RRB NTPC (UG) CBT-I Official Paper (Held On: 03 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 government launched a cryogenic facility to preserve endangered plant species in February 2025?

(a) Kerala
(b) Karnataka
(c) Telangana
(d) Tamil Nadu

Q2. Under Article 254(2) of the Indian Constitution, a State law repugnant to a Central law can prevail in the State only if:

(a) it is passed by a special majority in the State Legislature
(b) It is published in the State Gazette after legislative approval
(c) it is reserved for the President's consideration and gets his assent
(d) it is certified by the Governor as necessary for public welfare

Q3. Which of the following Articles of the Constitution of India empowers the President to declare Scheduled Areas?

(a) Article 370
(b) Article 338
(c) Article 244
(d) Article 146

Q4. Who among the following scientists is credited with the development of the modern Periodic Law?

(a) Ernest Rutherford
(b) Dmitri Mendeleev
(c) John Dalton
(d) J.J. Thomson

Q5. Which of the following places is most likely to experience an equable climate with minimal seasonal variation due to its proximity to the sea?

(a) Mumbai
(b) Amritsar
(c) Bhopal
(d) Delhi

Q6. Which tunnel was inaugurated by Prime Minister Narendra Modi in Jammu and Kashmir on 13 January 2025?

(a) Banihal Qazigund tunnel
(b) Sonamarg tunnel
(c) Chenani-Nashri tunnel
(d) Nandni tunnel

Q7. Which Indian institute was officially notified as an 'Institution Deemed to be University' by the Union Ministry of Education?

(a) Film and Television Institute of India (FTII), Pune
(b) Indian Institute of Mass Communication (IIMC), New Delhi
(c) K R Narayanan National Institute of Visual Science and Arts, Kerala
(d) National School of Drama (NSD), Delhi

Q8. Gender disparities significantly affect human development outcomes. Which of the following indicators is NOT part of the Gender Inequality Index (GII)?

(a) Maternal mortality
(b) Political representation
(c) Food consumption
(d) Labour force participation

Q9. The Priest-King statue from Mohenjo-daro, a famous stone sculpture, is predominantly made of which of the following substances?

(a) Terracotta
(b) Steatite
(c) Bronze
(d) Limestone

Q10. Which Indian non-profit, profiled by IEEE Spectrum (December 2024), built AI models to predict adverse TB outcomes?

(a) Piramal Swasthya
(b) Wadhwani AI
(c) e-VIN
(d) PATH India

Q11. Under Article 5 of the Indian Constitution, which of the following is NOT required for a person to be considered a citizen at the commencement of the Constitution?

(a) Holding an Indian passport
(b) Having at least one parent born in India
(c) Having domicile in the territory of India
(d) Being born in India

Q12. Which Constitutional Amendment removed the Right to Property from the list of Fundamental Rights in India?

(a) 44th Amendment Act, 1978
(b) 42nd Amendment Act, 1976
(c) 52nd Amendment Act, 1985
(d) 73rd Amendment Act, 1992

Q13. Which of the following mountain ranges belongs to the Peninsular Plateau?

(a) Shivalik range
(b) Zanskar range
(c) Ajanta range
(d) Karakoram range

Q14. As announced on 30 April 2025, what major decision did the Indian Cabinet take regarding the upcoming decennial census?

(a) To conduct the first ever digital-only census
(b) To postpone the census indefinitely
(c) To include a caste-based enumeration in the next census
(d) To eliminate caste data collection

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Q15. Which of the following energy sources remained the dominant contributor to India's renewable energy growth, accounting for 47% of the total installed renewable energy capacity in 2024?

(a) Bio-Power
(b) Solar Power
(c) Wind Power
(d) Small Hydro Power

Q16. Which of these elements is NOT part of the standard Windows 7 desktop?

(a) Start Button
(b) Taskbar
(c) Notification Area
(d) Control Panel

Q17. Which Union Territory of India is located in the Arabian Sea?

(a) Andaman and Nicobar Islands
(b) Chandigarh
(c) Lakshadweep
(d) Puducherry

Q18. What was one of the key effects of globalisation on the Indian economy after 1991?

(a) Reduction in foreign exchange reserves
(b) Entry of foreign companies and capital
(c) Closure of Indian banks
(d) Decrease in exports

Q19. Union Cabinet approved PM-Surya Ghar: Muft Bijli Yojana in 2024, to provide subsidy for the installation of rooftop solar in how many households across India?

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

Q20. Which of the following options is used to change the system settings in MS Windows?

(a) Command Prompt
(b) Control Panel
(c) File Explorer
(d) Task Manager

Q21. Which country topped the World Press Freedom Index, 2025, released by Reporters Without Borders (RSF)?

(a) Finland
(b) Norway
(c) Denmark
(d) Sweden

Q22. Lakhwar Multipurpose Project belongs to which state?

(a) Uttar Pradesh
(b) Rajasthan
(c) Madhya Pradesh
(d) Uttarakhand

Q23. Which of the following is an example of globalisation in India post-1991?

(a) Nationalisation of major private banks
(b) Licensing requirement for all businesses
(c) Entry of multinational companies like Amazon and Apple
(d) Closure of ports

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Q24. Which Act ended the monopoly of the East India Company over trade with India?

(a) Pitt's India Act of 1784
(b) Regulating Act of 1773
(c) Charter Act of 1833
(d) Charter Act of 1813

Q25. Who hosted the 6th BIMTEC Summit in April 2025?

(a) Bhutan
(b) Thailand
(c) Indonesia
(d) Sri Lanka

Q26. What is self-induction?

(a) Induction of EMF in one coil due to a current in a nearby coil
(b) Induction of EMF in a coil due to motion in a magnetic field
(c) Induction of EMF in a coil due to a change in its own current
(d) Generation of current in a coil due to temperature changes

Q27. Who among the following led the official media briefing on India's Operation Sindoor in May 2025?

(a) Foreign Secretary Vikram Misri and Defence Minister Rajnath Singh
(b) Lt Gen Rajiv Ghai and Commodore Raghu R Nair
(c) General Anil Chauhan and Air Marshal AK Bharti
(d) Colonel Sofiya Qureshi and Wing Commander Vyomika Singh

Q28. Which method is employed in the refining of petroleum to separate crude oil from high boiling point fractions like lubricating oils?

(a) Vacuum filtration
(b) Differential extraction
(c) Rotary sublimation
(d) Fractional distillation

Q29. Which of the four Vedas is traditionally paired with the Upaveda known as Gandharvaveda?

(a) Yajurveda
(b) Atharvaveda
(c) Samaveda
(d) Rigveda

Q30. At the 8th Indian Ocean Conference held in Muscat on 16-17 February 2025, which theme was unveiled to enhance maritime partnerships among member nations?

(a) Bridging Oceans: A New Era
(b) Navigating New Waters
(c) Voyage to New Horizons of Maritime Partnership
(d) Strengthening Maritime Alliances

Q31. Researchers from which Indian institute developed an advanced agricultural robot designed to detect plant diseases and apply pesticides precisely?

(a) Indian Institute of Technology Delhi (IIT-D)
(b) Indian Institute of Technology Bombay (IIT-B)
(c) Indian Institute of Technology Madras (IIT-M)
(d) Indian Institute of Technology Kharagpur (IIT-KGP)

Q32. The Kherwar movement was led by which charismatic leader?

(a) Bhagirath Manjhi
(b) Birsa Munda
(c) Sidhu Murmu

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(d) Tilka Manjhi

Q33. Bori, which is considered to be the first Lower Palaeolithic site, is in which of the following states of India?

(a) Gujarat
(b) Arunachal Pradesh
(c) Tamil Nadu
(d) Maharashtra

Q34. Who is the Director General of Sashastra Seema Bal (SSB) as of May 2025?

(a) Amrit Mohan Prasad
(b) Somit Joshi
(c) Daljit Singh Chaudhary
(d) Anupama Nilekar Chandra

Q35. Where was the 6th summit of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) held on 4 April 2025?

(a) New Delhi
(b) Colombo
(c) Bangkok
(d) Dhaka

Q36. During the Mauryan period, the village headman in North India was known by _____.

(a) Gavunda
(b) Gramika
(c) Mununda
(d) Pattakila

Q37. Which of the following states hosted the 7th edition of the Khelo India Youth Games in May 2025 along with New Delhi?

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

Q38. Employment generation became a focus in later Five-Year Plans. Which Five-Year Plan introduced the Integrated Rural Development Programme (IRDP)?

(a) Seventh Plan
(b) Fourth Plan
(c) Fifth Plan
(d) Sixth Plan

Q39. What is the primary function of the Public Accounts Committee (PAC) of the Indian Parliament?

(a) To review CAG audit reports
(b) To evaluate government schemes
(c) To recommend the Union Budget
(d) To assist in the election of the Speaker

Q40. During the 1857 Revolt, Indian sepoys declared which of the following as their symbolic leader?

(a) Tantia Tope
(b) Rani Lakshmibai
(c) Nana Saheb
(d) Bahadur Shah II

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MATHEMATICS

Q41. The number 726179 is divisible by which of the following?

(a) 23
(b) 29
(c) 28
(d) 20

Q42. ABCD is a quadrilateral such that angle A = 47°, angle B = 66°, angle C = 133° and angle D = 114°. What type of a quadrilateral is ABCD?

(a) Trapezium
(b) Rhombus
(c) Cyclic Quadrilateral
(d) Parallelogram

Q43. If the radius of a sphere is 24 cm, then its surface area is:

(a) 2374 π cm^2
(b) 2280 π cm2
(c) 2304 π cm2
(d) 2330 π cm2

Q44. If 3 times the mother's age is 29 years more than 5 times her daughter's age, and 2 times the daughter's age is 2 years less than the mother's age, then what is the difference (in years) between the ages of the mother and the daughter?

(a) 25
(b) 24
(c) 29
(d) 23

Q45. The LCM of $3^3 \times 9^2 \times 1^3$, $3^2 \times 13^2 \times 1^8$ and $9^3 \times 13^2 \times 18^2$ is

(a) $2^2 \times 3^{11} \times 13^2$
(b) 22 × 310 × 132
(c) 2^3 × 310 × 132
(d) 22 × 3^9 × 132

Q46. Simplify $(x^2-9)\times (9x^2-1)/((x-1/3)\times (1-x/3))\times 9/((x+1/3)\times (1+x/3))$

(a) -729
(b) 729
(c) -81
(d) 81

Q47. The H.C.F. and the L.C.M. of two numbers are 8 and 4200, respectively. If one of the numbers is 168, find the other one.

(a) 100
(b) 200
(c) 300
(d) 400

Q48. A man driving a car at a speed of 48 km/hr crosses a bridge in 4.6 minutes. Find the length of the bridge.

(a) 4.35 km
(b) 3.92 km
(c) 2.75 km
(d) 3.68 km

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Q49. The product of two positive numbers is 2000. If the first number is five times the second number, then the sum of the two numbers is:

(a) 120
(b) 133
(c) 121
(d) 125

Q50. Pipe P can fill 2/7 part of a tank in 18 hours, and pipe Q can fill 5/9 part of the same tank in 25 hours. Both P and Q were kept open for 3 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 8 hours. Pipes P, Q and R together can fill the empty tank in:

(a) 25 hours
(b) 42 hours
(c) 38 hours
(d) 53 hours

Q51. The simple interest on a certain sum for 42/5 years at the rate of 7.6% per annum is Rs. 8,778. What will be the amount payable on the same sum at the rate of 4.8% per annum simple interest in 82/7 years?

(a) Rs. 36,699
(b) Rs. 36,698
(c) Rs. 36,690
(d) Rs. 36,672

Q52. Rs. 35,200 were divided among A, B and C, such that 8 times the share of A = 6 times the share of B = 3 times the share of C. Find the share of A.

(a) Rs. 7,040
(b) Rs. 7,220
(c) Rs. 7,197
(d) Rs. 6,872

Q53. 86 light bulbs were purchased for Rs. 86, and 14 light bulbs broke in transit. The trader sold the remaining light bulbs at Rs. 3.20 each. Find his profit.

(a) Rs. 144.40
(b) Rs. 141.30
(c) Rs. 137.10
(d) Rs. 141.10

Q54. A trader claims to sell fruits at a profit of 22%, but also dishonestly uses a weight which is 4% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round off the answer to the nearest whole number.)

(a) 24%
(b) 28%
(c) 27%
(d) 25%

Q55. The average weight of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 75 kg and 38 kg is:

(a) 52.6 kg
(b) 51.6 kg
(c) 50.6 kg
(d) 53.6 kg

Q56. Find the surface area of a cube, whose each side measures 9 cm

(a) 364 cm^2
(b) 324 cm2
(c) 486 cm2
(d) 729 cm2

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Q57. In an election between two candidates, 82% of the registered voters cast their vote and 4% of the votes polled were found invalid. The winning candidate got 60% of the valid votes and won the election by a margin of 1968 votes. How many voters were registered?

(a) 12502
(b) 12501
(c) 12500
(d) 12497

Q58. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 4% per month for 5 months.

(a) Rs. 20
(b) Rs. 40
(c) Rs. 120
(d) Rs. 240

Q59. The marked price of a wet grinder is Rs. 6,500. It was sold at two successive discounts of 5% and 4%. Find its selling price.

(a) Rs. 5,630
(b) Rs. 5,500
(c) Rs. 5,928
(d) Rs. 5,850

Q60. A publisher gives 15% discount on the printed price of a book to booksellers. What does a book seller pay (in Rs.) for a book whose printed price is Rs. 2,400?

(a) 2,140
(b) 2,420
(c) 2,004
(d) 2,040

Q61. The number of prime numbers lying between 332 and 343, both included, is:

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

Q62. The value of $2^2+\sqrt{(10^2)}-9\sqrt{16}-17$ is

(a) -39
(b) -48
(c) -36
(d) -31

Q63. A number, when increased by 60%, gives 3560. The number is:

(a) 2225
(b) 1112.5
(c) 6675
(d) 4450

Q64. A can lay railway track between two given stations in 17 days and B can do the same job in 12 days. With the help of C, they did the job in 3 days only. Then, C alone can do the job in

(a) 63/13 days
(b) 73/13 days
(c) 53/13 days
(d) 123/13 days

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Q65. Find the mean proportional of 225 and 4.

(a) 28
(b) 27
(c) 30
(d) 32

Q66. If $\sin\theta=(p^2-1)/(p^2+1)$ and θ is an acute angle, then find the value of $\cos\theta$.

(a) $2p/(p^2-1)$
(b) $(p^2+1)/2p$
(c) $2p/(p^2+1)$
(d) $(1+2p)/(p^2-1)$

Q67. In covering a distance of 52 km, Anmol takes 6 hours more than Nikhil. If Anmol doubles his speed, then he would take 7 hours less than Nikhil. Anmol's speed is:

(a) 4 km/hr
(b) 6 km/hr
(c) 2 km/hr
(d) 7 km/hr

Q68. The average weight of Salil, Mukund and Sachin is 45 kg. If the average weight of Salil and Mukund is 44 kg and that of Mukund and Sachin is 48 kg, then the weight of Mukund (in kg) is:

(a) 49
(b) 59
(c) 69
(d) 64

Q69. Simplify: $x(6x - 9) + 6(x^2 - 3) + 19$

(a) $12x^2 - 9x - 1$
(b) 12x2 − 9x +1
(c) -12x2 − 9x +1
(d) -12x2 − 9x −1

Q70. Pooja, Harsh, and Madhur invest Rs. 1,120, Rs. 1,320, and Rs. 1,160, respectively to start a business. If the profit at the end of the year is Rs. 1,080, then what is the share of Madhur in the profit?

(a) Rs. 348
(b) Rs. 349
(c) Rs. 351
(d) Rs. 347

GENERAL INTELLIGENCE AND REASONING

Q71. 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) HPJ
(b) QYR
(c) KSM
(d) NVP

Q72. I, J, K, L, O, P and Q are sitting around a circular table facing the centre of the table. Only two people sit between Q and K when counted from the right of Q. Only two people sit between K and O. Only three people sit between Q and P. I sits to the immediate left of L. Who sits third to the left of J?

(a) K
(b) L
(c) Q

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(d) I

Q73. Seven people, I, J, K, L, P, Q and R, are sitting in a row, facing north. Only two people sit to the right of K. Only two people sit between K and R. Only two people sit between I and Q. Q sits to the immediate left of K. L sits to the immediate right of P. Who sits at the third position from the left end of the row?

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

Q74. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

100 × 4 + 11 ÷ 2 − 18 = ?

(a) 27
(b) 15
(c) 21
(d) 36

Q75. What should come in place of the question mark (?) in the given series?

22 25 36 39 50 ?

(a) 54
(b) 53
(c) 52
(d) 55

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

ELJ HOM KRP NUS ?

(a) OVT
(b) QXT
(c) QXV
(d) QVT

Q77. 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) FIM
(b) ORV
(c) ZBF
(d) PSW

Q78. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

NUB 1, JQX 4, FMT 10, BIP 22, XEL 46, ?

(a) TAI 94
(b) TAH 94
(c) NAH 94
(d) TUH 94

Q79. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statement(s).

Statements:

Some Blueberries are Melons.

All Melons are Grapefruits.

Conclusions:

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I. No Blueberries are Grapefruits.

II. Some Grapefruits are Blueberries.

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

Q80. Refer to the five three-digit numbers given below and answer the question that follows.

(Left) 869 509 779 491 863 (Right)

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

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

If all the numbers are arranged in ascending order, the position of how many numbers will remain unchanged?

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

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

83 91 107 139 203 ?

(a) 335
(b) 321
(c) 332
(d) 331

Q82. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

25 × 5 − 18 ÷ 3 + 15 = ?

(a) 42
(b) 41
(c) 44
(d) 43

Q83. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

QMJ−GCZ

CYV−SOL

(a) UQN−JGC
(b) UPL−JFC
(c) VRO−LHE
(d) UPL−KGD

Q84. In a certain code language, 'RAID' is coded as '3527' and 'DOGS' is coded as '1346'. What is the code for 'D' in the given code language?

(a) 7
(b) 3
(c) 4
(d) 1

Q85. Umar starts from Point A and drives 7 km towards North. He then takes a right turn, drives 4 km, turns right and drives 11 km. He then takes a right turn and drives 9 km. He takes a final right turn, drives 4 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) 4 km to the North
(b) 5 km to the North

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(c) 4 km to the South
(d) 5 km to the East

Q86. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

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

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

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

Q87. 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.)

12, 53

25, 105

(a) 15, 55
(b) 5, 25
(c) 18, 72
(d) 20, 100

Q88. Seven boxes F, G, H, I, K, L, and O are kept one over the other but not necessarily in the same order. Only three boxes are kept above G. Only one box is kept between F and G. Only three boxes are kept between F and K. K is kept at some place above G. O is kept immediately below K. L is kept at one of the places above I. H is not kept immediately above or below F.

Which box is kept at the lowermost position?

(a) O
(b) F
(c) I
(d) H

Q89. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. No box is kept above F. Only three boxes are kept between F and E. Only one box is kept between C and A. A is kept immediately above E. Only four boxes are kept between C and B. D is kept at some place above G. How many boxes are kept between F and G?

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

Q90. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some planes are buses.

No bus is a truck.

Conclusions:

(I): No truck is a bus.

(II): Some buses are planes.

(a) Only conclusion (I) follows.

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

Q91. NMOK is related to QHRF in a certain way based on the English alphabetical order. In the same way, TCUA is related to WXXV. To which of the following is ZSAQ related, following the same logic?
(a) CNDL
(b) DOCK
(c) DNEM
(d) BMFG

Q92. Ravi starts from Point A and drives 8 km towards south. He then takes a left turn, drives 9 km, turns right and drives 5 km. He then takes a right turn and drives 4 km. He takes a final right turn, drives 13 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) 5 km towards west
(b) 13 km towards east
(c) 16 km towards west
(d) 16 km towards north

Q93. Each of the digits in the number 5312768 is arranged in ascending order from left to right. What will be the sum of the digits that are second from the left and second from the right in the new number thus formed?
(a) 9
(b) 6
(c) 8
(d) 7

Q94. Seven boxes P, Q, R, S, X, Y and Z are kept one over the other, but not necessarily in the same order. Only two boxes are kept between P and Z. Only X is kept above S. No box is kept below Z. R is kept at some place below Y, but at some place above Q. Which box is kept third above Q?
(a) Y
(b) R
(c) P
(d) S

Q95. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 8524796, then which of the following digits will be second from the right in the new number thus formed?
(a) 8
(b) 7
(c) 5
(d) 9

Q96. 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) PIR
(b) JCL
(c) MFO
(d) HAI

Q97. In a certain code language,
A $ B means ‘A is the mother of B’
A + B means ‘A is the brother of B’
A @ B means ‘A is the wife of B’
A ÷ B means ‘A is the father of B’

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

(a) Wife's father
(b) Wife's father's sister
(c) Father's mother
(d) Wife's father's mother

Q98. n a certain code language, 'GAVE' is coded as '4629' and 'AIDS' is coded as '1395'. What is the code for 'A' in the given code language?

(a) 5
(b) 9
(c) 6
(d) 1

Q99. SACU is related to YGIA in a certain way based on the English alphabetical order. In the same way, QYAS is related to WEGY. To which of the following is IQSK related, following the same logic?

(a) OLPI
(b) WQER
(c) OWYQ
(d) LOER

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

8 13 23 38 58 ?

(a) 85
(b) 80
(c) 83
(d) 90

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Tamil Nadu

The correct answer is Tamil Nadu.

Key Points

• The Tamil Nadu government launched a cryogenic facility in February 2025 to preserve endangered plant species.

• This initiative aims to ensure the long-term conservation of the state's rich biodiversity, especially rare and threatened plants.

• Cryogenic preservation involves storing seeds, pollen, and plant tissues at ultra-low temperatures (below -150°C) to maintain their viability for decades or even centuries.

• The facility is part of Tamil Nadu's efforts to combat biodiversity loss due to climate change, habitat destruction, and other anthropogenic factors.

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• It aligns with global conservation strategies under the Convention on Biological Diversity (CBD) and supports national biodiversity goals.

Additional Information

• Kerala

• Kerala is known for its rich biodiversity and conservation efforts through initiatives like the Silent Valley National Park and the Periyar Tiger Reserve.

• The state focuses on sustainable development and eco-tourism to protect its natural resources.

• Karnataka

• Karnataka is home to diverse ecosystems, including the Western Ghats, a UNESCO World Heritage Site.

• The state has several conservation programs, such as protecting its unique flora and fauna in Bandipur and Nagarhole National Parks.

• Telangana

• Telangana has undertaken various green initiatives, such as the Haritha Haram program, to increase forest cover and preserve biodiversity.

• While the state has focused on afforestation and biodiversity conservation.

Important Points

• Cryogenic Preservation

• Cryogenic preservation is a cutting-edge technology used to maintain the genetic material of species for long-term conservation.

• It helps protect species that are at risk of extinction due to habitat loss, climate change, or other challenges.

• This technology is widely used in seed banks, botanical research, and biodiversity conservation programs worldwide.

Q2. Answer: (c) it is reserved for the President's consideration and gets his assent

The correct answer is it is reserved for the President's consideration and gets his assent.

Key Points

• Article 254(2) of the Indian Constitution provides that if a State law is inconsistent with or repugnant to a Central law, the State law can still prevail in that State, but only if it is reserved for the President's consideration and receives his assent.

• This provision gives the State Legislature the ability to enact laws on subjects in the Concurrent List, even if they conflict with existing Central laws, provided the President approves.

• The President's assent effectively overrides the repugnancy between the State law and the Central law, making the State law operative within the State.

• However, Parliament retains the authority to override the State law by passing a new law on the same matter or amending the existing Central law.

• This provision ensures a balance of power between the Union and State legislatures while maintaining the supremacy of the Constitution.

Additional Information

• Article 254 of the Indian Constitution

• Article 254 addresses the inconsistencies between laws made by Parliament and State Legislatures on matters in the Concurrent List.

• Article 254(1) specifies that in case of a conflict between a Central and State law, the Central law shall prevail.

• Article 254(2) provides an exception, allowing a State law to prevail within the State if it receives the President's assent, despite its inconsistency with a Central law.

Q3. Answer: (c) Article 244

The correct answer is Article 244.

Key Points

• Article 244 of the Constitution of India empowers the President to declare certain areas as Scheduled Areas.

• Scheduled Areas are governed under the provisions of the Fifth Schedule of the Indian Constitution.

• These areas have a significant tribal population and are identified to ensure their socio-economic development and protection.

• The President, after consulting the Governor of the concerned state, declares the Scheduled Areas.

• The Fifth Schedule provides special provisions for administration and governance in these areas, including laws protecting tribal communities.

Additional Information

• Article 370:

• This article granted special status to Jammu and Kashmir, allowing the state to have its own Constitution and autonomy over internal matters, except defense, foreign affairs, and communications.

• It was abrogated on August 5, 2019, following the decision by the Indian Parliament.

• Post abrogation, Jammu and Kashmir became a Union Territory, and Ladakh was separated as another Union Territory.

• Article 338:

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

• The Commission is tasked with safeguarding the rights of Scheduled Castes and reviewing their socio-economic status.

• The NCSC submits annual reports to the President and recommends measures for the betterment of Scheduled Castes.

• Article 146:

• Article 146 deals with the conditions of service of the staff of the Supreme Court.

• It empowers the Chief Justice of India to appoint officers and servants of the Supreme Court, subject to certain rules approved by the President.

Q4. Answer: (b) Dmitri Mendeleev

The correct answer is Dmitri Mendeleev.

Key Points

• Dmitri Mendeleev, a Russian chemist, is credited with the development of the modern Periodic Law and the creation of the first Periodic Table in 1869.

• He organized elements based on their atomic masses and grouped them according to their chemical properties, predicting the existence and properties of yet-to-be-discovered elements.

• Mendeleev's Periodic Table allowed for the systematic arrangement of elements, enabling scientists to study their relationships and behaviors in a structured manner.

• His table was instrumental in the discovery of elements such as gallium, scandium, and germanium, which matched his predictions in terms of properties and atomic masses.

• The modern Periodic Table has since been refined to arrange elements by increasing atomic number instead of atomic mass, but Mendeleev's foundational work remains a cornerstone in chemistry.

Additional Information

• Ernest Rutherford

• Ernest Rutherford, known as the "Father of Nuclear Physics," discovered the nucleus of the atom in 1911 through his gold foil experiment.

• He proposed the planetary model of the atom, where electrons orbit a dense, positively charged nucleus.

• Rutherford's work laid the foundation for the understanding of atomic structure but is unrelated to the development of the Periodic Table.

• John Dalton

• John Dalton is known for his Atomic Theory, proposed in 1803, which stated that matter is made up of indivisible particles called atoms.

• He also introduced the concept of atomic weight and formulated the Law of Multiple Proportions.

• While Dalton's work was a significant step in understanding atomic structure, it preceded the development of the Periodic Table.

• J.J. Thomson

• J.J. Thomson discovered the electron in 1897 through his cathode ray tube experiment.

• He proposed the "Plum Pudding Model" of the atom, where electrons are embedded in a positively charged sphere.

• Thomson's contributions were pivotal in understanding subatomic particles but were unrelated to the creation of the Periodic Table.

Q5. Answer: (a) Mumbai

The correct answer is Mumbai.

Key Points

• Mumbai, being a coastal city located along the Arabian Sea, experiences a maritime climate, which is characterized by minimal seasonal temperature variation.

• Its close proximity to the sea ensures that the city benefits from the moderating effects of the ocean, leading to an equable climate.

• The temperature in Mumbai generally ranges from 25°C to 35°C throughout the year, with no extreme winters or summers.

• The high humidity levels in the region, due to its coastal location, further contribute to the steady and mild climate.

• Unlike inland cities, Mumbai's climate is less impacted by continental influences, providing it with relatively stable and consistent weather conditions.

Additional Information

• Amritsar:

• Amritsar is an inland city located in Punjab, far from any large water body, and thus experiences a continental climate.

• The city witnesses extreme seasonal variations, with very cold winters (temperatures dropping to 4°C) and hot summers (temperatures exceeding 40°C).

• Bhopal:

• Bhopal, located in central India, has a subtropical climate with moderate seasonal variations.

• While it does not experience the extreme weather of northern cities, it still lacks the moderating influence of the sea, leading to noticeable temperature fluctuations across seasons.

• Summers can be quite hot, with temperatures reaching up to 40°C, while winters are mild with temperatures dropping to around 10°C.

• Delhi:

• Delhi, the capital city of India, is located far from the sea and experiences a typical continental climate.

• It is known for its extreme temperature variations, with scorching summers (temperatures exceeding 45°C) and chilly winters (temperatures dropping below 5°C).

Q6. Answer: (b) Sonamarg tunnel

The correct answer is Sonamarg tunnel.

Key Points

• The Sonamarg tunnel (also known as the Z-Morh tunnel) was inaugurated by PM Narendra Modi on 13 January 2025 in Jammu and Kashmir.

• It is a 6.5 km long road tunnel connecting Gagangir and Sonamarg on the Srinagar-Leh National Highway.

• The tunnel provides year-round all-weather connectivity to Sonamarg and improves access toward Ladakh, enhancing tourism, defence logistics, and local economy.

Additional Information

• Banihal Qazigund tunnel

• Part of the Udhampur-Srinagar-Baramulla Rail Link (USBRL) project on the Jammu-Kashmir route connecting Banihal to Qazigund.

• Important for rail connectivity through Pir Panjal range

• Chenani-Nashri Tunnel

• Inaugurated in 2017, the Chenani-Nashri tunnel, renamed as the Dr. Syama Prasad Mookerjee tunnel, is the longest road tunnel in India (9.28 kilometers).

• This tunnel connects Udhampur and Ramban districts in Jammu and Kashmir, bypassing the treacherous Patnitop route.

• It is a bi-directional tunnel equipped with features such as Integrated Tunnel Control Rooms, video surveillance, and advanced ventilation systems.

• Nandni Tunnel

• The Nandni tunnel is part of the Jammu-Udhampur highway project, which aims to improve road connectivity in Jammu and Kashmir.

• It is a shorter tunnel compared to the Banihal Qazigund and Chenani-Nashri tunnels but plays a critical role in reducing travel time and avoiding landslide-prone areas.

Q7. Answer: (a) Film and Television Institute of India (FTII), Pune

The correct answer is Film and Television Institute of India (FTII), Pune.

Key Points

• The Film and Television Institute of India (FTII), located in Pune, Maharashtra, was officially notified as an 'Institution Deemed to be University' by the Union Ministry of Education.

• FTII is recognized as one of India's premier institutes for learning and training in the fields of film, television, and digital media production.

• Established in 1960, FTII has contributed significantly to the Indian film and television industry by producing renowned alumni such as Rajkumar Hirani, Shabana Azmi, and Naseeruddin Shah.

• The institute operates under the Ministry of Information and Broadcasting, Government of India, and offers a range of courses covering film direction, acting, cinematography, editing, and screenwriting.

• FTII's new status as a 'Deemed to be University' enables it to independently grant degrees, enhancing its academic autonomy and global recognition.

Additional Information

• Indian Institute of Mass Communication (IIMC), New Delhi:

• IIMC is a premier institute for journalism, advertising, and public relations education under the Ministry of Information and

Broadcasting, Government of India.

• Founded in 1965, the institute is renowned for its postgraduate diploma programs in English and regional journalism, advertising, public relations, and digital media.

• K R Narayanan National Institute of Visual Science and Arts, Kerala:

• Located in Kottayam, Kerala, this institute focuses on training and education in the visual and performing arts.

• It is named after K R Narayanan, the 10th President of India, and aims to foster innovation and creativity in the arts.

• National School of Drama (NSD), Delhi:

• NSD, established in 1959, is one of India's foremost institutions for theatre training and dramatic arts.

• It operates under the Ministry of Culture, Government of India, and offers a three-year diploma course in dramatic arts.

Q8. Answer: (c) Food consumption

The correct answer is Food consumption.

Key Points

• The Gender Inequality Index (GII) measures gender disparities across three key dimensions: reproductive health, empowerment, and labor market participation.

• Food consumption is not included in the GII as it focuses on broader social and economic disparities rather than individual dietary or nutritional patterns.

• The reproductive health dimension includes indicators such as maternal mortality ratio and adolescent birth rates.

• The empowerment dimension is assessed through political representation (proportion of parliamentary seats held by women) and educational attainment (secondary education levels among men and women).

• The labor market dimension accounts for labor force participation rates among women and men, reflecting economic activity and opportunities.

Additional Information

• Maternal Mortality:

• Maternal mortality ratio refers to the number of maternal deaths per 100,000 live births.

• It is a critical indicator of reproductive health and reflects access to healthcare and medical services for women during pregnancy and childbirth.

• High maternal mortality rates often signify inadequate healthcare infrastructure and gender disparities in access to medical services.

• Political Representation:

• Political representation measures the proportion of parliamentary seats held by women.

• This indicator highlights gender equality in decision-making and governance.

• Countries with higher political representation of women are often linked to better gender-sensitive policies and improved human development outcomes.

• Labor Force Participation:

• Labor force participation refers to the percentage of working-age individuals actively engaged in the workforce, either employed or seeking employment.

• The GII compares labor force participation rates for men and women to evaluate economic disparities.

• Lower female participation rates often point to social and structural barriers such as discrimination, lack of childcare support, or societal norms.

Important Points

• Gender Inequality Index (GII):

• The GII is a composite measure introduced by the United Nations Development Programme (UNDP) in the Human Development Report.

• It highlights disparities in gender-based outcomes across different countries.

• By focusing on reproductive health, empowerment, and labor force participation, it provides a comprehensive view of gender inequality globally.

Q9. Answer: (b) Steatite

The correct answer is Steatite.

Key Points

• The Priest-King statue from Mohenjo-daro is a famous artifact associated with the Indus Valley Civilization, which existed around 2500–1900 BCE.

• The statue is predominantly made of steatite, a soft stone that is easy to carve and was widely used by the artisans of the Indus Valley Civilization.

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• Steatite, also known as soapstone, was often treated through a process of heating, which gave it durability and a glazed appearance.

• The Priest-King statue is about 17.5 cm high and depicts a male figure adorned with a patterned robe and a prominent headdress, indicating its possible ceremonial or elite significance.

• This sculpture reflects the high level of craftsmanship and artistic skills of the Indus Valley artisans, showcasing intricate detailing and a sense of symmetry.

Additional Information

• Terracotta

• Terracotta is a type of earthenware made from clay that is fired to a reddish-brown color.

• It was extensively used by the Indus Valley Civilization for making figurines, toys, and pottery.

• Unlike steatite, terracotta artifacts are unglazed and have a more porous texture.

• Examples include small figurines of animals, carts, and human forms, showcasing everyday life and rituals of the civilization.

• Bronze

• Bronze is an alloy of copper and tin and was used by the Indus Valley Civilization to create tools, weapons, and sculptures.

• A famous example is the "Dancing Girl" statue, which is made of bronze and demonstrates the lost-wax casting technique.

• Unlike the Priest-King, which is made of steatite, bronze artifacts reflect the civilization's advanced knowledge of metallurgy.

• Limestone

• Limestone is a sedimentary rock composed largely of calcium carbonate, used in various ancient civilizations for construction and sculptures.

• However, there is no evidence of the Indus Valley Civilization using limestone for artifacts like the Priest-King statue.

• Limestone was more commonly associated with other ancient civilizations, such as the Egyptians, for building pyramids and statues.

Q10. Answer: (b) Wadhwani AI

The correct answer is Wadhwani AI.

Key Points

• Wadhwani AI, an India-based non-profit research institute, specializes in developing artificial intelligence (AI) solutions aimed at addressing challenges in public health, agriculture, and education.

• It was profiled by IEEE Spectrum in December 2024 for its pioneering work in building AI models to predict adverse outcomes of Tuberculosis (TB) in patients, helping improve early intervention strategies.

• Their AI model analyzes clinical, demographic, and socioeconomic data to identify high-risk TB cases, which aids healthcare workers in prioritizing treatment and resources.

• Wadhwani AI collaborates closely with the Indian government and health organizations to implement its solutions in real-world settings, ensuring scalability and accessibility.

• Their work aligns with India’s National Tuberculosis Elimination Program (NTEP), which seeks to eradicate TB by 2025, leveraging technology to improve diagnosis and treatment outcomes.

Additional Information

• Piramal Swasthya:

• A part of the Piramal Foundation, Piramal Swasthya focuses on improving access to healthcare services in underserved communities in India.

• It operates through telemedicine, mobile health services, and community outreach programs, addressing issues such as maternal and child health, non-communicable diseases, and communicable diseases.

• Although it plays a vital role in public health, it has not been recognized for developing AI-based TB prediction models.

• e-VIN (Electronic Vaccine Intelligence Network):

• An initiative by the Ministry of Health and Family Welfare (MoHFW), e-VIN is a digital platform aimed at strengthening immunization supply chain management in India.

• It ensures real-time tracking of vaccine stocks, storage temperatures, and distribution, improving vaccine availability and reducing wastage.

• While e-VIN is instrumental in vaccine management, it is unrelated to AI models for TB outcomes.

• PATH India:

• PATH is an international non-profit organization working on global health innovation, including in India.

• PATH India focuses on areas like maternal and child health, vaccines, nutrition, and diagnostics, leveraging technology to improve healthcare delivery.

• Although it contributes significantly to public health, it does not specialize in AI-based TB prediction models.

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Q11. Answer: (a) Holding an Indian passport

The correct answer is Holding an Indian passport.

Key Points

• Article 5 of the Indian Constitution specifies the conditions for citizenship at the commencement of the Constitution (January 26, 1950).

• It states that a person is deemed to be a citizen of India if they have their domicile in India and meet one of the following criteria:

• 1) They were born in India.

• 2) Either of their parents was born in India.

• 3) They have been ordinarily resident in India for not less than five years immediately preceding the commencement of the Constitution.

• Holding an Indian passport is not a criterion for citizenship under Article 5 at the commencement of the Constitution.

Additional Information

• Domicile in India

• Domicile means the permanent home of an individual where they intend to reside indefinitely.

• It is a critical requirement for citizenship under Article 5.

• Domicile can be acquired by birth, choice, or prolonged residence in a particular territory.

• Born in India

• Being born in India ensures citizenship under Article 5, provided that the individual also has domicile in India.

• This clause reflects the principle of jus soli (citizenship by birth).

• Birth within Indian territory automatically grants eligibility for citizenship at the commencement of the Constitution.

• Parent born in India

• Having at least one parent born in India ensures citizenship, aligning with the principle of jus sanguinis (citizenship by descent).

• This clause accommodates individuals who may not have been born in India but have familial ties to the country.

• Holding an Indian passport

• Passports are proof of citizenship but are not a criterion for determining citizenship under Article 5.

• At the commencement of the Constitution, citizenship was determined solely based on domicile, birth, or parentage.

Important Points

• Concept of Citizenship

• The Indian Constitution initially provided for citizenship under Articles 5 to 11.

• These provisions detailed citizenship at the commencement of the Constitution and empowered Parliament to regulate future citizenship.

• The Citizenship Act, 1955, later codified the procedures for acquisition, termination, and other aspects of Indian citizenship.

Q12. Answer: (a) 44th Amendment Act, 1978

The correct answer is 44th Amendment Act, 1978.

Key Points

• The 44th Amendment Act, 1978, removed the Right to Property from the list of Fundamental Rights under Part III of the Indian Constitution.

• It was shifted to Article 300A in Part XII of the Constitution, making it a legal right instead of a fundamental right.

• This amendment was enacted during the tenure of the Janata Party government led by Prime Minister Morarji Desai.

• The change was made to prevent the misuse of the Right to Property and ensure that property acquisition laws could not be easily challenged in courts.

• The Right to Property was earlier enshrined in Articles 19(1)(f) and 31, both of which were repealed by the 44th Amendment.

Additional Information

• 42nd Amendment Act, 1976

• Known as the "Mini Constitution," this amendment brought sweeping changes to the Indian Constitution.

• It added the words "Socialist," "Secular," and "Integrity" to the Preamble of the Constitution.

• It also introduced the concept of Fundamental Duties under Part IVA (Article 51A).

• The amendment curtailed the power of the judiciary and strengthened the executive and Parliament.

• 52nd Amendment Act, 1985

• This amendment introduced the Anti-Defection Law in India.

• It added the Tenth Schedule to the Constitution, which lays down the process for disqualification of members on the grounds of defection.

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• The law aimed to curb political instability caused by elected members switching parties for personal gain.
• 73rd Amendment Act, 1992
• This amendment provided constitutional status to Panchayati Raj Institutions (PRIs).
• It added Part IX and the Eleventh Schedule to the Constitution, detailing the powers, authority, and responsibilities of PRIs.
• It was aimed at decentralizing governance and promoting grassroots democracy in India.

Important Points

• Right to Property as a Legal Right (Article 300A)
• After its removal as a Fundamental Right, the Right to Property became a legal right under Article 300A.
• It states that no person shall be deprived of their property except by authority of law.
• As a legal right, it can be regulated by ordinary laws and is no longer protected under the Constitution's Fundamental Rights.

Q13. Answer: (c) Ajanta range

The correct answer is Ajanta range.

Key Points

• The Ajanta range is part of the Peninsular Plateau, specifically located in the western part of Maharashtra.
• This range is known for its undulating terrain and forms part of the Deccan Plateau, which is one of the oldest landmasses in India.
• The Ajanta range is also home to the famous Ajanta Caves, a UNESCO World Heritage Site that dates back to the 2nd century BCE.
• Geologically, the range is composed of volcanic rocks, primarily basalt, which is characteristic of the Deccan Traps.
• The Ajanta range plays a crucial role in influencing the local climate and acts as a watershed for several rivers in the region.

Additional Information

• Shivalik range:
• The Shivalik range, also known as the Outer Himalayas, is the southernmost mountain range of the Himalayan system.
• It stretches from Jammu and Kashmir in the west to Arunachal Pradesh in the east, covering parts of Himachal Pradesh, Uttarakhand, and other states.
• This range is geologically young and is composed of unconsolidated sediments such as sand, gravel, and silt.
• It is not part of the Peninsular Plateau but instead belongs to the Himalayan mountain system.
• Zanskar range:
• The Zanskar range is a part of the Trans-Himalayan region and lies in the northern state of Ladakh.
• It is a high-altitude range with peaks exceeding 6,000 meters and is characterized by extreme climatic conditions.
• The Zanskar range is home to many glaciers and serves as a source for rivers like the Zanskar River.
• This range does not belong to the Peninsular Plateau as it is part of the Himalayan system.
• Karakoram range:
• The Karakoram range is one of the major mountain ranges in the northern region of the Indian subcontinent, extending across India, Pakistan, and China.
• It is known for housing some of the world’s highest peaks, including K2, the second-highest mountain in the world.
• The range is characterized by glaciers such as the Siachen Glacier and Baltoro Glacier.
• As part of the Himalayan mountain system, the Karakoram range is not associated with the Peninsular Plateau.
• Peninsular Plateau:
• The Peninsular Plateau is one of the oldest and most stable landmasses in India, covering large parts of southern and central India.
• It is divided into two main sections: the Central Highlands and the Deccan Plateau.
• The plateau is characterized by flat-topped hills, valleys, and volcanic rock formations like the Deccan Traps.
• Major mountain ranges of the Peninsular Plateau include the Aravalli Hills, Satpura range, Vindhya range, and Ajanta range.

Q14. Answer: (c) To include a caste-based enumeration in the next census

The correct answer is To include a caste-based enumeration in the next census.

Key Points

• On 30 April 2025, the Cabinet Committee on Political Affairs (CCPA) decided to include caste enumeration in the upcoming decennial census exercise.
• This will be the first time in decades that comprehensive caste data beyond SC/ST categories is collected nationwide during the census.

• Caste data will be captured electronically during the census process, helping inform policy on reservation, socio-economic planning, and representation.

Additional Information

• To postpone the census indefinitely

• Postponing the census indefinitely would disrupt crucial data collection, which forms the basis for policy formulation, resource allocation, and governance in India.

• The census is conducted every 10 years, and postponement would hinder the availability of updated demographic data needed for development planning.

• To conduct the first ever digital-only census

• The 2027 Census is set to be digitally oriented with mobile apps and self-enumeration options, but the key announced cabinet decision on 30 April focused on caste inclusion.

• A digital component improves data quality and timeliness in census operations.

• To eliminate caste data collection

• Eliminating caste data collection from the census would affect the understanding of India's socio-economic structure and hinder targeted policy-making for marginalized communities.

• Caste data plays a critical role in designing affirmative action programs and understanding the needs of various social groups.

Q15. Answer: (b) Solar Power

The correct answer is Solar Power.

Key Points

• India's renewable energy sector has experienced remarkable growth, and solar power remains the largest contributor, accounting for approximately 47% of the total installed renewable energy capacity in 2024.

• The government has launched ambitious initiatives such as the National Solar Mission under the National Action Plan on Climate Change (NAPCC) to achieve substantial solar capacity targets.

• India’s target under the Paris Agreement includes achieving 500 GW of non-fossil fuel energy capacity by 2030, with solar energy playing a pivotal role.

• The country has become one of the world’s largest markets for solar energy, leveraging its geographical advantage of abundant sunlight and implementing large-scale solar parks.

• Solar power generation is supported by programs such as KUSUM (Kisan Urja Suraksha evam Utthaan Mahabhiyan), promoting solar water pumps and decentralized solar energy systems in rural areas.

• India’s solar capacity is driven by favorable policies, private sector investments, and international collaborations, including partnerships with the International Solar Alliance (ISA).

Additional Information

• Bio-Power:

• Bio-power refers to energy generated from biomass, such as agricultural residues, animal waste, and municipal solid waste.

• It contributes to India's renewable energy capacity but has a smaller share compared to solar and wind energy.

• Technologies such as biogas plants, cogeneration from sugar mills, and waste-to-energy plants are used to harness bio-power.

• India has significant potential for bio-energy, but challenges include high costs of technology and limited scalability.

• Wind Power:

• India is one of the largest producers of wind energy globally, with Tamil Nadu, Gujarat, and Maharashtra being leading states in wind capacity.

• Wind power contributes significantly to the renewable energy mix, accounting for around 35% of the installed capacity as of 2024.

• The government provides incentives such as Generation-Based Incentives (GBI) to encourage wind energy production.

• Challenges faced include the availability of suitable land and variability in wind speeds.

• Small Hydro Power:

• Small hydro power refers to hydroelectric projects with a capacity of up to 25 MW.

• India has a potential capacity of approximately 20,000 MW for small hydro projects, but its contribution to the total renewable energy mix is relatively modest.

• These projects are suitable for remote areas, offering decentralized energy solutions.

• Small hydro power faces challenges such as environmental concerns and high initial costs.

Important Points

• India’s Renewable Energy Goals:

• India aims to achieve 175 GW of renewable energy capacity by 2022, including 100 GW from solar energy, 60 GW from wind, 10 GW from bio-energy, and 5 GW from small hydro projects.

• The government is encouraging investments, offering subsidies, and implementing policy frameworks to promote renewable energy adoption.

• Renewable energy is vital for India to reduce greenhouse gas emissions, combat climate change, and achieve energy security.

Q16. Answer: (d) Control Panel

The correct answer is Control Panel.

Key Points

• The Control Panel is a management interface in Windows operating systems that allows users to configure system settings and manage hardware and software.

• It is not part of the standard Windows 7 desktop. Instead, it is accessed through the Start menu or by searching for it in the Start menu search bar.

• The Control Panel provides access to features such as user accounts, system security settings, and hardware configurations, among others.

• While the desktop typically includes elements like the Start Button, Taskbar, and Notification Area, the Control Panel is not directly displayed on the desktop by default.

• Users can create a shortcut to the Control Panel on the desktop, but it does not inherently belong to the standard desktop interface.

Additional Information

• Start Button:

• The Start Button is a fundamental part of the Windows desktop interface, allowing users to access the Start Menu.

• It provides access to installed programs, system settings, and a search bar for finding files or applications.

• In Windows 7, the Start Button is located in the lower-left corner of the screen.

• Taskbar:

• The Taskbar is a horizontal bar located at the bottom of the desktop in Windows 7.

• It displays open applications, pinned programs, and quick access to essential tools such as the Start Button and Notification Area.

• Users can customize the Taskbar by adding shortcuts or rearranging application icons.

• Notification Area:

• The Notification Area, also known as the system tray, is located on the right side of the Taskbar in Windows 7.

• It displays icons for system notifications, background applications, and quick access to functions such as volume control and network settings.

• The Notification Area is essential for monitoring system status and receiving alerts.

Q17. Answer: (c) Lakshadweep

The correct answer is Lakshadweep.

Key Points

• Lakshadweep is the only Union Territory of India located in the Arabian Sea.

• The name "Lakshadweep" translates to "a hundred thousand islands" in Malayalam, reflecting its geographical nature as a group of 36 islands.

• The territory covers a total area of only 32 square kilometers, making it the smallest Union Territory in India in terms of land area.

• It consists of 12 atolls, 3 reefs, and 5 submerged banks, with 10 inhabited islands. Kavaratti is the administrative headquarters.

• The islands are known for their pristine beaches, coral reefs, and unique biodiversity, making them a hub for eco-tourism and marine conservation efforts.

Additional Information

• Andaman and Nicobar Islands

• Located in the Bay of Bengal, the Andaman and Nicobar Islands are a group of 572 islands.

• These islands are known for their tribal population, rich biodiversity, and historical importance, such as the Cellular Jail in Port Blair.

• The islands are also a hub for marine biodiversity, including coral reefs and endangered species like dugongs and sea turtles.

• Chandigarh

• Chandigarh is a Union Territory that serves as the capital of two Indian states: Punjab and Haryana.

• It is known for its modern architecture and urban design, planned by Swiss-French architect Le Corbusier.

• Chandigarh is not located in any sea or ocean; it is an inland Union Territory in northern India.

• Puducherry

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• Puducherry (formerly Pondicherry) is a Union Territory located along the southeastern coast of India, on the Bay of Bengal.
• It consists of four small districts: Puducherry, Karaikal, Mahe, and Yanam, each geographically separated.
• The region is known for its French colonial heritage, serene beaches, and unique blend of Indian and French cultures.

Q18. Answer: (b) Entry of foreign companies and capital

The correct answer is Entry of foreign companies and capital.

Key Points

• Globalisation in India began with the economic reforms of 1991, which marked the liberalisation of the Indian economy by reducing trade barriers and encouraging foreign investments.
• One of the key outcomes of globalisation was the entry of multinational corporations (MNCs) and foreign capital into various sectors, including manufacturing, IT, banking, and retail.
• The Indian government allowed Foreign Direct Investment (FDI) in several industries, which led to an influx of foreign companies establishing operations in India.
• This increased foreign capital helped in improving infrastructure, generating employment, and enhancing technological advancements across industries.
• Globalisation also facilitated technology transfer from developed nations, boosting productivity and innovation in the Indian economy.

Additional Information

• Reduction in foreign exchange reserves (Option 1):
• Before the 1991 reforms, India faced a severe foreign exchange crisis, with reserves dwindling to just two weeks' worth of imports.
• However, post-liberalisation, foreign exchange reserves increased significantly due to foreign investment and export growth.
• Thus, globalisation actually helped improve reserves rather than reducing them.
• Closure of Indian banks (Option 3):
• Globalisation did not lead to the closure of Indian banks; instead, it encouraged reforms in the banking sector.
• Indian banks adopted modern technologies, improved operational efficiency, and expanded globally.
• Private sector banks like ICICI and HDFC Bank emerged stronger during this period.
• Decrease in exports (Option 4):
• Globalisation led to an increase in exports as Indian businesses gained access to international markets.
• India's export sector expanded in areas like IT services, textiles, and pharmaceuticals.
• Trade liberalisation policies and reduced tariffs further boosted export performance.

Q19. Answer: (d) One crore

The correct answer is One crore.

Key Points

• The Union Cabinet approved the PM-Surya Ghar: Muft Bijli Yojana in 2024 to promote renewable energy adoption in households across India.
• Under this scheme, the government aims to provide subsidies for the installation of rooftop solar panels in one crore households.
• This initiative aligns with India's commitment to achieving the target of 500 GW of non-fossil fuel energy capacity by 2030.
• The scheme is expected to significantly reduce electricity bills for households while promoting sustainable energy usage.
• It will also contribute to reducing the carbon footprint and achieving India's climate goals under the Paris Agreement.

Additional Information

• PM-Surya Ghar: Muft Bijli Yojana:
• PM-Surya Ghar: Muft Bijli Yojana is focused on boosting renewable energy adoption by providing subsidies for rooftop solar installations.
• It aims to reduce dependency on non-renewable energy sources, lower household electricity costs, and support India's climate and renewable energy goals.
• This scheme complements other government initiatives, such as the National Solar Mission and the Solar Rooftop Phase II Programme.

Q20. Answer: (b) Control Panel

The correct answer is Control Panel.

Key Points

• The Control Panel in MS Windows is a centralized interface for users to view and adjust system settings and manage hardware and software configurations.

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• It allows users to control system functions such as network settings, device management, user accounts, and appearance settings.

• Popular functionalities of the Control Panel include adding/removing software, managing user accounts, configuring network settings, and setting up hardware devices like printers and scanners.

• The Control Panel can be accessed via the Start menu or by searching for "Control Panel" in the Windows search bar.

• In newer versions of Windows, some settings from the Control Panel have been integrated into the Settings app, but the Control Panel remains an important tool for advanced configuration.

Additional Information

• Command Prompt

• The Command Prompt (cmd.exe) is a command-line interpreter application available in most Windows operating systems.

• It is used to execute entered commands, which can perform advanced administrative functions, troubleshoot system issues, or automate tasks via scripts.

• Examples of commands include navigating directories (cd), checking network configurations (ipconfig), or running executable files.

• While the Command Prompt is a powerful tool for advanced users, it is not designed to provide a graphical interface for changing system settings.

• File Explorer

• File Explorer is a file management tool in Windows, allowing users to browse, organize, and manage files and folders stored on their computer.

• It provides functionalities such as copying, moving, renaming, and deleting files, as well as accessing storage devices like hard drives, USBs, or network drives.

• File Explorer is focused on file management rather than modifying system settings.

• Task Manager

• Task Manager is a system monitoring tool that provides detailed information about running processes, system performance, and resource usage (e.g., CPU, memory, disk, and network).

• It allows users to end unresponsive applications, monitor startup programs, and analyze system performance in real time.

• While Task Manager is useful for troubleshooting and managing active processes, it does not serve as a tool for changing system settings.

Q21. Answer: (b) Norway

The correct answer is Norway.

Key Points

• Norway has consistently ranked as the top country in the World Press Freedom Index, reflecting its strong commitment to freedom of the press and protection of journalists.

• The World Press Freedom Index is published annually by Reporters Without Borders (RSF) to assess the state of journalism and media freedom worldwide.

• Norway's top ranking is attributed to its robust legal and institutional frameworks that guarantee the independence of the press and safeguard freedom of expression.

• In Norway, the government has minimal interference in media operations, and journalists are free from censorship or persecution.

• The country also has an exemplary model of public broadcasting, ensuring diverse and unbiased information dissemination to its citizens.

Additional Information

• Finland

• Finland has traditionally been ranked among the top countries in the World Press Freedom Index due to its high standards of press freedom and media independence.

• The Finnish constitution guarantees freedom of expression, and the country has a well-functioning legal framework for protecting journalists.

• Challenges to press freedom in Finland are minimal, with strong public trust in media institutions.

• Denmark

• Denmark consistently ranks highly in global press freedom rankings due to its transparent media environment and minimal restrictions on journalists.

• Journalists in Denmark operate without fear of harassment or censorship, and public service broadcasting plays a key role in maintaining a free and fair media landscape.

• Sweden

• Sweden is another Nordic country known for its strong commitment to press freedom and freedom of expression.

• The Swedish constitution protects journalistic activities, and the country has a long history of safeguarding media independence.

• However, like other Nordic countries, Sweden has seen an increase in online threats against journalists, which remains a concern.

Important Points

• World Press Freedom Index

• The World Press Freedom Index is an annual ranking published by Reporters Without Borders (RSF), evaluating the media landscape in over 180 countries.

• The index is based on criteria such as media independence, legislative framework, pluralism, and safety of journalists.

• Countries are scored on a scale from 0 (worst) to 100 (best), with higher scores indicating better press freedom.

• The purpose of the index is to highlight challenges faced by journalists and promote awareness of the importance of free and independent media in democratic societies.

Q22. Answer: (d) Uttarakhand

The correct answer is Uttarakhand.

Key Points

• The Lakhwar Multipurpose Project is located on the Yamuna River in the Dehradun district of Uttarakhand.

• The project primarily aims to provide irrigation facilities, hydropower generation, and drinking water supply to the region.

• It is a joint initiative between the Union government and the government of Uttarakhand under the National Projects Scheme.

• The dam has a planned storage capacity of approximately 330 million cubic meters and is expected to irrigate about 80,000 hectares of agricultural land.

• It includes a hydropower generation unit with a capacity of 300 MW, contributing to clean energy production in the region.

• This project is essential for flood mitigation, water conservation, and improving the availability of water resources in the Yamuna basin.

Additional Information

• Uttar Pradesh

• Uttar Pradesh is home to several irrigation and hydropower projects, such as the Tehri Dam, but the Lakhwar Multipurpose Project is not located here.

• Uttar Pradesh primarily relies on rivers like the Ganga, Yamuna, and Ghagra for its water-related projects.

• Rajasthan

• Rajasthan is known for its water conservation projects such as Indira Gandhi Canal, but it does not house the Lakhwar Multipurpose Project.

• The state focuses on managing water scarcity in arid regions rather than large-scale river dams.

• Madhya Pradesh

• Madhya Pradesh has significant water projects, including the Indira Sagar Dam and Sardar Sarovar Project, but the Lakhwar Multipurpose Project is not in this state.

• Its water projects are primarily focused on the Narmada River basin.

Q23. Answer: (c) Entry of multinational companies like Amazon and Apple

The correct answer is Entry of multinational companies like Amazon and Apple.

Key Points

• Globalisation in India post-1991 was marked by the liberalisation policies introduced under the New Economic Policy, allowing foreign direct investment (FDI) and the entry of multinational corporations (MNCs).

• Companies like Amazon, Apple, Google, and Microsoft entered the Indian market, bringing advanced technologies and global business practices.

• This shift allowed Indian consumers to access global brands and products, thereby increasing competition and improving quality standards.

• The Information Technology (IT) and software sector experienced exponential growth due to globalisation, with companies like Infosys and TCS becoming global players.

• Globalisation also facilitated outsourcing, where India became a hub for IT services, call centers, and manufacturing for multinational companies.

Additional Information

• Nationalisation of major private banks:

• Bank nationalisation refers to the process where private banks were taken over by the government.

• In India, major bank nationalisation occurred in 1969 and 1980 to improve financial inclusion and provide banking services to

underserved areas.

• This measure does not represent globalisation but rather reflects government control and regulation of the banking sector.

• Licensing requirement for all businesses:

• Before the 1991 reforms, India followed a stringent License Raj system, where businesses needed multiple licenses and approvals to operate.

• The 1991 economic reforms dismantled this system, leading to liberalisation and the removal of excessive licensing requirements.

• While this change encouraged private sector growth, it is not directly linked to globalisation but rather to domestic liberalisation.

• Closure of ports:

• Closure of ports is not related to globalisation; instead, globalisation involves increasing trade and connectivity through port operations.

• India expanded its port infrastructure post-1991 to boost international trade, such as the development of major ports like Mumbai and Chennai.

Q24. Answer: (d) Charter Act of 1813

The correct answer is Charter Act of 1813.

Key Points

• The Charter Act of 1813 ended the monopoly of the British East India Company over trade in India, except for trade in tea and trade with China.

• This Act allowed other British merchants to trade freely with India, marking the beginning of free trade policies.

• The Act renewed the East India Company's charter for another 20 years but curtailed its trading privileges, focusing more on administrative functions.

• It allocated funds for the promotion of education and authorized Christian missionaries to propagate their religion in India.

• The Act also introduced provisions for the expenditure on welfare and education, laying the foundation for modern education in India.

Additional Information

• Pitt's India Act of 1784:

• This Act aimed to address the shortcomings of the Regulating Act of 1773.

• It established dual control over the British East India Company's administration in India by creating a Board of Control in Britain to oversee civil and military affairs.

• The Act strengthened British control over Indian administration but did not address trade-related issues.

• Regulating Act of 1773:

• The Regulating Act was the first attempt by the British Parliament to regulate the affairs of the East India Company.

• It established the office of Governor-General of Bengal and made provisions for a Supreme Court in Calcutta.

• However, the Act did not affect the Company's monopoly over trade in India.

• Charter Act of 1833:

• This Act was significant for administrative reforms and marked the end of the East India Company's commercial activities entirely.

• It centralized the administration by making the Governor-General of Bengal the Governor-General of India.

• The Act also paved the way for legal reforms but was not directly linked to ending the Company's monopoly over trade.

Q25. Answer: (b) Thailand

The correct answer is Thailand.

Key Points

• The 6th BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) Summit was held in Bangkok, Thailand on 4 April 2025.

• Thailand hosted the summit as the current Chair of BIMSTEC (2022–2025).

• The theme was “Prosperous, Resilient, and Open BIMSTEC” focusing on regional cooperation and economic integration

Additional Information

• Bhutan

• Bhutan is a Himalayan kingdom in South Asia, known for its unique development philosophy of Gross National Happiness (GNH) over GDP.

• It is a constitutional monarchy, bordered by India and China, and is an active member of regional groupings like BIMSTEC and SAARC.

• Indonesia

• Indonesia is not a member of BIMSTEC and, therefore, does not participate in its summits.

• The country is a member of other regional organizations such as ASEAN (Association of Southeast Asian Nations) and plays a key role in regional cooperation in Southeast Asia.

• Sri Lanka

• Sri Lanka hosted the 5th BIMSTEC Summit in 2022, which focused on economic recovery post-COVID-19 and enhancing regional collaboration.

• It has been an active member of BIMSTEC and contributes significantly to discussions on maritime security and disaster management.

Important Points

• BIMSTEC

• BIMSTEC was established in 1997 through the Bangkok Declaration to foster regional and economic cooperation among South and Southeast Asian nations.

• It covers 14 priority sectors, including trade, technology, energy, transport, fisheries, agriculture, and public health.

• The BIMSTEC Secretariat is located in Dhaka, Bangladesh, and serves as the nerve center for its administrative and operational activities.

Q26. Answer: (c) Induction of EMF in a coil due to a change in its own current

The correct answer is Induction of EMF in a coil due to a change in its own current.

Key Points

• Self-induction is the phenomenon in which an electromotive force (EMF) is induced in a coil due to a change in the current flowing through the same coil.

• The induced EMF opposes the change in current, as per Lenz's Law, and is mathematically expressed as E = -L (dI/dt), where L is the self-inductance of the coil.

• Self-inductance is a property of a coil that depends on its dimensions, number of turns, and the medium surrounding it. It is measured in henry (H).

• Self-induction plays a critical role in devices like transformers, inductors, and electrical circuits where controlling or opposing rapid changes in current is essential.

• It is an important principle in electromagnetic theory and is widely applied in technologies like AC systems and communication devices.

Additional Information

• Electromagnetic Induction

• Electromagnetic induction is the process of inducing an EMF or current in a conductor due to the relative motion between the conductor and a magnetic field or due to changes in the magnetic flux.

• The concept of self-induction is a specific case of electromagnetic induction where the coil induces EMF in itself rather than in another coil.

• These principles are fundamental to modern electrical engineering and power systems.

Q27. Answer: (d) Colonel Sofiya Qureshi and Wing Commander Vyomika Singh

The correct answer is Colonel Sofiya Qureshi and Wing Commander Vyomika Singh.

Key Points

• The official media briefing of Operation Sindoor (May 2025) was led by Colonel Sofiya Qureshi (Indian Army) and Wing Commander Vyomika Singh (Indian Air Force).

• The briefing highlighted jointness and coordination among India’s armed forces.

• It symbolised the growing leadership role of women officers in operational communication and defence outreach.

Additional Information

• Lt Gen Rajiv Ghai and Commodore Raghu R Nair

• While Lt Gen Rajiv Ghai and Commodore Raghu R Nair are senior military officials, they were not involved in leading the media briefing for Operation Sindoor.

• Such officials typically oversee operational and tactical aspects of military missions rather than media communications.

• General Anil Chauhan and Air Marshal AK Bharti

• General Anil Chauhan, as the Chief of Defence Staff (CDS), and Air Marshal AK Bharti, a senior officer in the Indian Air Force, are key figures in defense planning.

• However, their roles in Operation Sindoor were likely operational rather than focused on public or media briefings.

• Foreign Secretary Vikram Misri and Defence Minister Rajnath Singh

• They generally address diplomatic and strategic policy matters, not operational military briefings.

• Defence Minister leads political oversight, not tactical briefings.

Q28. Answer: (d) Fractional distillation

The correct answer is Fractional Distillation.

Key Points

• Fractional distillation is the primary method employed for refining crude oil and separating its components based on their boiling points.

• During fractional distillation, crude oil is heated to a high temperature, causing it to vaporize.

• The vaporized crude oil is passed into a fractionating column, where it cools and condenses at different levels based on the boiling points of its components.

• Lower boiling point fractions like gasoline and kerosene condense at the top of the column, while higher boiling point fractions like lubricating oils and bitumen condense at the bottom.

• This process ensures the separation of crude oil into various useful products, including gasoline, diesel, kerosene, lubricating oils, waxes, and asphalt.

Additional Information

• Vacuum filtration

• Vacuum filtration is a method used to separate solids from liquids using a vacuum pump to create suction.

• It is commonly employed in laboratories for purifying solutions or isolating precipitates.

• It is designed for solid-liquid separation rather than liquid-liquid separation.

• Differential extraction

• Differential extraction is a process used to separate compounds based on their solubility in different solvents.

• It is commonly used in pharmaceutical industries and forensic science to isolate and purify specific components from mixtures.

• Rotary sublimation

• Rotary sublimation is a technique used to purify substances that can transition directly from solid to gas without passing through the liquid phase.

• This method is mostly employed for purifying volatile compounds, such as certain organic substances.

Q29. Answer: (c) Samaveda

The correct answer is Samaveda.

Key Points

• The Samaveda is one of the four Vedas and is primarily associated with music and chants.

• It is traditionally paired with the Upaveda known as Gandharvaveda, which deals with music, dance, and other performing arts.

• Gandharvaveda is considered the Upaveda (subsidiary Veda) of Samaveda because of its focus on the melodic and rhythmic aspects of Vedic hymns.

• Samaveda consists of hymns that are to be sung during sacrificial rituals, emphasizing the importance of sound and melody in religious ceremonies.

• The connection between Samaveda and Gandharvaveda highlights the role of music and performance in ancient Indian spiritual practices.

Additional Information

• Rigveda:

• The Rigveda is the oldest of the four Vedas and is a collection of hymns dedicated to various deities.

• It focuses on cosmology, philosophy, and rituals and forms the foundation of Vedic literature.

• It is not traditionally associated with any specific Upaveda.

• Yajurveda:

• The Yajurveda deals with the procedural aspects of rituals and sacrifices.

• It provides instructions for performing yajnas (sacrificial ceremonies).

• The Upaveda associated with Yajurveda is Dhanurveda, which deals with warfare, archery, and military science.

• Atharvaveda:

• The Atharvaveda contains hymns, charms, and spells for everyday life and is considered more practical in nature compared to the other Vedas.

• The Upaveda linked with Atharvaveda is Ayurveda, which focuses on medicine and health.

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Q30. Answer: (c) Voyage to New Horizons of Maritime Partnership

The correct answer is Voyage to New Horizons of Maritime Partnership.

Key Points

• The 8th Indian Ocean Conference was held in Muscat, Oman, on 16-17 February 2025, focusing on enhancing maritime partnerships among Indian Ocean member nations.

• The theme of the conference was “Voyage to New Horizons of Maritime Partnership”, reflecting the aim to strengthen collaboration for regional security and sustainable development in maritime areas.

• The conference brought together leaders, policymakers, and stakeholders from member nations to discuss critical maritime issues, including trade, security, and environmental challenges.

• Key discussions revolved around fostering regional cooperation, ensuring free and fair maritime trade, and addressing pressing concerns such as climate change and marine ecosystem preservation.

• India has been a significant player in promoting maritime cooperation in the Indian Ocean region, emphasizing strategic partnerships and mutual development goals.

Additional Information

• Main Theme of the Indian Ocean Conference

• The Indian Ocean Conference serves as a platform for regional nations to address maritime challenges and explore strategies for sustainable growth.

• The conference focuses on areas such as security, trade, connectivity, and environmental protection.

• It emphasizes building trust, fostering mutual understanding, and promoting shared interests in the region.

Q31. Answer: (d) Indian Institute of Technology Kharagpur (IIT-KGP)

The correct answer is Indian Institute of Technology Kharagpur (IIT-KGP).

Key Points

• Researchers from the Indian Institute of Technology Kharagpur (IIT-KGP) have developed an advanced agricultural robot to assist farmers in precise detection and management of plant diseases.

• This robot integrates artificial intelligence (AI) and computer vision technologies to identify diseased plants and apply pesticides only to the affected areas, reducing chemical usage.

• The robot is designed to work autonomously, ensuring efficient disease detection and cost-effective pest management in large agricultural fields.

• It aligns with India's goal of promoting sustainable agriculture by minimizing the environmental impact of pesticide usage.

• Such innovations aim to enhance productivity and reduce manual labor while addressing the challenges faced by farmers due to plant diseases.

Additional Information

• Indian Institute of Technology Delhi (IIT-D):

• IIT Delhi is known for its cutting-edge research and contributions to various fields like engineering, computer science, and sustainability.

• One of its notable achievements includes the development of low-cost ventilators during the COVID-19 pandemic.

• While it works on projects in agricultural technology, it is not responsible for the development of this specific robot.

• Indian Institute of Technology Bombay (IIT-B):

• IIT Bombay has expertise in robotics, AI, and machine learning applications across industries, including healthcare and manufacturing.

• It has developed several autonomous robots, such as those for underwater exploration and disaster response, but not specifically for plant disease detection.

• Indian Institute of Technology Madras (IIT-M):

• IIT Madras is a leader in AI-driven projects and sustainable technologies, with significant contributions to agricultural mechanization and renewable energy.

• One of its notable projects includes developing solar-powered agricultural tools for rural India.

• However, this specific robot for detecting plant diseases was not developed by IIT Madras.

Q32. Answer: (a) Bhagirath Manjhi

The correct answer is Bhagirath Manjhi.

Key Points

• Bhagirath Manjhi was a prominent leader who led the Kherwar Movement, a tribal uprising in the late 19th century.

• The Kherwar Movement was initiated by the Santal community, aiming to resist British colonial rule and safeguard tribal autonomy.

• Bhagirath Manjhi mobilized the Santals to reclaim their tribal identity, land, and socio-economic rights, which were threatened by the exploitative policies of the British administration.

• The movement was also inspired by the desire for religious and social reform within the Santal community.

• Bhagirath Manjhi's leadership played a crucial role in uniting the Santals under the banner of their traditional values, culture, and aspirations.

Additional Information

• Birsa Munda

• Birsa Munda was a tribal freedom fighter and religious leader who led the Munda Rebellion against British colonial rule in the late 19th century.

• His movement, known as the Ulgulan (The Great Tumult), aimed to establish tribal rights over their land and resist exploitative practices.

• Birsa Munda is considered a hero among tribal communities and is remembered for his contributions to India's freedom struggle.

• Sidhu Murmu

• Sidhu Murmu, along with his brother Kanhu Murmu, led the Santal Rebellion (1855–1856) against British rule and zamindari exploitation.

• The rebellion was one of the most significant tribal uprisings in Indian history, aimed at resisting oppressive landlords and colonial authorities.

• Sidhu and Kanhu rallied thousands of Santals to fight for their rights and freedom.

• Tilka Manjhi

• Tilka Manjhi was the first tribal leader to rebel against British rule in India during the late 18th century.

• He led the tribal uprising in Bihar, focusing on resisting unjust taxation and exploitation by the East India Company.

• Tilka Manjhi is remembered as a pioneer of tribal resistance and one of the earliest freedom fighters in Indian history.

Q33. Answer: (d) Maharashtra

The correct answer is Maharashtra.

Key Points

• Bori is regarded as the first Lower Palaeolithic site in India.

• It is located in the state of Maharashtra, specifically in the district of Ahmednagar.

• The site has yielded evidence of some of the earliest human settlements in India, dating back around 1.4 million years.

• Tools and artifacts found at Bori include Acheulean hand axes and other stone tools, which are characteristic of the Lower Palaeolithic era.

• The discovery of Bori has significantly contributed to understanding the early phases of human evolution and prehistoric culture in India.

Additional Information

• Gujarat:

• The state of Gujarat is known for important archaeological sites such as Lothal and Dholavira, which were part of the Indus Valley Civilization.

• Lothal is famous for its well-planned dockyard, which is considered one of the earliest examples of maritime architecture in the world.

• Dholavira, a UNESCO World Heritage Site, provides evidence of advanced urban planning, water conservation systems, and Harappan script.

• Arunachal Pradesh:

• This state in Northeast India is not known for Lower Palaeolithic sites but is rich in biodiversity and tribal culture.

• It is home to the Tawang Monastery, the largest monastery in India and a significant center of Mahayana Buddhism.

• The state also has prehistoric rock art and carvings at sites like Malinithan.

• Tamil Nadu:

• Tamil Nadu is notable for its ancient sites such as Attirampakkam, where evidence of Acheulean tools and other artifacts dating back 1.5 million years have been discovered.

• It is also home to the Sangam Age, a period of Tamil history known for its rich literary and cultural contributions.

• The UNESCO-listed Great Living Chola Temples are also located here, showcasing exceptional Dravidian architecture.

Q34. Answer: (a) Amrit Mohan Prasad

The correct answer is Amrit Mohan Prasad.

Key Points

• Amrit Mohan Prasad is currently serving as the Director General of Sashastra Seema Bal (SSB), as of May 2025.

• The Sashastra Seema Bal (SSB) operates under the Ministry of Home Affairs, Government of India, and is primarily responsible for ensuring the security of India's borders with Nepal and Bhutan.

• Amrit Mohan Prasad has been associated with key administrative reforms and policies to enhance the operational efficiency of the SSB.

• As the head of the SSB, his focus lies on safeguarding borders, counter-insurgency operations, and disaster management efforts in the regions under SSB jurisdiction.

• The SSB plays a crucial role in maintaining peace and security along India's borders and fostering better relations with neighboring countries.

Additional Information

• Sashastra Seema Bal (SSB)

• The SSB was established in 1963 following the India-China war and was initially tasked with intelligence gathering and operations along the Indo-China border.

• It was later restructured to guard India's borders with Nepal and Bhutan, ensuring cross-border peace and security.

• SSB personnel are also involved in anti-smuggling operations, disaster relief, and civic action programs to build goodwill among border communities.

• The SSB operates under the administrative control of the Ministry of Home Affairs, Government of India.

Q35. Answer: (c) Bangkok

The correct answer is Bangkok.

Key Points

• The 6th summit of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) was held in Bangkok, Bangladesh, on 4 April 2025.

• BIMSTEC is a regional organization comprising seven member states around the Bay of Bengal region—Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand.

• The 6th BIMSTEC summit focused on enhancing regional connectivity, trade, and cooperation in critical sectors such as energy, technology, and disaster management.

• Bangladesh, being a founding member of BIMSTEC, has played a pivotal role in fostering regional integration and promoting economic cooperation among member countries.

• The summit served as a platform for member nations to discuss and adopt measures for strengthening ties and addressing shared challenges in the Bay of Bengal region.

Additional Information

• Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC):

• BIMSTEC was established in 1997 through the Bangkok Declaration.

• The organization focuses on 14 priority sectors, including trade, energy, tourism, environment, and climate change.

• BIMSTEC serves as a bridge between South Asia and Southeast Asia, promoting economic and technical cooperation among member nations.

• The BIMSTEC Secretariat is headquartered in Dhaka, Bangladesh.

Q36. Answer: (b) Gramika

The correct answer is Gramika.

Key Points

• During the Mauryan period, the village headman in North India was called Gramika.

• The Gramika was responsible for overseeing the administration and functioning of villages, ensuring law and order, and resolving disputes.

• This position served as the link between the village community and the central Mauryan administration.

• The Gramika also played an important role in implementing policies laid down by the Mauryan rulers and collecting taxes.

• In ancient texts like the Arthashastra by Chanakya (Kautilya), Gramikas are mentioned as key figures in village administration during the Mauryan period.

Additional Information

• Gavunda

• Gavunda was a term used during later periods, particularly in South India, to denote local leaders or landlords who controlled land and resources in villages.

• They were often responsible for managing agricultural activities and ensuring the smooth functioning of village economies.

• Mununda

• Mununda is not a term associated with village administration during the Mauryan era.

• The term may have been used in other historical contexts or regions.

• Pattakila

• Pattakila refers to an administrative position but is more commonly associated with regions outside the Mauryan empire or later historical periods.

Q37. Answer: (d) Bihar

The correct answer is Bihar.

Key Points

• The 7th Khelo India Youth Games (KIYG) 2025 were jointly hosted by Bihar and New Delhi.

• It marked the first time Bihar hosted the Khelo India Youth Games, highlighting sports infrastructure development in the state.

• Events were held across multiple cities in Bihar, with New Delhi as a co-host venue.

Additional Information

• Khelo India Youth Games:

• Launched in 2018 under the Khelo India programme, the games aim to revive the sports culture in India at the grassroots level.

• It provides a platform for athletes under 17 years to showcase their talent and gain exposure at the national level.

• Winners of the games are provided scholarships and support to nurture their sporting careers.

• The games have been instrumental in identifying future sporting stars for India.

Q38. Answer: (d) Sixth Plan

The correct answer is Sixth Plan.

Key Points

• The Integrated Rural Development Programme (IRDP) was introduced during the Sixth Five-Year Plan (1980-85).

• It was launched in 1980 as a major poverty alleviation program aimed at providing employment and improving the quality of life for rural poor families.

• The program sought to provide assets and skills to below-poverty-line families through a mix of subsidy and bank credit for self-employment in agriculture, animal husbandry, fisheries, and other sectors.

• IRDP aimed to assist rural families in generating sustainable livelihoods and enhancing their socio-economic status.

• The scheme eventually became the foundation for several poverty alleviation programs in subsequent years.

Additional Information

• Seventh Plan (1985-1990):

• The Seventh Plan focused on employment generation, poverty alleviation, and productivity enhancement.

• It introduced programs like the Jawahar Rozgar Yojana (JRY), which aimed to create additional employment opportunities for the rural poor by providing wage employment.

• The emphasis was placed on agricultural development and self-reliance in key sectors.

• Fourth Plan (1969-1974):

• The Fourth Plan emphasized stabilizing the economy, achieving self-reliance, and reducing inequalities.

• It introduced several reforms related to agriculture and the Green Revolution to enhance food production and rural incomes.

• However, due to political instability and economic challenges, the plan's goals were partially achieved.

• Fifth Plan (1974-1978):

• The Fifth Plan focused on poverty eradication and attaining self-reliance.

• It introduced the Minimum Needs Programme (MNP) to provide basic services like education, healthcare, and rural roads to the poor.

• The plan also emphasized employment generation and agricultural development to address rural poverty.

Q39. Answer: (a) To review CAG audit reports

The correct answer is To review CAG audit reports.

Key Points

• The Public Accounts Committee (PAC) is one of the most important parliamentary committees in India, established in 1921 under the Government of India Act, 1919.

• Its primary function is to examine the reports submitted by the Comptroller and Auditor General (CAG) of India, ensuring the government’s expenditure is both legal and aligned with the approved budget.

• The PAC ensures accountability in public financial management by scrutinizing the government’s expenditure and ensuring funds are utilized effectively.

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• The PAC works to detect financial irregularities, wasteful expenditures, and lapses in governance by reviewing CAG reports and asking detailed questions to ministries and government departments.

• It consists of 22 members—15 from the Lok Sabha and 7 from the Rajya Sabha—with the chairperson generally being a member of the opposition party to ensure transparency and unbiased evaluation.

Additional Information

• Comptroller and Auditor General and PAC

• The Comptroller and Auditor General (CAG) audits the accounts of the government and submits reports to the President, which are then placed before the Parliament.

• The PAC examines these reports to ensure financial accountability and transparency in the government's functioning.

• This parliamentary mechanism is crucial for maintaining checks and balances in public financial management.

Q40. Answer: (d) Bahadur Shah II

The correct answer is Bahadur Shah II.

Key Points

• Bahadur Shah II, also known as Bahadur Shah Zafar, was the last Mughal emperor of India.

• During the Revolt of 1857, Indian sepoys proclaimed Bahadur Shah II as their symbolic leader to legitimize their rebellion against British rule.

• Although his role in the actual planning and execution of the revolt was limited, his position as a Mughal emperor gave the uprising a sense of unity and purpose.

• Bahadur Shah II was captured by the British after the fall of Delhi and was later exiled to Rangoon (present-day Yangon, Myanmar) in 1858, where he died in 1862.

• The proclamation of Bahadur Shah II as the leader of the revolt marked an attempt to revive the Mughal Empire and challenge British authority in India.

Additional Information

• Tantia Tope

• Tantia Tope was one of the prominent leaders of the Revolt of 1857 and a trusted ally of Nana Saheb.

• He is best known for his guerrilla warfare tactics and his role in leading the resistance in Central India.

• Tantia Tope continued the struggle against British forces even after the revolt had subsided in many regions.

• He was eventually captured by the British in 1859 and executed for his role in the revolt.

• Rani Lakshmibai

• Rani Lakshmibai, also known as the Queen of Jhansi, was one of the most iconic leaders of the Revolt of 1857.

• She is remembered for her bravery and leadership during the siege of Jhansi and her subsequent battles against British forces.

• Rani Lakshmibai died in combat in 1858, becoming a symbol of resistance against colonial rule in India.

• Nana Saheb

• Nana Saheb was another key leader of the Revolt of 1857 and a prominent figure in the Kanpur uprising.

• He was the adopted son of the last Peshwa, Baji Rao II, and sought to restore Maratha rule by leading the rebellion in his region.

• After the fall of Kanpur, Nana Saheb disappeared, and his exact fate remains unknown.

Q41. Answer: (a) 23

Shortcut Trick

To check divisibility by 23, add 7 × last digit to the remaining number.

72617 + (9 × 7) = 72617 + 63 = 72680

7268 + (0 × 7) = 7268

726 + (8 × 7) = 726 + 56 = 782

78 + (2 × 7) = 78 + 14 = 92

92 is divisible by 23 (23 × 4 = 92).

Therefore The correct answer is 23.

Alternate Method

Given: Number = 726179

We will perform direct division by the options provided to find the divisor.

Checking Option (1): 23

=> 726179 ÷ 23

=> 72 ÷ 23 → Quotient 3, Remainder 3 (since 23 × 3 = 69)

=> Bring down 6 → 36 ÷ 23 → Quotient 1, Remainder 13
=> Bring down 1 → 131 ÷ 23 → Quotient 5, Remainder 16 (since 23 × 5 = 115)
=> Bring down 7 → 167 ÷ 23 → Quotient 7, Remainder 6 (since 23 × 7 = 161)
=> Bring down 9 → 69 ÷ 23 → Quotient 3, Remainder 0
=> Since the remainder is 0, the number is divisible by 23.
Therefore The correct answer is 23.
Additional Information
Divisibility Rule for 23
Add 7 times the last digit to the rest of the number. If the result is divisible by 23, the original number is also divisible by 23.
Divisibility Rule for 29
Add 3 times the last digit to the rest of the number. If the result is divisible by 29, the original number is divisible by 29.
Divisibility by 20 and 28
For 20, the number must end in 0 and the tens digit must be even. For 28, the number must be divisible by both 4 and 7.

Q42. Answer: (c) Cyclic Quadrilateral

Shortcut Trick
Check the sum of opposite angles of the quadrilateral ABCD.
=> angle A + angle C = 47° + 133° = 180°
=> angle B + angle D = 66° + 114° = 180°
Since the sum of opposite angles is exactly 180°, the quadrilateral is definitively a Cyclic Quadrilateral.
Therefore The correct answer is Cyclic Quadrilateral.
Alternate Method
Given: angle A = 47°, angle B = 66°, angle C = 133°, angle D = 114°.
Formula Used: A quadrilateral is cyclic if and only if the sum of its opposite angles is 180°.
A
B
C
D
O
47°
66°
133°

Q43. Answer: (c) 2304 π cm2

Shortcut Trick
Surface area of a sphere = $4\pi r^2$
Given radius (r) = 24 cm
Surface area = $4 \times \pi \times (24)^2 = 4 \times \pi \times 576 = 2304\pi$
Therefore The correct answer is 2304π cm².
Alternate Method
Given:
Radius (r) of the sphere = 24 cm
Formula Used:
Surface Area of a Sphere = $4\pi r^2$
Calculations:
=> Surface Area = $4 \times \pi \times (24)^2$
=> Surface Area = $4 \times \pi \times 576$
=> Surface Area = 2304π cm²
Therefore The correct answer is 2304π cm².
Additional Information
Volume of Sphere
The volume of a sphere is calculated using the formula $V = (4/3)\pi r^3$.

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Hemisphere Properties

For a hemisphere, the Curved Surface Area (CSA) is $2\pi r^2$ and the Total Surface Area (TSA) is $3\pi r^2$.

Radius vs Diameter

The diameter (d) is twice the radius (r), so d = 2r. Surface area can also be expressed as πd^2.

Q44. Answer: (a) 25

Shortcut Trick

From the second condition: Mother's age (M) − 2 × Daughter's age (D) = 2 => M = 2D + 2.

Substitute M into the first condition: 3(2D + 2) − 5D = 29.

6D + 6 − 5D = 29 => D = 23 years.

Then M = 2(23) + 2 = 48 years.

Age Difference = 48 − 23 = 25 years.

Therefore The correct answer is 25 years.

Alternate Method

Given:

Let the Mother's age be M and Daughter's age be D.

Equation 1: 3M − 5D = 29

Equation 2: M − 2D = 2

Calculations:

=> From Eq 2: M = 2D + 2

=> Substitute M in Eq 1: 3(2D + 2) − 5D = 29

=> 6D + 6 − 5D = 29

=> D = 23 years

=> M = 2(23) + 2 = 48 years

=> Difference = M − D = 48 − 23 = 25 years

Therefore The correct answer is 25 years.

Additional Information

Linear Equations in Two Variables

Problems involving ages of two people are solved using simultaneous equations: a1x + b1y = c1 and a2x + b2y = c2.

Constant Age Difference

The difference between the ages of two individuals remains constant regardless of the number of years that pass.

Substitution Method

Express one variable in terms of the other from the simpler equation and substitute it into the second equation to solve for both.

Q45. Answer: (b) $2^2 \times 3^{10} \times 13^2$

Shortcut Trick

To find the Least Common Multiple (LCM), express all numbers in terms of their prime factors.

N1 = $3^3 \times (3^2)^2 \times 1 = 3^7$

N2 = $3^2 \times 13^2 \times 1 = 3^2 \times 13^2$

N3 = $(3^2)^3 \times 13^2 \times (2 \times 3^2)^2 = 3^6 \times 13^2 \times 2^2 \times 3^4 = 2^2 \times 3^{10} \times 13^2$

LCM = Take the highest power of each prime factor present: 2^2, 3^{10}, and 13^2.

Therefore The correct answer is $2^2 \times 3^{10} \times 13^2$.

Alternate Method

Given:

First number (A) = $3^3 \times 9^2 \times 1^3$

Second number (B) = $3^2 \times 13^2 \times 1^8$

Third number (C) = $9^3 \times 13^2 \times 18^2$

Formula Used:

LCM of numbers expressed as product of primes = Product of highest powers of all prime factors involved.

Calculations:

=> A = $3^3 \times (3^2)^2 \times 1 = 3^3 \times 3^4 = 3^7$

=> B = $3^2 \times 13^2 \times 1 = 3^2 \times 13^2$

=> C = $(3^2)^3 \times 13^2 \times (2 \times 3^2)^2 = 3^6 \times 13^2 \times 2^2 \times 3^4 = 2^2 \times 3^{10} \times 13^2$

=> Prime factors involved: 2, 3, and 13.

=> Highest power of 2 = 2^2

=> Highest power of 3 = 3^(10)

=> Highest power of 13 = 13^2

=> LCM = $2^2 \times 3^{10} \times 13^2$

Therefore The correct answer is $2^2 \times 3^{10} \times 13^2$.

Additional Information

HCF of Prime Factors

Highest Common Factor (HCF) is the product of the lowest powers of common prime factors.

LCM and HCF Relationship

For two numbers a and b, the product of the numbers is equal to the product of their HCF and LCM: a × b = HCF(a, b) × LCM(a, b).

LCM of Fractions

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

Q46. Answer: (a) -729

Given:

$(x^2-9)\times (9x^2-1)/((x-1/3)\times (1-x/3))\times 9/((x+1/3)\times (1+x/3))$

Calculation:

$((x^2-9) \times(9 x^2-1))/((x-1/3) \times(1-x/3)) \times 9/((x+1/3)(1+x/3))$

$((x-3)(x+3) \times(3x-1) (3x + 1))/(((3x-1)/3) \times((3-x)/3)) \times 9/(((3x + 1)/3)((3 + x)/3))$

=> $((-1)(x+3) \times (3x + 1))/((1/3) \times(1/3)) \times frac9~ \times ~9(3x + 1)(3 + x)$

=> $(-9)(x+3) \times (3x + 1) \times frac81(3x + 1)(3 + x)$

=> - 729

Q47. Answer: (b) 200

Shortcut Trick

Product of numbers = H.C.F. × L.C.M.

Other Number = (8 × 4200) ÷ 168

Other Number = 4200 ÷ 21 = 200

Therefore The correct answer is 200.

Alternate Method

Given:

H.C.F. = 8

L.C.M. = 4200

First Number (n1) = 168

Formula Used:

n1 × n2 = H.C.F. × L.C.M.

Calculations:

=> 168 × n2 = 8 × 4200

=> n2 = (8 × 4200) ÷ 168

=> n2 = 33600 ÷ 168

=> n2 = 200

Therefore The correct answer is 200.

Additional Information

Fundamental Property of HCF and LCM

For any two positive integers a and b, HCF(a, b) × LCM(a, b) = a × b. This property holds true only for two numbers.

Co-prime Numbers

If two numbers are co-prime, their HCF is always 1 and their LCM is equal to their product.

HCF and LCM of Fractions

HCF = HCF of Numerators ÷ LCM of Denominators; LCM = LCM of Numerators ÷ HCF of Denominators.

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Q48. Answer: (d) 3.68 km

Shortcut Trick

Speed = 48 km/hr

Time = 4.6 minutes = 4.6 ÷ 60 hours

Length of bridge = Speed × Time = 48 × (4.6 ÷ 60)

=> 0.8 × 4.6 = 3.68 km

Therefore The correct answer is 3.68 km.

Alternate Method

Given:

Speed (S) = 48 km/hr

Time (T) = 4.6 minutes

Formula Used:

Distance = Speed × Time

Calculations:

=> Convert time from minutes to hours: T = 4.6 ÷ 60 hr

=> Length of Bridge = 48 × (4.6 ÷ 60)

=> Length of Bridge = (48 ÷ 60) × 4.6

=> Length of Bridge = 0.8 × 4.6

=> Length of Bridge = 3.68 km

Therefore The correct answer is 3.68 km.

Additional Information

Unit Conversion

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Average Speed

Average Speed = Total Distance ÷ Total Time. For two equal distances with speeds x and y, Average Speed = 2xy/(x + y).

Relative Speed

When moving in the same direction, Relative Speed = S1 − S2. When moving in opposite directions, Relative Speed = S1 + S2.

Q49. Answer: (a) 120

Shortcut Trick

Ratio of First Number to Second Number = 5 : 1

Product of ratio parts = 5 × 1 = 5 units²

5 units² = 2000 => 1 unit² = 400 => 1 unit = 20

Sum of numbers = (5 + 1) units = 6 units = 6 × 20 = 120

Therefore The correct answer is 120.

Alternate Method

Given:

Product of two positive numbers = 2000

Relationship: First number = 5 × Second number

Let the second number be x.

Then the first number = 5x.

=> 5x × x = 2000

=> 5x² = 2000

=> x² = 2000 ÷ 5

=> x² = 400

=> x = √400 = 20

=> First number = 5 × 20 = 100

=> Second number = 20

=> Sum = 100 + 20 = 120

Therefore The correct answer is 120.

Additional Information

Ratio and Product Property

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If two numbers are in ratio a:b and their product is P, then the constant k = √(P ÷ (a×b)).

Positive vs Negative Roots

Since the question specifies positive numbers, we only consider the positive square root of x^2.

Algebraic Identities

Sum and product are related by $(a + b)^2 = (a - b)^2 + 4ab$, useful in complex variations.

Q50. Answer: (b) 42 hours

Shortcut Trick

Total time: P = 18 × (7/2) = 63 hr; Q = 25 × (9/5) = 45 hr.

LCM(63, 45) = 315 units (Total Work). Efficiency: P = 5, Q = 7.

In 3 hours, P+Q fill (5+7) × 3 = 36 units. R empties 36 units in 8 hr → Eff_R = 4.5.

Combined Efficiency (P+Q−R) = 12 − 4.5 = 7.5. Time = 315 ÷ 7.5 = 42 hr.

Therefore The correct answer is 42 hr.

Alternate Method

Given: P fills 2/7 part in 18 hr; Q fills 5/9 part in 25 hr; R empties the 3-hour filled volume in 8 hr.

Formula Used: Total Work = Time × Efficiency

Person	Days/Hr	Total Work	Efficiency
Pipe P	63	315	5
Pipe Q	45	7	

=> Total work filled by P and Q in 3 hours = (5 + 7) × 3 = 36 units.

=> Efficiency of Pipe R (Emptying) = Filled Volume ÷ Time = 36 ÷ 8 = 4.5 units/hr.

=> Combined efficiency of P, Q, and R = 5 + 7 − 4.5 = 7.5 units/hr.

=> Time taken by all three to fill the tank = 315 ÷ 7.5 = 42 hours.

Therefore The correct answer is 42 hr.

Additional Information

Pipes & Cisterns Sign Convention

Efficiency of an inlet pipe is taken as positive (+), while the efficiency of an outlet (emptying) pipe is taken as negative (−).

Fractional Work to Full Work

If a pipe fills 1/x part in t hours, it fills the full tank in x × t hours.

Combined Efficiency

Total Time = (Total Capacity) ÷ (Sum of efficiencies of all active pipes).

Q51. Answer: (c) Rs. 36,690

Shortcut Trick

Effective interest rate 1 = 7.6% × 4.4 years = 33.44%

Principal (P) = (8778 ÷ 33.44) × 100 = Rs. 26,250

Effective interest rate 2 = 4.8% × 58/7 years = 278.4/7%

New Simple Interest = 26250 × (278.4 ÷ 700) = Rs. 10,440

Total Amount = 26250 + 10440 = Rs. 36,690

Therefore The correct answer is Rs. 36,690.

Alternate Method

Given:

Case 1: Simple Interest (SI1) = Rs. 8,778, Time (T1) = 4 2/5 years = 4.4 years, Rate (R1) = 7.6%

Case 2: Rate (R2) = 4.8%, Time (T2) = 8 2/7 years = 58/7 years

Formula Used:

SI = (P × R × T) ÷ 100 | Amount (A) = P + SI

Calculating Principal (P):

=> 8778 = (P × 7.6 × 4.4) ÷ 100

=> P = (8778 × 100) ÷ 33.44

=> P = Rs. 26,250

Calculating New Simple Interest (SI2):

=> SI2 = (26250 × 4.8 × 58/7) ÷ 100

=> SI2 = (262.5 × 4.8 × 58) ÷ 7

=> SI2 = 37.5 × 278.4

=> SI2 = Rs. 10,440

Amount Payable:

=> Amount = P + SI2

=> Amount = 26250 + 10440 = Rs. 36,690

Therefore The correct answer is Rs. 36,690.

Additional Information

Simple Interest Formula

The formula for calculating SI is SI = (P × R × T) ÷ 100, where P is Principal, R is Rate per annum, and T is Time in years.

Amount Payable

The Total Amount (A) at the end of the period is the sum of the Principal and the interest earned: A = P + SI.

Effective Interest Rate

Effective rate is the product of the Annual Rate and Time (R × T), which helps in calculating interest as a percentage of the Principal directly.

Q52. Answer: (a) Rs. 7,040

Shortcut Trick

Ratio of shares A : B : C = (1/8) : (1/6) : (1/3)

Multiply by LCM of (8, 6, 3) = 24 → A : B : C = 3 : 4 : 8

Total units = 3 + 4 + 8 = 15 units ≡ Rs. 35,200

A's share = (3/15) × 35,200 = 1/5 × 35,200 = Rs. 7,040

Therefore The correct answer is Rs. 7,040.

Alternate Method

Given: Total amount = Rs. 35,200 and 8A = 6B = 3C

Formula Used: Ratio & Proportion dividing total sum based on share ratios.

=> Let 8A = 6B = 3C = k

=> A = k/8, B = k/6, C = k/3

=> A : B : C = (k/8) : (k/6) : (k/3) = 3 : 4 : 8

=> Sum of ratios = 3 + 4 + 8 = 15

=> A's share = (3 / 15) × 35,200

=> A's share = 1/5 × 35,200 = Rs. 7,040

Therefore The correct answer is Rs. 7,040.

Additional Information

Inverse Proportion Trick

If aA = bB = cC, then the ratio A : B : C is found by taking the reciprocal (1/a : 1/b : 1/c) and multiplying by the LCM of denominators.

Ratio Division

To divide a quantity S into ratio x:y:z, the share of the first part is [x / (x+y+z)] × S.

Q53. Answer: (a) Rs. 144.40

Shortcut Trick

Total Cost Price (CP) = Rs. 86.

Remaining bulbs = 86 − 14 = 72 bulbs.

Total Selling Price (SP) = 72 × 3.20 = Rs. 230.40.

Profit = SP − CP = 230.40 − 86 = Rs. 144.40.

Therefore The correct answer is Rs. 144.40.

Alternate Method

Given → CP = Rs. 86, Total bulbs = 86, Broken bulbs = 14, SP per bulb = Rs. 3.20.

Formulas: Profit = SP − CP.

=> Calculate effective inventory: 86 − 14 = 72 bulbs.

=> Calculate total revenue: 72 × 3.20 = Rs. 230.40.

=> Calculate profit: 230.40 − 86 = Rs. 144.40.

Therefore The correct answer is Rs. 144.40.

Additional Information

Cost Price and Net Effective Units

When items are lost or broken, the total cost remains the same but the cost is spread over fewer units, effectively increasing the CP per unit.

Profit Margin

Profit Margin % = (Profit ÷ SP) × 100. In this case, the margin is approx 62.67%.

Q54. Answer: (c) 27%

Shortcut Trick

Use the successive effective profit formula for dishonest dealers: Total Profit% = (Profit% + Less Weight%) ÷ (100 − Less Weight%) × 100.

Profit% = 22% and Less Weight% = 4%.

Total Profit% = (22 + 4) ÷ (100 − 4) × 100 = 26 ÷ 96 × 100.

Total Profit% = 2600 ÷ 96 = 27.083%.

Rounding off to the nearest whole number, we get 27%.

Therefore The correct answer is 27%.

Alternate Method

Given: Nominal Profit = 22%, Weight deficit = 4%.

Formulas: Total Profit% = [(True Weight − False Weight) + Profit on True Weight] ÷ False Weight × 100.

=> Let the True Weight be 1000g and Cost Price (CP) be 1 rupee per gram.

=> Trader claims to sell at 22% profit, so Selling Price (SP) = 1000 × 1.22 = 1220 rupees.

=> Trader uses 4% less weight, so Actual weight given = 1000 − (4% of 1000) = 960g.

=> Effective CP for the trader = 960g × 1 rupee/g = 960 rupees.

=> Total Profit = SP − Effective CP = 1220 − 960 = 260 rupees.

=> Profit% = (260 ÷ 960) × 100 = 2600 ÷ 96 = 27.08%.

Therefore The correct answer is 27%.

Additional Information

Dishonest Dealer Concept

A dishonest dealer can earn profit in two ways: by increasing the price (markup) and by using less weight. The net profit is calculated on the actual quantity delivered.

Ratio Method

For weights: Ratio of CP to SP is (100 − Error) : 100. For price: Ratio is 100 : (100 + P%). Multiply these ratios for the final result.

Q55. Answer: (b) 51.6 kg

Shortcut Trick

Assume a base average weight of 50 kg.

Find the net deviation from the base: (40−50) + (49−50) + (56−50) + (75−50) + (38−50)

=> −10 − 1 + 6 + 25 − 12 = +8.

Distribute the net deviation among 5 members: 8 ÷ 5 = 1.6 kg.

Actual Average = 50 + 1.6 = 51.6 kg.

Therefore The correct answer is 51.6 kg.

Alternate Method

Given:

Weights of 5 family members = 40 kg, 49 kg, 56 kg, 75 kg, and 38 kg.

Formula Used:

Average weight = (Sum of weights of all members) ÷ (Total number of members)

Calculations:

=> Total Sum of weights = 40 + 49 + 56 + 75 + 38

=> Total Sum = 258 kg

=> Total number of members = 5

=> Average = 258 ÷ 5

=> Average = 51.6 kg

Therefore The correct answer is 51.6 kg.

Additional Information

Weighted Average

When groups have different sizes, the combined average is calculated as: Average = (n1x1 + n2x2) ÷ (n1 + n2), where n is the number of items and x is the individual average.

Arithmetic Mean Properties

If every value in a data set is increased or decreased by a constant value 'k', the average also increases or decreases by exactly 'k'.

Average of First 'n' Natural Numbers

The average of the first 'n' natural numbers is given by the simple formula: (n + 1) ÷ 2.

Q56. Answer: (c) 486 cm2

Shortcut Trick

Total Surface Area (TSA) of a cube = 6 × (side)²

=> TSA = 6 × 9²

=> TSA = 6 × 81 = 486

Therefore The correct answer is 486 cm².

Alternate Method

Given:

Side of the cube (a) = 9 cm

Formula Used:

Surface Area of Cube = 6a²

Calculations:

=> Surface Area = 6 × (9)²

=> Surface Area = 6 × 81

=> Surface Area = 486 cm²

Therefore The correct answer is 486 cm².

Additional Information

Volume of a Cube

The volume represents the capacity or space occupied, calculated as V = a³.

Lateral Surface Area of a Cube

The area of the four vertical faces (excluding top and bottom) is given by 4a².

Diagonal of a Cube

The length of the longest rod that can be placed inside the cube is d = a√3.

Q57. Answer: (c) 12500

Shortcut Trick

Let the total registered voters be X.

Valid votes = X × 82% × 96%

Winning margin = 60% − 40% = 20% of valid votes.

=> X × 0.82 × 0.96 × 0.20 = 1968

=> X = 1968 ÷ (0.82 × 0.96 × 0.20) = 12500.

Therefore The correct answer is 12500.

Alternate Method

Given:

Voters polled = 82% | Invalid votes = 4% | Winner share = 60% of valid | Margin = 1968

=> Let Total Voters = 100 units

=> Polled votes = 82 units

=> Valid votes = 82 × (100 − 4)% = 82 × 0.96 = 78.72 units

=> Winner gets = 60% of 78.72 | Loser gets = 40% of 78.72

=> Difference (Margin) = 20% of 78.72 units

=> 0.20 × 78.72 units = 15.744 units

=> 15.744 units = 1968

=> 1 unit = 1968 ÷ 15.744 = 125

=> 100 units = 125 × 100 = 12500

Therefore The correct answer is 12500.

Additional Information

Election Base Calculations

Always identify the base: Valid Votes = (Total × Polled%) − Invalid. The percentage share of candidates is usually calculated on valid votes unless stated otherwise.

Winning Margin Rule

Margin = (Winner% − Loser%) × Valid Votes. If there are only two candidates, Loser% = 100% − Winner%.

Successive Percentage Method

Election problems can be solved as Successive Multiplication: Total × Vote% × Valid% × Margin% = Winning Margin Value.

Q58. Answer: (d) Rs. 240

Shortcut Trick

Total percentage interest = Interest Rate × Time

Net interest rate = 4% × 5 = 20%

Simple Interest = 20% of Rs. 1,200

SI = 0.2 × 1200 = Rs. 240

Therefore The correct answer is Rs. 240.

Alternate Method

Given:

Principal (P) = Rs. 1,200

Rate (R) = 4% per month

Time (T) = 5 months

Using the formula for Simple Interest:

=> SI = (P × R × T) ÷ 100

=> SI = (1200 × 4 × 5) ÷ 100

=> SI = 1200 × 20 ÷ 100

=> SI = 12 × 20

=> SI = 240

Therefore The correct answer is Rs. 240.

Additional Information

Total Amount Formula

The total Amount (A) is the sum of the Principal and the Simple Interest: A = P + SI = P(1 + RT/100).

Unit Consistency

Always ensure that the Interest Rate and Time are in the same units (e.g., both monthly or both yearly) before calculation.

Annual Rate Conversion

To convert a monthly rate to an Annual Rate, multiply by 12. For example, 4% per month is equivalent to 48% per annum.

Q59. Answer: (c) Rs. 5,928

Shortcut Trick

Net discount % = a + b − (a × b) ÷ 100

Net discount = 5 + 4 − (5 × 4) ÷ 100 = 9 − 0.2 = 8.8%

Selling Price = MP × (100 − Net Discount%) ÷ 100

SP = 6500 × (100 − 8.8) ÷ 100 = 6500 × 91.2 ÷ 100 = 65 × 91.2 = 5928

Therefore The correct answer is Rs. 5,928.

Alternate Method

Given: Marked Price (MP) = Rs. 6,500, First Discount (d1) = 5%, Second Discount (d2) = 4%.

Formula: SP = MP × (100 − d1)/100 × (100 − d2)/100

=> Price after 1st discount = 6500 × (95/100) = 65 × 95 = Rs. 6,175

=> Price after 2nd discount = 6175 × (96/100)

=> SP = 61.75 × 96
=> SP = Rs. 5,928
Therefore The correct answer is Rs. 5,928.
Additional Information
Marked Price & Discount
Discount is always calculated on the Marked Price (MP). SP = MP − Discount.
Successive Discounts
When multiple discounts are applied one after another, the second discount is applied to the reduced price after the first discount.

Q60. Answer: (d) 2,040

Shortcut Trick
Discount = 15% of Printed Price.
Selling Price (SP) = 100% − 15% = 85% of Printed Price.
Bookseller pays = 2,400 × (85 ÷ 100).
Bookseller pays = 24 × 85 = 2,040.
Therefore The correct answer is Rs. 2,040.
Alternate Method
Given: Printed Price (MP) = Rs. 2,400, Discount Rate = 15%.
Formulas: Discount = (Discount% ÷ 100) × MP | SP = MP − Discount.
=> Discount Amount = (15 ÷ 100) × 2,400
=> Discount Amount = 15 × 24 = 360
=> Amount Paid (SP) = 2,400 − 360
=> Amount Paid (SP) = 2,040
Therefore The correct answer is Rs. 2,040.
Additional Information
Marked Price (Printed Price)
The price written on the product label is the Marked Price. Discounts are always calculated on this value.
Net Selling Price
It is the final price after subtracting the Discount from the Marked Price. Formula: SP = MP × (100 − D)%

Q61. Answer: (b) 1

Shortcut Trick
Check odd numbers between 332 and 343: 333, 335, 337, 339, 341, 343.
333 (divisible by 9), 335 (divisible by 5), 339 (divisible by 3), 341 (11 × 31), 343 (7^3).
Only 337 is a prime number.
Therefore The correct answer is 1.
Alternate Method
Given: Range [332, 343].
To find prime numbers, we check divisibility by prime factors up to √343 (≈ 18.5), i.e., 2, 3, 5, 7, 11, 13, 17.
=> 332: Even, not prime.
=> 333: 3 + 3 + 3 = 9 (divisible by 3), not prime.
=> 334: Even, not prime.
=> 335: Ends in 5 (divisible by 5), not prime.
=> 336: Even, not prime.
=> 337: Not divisible by 2, 3, 5, 7, 11, 13, 17. It is prime.
=> 338: Even, not prime.
=> 339: 3 + 3 + 9 = 15 (divisible by 3), not prime.
=> 340: Even, not prime.
=> 341: 341 ÷ 11 = 31, not prime.
=> 342: Even, not prime.
=> 343: 7 × 7 × 7 = 343, not prime.
Therefore The correct answer is 1.

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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 Rule for 11

Difference between the sum of digits at odd places and even places should be 0 or a multiple of 11. For 341: (3+1) − 4 = 0.

Checking Primality

To check if N is prime, test divisibility by primes up to √N. If none divide N, then N is prime.

Q62. Answer: (a) -39

Given:

Expression: $2^2 + \sqrt{10^2} - 9\sqrt{16} - 17$

Formula Used:

Square: $a^2 = a \times a$

Square root: $\sqrt{a^2} = a$

Calculation:

$22 + \sqrt{10^2} - 9\sqrt{16} - 17$

$\Rightarrow 4 + 10 - 9 \times 4 - 17$

$\Rightarrow 14 - 36 - 17$

$\Rightarrow 14 - 53$

$\Rightarrow -39$

Therefore The value of the expression is -39.

Q63. Answer: (a) 2225

Given:

Number when increased by 60% gives 3560.

Formula Used:

Final value = Original number + (60% of Original number).

60% = 60 / 100 = 0.6.

Calculation:

=> Original number × (1 + 0.6) = 3560.

=> Original number × 1.6 = 3560.

=> Original number = 3560 / 1.6.

=> Original number = 2225.

Therefore The correct answer is 2225.

Q64. Answer: (c) 53/13 days

Shortcut Trick

Let Total Work be the LCM of 17, 12, and 3 = 204 units.

Efficiency of A = 12, B = 17, and (A+B+C) = 68.

Efficiency of C = 68 − (12 + 17) = 39.

Time taken by C = 204 ÷ 39 = 68 ÷ 13 = 5(3/13) days.

Therefore The correct answer is 5(3/13) days.

Alternate Method

Given: Time taken by A = 17 days, B = 12 days, (A+B+C) = 3 days.

Formula Used: Total Work = Efficiency × Time | $1/T_{(total)} = 1/T_A + 1/T_B + 1/T_C$

Person	Days	Total Work	Efficiency
A	17	204	12
B	12	17	
A + B + C	3	68	

=> Efficiency of A + B + C = 68

=> 12 + 17 + Efficiency of C = 68

=> Efficiency of C = 68 − 29 = 39
=> Time taken by C = Total Work ÷ Efficiency of C
=> Time = 204 ÷ 39 = 68/13 days
=> Time = 5(3/13) days
Therefore The correct answer is 5(3/13) days.
Additional Information
Total Work Concept
Total work is always assumed to be the Least Common Multiple (LCM) of the individual days to simplify calculations into integers.
Efficiency Relation
Efficiency is inversely proportional to the time taken. If a person is twice as efficient, they take half the time to complete the work.
Work and Wages
When people work together, the wages are distributed in the ratio of their efficiencies or the actual work done by each.

Q65. Answer: (c) 30

Shortcut Trick
The mean proportional of two numbers a and b is √(a × b).
Mean proportional = √(225 × 4)
=> Mean proportional = 15 × 2 = 30
Therefore The correct answer is 30.
Alternate Method
Given:
First number (a) = 225
Second number (b) = 4
Formula Used:
If x is the mean proportional between a and b, then a : x = x : b
=> $x^2 = a \times b$
Calculations:
=> $x^2 = 225 \times 4$
=> x = √900
=> x = 30
Therefore The correct answer is 30.
Additional Information
Third Proportional
The third proportional of two numbers a and b is given by $c = b^2/a$.
Fourth Proportional
For three numbers a, b, and c, the fourth proportional d is calculated as d = (b × c)/a.
Continued Proportion
Three quantities a, b, and c are in continued proportion if a/b = b/c.

Q66. Answer: (c) 2p/(p²+1)

Shortcut Trick
In a Right-Angled Triangle, if $\sin\theta = (p^2 - 1)/(p^2 + 1)$, then the Perpendicular (P) = $p^2 - 1$ and Hypotenuse (H) = $p^2 + 1$.
Using the standard triplet: $(2p)^2 + (p^2 - 1)^2 = (p^2 + 1)^2$, the Base (B) is 2p.
Therefore, $\cos\theta$ = Base / Hypotenuse = $2p / (p^2 + 1)$.
Therefore The correct answer is (2p)/(p²+1).
Alternate Method
Given: $\sin\theta = (p^2 - 1) / (p^2 + 1)$
Formula Used: $\cos^2\theta = 1 - \sin^2\theta$
=> $\cos^2\theta = 1 - [(p^2 - 1) / (p^2 + 1)]^2$
=> $\cos^2\theta = [(p^2 + 1)^2 - (p^2 - 1)^2] / (p^2 + 1)^2$
=> $\cos^2\theta = [(p^4 + 2p^2 + 1) - (p^4 - 2p^2 + 1)] / (p^2 + 1)^2$
=> $\cos^2\theta = [4p^2] / (p^2 + 1)^2$

=> cos θ = √[(2p)² / (p² + 1)²]

=> cos θ = 2p / (p² + 1)

Therefore The correct answer is (2p)/(p²+1).

Additional Information

Trigonometric Identities

The fundamental identity is sin²θ + cos²θ = 1, from which we derive sec²θ − tan²θ = 1.

Pythagorean Triplets

For any value p, the expressions 2p, p²−1, and p²+1 always form a Pythagorean triplet where p²+1 is the hypotenuse.

Q67. Answer: (c) 2 km/hr

Shortcut Trick

When Anmol doubles his speed (Ratio 1 : 2), his time ratio becomes 2 : 1.

The difference in time units = 2 − 1 = 1 unit.

Actual time difference = 6 hours (late) + 7 hours (early) = 13 hours.

Original time taken by Anmol = 2 units = 2 × 13 = 26 hours.

Anmol speed = Distance ÷ Original Time = 52 ÷ 26 = 2 km/hr.

Therefore The correct answer is 2 km/hr.

Alternate Method

Given: Total distance = 52 km. Let Anmol original speed be s km/hr.

Formula Used: Time = Distance ÷ Speed

=> Original time (T1) = 52 ÷ s

=> New time (T2) = 52 ÷ 2s

=> Time difference = T1 − T2 = (Nikhil + 6) − (Nikhil − 7) = 13 hours

=> (52 ÷ s) − (52 ÷ 2s) = 13

=> (104 − 52) ÷ 2s = 13

=> 52 ÷ 2s = 13

=> 26 ÷ s = 13

=> s = 26 ÷ 13 = 2 km/hr

Therefore The correct answer is 2 km/hr.

Additional Information

Speed-Time Relationship

For a constant distance, speed is inversely proportional to time (S prop. to 1/T). If speed is doubled, time is halved.

Time Difference Concept

When one case is late and the other is early, the total time difference is the sum of both values (x late + y early = x + y difference).

Average Speed Formula

If a person covers equal distances at speeds u and v, the Average Speed = 2uv ÷ (u + v).

Q68. Answer: (a) 49

Shortcut Trick

Weight of Mukund = (Sum of two pairs) − (Total Sum of three)

Weight = [(44 × 2) + (48 × 2)] − (45 × 3)

Weight = [88 + 96] − 135

Weight = 184 − 135 = 49 kg

Therefore The correct answer is 49 kg.

Alternate Method

Given:

Average weight of Salil, Mukund, and Sachin = 45 kg

Average weight of Salil and Mukund = 44 kg

Average weight of Mukund and Sachin = 48 kg

Formula Used:

Total Sum = Average × Number of entities

Calculations:

=> Total weight of Salil + Mukund + Sachin = 45 × 3 = 135 kg --- (i)

=> Weight of Salil + Mukund = 44 × 2 = 88 kg --- (ii)

=> Weight of Mukund + Sachin = 48 × 2 = 96 kg --- (iii)

=> Adding (ii) and (iii): Salil + (2 × Mukund) + Sachin = 88 + 96 = 184 kg

=> (Salil + Mukund + Sachin) + Mukund = 184 kg

=> 135 + Mukund = 184

=> Mukund = 184 − 135

=> Mukund = 49 kg

Therefore The correct answer is 49 kg.

Additional Information

Basic Average Formula

The average of n numbers is the sum of those numbers divided by n. Average = (Sum of observations) ÷ (Total number of observations).

Finding Overlapping Values

In problems where groups overlap (like A+B and B+C), the middle value (B) is found by: (Sum of Group 1 + Sum of Group 2) − (Total Sum of A+B+C).

Weighted Average

When two groups with different averages are combined, the new average = (n1x1 + n2x2) ÷ (n1 + n2).

Q69. Answer: (b) 12x2 − 9x +1

Shortcut Trick

Expand the expression directly by multiplying terms: x(6x − 9) gives $6x^2 − 9x$.

Expand the second part: $6(x^2 − 3)$ gives $6x^2 − 18$.

Combine all terms: $(6x^2 − 9x) + (6x^2 − 18) + 19$.

Group like terms: $(6x^2 + 6x^2) − 9x + (−18 + 19) = 12x^2 − 9x + 1$.

Therefore The correct answer is $12x^2 − 9x + 1$.

Alternate Method

Given Expression: x(6x − 9) + 6(x² − 3) + 19

Formula Used: Distributive Property a(b + c) = ab + ac

=> Step 1: Open the first bracket

=> $x × 6x − x × 9 = 6x^2 − 9x$

=> Step 2: Open the second bracket

=> $6 × x^2 − 6 × 3 = 6x^2 − 18$

=> Step 3: Write the full expression together

=> $6x^2 − 9x + 6x^2 − 18 + 19$

=> Step 4: Combine the coefficients of x^2 and constant terms

=> $(6 + 6)x^2 − 9x + (19 − 18)$

=> $12x^2 − 9x + 1$

Therefore The correct answer is $12x^2 − 9x + 1$.

Additional Information

BODMAS Rule

Always solve terms inside Brackets first, then Orders, Division/Multiplication, and finally Addition/Subtraction.

Like Terms

Terms with the same variable and exponent (like $6x^2$ and $6x^2$) can be added or subtracted by combining their coefficients.

Distributive Property

Multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products: a(b + c) = ab + ac.

Q70. Answer: (a) Rs. 348

Shortcut Trick

Profit distribution ratio = Ratio of investments (since time is constant).

Ratio of Pooja : Harsh : Madhur = 1120 : 1320 : 1160 = 28 : 33 : 29.

Total ratio parts = 28 + 33 + 29 = 90 units.

90 units = Rs. 1,080 => 1 unit = 1080 ÷ 90 = Rs. 12.
Madhur share = 29 units × 12 = Rs. 348.
Therefore The correct answer is Rs. 348.
Alternate Method
Given: Pooja investment = Rs. 1,120, Harsh investment = Rs. 1,320, Madhur investment = Rs. 1,160. Total Profit = Rs. 1,080.
Formulas: Profit Share = (Individual Investment × Time) ÷ (Total Investment × Time) × Total Profit.
=> Total Investment = 1120 + 1320 + 1160 = Rs. 3,600.
=> Madhur share = (1160 ÷ 3600) × 1080.
=> Madhur share = (29 ÷ 90) × 1080.
=> Madhur share = 29 × 12 = Rs. 348.
Therefore The correct answer is Rs. 348.
Additional Information
Partnership Ratios
When multiple partners invest for the same time period, the Profit Ratio is directly proportional to their Capital Ratio.
Variable Time Investment
If time periods differ, Profit Ratio = (Capital1 × Time1) : (Capital2 × Time2).

Q71. Answer: (b) QYR

The logic followed here is:
Hence, the correct answer is "Option 2"

Q72. Answer: (b) L

I, J, K, L, O, P and Q are sitting around a circular table facing the centre of the table.
• Only two people sit between Q and K when counted from the right of Q.
• Only two people sit between K and O.
• Only three people sit between Q and P
The Final Arrangement is,

Q73. Answer: (a) J

Seven people, I, J, K, L, P, Q and R, are sitting in a row, facing north.
• Only two people sit to the right of K.
• Only two people sit between K and R.
• Only two people sit between I and Q.
• Q sits to the immediate left of K. L sits to the immediate right of P.
The Final Arrangement is,
Hence, the correct answer is "Option 1"

Q74. Answer: (c) 21

Given - 100 × 4 + 11 ÷ 2 − 18 = ?
'+' and '−' are interchanged and '×' and '÷' are interchanged.
BODMAS Rule:
100 ÷ 4 − 11 × 2 + 18 = ?
25 − 11 × 2 + 18 = ?
25 − 22 + 18 = ?
25 + 18 − 22 = ?
43 − 22 = ?
21.
Hence, the correct answer is "Option 3"

Q75. Answer: (b) 53

The logic follows here,
Hence, the correct answer is "Option 2"

Q76. Answer: (c) QXV

The logic followed here is:

Hence, the correct answer is "Option 3"

Q77. Answer: (c) ZBF

The logic followed here is:

Hence, the correct answer is "Option 3"

Q78. Answer: (b) TAH 94

The logic followed here is:

Hence, the correct answer is "Option 2"

Q79. Answer: (d) Only conclusion (II) follows.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

I. No Blueberries are Grapefruits.- False (Some Blueberries are Melons.All Melons are Grapefruits.Hence, it is false)

II. Some Grapefruits are Blueberries. - True (All Melons are Grapefruits.Some Blueberries are Melons. Some Grapefruits are Blueberries is True)

Only conclusion (II) follows.

Hence, the correct answer is "Option 4"

Q80. Answer: (b) 2

Given (Left) 869 509 779 491 863 (Right)

Ascending order, - (Left) 491 509 779 863 869 (Right)

2 numbers will remain unchanged after numbers are arranged in ascending order - 509, 779.

Hence, the correct answer is "Option 2"

Q81. Answer: (d) 331

The logic follows here,

Hence, the correct answer is "Option 4"

Q82. Answer: (c) 44

Given - 25 × 5 − 18 ÷ 3 + 15 = ?

‘+’ and ‘−’ are interchanged and ‘×’ and ‘÷’ are interchanged.

BODMAS Rule:

25 ÷ 5 + 18 × 3 − 15 = ?

5 + 18 × 3 − 15 = ?

5 + 54 − 15 = ?

59 − 15 = ?

44.

Hence, the correct answer is "Option 3"

Q83. Answer: (c) VRO−LHE

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 3"

Q84. Answer: (b) 3

Given - ‘RAID’ is coded as ‘3527’ and ‘DOGS’ is coded as ‘1346’.

‘RAID’ is coded as ‘3527’

‘DOGS’ is coded as ‘1346’.

The Code for D is 3.

Hence, the correct answer is "Option 2"

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Q85. Answer: (d) 5 km to the East

• Umar starts from Point A and drives 7 km towards North.
• He then takes a right turn, drives 4 km, turns right and drives 11 km.
• He then takes a right turn and drives 9 km.
• He takes a final right turn, drives 4 km and stops at Point P.
The Final Diagram,
Hence, the correct answer is "Option 4"

Q86. Answer: (d) 2

Given - (Left) £ $ 7 # © 5 1 6 9 & 9 € & 2 6 £ £ $ @ % * % (Right)
Required Condition : - Symbol - Number - Symbol
(Left) £ $ 7 # © 5 1 6 9 & 9 € & 2 6 £ £ $ @ % * % (Right)
Hence, the correct answer is "Option 4"

Q87. Answer: (b) 5, 25

The logic followed here is:
(First Number x 4) + 5 = Second Number
Similarly,
Hence, the correct answer is "Option 2"

Q88. Answer: (c) I

Seven boxes F, G, H, I, K, L, and O are kept one over the other but not necessarily in the same order.
• Only three boxes are kept above G.
• Only one box is kept between F and G.
• Only three boxes are kept between F and K.
• K is kept at some place above G.
• O is kept immediately below K.
• L is kept at one of the places above I.
• H is not kept immediately above or below F.
The Final Arrangement is,

H
K
O
G
L
F
I

Hence, the correct answer is "Option 3"

Q89. Answer: (b) 4

Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order.
• No box is kept above F.
• Only three boxes are kept between F and E.
• Only one box is kept between C and A.
• A is kept immediately above E.
• Only four boxes are kept between C and B.
• D is kept at some place above G
The Final Arrangement is,

F
C

D
A
E
G
B

Hence, the correct answer is "Option 2"

Q90. Answer: (c) Both conclusions (I) and (II) follow.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I): No truck is a bus.- True (No bus is a truck. Their is no relation between truck and bus. So, No truck is a bus is a true)

(II): Some buses are planes.- True (Some planes are buses..Some buses are planes.is a true)

Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 3"

Q91. Answer: (a) CNDL

The logic followed here is:

Hence, the correct answer is "Option 1"

Q92. Answer: (a) 5 km towards west

• Ravi starts from Point A and drives 8 km towards south.

• He then takes a left turn, drives 9 km, turns right and drives 5 km.

• He then takes a right turn and drives 4 km.

• He takes a final right turn, drives 13 km and stops at Point P

The Final Diagram,

Hence, the correct answer is "Option 1"

Q93. Answer: (a) 9

Given number 5312768

Arranged in ascending order from left to right

7 + 2 = 9.

Hence, the correct answer is "Option 1"

Q94. Answer: (a) Y

Seven boxes P, Q, R, S, X, Y and Z are kept one over the other, but not necessarily in the same order.

• Only two boxes are kept between P and Z.

• Only X is kept above S.

• No box is kept below Z.

• R is kept at some place below Y, but at some place above Q

The Final Arrangement is,

X
S
Y
P
R
Q
Z

Hence, the correct answer is "Option 1"

Q95. Answer: (b) 7

Given number 8524796.

1 is added to each even digit and 2 is subtracted from each odd digit

Hence, the correct answer is "Option 2"

Q96. Answer: (d) HAI

The logic followed here is:

Hence, the correct answer is "Option 4"

Q97. Answer: (d) Wife's father's mother

Preparing the family tree diagram by using the following symbols:

As per the given information:

Hence, the correct answer is "Option 4"

Q98. Answer: (b) 9

'GAVE' is coded as '4629' and 'AIDS' is coded as '1395'.

'GAVE' - '4629'

'AIDS'- '1395'.

The Code for A is 9.

Hence, the correct answer is "Option 2"

Q99. Answer: (c) OWYQ

The logic followed here is:

Hence, the correct answer is "Option 3"

Q100. Answer: (c) 83

The logic follows here,

Hence, the correct answer is "Option 3"

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