 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 walls are roofs.

No roof is a floor.

Conclusions (I): No roof is a wall.

Conclusions (II): Some floors are roofs.

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

Q83. All 43 people are standing in a row, facing North. Kishor is 24th from the left-end while Monu is 12th from the right-end. How many people are there between Kishor and Monu?

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

Q84. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) LP-KN
(b) EI-DG
(c) HL-GJ
(d) BF-AC

Q85. In a certain code language, ‘YARN’ is coded as ‘25#@’ and ‘ARTY’ is coded as ‘#$52’. What is the code for ‘T’ in the given code language?

(a) 2
(b) $
(c) #
(d) 5

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Q86. Select the number from among the given options that can replace the question mark (?) in the following series.

32 40 50 62 76 ?

(a) 86
(b) 98
(c) 95
(d) 92

Q87. Each of the digits in the number 2786431 is arranged in the ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q88. Paula starts from Point A and drives 5 km towards South. He then takes a right turn, drives 9 km, turns right and drives 13 km. He then takes a right turn and drives 11 km. He takes a final right turn, drives 8 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 2 km to the West
(b) 5 km to the West
(c) 6 km to the North
(d) 4 km to the East

Q89. Seven people, I, J, K, L, P, Q and R are sitting in a row, facing north. Only two people sit between J and I. Only P sits to the right of K. Only one person sits between I and K. Q sits at some place to the right of L but at some place to the left of R. How many people sit between R and L?

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

Q90. 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.

SACK - CSAK - KCAS

LEAP - ALEP - PAEL

(a) PLAY - APLY - LAYP
(b) EMIT - MEIT - TMIE
(c) GOLD - LGOD - DLOG
(d) TEMP - TMEP - PMET

Q91. Seven people A, B, C, D, E, F and G are sitting in a row, facing the north. F sits sixth from the right end of the row. Only two people sit between E and F. A sits to the right of E but left of G. D sits third to the left of C. How many people sit to the right of B?

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

Q92. 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.

SAVE - EASV - AVSE

CROW - WRCO - ROCW

(a) GROW - GORW - WORG
(b) TERM - METR - RETM
(c) DEWS - EDWS - SEWD

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(d) JUST - TUJS - USJT

Q93. Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order.

Only two boxes are kept between C and E. Only A is kept above B. No box is kept below E. F is kept at some place below D but at some place above G. How many boxes are kept between A and G?

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

Q94. In a certain code language, 'MEAT' is coded as '4257' and 'TURN' is coded as '1365'. What is the code for 'T' in the given code language?

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

Q95. This question is based on five, four-digit numbers given below.

(Left) 4138 2345 6367 5353 1276 (Right)

(Example: 6975 – First digit = 6, second digit = 9, third digit = 7 and fourth digit = 5)

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

What will be the resultant if the first digit of the largest number is multiplied to the second digit of the smallest number?

(a) 12
(b) 17
(c) 14
(d) 15

Q96. What will come in the place of the question mark (?) in the following equation, if '+' and '×' are interchanged, and '–' and '÷' are interchanged?

46 − 2 ÷ 10 + 3 × 24 = ?

(a) 12
(b) 17
(c) 22
(d) 28

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

288 233 183 138 98 ?

(a) 53
(b) 73
(c) 63
(d) 43

Q98. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All oranges are melons.

All grapes are oranges.

Conclusions:

(I) Some melons are oranges.

(II) All grapes are melons.

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

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(c) Only conclusion (II) follows.

(d) Only conclusion (I) follows.

Q99. 1 is subtracted from each even digit of the number 95423671. Find the product of the digits that are third from the left and third from the right in the new number formed.

(a) 10

(b) 8

(c) 0

(d) 15

Q100. 38 people are standing in a row facing North. Harman is 15th from the right end while Hinal is 13th from the left end. How many people are there between Harman and Hinal?

(a) 8

(b) 9

(c) 10

(d) 7

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Madhya Pradesh

The correct answer is Madhya Pradesh.

Key Points

• Madhya Pradesh launched India's first Public-Private Partnership (PPP) based green waste processing plant, a significant step towards sustainable waste management.

• Located in Indore, this plant was inaugurated to process wet and dry waste generated in the city efficiently.

• The plant operates on advanced waste segregation and recycling technologies to convert biodegradable waste into bio-CNG, a renewable energy source.

• The initiative is a key component of Indore's consistent efforts to remain India's cleanest city under the Swachh Survekshan rankings for several consecutive years.

• This innovative model integrates private sector participation in waste management, ensuring environmental sustainability and resource optimization.

Additional Information

• Chhattisgarh:

• Chhattisgarh has emerged as a model for decentralized waste management systems, especially in rural areas.

• The state has implemented solid waste management initiatives through women-run self-help groups, focusing on segregation, composting, and recycling.

• It has also established Garbage Clinic services in urban areas to improve cleanliness and waste collection efficiency.

• Kerala:

• Kerala is recognized for its community-driven waste management programs and plastic-free initiatives.
• The state promotes decentralized composting and encourages households to manage biodegradable waste at the source.
• Projects like Green Protocol aim to minimize waste generation during public events and celebrations.
• Telangana:
• Telangana has implemented significant waste management reforms, particularly in urban areas like Hyderabad.
• The Hyderabad Integrated Solid Waste Management (ISWM) project focuses on waste segregation, transportation, and treatment.
• The state also promotes the establishment of waste-to-energy plants to convert municipal waste into electricity.

Q2. Answer: (d) Nana Saheb

The correct answer is Nana Saheb.

Key Points

• Nana Saheb was a prominent leader during the Revolt of 1857 and played a crucial role in organizing the uprising against British rule.
• He was the adopted son of Peshwa Baji Rao II, the last Peshwa of the Maratha Empire.
• During the revolt, Nana Saheb proclaimed himself the Peshwa and led an armed resistance against the British forces.
• He expelled the British garrison from Kanpur, which became one of the centers of the rebellion.
• Nana Saheb's leadership and military strategies were pivotal in the initial success of the rebellion in Kanpur, although the British later regained control of the city.

Additional Information

• Kunwar Singh
• Kunwar Singh was one of the leading figures of the Revolt of 1857 and hailed from the state of Bihar.
• He was the Raja of Jagdishpur and led the uprising in Bihar against British forces.
• Despite being over 80 years old, Kunwar Singh displayed remarkable bravery and fought valiantly against the British.
• He is remembered for his guerrilla tactics and his ability to rally local forces against colonial rule.
• Mangal Pandey
• Mangal Pandey was an Indian soldier in the British East India Company's army who is often regarded as one of the first martyrs of the Revolt of 1857.
• He is best known for his attack on British officers at Barrackpore, which is considered to be one of the incidents that sparked the uprising.
• Mangal Pandey's actions were driven by anger over the introduction of cartridges rumored to be greased with cow and pig fat, which offended both Hindu and Muslim sentiments.
• He was executed by the British, but his bravery inspired widespread resistance across India.
• Tantia Tope
• Tantia Tope was another prominent leader of the Revolt of 1857 and a close ally of Nana Saheb.
• He is best known for his military expertise and his role in organizing armed resistance against the British forces.
• After the fall of Kanpur, Tantia Tope carried on the rebellion by joining forces with Rani Lakshmibai of Jhansi and other leaders.
• He used guerrilla warfare tactics to challenge British control but was eventually captured and executed in 1859.

Q3. Answer: (a) 2933 km

The correct answer is 2933 km.

Key Points

• The actual mainland distance of India from east to west is approximately 2933 kilometers.
• This distance is measured between the easternmost point, Arunachal Pradesh (Kibithu), and the westernmost point, Gujarat (Ghuar Mota).
• The geographical extent of India lies between 68°7' E longitude (west) to 97°25' E longitude (east).
• India's geographical spread from east to west plays a significant role in its diverse climate, culture, and agricultural patterns.
• This vast expanse contributes to India having multiple time zones geographically, but the country follows a single standard time (Indian Standard Time, IST).

Additional Information

• India's Geography and Strategic Significance
• India is the 7th largest country in the world, with a total area of approximately 3.28 million square kilometers.
• The country is bordered by the Arabian Sea on the west, the Bay of Bengal on the east, and the Indian Ocean to the south.
• The north-south extent of India (from Kashmir to Kanyakumari) is approximately 3214 kilometers.

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• India’s geographical diversity also includes the Himalayan mountain ranges in the north, the Thar Desert in the west, and the coastal plains in the east and west.

• The vast geographical diversity contributes to India’s rich cultural, linguistic, and biological diversity.

Q4. Answer: (a) 10 May

The correct answer is 10 May.

Key Points

• On May 10, 2025, India and Pakistan agreed to a US-brokered ceasefire with immediate effect.

• This agreement marked an important milestone in the efforts to ease tensions between the two nuclear-armed nations.

• The ceasefire aimed to end hostilities along the highly sensitive Line of Control (LoC) in Jammu and Kashmir.

• The US facilitated this agreement as part of its diplomatic efforts to maintain stability in the South Asian region.

• Ceasefires like these are crucial in mitigating border conflicts and ensuring peace in one of the world's most volatile regions.

Additional Information

• Ceasefire Agreement

• The Line of Control (LoC) between India and Pakistan has been a longstanding point of conflict, with frequent ceasefire violations.

• The US and other international actors have historically played a role in mediating peace efforts between the two nations.

• The 2025 ceasefire agreement was seen as a positive step toward reducing tensions in the region and improving bilateral relations.

• Such agreements are often fragile and require sustained efforts to ensure long-term peace and stability.

Q5. Answer: (d) OCR Scanner

The correct answer is OCR Scanner.

Key Points

• OCR Scanner is a specialized device used for Optical Character Recognition (OCR), which converts printed or handwritten text into machine-readable text.

• It works by scanning the text and using advanced algorithms to recognize characters and symbols, converting them into editable digital formats such as Word or PDF.

• OCR technology is widely used in document digitization, enabling the extraction of data from forms, invoices, or books for digital archiving or processing.

• It eliminates the need for manual data entry and is instrumental in applications such as automated data processing, text retrieval, and e-discovery.

• Modern OCR systems are capable of recognizing multiple languages and complex font styles with high accuracy.

Additional Information

• OMR Scanner

• OMR stands for Optical Mark Recognition, which is used to read marks made on pre-designed forms, such as multiple-choice answer sheets.

• Unlike OCR, OMR does not recognize text but detects the presence or absence of marks in specific areas.

• OMR scanners are commonly used in educational assessments, surveys, and voting systems.

• Flatbed Scanner

• A flatbed scanner is a general-purpose scanning device that captures high-resolution images of documents, photos, or other objects placed on its glass surface.

• It does not perform OCR by default but can be combined with OCR software to convert scanned images into text.

• Flatbed scanners are versatile and widely used in offices and homes for document digitization.

• Barcode Reader

• A barcode reader is a device used to scan and decode barcodes containing encoded information about products or items.

• It uses laser or imaging technology to read barcodes and convert the data into a usable format, typically for inventory management or point-of-sale systems.

• Barcode readers are not designed to recognize text or characters like OCR scanners.

Q6. Answer: (a) Article 243Q

The correct answer is Article 243Q.

Key Points

• Article 243Q of the Constitution of India deals with the constitution of Municipalities, providing a framework for urban local governance.

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• It mandates the formation of three types of municipalities in every state: Nagar Panchayat (for areas in transition from rural to urban), Municipal Council (for smaller urban areas), and Municipal Corporation (for larger urban areas).

• Municipalities are empowered to carry out functions related to urban development, including planning, infrastructure, sanitation, and public amenities.

• This Article forms part of the 74th Constitutional Amendment Act, 1992, which aimed to strengthen decentralized governance in urban areas.

• It ensures democratic representation in municipalities through elected representatives, promoting grassroots democracy and efficient urban administration.

Additional Information

• Article 243W:

• This Article specifies the powers, authority, and responsibilities of Municipalities.

• It empowers municipalities to prepare plans for economic development and social justice, along with the implementation of schemes related to 18 functional areas listed in the Twelfth Schedule.

• Key functions include urban planning, water supply, sanitation, public health, urban forestry, slum improvement, and poverty alleviation.

• Article 243Z:

• This Article focuses on the audit and accounts of municipalities.

• It ensures financial accountability by mandating regular audits of municipal accounts by the State Government or an authorized agency.

• The Article aims to enhance transparency and efficiency in the management of municipal resources.

• Article 243P:

• Article 243P provides definitions related to municipalities and urban governance.

• Key terms such as "district," "municipal area," and "population" are defined for clarity in the application of other provisions under Part IXA of the Constitution.

• This Article serves as the foundation for understanding the framework of municipal governance introduced by the 74th Amendment.

Q7. Answer: (a) 100 days

The correct answer is 100 days.

Key Points

• The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), enacted in 2005, provides a legal guarantee of 100 days of wage employment in a financial year to every rural household in India.

• Under the scheme, adult members of a rural household willing to do unskilled manual work can apply for employment.

• MGNREGA aims to enhance livelihood security in rural areas by providing employment opportunities and creating durable assets such as roads, irrigation facilities, and other infrastructure.

• It is implemented by the Ministry of Rural Development, and the wages are paid directly into the bank accounts of beneficiaries to ensure transparency.

• The scheme also promotes social inclusion by providing employment opportunities to marginalized sections, including women and Scheduled Castes/Scheduled Tribes.

Additional Information

• MGNREGA

• MGNREGA is one of the largest social security and public works programs globally, addressing poverty and unemployment in rural areas.

• The scheme empowers rural households, ensures gender parity, and improves the economic condition of marginalized communities.

• It also focuses on sustainable development by promoting water conservation, afforestation, and land development projects.

Q8. Answer: (a) First Amendment Act, 1951

The correct answer is First Amendment Act, 1951.

Key Points

• The Ninth Schedule was added to the Constitution of India through the First Constitutional Amendment Act of 1951.

• It was created to protect legislation related to land reforms and agrarian laws from being challenged in courts on the grounds of violation of fundamental rights.

• The main objective of the Ninth Schedule was to ensure social justice by implementing laws that aimed at equitable distribution of land.

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• The addition of the Ninth Schedule was done by inserting Article 31B, which provides immunity to laws listed under the schedule from judicial review.

• The First Amendment Act of 1951 was introduced by the then Prime Minister Jawaharlal Nehru and passed by Parliament to safeguard certain laws under the agenda of promoting social welfare.

• The Ninth Schedule originally contained 13 laws when it was enacted, and additional laws have been added over time.

Additional Information

• Seventeenth Amendment Act, 1964:

• This amendment further expanded the Ninth Schedule by including 44 additional laws related to land reforms.

• It also amended Article 31A of the Constitution to broaden the scope of agrarian reforms and ensure protection of such laws from judicial scrutiny.

• Twenty-ninth Amendment Act, 1972:

• This amendment included two Kerala Land Reform Acts in the Ninth Schedule.

• The aim was to ensure that these land reforms laws were implemented without legal challenges under fundamental rights.

• Fourth Amendment Act, 1955:

• This amendment dealt with property rights and aimed at limiting the right to compensation for property acquisition.

• It was not directly related to the addition of the Ninth Schedule but focused on addressing issues pertaining to property laws.

Important Points

• Ninth Schedule Overview:

• The Ninth Schedule is a unique provision under the Indian Constitution that protects certain laws from judicial review.

• Over time, debates have arisen about the scope of judicial review and the possibility of misuse of the Ninth Schedule.

• In the landmark judgment of I.R. Coelho vs. State of Tamil Nadu (2007), the Supreme Court ruled that laws placed under the Ninth Schedule after April 24, 1973, are open to judicial review if they violate the basic structure of the Constitution.

Q9. Answer: (c) Garden Reach Shipbuilders & Engineers

The correct answer is Garden Reach Shipbuilders & Engineers.

Key Points

• Garden Reach Shipbuilders & Engineers (GRSE), a Kolkata-based government-owned shipbuilding company, emerged as the lowest bidder for the Indian Navy's Next Generation Corvettes (NGC) project in May 2025.

• The NGC project is valued at over Rs. 25,000 crore and includes the construction of state-of-the-art corvettes equipped with advanced technology for coastal and deep-sea operations.

• GRSE has a proven track record of delivering high-quality naval vessels, including warships, patrol boats, and corvettes for the Indian Navy and Coast Guard.

• This bid highlights GRSE's capability to handle large-scale defense contracts and its contribution to India's goal of self-reliance in defense manufacturing under the "Make in India" initiative.

• The Next Generation Corvettes are expected to bolster the Indian Navy's operational capabilities and contribute to maritime security in the Indian Ocean Region.

Additional Information

• Hindustan Shipyard Limited

• Hindustan Shipyard Limited (HSL) is a government-owned shipyard located in Visakhapatnam, Andhra Pradesh.

• Established in 1941, HSL primarily focuses on shipbuilding, ship repairs, and submarine construction.

• While it plays a crucial role in India's defense sector, HSL did not emerge as the lowest bidder for the NGC project.

• Cochin Shipyard Limited

• Cochin Shipyard Limited (CSL), located in Kochi, Kerala, is one of the largest shipbuilding and maintenance facilities in India.

• It is renowned for constructing high-quality commercial and defense vessels, including India's first indigenous aircraft carrier, INS Vikrant.

• Despite its significant contributions to the defense sector, CSL was not the lowest bidder for this specific project.

• Mazagon Dock Shipbuilders Limited

• Mazagon Dock Shipbuilders Limited (MDL) is a leading defense public sector undertaking headquartered in Mumbai.

• It specializes in building warships, submarines, and other naval vessels for the Indian Navy.

• MDL is involved in several prestigious defense projects but was not selected as the lowest bidder for the NGC project.

Q10. Answer: (d) It allows the flow of heat between systems.

The correct answer is It allows the flow of heat between systems..

Key Points

• A diathermic wall is a type of boundary in thermodynamics that permits the transfer of heat between two systems or between a system and its surroundings.

• It does not allow the exchange of matter between systems, ensuring that the systems remain physically separate.

• Diathermic walls are typically used in thermodynamic experiments to study heat transfer while isolating other forms of energy transfer, such as work.

• Heat transfer occurs because of the temperature difference between systems separated by a diathermic wall.

• The concept of diathermic walls is crucial in understanding thermal equilibrium, as heat flows until both systems reach the same temperature.

Additional Information

• Main Theme: Thermodynamic Walls

• Thermodynamic walls are boundaries that separate systems and influence the type of interaction between them.

• They can be classified into different types, including adiabatic walls (prevent heat transfer), diathermic walls (allow heat transfer), and rigid walls (prevent work transfer).

• The study of these walls helps in understanding the exchange of energy in various thermodynamic processes.

Q11. Answer: (a) Be an elector (voter) in any State assembly constituency

The correct answer is Be an elector (voter) in any State assembly constituency.

Key Points

• To be eligible for membership in a State Legislature, a candidate must satisfy specific qualifications as per the Representation of the People Act, 1951.

• One of the fundamental eligibility criteria is that the candidate must be an elector (voter) in any State assembly constituency.

• This implies that the candidate must be registered as a voter in any constituency within the State where they are contesting elections.

• Additionally, the candidate must meet the minimum age requirement: 25 years for the Legislative Assembly and 30 years for the Legislative Council (if applicable).

• These qualifications ensure that the candidate is an active participant in the democratic process and represents the electorate effectively.

Additional Information

• Representation of the People Act, 1951

• This Act provides the framework for the conduct of elections in India, including qualifications and disqualifications for membership of the Parliament and State Legislatures.

• It also lays down the procedures for the conduct of elections, resolution of disputes, and other related matters.

Q12. Answer: (a) Nitanshi Goel

The correct answer is Nitanshi Goel.

Key Points

• Nitanshi Goel received the Best Actress award at the prestigious 25th IIFA Awards in 2025, recognizing her outstanding performance in a leading role.

• Her performance in the film was widely acclaimed for its depth, emotional resonance, and nuanced portrayal of her character.

• The IIFA (International Indian Film Academy) Awards celebrate excellence in Indian cinema and are regarded as one of the most prestigious platforms for honoring talent in the film industry.

• Nitanshi Goel's achievement marks a significant milestone in her career, showcasing her as one of the most promising talents in the industry.

• The recognition at IIFA underscores her versatility and dedication to her craft, earning her respect and admiration from both audiences and critics.

Additional Information

• Neha Dixit

• Neha Dixit is a prominent journalist known for her investigative reporting on social and political issues in India.

• She has received accolades for her work in highlighting human rights violations and raising awareness about marginalized communities.

• Manisha Kulsherstha

• Manisha Kulsherstha is a celebrated Hindi author and poet, recognized for her contributions to contemporary Hindi literature.

• Her works often explore themes of identity, culture, and the human experience.

• Subhashree Ganguly

• Subhashree Ganguly is a popular actress in the Bengali film industry, known for her performances in both commercial and

critically acclaimed films.

• She has won several awards for her acting and is a prominent figure in regional cinema.

• The IIFA Awards

• Established in 2000, the IIFA Awards are a globally recognized event celebrating the excellence of Indian cinema.

• The awards function is held annually at international locations to promote Indian films on a global platform.

• Categories include acting, directing, music, and technical achievements, among others.

Q13. Answer: (d) National Airports Authority

The correct answer is National Airports Authority.

Key Points

• The National Airports Authority (NAA) was established in June 1986 under the National Airports Authority Act, 1985.

• The NAA was responsible for the management of civil aerodromes and civil enclaves across India.

• It was also tasked with the maintenance and operation of aeronautical communication systems at all airports in the country.

• Later, the National Airports Authority merged with the International Airports Authority of India in 1995 to form the Airports Authority of India (AAI).

• This merger aimed to improve efficiency in airport management and streamline operations across all civil aviation facilities in India.

Additional Information

• Delhi International Airport Limited (DIAL):

• DIAL is a joint venture consortium established to manage and operate the Indira Gandhi International Airport in Delhi.

• It is a Public-Private Partnership (PPP) between the Airports Authority of India, GMR Group, and other stakeholders.

• DIAL focuses on modernization and efficient management of Delhi Airport but is not responsible for other civil aerodromes in India.

• Airports Authority of India (AAI):

• AAI was formed in 1995 after the merger of the National Airports Authority (NAA) and the International Airports Authority of India (IAAI).

• It is responsible for managing and operating airports, providing air navigation services, and ensuring the development and modernization of civil aviation infrastructure in India.

• AAI oversees more than 100 airports in India, including both domestic and international airports.

• Airports Council International (ACI):

• ACI is a global organization representing the world’s airports.

• It provides a platform for airport operators to exchange best practices, promote airport excellence, and advocate for policies benefiting the aviation industry.

• However, ACI is not directly involved in managing or operating airports.

Q14. Answer: (a) Akbar

The correct answer is Akbar.

Key Points

• Abu'l Fazl was a prominent court historian and one of the Navaratnas (Nine Gems) in Emperor Akbar's court.

• He authored the famous historical text "Akbarnama", which chronicles the life and reign of Akbar in three volumes.

• The third volume of Akbarnama is known as "Ain-i-Akbari", a detailed account of Akbar's administration, culture, and governance.

• Abu'l Fazl played a significant role in shaping Akbar's policies, including his religious policy of Sulh-i-Kul, which promoted tolerance and harmony among various religions.

• He was also a close advisor to Akbar and helped in the formulation of Din-i-Ilahi, Akbar's syncretic religious philosophy.

Additional Information

• Babar

• Babur, the founder of the Mughal Empire in India, reigned from 1526 to 1530.

• He was a descendant of Timur and Genghis Khan and authored "Baburnama," his autobiography written in Chagatai Turkish.

• Babar is known for his victory in the Battle of Panipat (1526), which marked the beginning of Mughal rule in India.

• Alauddin Khilji

• Alauddin Khilji was the second ruler of the Khilji dynasty and reigned from 1296 to 1316.

• He is known for his military conquests, administrative reforms, and market control measures.

• He successfully repelled the Mongol invasions and expanded his empire significantly.

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• Aurangzeb

• Aurangzeb, the sixth Mughal emperor, reigned from 1658 to 1707.

• He is known for his expansionist policies and strict adherence to Islamic principles.

• Aurangzeb imposed the Jizya tax on non-Muslims and is often criticized for his religious intolerance.

Q15. Answer: (c) North India

The correct answer is North India.

Key Points

• Kathak is one of the eight classical dance forms of India and has its origins in North India.

• The term "Kathak" is derived from the Sanskrit word "Katha," which means storytelling. Kathak dancers narrate stories through facial expressions, hand gestures, and rhythmic footwork.

• This dance form was historically performed by Kathakars (storytellers) in temple courtyards and later flourished in the royal courts of North India during the Mughal era.

• Kathak is characterized by intricate footwork, spins, and graceful movements, along with the use of ghungroos (ankle bells) to enhance the rhythmic quality.

• It is deeply influenced by both Hindu and Mughal traditions, blending devotional themes with Persian and Islamic elements like the tukras and parans in its repertoire.

Additional Information

• Western India:

• Western India is known for folk dance forms like Garba and Dandiya Raas from Gujarat, and Lavani from Maharashtra.

• Garba is a devotional dance performed in honor of Goddess Durga, characterized by circular formations and vibrant traditional attire.

• Lavani is a popular dance and music tradition that combines strong beats and storytelling, often performed in Marathi theater.

• South India:

• South India is the birthplace of classical dance forms like Bharatanatyam (Tamil Nadu), Kuchipudi (Andhra Pradesh), Mohiniyattam (Kerala), and Odissi (though Odissi primarily belongs to Eastern India).

• Bharatanatyam emphasizes intricate postures, expressions, and footwork and is one of the oldest dance traditions in India.

• Kuchipudi is known for its dramatic storytelling with dialogues and dance, while Mohiniyattam is recognized for its graceful movements and feminine charm.

• Eastern India:

• Eastern India is primarily associated with Odissi, a classical dance form from Odisha, which is known for its lyrical grace and sculptural poses.

• Folk dances like Chhau (from Odisha, West Bengal, and Jharkhand) also originate from Eastern India, characterized by martial art techniques and masks.

• Odissi is deeply rooted in temple traditions, with themes often revolving around the love stories of Lord Krishna and Radha.

Q16. Answer: (a) Greenhouse effect

The correct answer is Greenhouse Effect.

Key Points

• The greenhouse effect is the process by which certain gases in Earth’s atmosphere trap heat, preventing it from escaping into space and leading to a rise in Earth's average temperature.

• These greenhouse gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor, and fluorinated gases, which act like a blanket surrounding the planet.

• Human activities, such as burning fossil fuels, deforestation, and industrial processes, have significantly increased the concentration of these gases, exacerbating the greenhouse effect.

• The greenhouse effect is a natural phenomenon that is essential for maintaining the Earth’s temperature within a range suitable for life, but its intensification due to human activities is a major driver of global warming.

• This process is closely linked to climate change, which encompasses long-term changes in global or regional climate patterns caused by natural and anthropogenic factors.

Additional Information

• Ocean Acidification:

• Ocean acidification refers to the decrease in pH levels of the Earth’s oceans due to the absorption of excess carbon dioxide (CO_2) from the atmosphere.

• It poses a major threat to marine ecosystems, particularly organisms that rely on calcium carbonate for their shells and skeletons, such as corals and shellfish.

• Ocean acidification is a direct consequence of increased greenhouse gas emissions but is distinct from the greenhouse effect.

• Ozone Depletion:

• Ozone depletion refers to the thinning of the ozone layer in the Earth's stratosphere, primarily caused by the release of chlorofluorocarbons (CFCs) and other ozone-depleting substances.

• The ozone layer protects life on Earth by absorbing harmful ultraviolet (UV) radiation from the sun.

• Unlike the greenhouse effect, ozone depletion does not directly contribute to global warming but has its own environmental consequences, such as increased UV radiation exposure.

• Climate Change:

• Climate change refers to significant changes in global or regional climate patterns over time, caused by natural factors, human activities, or both.

• The greenhouse effect plays a major role in driving climate change by contributing to global warming.

• Other manifestations of climate change include rising sea levels, melting glaciers, extreme weather events, and shifts in ecosystems.

Q17. Answer: (c) Union Budget 2017-18

The correct answer is Union Budget 2017-18.

Key Points

• Mission Antyodaya, a convergence and accountability framework aimed at optimal resource management, was officially adopted in the Union Budget 2017-18.

• The initiative focuses on uplifting the poorest households through targeted interventions in villages across India.

• Key objectives include reducing poverty, improving livelihood opportunities, and ensuring sustainable development through efficient convergence of schemes.

• It integrates various governmental schemes and programs to ensure better service delivery and promote grassroots-level accountability.

• The mission emphasizes creating measurable outcomes and tracking progress using data-driven approaches and surveys.

Additional Information

• Union Budget 2018-19

• This budget introduced the Ayushman Bharat Scheme, aimed at providing health insurance coverage of up to Rs. 5 lakh per family per year.

• Another major initiative was the Operation Green, focusing on enhancing the income of farmers through better price realization for crops like tomato, onion, and potato.

• It also emphasized the development of infrastructure through the Affordable Housing Fund under the National Housing Bank.

• Union Budget 2016-17

• This budget focused on the rural sector, agriculture, and poverty alleviation, introducing schemes like Krishi Kalyan Cess.

• It aimed to double farmers' incomes by 2022 through investments in irrigation, crop insurance, and rural development.

• The budget also highlighted the need for financial reforms and launched initiatives like Digital Literacy Mission.

• Union Budget 2015-16

• The budget introduced the Atal Pension Yojana, a pension scheme aimed at providing old-age income security to unorganized workers.

• It focused on financial inclusion and social security by launching schemes like Pradhan Mantri Suraksha Bima Yojana and Pradhan Mantri Jeevan Jyoti Bima Yojana.

• Infrastructure development was emphasized with the allocation of funds for roads, railways, and energy projects.

Q18. Answer: (d) International Labour Organization

The correct answer is International Labour Organization.

Key Points

• The International Labour Organization (ILO) is responsible for publishing the World Social Protection Report (WSPR) 2024-2025.

• This report provides a comprehensive analysis of the state of social protection systems worldwide, examining their coverage, benefits, and financing.

• The aim of the report is to highlight gaps in social protection and present actionable recommendations for improving access and equity in social security systems globally.

• The ILO is a specialized agency of the United Nations that focuses on promoting decent work, setting international labor standards, and advocating for social justice.

• The organization was established in 1919 and is headquartered in Geneva, Switzerland.

Additional Information

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• United Nations Security Council (UNSC)

• The UNSC is one of the six principal organs of the United Nations, primarily responsible for maintaining international peace and security.

• It has 15 members, including 5 permanent members (China, France, Russia, the United Kingdom, and the United States) and 10 non-permanent members elected for two-year terms.

• The UNSC adopts binding resolutions and can authorize military action, impose sanctions, or establish peacekeeping operations.

• It does not publish reports related to social protection systems.

• World Health Organization (WHO)

• The WHO is a specialized agency of the United Nations responsible for international public health.

• It was established in 1948 and is headquartered in Geneva, Switzerland.

• The WHO publishes reports such as the World Health Report and the Global Health Observatory, focusing on health systems, disease prevention, and health equity.

• It does not release reports specifically on social protection systems.

• International Monetary Fund (IMF)

• The IMF is an international financial institution established in 1944 to promote global monetary cooperation, financial stability, and economic growth.

• It provides financial support and policy advice to member countries to address economic challenges.

• The IMF publishes reports such as the World Economic Outlook and Global Financial Stability Report, which focus on macroeconomic issues.

• It does not focus on social protection systems or publish reports like the WSPR.

Q19. Answer: (a) Himachal Pradesh

The correct answer is Himachal Pradesh.

Key Points

• Lahaulas and Pangwalas are indigenous tribal groups primarily found in the Lahaul and Pangi valleys of Himachal Pradesh.

• These tribes are known for their distinct cultural practices, traditional clothing, and unique dialects, which are part of the region's rich heritage.

• The Lahaul valley is located in the northern region of Himachal Pradesh, while the Pangi valley lies in the district of Chamba.

• The tribal population in these regions engages in agriculture, animal husbandry, and handloom weaving, contributing to their local economy.

• Himachal Pradesh has a significant tribal population, with communities such as Gaddis, Gujjars, Kinnauris, and Lahaulas being recognized under the Scheduled Tribes category.

Additional Information

• Option 2: Goa

• Goa is a coastal state in western India, known for its beaches, Portuguese heritage, and vibrant tourism industry.

• The major tribes found in Goa include Kunbis, Velips, and Gawdas, who have distinct cultural practices and contribute to the state's cultural diversity.

• Unlike Himachal Pradesh, Goa does not host Lahaulas or Pangwalas as these tribes are specific to the Himalayan region.

• Option 3: Jharkhand

• Jharkhand is a mineral-rich state in eastern India, with a substantial tribal population.

• Major tribes in Jharkhand include Santhals, Oraons, Mundas, and Hos, who have played a significant role in the cultural and historical development of the state.

• Though Jharkhand is home to many indigenous communities, it does not feature tribes such as Lahaulas and Pangwalas, as these are exclusive to Himachal Pradesh.

• Option 4: Assam

• Assam is a northeastern state of India, renowned for its tea plantations, biodiversity, and cultural heritage.

• The state is home to several tribes such as Bodos, Karbis, Mishings, and Rabhas, who have distinct traditions and languages.

• Assam's tribal population is primarily concentrated in the Brahmaputra valley and other parts of the northeast. However, it does not include the Lahaulas or Pangwalas, who are native to Himachal Pradesh.

Q20. Answer: (b) Act of 1872

The correct answer is Act of 1872.

Key Points

• The Act of 1872, also known as the Special Marriage Act of 1872, was enacted during British India to allow civil marriages

between individuals of different castes and religions.

• It provided a framework for inter-caste and inter-religious marriages without the need for conversion or adherence to personal religious laws.

• The Act required individuals to renounce their religious practices temporarily and marry under a secular framework.

• This was a significant step towards promoting social reform and addressing caste and religious barriers in Indian society.

• The Act served as the precursor to the Special Marriage Act of 1954, which governs civil marriages in independent India.

Additional Information

• Widow Remarriage Act (1856):

• This Act was introduced by Lord Dalhousie and passed by Lord Canning in 1856.

• It legalized the remarriage of Hindu widows and aimed to improve the social condition of women in India.

• The Act was a progressive step influenced by reformers such as Ishwar Chandra Vidyasagar.

• Sarda Act (1929):

• Also known as the Child Marriage Restraint Act, it was passed in 1929 to curb the practice of child marriage in India.

• The Act set the minimum age of marriage for girls at 14 years and for boys at 18 years, later revised to 18 and 21 years, respectively.

• It was spearheaded by Harbilas Sarda, a social reformer and judge.

• Act of Settlement (1781):

• This Act was passed by the British Parliament to settle disputes regarding the jurisdiction of courts in British India.

• It clarified the roles and functions of the Supreme Court of Calcutta and the East India Company's judicial system.

• It did not pertain to social or marital reforms but rather focused on legal and administrative matters.

Q21. Answer: (d) Agnikul Cosmos

The correct answer is Agnikul Cosmos.

Key Points

• Agnikul Cosmos, an Indian space startup, successfully tested the country's first electric motor-driven semicryogenic rocket engine in May 2025.

• The company's semicryogenic engine technology is considered groundbreaking as it utilizes electric motors for precise control and efficient performance.

• Founded in 2017, Agnikul Cosmos specializes in developing affordable and customizable satellite launch vehicles for small payloads.

• The semicryogenic rocket engine technology is designed to enhance reliability and reduce costs, making space exploration more accessible.

• Agnikul Cosmos operates from its headquarters in Chennai, Tamil Nadu, and has collaborated with ISRO and other agencies for technological advancements in the aerospace sector.

Additional Information

• Skyroot Aerospace:

• Skyroot Aerospace is another prominent Indian space startup that focuses on developing cost-effective satellite launch vehicles.

• It successfully launched India's first privately developed rocket, Vikram-S, in November 2022.

• Skyroot's launch vehicles are named Vikram, in honor of Dr. Vikram Sarabhai, the father of the Indian space program.

• Skyroot aims to revolutionize access to space by providing reliable and affordable solutions for satellite launches.

• Bellatrix Aerospace:

• Bellatrix Aerospace is a Bengaluru-based startup specializing in propulsion systems for spacecraft.

• The company is known for developing advanced green propulsion systems that are eco-friendly and efficient.

• Bellatrix aims to reduce the cost of accessing space while introducing innovative technologies for satellite and spacecraft propulsion.

• It is collaborating with ISRO and other agencies to commercialize its propulsion systems for global markets.

• Pixxel:

• Pixxel is an Indian startup focused on building a constellation of earth-imaging satellites to provide high-resolution data for various industries.

• Its mission is to monitor global environmental changes and offer actionable insights for agriculture, disaster management, and climate studies.

• Pixxel successfully launched its hyperspectral imaging satellite, Shakuntala, in April 2022.

• The startup's cutting-edge imaging technology is designed to enhance data accuracy for sustainable development worldwide.

• Semicryogenic Rocket Engines:

• Semicryogenic engines use a combination of cryogenic and non-cryogenic propellants, such as liquid oxygen and refined kerosene, to achieve high efficiency.

• These engines are designed to provide enhanced thrust, reliability, and cost-effectiveness compared to traditional engines.

• The integration of electric motor-driven technology further improves precision and reduces operational complexities.

• Semicryogenic engines are widely used in modern aerospace systems for launching satellites and interplanetary missions.

Q22. Answer: (c) France

The correct answer is France.

Key Points

• India signed a $7.4 billion agreement with France in April 2025 to procure 26 Rafale Marine fighter jets.

• The deal is aimed at strengthening the Indian Navy's combat capabilities, particularly on its aircraft carriers, such as INS Vikrant.

• The Rafale Marine jets, manufactured by Dassault Aviation, are specifically designed for naval operations, including carrier-based takeoffs and landings.

• This deal follows India's earlier purchase of 36 Rafale fighter jets for the Indian Air Force, further solidifying defense ties between India and France.

• The agreement also includes advanced weaponry, maintenance packages, and technology transfer provisions to boost indigenous defense manufacturing in India.

Additional Information

• Russia

• Russia is a key defense partner of India and has supplied various military platforms such as the S-400 air defense system, Sukhoi fighter jets, and submarines.

• However, the Rafale fighter jet is manufactured by Dassault Aviation in France, not Russia.

• United States

• The United States has also been a significant defense partner of India, offering platforms like the Apache and Chinook helicopters, as well as P-8I maritime patrol aircraft.

• While the U.S. has offered fighter jets like the F-21 and F/A-18 Super Hornet for Indian defense requirements, the Rafale is exclusively produced by France.

• Israel

• Israel is known for its advanced defense systems like the Iron Dome and Barak missile systems, as well as UAVs (Unmanned Aerial Vehicles).

• Although India collaborates extensively with Israel on defense technology, the Rafale deal does not involve Israel.

• About the Rafale Fighter Jet

• The Rafale is a 4.5-generation multirole fighter jet, capable of air superiority, ground support, and nuclear strike missions.

• It features advanced avionics, AESA radar, and the capability to carry a wide range of weapons, including the Meteor air-to-air missile and SCALP cruise missile.

• The Rafale Marine variant is specifically designed for naval operations and is compatible with aircraft carrier operations.

Q23. Answer: (d) Increased production of cash crops

The correct answer is Increased production of cash crops.

Key Points

• Commercialisation of agriculture under British rule in India meant that agricultural practices were increasingly oriented towards market production rather than subsistence farming.

• This change was primarily driven by the colonial government's demand for raw materials, such as cotton, indigo, and jute, to fuel the Industrial Revolution in Britain.

• The focus shifted from growing food crops to cultivating cash crops, which were meant for export to Britain.

• Crops such as cotton, indigo, opium, tea, and jute became prominent, often replacing traditional food crops, leading to a decline in the food grain supply for local consumption.

• The increased production of cash crops disrupted traditional agrarian economies, leading to the dependency of Indian farmers on fluctuating global markets and exploitative colonial policies.

Additional Information

• Elimination of rural debt:

• The commercialisation of agriculture under British rule did not lead to the elimination of rural debt. On the contrary, it often increased rural indebtedness.

• The growing dependence on moneylenders for credit to purchase seeds and pay taxes led many farmers into a cycle of debt.

• High taxation policies and fluctuating prices of cash crops further exacerbated this issue, leaving farmers vulnerable to

exploitation.

• Growth of self-sufficient villages:

• Contrary to the suggestion, the commercialisation of agriculture eroded the self-sufficiency of Indian villages.

• Traditional practices, which focused on producing food grains for local consumption, were replaced by cash crop cultivation for export.

• This disrupted local agrarian economies and made villages dependent on external markets for their sustenance.

• Rise in food grain production:

• The commercialisation of agriculture did not lead to an increase in food grain production; in fact, it caused a decline in food production.

• Due to the prioritisation of cash crops like indigo, cotton, and tea, less land was available for cultivating essential food grains.

• This shift contributed to food shortages and famines in various parts of the country during British rule.

Q24. Answer: (c) Acetic acid

The correct answer is Acetic acid.

Key Points

• Industrially, acetic acid is primarily produced by the carbonylation of methanol, which involves the reaction of methanol with carbon monoxide in the presence of a catalyst.

• The process is widely known as the Monsanto process or the Cativa process, utilizing rhodium or iridium-based catalysts for high efficiency.

• This method is preferred due to its high yield and cost-effectiveness compared to other production methods.

• Acetic acid is a key ingredient in the production of synthetic fibers, plastics, and other chemical compounds, such as vinyl acetate and acetic anhydride.

• Globally, acetic acid is extensively used in industries ranging from food to pharmaceuticals and is a vital commodity chemical.

Additional Information

• Nitric acid

• Nitric acid is a highly corrosive mineral acid primarily used in the production of fertilizers, explosives, and nitration reactions.

• It is industrially produced by the Ostwald process, which involves the catalytic oxidation of ammonia.

• Nitric acid is not synthesized by the carbonylation of methanol.

• Citric acid

• Citric acid is an organic acid naturally found in citrus fruits and is widely used as a food additive and preservative.

• It is produced industrially via the fermentation of carbohydrates, such as molasses or glucose, using Aspergillus niger fungus.

• It is unrelated to the carbonylation of methanol process.

• Hydrochloric acid

• Hydrochloric acid is a strong acid formed by dissolving hydrogen chloride gas in water.

• It is primarily used in metal cleaning, pH regulation, and chemical synthesis.

• Hydrochloric acid is not produced through the carbonylation of methanol.

Q25. Answer: (a) Displays currently running applications and allows switching between them

The correct answer is Displays currently running applications and allows switching between them.

Key Points

• The Taskbar is a core component of the Windows operating system interface, located typically at the bottom of the screen.

• Its primary function is to display currently running applications, making it easy to switch between them seamlessly.

• The Taskbar includes essential elements such as the Start menu, pinned applications, and the system tray (notification area).

• Users can pin frequently used applications to the Taskbar for quick access, enhancing productivity.

• It also provides access to open windows and minimizes or restores them as needed, acting as a centralized control interface for multitasking.

Additional Information

• Option 2: Stores deleted files temporarily

• This function is performed by the Recycle Bin in Windows, not the Taskbar.

• The Recycle Bin temporarily stores deleted files and folders, allowing users to restore them if needed.

• Files in the Recycle Bin occupy disk space until permanently deleted or until the bin is emptied.

• Option 3: Opens the file manager window

• The File Explorer in Windows is responsible for managing files and folders.

• While users can open File Explorer from the Taskbar if pinned, the Taskbar itself is not dedicated to file management.
• File Explorer helps users navigate through drives, create folders, and manage files within the operating system.
• Option 4: Shuts down the computer immediately
• This action is performed through the Start menu or power button options in Windows, not directly by the Taskbar.
• The Taskbar may provide quick access to the Start menu, where options to shut down, restart, or sleep the system are available.

Q26. Answer: (d) Land tax

The correct answer is Land tax.

Key Points

• Land tax was the primary source of revenue for the Pallava empire, which was essential for funding their army and administrative expenditures.
• The Pallavas implemented a well-organized taxation system, with land revenue collected from agricultural lands being a major component.
• The tax system was based on the productivity of the land, and the revenue collected was used to maintain governance, temples, and infrastructure.
• Landowners were obligated to pay taxes to the state, and this revenue was utilized for military expenses and administrative costs.
• In addition to land tax, the Pallavas also collected taxes from trade and commerce, but land tax remained the dominant source of income.

Additional Information

• Trade tax:
• Trade tax was collected on goods traded within and outside the empire. However, it was not the primary source of revenue for the Pallava empire.
• Trade flourished under the Pallavas, particularly in ports like Mamallapuram, which facilitated maritime trade with Southeast Asia.
• While trade tax contributed to the empire's economy, it was secondary compared to land tax.
• Toll tax:
• Toll tax was levied on travelers and merchants for using roads and transport routes.
• It was a minor source of revenue compared to land tax and was mainly used for maintaining infrastructure such as roads and bridges.
• The Pallavas invested in trade routes, but toll tax did not play a significant role in sustaining the empire's major expenses.
• Salt tax:
• Salt tax was imposed on the production and trade of salt, but it was not a major source of revenue for the Pallava empire.
• Salt production was localized and contributed to the economy, but its revenue impact was limited compared to land tax.
• The Pallava Empire:
• The Pallava empire ruled parts of South India between the 3rd and 9th centuries CE, with Kanchipuram as its capital.
• The empire is renowned for its contributions to art, architecture, and literature, including the rock-cut temples of Mamallapuram.
• Revenue from land tax was crucial for sustaining the empire's administrative structure and military strength.

Q27. Answer: (d) Article 11

The correct answer is Article 11.

Key Points

• Article 11 of the Indian Constitution empowers the Parliament to regulate the acquisition and termination of Indian citizenship through legislation.
• This article provides the Parliament with the authority to make laws concerning all aspects of citizenship, including the procedures for acquiring, renouncing, or terminating it.
• The Citizenship Act of 1955, enacted under Article 11, governs the provisions related to Indian citizenship and details various modes of acquiring and losing citizenship.
• Article 11 ensures that matters related to citizenship are flexible and can be amended or updated by Parliament as required without requiring a constitutional amendment.
• The inclusion of Article 11 highlights the foresight of the Constitution's drafters to allow adaptability in citizenship laws to suit India's evolving socio-political environment.

Additional Information

• Article 12
• Article 12 defines the term "State" for the purpose of Part III (Fundamental Rights) of the Indian Constitution.

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• The term "State" includes the Government and Parliament of India, the Government and Legislature of each State, and all local or other authorities within the territory of India or under the control of the Indian Government.

• It is not directly related to citizenship but forms the basis for determining which entities are bound by the Fundamental Rights provisions.

• Article 10

• Article 10 deals with the continuation of rights of citizenship for individuals who are already citizens of India at the commencement of the Constitution.

• It ensures that such individuals shall continue to be citizens of India unless they voluntarily renounce their citizenship or it is terminated under the provisions of any law made by Parliament.

• This article emphasizes the protection of the citizenship status of individuals post-independence and Constitution enactment.

• Article 7

• Article 7 addresses the rights of certain individuals who had migrated to Pakistan after March 1, 1947, but later returned to India on resettlement permits.

• It allows these individuals to be treated as citizens of India, subject to the provisions of any law made by Parliament.

• This article was included to address the unique challenges of partition and migration during India's independence.

• Main Theme

• The Constitution of India originally provided citizenship provisions under Articles 5 to 11, but it left the detailed laws regarding citizenship to be legislated by Parliament.

• To implement these provisions, the Citizenship Act of 1955 was enacted, which has been amended several times to address changing needs related to citizenship, such as the Citizenship Amendment Act, 2019.

Q28. Answer: (a) Beijing, China

The correct answer is Beijing, China.

Key Points

• The 29th World Gas Conference (WGC) was held in Beijing, China, marking the first time the event was hosted in China since its inception nearly 100 years ago.

• The WGC is often referred to as the "Olympics" of the global gas industry and serves as the most significant and prestigious global gas event.

• The conference brought together key stakeholders, policymakers, industry leaders, and experts from across the globe to discuss the future of the natural gas sector and its role in the energy transition.

• The WGC 2025 focused on critical themes such as energy sustainability, decarbonization, energy security, and the role of natural gas in achieving global energy goals.

• By hosting the WGC, China showcased its growing influence in the energy sector and its efforts to transition toward a more sustainable and clean energy future.

Additional Information

• Dubai, UAE

• Dubai has emerged as a significant hub for global energy conferences, particularly in the oil and gas sector, due to its strategic location and advanced infrastructure.

• The UAE is a major player in the global energy industry, with a focus on both traditional fossil fuels and renewable energy sources.

• While Dubai has hosted several energy-related events, it did not host the 29th World Gas Conference in 2025.

• Tokyo, Japan

• Japan is a leading consumer of natural gas, particularly liquefied natural gas (LNG), and has been a key player in the global energy market.

• Tokyo has hosted several international energy conferences, but it was not the host city for the 29th World Gas Conference in 2025.

• Japan remains committed to energy efficiency and renewable energy initiatives while balancing its reliance on LNG imports.

• Paris, France

• Paris is known as a major venue for international events, including climate-related conferences such as the landmark Paris Agreement in 2015.

• France is a global leader in nuclear energy and has been increasing its focus on clean energy and sustainability.

• Although Paris has hosted several energy-related events, it was not the location for the 29th World Gas Conference in 2025.

• The World Gas Conference (WGC)

• The WGC is held every three years and is organized by the International Gas Union (IGU).

• It serves as a platform for global leaders in the energy sector to discuss advancements, challenges, and innovations in the

natural gas industry.

• The event features exhibitions, technical sessions, and networking opportunities for industry professionals.

• The conference emphasizes the role of natural gas as a transition fuel in the shift toward a low-carbon energy future.

Q29. Answer: (d) India will begin building its first indigenously made Polar Vessel.

The correct answer is India will begin building its first indigenously made Polar Vessel..

Key Points

• The MoU signed between GRSE (Garden Reach Shipbuilders & Engineers Limited) and Norway's Kongsberg at Nor-Shipping 2025 signifies a collaboration aimed at leveraging Norway's maritime expertise to build India's first indigenously developed Polar Research Vessel.

• This development is a major milestone for India in advancing indigenous capabilities for polar research and operations, aligning with the "Make in India" initiative.

• Polar Vessels are crucial for conducting research in extreme environments, including the Arctic and Antarctic regions, where India has ongoing scientific exploration programs.

• The vessel will be equipped with advanced technology provided by Kongsberg, including navigation systems, scientific equipment, and sustainable fuel systems.

• This initiative supports India's commitment to climate change studies and sustainable development in polar regions, contributing to global efforts in environmental conservation.

Additional Information

• Polar Research Vessels and their Importance

• Polar Research Vessels are specialized ships designed to operate in the icy waters of the Arctic and Antarctic regions.

• They are equipped with advanced tools to conduct scientific research, including climate studies, oceanography, and biodiversity assessments.

• India’s initiative to build an indigenous Polar Vessel aligns with its goals to enhance scientific exploration and contribute significantly to global climate change studies.

Q30. Answer: (a) Dr. Mayank Sharma

The correct answer is Dr. Mayank Sharma.

Key Points

• Dr. Mayank Sharma took charge as the Controller General of Defence Accounts (CGDA) on 1 March 2025.

• He succeeded the outgoing CGDA and assumed the role, becoming the top authority in the Defence Accounts Department (DAD), a key financial management body of the Ministry of Defence, Government of India.

• The CGDA is responsible for providing financial advice, budgetary control, and payment services to the armed forces, defence establishments, and other related organizations.

• Dr. Mayank Sharma has an extensive career in financial management and has made significant contributions to the modernization and efficiency of defence financial systems in India.

• Under his leadership, the Defence Accounts Department is expected to further enhance transparency, accountability, and efficiency in defence financial operations.

Additional Information

• Ajay Kumar

• Ajay Kumar is a senior Indian Administrative Service (IAS) officer who has served as the Defence Secretary of India.

• He played a key role in the implementation of several defence reforms, including the establishment of the Chief of Defence Staff (CDS) post.

• He has also contributed to India’s defence modernization and indigenization efforts.

• Shailendra Nath Gupta

• Shailendra Nath Gupta is a reputed bureaucrat who has held key positions in various government departments.

• Although not the CGDA, he has contributed significantly to public administration and governance in India.

• Alok Joshi

• Alok Joshi is a former chief of India’s external intelligence agency, Research and Analysis Wing (R&AW).

• He has a distinguished career in Indian intelligence and has worked extensively in areas of national security and strategic affairs.

• His role and contributions are distinct from the responsibilities of the CGDA.

• Controller General of Defence Accounts (CGDA)

• The CGDA is the principal accounting advisor to the Ministry of Defence and is responsible for handling the accounts of the armed forces and other defence-related organizations.

• The CGDA also oversees the disbursement of salaries, pensions, and financial management within the defence services.

• The Defence Accounts Department, under the CGDA, also ensures compliance with financial regulations and provides financial advice for efficient resource allocation.

• This position plays a vital role in ensuring the fiscal discipline of India's defence expenditure.

Q31. Answer: (d) Violation of Article 22(1) (Failure to inform grounds of arrest)

The correct answer is Violation of Article 22(1) (Failure to inform grounds of arrest).

Key Points

• Article 22(1) of the Indian Constitution states that no individual who is arrested shall be detained without being informed of the reasons for their arrest or without being provided an opportunity to consult a legal practitioner of their choice.

• In the case of Vihaan Kumar vs. State of Haryana, the Supreme Court declared the arrest illegal because the authorities failed to communicate the grounds of the arrest to the individual, violating their fundamental right under Article 22(1).

• This provision protects individuals against arbitrary arrests and ensures procedural fairness in criminal proceedings.

• The right to be informed of the grounds of arrest is essential for the effective exercise of the right to legal representation.

• The Supreme Court emphasized the importance of adhering to constitutional safeguards during the arrest to prevent the misuse of power by law enforcement agencies.

Additional Information

• Article 21 (Right to Life and Personal Liberty):

• Article 21 guarantees the right to life and personal liberty, stating that no person shall be deprived of their life or personal liberty except according to the procedure established by law.

• It is one of the most significant fundamental rights and has been interpreted broadly by the judiciary to include various dimensions of human life, such as privacy, dignity, and health.

• This article was not directly violated in this case, as the issue pertained specifically to procedural safeguards during an arrest under Article 22(1).

• Article 14 (Right to Equality):

• Article 14 guarantees equality before the law and equal protection of the laws to all individuals within the territory of India.

• It prohibits discrimination on arbitrary grounds and ensures fairness in legislative and executive actions.

• While Article 14 is a cornerstone of justice in India, it was not the primary focus in this case.

• Article 19(1)(a) (Freedom of Speech and Expression):

• Article 19(1)(a) guarantees the right to freedom of speech and expression, which includes the freedom to express one's opinions freely through speech, writing, or any other form of communication.

• This right is essential for the functioning of a democracy and allows individuals to express dissent and participate in public discourse.

• However, this article was unrelated to the procedural violation under Article 22(1) in the given case.

Q32. Answer: (d) It reflects improved services, urban growth and rising demand.

The correct answer is It reflects improved services, urban growth and rising demand.

Key Points

• Tertiary activities include services such as transport, communication, trade, health, education, and financial services.

• The growth of tertiary activities in India reflects urbanization, industrialization, and an increase in income levels, leading to higher demand for services.

• This growth indicates a structural shift in the economy from traditional agriculture and manufacturing to service-based industries.

• It also showcases advancements in technology and infrastructure that support urban growth and improved living standards.

Additional Information

• Option 1 (It highlights a fall in manufacturing employment): While there may be shifts in employment from manufacturing to services, the growth of tertiary activities does not inherently indicate a decline in manufacturing employment. Instead, it shows diversification in employment opportunities.

• Option 2 (It indicates a slowdown in overall income generation): Tertiary sector growth is actually a sign of economic progress and increased income generation rather than a slowdown, as services contribute significantly to GDP and employment.

• Option 3 (It shows a shift back to farm-based occupations): The growth of tertiary activities is contrary to this idea, as it signifies a move away from agriculture toward modern services and urban-based professions.

• Important Terms:

• Urbanization: The process by which rural areas transform into urban centers due to migration and development.

• Structural Shift: A change in the dominant sectors of the economy, moving from primary (agriculture) to secondary (manufacturing) and tertiary (services).

• Infrastructure Development: Investments in transport, communication, and technology that support the growth of services and

urbanization.

• Income Growth: Increased earnings for individuals and households, leading to higher consumption and demand for services.

Q33. Answer: (c) La French Tech India AI Summit

The correct answer is La French Tech India AI Summit.

Key Points

• The La French Tech India AI Summit was held in Bengaluru in 2025, emphasizing the growing collaboration between India and France in the field of artificial intelligence (AI).

• This summit focused on ethical and inclusive AI development, highlighting the significance of responsible AI practices in addressing global challenges.

• The event brought together leading AI researchers, policymakers, and entrepreneurs from both countries to foster innovation and strengthen partnerships.

• One of the major objectives of this summit was to explore the potential of AI in diverse fields such as healthcare, education, climate change mitigation, and smart cities.

• The summit also showcased advanced AI technologies and startups from both nations, fostering opportunities for collaboration and investments in AI initiatives.

Additional Information

• Indo-European AI Partnership Meet

• This event typically highlights the collaboration between India and European nations in advancing AI technologies.

• It focuses on knowledge exchange, joint research initiatives, and policy discussions to promote innovation in AI and its applications.

• Although an important initiative, it is a broader collaboration and not specific to France or the 2025 summit.

• Global AI Ethics Forum

• This forum is an international platform that addresses the ethical implications of AI and promotes responsible usage of AI technologies.

• The forum emphasizes issues such as data privacy, algorithmic bias, and accountability in AI applications.

• It is not directly associated with India-France collaboration but serves as an important global platform for ethical AI discussions.

• India-US AI Conference

• This conference underscores the partnership between India and the United States in advancing AI research and development.

• It focuses on AI applications in sectors such as defense, healthcare, and technology, fostering bilateral cooperation.

• While significant, it is unrelated to the India-France collaboration highlighted in the question.

Q34. Answer: (c) Gibbs free energy

The correct answer is Gibbs free energy.

Key Points

• Gibbs free energy (G) determines the spontaneity of a chemical reaction under constant pressure and temperature.

• A reaction is spontaneous if the change in Gibbs free energy, ΔG, is negative. This indicates that the system releases free energy.

• The formula for Gibbs free energy is $\Delta G = \Delta H - T\Delta S$, where:

• ΔH = change in enthalpy (heat energy)

• T = temperature in Kelvin

• ΔS = change in entropy

• $\Delta G = 0$ indicates a system in equilibrium, while $\Delta G > 0$ means the reaction is non-spontaneous.

• Gibbs free energy is a critical thermodynamic quantity used in chemical, biological, and physical processes to predict reaction feasibility.

Additional Information

• Enthalpy (ΔH):

• Enthalpy is the total heat content of a system, often associated with the heat exchanged in a reaction under constant pressure.

• It is not sufficient on its own to predict reaction spontaneity, as it does not account for entropy changes.

• Reactions with a negative ΔH (exothermic) are often spontaneous, but this depends on the temperature and entropy.

• Entropy (ΔS):

• Entropy measures the disorder or randomness in a system.

• An increase in entropy (positive ΔS) favors spontaneity, as systems tend to move toward higher disorder.

• However, entropy alone cannot determine spontaneity; it must be considered alongside enthalpy and temperature.

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• Internal Energy:

• Internal energy is the total energy contained within a system, including kinetic and potential energies of particles.

• It is a fundamental thermodynamic property but does not directly indicate reaction spontaneity.

• Thermodynamic Spontaneity:

• Spontaneity depends on the balance of enthalpy, entropy, and temperature, as captured in the Gibbs free energy equation.

• Understanding these interrelations is critical for predicting whether a chemical or physical process will occur naturally.

Q35. Answer: (d) Central Public Information Officer

The correct answer is Central Public Information Officer.

Key Points

• The RTI (Right to Information) Act, 2005 empowers citizens to seek information from public authorities to promote transparency and accountability.

• Under Section 5 of the RTI Act, every public authority is required to designate officers as Central Public Information Officers (CPIOs) or State Public Information Officers (SPIOs).

• CPIOs are responsible for receiving and responding to RTI applications and ensuring the requested information is provided within the stipulated time frame of 30 days.

• The CPIO is also responsible for transferring the application to the appropriate department if the information sought pertains to another public authority.

• In case of non-compliance or delay, the CPIO can be penalized, emphasizing their critical role in the implementation of the RTI Act.

Additional Information

• Director General

• The Director General is typically the head of specific organizations or departments such as police forces, military units, or scientific bodies, and is not directly responsible for RTI implementation.

• Their role involves overseeing operations, policies, and strategies within their domain but does not include managing RTI applications.

• District Magistrate

• The District Magistrate (DM) is primarily responsible for maintaining law and order in their jurisdiction and implementing developmental schemes.

• While DMs may play a supervisory role in ensuring transparency in district-level administration, they are not designated as information officers under the RTI Act.

• Central Vigilance Officer

• The Central Vigilance Officer (CVO) is tasked with overseeing vigilance activities within public organizations to prevent corruption.

• Their role focuses on maintaining integrity and accountability but does not encompass responding to RTI requests or ensuring transparency in public departments.

Important Points

• RTI Act:

• The RTI Act, 2005, is a landmark legislation in India aimed at promoting transparency and accountability in governance.

• It empowers citizens to seek information from public authorities, thereby enabling them to participate in the democratic process more effectively.

• Public authorities are required to maintain records and provide them to applicants upon request unless exempted under Section 8 of the Act.

• The Act also establishes an appellate mechanism for individuals dissatisfied with the response received from Public Information Officers.

Q36. Answer: (a) Haji Shariatullah

The correct answer is Haji Shariatullah.

Key Points

• Haji Shariatullah was the founder of the Faraizi Movement, which emerged in Bengal during the early 19th century.

• The movement was aimed at purifying Islam and eradicating un-Islamic practices among Bengali Muslims.

• Haji Shariatullah emphasized the strict adherence to the fundamental principles of Islam, known as "Faraiz," meaning mandatory religious duties.

• He urged Muslims to boycott British-imposed taxes and feudal practices, promoting socio-economic justice and Islamic reform.

• The Faraizi Movement played a significant role in raising awareness of Islamic identity and resisting colonial oppression during

British rule in India.

Additional Information

• Muhammad Barkatullah

• He was an Indian revolutionary known for his participation in the Indian independence movement.

• Barkatullah served as the Prime Minister of the Provisional Government of India, established in Kabul in 1915.

• He collaborated with other revolutionaries like Raja Mahendra Pratap and Maulana Obaidullah Sindhi to oppose British rule.

• His efforts were focused on mobilizing international support for India's independence, particularly from Germany and Turkey.

• Hakim Ajmal Khan

• Hakim Ajmal Khan was a renowned physician, freedom fighter, and educationist during British rule in India.

• He was a prominent leader of the Khilafat Movement, which sought to protect the Ottoman Caliphate after World War I.

• Ajmal Khan was also one of the founders of Jamia Millia Islamia, a leading educational institution in India.

• He actively participated in the Indian National Congress and was committed to the cause of India's independence.

• Nawab Salimullah

• Nawab Salimullah was a prominent political figure in Bengal and the founding member of the All India Muslim League in 1906.

• He played a crucial role in advocating for the interests of Muslims in British India.

• Salimullah supported the partition of Bengal in 1905, which he believed would provide better governance and educational opportunities for Muslims.

• He was instrumental in the development of Dhaka as an important cultural and political center in Bengal.

• Faraizi Movement

• The Faraizi Movement was a significant socio-religious reform movement initiated in Bengal during British rule.

• It aimed at purifying Islamic practices and creating awareness about socio-economic injustices faced by Muslims under colonial rule.

• The movement opposed oppressive zamindari practices and British exploitation of farmers.

• Haji Shariatullah and his son Dudu Miyan were the key leaders of this movement, which influenced the socio-political landscape of Bengal.

Q37. Answer: (d) China

The correct answer is China.

Key Points

• The McMahon Line is a boundary line between India and China, specifically between the northeastern Indian state of Arunachal Pradesh and Tibet (an autonomous region of China).

• It was drawn as part of the 1914 Simla Convention, an agreement between British India and Tibet, with China as a participant that ultimately did not accept the agreement.

• The McMahon Line spans approximately 890 kilometers and is considered the de facto boundary between India and China in the eastern sector.

• China disputes the legitimacy of the McMahon Line, referring to Arunachal Pradesh as "South Tibet," and this dispute has been a source of tension between the two nations.

• The disagreement over the McMahon Line was one of the factors that led to the Sino-Indian War of 1962, during which China captured parts of Arunachal Pradesh but later withdrew.

Additional Information

• Pakistan

• India shares a boundary with Pakistan called the Radcliffe Line, which was drawn during the partition of India in 1947.

• The India-Pakistan border spans approximately 3,323 kilometers and includes the Line of Control (LoC) in Jammu and Kashmir, which is a de facto military boundary.

• The Radcliffe Line was named after Sir Cyril Radcliffe, the chairman of the boundary commission, and is distinct from the McMahon Line.

• Myanmar

• India shares a border of about 1,643 kilometers with Myanmar, covering the northeastern states of Arunachal Pradesh, Nagaland, Manipur, and Mizoram.

• The India-Myanmar boundary is not related to the McMahon Line and was delineated through agreements between the British colonial government and Burma (now Myanmar).

• This boundary is significant for trade and cultural exchanges and also for addressing insurgency issues in the northeastern region of India.

• Afghanistan

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• India shares a small border with Afghanistan in the northwestern region of Jammu and Kashmir, known as the Wakhan Corridor.

• This border, approximately 106 kilometers long, lies in the Gilgit-Baltistan region, which is currently under Pakistani control and part of the larger Kashmir dispute.

• The boundary was established during the Durand Line agreement of 1893 between British India and Afghanistan, which is unrelated to the McMahon Line.

Q38. Answer: (a) Kamle

The correct answer is Kamle.

Key Points

• The Khelo India Multipurpose Hall in Arunachal Pradesh was inaugurated in May 2025 by Union Minister Dr. Mansukh Mandaviya in the Kamle district.

• This initiative aligns with the Khelo India Programme, which aims to enhance sports infrastructure and promote sports culture across the nation.

• The multipurpose hall is equipped to host various sports activities and events, encouraging local talent and youth participation in sports.

• Kamle district, being one of the youngest districts of Arunachal Pradesh, has been receiving attention for development initiatives, including sports infrastructure.

• The Khelo India Multipurpose Hall is expected to serve as a hub for nurturing sports talent and fostering community engagement in the region.

Additional Information

• Lower Subansiri

• Lower Subansiri is known for its picturesque landscapes and cultural heritage.

• It is home to Ziro Valley, a popular tourist destination famous for its scenic beauty and Ziro Music Festival.

• The district has also been a focus for agricultural and eco-tourism initiatives.

• West Kameng

• West Kameng is renowned for its biodiversity and stunning natural beauty.

• It houses several tourist attractions, including Bomdila Monastery and Sela Pass.

• The district plays a significant role in preserving indigenous traditions and promoting eco-tourism.

• Tawang

• Tawang is one of the most famous districts in Arunachal Pradesh, known for Tawang Monastery, the largest monastery in India.

• The district has a strategic location near the Indo-China border, making it geopolitically significant.

• Tawang also attracts tourists for its breathtaking landscapes, snow-capped mountains, and rich Tibetan heritage.

Q39. Answer: (a) Lapolith

The correct answer is Lopolith.

Key Points

• A lopolith is a saucer-shaped intrusive igneous rock body that has a concave shape facing upwards (towards the sky).

• It forms when magma intrudes between layers of sedimentary rock and cools, causing the layers above it to sag.

• Lopoliths are typically composed of mafic or ultramafic rocks, such as gabbro or anorthosite.

• They are associated with large igneous provinces and are considered important for understanding geological processes of magma emplacement.

• Examples of lopoliths include the Bushveld Complex in South Africa, which is one of the largest known lopoliths and a significant source of platinum group elements.

Additional Information

• Sill:

• A sill is a flat, horizontal, or nearly horizontal sheet of igneous rock that forms when magma intrudes parallel to the bedding planes of sedimentary rocks.

• Sills are concordant intrusions, meaning they do not cut through the layers of rock they intrude.

• They differ from lopoliths in their flat shape and lack of sagging caused in the overlying rock layers.

• Phacolith:

• A phacolith is an igneous intrusion that forms in the crests of anticlines or troughs of synclines (geological folds).

• It typically has a lens-like or crescent-shaped appearance.

• Phacoliths are usually smaller in size compared to lopoliths and are associated with folded sedimentary rocks.

• Batholith:

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• A batholith is a large, irregularly shaped mass of intrusive igneous rock that has solidified deep beneath the Earth's surface.
• Batholiths are massive and can cover hundreds of square kilometers, often forming the cores of mountain ranges.
• An example is the Sierra Nevada Batholith in the western United States.

Q40. Answer: (b) 7

The correct answer is 7.

Key Points

• The Indian team won a total of 7 medals at the Archery World Cup Stage 2 held in Shanghai, China, in May 2025.
• The medal tally included 2 gold medals, 4 silver medals, and 1 bronze medals, showcasing India's excellence in archery.
• Indian archers performed exceptionally well in both compound and recurve categories, securing top positions in individual and team events.
• The Archery World Cup is an annual international competition organized by the World Archery Federation, where top archers from around the world compete.
• This achievement reflects India’s growing dominance in the sport and highlights the development of archery infrastructure and training programs in the country.

Additional Information

• Archery World Cup
• The Archery World Cup is a prestigious event conducted annually to determine the best archers globally.
• The competition features events in two main disciplines: recurve and compound archery.
• India has emerged as a strong contender in archery, producing world-class athletes through improved training facilities and coaching.
• Participation in such events boosts international recognition and strengthens India's medal prospects in upcoming competitions, including the Olympics.

Q41. Answer: (a) 61/84

Given:

3/4 + (1/(1+5/9)) - 2/3

Calculation:

=> 3/4 + (1/(1+5/9)) - 2/3
=> 3/4 + (1/(14/9)) - 2/3
=> 3/4 + 9/14 - 2/3
=> (63 + 54 - 56)/84
=> 61/84

Therefore The correct answer is 61/84.

Q42. Answer: (c) 47,436

Shortcut Trick

Assume Cost Price (CP) = 100 units.
List Price (MP) = 100 + 34% of 100 = 134 units.
Selling Price (SP) = 134 − 25% of 134 = 134 − 33.5 = 100.5 units.
Profit = SP − CP = 100.5 − 100 = 0.5 units.
Given 0.5 units = 177 => 1 unit = 354.
List Price = 134 units = 134 × 354 = 47,436.
Therefore The correct answer is Rs. 47,436.

Alternate Method

Given: Markup% = 34%, Discount% = 25%, Profit = 177.
Formulas: SP = MP × (100 − D%) ÷ 100 | Profit = SP − CP.
=> Let Cost Price (CP) = x.
=> Marked Price (MP) = 1.34x.
=> Selling Price (SP) = 1.34x × 0.75 = 1.005x.
=> Profit = 1.005x − x = 0.005x.
=> 0.005x = 177 => x = 177 ÷ 0.005 = 35,400.
=> List Price (MP) = 1.34 × 35,400 = 47,436.
Therefore The correct answer is Rs. 47,436.

Additional Information

Marked Price and Discount

The List Price or Marked Price is the price printed on an item. Discount is always calculated on the Marked Price to arrive at the Selling Price.

Net Profit Formula

Successive percentage change formula: Net % = a + b + (ab/100). Here, Markup (a) is positive and Discount (b) is negative.

Q43. Answer: (d) 24

Shortcut Trick

HCF is the highest common factor that divides all given numbers.

Find the difference between the numbers:

144 − 120 = 24

168 − 144 = 24

Since 24 divides 120, 144, and 168 perfectly, it is the HCF.

Therefore The correct answer is 24.

Alternate Method

Given: Numbers are 120, 144, and 168.

Formula: HCF (Highest Common Factor) using Prime Factorization.

=> Prime factorization of 120 = 2 × 2 × 2 × 3 × 5 = $2^3 \times 3^1 \times 5^1$

=> Prime factorization of 144 = 2 × 2 × 2 × 2 × 3 × 3 = 2^4 × 3^2

=> Prime factorization of 168 = 2 × 2 × 2 × 3 × 7 = $2^3 \times 3^1 \times 7^1$

=> HCF = Product of the lowest powers of common prime factors

=> HCF = $2^3 \times 3^1$ = 8 × 3 = 24

Therefore The correct answer is 24.

Additional Information

HCF (Highest Common Factor)

Also known as GCD (Greatest Common Divisor), it is the largest positive integer that divides each of the integers.

Relationship with LCM

For two numbers a and b: Product of numbers = HCF(a, b) × LCM(a, b).

HCF of Fractions

HCF of Fractions = (HCF of Numerators) ÷ (LCM of Denominators).

Q44. Answer: (c) 1375

Shortcut Trick

If a number is increased by 100%, it becomes double (200%) of itself.

2 units → 2750

1 unit → 2750 ÷ 2 = 1375

Therefore The correct answer is 1375.

Alternate Method

Given:

Final value after 100% increase = 2750

Formula Used:

Final Value = Original Number × (1 + Increase%/100)

Calculations:

Let the original number be x.

=> x + (100% of x) = 2750

=> x + x = 2750

=> 2x = 2750

=> x = 2750 ÷ 2

=> x = 1375

Therefore The correct answer is 1375.

Additional Information

Percentage Increase

To increase a number by P%, multiply the number by (100 + P)/100.

Base Value Concept

Whenever a percentage change is applied, the original number is always treated as the 100% base.

Successive Percentage

If a number increases by a% and then b%, the net increase is [a + b + (a×b)/100]%.

Q45. Answer: (c) 42

Shortcut Trick

Let P and Q be their present ages.

From first condition: 8P − Q = 46 => 8P = Q + 46

From second condition: 3(Q + 10) = 8(P + 10) − 12

Substitute 8P with (Q + 46): 3Q + 30 = (Q + 46) + 80 − 12

2Q = 114 − 30 => 2Q = 84 => Q = 42

Therefore The correct answer is 42 years.

Alternate Method

Given: Relation between P and Q at present and after 10 years.

Calculations:

=> 8P − Q = 46 --- (i)

=> 3(Q + 10) = 8(P + 10) − 12

=> 3Q + 30 = 8P + 80 − 12

=> 3Q + 30 = 8P + 68

=> 8P − 3Q = −38 --- (ii)

Subtract (ii) from (i):

=> (8P − Q) − (8P − 3Q) = 46 − (−38)

=> 8P − Q − 8P + 3Q = 46 + 38

=> 2Q = 84

=> Q = 42

Therefore The correct answer is 42 years.

Additional Information

Linear Equations in Two Variables

A system of equations like a1x + b1y = c1 can be solved using substitution or elimination methods.

Age Problems Logic

If the current age is x, then age after 'n' years is (x + n) and age 'n' years ago was (x − n).

Age Difference

The difference between the ages of two people remains constant regardless of the number of years passed.

Q46. Answer: (d) 1

Shortcut Trick

To find prime numbers between 317 and 322, check divisibility by prime numbers up to √322 ≈ 17.

Numbers to check: 317, 318, 319, 320, 321, 322.

Only 317 is not divisible by 2, 3, 5, 7, 11, 13, or 17.

Therefore The correct answer is 1.

Alternate Method

Given: Range of numbers = 317 to 322.

Step-by-step verification:

=> 317: Not divisible by any prime up to 17. 317 is a prime number.

=> 318: Even number, divisible by 2. (Composite)

=> 319: Sum of digits = 13. Divisibility check: 319 = 11 × 29. (Composite)

=> 320: Ends in 0, divisible by 2, 5, 10. (Composite)

=> 321: Sum of digits = 3 + 2 + 1 = 6 (divisible by 3). (Composite)

=> 322: Even number, divisible by 2. (Composite)

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=> Total prime numbers found = {317}.

Therefore The correct answer is 1.

Additional Information

Prime Number Definition

A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself.

Divisibility Test for Primes

To check if N is prime, test divisibility by all primes less than or equal to √N.

Twin Primes

A pair of prime numbers that differ by 2 (e.g., 3 and 5, 11 and 13) are called Twin Primes.

Q47. Answer: (a) 6.67

Shortcut Trick

Cost Price (CP) of 12 pencils = Rs. 180.

Cost Price (CP) of 1 pencil = 180 ÷ 12 = Rs. 15.

Selling Price (SP) of 1 pencil = Rs. 16.

Profit = SP − CP = 16 − 15 = Rs. 1.

Profit% = (Profit ÷ CP) × 100 = (1 ÷ 15) × 100 = 6.67%.

Therefore The correct answer is 6.67%.

Alternate Method

Given: CP of 1 dozen = Rs. 180 | SP of 1 pencil = Rs. 16.

Formulas: CP per unit = Total CP ÷ Quantity | Profit = SP − CP | Profit% = (Profit ÷ CP) × 100.

=> Cost Price (CP) of 12 pencils = Rs. 180.

=> Cost Price (CP) of 1 pencil = 180 ÷ 12 = Rs. 15.

=> Selling Price (SP) of 1 pencil = Rs. 16.

=> Profit = 16 − 15 = Rs. 1.

=> Profit Percentage = (1 ÷ 15) × 100 = 20 ÷ 3 = 6.666...% ≈ 6.67%.

Therefore The correct answer is 6.67%.

Additional Information

Unit Calculation

Always ensure that the Cost Price and Selling Price are calculated for the same number of units to find the correct profit or loss percentage.

Profit and Loss Percent

Profit% and Loss% are always calculated on the Cost Price (CP) unless stated otherwise in the question.

Q48. Answer: (a) -533/17

Given:

$1 \times (5 \times (3^2)) \div 17 + 44 - 78$

Formula Used:

BODMAS rule: Brackets → Orders → Division/Multiplication → Addition/Subtraction

Calculation:

$1 \times (5 \times (3^2)) \div 17 + 44 - 78$

=> $1 \times (5 \times 9) \div 17 + 44 - 78$

=> $1 \times 45 \div 17 + 44 - 78$

=> $45/17 + 44 - 78$

=> $45/17 + (44 - 78)$

=> $45/17 - 34$

=> $45/17 - 578/17$

=> $-533/17$

Therefore The correct answer is −533/17.

Q49. Answer: (b) Rs. 13,500

Shortcut Trick

Selling Price (SP) = Marked Price (MP) × (100 − Discount%) ÷ 100.

SP = 15,000 × (100 − 10) ÷ 100 = 15,000 × 0.90.
SP = 13,500.
The customer pays 13,500.
Therefore The correct answer is Rs. 13,500.
Alternate Method
Given: Marked Price (MP) = Rs. 15,000, Discount Rate = 10%.
Formulas: Discount Amount = (MP × Discount%) ÷ 100 | SP = MP − Discount Amount.
=> Discount Amount = (15,000 × 10) ÷ 100 = Rs. 1,500.
=> Selling Price (SP) = 15,000 − 1,500 = Rs. 13,500.
Therefore The correct answer is Rs. 13,500.
Additional Information
Marked Price & Discount
The Marked Price is the price listed on the product. Discount is always calculated on the Marked Price.
Net Selling Price
The price at which the item is sold after reducing the discount from the Marked Price is the Selling Price.

Q50. Answer: (c) 432/67 hours

Shortcut Trick
Total Work (LCM of 12, 25, 10) = 300 units.
Efficiencies: A = 25, B = 12, C = 30.
Combined Efficiency = 25 + 12 + 30 = 67.
Time Taken = 300 ÷ 67 = 4(32/67) hours.
Therefore The correct answer is 4(32/67) hr.
Alternate Method
Given: Pipe A fills in 12 hours, Pipe B in 25 hours, and Pipe C in 10 hours.
Formula Used: Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
Pipe A	12	300	25
Pipe B	25	12	
Pipe C	10	30	

=> Sum of efficiencies of (A + B + C) = 25 + 12 + 30 = 67 units/hr
=> Total Time Taken = Total Work ÷ Total Efficiency
=> Time = 300 ÷ 67
=> Time = 4(32/67) hr
Therefore The correct answer is 4(32/67) hr.
Additional Information
Pipes and Cisterns Logic
Filling pipes have positive efficiency, while outlet/leakage pipes have negative efficiency.
Time and Work Relation
Time is inversely proportional to efficiency: Time = 1 / Efficiency when work is constant.

Q51. Answer: (c) -19/24

Shortcut Trick
Expand the expression and observe that $16x^2$ terms cancel out.
=> −20 − 24x + 16 = 15
=> −24x − 4 = 15
=> −24x = 19
Therefore The correct answer is −19/24.
Alternate Method
Given Equation: $4(4x^2 − 5) − 4(4x^2 + 6x − 4) = 15$
Step 1: Expand the brackets by multiplying with 4.

=> $(16x^2 - 20) - (16x^2 + 24x - 16) = 15$

Step 2: Remove parentheses and change signs for the second term.

=> $16x^2 - 20 - 16x^2 - 24x + 16 = 15$

Step 3: Combine like terms ($16x^2 - 16x^2 = 0$).

=> $-24x - 20 + 16 = 15$

=> $-24x - 4 = 15$

Step 4: Solve for x.

=> $-24x = 15 + 4$

=> $-24x = 19$

=> $x = 19 / (-24)$

Therefore The correct answer is −19/24.

Additional Information

Linear Equations

A linear equation in one variable is an equation of the form $ax + b = 0$, where $a \neq 0$.

Distributive Property

The rule $a(b + c) = ab + ac$ is essential for simplifying algebraic expressions before solving.

Sign Convention

When a negative sign is outside a bracket, all signs inside the bracket must be reversed during expansion.

Q52. Answer: (a) 24

Shortcut Trick

When the distance is same for both directions, the Average Speed = $(2 \times x \times y) \div (x + y)$

Here, x = 20 km/hr and y = 30 km/hr.

Average Speed = $(2 \times 20 \times 30) \div (20 + 30) = 1200 \div 50 = 24$ km/hr.

Therefore The correct answer is 24 km/hr.

Alternate Method

Given:

Speed from Bhopal to Indore (v1) = 20 km/hr

Speed from Indore to Bhopal (v2) = 30 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Calculations:

Let the distance between Bhopal and Indore be D km.

=> Time taken to go (t1) = D ÷ 20

=> Time taken to return (t2) = D ÷ 30

=> Total distance = D + D = 2D

=> Total time = (D ÷ 20) + (D ÷ 30) = (3D + 2D) ÷ 60 = 5D ÷ 60 = D ÷ 12

=> Average Speed = 2D ÷ (D ÷ 12) = 2 × 12 = 24 km/hr

Therefore The correct answer is 24 km/hr.

Additional Information

Average Speed for Equal Time

If a body travels at speed v1 for time T and speed v2 for the same time T, the average speed is the Arithmetic Mean: (v1 + v2) ÷ 2.

Average Speed for Three Equal Distances

If three equal distances are covered at speeds u, v, and w, Average Speed = (3uvw) ÷ (uv + vw + wu).

Relative Speed

When two objects move in the opposite direction, relative speed is (v1 + v2). In the same direction, it is |v1 − v2|.

Q53. Answer: (b) 60 years

Shortcut Trick

If a sum becomes n times in t years, it becomes n^k times in t × k years at compound interest.

Given: Sum becomes 3 times in 15 years (n = 3, t = 15).

Target: 81 times which can be written as 3^4 (so k = 4).

Required time → 15 × 4 = 60 years.

Therefore The correct answer is 60 years.

Alternate Method

Given:

Principal (P) triples in 15 years => Amount = 3P

Time (t1) = 15 years

Target Amount = 81P

Formula Used:

Amount (A) = $P(1 + r/100)^n$

Calculations:

=> 3P = P(1 + r/100)^(15)

=> 3 = (1 + r/100)^(15) ... (i)

We want the sum to become 81 times:

=> 81P = P(1 + r/100)^t

=> 81 = (1 + r/100)^t

=> 3^4 = (1 + r/100)^t ... (ii)

Substituting the value of 3 from equation (i) into equation (ii):

=> [(1 + r/100)^(15)]^4 = (1 + r/100)^t

=> (1 + r/100)^(60) = (1 + r/100)^t

=> t = 60 years

Therefore The correct answer is 60 years.

Additional Information

Compound Interest Multiplier

In CI, the amount grows geometrically. If it becomes 'x' times in 't' years, it will become 'x^2' times in '2t' years, 'x^3' times in '3t' years, and so on.

Simple Interest vs Compound Interest

In Simple Interest, the growth is linear. If a sum triples (adds 2P interest) in 15 years, it adds another 2P every 15 years. To become 81 times (add 80P interest), it would take (80/2) × 15 = 600 years.

Rule of 72

A quick way to estimate the time to double an investment: Time ≈ 72 ÷ Interest Rate.

Q54. Answer: (a) 12

Given:

16 + 12 ÷ 6 − 2 × 3

Formula Used:

Follow BODMAS (Bracket, Order, Division/Multiplication, Addition/Subtraction).

Calculation:

16 + 12 ÷ 6 − 2 × 3

=> 16 + 2 − 2 × 3

=> 16 + 2 − 2 × 3

=> 16 + 2 - 6

=> 18 - 6

=> 12

Therefore The correct answer is 12.

Q55. Answer: (d) 180 cm3

Shortcut Trick

Volume (V) of a rectangular box when areas of three adjacent faces are given:

V = √(Area1 × Area2 × Area3)

V = √(45 × 24 × 30) = √(32400)

V = 180 cm^3

Therefore The correct answer is 180 cm^3.

Alternate Method

Given: Areas of adjacent faces are 45 cm^2, 24 cm^2, and 30 cm^2.
Formula Used: Area of faces are lb, bh, and hl. Volume (V) = lbh.
=> Let length = l, breadth = b, and height = h.
=> lb = 30, bh = 24, hl = 45
=> (lb) × (bh) × (hl) = 30 × 24 × 45
=> $l^2b^2h^2 = 32400$
=> $(lbh)^2 = 180^2$
=> Volume (lbh) = 180 cm^3
Therefore The correct answer is 180 cm^3.
Additional Information
Total Surface Area of Cuboid
The total area of all six faces is given by 2(lb + bh + hl).
Diagonal of a Cuboid
The longest rod that can be placed in a box is $\sqrt{(l^2 + b^2 + h^2)}$.
Lateral Surface Area
Area of the four walls of a room = 2h(l + b).

Q56. Answer: (b) 1300

Shortcut Trick
Let the monthly salary be 100%.
After paying 20% loan payment, remaining = 80%.
He spends 25% of 80% → 20%, so savings = 80% − 20% = 60%.
60% = Rs. 780 => 1% = 13 => 100% = Rs. 1300.
Therefore The correct answer is Rs. 1300.
Alternate Method
Given: Loan payment = 20%, Expenditure = 25% of remaining, Savings = Rs. 780.
Let Total Salary be S.
=> Remaining Salary after loan = S × (1 − 20/100) = 0.80S
=> Savings = 0.80S × (1 − 25/100) = 0.80S × 0.75
=> 780 = 0.60S
=> S = 780 ÷ 0.60
=> S = 1300
Therefore The correct answer is Rs. 1300.
Additional Information
Remaining Value Formula
When percentages are calculated on a "remaining" balance, use the formula: Final = Initial × (1 − r1/100) × (1 − r2/100).
Successive Percentage Change
The effective percentage change for two successive changes a% and b% is given by (a + b + ab/100)%.
Base Change Property
Always identify the base of the percentage. 25% of the "remaining" is different from 25% of the "total".

Q57. Answer: (c) 11 km/hr

Shortcut Trick
When Amit doubles his speed (ratio 1 : 2), the time ratio becomes 2 : 1.
Difference in time units = 2 − 1 = 1 unit.
Actual time difference = 4 hours (more) + 5 hours (less) = 9 hours.
Therefore 1 unit = 9 hours. Original time taken by Amit = 2 units = 18 hours.
Amit's speed = Distance ÷ Original Time = 198 ÷ 18 = 11 km/hr.
Therefore The correct answer is 11 km/hr.
Alternate Method
Given: Total distance = 198 km. Let Amit's speed be 's' and Vinay's time be 'T'.
=> Case 1: 198/s = T + 4

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=> Case 2: 198/(2s) = T − 5

=> Subtracting Case 2 from Case 1: (198/s) − (198/2s) = (T + 4) − (T − 5)

=> 198/2s = 9

=> 198 = 18s

=> s = 198 ÷ 18

=> s = 11 km/hr

Therefore The correct answer is 11 km/hr.

Additional Information

Inverse Proportion of Speed and Time

When distance is constant, speed is inversely proportional to time (S1/S2 = T2/T1). This is the core logic for ratio-based shortcuts.

Relative Speed

In same direction, relative speed = S1 − S2. In opposite directions, relative speed = S1 + S2.

Average Speed Formula

For two equal distances covered at speeds x and y, Average Speed = (2 × x × y) ÷ (x + y).

Q58. Answer: (d) 8

Shortcut Trick

The Marked Price (MP) is Rs. 2,500.

After 1st discount (25%): 2,500 × (100 − 25) ÷ 100 = Rs. 1,875.

After 2nd discount (20%): 1,875 × (100 − 20) ÷ 100 = Rs. 1,500.

Final Selling Price (SP) is given as Rs. 1,380.

Discount amount for K% = 1,500 − 1,380 = Rs. 120.

Value of K = (120 ÷ 1,500) × 100 = 8%.

Therefore The correct answer is 8.

Alternate Method

Given: MP = Rs. 2,500, SP = Rs. 1,380, d1 = 25%, d2 = 20%, d3 = K%.

Formula: SP = MP × (100 − d1)/100 × (100 − d2)/100 × (100 − d3)/100

=> 1,380 = 2,500 × (75/100) × (80/100) × (100 − K)/100

=> 1,380 = 2,500 × (3/4) × (4/5) × (100 − K)/100

=> 1,380 = 1,500 × (100 − K)/100

=> 1,380 = 15 × (100 − K)

=> 92 = 100 − K

=> K = 100 − 92 = 8.

Therefore The correct answer is 8.

Additional Information

Successive Discounts

When multiple discounts are applied one after another on the reduced price, they are called successive discounts. Total discount is not the simple sum of individual percentages.

Marked Price & Selling Price

Marked Price (MP) is the price printed on the article. Selling Price (SP) is the price after deducting the discount from the MP: SP = MP − Discount.

Q59. Answer: (c) 500 m

Given:

Height of kite = 353.55 m

Angle of string with horizontal = 45°

Formula used:

sin(θ) = height ÷ string length

String length = height ÷ sin(θ)

Calculations:

=> sin 45° = √2/2 ≈ 0.707

=> string length = 353.55 ÷ 0.707

=> string length ≈ 500 m

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Therefore The approximate length of the string = 500 m.

Q60. Answer: (a) 49

Shortcut Trick

Arrange the given 11 terms in ascending order:

23, 30, 36, 44, 46, 49, 54, 55, 59, 96, 97

Since the number of terms (N = 11) is odd, the median is the middle-most term, which is the 6th term.

Median = 6^(th) term = 49

Therefore The correct answer is 49.

Alternate Method

Given data: 49, 96, 59, 54, 97, 30, 44, 46, 36, 55, 23

Total number of observations (N): 11

Formula:

When N is odd, Median = ((N + 1) ÷ 2)^(th) observation after arranging in ascending order.

Calculations:

Arrange the observations in ascending order:

=> 23, 30, 36, 44, 46, 49, 54, 55, 59, 96, 97

Here, the number of observations N = 11 (which is an odd number).

=> Median = ((11 + 1) ÷ 2)^(th) term

=> Median = (12 ÷ 2)^(th) term

=> Median = 6^(th) term

=> Median = 49

Option Analysis:

=> Option (1) 49: This is the correct median as it is the exact middle value of the sorted dataset.

=> Option (2) 49.5: This is incorrect because the number of terms is odd, so the median is a single middle term, not the average of two terms.

=> Option (3) 50: This is incorrect as 50 is not present in the dataset and is not the 6th term.

=> Option (4) 48.5: This is incorrect as it does not correspond to the central value of this dataset.

Therefore The correct answer is 49.

Additional Information

Median for Even Number of Terms

If N is even, the median is the average of the (N ÷ 2)^(th) and ((N ÷ 2) + 1)^(th) terms: Median = [Value_((N/2)) + Value_((N/2 + 1))] ÷ 2.

Empirical Relationship

The relationship between Mean, Median, and Mode is given by: Mode = 3 × Median − 2 × Mean.

Effect of Outliers

Unlike the Mean, the Median is highly robust and is not affected by extreme values (outliers) in the dataset.

Q61. Answer: (c) 126 hours

Shortcut Trick

Time for P = 28 × (9/2) = 126 hrs; Time for Q = 12 × (7/2) = 42 hrs.

Work in 6 hrs = 6 × (1/126 + 1/42) = 6 × (1 + 3)/126 = 24/126 = 4/21 units.

R empties 4/21 units in 8 hrs → Full tank empty time = 8 × (21/4) = 42 hrs.

Combined Efficiency = 1/126 + 1/42 − 1/42 = 1/126.

Therefore The correct answer is 126 hr.

Alternate Method

Given:

Pipe P fills 2/9 part in 28 hrs.

Pipe Q fills 2/7 part in 12 hrs.

Calculations:

=> Full tank time for P = 28 × (9/2) = 126 hours.

=> Full tank time for Q = 12 × (7/2) = 42 hours.

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Person	Days	Total Work	Efficiency
P	126	126	1
Q	42	3	

=> Work done by P and Q in 6 hours = 6 × (1 + 3) = 24 units.
=> Pipe R empties 24 units in 8 hours.
=> Efficiency of R = 24 ÷ 8 = 3 units/hr (negative work).
=> Combined Efficiency (P + Q + R) = 1 + 3 − 3 = 1 unit/hr.
=> Time taken by all three = Total Work ÷ Combined Efficiency = 126 ÷ 1 = 126 hours.
Therefore The correct answer is 126 hr.
Additional Information
Inlet and Outlet Pipes
Inlet pipes add water (positive efficiency) while outlet pipes remove water (negative efficiency).
Fractional Work Formula
If 1/n part is done in t hours, total time T = n × t.

Q62. Answer: (c) 5

Shortcut Trick
Ratio of Interior angle : Exterior angle = 3 : 2
Sum of angles = 3 + 2 = 5 units → 180°
1 unit = 180° ÷ 5 = 36°
Exterior angle = 2 × 36° = 72°
Number of sides (n) = 360° ÷ Exterior angle = 360° ÷ 72° = 5
Therefore The correct answer is 5 sides.
Alternate Method
Given: Ratio of Interior angle (I) to Exterior angle (E) = 3 : 2.
Formula Used: I + E = 180° and Number of sides (n) = 360° ÷ E.
=> Let the Interior angle be 3x and the Exterior angle be 2x.
=> 3x + 2x = 180°
=> 5x = 180°
=> x = 36°
=> Exterior angle (E) = 2 × 36° = 72°
=> Number of sides (n) = 360° ÷ E
&r

Q63. Answer: (d) 87

Shortcut Trick
Product of numbers = HCF × LCM
Other number = (29 × 174) ÷ 58
Other number = 174 ÷ 2 = 87
Therefore The correct answer is 87.
Alternate Method
Given:
HCF = 29
LCM = 174
First Number (n1) = 58
Formula Used:
n1 × n2 = HCF × LCM
Calculations:
=> 58 × n2 = 29 × 174
=> n2 = (29 × 174) ÷ 58
=> n2 = 5046 ÷ 58

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=> n2 = 87

Therefore The correct answer is 87.

Additional Information

Co-prime Numbers

Two numbers are said to be co-prime if their HCF is 1. Example: (8, 15).

Relation for Three Numbers

Note that the product rule (n1×n2 = HCF×LCM) does not apply to more than two numbers.

LCM and HCF Property

The LCM of any set of numbers is always exactly divisible by their HCF.

Q64. Answer: (a) Rs. 17,976

Shortcut Trick

Given: 2A = 7B = 4C

Ratio A : B : C = (1/2) : (1/7) : (1/4)

Multiply by LCM(2, 7, 4) = 28 → A : B : C = 14 : 4 : 7

Total units = 14 + 4 + 7 = 25 units → Rs. 32,100

A's share = (14/25) × 32,100 = 14 × 1,284 = Rs. 17,976

Therefore The correct answer is Rs. 17,976.

Alternate Method

Given:

Total amount = Rs. 32,100

Condition: 2A = 7B = 4C

Calculations:

=> Let 2A = 7B = 4C = k

=> A = k/2, B = k/7, C = k/4

=> Ratio A : B : C = k/2 : k/7 : k/4 = 14 : 4 : 7

=> Sum of ratio parts = 14 + 4 + 7 = 25

=> Value of 25 units = Rs. 32,100

=> Value of 1 unit = 32,100 ÷ 25 = Rs. 1,284

=> A's share = 14 units = 14 × 1,284

=> A's share = Rs. 17,976

Therefore The correct answer is Rs. 17,976.

Additional Information

Inverse Ratio Conversion

When coefficients are given as aA = bB = cC, the ratio A:B:C is found by taking the reciprocal of coefficients: (1/a) : (1/b) : (1/c).

Ratio Balancing

To convert fractional ratios to integers, multiply each term by the LCM of the denominators.

Proportional Division

Share of a person = (Individual Ratio / Total Ratio Sum) × Total Amount.

Q65. Answer: (a) 151

Shortcut Trick

The average of the first n odd natural numbers is always n.

Given n = 151.

Therefore Average = 151.

Therefore The correct answer is 151.

Alternate Method

Given:

Number of terms (n) = 151

The sequence of first 151 odd numbers is 1, 3, 5, ..., l

Formula Used:

Average of an Arithmetic Progression (AP) = (First term + Last term) ÷ 2

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Last term (l) of n odd numbers = 2n − 1
Calculations:
=> First term (a) = 1
=> Last term (l) = 2 × 151 − 1 = 302 − 1 = 301
=> Average = (1 + 301) ÷ 2
=> Average = 302 ÷ 2
=> Average = 151
Therefore The correct answer is 151.
Additional Information
Sum of First n Odd Numbers
The sum of the first n odd natural numbers is always n^2.
Average of First n Even Numbers
The average of the first n even natural numbers is (n + 1).
Average of First n Natural Numbers
The average of the first n natural numbers (1, 2, 3...n) is (n + 1) ÷ 2.

Q66. Answer: (b) 9,120

Shortcut Trick
If Simple Interest and Time are equal for both parts, the Principal Ratio is the inverse of the Rate Ratio.
Ratio of Investment (P1 : P2) = R2 : R1 = 4 : 6 = 2 : 3
Total Ratio Parts = 2 + 3 = 5 units
Total Investment = Rs. 22,800 => 1 unit = 22,800 ÷ 5 = Rs. 4,560
Sum invested at 6% (P1) = 2 × 4,560 = Rs. 9,120
Therefore The correct answer is Rs. 9,120.
Alternate Method
Given: Total Sum = Rs. 22,800, Rate 1 (R1) = 6%, Rate 2 (R2) = 4%, Time (T) = 8 years.
Formula Used: Simple Interest (SI) = (P × R × T) ÷ 100
Let the two parts be P1 and P2.
=> SI1 = SI2
=> (P1 × 6 × 8) ÷ 100 = (P2 × 4 × 8) ÷ 100
=> 6P1 = 4P2
=> P1 / P2 = 4 / 6 = 2 / 3
=> P1 = [2 ÷ (2 + 3)] × 22,800
=> P1 = (2 ÷ 5) × 22,800
=> P1 = 2 × 4,560 = 9,120
Therefore The correct answer is Rs. 9,120.
Additional Information
Simple Interest Formula
The basic formula for Simple Interest is SI = (P × R × T) ÷ 100, where P is Principal, R is Rate, and T is Time.
Equal Amounts Condition
If Amounts (Principal + Interest) are equal after time T1 and T2, the Principal Ratio is: P1 : P2 = 1/(100 + R1T1) : 1/(100 + R2T2).
Relationship of Principal and Rate
When Interest and Time are constant, the Principal is inversely proportional to the Rate (P prop. to 1/R).

Q67. Answer: (d) Rs. 2,400

Shortcut Trick
Ratio of Profit = Ratio of Investment = 2 : 22 : 70.
Total ratio parts = 2 + 22 + 70 = 94 units.
94 units = Rs. 4,700 => 1 unit = 4700 ÷ 94 = Rs. 50.
Difference between Q and R = 70 − 22 = 48 units.
Difference in profit = 48 × 50 = Rs. 2,400.
Therefore The correct answer is Rs. 2,400.

Alternate Method

Given → Investment Ratio (P:Q:R) = 2:22:70 | Total Profit = Rs. 4,700.

Formulas: Profit Share = (Individual Ratio ÷ Total Ratio) × Total Profit | Difference = Profit_R − Profit_Q.

=> Sum of ratios = 2 + 22 + 70 = 94.

=> Profit of Q = (22 ÷ 94) × 4700 = 22 × 50 = Rs. 1,100.

=> Profit of R = (70 ÷ 94) × 4700 = 70 × 50 = Rs. 3,500.

=> Difference = 3500 − 1100 = Rs. 2,400.

Therefore The correct answer is Rs. 2,400.

Additional Information

Partnership Principle

When the time period of investment is the same for all partners, the profit is distributed directly in the ratio of their capital investments.

Variable Time Investment

If time periods differ, Profit Ratio = (Capital1 × Time1) : (Capital2 × Time2).

Q68. Answer: (b) 48 : 55

Shortcut Trick

Convert each ratio to its decimal equivalent or approximate percentage to compare.

30 ÷ 53 ≈ 0.56 | 48 ÷ 55 ≈ 0.87 | 22 ÷ 51 ≈ 0.43 | 40 ÷ 90 ≈ 0.44

Since 0.87 is the highest value, 48 : 55 is the greatest ratio.

Therefore The correct answer is 48 : 55.

Alternate Method

Given: Ratios are 30/53, 48/55, 22/51, and 40/90.

Calculations:

=> Ratio 1: 30 ÷ 53 = 0.566

=> Ratio 2: 48 ÷ 55 = 0.872

=> Ratio 3: 22 ÷ 51 = 0.431

=> Ratio 4: 40 ÷ 90 = 0.444

=> Comparing all values: 0.872 > 0.566 > 0.444 > 0.431

Therefore The correct answer is 48 : 55.

Additional Information

Comparison by Cross-Multiplication

For two fractions a/b and c/d, if a × d > b × c, then a/b > c/d.

Percentage Conversion

Multiply the fraction by 100 to find the percentage. A higher percentage signifies a greater ratio.

Like Denominator Method

Find the LCM of all denominators and convert all fractions to have the same denominator; the one with the largest numerator is greatest.

Q69. Answer: (b) 158 square cm.

Shortcut Trick

Direct formula for Surface Area: 2 × (lb + bh + lh)

Surface Area = 2 × (3 × 5 + 5 × 8 + 8 × 3)

Surface Area = 2 × (15 + 40 + 24) = 2 × 79

Therefore The correct answer is 158 square cm.

Alternate Method

Given:

Length (l) = 3 cm

Breadth (b) = 5 cm

Height (h) = 8 cm

Formula Used:

Total Surface Area (TSA) of Cuboid = 2(lb + bh + hl)

Calculations:

=> Surface Area = 2 × [(3 × 5) + (5 × 8) + (8 × 3)]
=> Surface Area = 2 × [15 + 40 + 24]
=> Surface Area = 2 × [79]
=> Surface Area = 158 square cm
Therefore The correct answer is 158 square cm.
Additional Information
Volume of Cuboid
The space occupied by the cuboid is calculated as Volume = Length × Breadth × Height (l × b × h).
Lateral Surface Area
The area of the four side faces (excluding top and bottom) is given by LSA = 2h(l + b).
Diagonal of a Cuboid
The longest rod that can be placed in a cuboid has length = $\sqrt{(l^2 + b^2 + h^2)}$.

Q70. Answer: (b) 10

Shortcut Trick
Identify the nearest perfect square to 90.
$9^2 = 81$ and $10^2 = 100$.
Since 9 × 10 = 90, the numbers are 9 and 10.
The greater number is 10.
Therefore The correct answer is 10.
Alternate Method
Given: Product of two consecutive natural numbers = 90.
Formula: Let the smaller number be x, then the greater number is (x + 1).
=> $x(x + 1) = 90$
=> $x^2 + x - 90 = 0$
=> $x^2 + 10x - 9x - 90 = 0$
=> $x(x + 10) - 9(x + 10) = 0$
=> $(x + 10)(x - 9) = 0$
=> x = 9 (as x must be a natural number)
=> Greater number = x + 1 = 9 + 1 = 10
Therefore The correct answer is 10.
Additional Information
Consecutive Numbers
Numbers that follow each other in order from smallest to largest without gaps (e.g., n, n+1, n+2).
Quadratic Roots
For $x^2 + bx + c = 0$, the sum of roots is −b and the product of roots is c.
Natural Numbers
Positive integers starting from 1 (1, 2, 3, ...). They do not include zero or negative values.

Q71. Answer: (c) 38, 158

Logic: second number = first number + 120.
165 = 45 + 120
144 = 24 + 120
Similarly,
38, 158
158 = 120 + 38.
Hence, the correct answer is "Option 3"

Q72. Answer: (a) IFBJ

The logic followed here is:
Hence, the correct answer is "Option 1"

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Q73. Answer: (a) 29

Given : 6 − 4 × 85 + 5 ÷ 22 = ?

BODMAS Rule:

Given the interchange rules:

'+' and '÷' are interchanged, and '−' and '×' are interchanged.

6 × 4 − 85 ÷ 5 + 22 = ?

6 × 4 − 17 + 22 = ?

24 + 22 − 17 = ?

46 − 17 = ?

29.

Hence, the correct answer is "Option 1"

Q74. Answer: (a) PMK 9

The logic followed here is:

Hence, the correct answer is "Option 1"

Q75. Answer: (c) NEX

The logic followed here is:

Hence, the correct answer is "Option 3"

Q76. Answer: (a) father of son's wife

By using the symbols in the table given below, we can draw the following family tree:

As per the given information,

R is wife of U and S is mother of R.

Hence, the correct answer is "Option 1"

Q77. Answer: (a) 547

The logic follows here,

Hence, the correct answer is "Option 1"

Q78. Answer: (a) RM-VP

The logic followed here is:

Hence, the correct answer is "Option 1"

Q79. Answer: (d) QNHB

The logic followed here is:

Hence, the correct answer is "Option 4"

Q80. Answer: (b) One

Given (Left) 7 # * © & 8 4 & 6 1 5 9 € 8 $ * 6 6 8 5 7 7 (Right)

Required Condition: Symbol - Number - Symbol

(Left) 7 # * © & 8 4 & 6 1 5 9 € 8 $ * 6 6 8 5 7 7 (Right)

Hence, the correct answer is "Option 2"

Q81. Answer: (b) Northwest

- Town A is to the west of Town B.
- Town C is to the south of Town A.
- Town D is to the east of Town C.
- Town E is to the west of Town A

The Final Diagram,

Hence, the correct answer is "Option 2"

Q82. Answer: (c) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram for the given statements is as shown below :

Conclusions (I): No roof is a wall—False (Some walls are roofs.And some roofs are walls. Hence, it is false.)

Conclusions (II): Some floors are roofs. - False (As their is no direct relation between floors and roofs, maybe it is possible but not definite. Hence, it is false.

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 3"

Q83. Answer: (c) 7

Total people = 43

• Kishor is 24th from the left → position = 24

• Monu is 12th from the right → position from left = 43−12+1=3243−12+1=32 43 - 12 + 1 = 32

Number of people between them:

(32−24)−1=8−1=7|32 - 24| - 1 = 8 - 1 = 7

Hence, the correct answer is "Option 3"

Q84. Answer: (d) BF-AC

The logic followed here is:

Hence, the correct answer is "Option 4"

Q85. Answer: (b) $

'YARN' is coded as '25#@' and 'ARTY' is coded as '#$52'

'YARN' - '2 5 # @ '

'ARTY' - '# $ 5 2 '

Code for T is $.

Hence, the correct answer is "Option 2"

Q86. Answer: (d) 92

The logic follows here,

Hence, the correct answer is "Option 4"

Q87. Answer: (c) None

Given number 2 7 8 6 4 3 1

Ascending order 1 2 3 4 6 7 8

No digit will remain unchanged as compared to that in the original number

Hence, the correct answer is "Option 3"

Q88. Answer: (a) 2 km to the West

Paula starts from Point A and drives 5 km towards South.

• He then takes a right turn, drives 9 km, turns right and drives 13 km.

• He then takes a right turn and drives 11 km.

• He takes a final right turn, drives 8 km and stops at Point P.

The Final Diagram,

Hence, the correct answer is "Option 1"

Q89. Answer: (d) Two

Seven people, I, J, K, L, P, Q and R are sitting in a row, facing north.

• Only two people sit between J and I.

• Only P sits to the right of K.

• Only one person sits between I and K.

• Q sits at some place to the right of L but at some place to the left of R.

The Final Arrangement is

Hence, the correct answer is "Option 4"

Q90. Answer: (c) GOLD - LGOD - DLOG

The logic follows here,

Similarly,

Hence, the correct answer is "Option 3"

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Q91. Answer: (b) Four

Seven people A, B, C, D, E, F and G are sitting in a row, facing the north.

• F sits sixth from the right end of the row.

• Only two people sit between E and F.

• A sits to the right of E but left of G.

• D sits third to the left of C

The Final Arrangement is,

Hence, the correct answer is "Option 2"

Q92. Answer: (d) JUST - TUJS - USJT

The logic follows here,

Similarly,

Hence, the correct answer is "Option 4"

Q93. Answer: (a) 4

Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order.

• Only two boxes are kept between C and E.

• Only A is kept above B.

• No box is kept below E.

• F is kept at some place below D but at some place above G.

The Final Arrangement is,

A
B
D
C
F
G
E

Hence, the correct answer is "Option 1"

Q94. Answer: (b) 5

'MEAT' is coded as '4257' and 'TURN' is coded as '1365'

'MEAT' - '4257'

'TURN' - '1365'

Code for T is 5.

Hence, the correct answer is "Option 2"

Q95. Answer: (a) 12

Given (Left) 4138 2345 6367 5353 1276 (Right)

The resultant first digit of the largest number is multiplied to the second digit of the smallest number.

6367, 1276 = 6 x 2.

12.

Hence, the correct answer is "Option 1"

Q96. Answer: (b) 17

Given 46 − 2 ÷ 10 + 3 × 24 = ?

'+' and '×' are interchanged, and '−' and '÷' are interchanged

BODMAS Rule:

46 ÷ 2 -10 '× 3 + 24 = ?

23 -10 '× 3 + 24 = ?

23 - 30 + 24 = ?

47 - 30 = 17.

Hence, the correct answer is "Option 2"

Q97. Answer: (c) 63

The logic follows here,

Hence, the correct answer is "Option 3"

Q98. Answer: (a) Both conclusions (I) and (II) follow.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I) Some melons are oranges.- True ('All oranges are melons.Some oranges are melons, and some melons are oranges this is true)

(II) All grapes are melons.- True (All grapes are oranges.All orange are melons. Hence, it is True)

Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 1"

Q99. Answer: (d) 15

Given number : 95423671

1 is subtracted from each even digit

Product of the digits that are third from the left and third from the right in the new number formed.

3 x 5 = 15.

Q100. Answer: (c) 10

Total people = 38

• Harman is 15th from the right → position from left

=38−15+1=24=38−15+1=24=38−15+1=24 = 38 - 15 + 1 = 24

• Hinal is 13th from the left → position = 13

Number of people between them:

(24 - 13) - 1 = 10.

Hence, the correct answer is "Option 3"

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