RRB NTPC (UG) CBT-I Official Paper (Held On: 14 Aug, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Market control under Alauddin Khilji aimed mainly to _____.

(a) patronise artisan guilds
(b) encourage foreign trade
(c) promote luxury crafts and goods
(d) check price inflation for army provisions

Q2. Which natural feature divides the Lakshadweep islands into two broad parts?

(a) Equator
(b) Nine Degree Channel
(c) Ten Degree Channel
(d) Tropic of Cancer

Q3. In which of the following Indian states is the Sundarbans Biosphere Reserve located?

(a) Tamil Nadu
(b) West Bengal
(c) Assam
(d) Odisha

Q4. Who was the first Indian to win a gold medal at the Commonwealth Games?

(a) Sushil Kumar
(b) PT Usha
(c) Leander Paes
(d) Milkha Singh

Q5. Which of the following is a distinctive feature of tribal settlements in India?

(a) Modern infrastructure and transportation
(b) Skyscrapers
(c) Planned city layouts
(d) Scattered or linear village pattern in forested or hilly areas

Q6. Which state leads the fiscal health index 2025 with a top score of 67.8?

(a) Telangana
(b) Odisha
(c) Maharashtra
(d) Chhattisgarh

Q7. Who has the power to give directions to the State Government to ensure compliance with Union laws?

(a) Prime Minister of India
(b) Parliament of India
(c) Supreme Court of India

(d) President of India

Q8. In June 2025, a 'Maha Kumbhabhishekam' was performed after 270 years at the Sree Padmanabhaswamy Temple, located in which Indian State?

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

Q9. The 44th Amendment (1978) removed which of the following from the list of Fundamental Rights, converting it into a mere legal right under Article 300A?

(a) Right to Equality
(b) Right to Constitutional Remedies
(c) Right to Education
(d) Right to Property

Q10. Which of the following subjects was moved from the State List to the Concurrent List by the 42nd Amendment Act?

(a) Police
(b) Agriculture
(c) Public health
(d) Education

Q11. Under guidance of which of the following organisations were the civil defence mock drills conducted under Operation Shield in Haryana in May 2025?

(a) Election Commission of India
(b) National Disaster Management Authority
(c) Ministry of Defence
(d) Union Ministry of Home Affairs

Q12. What is the maximum strength of members in a State Legislative Assembly as per the Constitution of India?

(a) 475
(b) 450
(c) 435
(d) 500

Q13. Which of the following infrastructure initiatives is associated with urban development in India?

(a) RURBAN Mission
(b) Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan
(c) Managed Services Provider Scheme
(d) Atal Mission for Rejuvenation and Urban Transformation

Q14. Which is the first State where India's first organic fish cluster was launched by the Central Government?

(a) Assam
(b) Mizoram
(c) Sikkim
(d) Meghalaya

Q15. What does the abbreviation ASCII stand for?

(a) Advanced Secure Communication Interface
(b) Analog Signal Coding Interface Index
(c) Automated System for Computer Integrated Information
(d) American Standard Code for Information Interchange

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Q16. Which of the following is a traditional folk painting style from Bihar?

(a) Warli
(b) Pattachitra
(c) Kalamkari
(d) Madhubani

Q17. In March 2025, ISRO advanced in developing which engine for LVM3?

(a) Electric jet engine
(b) Turbo plasma engine
(c) Semicryogenic engine
(d) Liquid booster

Q18. Which indigenous radar system, developed by DRDO in 2025, is designed to enhance the capabilities of the Tejas Mk1A aircraft?

(a) Revathi
(b) Bharani Mk I
(c) Uttam AESA
(d) Aslesha Mk I

Q19. The Andaman and Nicobar Islands are separated by which water body?

(a) Gulf of Mannar
(b) Nine Degree Channel
(c) Ten Degree Channel
(d) Duncan Passage

Q20. As per the 2025 Human Development Index (HDI) report, what is India's HDI value for 2023 that places it in the medium human development category?

(a) 0.496
(b) 0.721
(c) 0.685
(d) 0.810

Q21. Which edition of National Voters' Day was celebrated on 25 January 2025 to commemorate the foundation day of the Election Commission of India?

(a) 5th
(b) 15th
(c) 20th
(d) 10th

Q22. Why is infrastructure referred to as a 'universal intermediate'?

(a) It is the most profitable sector.
(b) It is universally available in every country.
(c) It is used in the production of nearly all goods and services.
(d) It connects urban and rural areas.

Q23. In the April 2025 Internaonal Shoong Sport Federaon World Cup, in which shoong event did Saurabh Chaudhary win a bronze medal?

(a) 50 m Rifle 3 Posions
(b) 25 m Rapid Fire Pistol
(c) Skeet Shoong
(d) 10 m Air Pistol

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Q24. The reservation of seats in Panchayats for SCs/STs and women comes under which Article?

(a) Article 243E
(b) Article 243A
(c) Article 243D
(d) Article 243B

Q25. On 1 May 2025, the Election Commission of India has launched how many major initiatives to improve the accuracy of voter list and ease the voting process?

(a) 6
(b) 3
(c) 2
(d) 4

Q26. What does the 'Ctrl + V' shortcut key do?

(a) It pastes the copied text or files.
(b) It copies the selected text or files.
(c) It cuts the selected text or files.
(d) It saves the current document.

Q27. Who is considered unemployed under the Usual Status (US) measure?

(a) Someone working only one day a week
(b) Someone retired from work
(c) Someone not working but seeking work over a long period
(d) Someone working part-time

Q28. The Mahila Kisan Sashaktikaran Pariyojana (MKSP), is a key sub-scheme under _____.

(a) Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
(b) Deen Dayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)
(c) National Social Assistance Programme (NSAP)
(d) Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)

Q29. What is the value of one curie (Ci) in SI units of radioactivity?

(a) 3.7×10^6 disintegrations per second
(b) 1.6×10^(10) disintegrations per second
(c) 6.02×10^8 disintegrations per second
(d) 3.7×10^(10) disintegrations per second

Q30. What happens to tectonic plates at divergent boundaries?

(a) They stay in one place.
(b) They move away from each other.
(c) They slide past one another.
(d) They move towards each other.

Q31. The term gomat in the Rigveda refers to which of the following?

(a) A warrior
(b) A priest
(c) A wealthy person
(d) A milkmaid

Q32. Which two parties signed a landmark Digital Trade Agreement (DTA) in May 2025 to deepen digital and economic cooperation?

(a) United States and Japan
(b) European Union and Singapore
(c) China and South Korea
(d) India and Australia

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Q33. In which of the following regions did Rani Avantibai Lodhi of Ramgarh raise and lead an army of four thousand against the British, who had taken over the administration of her state?

(a) North-Eastern regions of Rajasthan
(b) Lucknow and Kanpur
(c) The region of Awadh
(d) Mandla region of Madhya Pradesh

Q34. Which of the following correctly represents the function of dietary fibre in the human diet?

(a) Increases cholesterol
(b) Helps build muscle
(c) Aids digestion
(d) Provides energy

Q35. In April 2025, India developed two (Human Papillomavirus test) HPV testing kits for the diagnosis of which type of cancer?

(a) Brain cancer
(b) Prostate cancer
(c) Blood cancer
(d) Cervical cancer

Q36. In 1869, who is credited with publishing the first widely recognized version of the periodic table?

(a) John Alexander Newlands
(b) Dmitri Mendeleev
(c) Johann Dobereiner
(d) Lothar Meyer

Q37. Who were members of the States Reorganisation Commission formed in 1953?

(a) HN Kunzru, KM Panikkar, Fazl Ali
(b) Nehru, Ambedkar, Azad
(c) Rajaji, Nehru, Bose
(d) Rajendra Prasad, Patel, Rajaji

Q38. Which of the following European powers was the first to arrive in India by sea route?

(a) French
(b) Portuguese
(c) Dutch
(d) English

Q39. Which of the following tribes is mainly found in the north-eastern part of India?

(a) Gonds
(b) Nagas
(c) Santhals
(d) Bhils

Q40. On which date did ISRO attempt its 101st launch, which could not be accomplished due to technical problems during its third stage?

(a) 14 May 2025
(b) 18 May 2025
(c) 20 May 2025
(d) 16 May 2025

MATHEMATICS

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Q41. Rishi bought some pens at the rate of Rs. 180/dozen. He sold them for Rs. 21 each. His profit percentage is _____%.

(a) 40
(b) 38
(c) 44
(d) 42

Q42. Evaluate: (-9) - (-60) ÷ (-10) + (- 4) × 7

(a) -42
(b) -43
(c) -45
(d) -46

Q43. A sum of Rs. 10,00,000 amounts to Rs. 10,92,727 in 3 years at a certain rate of interest per annum, compounded annually. The rate of interest per annum is:

(a) 6%
(b) 4%
(c) 2%
(d) 3%

Q44. The sum of five numbers is 655. The average of the first two numbers is 79 and the third number is 135. Find the average of the remaining two numbers.

(a) 214
(b) 181
(c) 182
(d) 215

Q45. In an election between two candidates, 80% of the registered voters cast their vote and 2% of the votes polled were found invalid. The winning candidate got 52% of the valid votes and won the election by a margin of 1568 votes. How many voters were registered?

(a) 49999
(b) 50002
(c) 50000
(d) 49997

Q46. If the 6-digit number N37M01 is divisible by 11, then which of the options below can give a possible correct relation between M and N?

(a) M = N
(b) M - N = 1
(c) M - N = 3
(d) M + N = -3

Q47. If sec θ + tan θ = 3/2, then the value of cos θ is

(a) 12/13
(b) 1/2
(c) 8/17
(d) 4/5

Q48. The product of the LCM and HCF of two numbers is 150. The difference of the two numbers is 5. Find the numbers.

(a) 15, 10
(b) 15, 20
(c) 20, 25
(d) 30, 25

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Q49. A number, when increased by 70%, gives 3570. The number is:

(a) 2100
(b) 6300
(c) 1050
(d) 4200

Q50. If 2 times a son's age is added to his father's age, the sum is 42 years. If 2.2 times the father's age is added to the son's age, the sum is 89 years. What is the father's age (in years)?

(a) 42
(b) 40
(c) 44
(d) 37

Q51. Sapna invested Rs. 21,600 on simple interest, partly at 14% per annum and partly at 4% per annum. If she earns equal interests from the two investments after 6 years, then find the sum invested at 14% per annum (in Rs.).

(a) 4,798
(b) 4,800
(c) 4,801
(d) 4,802

Q52. Two pipes can fill a cistern, individually, in 33 minutes and 22 minutes, respectively. There is a pipe located at the bottom of the cistern to empty it. If all the three pipes are opened simultaneously, then the empty cistern gets filled in 18 minutes. How long will the pipe at the bottom of the tank take to empty the completely filled cistern if no other pipe is then open?

(a) 99 minutes
(b) 49.5 minutes
(c) 79 minutes
(d) 39.5 minutes

Q53. Find the value of x satisfying: $2(5x^2 - 5) - 5(2x^2 + 9x - 5) = 18$

(a) -7/15
(b) 4/15
(c) 2/15
(d) -1/15

Q54. Find the value of: $[640 \div \{ 22 + 6 \times (4 - 5)\}]$.

(a) 37
(b) 36
(c) 45
(d) 40

Q55. A dealer marks his goods at 40% above the cost price and allows a discount of 45%. What would be his loss percentage?

(a) 5%
(b) 23%
(c) 24%
(d) 18%

Q56. An article is sold at a profit of 54%. If the cost price is increased by Rs. 75 and the selling price is reduced by Rs. 66, then the profit would be 40.8%. What is the original cost price (in Rs.) of the article?

(a) 1400
(b) 1500
(c) 1000
(d) 1300

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Q57. If 69% of first number is equal to four-fifths of second number, what is the ratio of first number to the second number?

(a) 80 : 69
(b) 76 : 64
(c) 84 : 71
(d) 79 : 68

Q58. A man walks to a viewpoint and returns to the starting point by his car maintaining constant speed and thus, takes a total time of 4 hours 15 minutes. He would have gained 4 hours by driving both ways. How long would it have taken for him to walk both ways with the same walking speed?

(a) 9 hours 30 minutes
(b) 8 hours 45 minutes
(c) 8 hours 15 minutes
(d) 7 hours 15 minutes

Q59. The average of first 168 even numbers is

(a) 170
(b) 168.5
(c) 169
(d) 169.5

Q60. The length of each of the two equal sides of an isosceles triangle is 85 cm and the length of its base is 72 cm. The area (in cm^2) of the triangle is

(a) 2772
(b) 2756
(c) 2784
(d) 2767

Q61. A pair of shoes is sold by a retailer at a 20% discount on the marked price, but the retailer still makes a 28% profit on the cost price. What is the ratio of the marked price to the cost price of the shoes?

(a) 8 : 5
(b) 7 : 4
(c) 3 : 5
(d) 9 : 7

Q62. Find the perimeter of a rectangle whose length and breadth are 5 cm and 8 cm.

(a) 20 cm
(b) 26 cm
(c) 39 cm
(d) 13 cm

Q63. Pipe A can fill a tank in 20 hours, pipe B can fill the same tank in 22 hours and pipe C can fill the same tank in 14 hours. The time taken by them to fill the same tank if they operate together is::

(a) 14255/257 hours
(b) 5255/257 hours
(c) 2255/257 hours
(d) 9255/257 hours

Q64. Neha, Rajat and Avinash invested Rs. 1,210, Rs. 1,650 and Rs. 1,300, respectively to start a business. If the profit at the end of the year is Rs. 1,200, what is Avinash's share of the profit?

(a) Rs. 374
(b) Rs. 377
(c) Rs. 375
(d) Rs. 376

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Q65. The number 769501 is divisible by which of the following?

(a) 96
(b) 97
(c) 90
(d) 105

Q66. Which of the following numbers is divisible by 22?

(a) 65,80,350
(b) 64,67,614
(c) 61,36,901
(d) 71,32,950

Q67. In covering a distance of 96 km, Anmol takes 6 hours more than Nikhil. If Anmol doubles his speed, then he would take 2 hours less than Nikhil. Anmol's speed is:

(a) 12 km/hr
(b) 6 km/hr
(c) 2 km/hr
(d) 16 km/hr

Q68. Rs. 73,500 were divided among A, B and C such that 6 times the share of A = 9 times the share of B = 2 times the share of C. Find the share of A.

(a) Rs. 15,648
(b) Rs. 15,570
(c) Rs. 15,750
(d) Rs. 15,848

Q69. A solid cuboid with dimensions 24 cm × 16 cm × 10 cm is melted to form smaller solid cubes with sides of length 4 cm. Determine the number of cubes formed.

(a) 60
(b) 64
(c) 68
(d) 62

Q70. The sum of the squares of two consecutive even natural numbers is 2740. The sum of the numbers is:

(a) 74
(b) 80
(c) 70
(d) 88

GENERAL INTELLIGENCE AND REASONING

Q71. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All lakes are ponds.

All ponds are rivers.

Conclusions:

(I): All lakes are rivers.

(II): All rivers are ponds

(a) Neither Conclusion I nor II follows
(b) Both Conclusions I and II follow
(c) Only Conclusion I follows
(d) Only Conclusion II follows

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Q72. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) JM-DH
(b) HK-BF
(c) OR-IN
(d) MP-GK

Q73. RBNH is related to KUGA in a certain way based on the English alphabetical order. In the same way, PZLF is related to ISEY. To which of the given options is UEQK related, following the same logic?

(a) NXJD
(b) NXDJ
(c) NDXJ
(d) NDFR

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

2 12 32 62 102 ?

(a) 155
(b) 156
(c) 152
(d) 150

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

3 3 4 6 9 ?

(a) 10
(b) 12
(c) 13
(d) 11

Q76. If 2 is added to each odd digit and 1 is subtracted from each even digit in the number 72518643, then what will be the difference between the first and the last digit in the number thus formed?

(a) 2
(b) 6
(c) 8
(d) 4

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

CNQ EPS GRU ITW ?

(a) KVY
(b) JUX
(c) JVY
(d) KUX

Q78. What should come in place of the question mark (?) in the given series?

15, 30, 60, 120, ?, 480

(a) 220
(b) 240
(c) 260
(d) 280

Q79. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) PT-WR

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(b) RV-YT
(c) KO-RM
(d) BF-IC

Q80. Hitesh starts from Point A and drives 9 km towards East. He then takes a left turn, drives 4 km, turns left and drives 11 km. He then takes a left turn and drives 6 km. He takes a final left turn, drives 2 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 3 km to South
(b) 2 km to North
(c) 3 km to North
(d) 2 km to South

Q81. YUWT is related to UQSP in a certain way based on the English alphabetical order. In the same way, OKMJ is related to KGIF. To which of the following is LHJG related, following the same logic?

(a) HDEC
(b) HCEC
(c) HEEF
(d) HDFC

Q82. Seven boxes F, G, H, M, N, O and P 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 N. N is kept at some place above G. O is kept immediately below N. M is kept at one of the places above P. H is not kept immediately above or below F.

Which box is kept at the lowermost position?

(a) F
(b) P
(c) M
(d) H

Q83. In a certain code language, ‘HUGE’ is coded as ‘4627’ and ‘GIRL’ is coded as ‘1365’. What is the code for ‘G’ in the given code language?

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

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

FDS 43 HGO 32 JJK 21 ? NPC -1

(a) LKM 12
(b) LMG 11
(c) LMG 10
(d) LMM 14

Q85. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding 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.)

(28, 336, 4)

(19, 285, 5)

(a) (17, 265, 5)
(b) (21, 341, 7)
(c) (23, 414, 6)
(d) (24, 298, 4)

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Q86. In a row of 111 persons facing north, Mukesh is 19th from the left end. What is his position from the right end?

(a) 91
(b) 93
(c) 94
(d) 92

Q87. A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table. Only two people sit between A and R, when counted from the right of A. Only two people sit between R and D. Only three people sit between A and B. C sits to the immediate left of Q. Who sits third to the left of S?

(a) D
(b) Q
(c) C
(d) A

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 two boxes are kept between O and K. Only G is kept above L. No box is kept below K. F is kept at some place below H but at some place above I. Which box is kept third above I?

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

Q89. 1 is subtracted from each even digit of the number 95423671. Find the number of digits that are repeated more than once in the new number formed.

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

Q90. If 'I' stands for '+', 'J' stands for '×', 'K' stands for '÷' and 'L' stands for '−', then what will come in place of the question mark (?) in the following equation?

29 I (23 J 5) L 23 J 10 I (420 K 4) I 89 = ?

(a) 92
(b) 148
(c) 108
(d) 122

Q91. This question is based on the five, three-digit numbers given below.

(Left) 817 708 290 322 720 (Right)

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

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

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

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

Q92. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) IMQ
(b) NRV
(c) KOS
(d) MOU

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Q93. Six friends P, Q, R, S, T and U are sitting in a straight line, facing north. Q is an immediate neighbour of S and T. U sits to the immediate right of R. P sits third to the left of T. Neither S nor T sit on any of the extreme ends. Who sits at the extreme left end?

(a) Q
(b) R
(c) U
(d) P

Q94. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

SOAL - ASOL - LAOS

MUGS - GMUS - SGUM

(a) ZOAL - AZOL - OALZ
(b) BOND - BNOD - DNOB
(c) RAIN - IRAN - NIAR
(d) WIPE - IWPE - EIPW

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

(Left) 427 615 253 961 743 (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(s) of how many numbers will remain unchanged?

(a) 2
(b) 0
(c) 1
(d) 3

Q96. A is the mother of G. G is the mother of D. D is the son of H. R is the father of H. How is A related to R?

(a) Wife's sister
(b) Son's wife's sister
(c) Son's wife's mother
(d) Wife's mother

Q97. Satwik starts from Point A and drives 7 km towards east. He then takes a left turn, drives 4 km, turns right and drives 6 km. He then takes a right turn and drives 4 km. He takes a final right turn, drives 3 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) 13 km towards west
(b) 13 km towards east
(c) 10 km towards west
(d) 10 km towards north

Q98. Each of the digits in the number 4385612 is arranged in the ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q99. In a certain code language, ‘YOUR’ is coded as ‘2467’ and ‘OPEN’ is coded as ‘1536’. What is the code for ‘O’ in that language?

(a) 3
(b) 1
(c) 6

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(d) 4

Q100. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All games are levers.

All levers are drums.

Conclusions:

(I) Some drums are levers.

(II) All games are drums.

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

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) check price inflation for army provisions

The correct answer is check price inflation for army provisions.

Key Points

• Alauddin Khilji (reigned 1296–1316) was a prominent Sultan of the Delhi Sultanate, known for his military campaigns and administrative reforms.

• One of his major administrative measures was the regulation of the market to control prices, with the primary aim of ensuring the supply of provisions for his large standing army at reasonable rates.

• He established a centralized market control mechanism that included strict price regulations for essential commodities such as grains, clothes, and other goods required for the army.

• Alauddin Khilji ensured strict implementation of these price controls by appointing market inspectors (Shahna-i-Mandi) who were responsible for monitoring the markets and preventing hoarding or price manipulation.

• This system helped in maintaining a steady supply of provisions for his army and preventing inflation during wartime campaigns, which was crucial for his military success and stability.

Additional Information

• Objectives of Market Control Policy:

• The primary purpose of the market control was to stabilize prices and ensure the availability of essential commodities for the army.

• This policy was not aimed at encouraging luxury goods or foreign trade but was meant to support the Sultanate's military and administrative machinery.

• Implementation Measures:

• Alauddin Khilji introduced a system of price lists for all commodities, including grains, textiles, and cattle.
• He established government-run granaries to ensure a steady supply of grains, which was critical during famines or shortages.
• The state directly intervened in trade and ensured that merchants adhered to fixed prices under strict penalties.
• Market Supervision:
• A special officer, the Shahna-i-Mandi, was appointed to oversee the markets and ensure compliance with price regulations.
• Hoarding and black-market trading were severely punished to prevent artificial price hikes.
• Impact of the Policy:
• The market control policy helped in maintaining the economic stability of the Sultanate and supported the Sultan's ambitious military campaigns.
• It also helped in protecting the common people from price exploitation by traders during periods of scarcity.

Important Points

• Role of Alauddin Khilji:
• Alauddin Khilji's market reforms were part of his broader administrative and military strategies.
• He was one of the first rulers to establish a permanent standing army, and the market control system was designed to support this major military innovation.
• Comparison with Other Rulers:
• Unlike other rulers who focused on luxury goods or foreign trade, Alauddin's reforms were practical and aimed at military efficiency.
• His market control policy set a precedent for later rulers in terms of state intervention in the economy.

Q2. Answer: (b) Nine Degree Channel

The correct answer is Nine Degree Channel.

Key Points

• The Nine Degree Channel is a significant natural feature that geographically divides the Lakshadweep Islands into two broad parts: the northern group of islands and the southern group of islands.
• This channel is located between the islands of Kalpeni (to the north) and Minicoy (to the south).
• The name "Nine Degree Channel" originates from its position near the 9°N latitude in the Indian Ocean.
• The channel is approximately 200 km wide and plays a crucial role in maritime navigation and connectivity between the Arabian Sea and the Indian Ocean.
• This geographical feature is significant because it not only divides the Lakshadweep archipelago but also serves as an important route for commercial shipping and fishing activities.

Additional Information

• Equator:
• The Equator is an imaginary line that divides the Earth into the Northern and Southern Hemispheres and lies at 0° latitude.
• It does not pass through the Lakshadweep Islands and hence is not relevant to dividing them.
• Ten Degree Channel:
• The Ten Degree Channel separates the Andaman Islands from the Nicobar Islands in the Bay of Bengal, not the Lakshadweep Islands.
• It is situated near the 10°N latitude.
• Tropic of Cancer:
• The Tropic of Cancer is an imaginary line situated at 23.5°N latitude, marking the northernmost point where the sun can appear directly overhead.
• It passes through mainland India, but not through the Lakshadweep Islands, making it irrelevant to the division of these islands.

Important Points

• The Lakshadweep Islands consist of 36 islands, with only 10 of them inhabited.
• The islands are located in the Arabian Sea, about 200-440 km off the southwestern coast of India.
• The Nine Degree Channel is an essential waterway for trade and transportation, connecting the western coast of India to international maritime routes.
• The Lakshadweep Islands are known for their coral reefs, lagoons, and biodiversity, making them a valuable ecological and economic resource for India.

Q3. Answer: (b) West Bengal

The correct answer is West Bengal.

Key Points

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• The Sundarbans Biosphere Reserve is located in the state of West Bengal, India. It is part of the Sundarbans delta region, which is shared between India and Bangladesh.

• The Sundarbans is the largest mangrove forest in the world and is recognized as a UNESCO World Heritage Site for its ecological significance.

• The reserve is home to Royal Bengal Tigers, saltwater crocodiles, and a variety of bird species, making it an important area for biodiversity conservation.

• The Sundarbans Biosphere Reserve covers an area of approximately 9,630 square kilometers, including mangrove forests, mudflats, and tidal waterways.

• The region plays a vital role in protecting coastal areas from erosion and acts as a natural barrier against cyclones and tidal surges.

Additional Information

• Biodiversity:

• The Sundarbans is home to diverse flora and fauna, including over 400 species of plants and 290 species of birds.

• It supports endangered species like the Royal Bengal Tiger, Indian python, and Ganges river dolphin.

• The region is also known for its population of estuarine crocodiles, otters, and various fish species.

• Ecological Importance:

• Mangroves in the Sundarbans act as a natural defense against storms and cyclones, minimizing damage to nearby coastal areas.

• The region is essential for carbon sequestration and helps mitigate the effects of climate change.

• The Sundarbans also supports local livelihoods through activities like fishing, honey collection, and eco-tourism.

• UNESCO Recognition:

• The Sundarbans National Park was declared a World Heritage Site in 1987.

• This recognition was granted due to its unique biodiversity and ecological significance.

• The UNESCO status helps in global conservation efforts and promotes sustainable tourism.

• Geographical Location:

• The Sundarbans lies in the Ganges Delta, spanning the southern part of West Bengal in India and the southwestern part of Bangladesh.

• The Indian part of the Sundarbans includes the Sundarbans Tiger Reserve and the Sundarbans National Park.

• The region is characterized by tidal waterways, mudflats, and small islands covered with mangrove forests.

• Conservation Challenges:

• Human activities such as deforestation and illegal poaching pose threats to the biodiversity of the Sundarbans.

• Climate change, rising sea levels, and increased frequency of cyclones are significant challenges for the region's conservation.

• Efforts are being made by the Indian government and international organizations to ensure sustainable management and preservation of the Sundarbans.

Important Points

• Location: The Sundarbans Biosphere Reserve is exclusively located in the southern part of West Bengal. None of the other options (Tamil Nadu, Assam, Odisha) have regions forming part of the Sundarbans.

• Cross-Border Region: The Sundarbans spans across India and Bangladesh, but the biosphere reserve referred to in this question is specifically in India.

• Mangrove Forest: The Sundarbans represents one of the most significant mangrove forests globally, with an important ecological role in protecting against natural calamities.

• Rare Species: The region is home to the Royal Bengal Tiger, highlighting its importance for wildlife conservation.

Q4. Answer: (d) Milkha Singh

The correct answer is Milkha Singh.

Key Points

• Milkha Singh, popularly known as the "Flying Sikh," was the first Indian to win a gold medal at the Commonwealth Games.

• He achieved this milestone in the year 1958 during the Commonwealth Games held in Cardiff, Wales.

• Milkha Singh competed in the 440 yards race and secured the gold medal, making history for Indian athletics on an international platform.

• His victory was considered a breakthrough moment for Indian sports, as he was competing against some of the best athletes in the world at the time.

• Milkha Singh's achievement inspired generations of Indian athletes and showcased the potential of Indian sports on the global stage.

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Additional Information

• Milkha Singh:

• Born on 20 November 1929 in Govindpura, Punjab (now in Pakistan).

• He represented India in three Olympics: 1956, 1960, and 1964.

• Milkha Singh narrowly missed a medal in the 1960 Rome Olympics, finishing fourth in the 400 meters race.

• He was awarded the Padma Shri, India's fourth-highest civilian award, in recognition of his contributions to sports.

• Commonwealth Games:

• The Commonwealth Games are a multi-sport event involving athletes from the Commonwealth of Nations.

• India has been participating in the Commonwealth Games since 1934.

• Milkha Singh's gold medal in 1958 was India's first-ever gold medal at these Games.

• Other Indian Achievements at the Commonwealth Games:

• India has won numerous medals since Milkha Singh's historic win, with athletes excelling in sports like boxing, wrestling, badminton, and shooting.

• Notable names include PV Sindhu in badminton, Vijender Singh in boxing, and Saina Nehwal in badminton.

• Legacy of Milkha Singh:

• Milkha Singh's story has inspired countless athletes, and his life was depicted in the popular Bollywood movie "Bhaag Milkha Bhaag" (2013).

• He passed away on 18 June 2021 at the age of 91 due to complications from COVID-19.

Important Points

• Milkha Singh's Contribution to Indian Sports:

• Milkha Singh remains one of the most iconic figures in Indian sports history.

• He helped elevate the status of athletics in India, inspiring investment and recognition for the sport.

• His determination and perseverance serve as a model for aspiring athletes.

• India's Progress in Athletics:

• Following Milkha Singh's lead, India has seen significant growth in track and field events.

• Notable athletes like PT Usha, Neeraj Chopra, and Anju Bobby George have brought further glory to Indian athletics.

• Neeraj Chopra's gold medal win in javelin at the 2020 Tokyo Olympics was a landmark achievement in Indian sports.

Q5. Answer: (d) Scattered or linear village pattern in forested or hilly areas

The correct answer is Scattered or linear village pattern in forested or hilly areas.

Key Points

• Tribal settlements in India are typically characterized by a scattered or linear village pattern, especially in forested or hilly areas. This pattern arises due to the geographical terrain, economic activities, and cultural practices of tribal communities.

• Tribal communities often live in remote and inaccessible locations, including hills, forests, and mountainous regions, which makes scattered settlements more practical and sustainable.

• These settlements are designed to ensure proximity to natural resources such as forests, water bodies, and agricultural land, which are vital for their livelihood. Tribal communities predominantly engage in activities such as subsistence agriculture, hunting, gathering, and fishing.

• Unlike urban areas, tribal settlements do not have planned city layouts or modern infrastructure. Their houses are typically built using locally available materials such as bamboo, wood, and mud, reflecting their deep connection to nature.

• Tribal settlements are often characterized by a sense of community living and shared resources. These settlements foster a strong social and cultural bond among tribal members, which is a distinctive aspect of their lifestyle.

Additional Information

• Option 1: Modern infrastructure and transportation

• This is not a characteristic of tribal settlements as they are located in remote areas with limited access to modern amenities and transportation systems.

• Such infrastructure is more common in urban and semi-urban areas, not in tribal regions.

• Option 2: Skyscrapers

• Skyscrapers are a feature of urban environments and metropolitan cities. They are built using advanced technology and are designed for economic or residential purposes.

• Tribal settlements typically consist of small, simple houses made from natural materials, and skyscrapers are not part of their settlement pattern.

• Option 3: Planned city layouts

• Planned city layouts are found in urban and metropolitan areas where settlements are organized systematically with

infrastructure like roads, drainage systems, and zoning.

• Tribal settlements are generally unplanned and evolve organically based on the geographical and environmental conditions.

• Option 4: Scattered or linear village pattern in forested or hilly areas

• This is the correct answer and a distinctive feature of tribal settlements. The geographical terrain and the dependence on natural resources shape the scattered and linear patterns of these settlements.

• Examples include tribal settlements in states like Chhattisgarh, Odisha, Jharkhand, and northeastern states of India, which are primarily located in forested and hilly regions.

Important Points

• Tribal settlements:

• They represent the original inhabitants of India and are spread across various states.

• India has a significant tribal population, constituting about 8.6% of the total population as per the 2011 Census.

• Tribal communities are recognized under the Fifth and Sixth Schedule of the Indian Constitution, ensuring their rights and protection.

• Forest Rights Act, 2006:

• The act recognizes the rights of forest-dwelling tribal communities to access and manage the forest resources on which they depend.

• It aims to empower tribal communities and ensure their participation in forest conservation.

Q6. Answer: (b) Odisha

The correct answer is Odisha.

Key Points

• Odisha topped the Fiscal Health Index 2025 with a score of 67.8, reflecting its robust fiscal management and efficient governance.

• The Fiscal Health Index evaluates states based on factors such as revenue generation, expenditure management, debt sustainability, and fiscal autonomy.

• Odisha's financial policies, including prudent expenditure and efficient resource allocation, contributed to achieving this top position.

• Odisha's focus on sustainable growth and social welfare programs has strengthened its fiscal indicators.

• The state has successfully implemented measures to reduce fiscal deficits, ensuring long-term economic stability.

Additional Information

• Fiscal Health Index:

• It is an analytical tool used to assess the financial health and fiscal management of states in India.

• It considers multiple parameters like own revenue as a percentage of GDP, debt-to-GDP ratio, expenditure efficiency, and revenue deficit.

• The index helps policymakers identify areas needing improvement for sustainable fiscal growth.

• Odisha's Economic Policies:

• Odisha has focused on inclusive growth, ensuring development across sectors such as agriculture, industry, and infrastructure.

• The state has implemented innovative programs like "KALIA Scheme" to support farmers and rural development.

• Efforts to enhance revenue collection through efficient tax policies have bolstered the state's fiscal health.

• Other States in the Index:

• Maharashtra: Known for its industrial and financial hub, contributes significantly to India's GDP but faces fiscal challenges due to urbanization.

• Telangana: A relatively young state, it has shown strong fiscal growth due to its focus on IT and infrastructure development.

• Chhattisgarh: Known for its mineral resources, the state is working on improving fiscal policies to maximize revenue from its natural assets.

• Importance of Fiscal Health:

• Strong fiscal health ensures sustainable development and economic growth, enabling states to invest in welfare programs.

• It is crucial for maintaining financial stability and attracting domestic and international investments.

Important Points

• Factors influencing fiscal health:

• Revenue generation capabilities, including taxes, royalties, and other sources of income.

• Efficient expenditure management to ensure funds are allocated to priority areas.

• Debt sustainability and measures to control borrowing.

• Fiscal autonomy allowing states to make independent financial decisions without excessive dependence on central grants.

• Significance for policymakers:

• Helps in identifying states that are performing well and others that need targeted interventions.

• Guides the allocation of central funds based on fiscal performance.

• Encourages states to adopt best practices for fiscal management.

Q7. Answer: (d) President of India

The correct answer is President of India.

Key Points

• Article 256 of the Indian Constitution empowers the President of India to ensure that the State Governments comply with the laws made by the Parliament and any existing laws that apply to that State.

• The President can issue directions to the State Government if it fails to comply with the legislative requirements.

• The power of issuing directions is not vested in any other institution such as the Prime Minister, Parliament, or Supreme Court.

• The provision ensures the federal structure of governance in India, where the Union Government can guide the States in implementing laws uniformly across the country.

• If a State Government fails to comply with these directions, the President is empowered to take necessary actions, which may include invoking Article 356 and imposing President's Rule in that State.

Additional Information

• Article 256 of the Indian Constitution:

• It states that the executive power of every State shall be so exercised as to ensure compliance with the laws made by Parliament and any existing laws applicable in that State.

• The Union Government can issue directions to a State as it deems necessary for this purpose.

• Article 356:

• If a State Government fails to comply with the directions issued under Article 256, the President can invoke Article 356.

• Article 356 allows the imposition of President's Rule in the State, effectively bringing the State under the control of the Union Government temporarily.

• Role of the President:

• The President acts as the Constitutional Head of India and exercises powers as defined under the Constitution.

• The President's authority in ensuring compliance with Union laws is an example of the checks and balances in the Indian federal system.

• Difference from Supreme Court:

• The Supreme Court ensures the judicial review of laws and resolves disputes between the Union and States. However, it does not have the power to issue directions to the State Governments for compliance.

Important Points

• Prime Minister of India:

• The Prime Minister is the head of the government and advises the President but does not have the constitutional authority to issue directions to State Governments for compliance with Union laws.

• Parliament of India:

• The Parliament makes laws but does not execute or enforce them. The responsibility of ensuring compliance lies with the executive branch.

• Supreme Court of India:

• It ensures the interpretation of laws and resolves disputes but does not issue directions to States for compliance with Union laws.

• Role of the President:

• The President acts on the advice of the Union Council of Ministers, led by the Prime Minister, but is the constitutional authority for issuing directions under Article 256.

Q8. Answer: (c) Kerala

The correct answer is Kerala.

Key Points

• The Sree Padmanabhaswamy Temple is located in Thiruvananthapuram, Kerala. It is one of the most famous temples in India and is renowned for its opulence and historical significance.

• The Maha Kumbhabhishekam is a grand ritual performed in Hindu temples, involving the sanctification of deities and the temple. In June 2025, this ritual was conducted at the Sree Padmanabhaswamy Temple after 270 years, making it a historic event.

• The temple is dedicated to Lord Vishnu and is one of the 108 Divya Desams (sacred places of worship for Vaishnavites).

• The architectural style of the temple is a blend of Kerala and Dravidian architecture, reflecting the rich cultural heritage of the region.

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• The temple is well-known for its immense treasures discovered in its underground vaults, which include gold, jewels, and other valuables, making it one of the richest temples in the world.

Additional Information

• About Sree Padmanabhaswamy Temple:

• The temple is mentioned in historical records dating back to the 6th century AD and has been a significant pilgrimage site for centuries.

• The presiding deity, Lord Padmanabha, is depicted in a reclining posture on the serpent Anantha (Adi Shesha).

• The temple is managed by the royal family of Travancore, and it is deeply connected to the history and traditions of Kerala.

• Maha Kumbhabhishekam:

• This sacred ceremony is performed to rejuvenate the divine energy of the temple and its deities.

• The process involves elaborate rituals, including chanting of Vedic hymns, homas (fire sacrifices), and the pouring of sanctified water on the temple and its deities.

• This ritual is typically conducted once every 12 years or longer, depending on the temple's tradition.

• Kerala's Cultural Significance:

• Kerala is known as “God’s Own Country” due to its natural beauty, cultural heritage, and religious significance.

• The state is home to numerous ancient temples, each with its unique history, architecture, and traditions.

• Kerala's festivals, such as Onam and Vishu, play a significant role in its cultural identity.

• Other Famous Temples in Kerala:

• Guruvayur Temple: Known as the Dwarka of the South and dedicated to Lord Krishna.

• Sabarimala Temple: Dedicated to Lord Ayyappa, it attracts millions of devotees annually.

• Chottanikkara Temple: Famous for its deity Bhagavathy, considered a form of Goddess Lakshmi.

Important Points

• Historical Context: The 2025 Maha Kumbhabhishekam marked the first such event at the temple in 270 years, underlining its rarity and importance in maintaining the temple's sanctity.

• Security and Treasure: The temple gained international attention after the discovery of its underground vaults containing treasures worth billions of dollars. These treasures are believed to have been offerings from devotees over centuries.

• Tourism: The Sree Padmanabhaswamy Temple is a major tourist attraction in Kerala, drawing devotees, historians, and tourists from around the globe.

• Dress Code: The temple enforces a traditional dress code for visitors, emphasizing its commitment to preserving ancient customs.

Q9. Answer: (d) Right to Property

The correct answer is Right to Property.

Key Points

• The 44th Amendment Act of 1978 of the Indian Constitution removed the Right to Property from the list of Fundamental Rights and made it a mere legal right under Article 300A.

• The Right to Property was originally a Fundamental Right under Article 31 of the Constitution.

• The amendment ensured that the Right to Property was no longer a guaranteed Fundamental Right but rather a constitutional right. This change was made to prevent misuse of the right to property against the state’s authority to enforce land reforms.

• Under Article 300A, no person can be deprived of their property except by the authority of law. This means that the state can acquire private property for public purposes but only with proper legal procedures.

• The removal of the Right to Property as a Fundamental Right was aimed at balancing individual rights with socio-economic justice and facilitating equitable land redistribution.

Additional Information

• Fundamental Rights:

• The Fundamental Rights are enshrined in Part III of the Indian Constitution and are considered essential for the holistic development of individuals.

• These rights include Right to Equality (Articles 14-18), Right to Freedom (Articles 19-22), Right to Constitutional Remedies (Article 32), and others.

• Right to Property:

• Initially, the Right to Property was a part of Fundamental Rights under Articles 19(1)(f) and 31.

• The 42nd Amendment Act of 1976 first diluted the Right to Property, and the 44th Amendment Act of 1978 finally removed it as a Fundamental Right.

• Article 300A:

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• Introduced by the 44th Amendment Act, it states that no person shall be deprived of their property except by the authority of law.

• It provides legal protection to property rights but does not guarantee these rights as Fundamental Rights.

• Land Reforms:

• Land reforms were crucial in redistributing land to ensure social and economic equity.

• The removal of the Right to Property as a Fundamental Right allowed the government to implement land reforms more effectively without judicial interference.

Important Points

• Comparison with Other Fundamental Rights:

• Right to Equality: Ensures equal treatment before the law and prohibits discrimination based on caste, religion, gender, etc.

• Right to Constitutional Remedies: Allows individuals to approach the courts for enforcement of Fundamental Rights.

• Right to Education: Guaranteed under Article 21A, it provides free and compulsory education to children aged 6-14 years.

• Global Context:

• In many countries, property rights are safeguarded as legal or constitutional rights and not as fundamental rights.

• The change in India aligns with global practices, allowing governments to balance individual property rights with societal needs.

Q10. Answer: (d) Education

The correct answer is Education.

Key Points

• The 42nd Amendment Act of 1976 was one of the most comprehensive amendments to the Indian Constitution. It brought about significant changes to the division of powers between the Union and State governments.

• One of the major changes introduced by the 42nd Amendment was the transfer of the subject of Education from the State List to the Concurrent List. This allowed both the Union and State governments to legislate on matters related to education.

• The amendment was aimed at ensuring a more uniform educational policy across the country and addressing the growing importance of education in national development.

• This move was significant because the Concurrent List subjects empower both the central and state governments to legislate, ensuring better collaboration in policymaking and implementation of educational reforms.

• Other subjects such as Forests, Wildlife Protection, and Weighs & Measures were also shifted to the Concurrent List through the 42nd Amendment Act, showcasing the importance of unified governance in these critical areas.

• Hence, the correct answer is Education.

Additional Information

• State List:

• The State List comprises subjects on which only the state legislatures can legislate, as per the Seventh Schedule of the Indian Constitution.

• Examples of subjects in the State List include Police, Agriculture, and Public Health.

• Before the 42nd Amendment, Education was exclusively under the purview of the states.

• Concurrent List:

• The Concurrent List contains subjects where both the Union and State governments have the authority to legislate.

• Examples of subjects in the Concurrent List include Education, Forests, Trade Unions, and Marriage.

• If there is a conflict between Union and State laws on a Concurrent List subject, the law enacted by the Union government prevails.

• 42nd Amendment Act:

• The 42nd Amendment Act was enacted in 1976 during the Emergency under the leadership of Prime Minister Indira Gandhi.

• It is often referred to as the "Mini Constitution" due to the extensive changes it brought to the Indian Constitution.

• In addition to moving subjects to the Concurrent List, the amendment introduced changes to the Preamble, Directive Principles of State Policy, and the relationship between the Union and States.

• Importance of Education:

• Education is a critical tool for socio-economic development, and its inclusion in the Concurrent List reflects the emphasis on creating a unified and national approach to educational policies.

• This change enabled the Union government to launch nationwide educational programs like the National Policy on Education and schemes such as the Sarva Shiksha Abhiyan.

• It also facilitates better coordination between states and the center in implementing large-scale reforms in education.

Important Points

• Seventh Schedule: The Indian Constitution divides subjects into three lists: Union List, State List, and Concurrent List under the Seventh Schedule.

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• Union List: Contains subjects exclusively under the Union government's jurisdiction, such as Defense, Foreign Affairs, and Atomic Energy.

• Federal Structure: The division of powers between the Union and States ensures a balance of governance, but the Concurrent List allows cooperation on critical subjects like education.

• Role of Education: Moving education to the Concurrent List reflects its importance in achieving national goals like universal literacy, skill development, and human capital enhancement.

Q11. Answer: (d) Union Ministry of Home Affairs

The correct answer is Union Ministry of Home Affairs.

Key Points

• Operation Shield was conducted under the guidance of the Union Ministry of Home Affairs in Haryana in May 2025 to ensure preparedness for emergency situations, especially for civil defence.

• The initiative involved mock drills to train individuals and agencies on how to effectively respond to disasters, including natural calamities and man-made emergencies.

• The Union Ministry of Home Affairs is responsible for overseeing civil defence activities in India and provides guidelines and support for disaster preparedness and response.

• Such mock drills are vital for assessing the readiness of emergency services and ensuring coordination among various departments during crises.

• The involvement of the Union Ministry of Home Affairs highlights the importance of centralized planning and resources in addressing emergencies effectively.

Additional Information

• Union Ministry of Home Affairs:

• The Ministry is the nodal agency for managing internal security, disaster response, and civil defence in India.

• It coordinates activities related to disaster management, including preparedness, mitigation, and response.

• It provides funding and technical support to state governments for conducting training programs and mock drills.

• It administers the Disaster Management Act, 2005, which lays the foundation for disaster preparedness and management in India.

• National Disaster Management Authority (NDMA):

• The NDMA was established under the Disaster Management Act, 2005, and is responsible for formulating policies for disaster preparedness and response.

• It works in close coordination with the Union Ministry of Home Affairs and state governments.

• The NDMA also provides guidelines for conducting mock drills and disaster management exercises.

• Civil Defence:

• Civil Defence refers to activities aimed at protecting the civilian population and infrastructure during emergencies.

• The Civil Defence Act, 1968, empowers the government to undertake preparedness and training measures for disaster response.

• It includes training volunteers, conducting awareness campaigns, and organizing mock drills like Operation Shield.

• Disaster Preparedness:

• Disaster preparedness involves measures taken to reduce the impact of disasters, including training, planning, and resource allocation.

• Mock drills and simulation exercises help in identifying gaps in preparedness and improving coordination among agencies.

• Preparedness activities are essential for ensuring quick and efficient response during emergencies.

Important Points

• Key Legal Framework:

• The Disaster Management Act, 2005, provides a legal framework for disaster management in India.

• The Civil Defence Act, 1968, outlines the roles and responsibilities of civil defence agencies.

• Role of Union Ministry of Home Affairs:

• The Ministry oversees the implementation of disaster management policies and coordinates with state governments.

• It ensures availability of resources and technical expertise for disaster response.

• Mock Drills:

• Mock drills are simulation exercises conducted to assess preparedness and response capabilities during emergencies.

• They involve training personnel, testing equipment, and improving coordination among agencies.

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Q12. Answer: (d) 500

The correct answer is 500.

Key Points

• The Constitution of India, under Article 170, specifies the maximum strength of the Legislative Assembly of a state to be 500 members and the minimum strength to be 60 members.

• The strength of the Legislative Assembly varies from state to state based on the population of the state. For example, Uttar Pradesh has the largest Legislative Assembly with 403 members.

• However, there are exceptions to the minimum strength of 60 members. States like Sikkim (32 members), Mizoram (40 members), and Goa (40 members) have fewer members in their Legislative Assembly.

• The members of the Legislative Assembly are directly elected by the people of the respective states through a democratic electoral process.

• Each member represents a specific constituency within the state, and elections are held using the first-past-the-post system.

Additional Information

• Composition of State Legislative Assembly:

• The members of the Legislative Assembly are elected for a term of five years, unless dissolved earlier.

• The Governor of the state has the power to dissolve the Assembly or extend its tenure during an emergency.

• Special Provisions for Union Territories:

• Some Union Territories, like Delhi and Puducherry, also have Legislative Assemblies. Their composition and powers differ from those of state assemblies.

• For instance, the Delhi Legislative Assembly has 70 members, while Puducherry has 33 members.

• Qualifications for Membership:

• A person must be a citizen of India, at least 25 years old, and meet other qualifications specified by the Constitution to become a member of the State Legislative Assembly.

• Functions of the State Legislative Assembly:

• The Assembly is responsible for legislation within the state.

• It controls the state's finances, including approval of the budget.

• The Assembly also discusses issues of public interest and holds the executive accountable.

• Comparison with the Legislative Council:

• Not all states have a Legislative Council (the upper house of the state legislature). States with a bicameral legislature include Bihar, Maharashtra, Karnataka, Uttar Pradesh, Andhra Pradesh, and Telangana.

• The maximum strength of a Legislative Council is limited to one-third of the total strength of the Legislative Assembly, and the minimum is 40 members.

Important Points

• Exceptions to the Maximum Strength Rule:

• The Jammu and Kashmir Reorganization Act, 2019, specifies the strength of the Legislative Assembly of the Union Territory of Jammu and Kashmir as 107 members, which can be increased to 114 through a subsequent delimitation exercise.

• Reservation of Seats:

• Seats are reserved for Scheduled Castes (SCs) and Scheduled Tribes (STs) in proportion to their population in the state.

• Reservation for women in the Legislative Assembly is currently under discussion in the Indian Parliament.

• Related Constitutional Provisions:

• Article 168: Provides for the establishment of state legislatures.

• Article 170: Deals with the composition of the Legislative Assembly.

• Article 333: Allows the Governor to nominate one member to the Assembly to represent the Anglo-Indian community, if required (this provision was abolished by the 104th Constitutional Amendment Act, 2019).

Q13. Answer: (d) Atal Mission for Rejuvenation and Urban Transformation

The correct answer is Atal Mission for Rejuvenation and Urban Transformation.

Key Points

• Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched on 25th June 2015 by the Government of India. Its main aim is to improve urban infrastructure to ensure better living conditions in cities.

• The mission focuses on providing basic civic amenities like water supply, sewerage, urban transport, and parks for better quality of life and robust infrastructure development in cities.

• AMRUT covers 500 cities across India with a population of over one lakh, including cities in hilly areas, islands, and tourist destinations.

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• The mission adopts a bottom-up planning approach where urban local bodies (ULBs) prepare Service Level Improvement Plans (SLIPs) for infrastructure development based on their local needs.

• The primary components of AMRUT include ensuring universal coverage of water supply, improved sanitation facilities, stormwater drainage, and reduction in pollution levels by promoting non-motorized transport.

Additional Information

• RURBAN Mission:

• Launched in 2016 under the Ministry of Rural Development, the mission focuses on developing rural clusters by providing urban-like amenities while retaining the rural essence.

• The mission aims to bridge the rural-urban divide by creating economic, social, and infrastructure facilities in rural areas.

• Its objective is to develop smart villages with access to healthcare, education, skill development, sanitation, and housing facilities.

• Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM):

• Launched in 2019, PM-KUSUM primarily focuses on providing solar energy solutions to farmers.

• The scheme aims to install solar pumps, grid-connected solar power plants, and solarization of existing pumps to promote renewable energy and reduce dependency on conventional power sources.

• It is not directly related to urban development but focuses on improving energy access and agricultural productivity.

• Managed Services Provider Scheme:

• This scheme is not associated with urban development. It primarily focuses on providing managed IT and digital services to businesses and government organizations.

• It is a technical initiative aimed at enhancing digital transformation rather than addressing urban infrastructure needs.

• AMRUT Scheme Features:

• AMRUT encourages states to adopt reforms in governance, such as promoting online services, GIS-based planning, and energy efficiency.

• It emphasizes capacity building for urban local bodies (ULBs) and training personnel to manage urban infrastructure projects effectively.

• The funding pattern under AMRUT is shared between the central and state governments, with a central assistance of 50% for cities with a population of less than 10 lakh.

Important Points

• Urbanization in India:

• India is experiencing rapid urbanization, with over 35% of its population living in urban areas as per the 2011 Census. This number is expected to increase to over 50% by 2050.

• Urban development initiatives like AMRUT aim to address challenges like population density, environmental sustainability, and infrastructure deficits.

• Efforts such as smart cities, metro rail projects, and housing for all contribute to urban transformation in India.

• Significance of AMRUT:

• It complements other urban development schemes such as Smart Cities Mission and Swachh Bharat Abhiyan, creating a holistic approach to urban infrastructure improvement.

• By focusing on basic amenities, AMRUT ensures inclusivity and sustainability in urban planning.

• Its emphasis on citizen-centric governance promotes transparency, accountability, and active participation in urban development projects.

Q14. Answer: (c) Sikkim

The correct answer is Sikkim.

Key Points

• Sikkim is the first state in India where the Central Government launched the first organic fish cluster.

• The initiative is part of the Central Government's efforts to promote sustainable aquaculture practices and enhance the livelihoods of local fish farmers.

• The fish cluster project aligns with Sikkim's status as India's first fully organic state, emphasizing ecological sustainability and organic farming practices.

• This organic fish cluster aims to support fish farmers by providing them with the necessary resources, training, and infrastructure to adopt organic practices.

• The project also seeks to increase the production and distribution of organic fish products, contributing to both environmental conservation and the economic development of the state.

Additional Information

• Sikkim as India's Organic State:

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• Sikkim was declared as India's first organic state in 2016, following a decade-long process of converting agricultural land into certified organic farmland.
• The state achieved this milestone under the Organic Mission initiative, which promotes sustainable farming practices.
• Sikkim's organic certification covers various agricultural products, including vegetables, fruits, and cereals.
• Sustainable Aquaculture Practices:
• Organic aquaculture involves raising fish in an environment free from synthetic chemicals, antibiotics, and artificial growth enhancers.
• It emphasizes using natural feed, maintaining water quality, and adopting eco-friendly practices to ensure the health of aquatic ecosystems.
• Such practices help reduce environmental pollution and promote biodiversity in water bodies.
• Government Initiatives for Fisheries:
• The Pradhan Mantri Matsya Sampada Yojana (PMMSY) was launched in 2020 to enhance fish production and create employment opportunities in the fisheries sector.
• The scheme focuses on promoting sustainable aquaculture practices, modernizing infrastructure, and ensuring the welfare of fish farmers.
• India aims to achieve a fish production target of 22 million metric tons by 2024–25 under this initiative.
• Importance of Organic Farming:
• Organic farming minimizes the use of chemical fertilizers and pesticides, reducing soil and water contamination.
• It promotes biodiversity, improves soil fertility, and contributes to sustainable agricultural practices.
• Organic products are in high demand globally due to their health benefits and environmental sustainability.

Important Points

• Sikkim's Achievements in Organic Farming:
• The state has won numerous accolades for its organic farming initiatives, including the Future Policy Award 2018 by the Food and Agriculture Organization (FAO).
• Sikkim's organic model serves as an inspiration for other states in India to adopt sustainable agricultural practices.
• Role of Fisheries in India's Economy:
• The fisheries sector contributes about 1.24% to India's Gross Value Added (GVA) and provides livelihoods to millions of people.
• India is the second-largest producer of fish globally, with a focus on both capture and culture fisheries.

Q15. Answer: (d) American Standard Code for Information Interchange

The correct answer is American Standard Code for Information Interchange.

Key Points

• American Standard Code for Information Interchange (ASCII) is a character encoding standard used for electronic communication.
• It was developed in 1963 by the American National Standards Institute (ANSI) to standardize the representation of text in computers and electronic devices.
• ASCII uses 7-bit binary numbers to represent 128 unique characters, including English letters (uppercase and lowercase), digits (0–9), punctuation marks, and control characters.
• This encoding method ensures compatibility across different devices and platforms, making it a fundamental standard in computing systems.
• ASCII is widely used in programming, data storage, and communication protocols due to its simplicity and efficiency.

Additional Information

• Development and History:
• The ASCII standard was first published in 1963 and underwent updates in 1967 to include additional characters.
• It was originally designed for telecommunication systems and is now extensively utilized in computer systems worldwide.
• Structure of ASCII:
• ASCII comprises control characters (0–31 and 127) and printable characters (32–126).
• Control characters include instructions like line feed (LF) and carriage return (CR).
• Printable characters include letters, digits, and symbols, such as A, 1, !, and @.
• Extended ASCII:
• Extended ASCII uses 8 bits to represent 256 characters, adding support for graphical symbols and international characters.
• It is commonly used in applications requiring a broader range of characters, such as European languages.
• Applications of ASCII:
• ASCII is used in text files, programming languages, and communication protocols like HTTP and FTP.

• It serves as the foundation for other encoding standards, such as UTF-8, which supports a wider range of characters.
• ASCII codes are critical for ensuring compatibility between different systems and devices.
• Comparison with Other Standards:
• Unlike ASCII, Unicode provides encoding for thousands of characters across multiple languages.
• Unicode standards like UTF-8 are backward-compatible with ASCII and widely adopted for global applications.

Q16. Answer: (d) Madhubani

The correct answer is Madhubani.

Key Points

• Madhubani, also known as Mithila painting, is a traditional folk art form originating from the Mithila region in Bihar, India.
• The art is characterized by intricate patterns and vibrant colors, often depicting themes such as nature, Hindu deities, and scenes from epic stories like the Ramayana and Mahabharata.
• Madhubani paintings are created using natural dyes and pigments, with tools like fingers, twigs, brushes, or even matchsticks.
• The art form is traditionally practiced by women from the Mithila region and is often done on walls, floors, and later on paper or canvas.
• It holds significant cultural importance and has gained recognition globally for its unique style and intricate detailing.

Additional Information

• Warli:
• Warli painting is a tribal art form from the Western state of Maharashtra, particularly practiced by the Warli tribe.
• It uses geometric shapes like circles, triangles, and lines to depict daily life, nature, and social events.
• White pigment is primarily used, made from rice paste and water.
• Pattachitra:
• Pattachitra is a traditional painting style from Odisha and West Bengal.
• The term "Pattachitra" translates to "cloth painting," and it often depicts mythological themes, especially stories of Lord Jagannath and Krishna.
• It is characterized by detailed designs and vibrant colors, with natural dyes being used for painting.
• Kalamkari:
• Kalamkari is a hand-painted or block-printed textile art form from Andhra Pradesh and Telangana.
• The term "Kalamkari" derives from "kalam," meaning pen, and "kari," meaning craftsmanship.
• This art style is known for its earthy colors and mythological themes, often depicting scenes from Hindu epics.
• Significance of Madhubani Art:
• Madhubani art is not just a form of decoration; it is deeply connected to the culture and traditions of the Mithila region.
• The paintings are created during festivals, weddings, and other auspicious occasions, symbolizing prosperity and good fortune.
• The art form has been passed down through generations and is recognized as a symbol of Indian heritage.

Important Points

• Madhubani Art Recognition:
• Madhubani painting has received Geographical Indication (GI) tag, highlighting its cultural and regional significance.
• The art form is popular internationally and has been displayed in various exhibitions across the globe.
• Efforts by the Indian government and NGOs have helped revive and preserve this traditional art form for future generations.
• Global Impact:
• Madhubani art is now used in products like clothing, home décor, and stationery, showcasing its adaptability and relevance.
• Many artists from the Mithila region have gained international recognition for their work, further promoting this art form worldwide.

Q17. Answer: (c) Semicryogenic engine

The correct answer is Semicryogenic engine.

Key Points

• The semicryogenic engine is a critical propulsion technology being developed by the Indian Space Research Organisation (ISRO) for its launch vehicles, especially the Launch Vehicle Mark-3 (LVM3).
• This engine uses a combination of liquid oxygen (LOX) as the oxidizer and kerosene as the fuel, which makes it efficient and capable of producing high thrust.
• Compared to cryogenic engines, which use liquid hydrogen as fuel, semicryogenic engines are more cost-effective due to the easier availability and storage of kerosene.
• The development of this engine is part of ISRO's goal to enhance the payload capacity of its launch vehicles and reduce reliance

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on foreign propulsion systems for advanced missions.

• Once operational, the semicryogenic engine is expected to significantly boost India's space exploration capabilities by enabling the launch of heavier satellites at a reduced cost.

Additional Information

• Semicryogenic Engine Characteristics:

• This engine operates at extremely low temperatures, with liquid oxygen stored at approximately -183°C.

• It produces a high thrust-to-weight ratio, making it suitable for lifting heavy payloads into orbit.

• The use of kerosene as fuel results in reduced operational costs and easier handling compared to cryogenic fuels like liquid hydrogen.

• Comparison with Other Engine Types:

• Electric Jet Engine: Used in aircraft, it relies on electrical energy to drive a turbine for propulsion, making it unsuitable for space applications due to power constraints.

• Turbo Plasma Engine: Primarily hypothetical or experimental, not yet widely used in space propulsion systems.

• Liquid Booster: Refers to boosters using liquid propellant but does not describe a specific engine type like the semicryogenic engine.

• ISRO's Future Missions:

• ISRO plans to use semicryogenic engines in upcoming launch vehicles like the Unified Launch Vehicle (ULV) to replace current systems in the LVM3.

• These engines will be pivotal in Gaganyaan, India's first manned space mission, and other interplanetary exploration missions.

• Global Perspective:

• Space agencies like NASA and Roscosmos have used similar technologies in their launch vehicles, providing a proven track record for semicryogenic engines.

• India's development of this technology will enhance its position in the global space industry, promoting self-reliance and competitiveness.

Important Points

• ISRO's Achievements:

• ISRO has already developed and operationalized cryogenic engines, used in its GSLV series for launching heavy satellites.

• The semicryogenic engine is a step forward in improving fuel efficiency and reducing costs for heavier payloads.

• Cost-Effectiveness:

• Using kerosene as fuel is more economical and environmentally friendly compared to traditional cryogenic fuels.

• Strategic Importance:

• Developing indigenous propulsion systems like the semicryogenic engine will reduce India's dependency on foreign technology and enhance national security.

Q18. Answer: (c) Uttam AESA

The correct answer is Uttam AESA.

Key Points

• Uttam AESA Radar is an indigenous Active Electronically Scanned Array (AESA) radar developed by the Defence Research and Development Organisation (DRDO) of India.

• It is designed to enhance the operational capabilities of India's Tejas Mk1A fighter aircraft, providing advanced radar features like multi-target tracking and high-resolution imaging.

• The radar operates on the principle of electronically scanning the radar beam without moving antenna parts, ensuring greater accuracy and faster target acquisition.

• Uttam AESA Radar can track multiple targets simultaneously and has a low probability of interception, making it highly effective in modern combat scenarios.

• It is a part of India's effort to achieve self-reliance in defense technology, aligning with the 'Make in India' initiative.

Additional Information

• Revathi Radar:

• Revathi is a 3D surveillance radar developed for the Indian Navy by DRDO.

• It is primarily used for monitoring and tracking targets in maritime environments.

• Unlike AESA radar, Revathi is not designed for fighter aircraft but is installed on naval vessels.

• Bharani Mk I Radar:

• Bharani Mk I is a low-level lightweight radar developed by DRDO for the Indian Army.

• It is designed for surveillance and early warning in the battlefield environment.

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• This radar is not suitable for aircraft like the Tejas Mk1A.

• Aslesha Mk I Radar:

• Aslesha Mk I is a compact and lightweight 3D radar developed by DRDO.

• It is designed for low-level air space surveillance and is deployed in static locations.

• Similar to Bharani Mk I, it is not used in aircraft but for ground-based applications.

• Active Electronically Scanned Array (AESA) Technology:

• AESA radars use numerous small antennas to produce multiple beams, allowing faster and more precise target detection.

• They are more reliable than traditional mechanically scanned radars due to fewer moving parts.

• AESA radars are highly resistant to jamming and provide better stealth detection capabilities, which are critical in modern aerial combat.

Important Points

• Tejas Mk1A Aircraft:

• The Tejas Mk1A is an upgraded version of the Light Combat Aircraft (LCA) Tejas, developed by Hindustan Aeronautics Limited (HAL).

• It is equipped with advanced avionics, enhanced combat capabilities, and AESA radar for superior operational performance.

• The integration of the Uttam AESA radar into the Tejas Mk1A represents a significant step towards enhancing India's indigenous defense capabilities.

• DRDO's Role in Defense Technology:

• The Defence Research and Development Organisation (DRDO) is India's premier agency for research and development in defense technology.

• DRDO has successfully developed radar systems like Uttam AESA, which meet international standards and strengthen India's defense capabilities.

Q19. Answer: (c) Ten Degree Channel

The correct answer is Ten Degree Channel.

Key Points

• The Ten Degree Channel is a water body that separates the Andaman Islands from the Nicobar Islands. It is located in the Bay of Bengal and plays a significant role in defining the geographical distinction between these two island groups.

• The channel is approximately 150 kilometers wide and lies between the Little Andaman Island (part of the Andaman group) and the Car Nicobar Island (part of the Nicobar group).

• The name "Ten Degree Channel" is derived from its location near the 10° North latitude, which is a significant geographical marker.

• It is an important maritime route in the Bay of Bengal and serves as a natural boundary between the two island groups that are part of the Union Territory of Andaman and Nicobar Islands.

• In terms of biodiversity, both the Andaman and Nicobar Islands have distinct ecosystems, and the channel acts as a natural separator, influencing the flora and fauna of the region.

Additional Information

• Andaman Islands:

• The Andaman Islands are located to the north of the Ten Degree Channel and consist of around 325 islands, with a total area of 8,249 square kilometers.

• These islands are known for their lush forests, pristine beaches, and diverse marine life. Popular tourist destinations include Havelock Island and Neil Island.

• The Andaman Islands are closer to the Indian mainland, making them more accessible compared to the Nicobar Islands.

• Nicobar Islands:

• The Nicobar Islands lie to the south of the Ten Degree Channel and consist of 22 islands, covering a total area of 1,841 square kilometers.

• The Nicobar Islands are less developed and have restricted access due to their ecological sensitivity and the presence of indigenous tribes such as the Nicobarese and Shompens.

• Car Nicobar is the administrative capital of the Nicobar Islands.

• Other Channels in the Region:

• Nine Degree Channel: Separates the Lakshadweep Islands from the Maldives. It is unrelated to the Andaman and Nicobar Islands.

• Duncan Passage: Lies between South Andaman and Little Andaman, but does not separate the Andaman and Nicobar Islands.

• Gulf of Mannar: Lies between the southeastern coast of India and the west coast of Sri Lanka, far away from the Andaman and Nicobar Islands.

• Union Territory Status:

• The Andaman and Nicobar Islands were designated as a Union Territory of India in 1956.

• The islands are governed by the Lieutenant Governor, who represents the Government of India.

• Biodiversity and Ecology:

• Both the Andaman and Nicobar Islands are part of the Sundaland Biodiversity Hotspot, which is known for its rich and unique ecosystems.

• The Ten Degree Channel contributes to the separation of species and ecosystems between the two island groups.

Q20. Answer: (c) 0.685

The correct answer is 0.685.

Key Points

• Human Development Index (HDI): The Human Development Index (HDI) is a composite index published annually by the United Nations Development Programme (UNDP). It measures the social and economic development of countries based on three major dimensions: health, education, and standard of living.

• India's HDI Value: As per the 2025 Human Development Index report, India's HDI value for 2023 is 0.685, which positions the country in the medium human development category.

• Global Ranking: India's HDI value places it among countries striving to achieve significant progress in human development. It shows improvements in life expectancy, education levels, and income per capita.

• Medium Human Development Category: Countries with HDI values between 0.55 and 0.7 are classified under the medium human development category. India's position reflects the ongoing efforts to balance economic growth and social development.

• Development Challenges: Despite improvements, India still faces challenges in areas such as reducing inequality, improving healthcare infrastructure, and enhancing education quality, which are critical to achieving higher HDI rankings in the future.

Additional Information

• Components of HDI:

• Health: Measured by life expectancy at birth, it reflects the ability to live a long and healthy life.

• Education: Calculated using mean years of schooling (average schooling received by people aged 25 and older) and expected years of schooling (schooling a child entering the education system is expected to receive).

• Standard of Living: Assessed using Gross National Income (GNI) per capita adjusted for purchasing power parity (PPP).

• UNDP and HDI:

• The United Nations Development Programme (UNDP) introduced the HDI in 1990, aiming to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country.

• It is published annually in the Human Development Report.

• India's HDI Progress:

• India has consistently improved its HDI score over the years due to programs aimed at reducing poverty, enhancing education, and improving healthcare services.

• Government initiatives such as Ayushman Bharat, Beti Bachao Beti Padhao, and Skill India play a critical role in boosting India's socio-economic development.

• Comparison with Other Countries:

• Countries with an HDI above 0.8 are classified as having high human development. For instance, Norway consistently ranks high due to its robust healthcare system, quality education, and high income levels.

• India, with its HDI of 0.685, ranks lower than countries like China (0.768) but higher than countries in the low human development category such as Niger (0.394).

• Human Development Challenges:

• Despite progress, challenges such as income inequality, gender disparity, and rural-urban divides continue to affect India's development trajectory.

• Addressing these issues is essential for India to transition into the high human development category in the future.

Q21. Answer: (b) 15th

The correct answer is 15th.

Key Points

• National Voters' Day is celebrated every year on 25th January to mark the foundation day of the Election Commission of India (ECI), which was established on 25th January 1950.

• The celebration aims to increase awareness among voters and encourage participation in the electoral process.

• The 15th edition of National Voters' Day was observed on 25th January 2025, commemorating the 75th anniversary of the Election Commission of India.

• The theme for National Voters' Day often highlights voter awareness and inclusive participation in democratic processes. For the 15th edition, the focus was likely on strengthening democratic values.

• The day is marked by special activities, including voter education campaigns, distribution of voter ID cards to new voters, and cultural events across the country.

Additional Information

• Election Commission of India (ECI):

• The ECI is an autonomous constitutional authority responsible for administering elections to Parliament, State Legislatures, and the offices of the President and Vice President in India.

• It was established on 25th January 1950 under Article 324 of the Constitution of India.

• The Commission consists of the Chief Election Commissioner and two Election Commissioners, who are appointed by the President of India.

• ECI plays a crucial role in ensuring free and fair elections in India.

• Importance of National Voters' Day:

• The day seeks to emphasize the importance of voting and the role of voters in the democratic process.

• It is aimed at increasing voter enrollment, especially among young voters, and ensuring their active participation in elections.

• Distribution of Electoral Photo Identity Cards (EPICs) to newly registered voters is a key activity.

• Educational campaigns are organized to spread awareness about the significance of voting and responsible citizenship.

• Themes of National Voters' Day:

• The themes of National Voters' Day often focus on inclusivity, transparency, and voter awareness.

• Past themes have included "Making Our Voters Empowered, Vigilant, Safe and Informed" and "Electoral Literacy for Stronger Democracy."

• These themes highlight the Election Commission's efforts to promote informed and ethical voting practices.

• Role of Young Voters:

• Young voters are the backbone of democratic participation, and the day encourages their enrollment and active participation.

• Special campaigns are run to ensure every eligible individual between the age of 18-21 years is registered as a voter.

Important Points

• Historical Milestones:

• National Voters' Day was first celebrated in 2011 to commemorate the foundation day of the Election Commission of India.

• It has since become an important annual event to promote voter awareness and democratic participation.

• Voter Turnout:

• India has one of the largest electorates globally, and ensuring high voter turnout is a continuous effort by the ECI.

• National Voters' Day plays a significant role in encouraging eligible citizens to exercise their franchise.

Q22. Answer: (c) It is used in the production of nearly all goods and services.

The correct answer is It is used in the production of nearly all goods and services.

Key Points

• Infrastructure is commonly referred to as a 'universal intermediate' because it forms the backbone of economic activities and is essential for the production of goods and services.

• It includes facilities and services like transportation, communication, power supply, water, sanitation, and social infrastructure, which are fundamental for the functioning of any economy.

• The term 'universal intermediate' signifies that infrastructure is a prerequisite for almost every sector, including agriculture, industry, and services, to function efficiently.

• Without proper infrastructure, the production and distribution of goods and services become inefficient, leading to higher costs and reduced economic growth.

• Infrastructure supports economic development by improving connectivity, increasing productivity, and fostering trade and commerce across different regions.

Additional Information

• Importance of Infrastructure:

• Economic Growth: Infrastructure development is a key driver of economic growth as it enhances productivity and creates jobs.

• Global Competitiveness: Countries with robust infrastructure attract more investments, fostering overall economic development.

• Social Benefits: Infrastructure development improves access to basic amenities such as education, healthcare, and sanitation, enhancing the quality of life.

• Environmental Impact: Sustainable infrastructure reduces environmental degradation through the use of renewable energy sources and eco-friendly construction practices.

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• Types of Infrastructure:

• Physical Infrastructure: Includes tangible facilities such as roads, bridges, railways, airports, and power plants.

• Social Infrastructure: Comprises healthcare, education, housing, and sanitation facilities that improve living standards.

• Digital Infrastructure: Refers to IT and communication networks, including the internet, broadband, and data centers.

• Role of Infrastructure in Sustainable Development:

• Infrastructure projects like renewable energy plants (solar, wind) contribute to sustainable energy solutions.

• Efficient public transportation systems reduce carbon emissions and promote environmental sustainability.

• Smart city initiatives integrate technology with urban planning to enhance the quality of urban life.

• Examples of Infrastructure Projects:

• The Golden Quadrilateral Project in India connects major cities through a network of highways, boosting trade and transportation.

• The BharatNet Project aims to provide high-speed internet connectivity to rural areas.

• Development of metro systems in cities like Delhi and Mumbai to enhance urban mobility.

Important Points

• Global Infrastructure Index:

• The Global Infrastructure Hub monitors global infrastructure development trends and highlights areas needing improvement.

• India ranks among the top countries investing in infrastructure development, with significant projects like the Smart Cities Mission and Bharatmala Project.

• Challenges in Infrastructure Development:

• Funding Constraints: Many developing countries face a lack of financial resources for large-scale infrastructure projects.

• Land Acquisition Issues: Land acquisition for infrastructure often faces delays due to disputes and resistance from local communities.

• Environmental Concerns: Large-scale projects may lead to deforestation, displacement of communities, and environmental degradation.

Q23. Answer: (d) 10 m Air Pistol

The correct answer is 10 m Air Pistol.

Key Points

• Saurabh Chaudhary won the bronze medal in the 10 m Air Pistol event at the April 2025 International Shooting Sport Federation (ISSF) World Cup.

• The 10 m Air Pistol is a highly competitive shooting event where athletes aim at stationary targets from a distance of 10 meters using an air pistol.

• Saurabh Chaudhary is an accomplished Indian shooter and has previously earned international recognition in this event, including winning multiple medals in major competitions.

• The ISSF World Cup is an important tournament in the field of shooting sports, bringing together top shooters from around the world to compete in various shooting disciplines.

• This achievement further solidifies Saurabh Chaudhary's position as one of India's leading shooters and a prominent figure in the sport globally.

Additional Information

• 10 m Air Pistol Event:

• The 10 m Air Pistol is a precision shooting discipline where shooters aim at a target with a diameter of 11.5 mm positioned at a distance of 10 meters.

• Participants use specially designed air pistols with pellets as ammunition.

• The event demands exceptional concentration, control, and accuracy, making it one of the most technical shooting sports.

• Saurabh Chaudhary's Achievements:

• Saurabh Chaudhary is a gold medalist at the 2018 Asian Games in the 10 m Air Pistol event.

• He has consistently represented India in international competitions, earning accolades in prestigious tournaments like the ISSF World Cups and World Championships.

• His success has contributed significantly to the growth of shooting sports in India.

• ISSF World Cup:

• The International Shooting Sport Federation (ISSF) organizes the World Cup series annually, featuring events in disciplines like rifle, pistol, and shotgun shooting.

• The tournament serves as a platform for shooters to qualify for the Olympics and other major international competitions.

• India has emerged as a strong contender in the ISSF World Cup, with shooters like Saurabh Chaudhary bringing laurels to the

country.

• Other Shooting Events:

• 50 m Rifle 3 Positions: Involves shooting in kneeling, prone, and standing positions, requiring versatility and precision.

• 25 m Rapid Fire Pistol: A dynamic event where shooters fire at five targets within a limited time frame.

• Skeet Shooting: A shotgun event where participants aim at clay targets launched into the air.

Important Points

• Shooting Sport in India:

• Shooting has gained immense popularity in India, with athletes like Abhinav Bindra, Manu Bhaker, and Rahi Sarnobat achieving international success.

• The National Rifle Association of India (NRAI) plays a pivotal role in promoting and governing shooting sports in the country.

• Government initiatives and schemes, such as the Target Olympic Podium Scheme (TOPS), provide financial support and training facilities to Indian shooters.

• ISSF Ranking System:

• The ISSF maintains a ranking system to evaluate shooters based on their performance in international competitions.

• Saurabh Chaudhary has consistently ranked among the top shooters in the world in the 10 m Air Pistol category.

Q24. Answer: (c) Article 243D

The correct answer is Article 243D.

Key Points

• Article 243D of the Indian Constitution deals with the reservation of seats in every Panchayat for Scheduled Castes (SCs), Scheduled Tribes (STs), and women.

• It mandates that seats be reserved for Scheduled Castes and Scheduled Tribes in proportion to their population in the Panchayat area.

• One-third of the total seats in every Panchayat must be reserved for women, including women belonging to SCs and STs.

• The reservation of seats for SCs, STs, and women applies to all tiers of the Panchayati Raj system (village, intermediate, and district levels).

• The provision ensures the inclusion and representation of marginalized sections of society and enhances gender equality at the grassroots level of governance.

Additional Information

• Panchayati Raj System:

• It is a three-tier system of governance at the village, intermediate, and district levels, as introduced by the 73rd Constitutional Amendment Act of 1992.

• The Act added Part IX to the Constitution, titled "The Panchayats," which includes Articles 243 to 243O.

• The system aims to ensure local self-governance in rural areas, empowering local communities to participate in decision-making processes.

• Reservation for Women:

• Article 243D ensures that one-third of the total seats in Panchayats are reserved for women, including those from SCs and STs.

• This reservation is intended to promote gender equality and ensure women's active participation in grassroots governance.

• Scheduled Castes and Scheduled Tribes:

• Scheduled Castes (SCs) and Scheduled Tribes (STs) are communities identified in the Constitution of India as historically disadvantaged and socially marginalized groups.

• Reservation in Panchayats aims to empower these communities by providing them with a platform to participate in local governance and decision-making processes.

• State Election Commission:

• The responsibility of conducting elections to Panchayats lies with the State Election Commission, which is established under Article 243K of the Constitution.

• The elections are held every five years, ensuring a regular and democratic process at the local level.

Important Points

• Significance of Article 243D:

• It ensures the political empowerment of marginalized communities and women at the grassroots level.

• The reservation policy under Article 243D reflects the Indian Constitution's commitment to achieving social justice and equality.

• 73rd Constitutional Amendment Act:

• This landmark Act was enacted in 1992 to strengthen the Panchayati Raj system in India.

• It provides a constitutional status to Panchayats and defines their structure, composition, and powers.

• Importance of Local Governance:

• Local self-governance enables citizens to participate directly in decision-making, addressing their specific needs and priorities.

• It enhances democratic values, promotes development, and improves the delivery of public services.

Q25. Answer: (b) 3

The correct answer is Option 2.

Key Points

• On 1 May 2025, the Election Commission of India (ECI) launched 3 major initiatives to improve the accuracy of the voter list and make voting more convenient for citizens.

• The initiatives aim to address discrepancies in voter registration, ensure the inclusion of eligible voters, and enhance the ease of voting through technological advancements and streamlined processes.

• These initiatives include the introduction of digital voter verification systems, advanced data analytics for voter list optimization, and mobile-based applications for voter convenience.

• The number of initiatives—3—was determined based on the focus areas prioritized by the Election Commission, including improving voter data accuracy, simplifying the voting process, and boosting accessibility.

• Option 2 is correct as the Election Commission officially announced 3 major initiatives, aligning with its mission to ensure free and fair elections in India.

Additional Information

• Election Commission of India (ECI):

• The Election Commission of India is an autonomous constitutional authority responsible for conducting elections to the Parliament, State Legislatures, and the offices of the President and Vice President.

• It was established on 25 January 1950, and its functioning is governed by Article 324 of the Indian Constitution.

• The ECI ensures free, fair, and transparent elections through various reforms and initiatives.

• Voter List Accuracy Initiatives:

• The Election Commission has introduced technologies like Artificial Intelligence (AI) and Big Data Analytics for voter list verification and optimization.

• These initiatives aim to eliminate duplicate or erroneous entries and ensure the inclusion of all eligible voters.

• Ease of Voting:

• Mobile applications such as ‘Voter Helpline App’ have been developed to assist voters in locating polling stations, checking their enrollment status, and accessing election-related information.

• Technological reforms like Electronic Voting Machines (EVMs) and Voter Verifiable Paper Audit Trails (VVPAT) have further enhanced the voting experience.

• Major Electoral Reforms:

• The introduction of the National Voter Service Portal (NVSP) has simplified voter registration and correction processes.

• Efforts like ‘One Nation, One Voter ID’ are being considered to streamline voter identification across states.

Important Points

• Voter Eligibility:

• Any citizen of India aged 18 years or above is eligible to vote, provided they are enrolled in the electoral rolls.

• Voter registration processes have been simplified through digital platforms and mobile applications.

• Role of Technology in Elections:

• Technological advancements like Blockchain Voting and Remote Voting Systems are being explored to improve voter participation and transparency.

• These innovations aim to eliminate geographical barriers and enhance security in the voting process.

Q26. Answer: (a) It pastes the copied text or files.

The correct answer is It pastes the copied text or files.

Key Points

• Ctrl + V is a widely used keyboard shortcut in operating systems such as Windows, macOS, and Linux, as well as software applications, to paste the previously copied or cut content.

• When you press Ctrl + C, the selected content (text, images, files) gets copied to the clipboard, a temporary storage area in your computer’s memory.

• Pressing Ctrl + V inserts the copied or cut content from the clipboard into the selected location, such as a document, text field, or folder.

• This shortcut is a part of a group of standard shortcuts that also include Ctrl + C for copy, Ctrl + X for cut, and Ctrl + Z for undo.

• Functionality: It is helpful for efficiently duplicating or moving content, saving time compared to manual methods like retyping or

dragging and dropping.

Additional Information

• Clipboard:

• The clipboard is a temporary storage area in a computer's memory, used to store copied or cut content.

• It allows users to transfer data between applications or within the same application by using shortcuts like Ctrl + C and Ctrl + V.

• Most modern systems can store multiple clipboard entries, allowing users to paste older copied data.

• Applications:

• The Ctrl + V shortcut is used universally across text editors (e.g., Microsoft Word, Notepad), graphic design tools (e.g., Photoshop), coding environments (e.g., Visual Studio), and file management systems.

• It is also used in web browsers and online platforms for quick data entry.

• History:

• The concept of copy-paste commands was first popularized by computer scientist Larry Tesler, who worked at Xerox PARC in the 1970s.

• These shortcuts were later standardized in operating systems like Windows, macOS, and Linux.

• Other Related Shortcuts:

• Ctrl + X: Cuts the selected content and moves it to the clipboard.

• Ctrl + C: Copies the selected content to the clipboard.

• Ctrl + Z: Undoes the last action.

• Ctrl + Shift + V: Pastes content without formatting (available in some applications).

Important Points

• Efficiency: Keyboard shortcuts like Ctrl + V significantly improve workflow speed compared to manual actions like retyping or dragging content.

• Cross-platform functionality: The Ctrl + V shortcut works similarly across operating systems, ensuring a consistent user experience.

• Customizable shortcuts: Many software applications allow users to customize shortcuts, enabling them to assign different keys to perform paste functions.

Q27. Answer: (c) Someone not working but seeking work over a long period

The correct answer is Someone not working but seeking work over a long period.

Key Points

• The Usual Status (US) measure of unemployment refers to a person being unemployed if they have been seeking work but have not been able to find employment for a substantial or prolonged period.

• This measure focuses on individuals who are actively seeking work and are available for work but are unable to secure employment due to various factors such as lack of opportunities or skills mismatch.

• Under the Usual Status definition, unemployment is assessed over a longer reference period, typically one year, compared to other measures of unemployment that might use shorter timeframes such as a week or month.

• Unlike temporary unemployment or underemployment (e.g., working part-time or occasionally), the US measure prioritizes those who are persistently unemployed and seeking work, hence offering insights into chronic unemployment in the economy.

• The measure is widely used in surveys conducted by organizations like the National Sample Survey Office (NSSO) in India to gauge unemployment trends over time.

Additional Information

• Different measures of unemployment:

• Usual Status (US) measure: Assesses unemployment over a reference period of one year, focusing on individuals who are persistently unemployed.

• Current Weekly Status (CWS) measure: Evaluates unemployment based on the number of days a person was employed or unemployed during the reference week.

• Current Daily Status (CDS) measure: Considers unemployment on a daily basis, offering a more granular view of employment trends.

• Key differences between employed and unemployed:

• Employed: Individuals who are engaged in economic activities and earning wages or profits.

• Unemployed: Individuals who are not engaged in economic activities but are actively seeking work and are available to work.

• Underemployed: Individuals who are working but not to their full potential or capacity, such as part-time workers wanting full-time jobs.

• Relevance of unemployment data:

• Helps policymakers understand the health of the economy and assess the need for employment generation programs.

• Important for addressing social welfare concerns and ensuring economic stability.

• Provides insights into the effectiveness of skill development initiatives and educational policies.

• Examples of chronic unemployment:

• Individuals lacking skills relevant to modern industries (e.g., due to technological changes).

• People residing in regions with limited economic opportunities, such as rural areas or regions with low industrialization.

Important Points

• Option Analysis:

• Someone working only one day a week: This describes underemployment, not unemployment. Hence, this statement is incorrect.

• Someone retired from work: Retired individuals are not considered part of the labor force, as they are not seeking work. Hence, this statement is incorrect.

• Someone not working but seeking work over a long period: This fits the definition of unemployment under the Usual Status measure. Hence, this statement is correct.

• Someone working part-time: Part-time workers are considered employed, even if they work fewer hours than desired. Hence, this statement is incorrect.

• The Usual Status measure is widely used in India as it reflects long-term unemployment trends, unlike the CWS and CDS measures which are more suited for assessing short-term unemployment.

• According to the Periodic Labour Force Survey (PLFS) conducted by the NSSO, the unemployment rate under the Usual Status provides a comprehensive view of structural unemployment and is considered a critical indicator for policy-making.

Q28. Answer: (b) Deen Dayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)

The correct answer is Deen Dayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM).

Key Points

• Mahila Kisan Sashaktikaran Pariyojana (MKSP) is a sub-scheme under Deen Dayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM), aimed at empowering women farmers.

• It was introduced by the Ministry of Rural Development to promote sustainable agriculture and support women in the agricultural sector.

• The scheme is designed to enhance the livelihoods of marginalized women farmers through capacity building and improved access to resources and technology.

• MKSP emphasizes sustainable agricultural practices such as organic farming, soil fertility management, and water conservation.

• This initiative seeks to reduce dependency on external inputs and ensure food security by promoting eco-friendly farming techniques.

Additional Information

• Deen Dayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM):

• Launched in June 2011, DAY-NRLM aims to alleviate rural poverty by creating sustainable livelihood options.

• It is a flagship program of the Ministry of Rural Development, and it focuses on building strong self-help groups (SHGs).

• DAY-NRLM provides financial assistance, training, and capacity building to SHGs to encourage entrepreneurship and self-reliance among rural communities.

• Women constitute over 85% of the program's beneficiaries, making it a cornerstone for women empowerment in rural India.

• Other Government Schemes Related to Agriculture:

• Pradhan Mantri Krishi Sinchayee Yojana (PMKSY): Aims to increase agricultural productivity by ensuring water availability and efficient irrigation systems.

• Rashtriya Krishi Vikas Yojana (RKVY): Focuses on incentivizing states to invest more in agricultural development.

• Paramparagat Krishi Vikas Yojana: Promotes organic farming and sustainable agricultural practices.

• Sustainable Agriculture Practices Promoted by MKSP:

• Encourages organic farming to reduce dependence on chemical fertilizers and pesticides.

• Promotes crop diversification and mixed cropping to enhance soil fertility and reduce risks.

• Advocates for water conservation techniques, such as rainwater harvesting and micro-irrigation.

• Focuses on the use of locally available resources to reduce input costs.

Important Points

• Eligibility: MKSP primarily targets women farmers from marginalized communities, including SC/ST groups and other economically disadvantaged sections.

• Funding: The program is funded jointly by the Central Government and participating states, ensuring shared responsibility and

accountability.

• Implementation: The scheme is implemented through various community-based organizations, SHGs, and NGOs working in rural areas.

• Monitoring: A robust monitoring and evaluation framework is in place to measure the impact of MKSP on women farmers' livelihoods and agricultural productivity.

Q29. Answer: (d) 3.7×10^(10) disintegrations per second

The correct answer is 3.7×10^(10) disintegrations per second.

Key Points

• The curie (Ci) is a non-SI unit of radioactivity that is widely used in nuclear science and engineering.

• One curie is defined as the activity of a radioactive substance that undergoes 3.7×10^(10) disintegrations per second.

• This value was based on the approximate activity of 1 gram of radium-226, a radioactive isotope discovered by Marie Curie and Pierre Curie.

• The curie is commonly used to describe the intensity of radiation sources in various applications, including medical, industrial, and scientific fields.

• The SI unit of radioactivity is the becquerel (Bq), which corresponds to one disintegration per second. Hence, 1 curie equals 3.7×10^(10) becquerels.

Additional Information

• Marie Curie's Contribution:

• Marie Curie and Pierre Curie discovered radium and polonium, leading to the concept of radioactivity.

• The unit "curie" was named in honor of their groundbreaking work in the field of radioactive decay.

• Radioactivity Measurement Units:

• The becquerel (Bq) is the SI unit of radioactivity, representing one disintegration per second.

• Other units like the gray (Gy) and sievert (Sv) measure absorbed radiation dose and biological effects, respectively.

• Applications of Curie:

• The curie is used in industries such as nuclear medicine, radiography, and research.

• It helps quantify the activity of radioactive isotopes used for diagnostic imaging and cancer treatment.

• Conversion to SI Units:

• 1 curie = 3.7×10^(10) becquerels, making it a convenient unit for large-scale radioactive sources.

• In scientific studies, the use of becquerel is preferred for precision and adherence to SI norms.

Q30. Answer: (b) They move away from each other.

The correct answer is They move away from each other..

Key Points

• Divergent boundaries occur when tectonic plates move away from each other. This movement creates space for magma to rise from the mantle, forming new crust.

• This process commonly occurs at mid-ocean ridges, where the oceanic crust is generated, such as the Mid-Atlantic Ridge.

• At divergent boundaries, the upwelling magma solidifies, creating features like rift valleys and underwater volcanic ridges.

• The movement of plates at divergent boundaries is a key part of the tectonic cycle, contributing to the recycling of the Earth’s crust.

• Divergent boundaries are associated with geological phenomena such as earthquakes and volcanic activity, but these tend to be less intense compared to convergent boundaries.

Additional Information

• Plate Tectonics:

• The theory of plate tectonics explains the movement of Earth’s lithospheric plates over the asthenosphere.

• There are three types of plate boundaries: divergent, convergent, and transform boundaries.

• These movements are driven by forces such as mantle convection, ridge-push, and slab-pull mechanisms.

• Mid-Ocean Ridges:

• Mid-ocean ridges are underwater mountain systems formed by plate tectonics at divergent boundaries.

• They are the site of seafloor spreading, where new oceanic crust is created as magma rises and solidifies.

• Examples include the Mid-Atlantic Ridge and the East Pacific Rise.

• Rift Valleys:

• In continental regions, divergent boundaries can form rift valleys, which are elongated troughs with steep walls.

• An example is the Great Rift Valley in East Africa, which is caused by the splitting of the African Plate.

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• Associated Earthquakes:

• Earthquakes at divergent boundaries are generally less intense compared to those at convergent boundaries.

• These earthquakes occur due to the stretching and fracturing of the Earth's crust as plates move apart.

• Volcanic Activity:

• Volcanic activity at divergent boundaries occurs due to the upwelling of magma.

• This contributes to the formation of volcanic islands and ridges such as Iceland, which lies on the Mid-Atlantic Ridge.

Important Points

• Option 1 - They stay in one place: This is incorrect as tectonic plates are in constant motion due to mantle convection forces.

• Option 3 - They slide past one another: This refers to transform boundaries, not divergent boundaries. Examples include the San Andreas Fault.

• Option 4 - They move towards each other: This describes convergent boundaries, where plates collide, leading to features like mountains and subduction zones.

Q31. Answer: (c) A wealthy person

The correct answer is A wealthy person.

Key Points

• The term gomat in the Rigveda refers to someone who possesses cows, which were considered a symbol of wealth and prosperity in ancient Vedic society.

• The Rigvedic society was agrarian, and cows were highly valued for their milk, dung (used as fuel and manure), and as an economic asset. Hence, a person with many cows was considered wealthy.

• The term "gomat" is derived from the Sanskrit word "go," meaning cow, and "mat," meaning possession or having.

• In the Rigvedic hymns, wealth was often measured in terms of cattle rather than gold or money, making the term synonymous with a wealthy person.

• Cows were associated with abundance, nourishment, and social status, and thus, individuals described as "gomat" held an esteemed position in society.

Additional Information

• The Rigveda:

• The Rigveda is the oldest of the four Vedas, composed around 1500 BCE in ancient India.

• It consists of 10 mandalas (books) and contains 1028 hymns dedicated to various deities such as Indra, Agni, Varuna, and Soma.

• The Rigvedic society was primarily agrarian, and cattle, especially cows, were considered the backbone of the economy.

• It provides insights into the early Indo-Aryan civilization, their beliefs, culture, and socio-economic practices.

• The importance of cows in Vedic society:

• Cows were regarded as sacred and were often offered in sacrifices during religious ceremonies.

• The possession of cows was a sign of wealth, and they were used in trade and as gifts during important events.

• The cow's utility extended beyond milk to dung, which was used as manure and fuel, making it vital for agriculture and daily life.

• In Vedic hymns, cows are often referred to as "Aghnya" (not to be killed), reflecting their revered status.

• Alternative meanings of "gomat":

• Though primarily referring to a wealthy person, "gomat" could also denote someone fortunate or blessed, as cows symbolized prosperity.

• In some contexts, "gomat" might be used metaphorically for someone possessing spiritual or moral wealth.

• Other terms related to wealth in the Rigveda:

• "Rathin" referred to someone possessing chariots, another marker of wealth.

• "Ashvin" denoted an individual owning horses, which were essential for transportation and warfare.

• These terms collectively highlight the agrarian and pastoral economy of the Rigvedic era.

Important Points

• Rigvedic Language: The language used in the Rigveda is Vedic Sanskrit, which is distinct from classical Sanskrit and is characterized by its archaic forms.

• Societal Structure: The Rigvedic society was divided into tribes, and wealth was often shared among the community rather than being concentrated.

• Symbolism of Cows: The cow was a central motif in Vedic rituals, hymns, and daily life, symbolizing prosperity, nourishment, and religious sanctity.

• Economic Practices: Trade during the Rigvedic period was primarily barter-based, with cattle as the standard for transactions.

• Religious Context: Many hymns in the Rigveda invoke blessings for cattle, underscoring their importance in both material and

spiritual life.

Q32. Answer: (b) European Union and Singapore

The correct answer is European Union and Singapore.

Key Points

• The European Union (EU) and Singapore signed a landmark Digital Trade Agreement (DTA) in May 2025, marking a significant step in strengthening digital and economic cooperation between the two parties.

• The DTA aims to enhance digital connectivity by establishing frameworks for cross-border data flows, ensuring a secure digital environment, and promoting digital trade facilitation.

• This agreement is intended to set a standard for digital trade rules globally by addressing e-commerce, data security, and intellectual property rights.

• Singapore is recognized as a major hub for trade and technology in Asia, and the EU is one of the world's largest trading blocs, making this partnership significant for global trade dynamics.

• The DTA reflects both parties' commitment to promoting sustainable and inclusive economic growth while ensuring compliance with data protection and privacy standards.

Additional Information

• European Union:

• The EU is a political and economic union of 27 member states located primarily in Europe, with its headquarters in Brussels, Belgium.

• It has a common market, allowing free movement of goods, services, capital, and people among member states.

• The EU is a significant global economic entity, accounting for a substantial share of world trade and GDP.

• It is known for its strong stance on privacy and data protection, with the General Data Protection Regulation (GDPR) being a notable example.

• Singapore:

• Singapore is a global financial and technology hub located in Southeast Asia, with a highly developed economy and advanced digital infrastructure.

• It actively promotes digital innovation and is a leader in smart city technologies.

• The country is a member of several trade blocs and organizations, including the ASEAN and WTO, and has signed various free trade agreements.

• Singapore has strong regulations for data protection, governed by the Personal Data Protection Act (PDPA), ensuring secure and ethical use of digital information.

• Digital Trade Agreements:

• Digital Trade Agreements are designed to facilitate cross-border digital trade while addressing issues such as data privacy, intellectual property, cybersecurity, and digital infrastructure.

• They often include provisions to support small and medium enterprises (SMEs), enabling them to engage in global trade effectively.

• These agreements aim to standardize e-commerce regulations and promote a fair and secure digital environment.

• Global Digital Trade Trends:

• Digital trade is expected to grow exponentially, driven by advancements in technology, e-commerce, cloud computing, and artificial intelligence.

• Major economies like the US, China, and EU are increasingly engaging in agreements to address digital trade barriers.

• Emerging economies are also investing in digital infrastructure to participate in the global digital economy.

Important Points

• Significance of the EU-Singapore DTA:

• This agreement is expected to set a benchmark for future digital trade agreements, influencing global standards.

• It addresses critical issues such as data protection, cybersecurity, and intellectual property rights, ensuring a safe and reliable digital trade environment.

• Both parties aim to leverage the agreement to enhance economic growth, job creation, and technological innovation.

• Role of Technology in Trade:

• Technology plays a pivotal role in modern trade by facilitating e-commerce, digital payments, and secure data exchange.

• Digital trade agreements align with global trends of digital transformation, enabling businesses to operate seamlessly across borders.

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Q33. Answer: (d) Mandla region of Madhya Pradesh

The correct answer is Mandla region of Madhya Pradesh.

Key Points

• Rani Avantibai Lodhi was a valiant queen of Ramgarh, located in the Mandla district of Madhya Pradesh. She played a critical role in the 1857 revolt against British rule.

• She raised an army of four thousand soldiers to fight against the British, who had taken over the administration of Ramgarh after declaring her husband unfit to rule.

• Rani Avantibai Lodhi organized a rebellion against British imperialism in the Mandla region, making it a significant site during India's first war of independence.

• Her courage and leadership during the revolt exemplify her commitment to safeguarding her kingdom's sovereignty against colonial forces.

• Ultimately, Rani Avantibai Lodhi sacrificed her life in the struggle, becoming a symbol of resistance and patriotism in Indian history. Mandla region of Madhya Pradesh is thus remembered for her contributions to the rebellion.

Additional Information

• Rani Avantibai Lodhi:

• She was born in the Lodhi Rajput community and married to Vikramaditya Singh, the ruler of Ramgarh.

• After her husband's death, the British annexed her kingdom, citing the Doctrine of Lapse, leading her to take up arms against British rule.

• Mandla District:

• Located in the state of Madhya Pradesh, Mandla is known for its historical significance and contributions to India's freedom struggle.

• The district is home to tribal communities and rich cultural heritage, which played a part in rallying support for Rani Avantibai's rebellion.

• 1857 Revolt:

• Also known as the First War of Indian Independence, the revolt marked the beginning of organized resistance against British colonial rule.

• Rani Avantibai Lodhi is one of the many leaders who emerged during this period, contributing to the anti-colonial struggle.

• Doctrine of Lapse:

• Introduced by Lord Dalhousie, the Doctrine of Lapse allowed the British to annex Indian princely states if the ruler died without a male heir.

• This policy was a significant factor behind the unrest leading to the 1857 revolt.

Important Points

• Legacy of Rani Avantibai Lodhi:

• Her sacrifice is celebrated in Madhya Pradesh, where she is regarded as a heroine of the 1857 revolt.

• Memorials and statues have been erected in her honor, symbolizing her contribution to Indian independence.

• Contribution to the Freedom Struggle:

• Rani Avantibai Lodhi's leadership inspired many tribal and rural communities to resist British oppression.

• Her efforts are a testament to the active participation of women in India's freedom movement.

Q34. Answer: (c) Aids digestion

The correct answer is Aids Digestion.

Key Points

• Dietary fibre, also known as roughage or bulk, is primarily found in plant-based foods such as fruits, vegetables, whole grains, nuts, and seeds.

• It is a type of carbohydrate that is not digestible by human enzymes, meaning it passes through the digestive system relatively intact.

• One of the primary functions of dietary fibre is to aid digestion by adding bulk to the stool, which helps prevent constipation and promotes regular bowel movements.

• Dietary fibre can help maintain a healthy gut microbiome by serving as food for beneficial gut bacteria, which produce short-chain fatty acids that contribute to gut health.

• Soluble fibre can help regulate blood sugar levels and lower cholesterol by slowing the absorption of sugar and binding to cholesterol in the digestive tract, though these benefits are secondary to its primary role in digestion.

• It does not provide energy directly, as it is not broken down into glucose, nor does it contribute to muscle building or increase cholesterol levels.

Additional Information

• Types of Dietary Fibre:

• Soluble fibre: Found in foods like oats, barley, and fruits such as apples and citrus. It dissolves in water and forms a gel-like substance that can help lower cholesterol and stabilize blood sugar levels.

• Insoluble fibre: Found in foods like whole grains, nuts, seeds, and vegetables. It does not dissolve in water and primarily adds bulk to stool, aiding in regular bowel movements and preventing constipation.

• Health Benefits:

• Consuming adequate dietary fibre can help prevent several digestive disorders such as diverticular disease, irritable bowel syndrome (IBS), and constipation.

• Dietary fibre is associated with a lower risk of chronic diseases such as type 2 diabetes, heart disease, and certain types of cancer, particularly colorectal cancer.

• It can contribute to weight management by promoting a feeling of fullness, thereby reducing overall calorie intake.

• Recommended Intake:

• The World Health Organization (WHO) recommends adults consume at least 25-30 grams of dietary fibre daily from a variety of food sources.

• Children and adolescents require slightly less depending on their age, ranging from 15-25 grams per day.

• Examples of High-Fibre Foods:

• Whole grains like brown rice, quinoa, and whole wheat bread.

• Legumes such as lentils, chickpeas, and black beans.

• Fruits such as bananas, apples, and berries.

• Vegetables like broccoli, carrots, and spinach.

• Nuts and seeds such as almonds, chia seeds, and flaxseeds.

Important Points

• Misconceptions about Dietary Fibre:

• Dietary fibre does not directly provide energy or calories because it is not digestible.

• It does not help build muscle, as its function is primarily related to digestion and gut health.

• While dietary fibre can lower cholesterol, it does not increase it.

• Global Trends:

• Many regions, including North America and Europe, report a significant fibre deficiency in their diets, often due to the prevalence of processed foods.

• Countries such as India and China, with diets rich in grains, legumes, and vegetables, typically meet or exceed recommended fibre levels.

• Practical Tips for Increasing Fibre Intake:

• Replace refined grains with whole grains, such as switching from white bread to whole wheat bread.

• Add more fruits and vegetables to meals and snacks.

• Incorporate nuts, seeds, and legumes into daily meals.

• Hydrate adequately, as fibre requires water to move effectively through the digestive system.

Q35. Answer: (d) Cervical cancer

The correct answer is Cervical cancer.

Key Points

• Human Papillomavirus (HPV) test is primarily used for the diagnosis of cervical cancer, caused by persistent infection with high-risk HPV types.

• India introduced two indigenous HPV testing kits in April 2025 to provide accessible and affordable diagnostic solutions for cervical cancer detection.

• Cervical cancer is the second-most common cancer among women in India, particularly affecting women in the age group of 30-60 years.

• HPV testing is a screening method used to detect high-risk types of HPV that might lead to cervical cancer. It is more effective than the traditional Pap smear test.

• Regular screening, vaccination against HPV, and early detection through such kits can significantly reduce the mortality rate caused by cervical cancer.

Additional Information

• Human Papillomavirus (HPV):

• HPV is a group of viruses, with more than 100 types, of which around 14 types are high-risk and associated with cancer.

• It is the most common viral infection of the reproductive tract and is transmitted through sexual contact.

• The virus can cause abnormal changes in the cells of the cervix, which may lead to cancer if left untreated.
• HPV vaccines, such as Gardasil and Cervarix, are effective in preventing infections caused by high-risk HPV types.
• Cervical Cancer:
• Cervical cancer is caused by the uncontrolled growth of cells in the cervix, the lower part of the uterus connecting to the vagina.
• Symptoms may include abnormal vaginal bleeding, pelvic pain, and pain during intercourse.
• It can be prevented through vaccination, regular screening (Pap smear and HPV test), and early detection.
• Globally, cervical cancer accounts for approximately 604,000 new cases and 342,000 deaths annually (WHO data).
• Other Cancer Types:
• Brain Cancer: A rare cancer that affects the brain's tissues. It has no connection to HPV infection.
• Prostate Cancer: This affects the prostate gland in men and is unrelated to HPV.
• Blood Cancer: Includes leukemia, lymphoma, and myeloma, none of which are linked to HPV.
• Importance of Indigenous HPV Testing Kits:
• Indigenous kits help reduce the cost of diagnosis and make cervical cancer screening accessible to women in rural and low-income areas.
• Promoting such kits aligns with India's efforts to achieve universal health coverage and reduce the burden of preventable diseases.
• It also enhances India's capabilities in biotechnology and medical diagnostics.

Important Points

• HPV Vaccination:
• HPV vaccines are recommended for girls aged 9-14 years for maximum efficacy.
• India launched its first indigenously developed HPV vaccine, CERVAVAC, in 2023.
• Global Efforts to Eliminate Cervical Cancer:
• The World Health Organization (WHO) has set a target to eliminate cervical cancer as a public health problem by achieving 90% vaccination coverage, 70% screening, and 90% treatment by 2030.
• Cervical cancer is highly preventable and treatable if detected early, making such initiatives critical.

Q36. Answer: (b) Dmitri Mendeleev

The correct answer is Dmitri Mendeleev.

Key Points

• Dmitri Mendeleev, a Russian chemist, is credited with publishing the first widely recognized version of the periodic table in 1869.
• He arranged the elements in order of increasing atomic mass and grouped them based on their chemical properties.
• Mendeleev left gaps in his table for elements that were not yet discovered and even predicted their properties, which was later confirmed by discoveries like gallium and germanium.
• The periodic table proposed by Mendeleev helped in understanding the periodic trends and relationships between elements, revolutionizing the study of chemistry.
• Mendeleev's periodic table provided a systematic framework for organizing elements, making it possible to predict the existence and properties of unknown elements.

Additional Information

• John Alexander Newlands:
• Newlands proposed the Law of Octaves in 1864, suggesting that every eighth element has similar properties when arranged by atomic weight.
• However, his classification was limited to known elements at the time and did not account for undiscovered elements, leading to inconsistencies.
• Johann Dobereiner:
• Dobereiner introduced the concept of triads in 1829, grouping three elements with similar properties where the middle element had properties that were an average of the other two.
• This concept was an early step towards understanding periodicity but was limited in scope.
• Lothar Meyer:
• Meyer independently developed a periodic table around the same time as Mendeleev but did not receive the same recognition as his table was less comprehensive.
• He plotted atomic volume against atomic mass to show periodic trends but did not predict undiscovered elements as Mendeleev did.
• Periodic Table:
• The Periodic Table organizes elements based on increasing atomic number and recurring chemical properties.

• Modern periodic tables are based on the work of Mendeleev but use atomic numbers instead of atomic masses.

• The table is divided into groups and periods, with elements sharing similar properties placed in the same column.

Important Points

• Mendeleev's prediction:

• He predicted the existence and properties of several elements like eka-aluminum (later discovered as gallium) and eka-silicon (later discovered as germanium).

• This ability to predict elements made his periodic table more widely accepted compared to other models.

• Periodic Trends:

• Key periodic trends include atomic radius, electronegativity, ionization energy, and electron affinity, which are crucial in understanding chemical properties.

• Modern Periodic Table:

• The modern periodic table, based on the Moseley's periodic law, arranges elements by their atomic number instead of atomic mass.

• It includes 18 groups and 7 periods, accommodating over 118 elements discovered so far.

Q37. Answer: (a) HN Kunzru, KM Panikkar, Fazl Ali

The correct answer is HN Kunzru, KM Panikkar, Fazl Ali.

Key Points

• The States Reorganisation Commission was formed in 1953 by the Government of India to look into the demand for the reorganization of states along linguistic lines.

• The commission consisted of three members: Justice Fazl Ali (Chairman), KM Panikkar, and HN Kunzru.

• The primary responsibility of the commission was to recommend the reorganization of Indian states to promote administrative convenience and linguistic unity.

• The commission submitted its report on September 30, 1955, recommending the reorganization of states based on linguistic criteria.

• The report led to the implementation of the States Reorganisation Act of 1956, which resulted in the creation of states such as Andhra Pradesh, Gujarat, Maharashtra, and Karnataka based on linguistic lines.

Additional Information

• Justice Fazl Ali:

• He served as the Chairman of the States Reorganisation Commission.

• Fazl Ali was a former judge of the Supreme Court of India and played a crucial role in the commission's deliberations.

• KM Panikkar:

• KM Panikkar was a diplomat, historian, and writer who contributed significantly to the commission's work.

• He was known for his expertise in governance and administration.

• HN Kunzru:

• HN Kunzru was a prominent Indian politician and social reformer.

• He brought valuable insights into the administrative and political aspects of the states' reorganization.

• States Reorganisation Act, 1956:

• Based on the commission's recommendations, the act was passed, leading to the reorganization of states along linguistic lines.

• The act remains one of the most significant events in Indian administrative history.

• Linguistic Reorganization:

• The demand for linguistic states originated from the belief that language is a crucial aspect of cultural identity.

• This reorganization aimed to unite people speaking the same language under one administrative boundary.

Important Points

• The States Reorganisation Commission was the first commission appointed to address the issue of linguistic states.

• It emphasized the importance of administrative efficiency while also considering cultural and linguistic factors.

• The creation of linguistic states was seen as a way to strengthen India's unity and promote democracy by recognizing diverse identities.

• States reorganization was a milestone in Indian governance, setting a precedent for future administrative changes such as the formation of Uttarakhand, Jharkhand, and Telangana.

• The decision to reorganize states faced opposition from some political leaders but was ultimately accepted as a necessary step for national integration.

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Q38. Answer: (b) Portuguese

The correct answer is Portuguese.

Key Points

• Portuguese explorer Vasco da Gama was the first European to reach India via the sea route. He arrived in Calicut (now Kozhikode, Kerala) on May 20, 1498.

• This journey marked the establishment of the direct sea route between Europe and India, bypassing traditional overland routes controlled by Middle Eastern traders.

• The Portuguese were motivated by trade opportunities, particularly in spices like pepper and cardamom, which were highly valued in Europe.

• Following Vasco da Gama's success, the Portuguese established several trading posts and settlements along the Indian coastline, including Goa, which became their major stronghold in India.

• The Portuguese influence in India lasted for centuries, laying the foundation for European colonialism in the region.

Additional Information

• French:

• The French arrived in India much later, establishing their first trading post in Pondicherry in 1674.

• They had a relatively limited presence in India compared to the Portuguese, Dutch, and English.

• The French influence was concentrated in the regions of Pondicherry, Mahe, Karaikal, and Chandernagore.

• Dutch:

• The Dutch East India Company established its presence in India in 1605, starting with a factory at Masulipatnam.

• Their focus was primarily on trade in spices, textiles, and indigo.

• Unlike the Portuguese, the Dutch did not seek territorial control but focused on commercial interests.

• English:

• The English East India Company arrived in India in 1608, starting their first factory at Surat.

• Their involvement gradually transitioned from trade to territorial control, eventually leading to the colonization of India.

• The English influence became dominant after the decline of other European powers in India.

• Portuguese Contributions:

• The Portuguese introduced several crops to India, including cashew nuts, potatoes, tomatoes, and tobacco.

• Their architectural legacy is evident in the form of churches and forts, especially in Goa.

• They also influenced Indian cuisine, introducing dishes like vindaloo and bebinca.

Q39. Answer: (b) Nagas

The correct answer is Nagas.

Key Points

• The Nagas are an indigenous group of people primarily found in the north-eastern states of India, particularly in Nagaland, Manipur, Arunachal Pradesh, and parts of Assam.

• They are known for their distinctive cultural heritage, which includes colorful attire, intricate handicrafts, and unique traditional practices.

• The Nagas are divided into several tribes, such as the Ao, Angami, Sema, Konyak, Lotha, and Chakhesang, each with its distinct language and traditions.

• Their lifestyle is majorly agrarian, with agriculture being the primary source of livelihood. They practice shifting cultivation, locally known as "jhum cultivation."

• One of the most famous festivals celebrated by the Nagas is the Hornbill Festival, held annually in Nagaland, which showcases their rich culture, music, dance, and traditions.

Additional Information

• Gonds:

• The Gonds are one of the largest tribal groups in India.

• They primarily reside in the central and southern parts of India, including Madhya Pradesh, Maharashtra, Chhattisgarh, and Odisha.

• The Gonds are known for their rich folk traditions, music, and dance.

• Santhals:

• The Santhals are an ethnic group native to the eastern parts of India, particularly Jharkhand, Bihar, Odisha, and West Bengal.

• They primarily rely on agriculture and are well-known for their traditional dance forms and music.

• The Santhal tribe played a significant role in the Santhal Rebellion of 1855-56 against the British colonial rulers and zamindars.

• Bhils:

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• The Bhils are one of the largest and oldest tribal groups in India, mainly found in the states of Madhya Pradesh, Gujarat, Rajasthan, and Maharashtra.
• They are known for their archery skills, folklore, and traditional art, especially Pithora paintings.
• The Bhils primarily depend on agriculture and forest produce for their livelihood.
• Nagas:
• As mentioned earlier, the Nagas are one of the prominent tribes in the north-eastern region of India.
• They have a history of tribal self-governance and distinct cultural identity.
• Their traditional attire, ornaments, and war dances are globally recognized and celebrated.

Q40. Answer: (b) 18 May 2025

The correct answer is Sun May 18 2025.

Key Points

• ISRO's 101st launch attempt was scheduled on Sun May 18 2025, marking an important milestone in India's space exploration journey.
• During this attempt, ISRO faced technical difficulties in the rocket's third stage, leading to the launch failure.
• The third stage is crucial for placing the satellite into its intended orbit, and any malfunction can compromise the mission's success.
• ISRO has had an impressive record of successful launches, and such failures often lead to comprehensive analysis and improvements for future missions.
• Despite this setback, ISRO's achievements in space technology continue to position India as a prominent player in the global space community.

Additional Information

• ISRO (Indian Space Research Organisation):
• Founded in 1969, ISRO is India's national space agency under the Department of Space.
• It is headquartered in Bengaluru, Karnataka.
• ISRO has been instrumental in launching satellites for communication, navigation, remote sensing, and exploration.
• Prominent missions include Chandrayaan (lunar exploration), Mangalyaan (Mars Orbiter Mission), and the Gaganyaan (human spaceflight mission).
• Stages of a Rocket:
• Rockets are typically composed of multiple stages, each powered by its own engine and fuel system.
• The first stage provides initial thrust to lift the rocket off the ground.
• The second stage further propels the rocket after the first stage is discarded.
• The third stage ensures the satellite reaches its orbit, which is critical for mission success.
• Failure in any stage can result in mission failure, emphasizing the need for rigorous testing and quality control.
• ISRO's Achievements:
• ISRO has successfully launched over 100 missions, including satellites for India and international clients.
• It developed the Polar Satellite Launch Vehicle (PSLV), which is considered one of the most reliable launch vehicles globally.
• ISRO's Mars Orbiter Mission (Mangalyaan) made India the first Asian nation to reach Mars orbit and the first globally to do so in its first attempt.
• India's Chandrayaan-3 mission successfully landed near the Moon's South Pole in 2023, showcasing ISRO's growing capabilities.
• Importance of Space Exploration:
• Space missions are vital for technological advancements, scientific discovery, and economic growth.
• They provide critical data for weather forecasting, disaster management, and communication.
• ISRO's missions have also contributed to international collaborations and strengthened India's global presence in space science.

Q41. Answer: (a) 40

Shortcut Trick

CP of 1 pen = 180 ÷ 12 = Rs. 15

SP of 1 pen = Rs. 21

Profit = 21 − 15 = Rs. 6

Profit % = (6 ÷ 15) × 100 = 40%

Therefore The correct answer is 40%.

Alternate Method

Given:
CP of 1 dozen pens = Rs. 180
Number of pens in 1 dozen = 12
SP of 1 pen = Rs. 21
Formula Used:
Profit = SP − CP
Profit % = (Profit ÷ CP) × 100
CP = Rs. 15
Profit = Rs. 6
SP = Rs. 21
Profit % = (6 ÷ 15) × 100 = 40%
Calculations:
=> CP of 1 pen = 180 ÷ 12 = Rs. 15
=> Profit on 1 pen = SP − CP = 21 − 15 = Rs. 6
=> Profit % = (6 ÷ 15) × 100
=> Profit % = (2 ÷ 5) × 100 = 40%
Therefore The correct answer is 40%.
Additional Information
Loss Percentage
When Cost Price (CP) is greater than Selling Price (SP), there is a loss. Loss % = (Loss ÷ CP) × 100.
Selling Price Formula (with Profit %)
SP = CP × (100 + Profit %) ÷ 100
Marked Price & Discount
Discount is always calculated on Marked Price (MP). SP = MP − Discount.

Q42. Answer: (b) -43

Shortcut Trick
Apply the BODMAS rule directly left to right based on priority.
=> (−9) − [−60 ÷ −10] + [−4 × 7]
=> −9 − 6 − 28
=> −15 − 28 = −43
Therefore The correct answer is −43.
Alternate Method
Given:
(−9) − (−60) ÷ (−10) + (−4) × 7
Concept Used:
BODMAS Rule dictates the order of mathematical operations: Brackets, Orders, Division, Multiplication, Addition, and Subtraction.
Calculations:
=> According to the BODMAS rule, perform the division operation first:
=> (−60) ÷ (−10) = 6
=> Substitute this value back into the expression:
=> (−9) − 6 + (−4) × 7
=> Next, perform the multiplication operation:
=> (−4) × 7 = −28
=> Substitute this value back into the expression:
=> −9 − 6 − 28
=> Finally, perform addition and subtraction from left to right:
=> −15 − 28 = −43
Therefore The correct answer is −43.
Additional Information
BODMAS Rule
It establishes the order of calculations: Brackets, Orders (powers and roots), Division, Multiplication, Addition, and Subtraction.

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Division and Multiplication share the same priority (solved left to right), as do Addition and Subtraction.

Sign Rules for Multiplication and Division

When multiplying or dividing two numbers: if the signs are identical (both positive or both negative), the resultant value is positive. If the signs are different, the resultant value is negative.

Q43. Answer: (d) 3%

Shortcut Trick

For Compound Interest, multiplying factor = ^t√(Amount ÷ Principal).

Here, Time (t) = 3 years, so we find the cube root of the ratio.

=> ³√(1092727 ÷ 1000000) = 103 ÷ 100

This means Rs. 100 becomes Rs. 103 in 1 year.

Rate of interest = (103 − 100) ÷ 100 × 100% = 3%.

Therefore The correct answer is 3%.

Alternate Method

Principal (P)

Rs. 10,00,000

Amount (A)

Rs. 10,92,727

Time = 3 Years

Rate = R%

Given:

Principal (P) = Rs. 10,00,000

Amount (A) = Rs. 10,92,727

Time (t) = 3 years

Formula Used:

Amount = P × (1 + R ÷ 100)^t

Calculations:

=> 1092727 = 1000000 × (1 + R ÷ 100)³

=> 1092727 ÷ 1000000 = (1 + R ÷ 100)³

=> (103 ÷ 100)³ = (1 + R ÷ 100)³

Taking cube root on both sides:

=> 103 ÷ 100 = 1 + R ÷ 100

=> R ÷ 100 = 103 ÷ 100 − 1

=> R ÷ 100 = (103 − 100) ÷ 100

=> R ÷ 100 = 3 ÷ 100

=> R = 3

Therefore The correct answer is 3%.

Additional Information

Effective Rate Method

For 2 years, the effective CI rate = R + R + (R×R)÷100 %. This is faster for calculating exact compound interest when rates are small numbers.

Difference Between CI and SI

For 2 years: Difference = P × (R÷100)².

For 3 years: Difference = P × (R÷100)² × (3 + R÷100).

Half-Yearly Compounding

When interest is compounded half-yearly, the rate is halved (R÷2) and the given time period is doubled (2t) before applying the formula.

Q44. Answer: (b) 181

Shortcut Trick

Sum of the first two numbers = 79 × 2 = 158

Sum of the remaining two numbers = Total sum − (Sum of first two + Third number)

Sum of the remaining two numbers = 655 − (158 + 135) = 362

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Average of the remaining two numbers = 362 ÷ 2 = 181

Therefore The correct answer is 181.

Alternate Method

Given:

Total sum of 5 numbers = 655

Average of first 2 numbers = 79

Third number = 135

Formula Used:

Sum = Average × Total number of observations

Sum: 158

3rd: 135

Remaining Sum: 362

Total Sum of 5 numbers = 655

Avg = 79

1 number

Avg = 362 ÷ 2 = 181

Calculations:

=> Sum of the first 2 numbers = 79 × 2 = 158

=> Sum of the first 3 numbers = 158 + 135 = 293

=> Sum of the remaining 2 numbers = Total sum − Sum of first 3 numbers

=> Sum of the remaining 2 numbers = 655 − 293 = 362

=> Average of the remaining 2 numbers = 362 ÷ 2

=> Average of the remaining 2 numbers = 181

Therefore The correct answer is 181.

Additional Information

Weighted Average

When dealing with groups of sizes n1, n2... having averages A1, A2..., the overall combined average is calculated as (n1A1 + n2A2 + ...) ÷ (n1 + n2 + ...).

Deviation Method

Rather than multiplying large datasets, select an assumed average and calculate the net deviation. The actual average is found using: Assumed Average + (Total Deviation ÷ Number of Observations).

Consecutive Series

The average of an arithmetic progression or any sequence of consecutive numbers is exactly the middle term, which can be easily found as (First Term + Last Term) ÷ 2.

Q45. Answer: (c) 50000

Shortcut Trick

Valid votes as a percentage of total registered voters = 80% × 98% = 78.4%.

Winner gets 52% of valid votes, meaning Loser gets 48%. Winning margin = 4% of valid votes.

Margin as a percentage of total voters = 4% of 78.4% = 3.136%.

Given 3.136% → 1568 votes.

Total registered voters (100%) = 1568 ÷ 3.136 × 100 = 50000.

Therefore The correct answer is 50000.

Alternate Method

Given:

Votes polled = 80% of registered voters

Invalid votes = 2% of polled votes

Winning candidate votes = 52% of valid votes

Margin of victory = 1568 votes

Formula Used:

Valid Votes = Total Polled Votes − Invalid Votes

Margin = Winner's Votes − Loser's Votes

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80% cast vote

98% valid (2% invalid)

Total Voters (100x)

Polled Votes (80x)

Valid Votes (78.4x)

Winner (52%)

Loser (48%)

Margin = 4% of Valid Votes = 1568

Calculations:

=> Let the total number of registered voters be 100x.

=> Total votes polled = 80% of 100x = 80x

=> Invalid votes = 2% of 80x = 1.6x

=> Valid votes = 80x − 1.6x = 78.4x

=> Winner's votes = 52% of 78.4x

=> Loser's votes = (100 − 52)% of 78.4x = 48% of 78.4x

=> Margin of victory = Winner's votes − Loser's votes

=> Margin = (52% − 48%) of 78.4x = 4% of 78.4x = 3.136x

=> Given margin = 1568 votes

=> 3.136x = 1568

=> x = 1568 ÷ 3.136 = 500

=> Total registered voters = 100x = 100 × 500 = 50000

Therefore The correct answer is 50000.

Additional Information

Valid and Invalid Votes in Elections

Invalid votes are discarded when determining the results. The winner and loser share percentages are calculated strictly on the base of Valid Votes unless explicitly stated otherwise.

Successive Percentage Change

When multiple percentage reductions occur successively (e.g., voters not voting, then votes becoming invalid), the final quantity can be found by multiplying the remaining fractions: Final Value = Initial Base × (1 − r1/100) × (1 − r2/100).

Margin of Victory Formula

The winning margin is directly equivalent to the difference between the percentage obtained by the winner and the loser: Margin = Total Valid Votes × (Winner % − Loser %).

Q46. Answer: (c) M - N = 3

Shortcut Trick

For divisibility by 11, the difference between the sums of alternating digits must be 0 or a multiple of 11.

Sum of odd-positioned digits = N + 7 + 0 = N + 7

Sum of even-positioned digits = 3 + M + 1 = M + 4

Difference = (N + 7) − (M + 4) = N − M + 3

Equating the difference to 0 gives N − M + 3 = 0 => M − N = 3.

Therefore The correct answer is M − N = 3.

Alternate Method

Given:

The 6-digit number N37M01 is divisible by 11.

Formula Used:

A number is divisible by 11 if the difference of the sum of its digits at odd places and the sum of its digits at even places is 0 or a multiple of 11.

Odd Sum = N + 7 + 0 = N + 7

N

3

7

M

0

1

Even Sum = 3 + M + 1 = M + 4

Calculations:

=> Sum of digits at odd places (1st, 3rd, 5th positions) = N + 7 + 0 = N + 7

=> Sum of digits at even places (2nd, 4th, 6th positions) = 3 + M + 1 = M + 4

=> Difference = (N + 7) − (M + 4) = N − M + 3

=> For the number to be perfectly divisible by 11, this difference must be exactly 0, 11, or −11.

=> Case 1: Assume Difference = 0

=> N − M + 3 = 0 => M − N = 3

=> Case 2: Assume Difference = 11

=> N − M + 3 = 11 => N − M = 8

=> Checking the given options, M − N = 3 represents the correctly matched possible relation.

Therefore The correct answer is M − N = 3.

Additional Information

Divisibility Rule of 3 & 9

A number is divisible by 3 or 9 if the sum of all its digits is a multiple of 3 or 9, respectively.

Divisibility Rule of 4 & 8

A number is divisible by 4 if its last two digits form a number divisible by 4. It is divisible by 8 if its last three digits form a number divisible by 8.

Combined Divisibility Rule of 7, 11 & 13

A number is divisible by 7, 11, or 13 if the difference between the number formed by its last three digits and the remaining digits is a multiple of 7, 11, or 13.

Q47. Answer: (a) 12/13

Shortcut Trick

If sec θ + tan θ = p, then cos θ = 2p ÷ (p² + 1).

Given p = 3/2, substitute directly into the shortcut formula.

cos θ = (2 × 3/2) ÷ ((3/2)² + 1)

cos θ = 3 ÷ (9/4 + 1) = 3 ÷ (13/4) = 12/13

Therefore The correct answer is 12/13.

Alternate Method

Given:

sec θ + tan θ = 3/2

Formula Used:

sec² θ − tan² θ = 1

θ

Base = 12

Perpendicular = 5

Hypotenuse = 13

Calculations:

=> (sec θ − tan θ) × (sec θ + tan θ) = 1

=> (sec θ − tan θ) × (3/2) = 1

=> sec θ − tan θ = 2/3

Adding both equations:

=> (sec θ + tan θ) + (sec θ − tan θ) = 3/2 + 2/3

=> 2 sec θ = (9 + 4) ÷ 6 = 13/6

=> sec θ = 13/12

=> sec θ = Hypotenuse ÷ Base = 13/12

=> By Pythagoras theorem: Perpendicular = √(13² − 12²) = √(169 − 144) = √25 = 5

=> cos θ = Base ÷ Hypotenuse = 12/13

Therefore The correct answer is 12/13.

Additional Information

Pythagorean Triplets

A Pythagorean triplet consists of three positive integers a, b, and c, such that $a^2 + b^2 = c^2$. Common exam triplets include (3, 4, 5), (5, 12, 13), and (8, 15, 17).

Trigonometric Identities

The three primary Pythagorean identities are: $\sin^2\theta + \cos^2\theta = 1$, $\sec^2\theta - \tan^2\theta = 1$, and $\text{cosec}^2\theta - \cot^2\theta = 1$.

Secant and Tangent Pair Rule

For any angle θ, if $\sec\theta + \tan\theta = x$, then $\sec\theta - \tan\theta = 1/x$. This specific pairing pattern is derived directly from factoring the difference of squares identity.

Q48. Answer: (a) 15, 10

Shortcut Trick

Product of two numbers = LCM × HCF = 150.

Given difference between the numbers = 5.

Check the given pairs to find which numbers give a product of 150 and a difference of 5.

The pair 15 and 10 satisfies both conditions (15 × 10 = 150 and 15 − 10 = 5).

Therefore The correct answer is 15, 10.

Alternate Method

Given:

Product of LCM and HCF = 150

Difference of the two numbers = 5

Formula Used:

Product of two numbers = LCM × HCF

Calculation:

Let the smaller number be y and the larger number be x.

=> $x - y = 5$

=> $x = y + 5$

=> $x \times y = 150$

=> $(y + 5) \times y = 150$

=> $y^2 + 5y - 150 = 0$

=> $y^2 + 15y - 10y - 150 = 0$

=> $y(y + 15) - 10(y + 15) = 0$

=> $(y - 10)(y + 15) = 0$

=> The roots are $y = 10$ and $y = -15$.

=> Since numbers are assumed to be positive in this context, $y = 10$.

=> $x = 10 + 5 = 15$

Therefore The correct answer is 15, 10.

Additional Information

Product Rule of LCM and HCF

The product of two given numbers is exactly equal to the product of their HCF and LCM. Formula: A × B = HCF(A, B) × LCM(A, B). Note that this rule applies only to two numbers, not for three or more.

Co-Prime Numbers

If two numbers are co-prime (having no common factor other than 1), their HCF is exactly 1, and their LCM is simply the product of the two numbers.

HCF and LCM of Fractions

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

Q49. Answer: (a) 2100

Shortcut Trick

Let the original number be 100%.

After a 70% increase, the number becomes 170%.

170% → 3570

100% → (3570 ÷ 170) × 100 = 2100
Therefore The correct answer is 2100.
Alternate Method
Original (100%)
• 70%
Total = 170% = 3570
Given:
A number when increased by 70% becomes 3570.
Formula Used:
Final Value = Original Value × (1 + Percentage Increase ÷ 100)
Calculation:
=> Let the original number be x.
=> Final Value = x + (70 ÷ 100) × x
=> 3570 = x + 0.7x
=> 1.7x = 3570
=> x = 3570 ÷ 1.7
=> x = 2100
Therefore The correct answer is 2100.
Additional Information
Percentage Change
Percentage change is given by: ((Final Value − Initial Value) ÷ Initial Value) × 100%.
Successive Percentage Change
If a value is changed by a% and then by b%, the net percentage change is (a + b + (a × b) ÷ 100)%.
Base Change Rule
If A is R% more than B, then B is [R ÷ (100 + R) × 100]% less than A.

Q50. Answer: (b) 40

Shortcut Trick
Let the father's age be F and the son's age be S.
Given equations: 2S + F = 42 and S + 2.2F = 89
Multiply the second equation by 2: 2S + 4.4F = 178
Subtract the first equation: (4.4F + 2S) − (F + 2S) = 178 − 42
=> 3.4F = 136 => F = 40
Therefore The correct answer is 40 years.
Alternate Method
Given:
Two times a son's age added to his father's age is 42 years.
2.2 times the father's age added to the son's age is 89 years.
Visual Representation of the Equations
Father
• Son
• Son
= 42
2.2 × Father
• Son
= 89
Calculations:
Let the father's age be F and the son's age be S.
=> F + 2S = 42 --- (1)
=> 2.2F + S = 89 --- (2)
From equation (1), express F in terms of S:
=> F = 42 − 2S

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Substitute this value of F into equation (2):

=> 2.2 × (42 − 2S) + S = 89

=> 92.4 − 4.4S + S = 89

=> 92.4 − 3.4S = 89

=> 3.4S = 92.4 − 89

=> 3.4S = 3.4

=> S = 1 year

Now, substitute S = 1 back into the expression for F:

=> F = 42 − 2 × 1

=> F = 42 − 2

=> F = 40 years

Therefore The correct answer is 40 years.

Additional Information

Linear Equations in Two Variables

A system of equations containing two unknown variables, commonly solved using substitution, elimination, or cross-multiplication.

Substitution Method

Express one variable in terms of the other from the first equation and substitute it into the second equation to easily solve for the unknowns.

Elimination Method

Multiply equations by suitable numbers to make the coefficients of one variable equal, then add or subtract the equations to eliminate that variable completely.

Q51. Answer: (b) 4,800

Shortcut Trick

When the simple interest earned from two parts over the same time period is equal, the ratio of their principals is inversely proportional to their rates.

Ratio of parts = 1/R1 : 1/R2 = 1/14 : 1/4 = 4 : 14 = 2 : 7

Total parts = 2 + 7 = 9 parts

Sum invested at 14% = (2/9) × 21,600 = 4,800

Therefore The correct answer is Rs. 4800.

Alternate Method

Given:

Total Investment = Rs. 21,600

Rate 1 (R1) = 14% per annum, Rate 2 (R2) = 4% per annum

Time (T) = 6 years for both

Simple Interest 1 (SI1) = Simple Interest 2 (SI2)

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Total: Rs. 21,600

Part 1 (x)

R = 14%, T = 6 yr

SI1

Part 2 (y)

R = 4%, T = 6 yr

SI2

SI1 = SI2

x : y = 4 : 14 = 2 : 7

Calculations:

Let the amount invested at 14% be x and at 4% be y.

=> Total Investment = x + y = 21,600

According to the question, SI on both investments are equal.

=> (x × 14 × 6) ÷ 100 = (y × 4 × 6) ÷ 100

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=> 84x = 24y

=> x / y = 24 / 84 = 2 / 7

Thus, x : y = 2 : 7

=> Sum of ratio parts = 2 + 7 = 9 parts

=> 9 parts = 21,600

=> 1 part = 21,600 ÷ 9 = 2,400

=> Sum invested at 14% (x) = 2 parts = 2 × 2,400 = 4,800

Therefore The correct answer is Rs. 4800.

Additional Information

Equal Simple Interest Rule

When a sum is divided into parts such that their Simple Interests are equal, the parts are in the ratio of 1/(R1T1) : 1/(R2T2) : 1/(R3T3).

Equal Amount Rule

When a sum is divided into parts such that the Amounts obtained from them are equal, the parts are in the ratio of 1/(100 + R1T1) : 1/(100 + R2T2).

Simple Interest Principle

Simple Interest = (Principal × Rate × Time) ÷ 100. The principal remains constant throughout the entire period, making interest accumulation linear over time.

Q52. Answer: (b) 49.5 minutes

Shortcut Trick

Total capacity = LCM(33, 22, 18) = 198 units.

Efficiency of filling Pipe A = 198 ÷ 33 = +6 units/min.

Efficiency of filling Pipe B = 198 ÷ 22 = +9 units/min.

Combined Efficiency (A + B − C) = 198 ÷ 18 = +11 units/min.

Efficiency of emptying Pipe C = (6 + 9) − 11 = 4 units/min.

Time taken by Pipe C to empty = 198 ÷ 4 = 49.5 minutes.

Therefore The correct answer is 49.5 minutes.

Alternate Method

Given:

=> Time taken by Pipe A to fill the cistern = 33 minutes

=> Time taken by Pipe B to fill the cistern = 22 minutes

=> Time taken by all three pipes (A, B and emptying Pipe C) to fill = 18 minutes

Formula Used:

=> Total Work = Efficiency × Time taken

Pipe

Time (min)

Total Work

Efficiency

Pipe A

33

198

+6

Pipe B

22

+9

A + B − C

18

+11

Calculations:

=> Let the efficiency of the emptying pipe C be x.

=> Total efficiency when all pipes are open = Efficiency of A + Efficiency of B − Efficiency of C

=> 11 = 6 + 9 − x

=> 11 = 15 − x

=> x = 4 units/min.

=> Time taken by Pipe C to empty the completely filled cistern = Total Work ÷ Efficiency of C

=> Time taken = 198 ÷ 4

=> Time taken = 49.5 minutes.

Therefore The correct answer is 49.5 minutes.

Additional Information

Pipes and Cisterns Sign Convention

In pipe and cistern problems, the work done by a filling pipe is considered positive (+), whereas the work done by an emptying pipe or leak is taken as negative (−).

Efficiency & Time Relation

Efficiency is inversely proportional to the time taken. For any setup, Total Capacity = Efficiency × Time.

Combined Work Rule

If pipe A can fill a tank in x hours and pipe B can empty it in y hours (where y > x), the net part filled in 1 hour is given by (1/x) − (1/y).

Q53. Answer: (d) -1/15

Shortcut Trick

Directly expand the given expression and observe that the quadratic terms cancel out:

$10x^2 - 10 - 10x^2 - 45x + 25 = 18$

=> −45x + 15 = 18

=> −45x = 3 => x = −1/15

Therefore The correct answer is −1/15.

Alternate Method

Given:

$2(5x^2 - 5) - 5(2x^2 + 9x - 5) = 18$

Calculations:

=> Apply the distributive property to expand the terms:

=> $10x^2 - 10 - 10x^2 - 45x + 25 = 18$

=> Combine like terms (notice that the $10x^2$ terms cancel each other out):

=> −45x + 15 = 18

=> Isolate x on one side by subtracting 15 from both sides:

=> −45x = 18 − 15

=> −45x = 3

=> Divide both sides by −45:

=> x = 3 / (−45)

=> x = −1/15

Therefore The correct answer is −1/15.

Additional Information

BODMAS Rule

It dictates the required order of mathematical operations: Brackets, Orders, Division, Multiplication, Addition, and Subtraction. Expressions inside brackets must be simplified or expanded first.

Distributive Property

Multiplying a sum by a given number yields the same result as multiplying each addend by that number and then adding the products together: a(b + c) = ab + ac.

Linear Equations

Equations of the first degree involving one variable. They can be solved directly by bringing all constant values to one side and variable terms to the opposite side to isolate the variable.

Q54. Answer: (d) 40

Shortcut Trick

Using the BODMAS rule, evaluate the expression from innermost brackets to outermost:

=> [640 ÷ { 22 + 6 × (4 − 5)}] = [640 ÷ { 22 + 6 × (−1) }]

=> [640 ÷ { 22 − 6 }] = [640 ÷ 16]

=> 40

Therefore The correct answer is 40.

Alternate Method

Given:

The expression is [640 ÷ { 22 + 6 × (4 − 5)}].

Concept Used:

BODMAS Rule: Brackets, Orders, Division, Multiplication, Addition, Subtraction.

Calculations:

=> First, simplify the terms inside the innermost parentheses ():

=> (4 − 5) = −1

=> Substitute this back into the expression:

=> [640 ÷ { 22 + 6 × (−1) }]

=> Next, solve the multiplication inside the curly brackets {}:

=> 6 × (−1) = −6

=> Now, solve the subtraction inside the curly brackets:

=> { 22 − 6 } = 16

=> Finally, solve the division inside the square brackets []:

=> 640 ÷ 16 = 40

Therefore The correct answer is 40.

Additional Information

BODMAS Rule

It dictates the order of mathematical operations: Brackets, Of/Orders, Division, Multiplication, Addition, and Subtraction. Always evaluate expressions in this sequence.

Order of Brackets

When multiple brackets are present, solve them from the innermost to outermost: first parenthesis (), then curly braces {}, and finally square brackets [].

Sign Rules in Multiplication

Multiplying a positive number by a negative number results in a negative product. Example: (+) × (−) = (−).

Q55. Answer: (b) 23%

Shortcut Trick

We can use the successive percentage change formula: Overall % = a + b + (a × b) ÷ 100

Here, the markup percentage (a) = +40% and the discount percentage (b) = −45%

Overall Profit/Loss % = 40 − 45 − (40 × 45) ÷ 100

Overall Profit/Loss % = −5 − 1800 ÷ 100 = −5 − 18 = −23%

The negative sign indicates a net loss of 23%.

Therefore The correct answer is 23%.

Alternate Method

Given:

Markup = 40% above the cost price

Discount = 45% on the marked price

Formula Used:

Marked Price (MP) = CP + (Markup% of CP)

Selling Price (SP) = MP − (Discount% of MP)

Loss % = ((CP − SP) ÷ CP) × 100

SP (77)

CP (100)

MP (140)

+40% (Markup)

−45% (Discount)

23% Loss

Calculations:

=> Let the Cost Price (CP) of the goods be 100.

=> The dealer marks his goods 40% above the CP.

=> Marked Price (MP) = 100 + 40% of 100 = 140

=> He allows a discount of 45% on the MP.

=> Discount Amount = 45% of 140 = (45 ÷ 100) × 140 = 63

=> Selling Price (SP) = MP − Discount = 140 − 63 = 77

=> Since the SP (77) is less than the CP (100), there is a loss.

=> Loss = CP − SP = 100 − 77 = 23

=> Loss % = (23 ÷ 100) × 100 = 23%

Therefore The correct answer is 23%.

Additional Information

Direct Relation between CP and MP

The ratio of Cost Price to Marked Price can be directly calculated using the rule: CP ÷ MP = (100 − Discount%) ÷ (100 + Profit% or − Loss%).

Successive Percentage Change

When a value is successfully changed by a% and then b%, the net effective change is calculated as (a + b + (a × b) ÷ 100)%. Use positive signs for increases/markups and negative signs for decreases/discounts.

Same Markup and Discount

If a product's price is marked up by x% and then a discount of x% is given on it, the seller always incurs a net loss which is exactly equal to (x² ÷ 100)%.

Q56. Answer: (d) 1300

Shortcut Trick

Let the original CP = 100a. Since the initial profit is 54%, the original SP = 154a.

After changes, New CP = 100a + 75 and New SP = 154a − 66.

The new profit is 40.8%, which means the ratio of New SP to New CP is 140.8/100 = 176/125.

Equating ratios: (154a − 66) ÷ (100a + 75) = 176 ÷ 125

=> 11(14a − 6) ÷ 25(4a + 3) = 176 ÷ 125 => 5(14a − 6) = 16(4a + 3)

=> 70a − 30 = 64a + 48 => 6a = 78 => a = 13. Original CP = 100a = 100 × 13 = 1300.

Therefore The correct answer is Rs. 1300.

Alternate Method

Given:

Original Profit = 54%

Let the original Cost Price (CP) be x.

=> Original Selling Price (SP) = x + 54% of x = 1.54x

If CP is increased by Rs. 75 and SP is reduced by Rs. 66:

=> New CP = x + 75

=> New SP = 1.54x − 66

New Profit = 40.8%

Formula Used:

Selling Price = Cost Price × (1 + Profit/100)

Calculations:

=> 1.54x − 66 = (x + 75) × (1 + 40.8/100)

=> 1.54x − 66 = (x + 75) × 1.408

=> 1.54x − 66 = 1.408x + (75 × 1.408)

=> 1.54x − 66 = 1.408x + 105.6

=> 1.54x − 1.408x = 105.6 + 66

=> 0.132x = 171.6

=> x = 171.6 ÷ 0.132

=> x = 171600 ÷ 132 = 1300

Therefore The correct answer is Rs. 1300.

Additional Information

Profit/Loss Percentage

Profit and Loss percentages are always calculated on the base Cost Price (CP) unless specifically mentioned otherwise. Formula: Profit % = [(SP − CP) ÷ CP] × 100.

Successive Absolute Changes

When both CP and SP change by different absolute numerical values, the profit ratio changes entirely. Applying the standard relation New SP = New CP × (1 + Profit/100) helps in framing a direct linear equation to solve such problems effortlessly.

Multiplying Factor Method

Instead of calculating the absolute profit and adding it to the CP, you can directly find the SP by multiplying the CP by a combined decimal factor. For instance, for a 40.8% profit margin, the directly used multiplying factor is 1.408 (i.e., SP = CP × 1.408).

Q57. Answer: (a) 80 : 69

Shortcut Trick

Convert the fraction directly into a percentage.

4/5 = (4 ÷ 5) × 100% = 80%

Given: 69% of First Number = 80% of Second Number

=> First Number / Second Number = 80 / 69

Therefore The correct answer is 80 : 69.

Alternate Method

Given:

69% of the first number is equal to 4/5 of the second number.

69% of I

=

4/5 of II (80%)

I : II = 80 : 69

Calculations:

Let the first number be x and the second number be y.

=> (69 / 100) × x = (4 / 5) × y

=> x / y = (4 / 5) ÷ (69 / 100)

=> x / y = (4 / 5) × (100 / 69)

=> x / y = (4 × 100) / (5 × 69)

=> x / y = (4 × 20) / 69

=> x / y = 80 / 69

Therefore The correct answer is 80 : 69.

Additional Information

Ratio & Proportion

A ratio compares two quantities using division (a/b or a:b). By equating percentages or fractions, we deduce the proportional relationship between the elements.

Fraction to Percentage Conversion

To convert a fraction into a percentage, directly multiply it by 100. For example, 4/5 × 100% = 80%.

Inverse Relationship

If A % of x = B % of y, then the ratio of x to y is always inversely proportional to their percentages, giving x : y = B : A.

Q58. Answer: (c) 8 hours 15 minutes

Shortcut Trick

For symmetric travel times, use the direct linear relationship:

Time for walking both ways = Time for (Walk + Drive) + Time gained by driving

=> Total Time = 4 hours 15 minutes + 4 hours

=> Total Time = 8 hours 15 minutes

Therefore The correct answer is 8 hours 15 minutes.

Alternate Method

Given:

Time taken to walk one way and drive back = 4 hours 15 minutes = 255 minutes.

Time gained by driving both ways = 4 hours = 240 minutes.

Walk + Drive

Walk (W)

D

4h 15m

Drive + Drive

D

D

Gained 4h

15m

Walk + Walk

Walk (W)

Walk (W)

8h 15m

Calculations:

Let the time taken to walk one way be W and drive one way be D.

=> W + D = 255 minutes

Time gained by driving both ways is 240 minutes, which means 2D takes 240 minutes less than walking and driving.

=> 2D = 255 − 240 = 15 minutes

=> D = 7.5 minutes

Substitute the value of D in the first equation:

=> W + 7.5 = 255

=> W = 255 − 7.5 = 247.5 minutes

Time taken to walk both ways = 2W

=> 2W = 2 × 247.5 = 495 minutes

=> 495 minutes = 8 hours 15 minutes

Therefore The correct answer is 8 hours 15 minutes.

Additional Information

Relative Speed

When two objects move in opposite directions, relative speed = S1 + S2. When moving in the same direction, relative speed = |S1 − S2|.

Average Speed

If a person covers equal distances at speeds S1 and S2, the average speed for the entire journey is calculated as (2 × S1 × S2) ÷ (S1 + S2).

Linear Equations in Time & Distance

For symmetric travel times, 2W = (W + D) + (W − D) and 2D = (W + D) − (W − D). This directly bypasses calculating single variable speeds or distances.

Q59. Answer: (c) 169

Shortcut Trick

The average of the first n even natural numbers is given directly by the formula: (n + 1).

Here, the number of terms (n) = 168.

Average = 168 + 1

Average = 169

Therefore The correct answer is 169.

Alternate Method

Given:

Number of terms (n) = 168

The series of first 168 even numbers is: 2, 4, 6, 8, ... up to 168 terms.

Formula Used:

For an Arithmetic Progression, Average = (First Term + Last Term) ÷ 2

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Last term (l) = a + (n − 1)d
Average of an Arithmetic Progression
2
(1st term)
4
6
169
Average
334
336
(168th term)
Avg = (First + Last) ÷ 2
Calculations:
=> First term (a) = 2
=> Common difference (d) = 2
=> Last term (l) = 2 + (168 − 1) × 2
=> l = 2 + 167 × 2
=> l = 2 + 334 = 336
=> Average = (2 + 336) ÷ 2
=> Average = 338 ÷ 2
=> Average = 169
Therefore The correct answer is 169.
Additional Information
Average of first n natural numbers
The average of the first n natural numbers is given by the formula (n + 1) ÷ 2.
Average of first n odd numbers
The average of the first n odd natural numbers is exactly equal to n.
Average of squares of first n natural numbers
The average of the squares of the first n natural numbers is (n + 1)(2n + 1) ÷ 6.
Average of an Arithmetic Progression
If a series is an Arithmetic Progression (having a constant difference between consecutive terms), its average is always the middle term, which can be found using (First Term + Last Term) ÷ 2.

Q60. Answer: (a) 2772

Shortcut Trick
Height of an isosceles triangle (h) = $\sqrt{(a^2 - (b/2)^2)}$
Where a = equal side = 85 cm, b = base = 72 cm
h = $\sqrt{(85^2 - 36^2)} = \sqrt{((85 - 36) \times (85 + 36))} = \sqrt{(49 \times 121)} = 7 \times 11 = 77$ cm
Area = 1/2 × base × height = 1/2 × 72 × 77 = 36 × 77 = 2772 cm^2
Therefore The correct answer is 2772 cm^2.
Alternate Method
Given:
Length of equal sides of the triangle (a) = 85 cm
Base of the triangle (b) = 72 cm
Formula Used:
Area of triangle = 1/2 × base × height
Height of an isosceles triangle = $\sqrt{(a^2 - (b/2)^2)}$
A
B
C
D
85 cm

85 cm

h = 77 cm

36 cm

36 cm

72 cm

Calculations:

=> The altitude drawn to the base of an isosceles triangle bisects the base into two equal halves.

=> Base of the right-angled triangle formed (BD) = 72 ÷ 2 = 36 cm

=> Using Pythagoras theorem in right-angled triangle ABD: (Height)² + (Base)² = (Hypotenuse)²

=> $h^2 + 36^2 = 85^2$

=> $h^2 = 85^2 - 36^2$

=> Using $a^2 - b^2 = (a - b)(a + b)$, we get:

=> $h = \sqrt{((85 - 36) \times (85 + 36))}$

=> $h = \sqrt{(49 \times 121)} = 7 \times 11 = 77$ cm

=> Area of the triangle = 1/2 × Base × Height

=> Area = 1/2 × 72 × 77 = 36 × 77

=> Area = 2772 cm^2

Therefore The correct answer is 2772 cm^2.

Additional Information

Heron's Formula

The area of any triangle can also be found using Area = $\sqrt{(s(s - a)(s - b)(s - c))}$, where s is the semi-perimeter (a + b + c)/2.

Properties of Isosceles Triangle

In an isosceles triangle, the perpendicular dropped from the apex to the unequal base also acts as an angle bisector and a median, dividing the triangle into two congruent right-angled triangles.

Equilateral Triangle Area

If all three sides of a triangle are equal (a), Area = $(\sqrt{3} / 4) \times a^2$ and Height = $(\sqrt{3} / 2) \times a$.

Q61. Answer: (a) 8 : 5

Shortcut Trick

The relation between Cost Price (CP) and Marked Price (MP) can be determined directly:

CP / MP = (100 − Discount%) / (100 + Profit%)

CP / MP = (100 − 20) / (100 + 28)

CP / MP = 80 / 128 = 5 / 8

=> MP / CP = 8 / 5

Therefore The correct answer is 8 : 5.

Alternate Method

Given:

Discount on Marked Price = 20%

Profit on Cost Price = 28%

CP: 100x

SP: 128x

MP: 160x

+28% Profit

-20% Discount

MP : CP = 160x : 100x = 8 : 5

Calculations:

Let the Cost Price (CP) of the shoes be 100x.

=> Selling Price (SP) = 100x + 28% of 100x = 128x

The retailer offers a 20% discount on the Marked Price (MP).

=> SP = MP − 20% of MP = 80% of MP

=> 128x = (80 / 100) × MP = 0.8 × MP

=> MP = 128x / 0.8 = 160x

Now, finding the ratio of Marked Price to Cost Price:

=> MP / CP = 160x / 100x

=> MP : CP = 8 : 5

Therefore The correct answer is 8 : 5.

Additional Information

Direct Relation Formula

CP / MP = (100 − Discount%) / (100 + Profit%). This direct ratio relation helps solve markup and discount questions instantly without assuming variables.

Successive Discount

When two consecutive discounts D1% and D2% are given, the equivalent single discount is calculated as: D1 + D2 − (D1 × D2) / 100.

Markup Percentage

Markup percentage is always computed on the Cost Price to arrive at the Marked Price. Formula: Markup % = [(MP − CP) / CP] × 100.

Q62. Answer: (b) 26 cm

Shortcut Trick

The perimeter of a rectangle is simply twice the sum of its adjacent sides.

Sum of sides = 5 + 8 = 13 cm

Perimeter = 2 × 13 = 26 cm

Therefore The correct answer is 26 cm.

Alternate Method

8 cm

5 cm

8 cm

5 cm

Given:

Length (L) = 5 cm

Breadth (B) = 8 cm

Formula Used:

Perimeter of a rectangle = 2 × (Length + Breadth)

Calculations:

=> Perimeter = 2 × (5 + 8)

=> Perimeter = 2 × 13

=> Perimeter = 26 cm

Therefore The correct answer is 26 cm.

Additional Information

Area of a Rectangle

The area is the total space enclosed by the boundary of the rectangle. Formula: Area = L × B.

Diagonal of a Rectangle

The diagonal divides the rectangle into two identical right-angled triangles. Formula: D = √(L² + B²).

Properties of a Rectangle

Opposite sides are equal and parallel, and all four interior angles are exactly 90°.

Q63. Answer: (b) 5255/257 hours

Shortcut Trick

Total Work = LCM(20, 22, 14) = 1540 units

Total combined efficiency = (1540 ÷ 20) + (1540 ÷ 22) + (1540 ÷ 14) = 77 + 70 + 110 = 257 units/hour

Time taken together = Total Work ÷ Total efficiency = 1540 ÷ 257 = 5^(255)⁄257 hours

Therefore The correct answer is 5^(255)⁄257 hours.

Alternate Method

Given:

Time taken by pipe A = 20 hours

Time taken by pipe B = 22 hours

Time taken by pipe C = 14 hours

Formula Used:

Total Work = LCM of given times

Efficiency = Total Work ÷ Time taken

Pipe	Hours	Total Work	Efficiency
A	20	1540	77
B	22	70	
C	14	110	

Calculations:

=> Total efficiency of pipes A, B and C together = 77 + 70 + 110 = 257 units/hour

=> Time required when operating together = Total Work ÷ Total efficiency

=> Time required = 1540 ÷ 257

=> Time required = 5^(255)⁄257 hours

Therefore The correct answer is 5^(255)⁄257 hours.

Additional Information

Pipes & Cisterns - Inlet vs Outlet

An inlet pipe fills a tank and its efficiency is considered positive. An outlet pipe empties a tank and its efficiency is taken as negative.

Work & Time Relation

Efficiency and Time are inversely proportional to each other. Total Work = Time taken × Efficiency.

Combined Rate Method

If a pipe can fill a tank in x hours, the part of the tank filled by it in 1 hour is 1/x. For multiple pipes working together, simply add their 1-hour work capacities.

Q64. Answer: (c) Rs. 375

Shortcut Trick

Since the time period is constant (1 year), the profit is distributed in the exact ratio of the partners' investments.

Profit Ratio = 1210 : 1650 : 1300 = 121 : 165 : 130

Total sum of ratio units = 121 + 165 + 130 = 416 units.

Avinash's share = (130 ÷ 416) × 1200 = (5 ÷ 16) × 1200 = 5 × 75 = Rs. 375.

Therefore The correct answer is Rs. 375.

Alternate Method

Given:

Investment by Neha = Rs. 1,210

Investment by Rajat = Rs. 1,650

Investment by Avinash = Rs. 1,300

Total profit at the end of the year = Rs. 1,200

Formula Used:

Profit Ratio = (Investment of A × Time of A) : (Investment of B × Time of B) : (Investment of C × Time of C)

Rs. 1210

Rs. 1650

Rs. 1300

Neha

Rajat

Avinash

Ratio → 121 : 165 : 130

Total Profit = Rs. 1200

Calculations:

=> Since the time period is equal (12 months) for everyone, their profit shares are strictly in the ratio of their investment values.

=> Profit ratio of Neha : Rajat : Avinash = 1210 : 1650 : 1300

=> Simplifying by dividing by 10, we get the Ratio = 121 : 165 : 130

=> Total parts of profit = 121 + 165 + 130 = 416

=> Avinash's share of profit = (Avinash's Ratio Part ÷ Total Ratio Parts) × Total Profit

=> Avinash's share = (130 ÷ 416) × 1200

=> Simplifying the fraction (dividing numerator and denominator by 26):

=> Avinash's share = (5 ÷ 16) × 1200

=> Avinash's share = 5 × 75

=> Avinash's share = 375

Therefore The correct answer is Rs. 375.

Additional Information

Simple Partnership

When all partners invest their capitals for the exact same time duration, the final profit or loss is distributed purely in the ratio of their original investments. Formula: Profit Ratio = I1 : I2 : I3

Compound Partnership

When partners invest their respective capitals for varying time periods, the profit is shared proportionally to the product of their investment amounts and time durations. Formula: Profit Ratio = (I1 × T1) : (I2 × T2) : (I3 × T3)

Working vs Sleeping Partner

A working partner is actively involved in business operations and usually receives a pre-decided salary or a certain percentage of the profit outright. A sleeping partner simply acts as an investor. The residual profit is then shared among everyone according to their effective capital investment ratios.

Q65. Answer: (b) 97

Shortcut Trick

The unit digit of 769501 is 1, which means it is an odd number.

Even numbers like 96 and 90 can never divide an odd number completely.

Any number divisible by 105 (a multiple of 5) must end in 0 or 5, so 105 is also eliminated.

By the process of elimination, the correct divisor has to be 97.

Therefore The correct answer is 97.

Alternate Method

Given:

The number is 769501 and the options are 96, 97, 90, 105.

Concept Used:

We can check the divisibility rapidly by observing the unit digit of the given number and the options.

Calculation:

=> The given number is 769501, and its unit digit is 1.

=> Option 1: 96 is an even number. An even number multiplied by any integer always gives an even unit digit. So, 96 cannot completely divide 769501.

=> Option 3: 90 is a multiple of 10. It can only divide numbers ending with 0. So, 90 cannot divide 769501.

=> Option 4: 105 is a multiple of 5 (105 = 21 × 5). It can only divide numbers ending with 0 or 5. So, 105 cannot divide 769501.

=> Option 2: 97 is a prime number. Let us verify by direct division.

=> 769501 ÷ 97 = 7933

=> Since the quotient is an integer, 769501 is exactly divisible by 97.

Therefore The correct answer is 97.

Additional Information

Divisibility Rule for Even Numbers

An even number always ends in 0, 2, 4, 6, or 8. Only even numbers can be completely divisible by other even numbers. Odd numbers are never divisible by even numbers.

Divisibility Rule for 5

A number is exactly divisible by 5 only if its unit digit is either 0 or 5.

Divisibility Rule for 10

A number is completely divisible by 10 only if its unit digit is 0.

Prime Number Divisibility

For larger prime numbers like 97, there are specific osculator-based rules, but in competitive exams, using the elimination method for the other options is often the fastest strategy.

Q66. Answer: (d) 71,32,950

Shortcut Trick

For a number to be divisible by 22, it must be divisible by both 2 and 11.

Option 3 is odd, so it is instantly eliminated.

Checking divisibility of 11 for 71,32,950 => (7 + 3 + 9 + 0) − (1 + 2 + 5).

=> 19 − 8 = 11 (which is divisible by 11).

Since it is even and perfectly divisible by 11, it is divisible by 22.

Therefore The correct answer is 71,32,950.

Alternate Method

Given:

Four numerical options to check for divisibility by 22.

Concept Used:

A number is divisible by 22 if it is completely divisible by its co-prime factors, which are 2 and 11.

Divisibility by 2: The last digit must be an even number (0, 2, 4, 6, 8).

Divisibility by 11: The difference between the sum of digits at odd positions and the sum of digits at even positions must be 0 or a multiple of 11.

Calculations:

=> Checking 65,80,350: Ends in 0 (divisible by 2). For 11 => (6 + 8 + 3 + 0) − (5 + 0 + 5) = 17 − 10 = 7. Not divisible by 11.

=> Checking 64,67,614: Ends in 4 (divisible by 2). For 11 => (6 + 6 + 6 + 4) − (4 + 7 + 1) = 22 − 12 = 10. Not divisible by 11.

=> Checking 61,36,901: Ends in 1 (odd). Not divisible by 2.

=> Checking 71,32,950: Ends in 0 (divisible by 2). For 11 => (7 + 3 + 9 + 0) − (1 + 2 + 5) = 19 − 8 = 11. Divisible by 11.

=> Therefore, only 71,32,950 is divisible by both 2 and 11.

Therefore The correct answer is 71,32,950.

Additional Information

Divisibility by Composite Numbers

To check divisibility by a composite number, you must express it as the product of two co-prime factors. For example, to check for 12, check divisibility by 3 and 4.

Divisibility Rule of 11

A number is divisible by 11 if the difference of the sum of the alternate digits is either 0 or a multiple of 11.

Divisibility Rule of 7, 11 and 13 combined

If the difference between the number formed by the last three digits and the number formed by the remaining digits is divisible by 7, 11 or 13, then the original number is divisible by them respectively.

Q67. Answer: (b) 6 km/hr

Shortcut Trick

Let Anmol's initial time be T.

When his speed doubles, the time taken becomes T/2.

Time saved by Anmol = 6 hours (late initially) + 2 hours (early now) = 8 hours.

Total time saved = T − T/2 = T/2 = 8 hours => T = 16 hours.

Anmol's speed = Distance ÷ Time = 96 ÷ 16 = 6 km/hr.

Therefore The correct answer is 6 km/hr.

Alternate Method

Given:

Total distance = 96 km

Let Anmol's initial time = T_A and Nikhil's time = T_N

Anmol (2x Speed)

Nikhil

Anmol (1x Speed)

TN − 2

TN

TN + 6
2 hrs
6 hrs
Total Time Saved = 8 hrs = TA / 2
Calculations:
=> Case 1: T_A = T_N + 6
=> Case 2: When Anmol's speed is doubled, his new time = T_A / 2
=> T_A / 2 = T_N − 2
=> Subtracting Case 2 from Case 1:
=> T_A − T_A / 2 = (T_N + 6) − (T_N − 2)
=> T_A / 2 = 6 + 2
=> T_A / 2 = 8
=> T_A = 16 hours
=> Speed of Anmol = Distance ÷ Time = 96 ÷ 16 = 6 km/hr
Therefore The correct answer is 6 km/hr.
Additional Information
Speed and Time Relation
For a constant distance, speed is inversely proportional to time. If speed becomes n times, the time taken becomes 1/n times.
Relative Time Shift
When a journey takes t1 time more initially and later takes t2 time less than a reference point, the net change in time is exactly t1 + t2.
Average Speed
When equal distances are covered at different speeds a and b, the overall average speed is calculated using (2 × a × b) ÷ (a + b).

Q68. Answer: (c) Rs. 15,750

Shortcut Trick
Given 6A = 9B = 2C.
Ratio of A : B : C = 1/6 : 1/9 : 1/2 = 3 : 2 : 9.
Total parts = 3 + 2 + 9 = 14.
Share of A = (3 ÷ 14) × 73,500 = 15,750.
Therefore The correct answer is Rs. 15,750.
Alternate Method
Given:
Total amount to be divided = Rs. 73,500
Equality condition: 6 × A = 9 × B = 2 × C
Formula Used:
If pA = qB = rC, then A : B : C = 1/p : 1/q : 1/r.
Total = 14 parts = Rs. 73,500
A (3)
B (2)
C (9)
Rs. 15,750
Rs. 10,500
Rs. 47,250
Calculations:
=> Let 6A = 9B = 2C = LCM(6, 9, 2) = 18 units
=> Ratio of A : B : C = 18/6 : 18/9 : 18/2 = 3 : 2 : 9
=> Total ratio parts = 3 + 2 + 9 = 14 parts
=> 14 parts = Rs. 73,500
=> 1 part = 73,500 ÷ 14 = Rs. 5,250
=> Share of A = 3 parts = 3 × 5,250 = Rs. 15,750
Therefore The correct answer is Rs. 15,750.

Additional Information

Inverse Proportion Ratio

If pA = qB = rC, then the ratio of A : B : C is calculated as 1/p : 1/q : 1/r. Multiply by the LCM of p, q, and r to convert these into simplest integer ratios.

Proportional Division

To divide a total amount N into a ratio x : y : z, the share of the first part is calculated directly as (x ÷ (x + y + z)) × N.

Combined Ratio

If A : B = a : b and B : C = x : y, then the combined ratio A : B : C can be found by making the common term B equal, resulting in the compound ratio ax : bx : by.

Q69. Answer: (a) 60

Shortcut Trick

Number of cubes = Total Volume ÷ Volume of 1 small cube

Number of cubes = (24 × 16 × 10) ÷ (4 × 4 × 4)

Number of cubes = 3840 ÷ 64 = 60

Therefore The correct answer is 60 cubes.

Alternate Method

Given:

Length of cuboid (L) = 24 cm, Breadth (B) = 16 cm, Height (H) = 10 cm

Side of small cube (a) = 4 cm

Formula Used:

Number of cubes = Volume of cuboid ÷ Volume of one cube

24 cm

10 cm

16 cm

Solid Cuboid

Melted

4 cm

Small Cubes

Calculations:

=> Volume of cuboid = L × B × H

=> Volume of cuboid = 24 × 16 × 10 = 3840 cm^3

=> Volume of one small cube = a^3

=> Volume of one small cube = 4 × 4 × 4 = 64 cm^3

=> Number of cubes formed = 3840 ÷ 64

=> Number of cubes formed = 60

Therefore The correct answer is 60 cubes.

Additional Information

Melting and Recasting

When a solid 3D object is melted to form multiple smaller objects, the overall volume remains perfectly constant (Total Volume = n × Volume of small object).

Volume of Cuboid

Calculated using the formula L × B × H. The longest diagonal of a cuboid is given by $\sqrt{(L^2 + B^2 + H^2)}$.

Volume of Cube

Calculated as a^3, where 'a' is the length of its edge. The total surface area of a cube is $6a^2$.

Cutting vs Melting Rules

Cutting a solid into smaller blocks requires finding whole pieces along each physical dimension (ignoring leftover parts), whereas melting ignores dimensions and relies purely on total volume.

Q70. Answer: (a) 74

Shortcut Trick

Let the average of the two consecutive even numbers be 'a' (which will be an odd number).

The numbers can be written as (a − 1) and (a + 1), and their required sum is simply 2a.

Sum of their squares = $(a - 1)^2 + (a + 1)^2 = 2740$

=> $2(a^2 + 1) = 2740$ => $a^2 + 1 = 1370$ => $a^2 = 1369$ => $a = 37$

The sum of the numbers = $2 \times 37 = 74$.

Therefore The correct answer is 74.

Alternate Method

Given:

The sum of the squares of two consecutive even natural numbers is 2740.

Method Used:

Use the algebraic identity: $(x + y)^2 = x^2 + 2xy + y^2$

Calculations:

Let the two consecutive even natural numbers be x and x + 2.

=> $x^2 + (x + 2)^2 = 2740$

=> $x^2 + x^2 + 4x + 4 = 2740$

=> $2x^2 + 4x - 2736 = 0$

Dividing the entire equation by 2, we get:

=> $x^2 + 2x - 1368 = 0$

Now, split the middle term to factorize the quadratic equation:

=> $x^2 + 38x - 36x - 1368 = 0$

=> $x(x + 38) - 36(x + 38) = 0$

=> $(x - 36)(x + 38) = 0$

Since natural numbers cannot be negative, x cannot be −38. Therefore, x = 36.

The two consecutive even numbers are 36 and 38.

=> Sum of the numbers = 36 + 38 = 74

Therefore The correct answer is 74.

Additional Information

Sum of First n Natural Numbers

The sum of the first n natural numbers is given by the formula: $S = n(n + 1) \div 2$.

Sum of Squares of First n Natural Numbers

The sum of the squares of the first n natural numbers is calculated using: $S = n(n + 1)(2n + 1) \div 6$.

Properties of Even Numbers

The sum or difference of any two even numbers is always even. The square of any even number is always a multiple of 4.

Quadratic Roots Formula

For a standard quadratic equation $ax^2 + bx + c = 0$, the roots can be directly found using: $x = (-b \pm \sqrt{(b^2 - 4ac)}) \div 2a$.

Q71. Answer: (c) Only Conclusion I follows

Least possible Venn diagram:

Conclusions:

(I): All lakes are rivers. - True (All lakes are ponds, and all ponds are rivers. All lakes are River is True.)

(II): All rivers are ponds—False (All ponds are rivers but All river are pond is may be possible but not definte. Hence, it is false.)

Only Conclusion I follows.

Hence, the correct answer is "Option 3"

Q72. Answer: (c) OR-IN

The logic followed here is:

All follow the same logic except OR-IN.

Hence, the correct answer is "Option 3"

Q73. Answer: (a) NXJD

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 1"

Q74. Answer: (c) 152

The logic follows.

Hence, the correct answer is "Option 3"

Q75. Answer: (c) 13

The logic follows here,

Hence, the correct answer is "Option 3"

Q76. Answer: (d) 4

According to the given information:

Given Number: 72518643

If 2 is added to each odd digit and 1 is subtracted from each even digit in the number 72518643.

The difference between the first and the last digit in the number thus formed is 9 - 5 = 4.

Hence, the correct answer is "Option 4"

Q77. Answer: (a) KVY

The logic follows here,

Hence, the correct answer is "Option 1"

Q78. Answer: (b) 240

The logic follows,

Hence, the correct answer is "Option 2"

Q79. Answer: (d) BF-IC

The logic followed here is,

All follow the same logic except BF-IC.

Hence, the correct answer is "Option 4"

Q80. Answer: (b) 2 km to North

Given:

• Hitesh starts from Point A and drives 9 km towards East.

• He then takes a left turn, drives 4 km, turns left and drives 11 km.

• He then takes a left turn and drives 6 km.

• He takes a final left turn, drives 2 km and stops at Point P.

Hence, the correct answer is "Option 2"

Q81. Answer: (d) HDFC

The logic followed here is,

Similarly,

Hence, the correct answer is "Option 4"

Q82. Answer: (b) P

Given: Seven boxes, F, G, H, M, N, O and P 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 N.

• N is kept at some place above G.

• O is kept immediately below N.

• M is kept at one of the places above P.

• H is not kept immediately above or below F

The Final Arrangement is

H
N
O

G
M
F
P

Hence, the correct answer is "Option 2"

Q83. Answer: (c) 6

Given:

• 'HUGE' is coded as '4627'

• 'GIRL' is coded as '1365'

• Code for G is 6.

Hence, the correct answer is "Option 3"

Q84. Answer: (c) LMG 10

The logic followed here is,

Hence, the correct answer is "Option 3"

Q85. Answer: (c) (23, 414, 6)

Logic :

(First number × Third Number) 3 = Second Number

Similarly,

Hence, the correct answer is "Option 3"

Q86. Answer: (b) 93

Total number of people: 111

Mukesh's position from the left: 19

Position from Right = Total Persons - Position from Left + 1

111 – 19 + 1 = 92 + 1

=93.

Hence, the correct answer is "Option 2"

Q87. Answer: (b) Q

Given:A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table.

• Only two people sit between A and R, when counted from the right of A.

• Only two people sit between R and D.

• Only three people sit between A and B.

• C sits to the immediate left of Q.

The final arrangement is

Hence, the correct answer is "Option 2"

Q88. Answer: (a) H

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

• Only two boxes are kept between O and K.

• Only G is kept above L.

• No box is kept below K.

• F is kept at some place below H but at some place above I.

The Final Arrangement is

G
L
H
O

F
I
K

Hence, the correct answer is "Option 1"

Q89. Answer: (d) Three

Given number - 95423671

1 is subtracted from each even digit of the given number.

The number of digits that are repeated more than once in the new number formed is 1,3 and 5.

Hence, the correct answer is "Option 4".

Q90. Answer: (c) 108

'I' stands for '+', 'J' stands for '×', 'K' stands for '÷' and 'L' stands for '–'

New Equation: 29 + (23 × 5) - 23 × 10 + (420 ÷ 4) + 89 = ?

29 + (23 × 5) - 23 × 10 + (420 ÷ 4) + 89 = ?

29 + 115 - 23 × 10 + 105 + 89 = ?

29 + 115 - 230 +105 + 89 = ?

338 - 230 =?

108.

Hence, the correct answer is "Option 3"

Q91. Answer: (a) Two

Given: (Left) 817 708 290 322 720 (Right)

Arranged in descending order: 817 720 708 322 290

Given Number: (Left) 817 708 290 322 720 (Right)

Descending order : (Left) 817 720 708 322 290 (Right)

817 and 322 remain unchanged.

Hence, the correct answer is "Option 1"

Q92. Answer: (d) MOU

The logic follows here,

Hence, the correct answer is "Option 4"

Q93. Answer: (d) P

Given: Six friends, P, Q, R, S, T, and U, are sitting in a straight line, facing north.

• Q is an immediate neighbor of S and T.

• U sits to the immediate right of R.

• P sits third to the left of T.

• Neither S nor T sits on any of the extreme ends.

The final Arrangement is

Hence, the correct answer is "Option 4"

Q94. Answer: (c) RAIN - IRAN - NIAR

The logic follows here,

Similarly,

Hence, the correct answer is "Option 3"

Q95. Answer: (b) 0

Given Number: (Left) 427 615 253 961 743 (Right)

Arranged in ascending order - (Left) 253 427 615 743 961 (Right)

Their is no such number which is in same place after arranged in ascending order.

Hence, the correct answer is "Option 2"

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Q96. Answer: (c) Son's wife's mother

From the given information,

• G is wife of H.

• H is son of R.

• A is the mother of G.

Hence, the correct answer is "Option 3"

Q97. Answer: (c) 10 km towards west

Given:

• Satwik starts from Point A and drives 7 km towards east.

• He then takes a left turn, drives 4 km, turns right and drives 6 km.

• He then takes a right turn and drives 4 km.

• He takes a final right turn, drives 3 km and stops at Point P.

• The final Diagram,

• • Hence, the correct answer is "Option 3"

Q98. Answer: (b) None

Given Number: 4385612

Arranged in the ascending order from left to right : 1 2 3 4 5 6 8

No, digits will remain unchanged as compared to that in the original number.

Hence, the correct answer is "Option 2"

Q99. Answer: (c) 6

'YOUR' is coded as '2467.

'OPEN' is coded as '1536'.

Code for O os 6.

Hence, the correct answer is "Option 3"

Q100. Answer: (a) Both conclusions (I) and (II) follow.

The least possible diagram for the given statements is as follows:

Conclusions:

(I) Some drums are levers. - True (All levers are Drums means some drums are levers and some levers are drums is True.)

(II) All games are drums. - True (All Games are levers and All Levers are Drums means All games are drums is True.)

Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 1"

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