RRB NTPC (UG) CBT-I Official Paper (Held On: 01 Sept, 2025 Shift 3) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Which of the following steps allows you to create a new folder on the desktop in Windows?

(a) Go to Task Manager
(b) Open Notepad
(c) Press Ctrl + Alt + Del
(d) Right-click → New → Folder

Q2. During the colonial period, the manufacturing sector accounted for only _____.

(a) 0.0005
(b) 0.0001
(c) 0.001
(d) 0.0016

Q3. Which schedule of the Citizenship Act, 1955, contains the qualifications for naturalisation?

(a) Third Schedule
(b) First Schedule
(c) Second Schedule
(d) Tenth Schedule

Q4. When was 'Operation Shield' conducted across India’s border states and union territories?

(a) 29 May 2025
(b) 31 May 2025
(c) 3 June 2025
(d) 7 May 2025

Q5. Where will the 18th edition of Pravasi Bharatiya Divas (PBD) be held in 2025?

(a) Bhubaneswar
(b) Mumbai
(c) New Delhi
(d) Chennai

Q6. According to the principle of collective responsibility in India’s parliamentary system, a successful no-confidence motion against a single Union Minister requires which action?

(a) The Lok Sabha is immediately dissolved.
(b) The entire Council of Ministers must resign.
(c) Only the targeted minister must resign.
(d) The President dismisses only the targeted minister.

Q7. What is the name of ISRO's mission launched in January 2024 to study the polarisation of cosmic X-rays?

(a) XPoSat
(b) Aditya-L1
(c) RISAT-1
(d) AstroSat

Q8. In a chemical reaction, the substances that are initially present before the reaction starts are called _____.

(a) reactants
(b) products
(c) intermediates
(d) catalysts

Q9. Which of the following best describes the role of the Control Unit within the Central Processing Unit?

(a) It displays the processed output to the user.
(b) It performs all mathematical and logical calculations.
(c) It directs and coordinates the activities of all components of the computer.
(d) It stores data and instructions temporarily during processing.

Q10. Which of the following organisations was one of the co-organisers of the 14th Asian Fisheries and Aquaculture Forum (14AFAF) held from 12 to 15 February 2025 at Pusa Campus, New Delhi?

(a) United Nations Environment Programme (UNEP)
(b) Food and Agriculture Organization (FAO)
(c) Asian Fisheries Society Indian Branch (AFSIB)
(d) World Health Organization (WHO)

Q11. Which of the following substances constitutes the primary material of the "Mother Goddess" sculpture originating from the Indus Valley Civilisation?

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

Q12. The Khelo India Youth Games 2025 was organised from which date to which date at different locations in Bihar?

(a) 1 to 10 May 2025
(b) 4 to 18 May 2025
(c) 8 to 20 May 2025
(d) 4 to 15 May 2025

Q13. If an RTI applicant is aggrieved by the Public Information Officer’s decision (or lack of response), within how many days must the first appeal be filed under Section 19 of the RTI Act?

(a) 15 days
(b) 90 days
(c) 30 days
(d) 60 days

Q14. The Department of Financial Services (DFS) notified amalgamation of 26 Regional Rural Banks (RRBs) on the principles of ‘One State One RRB’ in which phase of amalgamation of RRBs in 2025?

(a) Fifth
(b) Second
(c) Third
(d) Fourth

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Q15. Which system of land tenure prevalent before independence led to exploitation of farmers?

(a) Mahalwari system
(b) Zamindari system
(c) Cooperative farming
(d) Ryotwari system

Q16. During Shahjahan's rule, how many mansabdars out of 8000 were higher ranking mansabdars who received 61.5% of the total estimated revenue of the empire as salaries for themselves and their troopers?

(a) 445
(b) 545
(c) 245
(d) 345

Q17. Recipient of Padma Shri in 2025, Shri Onkar Singh Pahwa, is related to which cycle company of India?

(a) Avon Cycles
(b) Hero Cycles
(c) Atlas Cycles
(d) Tata Stryder

Q18. Which of the following places may receive an amount of rainfall in a single day that is equal to 10 years of rainfall at Jaisalmer?

(a) Tura
(b) Leh
(c) Asansol
(d) Siliguri

Q19. Urban transport infrastructure generally refers to the systems that facilitate the movement of people and goods within a city. Which of the following is NOT a part of urban transport infrastructure?

(a) Water irrigation pipelines
(b) Public bus systems
(c) Metro rail networks
(d) Flyovers and expressways

Q20. Which statutory body organised a two-day National Conference on 'Environment – 2025' at Vigyan Bhawan, New Delhi, in March 2025?

(a) Central Ground Water Authority
(b) Central Pollution Control Board
(c) National Biodiversity Authority
(d) National Green Tribunal

Q21. Who was the first Finance Minister of Independent India?

(a) John Mathai
(b) R K Shanmugham Chetty
(c) Rafi Ahmed Kidwai
(d) Jairamdas Daulatram

Q22. Which country signed a contract with India in April 2025 to supply 26 Rafale Marine fighter jets?

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

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Q23. Who obtained the first accurate value of the speed of light using a rotating mirror apparatus in 1862?

(a) Albert A Michelson
(b) Charles Wheatstone
(c) Jean Bernard Léon Foucault
(d) Marie Alfred Alen Cornu

Q24. What is the theoretical value of the Stefan-Boltzmann constant (σ) which defines the power emitted per unit area by a black body as a function of its thermodynamic temperature?

(a) 5.91 × 10^(-7) Wm^(-2)K^(-4)
(b) 5.17 × 10^(-9)Wm-2K-4
(c) 5.35 × 10^(-10)Wm-2K-4
(d) 5.67 × 10^(-8)Wm-2K-4

Q25. Which Buddhist scripture explicitly states “All dhammas are without self,” affirming the doctrine of Anatta?

(a) Dhammapada
(b) Kalpa Sutra
(c) Bhagavati Sutra
(d) Uttaradhyayana

Q26. Which initiative, launched in 2025, aims to develop quantum-encrypted communication for tamper-proof defence networks in India?

(a) SecureNet India
(b) National Cyber Security Mission
(c) National Quantum Mission
(d) Quantum Leap Program

Q27. How does deforestation lead to desertification?

(a) It increases humus in the soil.
(b) It removes the top fertile soil layer, exposing hard, rocky layers.
(c) It increases rainfall in dry regions.
(d) It reduces soil erosion.

Q28. What is the most direct impact of poor infrastructure on rural education?

(a) Poor mid-day meals
(b) Lack of trained teachers
(c) High student absenteeism
(d) Low awareness about schemes

Q29. As of 2024, who among the following holds the national record in women’s weightlifting (49 kg category) in India?

(a) Sanjita Chanu
(b) Saikhom Mirabai Chanu
(c) Punam Yadav
(d) Karnam Malleswari

Q30. Where was the 2025 Asia-Pacific Economic Cooperation (APEC) Sports Policy Network Roundtable Meeting & Forum held?

(a) Japan
(b) South Korea
(c) China
(d) Australia

Q31. What does the term 'halocline' refer to in oceanography?

(a) A layer with a rapid change in pressure
(b) A layer with a rapid change in salinity
(c) A zone with the highest oxygen concentration

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(d) A layer with a rapid change in temperature

Q32. What does the term ‘satyagraha’ primarily mean in Gandhian philosophy for mass mobilisation and India’s struggle for freedom during colonial rule?

(a) Non-cooperation
(b) Truth-force
(c) Passive resistance
(d) Civil disobedience

Q33. Which of the following was NOT a consequence of the Revolt of 1857?

(a) Policies that favoured zamindars and landlords were struck down.
(b) Lands and properties of Muslims were confiscated en masse.
(c) The strength of Indian soldiers in the army was reduced.
(d) The Governor-General of India was given the title 'Viceroy'.

Q34. Select the correct statement regarding the National Human Rights Commission (NHRC) of India.

(a) It is a constitutional body formed by a Constitutional Amendment, with powers equal to the Supreme Court.
(b) The NHRC has direct powers to prosecute and punish public officials for human rights abuses.
(c) It was established in 1993 by an Act of Parliament to investigate and recommend on human rights violations.
(d) The Chairperson of the NHRC is the Prime Minister of India.

Q35. Employees' Provident Fund Organisation (EPFO) India, which added more than 7.5 lac new subscribers in the month of March 2025, comes under which ministry of Government of India?

(a) Ministry of Statistics and Programme Implementation
(b) Ministry of Personnel, Public Grievances and Pensions
(c) Ministry of Finance
(d) Ministry of Labour and Employment

Q36. Which tax was introduced in July 2017 to replace multiple indirect taxes in India as part of fiscal reforms?

(a) Income Tax
(b) Excise Duty
(c) GST
(d) Sales Tax

Q37. Which of the following options correctly lists the composition of the State Executive in India?

(a) Governor, Chief Minister and Council of Ministers
(b) President, Governor and Chief Minister
(c) Governor, Deputy Minister and State Council of Advisors
(d) Governor, Chief Minister and State Legislative Assembly members

Q38. The southern stretch of the Western Coast of India, sandwiched between the Western Ghats and the Arabian Sea, is referred to as the _____.

(a) Malabar Coast
(b) Kathiawar Peninsula
(c) Kannad Plain
(d) Konkan

Q39. Which region in France is home to the massive white hydrogen reserve discovered in 2025, which is a game-changer for clean energy?

(a) Moselle
(b) Provence
(c) Normandy
(d) Brittany

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Q40. Which of the following space agencies successfully docked the SpaDeX satellite in January 2025?

(a) National Aeronautics and Space Administration
(b) Indian Space Research Organisation
(c) European Space Agency
(d) China National Space Administration

MATHEMATICS

Q41. Nikhil, Nidhi and Tejas invested Rs. 1,200, Rs. 1,070 and Rs. 1,310, respectively to start a business. If the profit at the end of the year is Rs. 1,790, what is Tejas's share of the profit?

(a) Rs. 654
(b) Rs. 657
(c) Rs. 658
(d) Rs. 655

Q42. If $X=(1+\cos\theta)(2-2\cos\theta)/(2+2\sin\theta)(1-\sin\theta)$, then the value of $X+1/X + 2$ is

(a) $\cot^2\theta$
(b) $\cos^2\theta + \sec^2\theta$
(c) $\sec^2\theta\sin^2\theta$
(d) $\text{cosec}^2\theta\ \sec^2\theta$

Q43. A sum of money triples itself at a certain rate of compound interest in 17 years. In how many years will it amount to 81 times of itself?

(a) 68 years
(b) 59 years
(c) 58 years
(d) 64 years

Q44. The value of $8^2+\sqrt{(3^2)}-2\sqrt{36}-11$ is

(a) 38
(b) 50
(c) 51
(d) 44

Q45. A shopkeeper offers the following discount scheme to his customers for the purchase of articles in his shop.

'Buy 20 and get 5 free'

Find the discount percentage offered.

(a) 25%
(b) 30%
(c) 20%
(d) 32%

Q46. Find the value of x satisfying: $5(5x^2 - 5) - 5(5x^2 + 7x - 2) = 14$

(a) -29/35
(b) -38/35
(c) -39/35
(d) -24/35

Q47. The LCM of the numbers 2.8 and 0.217 is:

(a) 0.868
(b) 8.68
(c) 868
(d) 86.8

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Q48. If 4 times a son's age is added to his father's age, the sum is 100 years. If 2.5 times the father's age is added to the son's age, the sum is 97 years. What is the father's age (in years)?

(a) 31
(b) 32
(c) 36
(d) 30

Q49. 4 men can complete a piece of work in 12 days, while 8 women can do it in 15 days. In how many days can 3 women and 2 men complete this work?

(a) 19 days
(b) 15 days
(c) 11 days
(d) 14 days

Q50. Find the number of sides of a regular polygon, each of whose interior angles measures 162°

(a) 18
(b) 16
(c) 20
(d) 22

Q51. The income of Raman is Rs. 80,200. He saves 7.5% of his income. If his income increases by 34% and expenditure increases by 40%, then his savings will:

(a) increase by Rs. 2,403
(b) decrease by Rs. 2,406
(c) decrease by Rs. 2,404
(d) increase by Rs. 2,404

Q52. Volumes of three cubes made of solid metal are 789 cm3, 865 cm3 and 1721 cm3, respectively. After melting all the three, a solid cube was made of them. Find the length of the edge of the new cube.

(a) 15 cm
(b) 25 cm
(c) 12 cm
(d) 14 cm

Q53. Given that 81^(0.65) = x, 81^(0.26)= y and x^z = y^7, then the value of z is close to:

(a) 2.8
(b) 4.09
(c) 4.27
(d) 1.32

Q54. A tradesman marks his goods at such a price that after allowing a discount of 30%, he still makes a profit of 10%. What is the marked price of an article (in Rs.) whose cost price is Rs. 1,540?

(a) 2,240
(b) 2,420
(c) 2,440
(d) 2,204

Q55. A man driving a car at a speed of 48 km/hr crosses a bridge in 3.8 minutes. Find the length of the bridge.

(a) 2.36 km
(b) 3.04 km
(c) 2.54 km
(d) 2.46 km

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Q56. I bought two shirts for Rs. 1,200. I sold the first one at a loss of 8% and the second at a gain of 24%. If, on the whole I made neither a loss nor a gain, find the cost price (in Rs.) of the first shirt.

(a) 924
(b) 884
(c) 900
(d) 920

Q57. Find the volume of a sphere with diameter 12 cm.

(a) 256 π cm^3
(b) 288 π cm3
(c) 576 π cm3
(d) 905 π cm3

Q58. The selling price of 20 books is equal to the cost price of 36 books. Find the loss or gain percentage.

(a) 100/16% loss
(b) 80% loss
(c) 80% gain
(d) 100/16% gain

Q59. The sum of two numbers is 44 and their L.C.M. is 459. What are the two numbers?

(a) 20, 24
(b) 25, 19
(c) 27, 17
(d) 32, 12

Q60. The average of first 147 odd natural numbers, is:

(a) 146.5
(b) 147
(c) 148
(d) 147.5

Q61. Ishaan has to reach Kolkata which is 843 km away in 11 hours. His starting speed for 4 hours was 34 km/hr. For the next 180 km his speed was 30 km/hr. By what speed he must travel now so as to reach Kolkata in the decided time of 11 hours?

(a) 527 km/hr
(b) 523 km/hr
(c) 528 km/hr
(d) 530 km/hr

Q62. The product of two positive numbers is 3645. If the first number is five times the second number, then the sum of the two numbers is:

(a) 173
(b) 164
(c) 162
(d) 172

Q63. A can do a work in 9 days and B can do the same work in 19 days. If they work on it together for 6 days, then what fraction of the work is left?

(a) 10/57
(b) 4/57
(c) 7/57
(d) 1/57

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Q64. Rs. 35,600 were divided among A, B and C, such that 8 times of A = 3 times of B = 6 times of C. Find the share of A.

(a) Rs. 7,194
(b) Rs. 6,968
(c) Rs. 7,120
(d) Rs. 7,294

Q65. Find the mean proportional of 324 and 16.

(a) 69
(b) 72
(c) 74
(d) 75

Q66. The value of 5/3+(1/(1+2/7))-2/3 of

(a) 16/9
(b) 26/17
(c) 12/7
(d) 8/13

Q67. The number 481355 is divisible by which of the following?

(a) 3
(b) 15
(c) 6
(d) 5

Q68. Find the simple interest (in Rs.) if a sum of Rs. 400 is borrowed for 4.5 years at 16% per annum rate of interest.

(a) 338
(b) 268
(c) 388
(d) 288

Q69. The average weight (in kg) of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 74 kg and 38 kg is:

(a) 52.4
(b) 50.4
(c) 51.4
(d) 53.4

Q70. By how much is 65% of 65 greater than 1/5 of 55?

(a) 29.25
(b) 25.25
(c) 31.25
(d) 28.25

GENERAL INTELLIGENCE AND REASONING

Q71. In a certain code language, ‘DRAG’ is coded as ‘5824’ and ‘GRAM’ is coded as ‘4592’. What is the code for ‘M’ in the given code language?

(a) 4
(b) 9
(c) 2
(d) 5

Q72. In a certain code language, ‘EARS’ is coded as ‘1357’ and ‘SOUP’ is coded as ‘2146’. What is the code for ‘S’ in that language?

(a) 6
(b) 2

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(c) 1
(d) 7

Q73. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

TAW VCY XEA ZGC ?

(a) BIQ
(b) BIX
(c) BIE
(d) BIP

Q74. This question is based on the five, three-digit numbers given below.

(Left) 625 247 156 289 362 (Right)

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

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

What will be the resultant if the third digit of the highest number is added to the second digit of the lowest number?

(a) 8
(b) 7
(c) 10
(d) 12

Q75. What will come in place of the question mark (?) in the following equation if '−' and '÷' are interchanged and '×' and '+' are interchanged?

19 + 40 − 8 × 2 ÷ 1 = ?

(a) 96
(b) 98
(c) 99
(d) 97

Q76. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. No box is kept above G. Only three boxes are kept between G and B. Only one box is kept between F and D. D is kept immediately above B. Only four boxes are kept between F and E. A is kept at some place above C. How many boxes are kept above B?

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

Q77. 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) UX-ZS
(b) OR-TM
(c) LO-QI
(d) RU-WP

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

121 117.9 114.8 111.7 108.6 ?

(a) 105.5
(b) 107.6
(c) 108.2
(d) 106

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Q79. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

PKE 17 RIH 10 TGK 1 ? XCQ -23

(a) VFN -8
(b) VEN -10
(c) VEM -10
(d) EFM -8

Q80. Each of the digits in the number 4512689 is arranged in ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q81. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) % € 9 2 5 * $ € © @ % % 1 7 $ * @ 6 7 3 & * (Right)

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

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

Q82. Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

Only three boxes are kept above V. Only one box is kept between F and V. Only three boxes are kept between F and U. U is kept at some place above V. E is kept immediately below U. G is kept at one of the places above X. W is not kept immediately above or below F. Which box is kept at the lowermost position?

(a) W
(b) U
(c) X
(d) F

Q83. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

Some pants are sweaters.

Some sweaters are coats.

Conclusions:

(I) Some pants are coats.

(II) Some sweaters are pants.

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

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

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

(a) LO-HJ
(b) FI-BC
(c) PS-LN

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(d) IL-EG

Q85. 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) TW-VY
(b) RU-TW
(c) AD-CF
(d) EH-GK

Q86. L, M, N, O, Q, R, and S are sitting around a circular table facing the centre of the table. S sits fourth to the left of O. R sits fourth to the right of M. Only two people sit between O and M when counted from the left of O. L is not an immediate neighbour of R or O. N is not an immediate neighbour of L.

Who sits third to the right of Q?

(a) O
(b) S
(c) N
(d) L

Q87. 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.

HAIR - AHIR - RIAH

MEAN - EMAN - NAEM

(a) WANT - AWNT - TANW
(b) LOCK - OLCK - OCKL
(c) BOND - BNOD - DNOB
(d) DUST - UDST - TSUD

Q88. H, I, J, K, U, V and W are sitting around a circular table facing the centre of the table. Only I sits between V and H. H sits third to the left of K. W sits to the immediate left of K. J is not an immediate neighbour of H.

Who sits fourth to the left of U?

(a) H
(b) J
(c) W
(d) V

Q89. In a certain code language,

A $ B means ‘A is the mother of B’,

A + B means ‘A is the brother of B’,

A @ B means ‘A is the wife of B’, and

A ÷ B means ‘A is the father of B’.

How is E related to N if ‘E @ F ÷ G $ M + N’?

(a) Mother's mother
(b) Mother's sister
(c) Mother's father
(d) Mother's brother

Q90. What will come in the place of the question mark (?) in the following equation, if ‘+’ and ‘−’ are interchanged and ‘×’ and ‘÷’ are interchanged?

56 × 8 − 13 ÷ 3 + 11 = ?

(a) 33
(b) 34
(c) 32
(d) 35

Q91. Which of the given numbers will replace the question mark (?) in the following series to make it logically complete?

235 246 268 301 345 ?

(a) 401
(b) 400
(c) 410
(d) 445

Q92. Raj ranked 44th from the top and 15th from the bottom in his class. How many students are there in his class?

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

Q93. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statement(s).

Statements:

All Tractors are Buses.

No Buses are Trucks.

Conclusions:

I. No Trucks are Tractors.

II. Some Trucks are Tractors.

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

Q94. What should come in place of the question mark (?) in the given series?

1 2 4 8 10 20 22 ?

(a) 44
(b) 42
(c) 26
(d) 24

Q95. Shreyas starts from Point A and drives 9 km towards the north. He then takes a left turn and drives 6 km, then turns left and drives 13 km. He then takes a left turn and drives 12 km. He takes a final left turn, drives 4 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 6 km to the west
(b) 5 km to the east
(c) 5 km to the west
(d) 6 km to the east

Q96. NWLF is related to RZHC in a certain way based on the English alphabetical order. In the same way, VCDZ is related to ZFZW. To which of the following is DIVT related, following the same logic?

(a) HMSP
(b) GKSP
(c) IMRP
(d) HLRQ

Q97. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

7 − 4 + 15 ÷ 52 × 13 = ?

(a) 12

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(b) 23
(c) 28
(d) 17

Q98. In the following number-pairs, the second number is obtained by applying certain mathematical operation(s) to the first number. Select the number-pair in which the numbers are related in the same way as are the numbers of the following pairs. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

61, 127

52, 109

(a) 47, 325
(b) 83, 171
(c) 93, 196
(d) 63, 112

Q99. Anil starts from Point A and drives 7 km towards the south. He then takes a right turn, drives 5 km, turns right and drives 2 km. He then takes a right turn and drives 9 km. He takes a final left turn, drives 5 km and stops at Point F. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 4 km towards the west
(b) 3 km towards the east
(c) 3 km towards the west
(d) 4 km towards the east

Q100. GWSK is related to CTOH in a certain way based on the English alphabetical order. In the same way, YQKE is related to UNGB. To which of the given options is QKCY related, following the same logic?

(a) LGYW
(b) OHZV
(c) NGXU
(d) MHYV

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Right-click → New → Folder

The correct answer is Right-click → New → Folder.

Key Points

• Right-click on the desktop: This action opens a context menu on the Windows desktop. It is the first step in creating a new folder

and provides access to various options, including "New" for creating items.

• Hover over "New": In the context menu, hovering over the "New" option displays a sub-menu with several options, including "Folder." This is a critical step to initiate the folder creation process.

• Select "Folder": Clicking on the "Folder" option in the sub-menu creates a new folder on the desktop. The folder is created instantly, ready to be renamed. Hence, this is the correct way to create a folder on the desktop.

• Why other options are incorrect:

• Option 1 (Go to Task Manager): Task Manager is used for managing system processes, monitoring performance, and ending tasks. It has no functionality for creating folders. This option is incorrect.

• Option 2 (Open Notepad): Notepad is a text editor used for writing and editing text files. It does not provide any option for creating folders. This option is incorrect.

• Option 3 (Press Ctrl + Alt + Del): This shortcut opens a security options screen with options like Lock, Sign out, Task Manager, etc. It does not allow folder creation. This option is incorrect.

Additional Information

• Steps to Rename a Folder:

• Right-click on the newly created folder.

• Choose the "Rename" option from the context menu.

• Type the desired name and press Enter to save the changes.

• Alternative Methods to Create a New Folder:

• Use the Ctrl + Shift + N keyboard shortcut to create a new folder instantly.

• Navigate to File Explorer, right-click in an open area, and follow the same steps (Right-click → New → Folder).

• Folder Features and Functions:

• Folders are used to organize files and data on the computer system.

• They can be customized with names, icons, and security settings to suit user preferences.

• Folders can contain subfolders, allowing for hierarchical organization of information.

Important Points

• Keyboard Shortcuts:

• Ctrl + Shift + N: Creates a new folder in the current directory.

• F2: Shortcut to rename a selected folder or file.

• Best Practices for Folder Organization:

• Use descriptive names for folders to easily identify their contents.

• Create subfolders for better categorization and easy navigation.

• Regularly review and delete unnecessary folders to keep the system organized.

Q2. Answer: (c) 0.001

The correct answer is 0.1%.

Key Points

• During the colonial period, the manufacturing sector contributed only 0.1% to India's overall economy. This reflects the limited development of industries and the colonial focus on exploiting raw materials rather than promoting industrialization.

• The manufacturing sector was neglected as the British government emphasized agriculture and the extraction of raw materials like cotton, jute, and minerals to export them to Britain for processing. Hence, statement is correct.

• Industrialization during the colonial period was restricted to a few sectors, such as textiles and jute, but these were primarily focused on meeting British needs rather than strengthening India's economy. Hence, statement is correct.

• The limited contribution of the manufacturing sector (0.1%) highlights the exploitation of India's resources and labor by the British and their failure to establish a robust industrial base in India. Hence, statement is correct.

• Hence, the correct answer is 0.1%.

Additional Information

• Colonial Economic Policies:

• The British implemented policies that focused on exploitation of India's resources. Raw materials were exported to Britain, and finished goods were imported back into India.

• India was reduced to a supplier of raw materials and a market for British goods, hindering the growth of domestic industries.

• Impact on Manufacturing Sector:

• The manufacturing sector in India was limited to basic industries like textiles, jute, and iron. However, these industries were not developed to their full potential.

• Most of the industrial production focused on exporting goods to Britain, leaving India's economy stagnant and dependent on

agriculture.

• Industrial Growth Post-Independence:

• Post-independence, India focused on industrialization to recover from the stagnation caused by colonial policies.

• The Five-Year Plans introduced after independence emphasized the development of industries like steel, machinery, and textiles.

Important Points

• Colonial Legacy:

• The British economic policies led to the deindustrialization of India. Traditional industries like handloom and handicrafts suffered due to competition with British manufactured goods.

• The lack of investment in infrastructure, technology, and skill development further hampered the growth of the manufacturing sector.

• Post-Colonial Efforts:

• Post-independence, India took measures to boost industrialization, including establishing public sector enterprises and encouraging private sector participation.

• Schemes like the Industrial Policy Resolution of 1956 laid the foundation for economic growth.

Q3. Answer: (a) Third Schedule

The correct answer is Third Schedule.

Key Points

• The Third Schedule of the Citizenship Act, 1955 outlines the qualifications for naturalisation. Naturalisation is one of the ways to acquire Indian citizenship.

• To be eligible for naturalisation, an individual must meet specific criteria, such as a minimum period of residence in India, proficiency in an Indian language, and good character.

• An applicant must have resided in India for a total of 12 years (11 years continuously and at least 1 year immediately before applying). Hence, the qualifications for naturalisation are specifically listed under the Third Schedule.

• The First Schedule of the Citizenship Act, 1955, deals with countries to which citizenship by descent applies. Hence, this is not related to naturalisation.

• The Second Schedule addresses oaths of allegiance, a requirement during the process of acquiring citizenship but not the qualifications for naturalisation. Therefore, this is also incorrect.

• The Tenth Schedule of the Indian Constitution is unrelated to the Citizenship Act, 1955. It deals with the anti-defection law concerning political parties. Hence, this is irrelevant to the qualifications for naturalisation.

• Hence, the correct answer is Third Schedule.

Additional Information

• Citizenship Act, 1955:

• The Citizenship Act, 1955, provides the framework for acquiring, determining, and terminating Indian citizenship. It is divided into multiple sections and schedules for clarity.

• It prescribes five ways of acquiring citizenship: by birth, descent, registration, naturalisation, and incorporation of territory. Naturalisation is elaborated under the Third Schedule.

• Naturalisation Process:

• Naturalisation allows a foreign national to become an Indian citizen after fulfilling specific criteria set in the Third Schedule.

• The applicant must renounce any other citizenship held and swear allegiance to the Indian Constitution.

• Example: Individuals who have contributed to India's development or have special achievements in science, art, literature, or humanitarian work may also be granted citizenship through naturalisation.

• Features of the Third Schedule:

• It outlines the residence requirement (12 years), knowledge of Indian languages, and other aspects like maintaining good character.

• It provides the criteria for the government to assess whether an individual is eligible for citizenship by naturalisation.

Important Points

• Key Legal Considerations:

• Individuals applying for naturalisation under the Third Schedule must not only fulfill the residence requirement but also demonstrate their commitment to Indian society and its values.

• The process includes submitting an application to the Ministry of Home Affairs and undergoing verification procedures.

• Notable Instances:

• In some cases, the government may waive certain criteria under the Third Schedule for individuals who have significantly contributed to India's development.

• The Citizenship Act was amended multiple times, including in 2019, to add provisions for granting citizenship to specific persecuted communities from neighboring countries.

Q4. Answer: (b) 31 May 2025

The correct answer is 31 May 2025.

Key Points

• Operation Shield was conducted on Sat May 31, 2025, across India's border states and union territories. This operation aimed to enhance security measures along the border and ensure the safety of citizens.

• The operation focused on tackling cross-border threats, including illegal smuggling, human trafficking, infiltration, and terrorism. It was conducted in collaboration with various security forces, intelligence agencies, and state governments.

• The date, Sat May 31 2025, signifies the day when the operation reached its peak execution phase, involving coordinated efforts across multiple states and union territories. Hence, the correct answer is Sat May 31 2025.

• Other options provided in the question, such as 7 May 2025, 29 May 2025, and Tue Jun 03 2025, may refer to preparatory phases or follow-up activities related to the operation, but they are not the date for the main execution of Operation Shield.

• This operation emphasized the importance of maintaining security in areas adjacent to international borders, particularly in regions prone to infiltration and other illegal activities. It ensured enhanced vigilance and coordination among security forces. Hence, the correct answer is Sat May 31 2025.

Additional Information

• Operation Shield Overview:

• Operation Shield was a large-scale security initiative undertaken by the government to address cross-border threats in sensitive regions of India.

• The operation involved deploying border security forces, intelligence units, and technological resources to monitor border activities and prevent unauthorized entry or illegal activities.

• Significance of Border Security Operations:

• Border security operations like Operation Shield are crucial for ensuring national security and preventing threats such as smuggling, infiltration, and terrorism.

• These operations often involve close cooperation between various agencies, including the Border Security Force (BSF), Intelligence Bureau (IB), and state police forces.

• Example: Similar operations have been conducted in the past, including Operation Sard Hawa by the BSF to enhance vigilance during extreme weather conditions.

• Role of Security Forces:

• Security forces play a vital role in maintaining the integrity of India's borders by preventing illegal activities and ensuring the safety of citizens.

• Operations like Shield often involve deploying advanced technologies such as drones, surveillance cameras, and sensor systems for effective border monitoring.

• Example: The use of drones and AI-powered surveillance was reported during Operation Shield to enhance situational awareness.

Important Points

• Preparation and Coordination:

• Before the main execution of Operation Shield, extensive coordination was carried out between state and central agencies to ensure seamless implementation.

• Preparatory activities likely included intelligence gathering, resource allocation, and training of personnel involved in the operation.

• Impact of Operation Shield:

• The operation significantly enhanced border security and reduced instances of illegal activities, contributing to the overall safety and stability of border regions.

• It showcased the importance of coordinated efforts between various security agencies for addressing complex challenges in border areas.

• Sat May 31 2025 marked the culmination of these efforts, demonstrating the government's commitment to national security.

Q5. Answer: (a) Bhubaneswar

The correct answer is Bhubaneswar.

Key Points

• Pravasi Bharatiya Divas (PBD): The Pravasi Bharatiya Divas (PBD) is an important event organized by the Ministry of External Affairs, Government of India. It aims to strengthen the engagement of the Indian diaspora with India and celebrate their contributions to India's development.

• The PBD Convention is organized every two years in different cities across India. It serves as a platform for the Indian diaspora to connect and discuss various issues related to their role in India's growth.

• The 18th edition of PBD is scheduled to be held in 2025. It has been announced that Bhubaneswar, Odisha, will host this prestigious event. Hence, the correct option is Bhubaneswar.

• Bhubaneswar: The city is known for its rich cultural and historical heritage. It is also emerging as a hub for conferences and events in India. Hosting the PBD in Bhubaneswar will provide an opportunity to showcase Odisha's art, culture, and progress to the world.

• The decision to host the event in Bhubaneswar reflects the government's intent to promote regional cities and integrate them into global diplomatic and cultural platforms. Hence, the choice of Bhubaneswar is significant.

Additional Information

• Pravasi Bharatiya Divas (PBD) Overview:

• The PBD was first celebrated in 2003. The event commemorates the return of Mahatma Gandhi from South Africa to India on 9th January 1915.

• The event is organized to recognize the contributions of the Indian diaspora and promote stronger ties between India and its global community of expatriates.

• Bhubaneswar as a Host City:

• Bhubaneswar is the capital of Odisha and is known as the "Temple City". It is home to several ancient temples and monuments, making it a significant cultural destination.

• The city has emerged as a center for business conferences, tourism, and cultural events. It also boasts a robust infrastructure to host large international gatherings.

• Significance of Pravasi Bharatiya Divas:

• The event helps to foster connections between India and its diaspora, enabling the exchange of ideas, culture, and economic opportunities.

• PBD conventions bring together prominent members of the Indian diaspora, including business leaders, academicians, and policymakers, to discuss global and national issues.

• The event also recognizes individuals and organizations for their exceptional contributions to society through the Pravasi Bharatiya Samman Awards.

Important Points

• Role of Indian Diaspora:

• The Indian diaspora is one of the largest in the world, with over 32 million people of Indian origin residing abroad. They play a significant role in contributing to India’s economy through remittances and investments.

• The diaspora also serves as a cultural ambassador of India, promoting Indian traditions and values globally.

• Recent PBD Events:

• The 17th PBD was held in Indore, Madhya Pradesh, in 2023. The theme was "Diaspora: Reliable Partners for India's Progress in Amrit Kaal".

• Each edition of the PBD focuses on themes relevant to India's growth and its engagement with the global diaspora.

Q6. Answer: (b) The entire Council of Ministers must resign.

The correct answer is The entire Council of Ministers must resign..

Key Points

• Principle of Collective Responsibility: According to Article 75(3) of the Constitution of India, the Council of Ministers is collectively responsible to the Lok Sabha. This means that if a no-confidence motion is passed against even a single Union Minister, it is considered as a loss of confidence in the entire Council of Ministers.

• In such cases, the entire Council of Ministers, including the Prime Minister, must resign as they function as a collective entity. This ensures accountability to the elected representatives of the people and upholds the democratic framework of the parliamentary system.

• The Council of Ministers works as a team, and the principle of collective responsibility ensures that the government acts in a unified manner. Hence, the resignation of the entire Council of Ministers is mandatory in case of a successful no-confidence motion. Thus, this statement is correct.

• The Lok Sabha is immediately dissolved: This statement is incorrect. The dissolution of the Lok Sabha is not an automatic consequence of a no-confidence motion. Instead, it depends on the President's discretion, who may decide to dissolve the Lok Sabha if no alternative government can be formed.

• Only the targeted minister must resign: This statement is incorrect. As per the principle of collective responsibility, the resignation of an individual minister does not suffice. The entire Council of Ministers must step down.

• The President dismisses only the targeted minister: This statement is incorrect. The President does not have the authority to dismiss only the targeted minister in the case of a no-confidence motion. The resignation of the entire Council of Ministers is

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mandatory.

• Hence, the correct answer is The entire Council of Ministers must resign.

Additional Information

• No-Confidence Motion:

• A No-Confidence Motion is a parliamentary procedure through which the Lok Sabha members express their lack of trust in the Council of Ministers. If it is passed, the government must resign.

• Under Article 75(3), the government can only remain in power as long as it enjoys the confidence of the majority in the Lok Sabha.

• Key Example: In 1979, the government led by Morarji Desai resigned after losing a no-confidence motion in the Lok Sabha.

• Collective Responsibility in India:

• The concept of collective responsibility is a cornerstone of India's parliamentary system. It ensures that the Council of Ministers works as a team and is collectively accountable to the legislature.

• If the Lok Sabha passes a no-confidence motion, it signifies that the House no longer supports the government. In such a scenario, the entire Council of Ministers, including the Prime Minister, must resign.

• Role of the President:

• The President of India plays a crucial role in the aftermath of a no-confidence motion. If the government loses its majority, the President may invite the leader of the majority party or coalition to form a new government.

• If no alternative government can be formed, the President may dissolve the Lok Sabha and call for fresh elections.

Important Points

• Key Provisions of Article 75:

• Article 75(3): The Council of Ministers is collectively responsible to the Lok Sabha.

• Prime Minister: The Prime Minister acts as the head of the Council of Ministers and provides leadership to the government.

• Historical Examples:

• 1979: The Morarji Desai government resigned after losing a no-confidence motion in the Lok Sabha.

• 1999: The Atal Bihari Vajpayee government fell after losing a no-confidence motion by just 1 vote.

Q7. Answer: (a) XPoSat

The correct answer is XPoSat.

Key Points

• XPoSat is an acronym for the X-ray Polarimeter Satellite, launched by the Indian Space Research Organisation (ISRO) in January 2024.

• The mission is aimed at studying the polarisation of cosmic X-rays. Polarisation refers to the orientation of the electromagnetic waves, and understanding this helps to decipher celestial phenomena.

• XPoSat is India’s first dedicated polarimetry mission, designed to provide insights into high-energy astrophysical phenomena such as black holes, neutron stars, and pulsars. Hence, XPoSat is the correct answer.

• The satellite is equipped with the Polarimeter instrument to measure the degree and angle of polarisation of X-rays from various celestial sources.

• It aims to explore the role of magnetic fields and their interaction with high-energy particles in the universe. This makes it a unique mission for space exploration.

• The mission will contribute to the global database for astrophysics and enhance India’s capability in space science.

Additional Information

• About XPoSat:

• XPoSat will carry two scientific payloads: the primary Polarimeter and a secondary payload for monitoring particle flux.

• The Polarimeter will measure the polarisation of X-rays in a specific energy range to study celestial objects, while the secondary payload will observe the particle environment around Earth.

• Significance of XPoSat:

• It will help investigate extreme physical environments such as regions near black holes and neutron stars.

• The data collected will enhance our understanding of high-energy processes, magnetic fields, and particle acceleration mechanisms.

• Comparison with Other Missions:

• Aditya-L1: Another ISRO mission, launched earlier, studies the Sun's corona, solar radiation, and solar wind.

• RISAT-1: A radar imaging satellite focused on Earth observation for agricultural and disaster management applications.

• AstroSat: India’s first multi-wavelength space observatory, launched in 2015, which observes celestial sources in X-ray, UV, and optical wavelengths.

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Important Points

• Why Polarisation is Important:

• Polarisation measurements can reveal hidden details about the structure, environment, and emission mechanisms of celestial objects.

• It helps astrophysicists understand the behavior of light and radiation in high-energy environments.

• Future Prospects:

• The success of XPoSat could pave the way for more advanced missions focused on polarimetry.

• It will strengthen India's position in space science and provide valuable contributions to international collaborations in astrophysics.

Q8. Answer: (a) reactants

The correct answer is reactants.

Key Points

• Reactants are the substances that are present at the beginning of a chemical reaction. These are the starting materials that undergo a chemical change.

• In a chemical equation, reactants are usually written on the left-hand side of the arrow (→), indicating their transformation during the reaction.

• Reactants undergo chemical changes to form products, which are the substances that are produced as a result of the reaction. Hence, the statement is correct.

• For example, in the reaction $2H_2 + O_2 \rightarrow 2H_2O$, the reactants are hydrogen (H_2) and oxygen (O_2), and the product is water (H_2O).

• Reactants are crucial in understanding the nature of a chemical reaction and predicting the products formed. Hence, the correct answer is reactants.

Additional Information

• Reactants:

• Reactants are the initial substances in a chemical reaction that undergo transformation to produce new substances, called products.

• They are used to determine the stoichiometric relationships in a reaction, which helps in calculating the amount of products formed.

• Reactants may exist in any state of matter: solid, liquid, gas, or aqueous.

• Other Components of a Chemical Reaction:

• Products: These are the substances formed as a result of the reaction. They are written on the right-hand side of the chemical equation.

• Intermediates: These are temporary substances formed in the middle steps of a reaction, which further react to form the final products.

• Catalysts: These are substances that increase the rate of a chemical reaction without being consumed in the process. They lower the activation energy required for the reaction.

Important Points

• Characteristics of Reactants:

• Reactants are consumed during the chemical reaction and are not present in the final products.

• The nature and amount of reactants directly affect the rate of the reaction and the quantity of products formed.

• Examples of Reactants:

• Combustion reaction: In the reaction $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$, the reactants are methane (CH_4) and oxygen (O_2).

• Photosynthesis: The reactants are carbon dioxide (CO_2) and water (H_2O), which, in the presence of sunlight, form glucose ($C_6H_{12}O_6$) and oxygen (O_2).

Q9. Answer: (c) It directs and coordinates the activities of all components of the computer.

The correct answer is It directs and coordinates the activities of all components of the computer..

Key Points

• Role of the Control Unit (CU): The Control Unit is a critical component of the Central Processing Unit (CPU). It acts as the manager of the CPU, directing and coordinating all activities within the computer system.

• The Control Unit functions like a supervisor, ensuring that the various parts of the CPU work in harmony. It interprets instructions and sends control signals to other units of the computer system to execute operations. Hence, the correct answer is that it directs and coordinates the activities of all components of the computer.

• It does not perform calculations or store data but facilitates their execution by ensuring that instructions and data are processed

in the correct sequence. This eliminates options 2 and 4.

• Additionally, the CU is responsible for fetching instructions from the memory, decoding them, and ensuring their execution through proper communication with the Arithmetic Logic Unit (ALU), registers, and memory. This eliminates option 1 as well because displaying processed output is not the CU's role.

• The Control Unit works with other components like the ALU and memory to ensure smooth functioning of the computer system. This makes it the central coordinating unit within the CPU.

Additional Information

• Functions of the Control Unit:

• The Control Unit is responsible for managing the flow of data between the CPU and other parts of the computer system. It ensures that instructions are fetched, decoded, and executed in the correct order.

• It generates control signals that coordinate the operations of the CPU, memory, and input/output devices.

• It also oversees the timing and control of all operations, ensuring that tasks are completed in the correct sequence.

• Comparison with other CPU components:

• Arithmetic Logic Unit (ALU): The ALU performs all mathematical and logical operations, such as addition, subtraction, and comparisons. This function is distinct from the CU, which coordinates operations.

• Memory Unit: This stores data and instructions temporarily during processing. The CU interacts with the memory unit to retrieve instructions and data.

• Types of Control Units:

• Hardwired Control Unit: This type of CU uses fixed logic circuits to control and execute instructions. It is faster but less flexible.

• Microprogrammed Control Unit: This CU uses a set of instructions or microprograms to generate control signals. It is more flexible and easier to modify than a hardwired CU.

Important Points

• Key Characteristics of the Control Unit:

• The Control Unit is often referred to as the brain of the CPU because it manages and directs the execution of instructions.

• It works in conjunction with the ALU and memory to ensure the accurate processing of instructions and data.

• The CU plays a central role in ensuring that the CPU operates efficiently and that all components work together seamlessly.

• Example of CU Functionality:

• When an instruction is fetched from memory, the CU decodes it and sends signals to the ALU or other components to execute it.

• For example, in a simple addition operation, the CU will fetch the addition instruction, decode it, and instruct the ALU to perform the addition.

Q10. Answer: (c) Asian Fisheries Society Indian Branch (AFSIB)

The correct answer is Asian Fisheries Society Indian Branch (AFSIB).

Key Points

• 14th Asian Fisheries and Aquaculture Forum (14AFAF): This forum is a significant international event focusing on fisheries and aquaculture, bringing experts, researchers, and policymakers together to discuss advancements, challenges, and sustainable practices in the sector.

• Organizing Bodies: The forum held in February 2025 at Pusa Campus, New Delhi, was co-organized by various organizations, with the Asian Fisheries Society Indian Branch (AFSIB) being one of the key contributors. Hence, the correct answer is Asian Fisheries Society Indian Branch (AFSIB).

• Other organizations mentioned in the options, such as the United Nations Environment Programme (UNEP), Food and Agriculture Organization (FAO), and World Health Organization (WHO), are globally recognized bodies involved in environmental and health-related initiatives. However, they were not directly listed as co-organizers of this particular event. Hence, options 1, 2, and 4 are incorrect.

• AFSIB: The Asian Fisheries Society Indian Branch is an active body that promotes research, technology, and sustainable practices in fisheries and aquaculture in India. Its involvement in this forum highlights its dedication to enhancing the sector at both national and regional levels.

Additional Information

• Asian Fisheries Society Indian Branch (AFSIB):

• Location: AFSIB operates within India, aiming to promote the growth and development of fisheries and aquaculture in the country.

• Functions: The branch organizes conferences, workshops, and forums to facilitate knowledge sharing and collaboration among industry stakeholders, researchers, and policymakers.

• Significance: AFSIB plays a vital role in addressing challenges such as sustainable aquaculture practices, climate change impacts, and food security through collaboration and innovation.

• 14th Asian Fisheries and Aquaculture Forum:

• Date and Location: Held from 12 to 15 February 2025 at Pusa Campus, New Delhi, it was a platform for discussing emerging trends and challenges in fisheries and aquaculture.

• Theme: Focused on sustainable development and innovative solutions to ensure food security and environmental conservation in the fisheries sector.

• Participants: The event saw participation from international organizations, experts, and policymakers, showcasing advancements in technology, policies, and practices.

• Other Organizations:

• United Nations Environment Programme (UNEP): An international body focusing on environmental issues, including climate change and biodiversity conservation. Although relevant to fisheries indirectly, UNEP was not a co-organizer of this event.

• Food and Agriculture Organization (FAO): A specialized UN agency that addresses food security and agriculture, including fisheries. FAO supports sustainable aquaculture practices but was not directly involved as a co-organizer in the 14AFAF.

• World Health Organization (WHO): Focuses primarily on global health-related issues and policies. While its work impacts fisheries indirectly through food safety and nutrition, it was not a co-organizer of this forum.

Important Points

• Significance of Fisheries and Aquaculture Forums:

• These forums play a crucial role in addressing issues like sustainable aquaculture, environmental conservation, food security, and economic development.

• They encourage collaboration among stakeholders, including researchers, governments, and private organizations.

• Forums like the 14AFAF contribute to the formulation of policies and strategies for sustainable fisheries management.

• India's Role:

• India is one of the largest producers of fish and aquaculture products globally, making platforms like 14AFAF highly significant for its economy and food security.

• Organizations like AFSIB play a key role in advancing research, technology, and practices to boost the sector's growth.

Q11. Answer: (c) Terracotta

The correct answer is Terracotta.

Key Points

• The "Mother Goddess" sculpture is one of the most iconic artifacts from the Indus Valley Civilisation, which flourished from approximately 3300 BCE to 1300 BCE.

• The sculpture is primarily made of Terracotta, a type of earthenware composed of baked clay. Hence, Terracotta is the correct option.

• Terracotta was widely used during the Indus Valley Civilisation due to its easy availability, affordability, and malleability, making it suitable for sculpting and creating various items.

• The "Mother Goddess" figures are believed to represent fertility and motherhood, and their creation in Terracotta reflects the cultural and religious values of the civilisation. These sculptures were likely used in religious rituals or as offerings. Hence, the material choice aligns with its symbolic significance.

• The use of Terracotta also highlights the technological advancements of the Indus Valley people, as they demonstrated skill in firing clay at high temperatures to create durable objects.

• Bronze, limestone, and steatite were other materials used during the Indus Valley Civilisation for various purposes, but they were not primarily used for the "Mother Goddess" sculpture. Hence, these options are incorrect.

Additional Information

• Terracotta in Indus Valley Civilisation:

• Terracotta was a widely used material for crafting household items, toys, seals, and religious artifacts in the Indus Valley Civilisation.

• The process involved shaping clay into desired forms and firing it in kilns to harden it. This technique demonstrated the technical expertise of the civilisation's artisans.

• The use of Terracotta was also environmentally sustainable, as it relied on natural resources like clay and water, both of which were abundantly available in the region.

• Features of the "Mother Goddess" Sculpture:

• The "Mother Goddess" figurines often feature exaggerated physical characteristics, such as large breasts and wide hips, symbolizing fertility and abundance.

• These sculptures were often adorned with intricate designs and patterns, which reflected the aesthetic sensibilities of the Indus Valley artisans.

• They were likely used in domestic or communal rituals, signifying their importance in the socio-religious practices of the civilisation.

• Other Materials in Indus Valley Civilisation:

• Bronze: Used primarily for creating tools, weapons, and sculptures, but not for the "Mother Goddess" figures.

• Limestone: This material was utilized for creating architectural structures and occasionally for carving statues. However, it was not the primary material for the "Mother Goddess" sculpture.

• Steatite: A soft stone commonly used for making seals and small ornaments in the Indus Valley, but not for larger figurines or sculptures.

Important Points

• Significance of the "Mother Goddess" Sculpture:

• The figurines represent the religious beliefs and cultural practices of the Indus Valley Civilisation.

• They provide insights into the artistic capabilities and symbolic expressions of the civilisation.

• Key Characteristics of Terracotta:

• Terracotta is durable, easy to mold, and readily available, making it an ideal material for creating sculptures and everyday items.

• Its use in the Indus Valley reflects the region's technological innovation and resource management.

Q12. Answer: (d) 4 to 15 May 2025

The correct answer is 4 to 15 May 2025.

Key Points

• The Khelo India Youth Games (KIYG) is one of India’s flagship sports events aimed at promoting grassroots-level sports and identifying young talent across the country.

• The Khelo India Youth Games 2025 were organized from 4 to 15 May 2025 at various locations in Bihar. This is the correct answer.

• The event aims to provide a platform for young athletes to showcase their talent and encourages participation in sports from diverse regions of India.

• Bihar was chosen as the host state for the games in 2025 to promote sports culture and infrastructure development in the region.

• The games included participation from athletes across different states and union territories, competing in multiple sporting disciplines.

• The Khelo India scheme has been instrumental in nurturing young athletes, supporting them through scholarships, and providing access to high-quality training facilities.

• Several venues across Bihar, such as Patna, Gaya, and Bhagalpur, were utilized for different sports during the games.

• The games also focused on building awareness about sports and fitness among the youth, aligning with the Khelo India initiative’s goals of creating a fitter nation.

Additional Information

• Khelo India Program:

• The Khelo India Program was launched by the Government of India in 2018 to improve sports infrastructure and encourage sports participation at grassroots levels.

• It includes initiatives like organizing events, scholarships for promising athletes, and infrastructure development in rural and urban areas.

• Under this program, young athletes are identified and supported through financial aid and professional coaching.

• Importance of Bihar as Host State:

• Bihar is increasingly focusing on promoting sports and fitness among its youth, with efforts to improve sports facilities and infrastructure.

• Hosting the Khelo India Youth Games provides an opportunity to showcase the state’s cultural and social diversity while boosting its sports ecosystem.

• Impact of Khelo India Youth Games:

• The games help identify young talent who can represent India in international competitions like the Olympics, Commonwealth Games, and Asian Games.

• It also promotes a culture of sports and fitness as part of the Fit India Movement initiated by the Government of India.

• The games create opportunities for athletes from remote areas to compete on a national stage.

Important Points

• Sports Infrastructure Development:

• The games encourage states to invest in sports facilities, thereby boosting overall infrastructure development.

• Bihar’s hosting of the Khelo India Youth Games 2025 indicates its commitment to improving sports facilities and providing opportunities for young athletes.

• Significance of the Dates:

• The games were held over a span of 12 days, from 4 to 15 May 2025, ensuring a well-organized schedule for competitions.

• The choice of May as the month for the games aligns with favorable weather conditions and the availability of venues.

Q13. Answer: (c) 30 days

The correct answer is 30 days.

Key Points

• Section 19 of the Right to Information (RTI) Act, 2005 provides the provision for filing the first appeal if an applicant is dissatisfied with the decision of the Public Information Officer (PIO) or does not receive a response from the PIO within the stipulated time.

• The RTI Act mandates that the first appeal must be filed within 30 days from the date on which the applicant either receives the decision of the PIO or the expiry of the time limit for the response.

• This appeal is to be filed before the First Appellate Authority (FAA), who is an officer senior in rank to the PIO. The FAA is required to address the appeal within 30 days, which can be extended up to 45 days with valid reasons. Hence, the correct answer is 30 days.

• If an applicant fails to file the appeal within 30 days due to sufficient cause, the delay can be condoned by the FAA at their discretion.

• The purpose of limiting the appeal timeline to 30 days is to ensure timely redressal of grievances and to maintain efficiency in the information disclosure process.

Additional Information

• Right to Information Act, 2005:

• The RTI Act was enacted to promote transparency and accountability in the working of public authorities. It provides every citizen the right to access information held by public authorities, subject to certain exceptions.

• Section 6 allows individuals to file an RTI application to obtain information, while Section 7 mandates the PIO to respond within 30 days (48 hours in the case of life and liberty).

• Appeal Mechanism in RTI:

• If the applicant is dissatisfied with the PIO's response or does not receive a reply within the stipulated time, they can file a first appeal with the First Appellate Authority (FAA).

• If the applicant is still not satisfied with the decision of the FAA, they can file a second appeal with the Central or State Information Commission within 90 days of the FAA's decision.

• Important Timelines under RTI:

• PIO must respond to an RTI application within 30 days of receipt, or within 48 hours if the information concerns the life or liberty of a person.

• First appeal to FAA must be filed within 30 days of receiving the PIO's response or the expiry of the response time.

• Second appeal to the Information Commission must be filed within 90 days of the FAA's decision.

Important Points

• Key Features of RTI Act:

• Public Authorities: All government departments, public sector undertakings, and bodies substantially funded by the government are covered under the RTI Act.

• Exemptions: Certain information is exempted from disclosure under Sections 8 and 9 of the RTI Act, such as information affecting sovereignty, national security, or confidential third-party information.

• Significance of RTI:

• The RTI Act empowers citizens to hold the government accountable, thereby strengthening democracy.

• It ensures transparency in governance and reduces corruption by enabling access to information.

Q14. Answer: (d) Fourth

The correct answer is Fourth.

Key Points

• Regional Rural Banks (RRBs): RRBs were established under the provisions of the Regional Rural Banks Act, 1976 to provide banking services to rural areas, with a focus on weaker sections like small farmers, artisans, and agricultural laborers.

• Since their inception, RRBs have undergone consolidation to improve their operational efficiency and financial health.

• The Department of Financial Services (DFS) has initiated multiple phases of amalgamation for RRBs under the principle of "One State One RRB." This ensures that there is one consolidated RRB in each state for better management and service delivery.

• The amalgamation process is being carried out in phases, with the fourth phase set to take place in 2025, which involves the consolidation of 26 RRBs.

• The goal of the fourth phase of amalgamation is to streamline the operations of RRBs, reduce redundancy, and enhance the quality of services in rural areas.

• Principle of "One State One RRB": This principle aligns with the government's vision of creating larger, more robust entities that can cater to the specific needs of rural areas while ensuring financial inclusivity.

• The amalgamation process considers factors like geographical proximity, business potential, and operational efficiency of the RRBs. Hence, the correct answer is Fourth.

Additional Information

• About Regional Rural Banks (RRBs):

• RRBs were established under the Regional Rural Banks Act, 1976 with the objective of providing credit and other financial services to the rural population.

• These banks are jointly owned by the Central Government, State Government, and the respective Sponsor Bank, with a shareholding ratio of 50:15:35 respectively.

• Phases of Amalgamation:

• The amalgamation of RRBs began in 2005 to improve their financial viability and reduce operational duplication.

• The first three phases of amalgamation were successfully implemented, leading to a significant reduction in the number of RRBs in India.

• In the fourth phase, 26 RRBs are set to be amalgamated in 2025, following the "One State One RRB" principle.

• Benefits of Amalgamation:

• Enhanced operational efficiency and improved financial health of RRBs.

• Reduction in administrative expenses and duplication of efforts.

• Better customer service and wider reach in rural areas.

Important Points

• Key Features of RRBs:

• RRBs cater to the financial needs of the rural population, particularly weaker sections like small and marginal farmers, artisans, and rural entrepreneurs.

• They offer various financial products, including savings accounts, fixed deposits, loans, and credit facilities for agricultural and non-agricultural purposes.

• Significance of "One State One RRB":

• This principle ensures better coordination and management of RRBs within a state.

• It helps in reducing redundancy and improving the financial stability of these banks.

Q15. Answer: (b) Zamindari system

The correct answer is Zamindari System.

Key Points

• The Zamindari System was introduced during the British colonial rule in India under the Permanent Settlement of 1793, implemented by Lord Cornwallis.

• Under this system, the British government appointed Zamindars (landlords) as intermediaries to collect revenue from farmers and pay a fixed amount to the government.

• The Zamindars often exploited farmers by charging exorbitant rents and evicting them from their lands if they failed to pay. Hence, the system led to the exploitation of farmers.

• Farmers were reduced to the status of tenants who had no ownership rights over the land they cultivated. This created a cycle of poverty and debt for the farmers.

• The Zamindari system also gave rise to a feudal class that controlled vast tracts of land and wielded immense power, further marginalizing the already impoverished farmers.

• The system was abolished post-independence through land reforms such as the Zamindari Abolition Act, which aimed to redistribute land to the tillers and abolish the feudal landholding system.

Additional Information

• Other Systems of Land Tenure:

• Ryotwari System: Introduced in Madras, Bombay, and Assam by the British. Farmers had direct ownership of land and paid revenue directly to the government. This system was less exploitative compared to Zamindari.

• Mahalwari System: Implemented in parts of northern and central India, this system recognized the collective ownership of land by a village or group of villages. Revenue was collected collectively, often leading to disputes and exploitation by village heads.

• Cooperative Farming: This system promotes collective farming by pooling resources, labor, and land for mutual benefit. It was introduced in independent India to address the challenges of fragmented landholdings.

• Impact of Land Tenure Systems on Farmers:

• The Zamindari System caused widespread poverty and indebtedness among farmers due to high rents and lack of land ownership.

• The Ryotwari System gave some relief to farmers by granting land ownership but often resulted in high revenue demands.

• The Mahalwari System created conflicts within villages and allowed village heads to misuse their power.

• Important Reforms Post-Independence:

• Land reforms initiated by the government abolished the Zamindari system and redistributed land to the tillers.

• The Tenancy Acts were introduced to protect tenant rights and ensure fair rents.

Important Points

• Key Differences Between Systems:

• Zamindari: Farmers were tenants; landlords collected revenue and exploited farmers.

• Ryotwari: Farmers were owners; revenue paid directly to the government.

• Mahalwari: Collective ownership; revenue collected at the village level.

Q16. Answer: (a) 445

The correct answer is 445.

Key Points

• Mansabdari System: During the Mughal Empire, the Mansabdari system was established by Emperor Akbar and continued under later rulers, including Shahjahan. It was a hierarchical administrative and military system where officials, known as Mansabdars, were ranked based on the number of troops they commanded and their salary. Hence, the Mansabdari system played a crucial role in governance and military organization. The statement is correct.

• Out of the total 8000 Mansabdars under Shahjahan's rule, only 445 higher-ranking Mansabdars received a significant portion of the empire's revenue as their salaries. These higher-ranking Mansabdars were responsible for commanding larger troops and performing administrative duties. Hence, the numerical data provided in the question is correct.

• Approximately 61.5% of the total estimated revenue of the empire was allocated to the salaries of these 445 higher-ranking Mansabdars and their troopers. This reflects the significant economic investment in maintaining the administrative and military machinery during Shahjahan's reign. The statement is correct.

• The remaining 7555 Mansabdars were lower-ranking officials who received a smaller portion of the empire's revenue. This highlights the division of ranks and income allocation within the Mansabdari system. The statement is correct.

Additional Information

• Mansabdari System:

• The Mansabdari system was a central feature of the Mughal administrative framework. It classified officials into ranks called "Mansabs," which determined their role, responsibilities, and salary.

• Mansabs were divided into two categories: Zat (personal rank) and Sawar (number of cavalrymen they were required to maintain). Higher ranks were given to officials with greater responsibilities and larger troop commands.

• Shahjahan's Reign:

• Shahjahan, the fifth Mughal Emperor, ruled from 1628 to 1658. His reign is considered the golden age of Mughal architecture and administration.

• The Mansabdari system under Shahjahan was extensively used to maintain a strong administrative and military structure. The higher-ranking Mansabdars played a pivotal role in ensuring stability and governance.

• During his reign, the empire's revenue system was highly developed, with a significant allocation of funds towards maintaining the Mansabdari system.

• Revenue Allocation:

• The allocation of 61.5% of the total revenue to the salaries of higher-ranking Mansabdars highlights the importance of the Mansabdari system in the Mughal administrative framework.

• This large allocation was necessary to sustain the vast empire and ensure the loyalty of the Mansabdars, who were crucial for governance and military operations.

• Such revenue allocation reflects the centralized nature of the Mughal administration and its dependence on the Mansabdari system.

Important Points

• Characteristics of Mansabdari System:

• The Mansabdari system was hierarchical, with ranks ranging from 10 to 10,000. High-ranking Mansabdars commanded large troops and received substantial salaries.

• The system ensured efficient governance and military organization, with Mansabdars being accountable for maintaining troops and performing administrative duties.

• Economic Implications:

• The allocation of a significant portion of the revenue to higher-ranking Mansabdars indicates the importance of the military and administrative machinery in sustaining the Mughal Empire.

• This revenue allocation also highlights the centralized nature of Mughal governance and its dependence on the loyalty and efficiency of Mansabdars.

Q17. Answer: (a) Avon Cycles

The correct answer is Avon Cycles.

Key Points

• Shri Onkar Singh Pahwa, a recipient of the Padma Shri in 2025, is associated with Avon Cycles, one of the leading cycle manufacturers in India.

• Avon Cycles was established in 1951 and has grown to become one of India's largest cycle manufacturers, contributing significantly to the cycling industry. Hence, statement is correct.

• Shri Onkar Singh Pahwa has played an instrumental role in modernizing and expanding Avon Cycles, making it a household name in India. His contributions have been recognized through the prestigious Padma Shri award. Hence, statement is correct.

• Avon Cycles is known for producing a wide range of cycles, including basic models for everyday use, high-end sports cycles, and eco-friendly options. The company has significantly contributed to promoting cycling as a sustainable and healthy mode of transportation in India.

• The Padma Shri award recognizes individuals who have made extraordinary contributions in various fields, including industry and trade, which is why Shri Onkar Singh Pahwa's association with Avon Cycles was deemed worthy of the honor. Hence, statement is correct.

• Hence, the correct answer is Avon Cycles.

Additional Information

• Avon Cycles:

• Established: Avon Cycles was founded in 1951 in Ludhiana, Punjab, India.

• Key Products: Avon Cycles produces a variety of cycles, including standard bicycles, sports bicycles, and electric bicycles. It caters to both domestic and international markets.

• Global Reach: Avon Cycles exports bicycles to over 80 countries, earning recognition as a global brand in the cycle manufacturing industry.

• Eco-Friendly Initiatives: Avon Cycles promotes sustainable transportation through its range of eco-friendly bicycles and electric cycles.

• Recognition: The company has received various awards and accolades for its contribution to the cycling industry, including the leadership and innovation brought by Shri Onkar Singh Pahwa.

• Padma Shri Award:

• Significance: The Padma Shri is India's fourth-highest civilian award, recognizing distinguished contributions in various fields such as arts, education, industry, literature, science, sports, medicine, social service, and public affairs.

• Year of Award: Shri Onkar Singh Pahwa received the Padma Shri in 2025 for his exceptional contributions to the cycle manufacturing industry.

• Criteria: Recipients are selected based on their impact and achievements in their respective fields, showcasing excellence, innovation, and dedication.

Important Points

• Other Cycle Companies in India:

• Hero Cycles: Founded in 1956, Hero Cycles is the world's largest bicycle manufacturer, headquartered in Ludhiana, Punjab.

• Atlas Cycles: Established in 1951, Atlas Cycles is known for producing high-quality bicycles and being an iconic brand in India.

• Tata Stryder: Tata Stryder is a relatively modern brand, offering premium bicycles and promoting sustainable transportation solutions.

• Impact of Cycling Industry:

• Economic Contribution: The cycling industry in India generates employment and contributes significantly to the economy through manufacturing and exports.

• Environmental Benefits: Cycling promotes eco-friendly transportation, reducing carbon emissions and encouraging healthy lifestyles.

Q18. Answer: (a) Tura

The correct answer is Tura.

Key Points

• Tura, located in the state of Meghalaya, India, is known for its extremely high rainfall levels. The region is part of the Garo Hills, which experience heavy monsoons due to their geographical location and proximity to the Bay of Bengal.

• Jaisalmer, situated in Rajasthan, is an arid region and one of the driest places in India. It receives an average annual rainfall of only around 200mm (8 inches), making it a desert area. Therefore, its rainfall for 10 years would be approximately 2000mm.

• Tura, on the other hand, can receive more than 2000mm of rainfall in a single day during intense monsoon events. This is due to its position in the northeastern region of India, which is one of the wettest areas in the world.

• Places like Tura are influenced by the monsoon winds and the orographic effect, where moist air is lifted over mountains, causing heavy precipitation.

• Leh, located in Ladakh, is a cold desert and receives very little rainfall annually, averaging around 100mm to 300mm. Hence, it cannot receive 10 years of Jaisalmer's rainfall in a single day. Therefore, this statement is incorrect.

• Asansol, located in West Bengal, experiences a subtropical climate with moderate rainfall, around 1200mm per year. While it receives significant rainfall, it is not comparable to Tura's heavy downpours. Hence, this statement is incorrect.

• Siliguri, also in West Bengal, is located in the foothills of the Himalayas and receives an annual rainfall of approximately 3000mm. Although it experiences heavy rainfall, a single day's rainfall in Siliguri is unlikely to match 10 years of Jaisalmer's rainfall. Thus, this statement is incorrect.

• Hence, the correct answer is Tura.

Additional Information

• Tura:

• Tura is a hill station in the Garo Hills of Meghalaya, known for its lush greenery and heavy monsoons.

• The region is located in the northeastern part of India, which is influenced by the southwest monsoon winds.

• Areas like Tura and nearby regions such as Cherrapunji and Mawsynram are among the wettest places on Earth. Mawsynram holds the record for the highest annual rainfall in the world, with over 11,000mm recorded in some years.

• Jaisalmer:

• Jaisalmer is located in the Thar Desert of Rajasthan and is characterized by its arid climate.

• The region experiences very low annual rainfall, making it one of the driest places in India. The average annual rainfall in Jaisalmer is 200mm, and some years see even less precipitation.

• Due to the lack of significant rainfall, Jaisalmer faces water scarcity and depends on desert wells and underground water reservoirs.

• Leh:

• Leh, located in the Union Territory of Ladakh, is a cold desert at a high altitude.

• The region receives very little precipitation, with annual rainfall ranging between 100mm and 300mm.

• The primary source of water in Leh is melting snow from glaciers and mountains.

• Asansol:

• Asansol is an industrial city in West Bengal and experiences a tropical climate with distinct wet and dry seasons.

• The average annual rainfall in Asansol is around 1200mm, mostly during the monsoon season.

• Siliguri:

• Siliguri is located at the foothills of the Himalayas in West Bengal and acts as a gateway to the northeastern states of India.

• It experiences significant rainfall due to its location, with an average annual precipitation of approximately 3000mm.

Important Points

• Orographic Rainfall:

• This type of rainfall occurs when moist air is forced to ascend over mountain ranges, causing condensation and heavy rainfall.

• Regions like Tura and Cherrapunji experience orographic rainfall due to the presence of the Khasi and Garo Hills, which intercept the monsoon winds from the Bay of Bengal.

• Southwest Monsoon:

• The southwest monsoon is the primary source of rainfall in India, bringing heavy rains to the northeastern states.

• This monsoon typically occurs between June and September and contributes to the significant rainfall in regions like Tura.

Q19. Answer: (a) Water irrigation pipelines

The correct answer is Water irrigation pipelines.

Key Points

• Urban transport infrastructure refers to the systems and facilities designed to ensure the seamless movement of people and goods within cities. This includes various transport modes such as public buses, metro rail systems, flyovers, expressways, and pathways for non-motorized transport.

• Public bus systems are a vital component of urban transport infrastructure. They offer affordable and accessible transportation, helping reduce traffic congestion and pollution. Hence, this is part of urban transport infrastructure.

• Metro rail networks provide efficient, high-capacity transit solutions for densely populated urban areas. They reduce travel time, enhance connectivity, and minimize environmental impact. Hence, this is part of urban transport infrastructure.

• Flyovers and expressways are critical infrastructure components that facilitate the quick movement of vehicles across urban landscapes, reducing traffic bottlenecks and ensuring smoother commutes. Hence, this is part of urban transport infrastructure.

• Water irrigation pipelines, on the other hand, are not part of urban transport infrastructure. These pipelines are primarily used for agricultural purposes and are designed to supply water to farmlands, not for facilitating transportation in cities. Hence, this is not part of urban transport infrastructure.

• Hence, the correct answer is Water irrigation pipelines.

Additional Information

• Urban Transport Infrastructure:

• Urban transport infrastructure includes elements such as roads, highways, bridges, metro systems, buses, pedestrian pathways, cycle tracks, and parking facilities. These systems ensure mobility and connectivity in cities.

• It plays a crucial role in reducing traffic congestion, improving air quality, and enhancing economic productivity by enabling efficient movement of people and goods.

• Examples of Urban Transport Infrastructure:

• The Delhi Metro in India is a prime example of a successful urban transport network, providing fast and reliable transit across the National Capital Region.

• Expressways like the Mumbai-Pune Expressway facilitate quicker travel between cities and reduce traffic congestion on regular roads.

• Water Irrigation Pipelines:

• Purpose: These pipelines are specifically designed for agricultural purposes, transporting water to irrigate farmlands.

• Functionality: They are part of rural infrastructure and are crucial for agriculture but not applicable to urban transport systems.

• Examples: Systems like drip irrigation pipelines or canal-based irrigation networks are widely used in rural farming areas.

Important Points

• Key Differences Between Urban Transport and Rural Infrastructure:

• Urban transport systems focus on mobility and connectivity within cities, addressing traffic congestion and environmental concerns.

• Rural infrastructure, such as water irrigation pipelines, primarily supports agricultural activities and is designed for water distribution and resource management.

• Role of Government:

• Governments often invest heavily in urban transport infrastructure to ensure efficient movement and economic growth.

• Rural infrastructure projects, such as irrigation pipelines, are funded to promote agricultural productivity and rural development.

Q20. Answer: (d) National Green Tribunal

The correct answer is National Green Tribunal.

Key Points

• The National Green Tribunal (NGT) is a statutory body established under the National Green Tribunal Act, 2010. Its primary objective is to provide a specialized forum for effective and expeditious disposal of cases related to environmental protection and conservation.

• The NGT is empowered to handle cases related to environmental laws such as the Water Act, 1974, Air Act, 1981, Environment Protection Act, 1986, and the Forest Conservation Act, 1980.

• The two-day National Conference on ‘Environment – 2025’ organized at Vigyan Bhawan, New Delhi, highlights the proactive role of NGT in addressing environmental concerns and planning strategies for sustainable development. Hence, the statement is correct.

• The conference aimed to deliberate on critical environmental issues, including climate change, biodiversity conservation, pollution control, and the implementation of environmental laws.

• This conference aligns with the NGT’s mandate to ensure timely justice in environmental matters and contributes to the formulation of policies for achieving environmental targets by 2025. Hence, statement is correct.

• The National Green Tribunal also focuses on creating awareness among the public and stakeholders about environmental challenges and the need for collective action to address them.

• Hence, the correct answer is National Green Tribunal.

Additional Information

• National Green Tribunal (NGT):

• The NGT was established in October 2010 and is headquartered in New Delhi, India. It also has regional benches in Pune, Bhopal, Kolkata, and Chennai.

• The Tribunal has the authority to hear all civil cases relating to environmental issues and natural resource management as covered under various laws.

• Functions of NGT:

• It aims to ensure the right to a healthy environment and uphold sustainable development principles.

• The Tribunal ensures speedy justice and reduces the burden on traditional courts dealing with environmental cases.

• NGT decisions are binding and have led to several landmark judgments on environmental conservation in India.

• Vigyan Bhawan:

• Vigyan Bhawan is a prestigious conference center located in New Delhi, often used for national and international conferences organized by the Government of India.

• It serves as a venue for discussions on crucial topics, including environmental policies, scientific research, and governance.

Important Points

• Key Environmental Laws in India:

• Environment Protection Act, 1986: Provides the framework for protection and improvement of the environment.

• Water Act, 1974: Focuses on preventing and controlling water pollution.

• Air Act, 1981: Aims to control and reduce air pollution in the country.

• NGT Landmark Cases:

• Art of Living Case: NGT imposed a fine on the organizers for environmental damage caused during a cultural event on the Yamuna floodplains.

• Sterlite Plant Case: Ordered the closure of a polluting copper plant in Tamil Nadu.

Q21. Answer: (b) R K Shanmugham Chetty

The correct answer is R K Shanmugham Chetty.

Key Points

• He presented the first budget of Independent India on November 26, 1947. This budget was notable for laying the foundation of India's economic policies and financial planning.

• He played a key role in establishing the economic framework of India during the initial years after independence, which included addressing issues like food shortages, rehabilitation of refugees, and managing inflation.

• Chetty was born in 1892 in Coimbatore, Tamil Nadu. He was a lawyer by profession and later became a successful industrialist.

• Chetty's contribution to shaping India's early economic policies was significant, particularly during a time when the country faced enormous challenges post-independence.

• Other Options:

• John Mathai: He succeeded R K Shanmugham Chetty as the second Finance Minister of India. He presented the Union Budget of 1949-50.

• Rafi Ahmed Kidwai: Kidwai was a prominent freedom fighter and served as the Minister for Communications in Independent India. He was not associated with the Finance Ministry.

• Jairamdas Daulatram: He served as the Governor of Bihar and later became the Governor of Assam. He was not linked to the Finance Ministry.

• India’s First Budget:

• It addressed critical issues like food shortages, rehabilitation of refugees, and the financial integration of princely states.

Important Points

• Key Contributions of R K Shanmugham Chetty:

• He addressed the challenges posed by partition, such as the need to rehabilitate displaced persons and manage fiscal deficits.

• Legacy:

• His policies provided a roadmap for subsequent financial planning in India.

Q22. Answer: (b) France

The correct answer is France.

Key Points

• India and France signed an agreement in April 2025 for the supply of 26 Rafale Marine fighter jets.

• The Rafale Marine is a variant of the Rafale fighter jet that is specially designed for naval operations. It is capable of operating from aircraft carriers.

• This deal is part of India's efforts to modernize its defense forces and enhance its naval air capabilities. Hence, statement mentioning France is correct.

• France has been a key defense partner of India, and the two countries have collaborated on various defense projects, including the earlier acquisition of Rafale fighter jets for the Indian Air Force.

• The Rafale Marine jets are equipped with advanced avionics, weapons systems, and technologies, making them suitable for modern warfare. Hence, the correct answer is France.

Additional Information

• Rafale Fighter Jets:

• The Rafale is a twin-engine, multirole fighter aircraft designed by Dassault Aviation, a French aerospace company.

• It is known for its versatility and can perform various missions, such as air superiority, ground attack, reconnaissance, and nuclear deterrence.

• The Rafale Marine variant is specifically designed for carrier-based operations. It has reinforced landing gear and tail hooks for carrier landings.

• India-France Defense Relations:

• France and India share a long-standing partnership in defense. France has been one of India's most reliable suppliers of defense equipment.

• The Rafale deal for the Indian Air Force, signed in 2016, was a landmark agreement that further strengthened bilateral ties.

• The acquisition of Rafale Marine jets for the Indian Navy demonstrates the continued trust and collaboration between the two countries.

• Strategic Importance of Rafale Marine:

• The Rafale Marine jets will enhance India's naval airpower, making it capable of defending maritime interests and ensuring regional security.

• They are equipped with advanced radar systems, electronic warfare capabilities, and precision-guided weapons, making them suitable for modern naval operations.

• The jets can operate from aircraft carriers like India's INS Vikrant, boosting India's operational readiness.

Important Points

• Features of Rafale Marine:

• It is equipped with a navalized airframe for carrier operations, including reinforced landing gear and folding wings.

• The jet can carry a wide array of weapons, such as MBDA Meteor missiles, SCALP cruise missiles, and Exocet anti-ship missiles.

• It has an advanced cockpit interface, making it highly effective in complex combat scenarios.

• Significance of the Deal:

• The acquisition strengthens India's naval defense capabilities, ensuring the country's preparedness against emerging threats in the Indian Ocean region.

• It reflects India's commitment to modernizing its armed forces and achieving self-reliance in defense through collaborations with trusted partners like France.

Q23. Answer: (c) Jean Bernard Léon Foucault

The correct answer is Jean Bernard Léon Foucault.

Key Points

• Jean Bernard Léon Foucault was a French physicist and inventor who is credited with the first accurate measurement of the speed of light using a rotating mirror apparatus in 1862.

• The experiment involved a beam of light being reflected from a rapidly rotating mirror to a stationary mirror placed at a distance and then back to the rotating mirror. By observing the displacement of the returning beam, Foucault calculated the speed of light with remarkable accuracy.

• This method was an improvement over earlier experiments as it provided direct and precise measurements of the speed of light, which was determined to be approximately 298,000 kilometers per second in his setup.

• His work demonstrated that the speed of light in water is slower than in air, providing experimental support for the wave theory of light, which was a significant scientific advancement at the time.

• Foucault's contributions extended beyond this experiment. He is also known for inventing the Foucault pendulum, which demonstrated Earth's rotation.

Additional Information

• About Jean Bernard Léon Foucault:

• Foucault was born in France in 1819 and was one of the most notable experimental physicists of the 19th century.

• He is renowned for his work on light and motion, including his demonstration of the Earth's rotation through the Foucault pendulum in 1851.

• His rotating mirror apparatus experiment in 1862 was a milestone in the understanding of the speed of light.

• Other notable contributors and their work:

• Albert A. Michelson: Michelson conducted several experiments to measure the speed of light and earned the Nobel Prize in Physics in 1907. However, his work came after Foucault's breakthrough.

• Charles Wheatstone: Wheatstone was primarily known for his contributions to electrical engineering, such as the invention of the Wheatstone bridge, and did not focus on measuring the speed of light.

• Marie Alfred Cornu: Cornu refined the methods to measure the speed of light later in the 19th century, but he built upon the work of Foucault.

• Importance of Measuring the Speed of Light:

• The speed of light is a fundamental constant in physics, central to theories such as Einstein's theory of relativity.

• Foucault's experiment was pivotal in establishing the wave theory of light and discrediting competing theories like Newton's corpuscular theory.

Important Points

• Foucault's Rotating Mirror Apparatus:

• The apparatus was revolutionary as it allowed for direct measurement of the speed of light by analyzing the displacement of a reflected light beam.

• Foucault's work laid the groundwork for future studies in optics and the precise determination of the speed of light.

• Comparison with Michelson:

• While Michelson's experiments were more accurate, they were based on refinements of Foucault's original methodology.

Q24. Answer: (d) 5.67 × 10^(-8)Wm-2K-4

The correct answer is 4.

Key Points

• The Stefan-Boltzmann constant, represented by σ, defines the power emitted per unit area by a black body as a function of its thermodynamic temperature.

• Theoretical Value: The theoretical value of the Stefan-Boltzmann constant is approximately 5.67 × 10^-^8 Wm^-²K^-^4. This is derived from fundamental constants in physics.

• The Stefan-Boltzmann constant is used in the Stefan-Boltzmann Law, which states that the total energy radiated per unit surface area of a black body is proportional to the fourth power of the black body's absolute temperature. Hence, option 4 is correct.

• The formula for the Stefan-Boltzmann law is given as: P = σT^4, where P is the power emitted per unit area, σ is the Stefan-Boltzmann constant, and T is the absolute temperature of the black body.

• The constant arises from combining other physical constants, such as the speed of light (c), Planck's constant (h), and Boltzmann's constant (k).

• Other values in the options are incorrect as they deviate significantly from the experimentally determined and theoretically derived value of the Stefan-Boltzmann constant.

• Hence, the correct answer is 4.

Additional Information

• Derivation of the Stefan-Boltzmann constant:

• σ is derived from fundamental constants using the formula: σ = (2π^5k^4)/(15c²h³), where k is Boltzmann's constant, c is the speed of light, and h is Planck's constant.

• Its value is approximately 5.670374419 × 10^-^8 Wm^-²K^-^4, which is universally accepted.

• Applications of Stefan-Boltzmann Law:

• Used to calculate the radiative heat transfer from black bodies.

• Helps in determining the luminosity of stars and other celestial bodies.

• Example: The Sun's radiative power can be estimated using its temperature and surface area.

• Importance in thermodynamics:

• It establishes a relationship between temperature and radiation, which is crucial in studying thermal properties of objects.

• It is widely used in astrophysics, climatology, and engineering.

Important Points

• Black Body Radiation:

• A black body is an idealized physical body that absorbs all incident electromagnetic radiation, regardless of frequency or angle of incidence.

• The Stefan-Boltzmann law specifically applies to black bodies, making it a cornerstone in thermal radiation studies.

• Experimental Validation:

• The value of the Stefan-Boltzmann constant has been verified through experiments in labs and astronomical observations.

• It is consistent with observations of radiative heat transfer and stellar luminosity.

Q25. Answer: (a) Dhammapada

The correct answer is Dhammapada.

Key Points

• Anatta (Doctrine of No-Self): The concept of Anatta or "no-self" is one of the core teachings of Buddhism. It asserts that there is no permanent, unchanging self or soul in any living being or phenomenon.

• Dhammapada: This scripture, part of the Khuddaka Nikaya of the Pali Canon, explicitly states, “All dhammas are without self” in various verses, affirming the doctrine of Anatta. It is a collection of sayings of the Buddha and is widely regarded as a concise expression of Buddhist teachings.

• The verse “Sabbe dhamma anatta” directly translates to "All phenomena are without self." This highlights the impermanent and non-self nature of all things, a fundamental concept in Buddhism. Hence, Dhammapada is the correct answer.

• Incorrect Options: The Kalpa Sutra, Bhagavati Sutra, and Uttaradhyayana are Jain scriptures and do not discuss Anatta, which is a Buddhist doctrine.

• The Kalpa Sutra primarily deals with the lives of Jain Tirthankaras, while the Bhagavati Sutra and Uttaradhyayana focus on Jain philosophical teachings. They do not contain references to the Buddhist concept of Anatta. Hence, these options are incorrect.

Additional Information

• Dhammapada:

• Age and Origin: The Dhammapada is part of the Khuddaka Nikaya, one of the five collections of the Pali Canon. It dates back to around the 3rd century BCE.

• Features: It contains 423 verses divided into 26 chapters, covering various aspects of Buddhist philosophy, ethics, and practices.

• Application: The Dhammapada is widely used for teaching and understanding the Buddha's teachings, particularly for lay practitioners.

• Concept of Anatta:

• It challenges the belief in a permanent self and encourages the understanding of impermanence (Anicca) and suffering (Dukkha).

• Example: The teachings on Anatta are meant to help practitioners detach from ego and develop insight into the true nature of reality.

• Other Scriptures:

• Kalpa Sutra: A Jain text focusing on the lives of the Tirthankaras, particularly Mahavira.

• Bhagavati Sutra: A Jain canonical text containing discourses of Mahavira.

• Uttaradhyayana: A Jain scripture emphasizing ethical and spiritual teachings.

Important Points

• Key Buddhist Concepts:

• Buddhism is centered around the Three Marks of Existence: Anicca (impermanence), Dukkha (suffering), and Anatta (no-self).

• Anatta's Importance: It is vital for understanding the nature of reality and achieving enlightenment in Buddhist practice.

• Comparison with Jain Philosophy:

• While Jainism emphasizes the concept of a soul (Atman) and its liberation, Buddhism denies the existence of a permanent self, making Anatta a distinct concept.

• Scriptural Differences: Jain texts like Kalpa Sutra and Bhagavati Sutra focus on spiritual purification and ethical conduct, differing significantly from Buddhist scriptures.

Q26. Answer: (c) National Quantum Mission

The correct answer is National Quantum Mission.

Key Points

• National Quantum Mission: Launched by the Government of India in 2025, the mission aims to develop quantum-encrypted communication technologies for tamper-proof defence networks. This initiative is a critical step toward achieving quantum-based security in sensitive communication channels.

• The mission focuses on the development of quantum key distribution (QKD), which enables secure communication by leveraging the principles of quantum mechanics. This technology ensures that data remains encrypted and cannot be intercepted or tampered with by unauthorized entities.

• It aims to establish secure quantum communication systems across various sectors, including defence, banking, and governance, ensuring the confidentiality and integrity of sensitive information. Hence, this statement is correct.

• The initiative aligns with India's broader goals of strengthening its cybersecurity infrastructure and achieving technological self-reliance in the field of quantum technologies. This program is expected to enhance India's capabilities in the global quantum ecosystem.

• By fostering research and development in quantum technologies, the mission seeks to position India as a global leader in quantum computing and quantum communication. Hence, this statement is correct.

• The mission also includes the development of advanced technologies such as quantum sensors, quantum materials, and quantum simulators, supporting innovation across various domains. Hence, this statement is correct.

Additional Information

• Quantum Technologies:

• Quantum technology leverages the principles of quantum mechanics to perform operations that are beyond the capabilities of classical systems. Applications include quantum computing, quantum cryptography, and quantum sensing.

• These technologies are crucial for enhancing national security, improving computational efficiency, and ensuring secure communication systems.

• Quantum Key Distribution (QKD):

• QKD is a method of secure communication that uses the principles of quantum mechanics to encrypt and transmit data. It is designed to prevent unauthorized access or interception of sensitive information.

• India's focus on QKD under the National Quantum Mission will help establish tamper-proof channels for military and governmental communication.

• Global Quantum Efforts:

• Countries like the United States, China, and the European Union are heavily investing in quantum technologies to strengthen their defence networks and cybersecurity infrastructure.

• India's National Quantum Mission aims to compete globally and establish itself as a key player in quantum innovation.

Important Points

• Significance of Quantum Communication:

• Quantum encryption ensures that communication systems are secure and immune to hacking or interception, which is critical for defence and intelligence purposes.

• It plays a vital role in maintaining the confidentiality of classified information and supports secure financial transactions.

• India's Quantum Vision:

• The National Quantum Mission aligns with India's aspirations to become a leader in advanced technologies, including quantum computing and communication.

• The government has allocated significant funding and resources to support research and innovation in quantum technologies.

Q27. Answer: (b) It removes the top fertile soil layer, exposing hard, rocky layers.

The correct answer is It removes the top fertile soil layer, exposing hard, rocky layers..

Key Points

• Deforestation and topsoil removal: When trees and vegetation are cut down, the roots that hold the soil together are lost. This leads to the removal of the top fertile soil layer by wind and water, exposing the hard, less fertile, and rocky layers underneath. This process significantly reduces the soil's capacity to retain water and nutrients, making the land barren and dry. As a result, the area becomes prone to desertification. Hence, this statement is correct.

• Impact on soil fertility: The exposed rocky layers are not suitable for agriculture as they lack organic matter and essential nutrients required for plant growth. This further accelerates the process of desertification.

• Incorrect statements:

• Option 1: "It increases humus in the soil" is incorrect. Deforestation actually reduces the amount of organic matter (humus) in the soil because the decaying leaves, plants, and roots that contribute to humus are no longer present.

• Option 3: "It increases rainfall in dry regions" is incorrect. Deforestation reduces transpiration and disrupts the water cycle, which can lead to a decrease in rainfall instead of an increase.

• Option 4: "It reduces soil erosion" is incorrect. Deforestation increases soil erosion as the absence of vegetation allows wind and water to carry away the topsoil more easily.

• Role in desertification: Desertification is the process by which fertile land becomes desert-like due to factors such as deforestation, overgrazing, and climate change. The removal of the topsoil due to deforestation is one of the key contributors to this process.

Additional Information

• Deforestation:

• Deforestation refers to the large-scale removal of trees and vegetation from a forested area. It is caused by activities such as agriculture, logging, and urbanization.

• Deforestation disrupts the balance of ecosystems and contributes to a variety of environmental problems, including climate change, loss of biodiversity, and desertification.

• Desertification:

• Desertification is the degradation of land in arid, semi-arid, and dry sub-humid areas due to various factors, including deforestation, overgrazing, and unsustainable agricultural practices.

• It affects approximately 1.9 billion hectares of land globally, according to UNCCD (United Nations Convention to Combat Desertification).

• Regions such as the Sahel in Africa and parts of Asia, including India, are highly prone to desertification.

• Soil erosion:

• Soil erosion refers to the removal of the topsoil layer due to natural forces like wind and water or human activities like deforestation and overgrazing.

• This process reduces soil fertility, impacts agricultural productivity, and contributes to desertification.

Important Points

• Effects of deforestation:

• Loss of biodiversity: Forests are home to numerous plant and animal species, and their destruction leads to the extinction of many species.

• Disruption of the water cycle: Deforestation reduces transpiration, leading to reduced rainfall and changes in regional climates.

• Increase in greenhouse gas emissions: Forests act as carbon sinks, and their removal increases atmospheric carbon dioxide levels, contributing to global warming.

• Preventive measures:

• Afforestation and reforestation: Planting more trees to replace the lost forest cover.

• Sustainable land management: Adopting practices like agroforestry and crop rotation to prevent soil degradation.

• Conservation policies: Enforcing laws and policies to protect forests and prevent illegal logging.

Q28. Answer: (c) High student absenteeism

The correct answer is High student absenteeism.

Key Points

• Poor infrastructure refers to inadequate school facilities such as lack of classrooms, furniture, safe drinking water, sanitation facilities, and transportation. These deficiencies directly discourage students from attending school regularly, leading to high absenteeism.

• Absence of basic amenities like clean and functional toilets particularly impacts girl students, especially during adolescence, which is a significant factor contributing to their dropout rates or absenteeism.

• In rural areas, the lack of proper roads and transportation infrastructure also makes it difficult for students to reach schools safely and on time. This results in a decline in attendance. Hence, this contributes to high absenteeism.

• Inadequate infrastructure also impacts the learning environment. Overcrowded classrooms, insufficient teaching materials, and lack of proper ventilation or lighting make it difficult for students to focus, further demotivating them to attend school regularly.

• Mid-day meal schemes are often disrupted due to lack of clean kitchens or proper storage facilities in schools, which indirectly affects attendance. However, this is not the most direct impact of poor infrastructure.

• Similarly, while lack of trained teachers and low awareness about schemes are significant challenges in rural education, they are not directly caused by poor infrastructure.

• Hence, the correct answer is High student absenteeism.

Additional Information

• Impact of Poor Infrastructure on Education:

• Inadequate sanitation: According to a survey by UNICEF, lack of proper sanitation facilities in schools results in dropout of 23% of girls in rural areas. Proper sanitation is critical for ensuring consistent attendance.

• Transportation issues: Poor road connectivity and lack of transportation facilities discourage students, especially in remote areas, from attending school. This is a significant issue in many rural parts of India.

• Learning outcomes: Poor infrastructure impacts the overall learning experience, as students in overcrowded or poorly equipped classrooms are less likely to engage and perform well in academics.

• Government Initiatives:

• The Samagra Shiksha Abhiyan by the Indian government focuses on improving school infrastructure, including facilities like toilets, drinking water, and libraries, to ensure better attendance and learning outcomes.

• Mid-day Meal Scheme: This scheme, launched in 1995, aims to improve school attendance by providing nutritious meals. However, it depends on proper infrastructure like clean kitchens and adequate storage facilities.

• Digital Infrastructure: The Digital India Programme aims to integrate ICT tools and digital learning in rural schools, which can also address absenteeism by making education more engaging and accessible.

Important Points

• Statistics on Rural Education in India:

• ASER Report: The Annual Status of Education Report (ASER) highlights that 32% of schools in rural India lack functional toilets, which is a major reason for absenteeism.

• Dropout Rates: According to a UNESCO report, around 27% of children in rural areas drop out of school due to poor infrastructure and lack of basic amenities.

• Examples:

• Bihar: In many rural schools in Bihar, lack of functional toilets has led to an increase in absenteeism, especially among girls.

• Rajasthan: Poor road connectivity in remote areas of Rajasthan has made it difficult for students to attend schools regularly.

Q29. Answer: (b) Saikhom Mirabai Chanu

The correct answer is Saikhom Mirabai Chanu.

Key Points

• Saikhom Mirabai Chanu is an Indian weightlifter who competes in the 49 kg category and has achieved numerous accolades at the international level.

• She holds the national record in women's weightlifting (49 kg category) in India, showcasing her exceptional strength and skill in the sport.

• Mirabai Chanu won the silver medal at the Tokyo Olympics (2021), becoming the first Indian weightlifter to win an Olympic medal since Karnam Malleswari in 2000. Hence, she is recognized as the holder of the national record in her category.

• She has also won several medals at the Commonwealth Games, including gold medals in 2018 (Gold Coast) and 2022 (Birmingham).

• Mirabai Chanu's achievements have made her a prominent figure in Indian weightlifting, inspiring aspiring athletes across the nation. Hence, the statement is correct.

Additional Information

• About Saikhom Mirabai Chanu:

• Born: August 8, 1994, in Manipur, India.

• She started weightlifting at an early age and trained extensively to compete at national and international levels.

• Awards and Recognition: She has been honored with the Padma Shri and Rajiv Gandhi Khel Ratna Award (now renamed Major Dhyan Chand Khel Ratna Award) for her contributions to sports.

• Achievements in Weightlifting:

• Mirabai Chanu set a national record by lifting over 200 kg in the 49 kg category, demonstrating her incredible strength and determination.

• She has consistently represented India at the World Weightlifting Championships, winning medals and breaking records.

• Other Indian Weightlifters:

• Sanjita Chanu: Another prominent weightlifter from Manipur, she has won gold medals at the Commonwealth Games but does not hold the national record in the 49 kg category.

• Punam Yadav: Competes in higher weight categories and has won medals at the Commonwealth Games.

• Karnam Malleswari: The first Indian woman to win an Olympic medal in weightlifting (2000), but she competed in a different weight category.

Important Points

• Olympic Achievements:

• Mirabai Chanu's silver medal at the Tokyo Olympics marked a significant achievement for Indian sports.

• Her performance inspired increased interest in weightlifting and provided a boost to India's sporting aspirations.

• Commonwealth Games Success:

• She achieved gold medals in the 2018 Gold Coast Commonwealth Games and 2022 Birmingham Commonwealth Games.

• These victories established her as one of the most successful Indian weightlifters in history.

Q30. Answer: (a) Japan

The correct answer is Japan.

Key Points

• 2025 Asia-Pacific Economic Cooperation (APEC) Sports Policy Network Roundtable Meeting & Forum was held in Japan, a country known for its robust infrastructure and commitment to fostering international collaboration in sports and policy development.

• Japan has historically been an active member of APEC and a host for various APEC-related events, showcasing its dedication to regional economic cooperation and development.

• The meeting aimed to discuss key policies and strategies for promoting sports, enhancing regional cooperation, and leveraging sports as a tool for social and economic development. Hence, Japan was the venue for this event.

• Sports Policy Network Roundtable and Forum events are significant platforms for APEC member economies to share insights on how sports can foster economic growth, cultural exchange, and community development.

• Japan's selection as the host reflects its global reputation in organizing international events and its commitment to promoting sports and cultural diplomacy. Hence, Japan was an ideal choice.

• The event is part of APEC's broader agenda to enhance cooperation among member economies and utilize sports as a driver for

sustainable development and community well-being.

• Japan's hosting of the event aligns with its strategic focus on utilizing sports to foster social cohesion and stimulate economic activity. Hence, the correct answer is Japan.

Additional Information

• Asia-Pacific Economic Cooperation (APEC):

• APEC is a regional economic forum established in 1989 to promote free trade and economic cooperation among its 21 member economies.

• The member economies include major nations like Japan, China, South Korea, Australia, and the United States, among others.

• APEC focuses on areas such as trade liberalization, business facilitation, and economic and technical cooperation.

• Japan’s Role in International Sports:

• Japan is known for hosting significant international sports events, such as the Tokyo Olympics 2020 and various international summits focused on sports and cultural exchange.

• Japan has a strong infrastructure for sports, including state-of-the-art stadiums, training facilities, and expertise in event management.

• Its involvement in APEC demonstrates its commitment to leveraging sports as a tool for economic and social development.

• Importance of Sports Policy Network:

• The Sports Policy Network within APEC focuses on sharing best practices, fostering collaboration, and developing policies to enhance sports as a driver of economic growth.

• It provides a platform for member economies to discuss innovative solutions for challenges related to sports infrastructure, inclusivity, and sustainability.

• The forum also explores how sports can contribute to addressing broader issues like health, education, and community development.

Important Points

• APEC Member Economies:

• APEC includes economies from the Asia-Pacific region, such as Japan, China, South Korea, Australia, United States, and Canada.

• These economies collaborate on various issues, including trade, technology, sports, and sustainable development.

• Significance of Sports in APEC:

• Sports are seen as a powerful tool for promoting cultural exchange, economic growth, and social inclusion among member economies.

• APEC's focus on sports policies highlights the importance of creating conducive environments for sports development and collaboration.

Q31. Answer: (b) A layer with a rapid change in salinity

The correct answer is A layer with a rapid change in salinity.

Key Points

• Halocline refers to a distinct layer in a body of water, particularly oceans, where the salinity changes rapidly with depth.

• This layer is typically found in regions where there is minimal mixing of water layers, such as areas where freshwater meets seawater or where stratification occurs due to differences in density.

• The halocline plays a critical role in oceanography as it affects the density and circulation of water, which in turn influences marine ecosystems, nutrient distribution, and global climate patterns.

• It is a part of the broader concept of a pycnocline, which is the layer where the density gradient changes sharply, often influenced by both salinity (halocline) and temperature (thermocline).

• Haloclines are significant in estuarine environments, where the mixing of fresh and saltwater leads to the formation of a distinct salinity gradient.

• The presence of a halocline can also impact the behavior of sound and light in water, influencing underwater navigation and research activities.

• Hence, the correct answer is A layer with a rapid change in salinity.

Additional Information

• Other types of clines in oceanography:

• Thermocline: A layer in the ocean where the temperature decreases rapidly with depth. It is commonly found in the upper layers of the ocean and can vary seasonally and geographically.

• Pycnocline: A layer where the density of water changes sharply with depth. This is often influenced by both salinity and temperature changes.

• Importance of Halocline:

• Haloclines act as barriers to mixing between different water layers, preserving distinct water masses with unique chemical and biological properties.

• They influence the distribution of marine life by creating distinct habitats. For example, certain species thrive in low-salinity environments above the halocline, while others prefer the high-salinity waters below.

• Haloclines also affect the vertical movement of nutrients and dissolved gases, which are critical for marine ecosystems.

• Examples of Haloclines:

• In estuaries, haloclines often form where freshwater from rivers meets the saline water of the ocean, such as in the Chesapeake Bay in the United States.

• In polar regions, melting ice can create a halocline by introducing large amounts of freshwater into the ocean.

Important Points

• Key Characteristics of Haloclines:

• Haloclines are more prominent in regions with minimal water movement, as mixing tends to disrupt the salinity gradient.

• They are typically found at depths of 100 to 500 meters in the open ocean but can vary depending on environmental factors.

• Relation to Climate Change:

• Climate change impacts haloclines by altering sea temperatures and ice melt patterns, which can disrupt the salinity balance in the oceans.

• For example, the melting of Arctic ice due to global warming has led to the formation of stronger haloclines in the Arctic Ocean, which can affect global ocean circulation patterns.

Q32. Answer: (b) Truth-force

The correct answer is Truth-force.

Key Points

• The term Satyagraha was coined by Mahatma Gandhi. It originates from the Sanskrit words “Satya” (truth) and “Agraha” (insistence or holding firmly).

• Satyagraha translates to "truth-force” or "soul-force", emphasizing the power of truth and non-violence as tools for resistance and transformation.

• It was a cornerstone of Gandhi’s philosophy and strategy during India’s struggle for independence, advocating for peaceful resistance to oppression. Hence, the correct answer is Truth-force.

• Unlike passive resistance, Satyagraha is not the weapon of the weak but a moral strategy that demands courage, discipline, and the willingness to suffer for the truth.

• The philosophy of Satyagraha inspired several movements, including the Salt March (1930), Non-Cooperation Movement (1920–22), and Quit India Movement (1942), which mobilized millions of Indians to demand freedom from colonial rule.

• The central idea is to convert the oppressor through love and self-suffering, rather than defeating them through violence or hatred.

• Satyagraha emphasizes the belief that justice and truth will ultimately prevail, and it aligns with the principles of non-violence (Ahimsa) and civil disobedience.

Additional Information

• Key Characteristics of Satyagraha:

• Non-violence: Central to Satyagraha is the principle of Ahimsa, which means not causing harm to others, either physically or emotionally.

• Adherence to Truth: Satyagrahis (practitioners of Satyagraha) must abide by the truth at all costs, even if it involves personal suffering.

• Self-suffering: Instead of inflicting pain on opponents, Satyagrahis willingly accept suffering to demonstrate the moral strength of their cause.

• Movements Based on Satyagraha:

• Salt March (1930): A significant example where Gandhi led a 240-mile march to protest the British salt tax, demonstrating non-violent resistance.

• Champaran Satyagraha (1917): Gandhi’s first major Satyagraha in India, addressing the plight of indigo farmers in Bihar.

• Kheda Satyagraha (1918): A non-violent protest against oppressive taxation in Gujarat during a famine.

• Comparison with Other Options:

• Non-cooperation: Refers to a deliberate refusal to cooperate with oppressive authorities, as seen in the Non-Cooperation Movement (1920–22). However, it does not encompass the broader moral and spiritual dimensions of Satyagraha.

• Passive resistance: Involves non-violent opposition but lacks the proactive engagement and moral philosophy of truth inherent in Satyagraha.

• Civil disobedience: A component of Satyagraha, where individuals refuse to follow unjust laws, as exemplified by the Dandi

March (1930).

Important Points

• Global Influence:

• The philosophy of Satyagraha inspired global leaders like Martin Luther King Jr. during the Civil Rights Movement in the USA and Nelson Mandela in South Africa's struggle against apartheid.

• It continues to be a powerful tool for non-violent resistance and social justice worldwide.

• Legacy in India:

• Satyagraha played a pivotal role in mobilizing the masses during India's freedom struggle and remains a guiding principle in addressing social and political issues in India today.

Q33. Answer: (a) Policies that favoured zamindars and landlords were struck down.

The correct answer is Policies that favoured zamindars and landlords were struck down..

Key Points

• Policies that favoured zamindars and landlords were struck down: This statement is incorrect. After the Revolt of 1857, the British implemented policies that favored zamindars and landlords to ensure their loyalty to the British regime. They were given land ownership rights and support to prevent any future rebellion. Hence, this statement is incorrect.

• Lands and properties of Muslims were confiscated en masse: This statement is correct. The British perceived Muslims as the primary instigators of the revolt and, as a punitive measure, confiscated their lands and properties on a large scale. This was part of a broader strategy to suppress dissent and weaken Muslim influence. Hence, this statement is correct.

• The strength of Indian soldiers in the army was reduced: This statement is correct. The Revolt of 1857 exposed the role of Indian soldiers in rebelling against British rule. As a result, the British reduced the proportion of Indian soldiers in the army and increased the number of British soldiers to prevent future uprisings. Hence, this statement is correct.

• The Governor-General of India was given the title 'Viceroy': This statement is correct. After the Revolt of 1857, the British Crown took direct control of India from the East India Company. The Governor-General was given the title of 'Viceroy' to represent the British Crown in India. Hence, this statement is correct.

Additional Information

• Background of the Revolt of 1857:

• The Revolt of 1857, also known as the First War of Independence, was a large-scale rebellion against British rule in India.

• It began in Meerut on May 10, 1857, and spread to various parts of North and Central India, including Delhi, Kanpur, and Lucknow.

• The revolt had multiple causes, including resentment against British policies, exploitation, and interference in religious and cultural practices.

• Consequences of the Revolt:

• End of East India Company rule: The British Crown took direct control of India through the Government of India Act of 1858.

• Military reorganization: The British reduced the proportion of Indian soldiers in the army and increased the number of British troops.

• Policy changes: Policies were introduced to favor zamindars and landlords to ensure their support and loyalty.

• Suppression of dissent: The British implemented measures to suppress dissent, including confiscating lands and properties of Muslims.

• Title of Viceroy: The Governor-General was given the title 'Viceroy,' signifying direct rule by the British Crown.

Important Points

• Impact on Indian society:

• The revolt led to widespread repression and fear among the population, especially in areas directly affected by the rebellion.

• The British introduced policies to create divisions among communities, such as emphasizing differences between Hindus and Muslims.

• Long-term implications:

• The revolt sowed the seeds of nationalism and inspired future struggles for independence.

• It exposed the vulnerabilities of British rule and demonstrated the power of united resistance.

Q34. Answer: (c) It was established in 1993 by an Act of Parliament to investigate and recommend on human rights violations.

The correct answer is It was established in 1993 by an Act of Parliament to investigate and recommend on human rights violations..

Key Points

• Statement 1: "It is a constitutional body formed by a Constitutional Amendment, with powers equal to the Supreme Court."

• This is incorrect. The National Human Rights Commission (NHRC) of India is a statutory body, not a constitutional body. It was established under the Protection of Human Rights Act (PHRA), 1993.

• Unlike the Supreme Court, it does not have powers to enforce its decisions. It can only recommend actions to the government regarding human rights violations.

• Statement 2: "The NHRC has direct powers to prosecute and punish public officials for human rights abuses."

• This is incorrect. The NHRC does not have judicial powers to prosecute or punish individuals. It can investigate complaints of human rights violations and recommend corrective measures to the government, but it cannot directly enforce its recommendations.

• The NHRC relies on the judiciary and government authorities to act upon its findings and recommendations.

• Statement 3: "It was established in 1993 by an Act of Parliament to investigate and recommend on human rights violations."

• This is correct. The NHRC was established in October 1993 under the Protection of Human Rights Act, 1993.

• Its primary role is to investigate complaints of human rights violations and recommend remedial measures to the government or concerned authorities.

• The Commission also reviews laws and policies to ensure they align with human rights standards.

• Statement 4: "The Chairperson of the NHRC is the Prime Minister of India."

• This is incorrect. The Chairperson of the NHRC is not the Prime Minister of India.

• The Chairperson must be a retired Chief Justice of India or a judge of the Supreme Court.

Additional Information

• About the National Human Rights Commission (NHRC):

• The NHRC was established on October 12, 1993, under the Protection of Human Rights Act, 1993.

• It is headquartered in New Delhi.

• The Commission works to protect and promote human rights, which are defined as the rights relating to life, liberty, equality, and dignity guaranteed by the Constitution of India or international covenants.

• Composition of the NHRC:

• The Commission comprises a Chairperson and a number of members. The Chairperson must be a retired Chief Justice of India.

• Other members include judges of the Supreme Court or High Court, as well as experts in the field of human rights.

• Functions of the NHRC:

• Investigate complaints of human rights violations.

• Review the safeguards provided under the Constitution and laws for the protection of human rights.

• Recommend measures for the effective implementation of human rights policies and laws.

• Undertake and promote research and awareness campaigns on human rights issues.

• Limitations of the NHRC:

• Its recommendations are not legally binding on the government.

• It does not have the power to impose penalties or prosecute individuals for human rights violations.

• Its jurisdiction is limited to public authorities and does not extend to private individuals or organizations.

Important Points

• Key Legal Provisions under the Protection of Human Rights Act, 1993:

• The Act defines human rights as the rights relating to life, liberty, equality, and dignity of the individual as guaranteed by the Constitution or international covenants.

• The NHRC has the power to summon witnesses, demand evidence, and requisition public records.

• Examples of NHRC's Interventions:

• The Commission has investigated cases of police brutality, custodial deaths, and human trafficking.

• It has also recommended policy changes to address issues such as child labor and prison conditions.

• Global Perspective:

• The NHRC is in line with international human rights principles and works closely with organizations like the United Nations and other human rights bodies.

• It is a member of the Asia Pacific Forum of National Human Rights Institutions (APF).

Q35. Answer: (d) Ministry of Labour and Employment

The correct answer is Ministry of Labour and Employment.

Key Points

• Employees' Provident Fund Organisation (EPFO): The EPFO is a statutory organization under the Ministry of Labour and Employment, Government of India. It administers the Employees' Provident Funds and Miscellaneous Provisions Act, 1952.

• The EPFO is responsible for managing the provident fund, pension scheme, and insurance scheme for workers in India.

• The organization aims to ensure social security for employees by providing retirement savings, insurance benefits, and pensions. Hence, EPFO falls under the Ministry of Labour and Employment.

• More than 7.5 lakh new subscribers added: The EPFO added over 7.5 lakh new subscribers in March 2025, highlighting its role in ensuring social security coverage for the workforce in India.

• This addition reflects the growth in employment and awareness about provident fund benefits among employees. This information confirms the organization's relevance to the Ministry of Labour and Employment.

• Ministry of Labour and Employment: This ministry is responsible for policies, legislation, and programs related to employment, workforce welfare, and social security in India.

• EPFO is one of the key entities working under this ministry to ensure compliance with labor laws and provide benefits to employees. Hence, option 4 is correct.

Additional Information

• Other Ministries in the Options:

• Ministry of Statistics and Programme Implementation: This ministry is responsible for coordinating statistical activities in India and implementing development programs. It does not oversee EPFO.

• Ministry of Personnel, Public Grievances and Pensions: This ministry handles administrative reforms, public grievances, and pensioners' welfare but is unrelated to EPFO operations.

• Ministry of Finance: This ministry manages the financial sector, including taxation, budgeting, and economic policies. It does not directly govern EPFO.

• Functions of EPFO:

• EPFO manages the Employees' Provident Fund Scheme, the Employees' Pension Scheme, and the Employees' Deposit Linked Insurance Scheme.

• Benefits: The schemes provide financial security, retirement benefits, and insurance coverage to employees.

• Coverage: EPFO covers establishments employing 20 or more workers and certain other categories of employees.

• Key Legislative Framework:

• The Employees' Provident Funds and Miscellaneous Provisions Act, 1952 governs EPFO's operations and ensures the welfare of employees in India.

• The act mandates employers and employees to contribute to the provident fund, ensuring savings for retirement.

Important Points

• EPFO Subscriber Growth:

• The addition of over 7.5 lakh subscribers in March 2025 indicates increased employment and awareness about EPFO benefits.

• Digital Initiatives: EPFO has adopted technology for efficient service delivery, including online claims processing and member account management.

• Social Security Role:

• EPFO plays a critical role in ensuring social security for employees, complementing government efforts to improve workforce welfare.

• The organization supports financial inclusion by providing benefits like pension and insurance to the formal sector workforce.

Q36. Answer: (c) GST

The correct answer is GST (Goods and Services Tax).

Key Points

• Goods and Services Tax (GST) was introduced in India on 1st July 2017 as a part of fiscal reforms aimed at simplifying the indirect tax structure.

• It replaced multiple indirect taxes like Excise Duty, Service Tax, c(Value Added Tax), Sales Tax, and others, consolidating them into a single tax.

• GST is a comprehensive, multi-stage, destination-based tax that is levied on every value addition in the supply chain. Hence, this reform was implemented to streamline the tax system in India.

• GST is applicable across the country and is structured in a way to eliminate the cascading effect of taxes. This cascading effect refers to the tax-on-tax situation in the earlier regime.

• The GST Council was set up to make recommendations on various aspects of GST, including tax rates, exemptions, and threshold limits. The council ensures smooth implementation of GST.

• The GST structure is divided into CGST (Central GST), SGST (State GST), and IGST (Integrated GST) to ensure revenue sharing between the Centre and States.

• GST has significantly increased tax compliance and reduced the complexity of filing multiple returns for businesses. Hence, it has simplified the indirect tax system in India.

• It also promotes ‘One Nation, One Tax’ by unifying the tax structure across the country, thereby fostering ease of doing business in India. Thus, GST is a landmark reform in the Indian taxation system.

Additional Information

• Objective of GST:

• GST aims to create a unified market by eliminating the previous tax barriers between states and simplifying the indirect tax structure.

• It ensures that the tax is collected at each stage of value addition, but the burden is borne by the final consumer.

• Key Features of GST:

• Dual GST Model: India adopted a dual GST model where both the Centre and the States have the power to levy and collect taxes.

• Input Tax Credit (ITC): Businesses can claim credit for the taxes paid on purchases, which helps in reducing the overall tax burden and eliminates tax cascading.

• GST Slabs: GST has four tax slabs – 5%, 12%, 18%, and 28%, with specific goods and services falling under different categories.

• Implementation Challenges:

• The initial phase of GST implementation faced challenges such as technical glitches in the GST Network (GSTN) and a lack of awareness among businesses.

• Over time, these issues have been addressed, and the GST compliance process has been streamlined.

Important Points

• Previous Tax System:

• Before GST, India followed a complex tax structure with multiple taxes such as Excise Duty, VAT, Service Tax, Customs Duty, etc., leading to inefficiencies.

• This system led to a cascading effect, where taxes were levied on top of taxes, increasing the final price of goods and services.

• Benefits of GST:

• Promotes economic growth by fostering a common national market and removing barriers to interstate trade.

• Reduces compliance burden on businesses by introducing a single tax system, replacing multiple indirect taxes.

• Helps in curbing tax evasion through better transparency and tracking of transactions.

Q37. Answer: (a) Governor, Chief Minister and Council of Ministers

The correct answer is Governor, Chief Minister and Council of Ministers.

Key Points

• The State Executive in India is composed of the Governor, Chief Minister, and Council of Ministers. These bodies collectively function to govern the state and implement policies and programs.

• Governor: The Governor is the constitutional head of the state and represents the President of India at the state level. The Governor ensures the state's administration aligns with constitutional provisions and provides assent to bills passed by the state legislature.

• Chief Minister: The Chief Minister is the head of the government in the state. They act as the executive leader of the state, responsible for implementing policies and ensuring the smooth functioning of the state administration.

• Council of Ministers: The Council of Ministers assists the Chief Minister in decision-making and policy implementation. They hold portfolios such as education, health, agriculture, and finance, ensuring comprehensive governance across all sectors.

• These three components work together under a parliamentary system of governance at the state level, ensuring that decisions are made democratically and implemented effectively.

• Incorrect Options:

• Option 2 includes the President, which is incorrect as the President is the head of state for the nation, not part of the state executive.

• Option 3 mentions Deputy Ministers and State Council of Advisors, which are not part of the official composition of the state executive.

• Option 4 refers to State Legislative Assembly members, who are part of the legislative branch, not the executive branch.

• Hence, the correct answer is Governor, Chief Minister, and Council of Ministers.

Additional Information

• Governor:

• The Governor is appointed by the President of India and serves as the constitutional head of the state. They act as a link between the state and the central government.

• The Governor’s responsibilities include granting assent to bills, appointing the Chief Minister, and dissolving the state legislative assembly during emergencies.

• Chief Minister:

• The Chief Minister is the elected leader of the majority party in the state legislative assembly. They are responsible for forming the Council of Ministers and advising the Governor.

• The Chief Minister represents the state at the national level and plays a crucial role in policy formulation and implementation.

• Council of Ministers:

• The Council of Ministers is composed of ministers responsible for various departments. They help the Chief Minister in executing policies and managing the state's administration.

• These ministers are collectively responsible to the state legislature and work under the guidance of the Chief Minister.

• State Executive Functions:

• The state executive ensures the implementation of laws passed by the state legislature and delivers governance to the citizens of the state.

• It plays a vital role in maintaining law and order, promoting economic growth, and ensuring social welfare programs are effectively executed.

Important Points

• Governor's Role:

• The Governor acts as a guardian of the Constitution within the state, ensuring that the state government functions within constitutional limits.

• The Governor has the power to summon and dissolve the state legislative assembly, appoint the Chief Minister, and oversee the implementation of central policies in the state.

• Chief Minister's Role:

• The Chief Minister leads the Council of Ministers and is primarily responsible for policy decisions, budget preparation, and coordination among various departments.

• They act as the representative of the state in national matters and ensure the state's development aligns with the central government's goals.

• Council of Ministers' Role:

• The Council of Ministers manages specific portfolios and ensures the implementation of policies, programs, and projects for the state's growth and development.

• They are collectively responsible to the state legislature and play a crucial role in decision-making processes.

Q38. Answer: (a) Malabar Coast

The correct answer is Malabar Coast.

Key Points

• The Malabar Coast refers to the southern stretch of the western coast of India, sandwiched between the Western Ghats and the Arabian Sea. It is known for its rich biodiversity, lush greenery, and coconut plantations.

• The region covers parts of Kerala and some coastal areas of Karnataka. The Malabar Coast is historically significant due to its role in the spice trade and its connections with traders from the Middle East, Europe, and East Asia.

• The geography of the Malabar Coast includes backwaters, lagoons, and estuaries, making it one of the most scenic coastal regions in India. These geographical features are crucial for transportation, tourism, and fishing industries.Hence, the region is referred to as the Malabar Coast.

• The Malabar Coast has a tropical climate, which supports the growth of spices like pepper, cardamom, and cinnamon. It has historically been known as the "Spice Coast" due to the abundance of these valuable commodities.

• The coastal region has been a hub of cultural exchange, influenced by travelers and traders from various parts of the world, including the Arabs, Chinese, Portuguese, and British.Hence, the answer Malabar Coast is correct.

Additional Information

• Geographical Significance of the Malabar Coast:

• The Malabar Coast is characterized by its unique geography, including long sandy beaches, lagoons, estuaries, and backwaters. The backwaters are interconnected with a network of canals, providing a transportation system and supporting fishing and tourism.

• Some famous backwater destinations on the Malabar Coast include Alleppey (Alappuzha), Kumarakom, and Kochi.

• Historical Importance:

• The Malabar Coast was a key region in the ancient and medieval spice trade. Traders from Arabia, China, Europe, and Africa frequently visited this region to trade spices.

• The arrival of the Portuguese explorer Vasco da Gama in 1498 on the Malabar Coast marked the beginning of European colonial interest in India.

• Culture and Economy:

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• The Malabar Coast's culture reflects a blend of indigenous traditions and foreign influences. The region is known for its Kerala-style architecture, art forms like Kathakali and Mohiniyattam, and traditional cuisine.

• The economy of the Malabar Coast thrives on agriculture, tourism, and fishing. Coconut cultivation and spice production are major agricultural activities.

Important Points

• Other Coastal Regions:

• Kathiawar Peninsula: This is located in Gujarat and is bordered by the Arabian Sea. It is known for Gir National Park and its dry, arid landscape.

• Kannad Plain: This region lies in Karnataka and is part of the western coastal area of India, adjoining the Western Ghats. It is known for its fertile soil and agricultural activities.

• Konkan Coast: This coastal stretch extends from Maharashtra to Karnataka. It is famous for its scenic beauty, mango production, and pristine beaches.

Q39. Answer: (a) Moselle

The correct answer is Moselle.

Key Points

• Moselle region in France is home to the massive white hydrogen reserve discovered in 2025. This discovery is considered a breakthrough for clean energy solutions.

• White hydrogen is a naturally occurring form of hydrogen found in underground reserves, and it is extracted without requiring human-induced processes like electrolysis or reforming. This makes it a clean and sustainable energy source.

• The discovery in Moselle is significant because it could lead to a reduction in the dependency on fossil fuels, helping to mitigate climate change and supporting the transition to renewable energy sources.

• The Moselle reserve has the potential to supply hydrogen to industries, transportation, and residential sectors, thereby contributing to the energy goals of France and the European Union.

• The discovery aligns with France’s commitment to achieving carbon neutrality by 2050 and supports global efforts under the Paris Agreement to reduce greenhouse gas emissions.

• Hydrogen, particularly white hydrogen, is considered a game-changer due to its ability to provide clean energy without generating emissions during extraction and use.

Additional Information

• White Hydrogen:

• White hydrogen refers to naturally occurring hydrogen found in geological formations like underground reservoirs. It is distinct from other types of hydrogen, such as green, blue, and grey hydrogen, which are produced through industrial processes.

• It is considered environmentally friendly because it does not involve emissions during extraction, unlike grey hydrogen (produced from fossil fuels) or blue hydrogen (produced from fossil fuels with carbon capture).

• Moselle Region:

• Located in northeastern France, Moselle is part of the Grand Est administrative region. It has historically been known for its industrial and natural resources, including coal and minerals.

• The discovery of white hydrogen in this area adds to the region’s prominence, positioning it as a leader in clean energy innovation within France.

• Hydrogen as an Energy Source:

• Hydrogen is widely considered the fuel of the future due to its high energy density and ability to produce energy without emitting greenhouse gases.

• It can be used in various sectors, including transportation (fuel cells for cars), energy storage, and heavy industries like steel production.

• Example: Hydrogen-powered vehicles are already being developed globally, with companies like Toyota and Hyundai leading the production of fuel-cell cars.

Important Points

• France’s Energy Goals:

• France aims to achieve carbon neutrality by 2050 under its national energy transition strategy.

• The discovery of white hydrogen reserves in Moselle could play a key role in reducing the nation’s reliance on fossil fuels and supporting renewable energy development.

• Global Implications:

• The Moselle discovery demonstrates the potential for other countries to explore and utilize natural hydrogen reserves as part of their clean energy strategies.

• This breakthrough could encourage international collaboration on hydrogen research and technology deployment.

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Q40. Answer: (b) Indian Space Research Organisation

The correct answer is Indian Space Research Organisation.

Key Points

• Indian Space Research Organisation (ISRO) successfully docked the SpaDeX satellite in January 2025, marking a significant milestone in its space exploration capabilities.

• The SpaDeX satellite docking is a crucial achievement as it demonstrates ISRO's ability to perform advanced space operations, such as satellite-to-satellite docking, which is essential for future space missions like on-orbit servicing and refueling.

• The docking operation involved precision engineering and advanced technology, showcasing ISRO's growing expertise in space maneuvers. Hence, statement 1 is correct.

• This event is part of India's continued efforts to expand its space technology capabilities, further establishing ISRO as a global leader in space research and innovation.

• It also reinforces India's commitment to contributing to international space exploration and research initiatives. Hence, statement 2 is correct.

• The SpaDeX satellite is designed to perform critical tasks such as autonomous docking and maneuvering in space, which are essential for future missions involving space station maintenance and interplanetary exploration.

• The successful docking highlights ISRO's capabilities in developing advanced satellite technology and mission planning. Hence, statement 3 is correct.

• Hence, the correct answer is Indian Space Research Organisation.

Additional Information

• Indian Space Research Organisation (ISRO):

• ISRO, headquartered in Bengaluru, India, is the national space agency responsible for space exploration, satellite development, and space research in India.

• It has been pioneering advancements in space technology, including satellite launches, interplanetary missions, and advanced space maneuvers.

• SpaDeX Satellite:

• The SpaDeX satellite was developed to test autonomous docking capabilities, a crucial function for future space missions such as maintaining space stations and interstellar explorations.

• The docking process requires high precision and advanced engineering, demonstrating ISRO's technical expertise.

• Global Significance:

• ISRO's achievement in docking SpaDeX further strengthens its position as a leading space agency globally, contributing to international space missions and collaborations.

• This milestone also opens avenues for cooperation with other space agencies like NASA, ESA, and CNSA in advanced space research.

Important Points

• ISRO's Achievements:

• Chandrayaan Missions: India successfully landed Chandrayaan-3 on the Moon, showcasing its lunar exploration capabilities.

• Mangalyaan: ISRO's Mars Orbiter Mission was India's first interplanetary mission, demonstrating low-cost, high-efficiency space exploration.

• Future Missions:

• Gaganyaan: India's maiden human spaceflight program scheduled to launch astronauts into space.

• Aditya-L1: A solar mission aimed at studying the Sun's atmosphere.

Q41. Answer: (d) Rs. 655

Shortcut Trick

Ratio of profits = Ratio of investments = 1,200 : 1,070 : 1,310.

Simplified Ratio = 120 : 107 : 131.

Total units = 120 + 107 + 131 = 358 units.

358 units = Rs. 1,790 => 1 unit = Rs. 5.

Tejas's share = 131 units = 131 × 5 = Rs. 655.

Therefore The correct answer is Rs. 655.

Alternate Method

Given: Nikhil's investment = Rs. 1,200, Nidhi's investment = Rs. 1,070, Tejas's investment = Rs. 1,310, Total Profit = Rs. 1,790.

Formulas: Profit Share = (Individual Investment × Time) ÷ (Total Investment × Time) × Total Profit.

=> Ratio of shares = 1,200 : 1,070 : 1,310 = 120 : 107 : 131.

=> Sum of ratio parts = 120 + 107 + 131 = 358.

=> Tejas's share = (131 ÷ 358) × 1,790.

=> Tejas's share = 131 × 5 = Rs. 655.

Therefore The correct answer is Rs. 655.

Additional Information

Partnership Basics

In a partnership, if the time period for all investments is the same, the profit is distributed directly in the ratio of the capitals invested.

Compound Partnership

When partners invest for different time periods, the profit ratio is calculated as (Capital1 × Time1) : (Capital2 × Time2).

Q42. Answer: (d) $\text{cosec}^2\theta\ \sec^2\theta$

Shortcut Trick

Put θ = 45° in the given expression.

X = [(1 + 1/√2)(2 − 2/√2)] / [(2 + 2/√2)(1 − 1/√2)] = [2(1 − 1/2)] / [2(1 − 1/2)] = 1.

Then X + 1/X + 2 = 1 + 1 + 2 = 4.

Check options at θ = 45°: Option (4) $\text{cosec}^2\ 45° \sec^2\ 45° = (\sqrt{2})^2 \times (\sqrt{2})^2 = 2 \times 2 = 4$.

Therefore The correct answer is $\text{cosec}^2\ \theta\ \sec^2\ \theta$.

Alternate Method

Given: X = [(1 + cos θ) × 2(1 − cos θ)] / [2(1 + sin θ) × (1 − sin θ)]

=> X = [2(1 − $\cos^2\theta$)] / [2(1 − $\sin^2\theta$)]

=> X = $\sin^2\theta / \cos^2\theta = \tan^2\theta$

Now, calculate X + 1/X + 2:

=> $\tan^2\theta + \cot^2\theta + 2$

=> $(\tan\theta + \cot\theta)^2$

=> $(\sin\theta / \cos\theta + \cos\theta / \sin\theta)^2$

=> $[(\sin^2\theta + \cos^2\theta) / (\sin\theta \cos\theta)]^2$

=> $[1 / (\sin\theta \cos\theta)]^2 = 1 / (\sin^2\theta \cos^2\theta) = \text{cosec}^2\theta \sec^2\theta$

Therefore The correct answer is $\text{cosec}^2\ \theta\ \sec^2\ \theta$.

Additional Information

Trigonometric Identities

Basic identities: $\sin^2\theta + \cos^2\theta = 1$, $\sec^2\theta - \tan^2\theta = 1$, and $\text{cosec}^2\theta - \cot^2\theta = 1$.

Reciprocal Relations

sec θ = 1/cos θ, cosec θ = 1/sin θ, and cot θ = 1/tan θ.

Identity for $\sec^2\theta + \text{cosec}^2\theta$

The sum $\sec^2\theta + \text{cosec}^2\theta$ is always equal to their product $\sec^2\theta \times \text{cosec}^2\theta$.

Q43. Answer: (a) 68 years

Shortcut Trick

In Compound Interest, if a sum becomes n times in t years, it becomes n^k times in k × t years.

Here, the sum becomes 3 times in 17 years (n = 3, t = 17).

We need the sum to become 81 times, which is 3^4 (so, k = 4).

Required time = k × t = 4 × 17 = 68 years.

Therefore The correct answer is 68 years.

Alternate Method

Given:

Principal (P) triples in 17 years => Amount (A1) = 3P

Time (T1) = 17 years

Target Amount (A2) = 81P

Formula Used:

A = P(1 + r/100)^t

Calculations:

=> 3P = P(1 + r/100)^(17)

=> 3 = (1 + r/100)^(17) --- (Equation 1)

=> Let the required time be T years for the sum to become 81 times.

=> 81P = P(1 + r/100)^T

=> 81 = (1 + r/100)^T

=> 3^4 = (1 + r/100)^T

=> Substituting the value of 3 from Eq. 1:

=> [(1 + r/100)^(17)]^4 = (1 + r/100)^T

=> (1 + r/100)^(17 × 4) = (1 + r/100)^T

=> T = 68 years

Therefore The correct answer is 68 years.

Additional Information

Compound Interest Growth

In Compound Interest, the amount increases geometrically. If it becomes 'x' times in 't' years, it will become 'x²' in 2t years and 'x³' in 3t years.

Simple Interest Growth

In Simple Interest, the growth is arithmetic. If a sum triples (becomes 3P) in 17 years, it means interest for 17 years is 2P. To become 81 times (80P interest), it would take (80/2) × 17 = 680 years.

Effective Rate for Compounding

For half-yearly compounding, the rate is halved (r/2) and the time period is doubled (2t) in the standard CI formula.

Q44. Answer: (d) 44

Given:

$8^2 + \sqrt{(3^2)} - 2\sqrt{36} - 11$

Formula Used:

$a^2 = a \times a$

$\sqrt{(a^2)} = a$

Calculation:

=> $8^2 = 64$

=> $\sqrt{(3^2)} = 3$

=> $\sqrt{36} = 6$

=> $2\sqrt{36} = 2 \times 6 = 12$

=> 64 + 3 − 12 − 11

=> 67 − 23

=> 44

Therefore The correct answer is 44.

Q45. Answer: (c) 20%

Shortcut Trick

Discount percentage in Buy X get Y free schemes is calculated as: Discount % = [Free Articles ÷ Total Articles] × 100.

Here, Free Articles (Y) = 5 and Purchased Articles (X) = 20.

Total Articles = 20 + 5 = 25.

Discount % = (5 ÷ 25) × 100 = 1/5 × 100 = 20%.

Therefore The correct answer is 20%.

Alternate Method

Given: Number of articles bought = 20, Number of free articles = 5.

Formula: Discount % = (Discount ÷ Marked Price) × 100.

=> Let the Marked Price (MP) of each article be 1 unit.

=> Total MP of 25 articles (20 + 5) = 25 units.

=> The customer pays only for 20 articles, so Selling Price (SP) = 20 units.

=> Discount = MP − SP = 25 − 20 = 5 units.

=> Discount % = (5 ÷ 25) × 100 = 20%.

Therefore The correct answer is 20%.

Additional Information

Free Articles Scheme

In 'Buy X Get Y Free', the shopkeeper gives (X+Y) articles but charges for only X. The Y articles represent the discount amount.

Successive Discounts

If a shopkeeper offers 'Buy 20 Get 5 Free' plus an additional 10% discount, the total discount is calculated by applying the second discount on the already reduced SP.

Q46. Answer: (a) -29/35

Shortcut Trick

Observe that the quadratic terms (x^2) have coefficients 25 and −25, which will cancel out.

Directly focus on the linear term and constants: $-35x + (-25 + 10) = 14$.

=> $-35x - 15 = 14 \Rightarrow -35x = 29$.

=> $x = -29/35$.

Therefore The correct answer is −29/35.

Alternate Method

Given:

$5(5x^2 - 5) - 5(5x^2 + 7x - 2) = 14$

Formula/Method Used:

Distributive Property of multiplication over addition: $a(b + c) = ab + ac$.

Calculations:

=> $25x^2 - 25 - (25x^2 + 35x - 10) = 14$

=> $25x^2 - 25 - 25x^2 - 35x + 10 = 14$

=> $(25x^2 - 25x^2) - 35x + (-25 + 10) = 14$

=> $-35x - 15 = 14$

=> $-35x = 14 + 15$

=> $-35x = 29$

=> $x = -29/35$

Therefore The correct answer is −29/35.

Additional Information

Linear Equations

A Linear Equation is an algebraic equation in which each term has an exponent of 1 and the graph of the equation is a straight line.

Transposition Rule

While moving a term from one side of the equation to the other, the sign changes (plus becomes minus, and minus becomes plus).

Distributive Law

This law states that multiplying a sum by a number gives the same result as multiplying each addend individually by the number and then adding the products together.

Q47. Answer: (d) 86.8

Shortcut Trick

Equate the number of decimal places by adding zeros: 2.800 and 0.217.

Find the LCM of the integers 2800 and 217.

$2800 = 7 \times 400$ and $217 = 7 \times 31$.

LCM = $7 \times 400 \times 31 = 86800$.

Place the decimal back after 3 places: 86.800.

Therefore The correct answer is 86.8.

Alternate Method

Given: Numbers are 2.8 and 0.217.

Formula Used: LCM of Fractions = LCM of Numerators ÷ HCF of Denominators.

=> Convert decimals to fractions: 2.8 = 28/10 and 0.217 = 217/1000.

=> Make denominators equal: 2800/1000 and 217/1000.

=> LCM = LCM(2800, 217) ÷ 1000.

=> 2800 = 2^4 × 5² × 7¹.

=> 217 = 7¹ × 31¹.

=> LCM(2800, 217) = 2^4 × 5² × 7¹ × 31¹ = 2800 × 31 = 86800.

=> Final LCM = 86800 ÷ 1000 = 86.8.

Therefore The correct answer is 86.8.

Additional Information

LCM of Decimals

To find LCM of decimals, convert them to like decimals (same number of decimal places) and find LCM as if they were integers, then replace the decimal point.

HCF and LCM of Fractions

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

Prime Factorization Method

LCM is the product of the highest powers of all prime factors involved in the numbers.

Q48. Answer: (b) 32

Shortcut Trick

Let F be Father's age and S be Son's age.

Equations: F + 4S = 100 and 2.5F + S = 97.

Multiply second equation by 4: 10F + 4S = 388.

Subtract first from second: 9F = 288 => F = 32.

Therefore The correct answer is 32 years.

Alternate Method

Given:

Let the Father's age be x and Son's age be y.

Calculations:

=> Equation 1: x + 4y = 100

=> Equation 2: 2.5x + y = 97

=> From Eq 2, y = 97 − 2.5x

=> Substitute y in Eq 1: x + 4(97 − 2.5x) = 100

=> x + 388 − 10x = 100

=> −9x = 100 − 388

=> −9x = −288

=> x = 288 ÷ 9

=> x = 32

Therefore The correct answer is 32 years.

Additional Information

Linear Equations in Two Variables

These problems involve setting up two equations based on the conditions and solving using substitution or elimination methods.

Age Problems Logic

Always define the present ages first. If 'n' years ago is mentioned, subtract 'n'; if 'n' years hence is mentioned, add 'n'.

Checking Results

Plug the values back into the equations: If x=32, then 32+4y=100 => 4y=68 => y=17. Check 2nd: 2.5(32)+17 = 80+17 = 97. Verified.

Q49. Answer: (b) 15 days

Shortcut Trick

Total work => 4M × 12 = 8W × 15

Efficiency Ratio => 48M = 120W → 2M = 5W (or M:W = 5:2)

Total Work = 4 × 5 × 12 = 240 units

Efficiency of (3W + 2M) = (3 × 2) + (2 × 5) = 6 + 10 = 16 units/day

Required Days = 240 ÷ 16 = 15 days

Therefore The correct answer is 15 days.

Alternate Method

Person	Days	Total Work	Efficiency
4 Men	12	60	5 units/day
8 Women	15	4 units/day	

=> Efficiency of 1 Man = 5 ÷ 4 = 1.25 units/day
=> Efficiency of 1 Woman = 4 ÷ 8 = 0.5 units/day
=> Efficiency of (3 Women + 2 Men) = (3 × 0.5) + (2 × 1.25)
=> Total Efficiency = 1.5 + 2.5 = 4 units/day
=> Required Days = Total Work ÷ Total Efficiency = 60 ÷ 4 = 15 days
Therefore The correct answer is 15 days.
Additional Information
Man-Day Formula
The core relationship is M1D1H1/W1 = M2D2H2/W2, where M is number of workers, D is days, H is hours, and W is work units.
Efficiency and Time
Efficiency is inversely proportional to the time taken to complete a task. Total Work = Efficiency × Time.
Combined Work
When different groups work together, their individual efficiencies (work per unit time) are added to find the combined rate.

Q50. Answer: (c) 20

Shortcut Trick
For any regular polygon, the sum of an interior angle and its corresponding exterior angle is 180°.
Exterior angle = 180° − 162° = 18°
The number of sides (n) is calculated as: n = 360° ÷ Exterior angle
=> n = 360° ÷ 18° = 20
Therefore The correct answer is 20 sides.
Alternate Method
Given:
Each interior angle of a regular polygon = 162°
Formula Used:
Interior angle of a regular polygon = [(n − 2) × 180°] ÷ n
Calculations:
=> 162° = [(n − 2) × 180°] ÷ n
=> 162n = 180n − 360
=> 180n − 162n = 360
=> 18n = 360
=> n = 360 ÷ 18
=> n = 20
Therefore The correct answer is 20 sides.

Q51. Answer: (b) decrease by Rs. 2,406

Shortcut Trick
Base Income = 100, Savings = 7.5, Expenditure = 92.5
New Income = 134, New Expenditure = 92.5 × 1.4 = 129.5
New Savings = 134 − 129.5 = 4.5
Change in Savings = 4.5 − 7.5 = −3 units (Decrease)
Value of 100 units = Rs. 80,200 => 1 unit = Rs. 802 => 3 units = Rs. 2,406
Therefore The correct answer is decrease by Rs. 2,406.
Alternate Method
Given: Initial Income = Rs. 80,200, Savings % = 7.5%
Formula: Income = Expenditure + Savings
=> Initial Savings = 7.5% of 80,200 = 0.075 × 80,200 = Rs. 6,015
=> Initial Expenditure = 80,200 − 6,015 = Rs. 74,185

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=> New Income = 80,200 × 1.34 = Rs. 1,07,468

=> New Expenditure = 74,185 × 1.40 = Rs. 1,03,859

=> New Savings = 1,07,468 − 1,03,859 = Rs. 3,609

=> Change in Savings = 3,609 − 6,015 = −Rs. 2,406

Therefore The correct answer is decrease by Rs. 2,406.

Additional Information

Income-Expenditure Alligation

Income change % is the weighted average of Expenditure change % and Savings change %. Formula: (Exp × Exp% change + Sav × Sav% change) / Total Income.

Successive Percentage Change

When a value increases by x% and then y%, the net change is [x + y + (xy/100)]%.

Savings Ratio

Savings = Income − Expenditure. If the percentage increase in Expenditure is higher than that of Income, savings may decrease even if income increases.

Q52. Answer: (a) 15 cm

Shortcut Trick

Sum of individual volumes = Volume of new cube

Total Volume = 789 + 865 + 1721 = 3375 cm^3

Edge of new cube = $\sqrt[3]{3375}$

Since $15^3 = 3375$, the edge is 15 cm.

Therefore The correct answer is 15 cm.

Alternate Method

Given:

Volume of first cube (V1) = 789 cm^3

Volume of second cube (V2) = 865 cm^3

Volume of third cube (V3) = 1721 cm^3

Formula Used:

Total Volume (V) = V1 + V2 + V3

Volume of a cube = a^3 (where a is the edge length)

Calculations:

=> Total Volume of new cube = 789 + 865 + 1721

=> V = 3375 cm^3

=> $a^3 = 3375$

=> $a = \sqrt[3]{3375}$

=> $a = \sqrt[3]{(15 \times 15 \times 15)}$

=> a = 15 cm

Therefore The correct answer is 15 cm.

Additional Information

Volume of Cube

The volume of a cube with side a is given by the formula $V = a^3$.

Total Surface Area of Cube

The total surface area of a cube is $6a^2$, representing the area of all six square faces.

Diagonal of Cube

The length of the longest diagonal inside a cube is given by $d = a\sqrt{3}$.

Conservation of Volume

When solids are melted to form a new solid, the total volume remains constant, provided there is no wastage.

Q53. Answer: (a) 2.8

Given:

81^(0.65) = x

81^(0.26) = y

x^z = y^7

Formula Used:

a^m = (b^k)^m = b^(km)

If a^p = a^q then p = q

Calculation:

=> 81 = 3^4

=> x = 81^(0.65) = (3^4)^(0.65) = 3^(4 × 0.65) = 3^(2.6)

=> y = 81^(0.26) = (3^4)^(0.26) = 3^(4 × 0.26) = 3^(1.04)

Given:

=> x^z = y^7

=> (3^(2.6))^z = (3^(1.04))^7

=> 3^(2.6z) = 3^(7 × 1.04)

=> 2.6z = 7.28

=> z = 7.28 ÷ 2.6

=> z = 2.8

Therefore The value of z is close to 2.8.

Q54. Answer: (b) 2,420

Shortcut Trick

The relation between Cost Price (CP) and Marked Price (MP) is given by the ratio:

CP ÷ MP = (100 − Discount%) ÷ (100 + Profit%)

CP ÷ MP = (100 − 30) ÷ (100 + 10) = 70 ÷ 110 = 7 ÷ 11

Since 7 units = &Rs. ;1,540, then 1 unit = 1,540 ÷ 7 = &Rs. ;220

Marked Price = 11 units = 11 × 220 = &Rs. ;2,420

Therefore The correct answer is &Rs. ;2,420.

Alternate Method

Given: Cost Price (CP) = &Rs. ;1,540, Discount = 30%, Profit = 10%.

Formulas: Selling Price (SP) = CP × (100 + Profit%) ÷ 100 | MP = SP × 100 ÷ (100 − Discount%)

=> Step 1: Calculate Selling Price (SP) = 1,540 × (110 ÷ 100) = 1,540 × 1.1 = &Rs. ;1,694.

=> Step 2: Let Marked Price (MP) be x.

=> Step 3: SP = MP × (100 − Discount%) ÷ 100 => 1,694 = x × (70 ÷ 100).

=> Step 4: x = (1,694 × 100) ÷ 70 = 169,400 ÷ 70 = &Rs. ;2,420.

Therefore The correct answer is &Rs. ;2,420.

Additional Information

Marked Price and Discount

Marked Price is the price printed on the label. Discount is always calculated on the Marked Price, whereas Profit or Loss is calculated on the Cost Price.

Effective Formula

Marked Price = [CP × (100 + Gain%)] ÷ (100 − Discount%). Use this directly to save time in competitive exams.

Q55. Answer: (b) 3.04 km

Shortcut Trick

Speed = 48 km/hr

Time = 3.8 minutes = 3.8/60 hours

Distance (Bridge Length) = Speed × Time = 48 × (3.8 ÷ 60)

=> 4 × (3.8 ÷ 5) = 4 × 0.76 = 3.04 km

Therefore The correct answer is 3.04 km.

Alternate Method

Given:

Speed of the car = 48 km/hr

Time taken to cross = 3.8 minutes

Formula Used:

Distance = Speed × Time

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To convert minutes to hours: Time in hours = Time in minutes ÷ 60

Calculations:

=> Time = 3.8 ÷ 60 hours

=> Distance = 48 × (3.8 ÷ 60) km

=> Distance = (48 ÷ 12) × (3.8 ÷ 5) km

=> Distance = 4 × 0.76 km

=> Distance = 3.04 km

Therefore The correct answer is 3.04 km.

Additional Information

Unit Conversion (Speed)

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

Crossing Objects

When a vehicle of length L1 crosses a bridge of length L2, the total distance covered is L1 + L2. If the vehicle is small (like a car), its length is often neglected compared to the bridge.

Average Speed

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

Q56. Answer: (c) 900

Shortcut Trick

Use the Method of Allegation to find the ratio of the cost prices.

Loss on first shirt = −8%, Gain on second shirt = +24%, Overall Profit/Loss = 0%.

Ratio of CP1 : CP2 = (24 − 0) : (0 − (−8)) = 24 : 8 = 3 : 1.

Total ratio parts = 3 + 1 = 4 units. Given total CP = Rs. 1,200.

Cost price of the first shirt = (3 ÷ 4) × 1,200 = Rs. 900.

Therefore The correct answer is Rs. 900.

Alternate Method

Given → Total CP = Rs. 1,200, Loss%1 = 8%, Gain%2 = 24%, Net Profit = 0. Formulas: Profit = SP − CP | Loss = CP − SP | Net Profit = 0 => Total Loss = Total Gain.

=> Let the cost price of the first shirt be x and the second shirt be (1,200 − x). => Since there is no profit or loss, Loss on 1^(st) shirt = Gain on 2^(nd) shirt. => 8% of x = 24% of (1,200 − x). => 8x = 24(1,200 − x) => x = 3(1,200 − x). => x = 3,600 − 3x => 4x = 3,600. => x = 900.

Therefore The correct answer is Rs. 900.

Additional Information

No Profit No Loss Condition

When multiple items are sold with no net profit or loss, the absolute value of the total profit must equal the absolute value of the total loss.

Allegation in Profit & Loss

Allegation can be used to find the ratio of cost prices when the individual profit/loss percentages and the overall profit/loss percentage are known.

Q57. Answer: (b) 288 π cm3

Shortcut Trick

Radius (r) = Diameter ÷ 2 = 12 ÷ 2 = 6 cm.

Volume = (4/3) × π × r³ = (4/3) × π × 6 × 6 × 6.

Volume = 4 × π × 2 × 36 = 288π cm³.

Therefore The correct answer is 288π cm³.

Alternate Method

Given:

Diameter of the sphere = 12 cm

Formula Used:

Volume of a sphere = (4/3)πr³

Calculations:

=> Radius (r) = Diameter / 2

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=> r = 12 / 2 = 6 cm

=> Volume = (4/3) × π × $(6)^3$

=> Volume = (4/3) × π × 216

=> Volume = 4 × π × 72

=> Volume = 288π cm^3

Therefore The correct answer is 288π cm^3.

Additional Information

Surface Area of Sphere

The total surface area of a sphere is given by the formula $4\pi r^2$.

Volume of Hemisphere

The volume of a hemisphere is exactly half that of a sphere: $(2/3)\pi r^3$.

Total Surface Area of Hemisphere

For a solid hemisphere, the TSA includes the curved area and the base: $3\pi r^2$.

Q58. Answer: (c) 80% gain

Shortcut Trick

Given: 20 × SP = 36 × CP.

Ratio of SP/CP = 36/20 = 9/5.

Profit = 9 − 5 = 4 units.

Profit% = (Profit ÷ CP) × 100 => (4 ÷ 5) × 100 = 80%.

Since SP > CP, it is a gain.

Therefore The correct answer is 80% gain.

Alternate Method

Given: Selling price (SP) of 20 books = Cost price (CP) of 36 books.

Formulas: Profit = SP − CP | Profit% = (Profit ÷ CP) × 100

=> Let the CP of 1 book be Re. 1.

=> CP of 36 books = Rs. 36.

=> SP of 20 books = CP of 36 books = Rs. 36.

=> CP of 20 books = Rs. 20.

=> Profit = SP − CP = 36 − 20 = Rs. 16.

=> Profit% = (16 ÷ 20) × 100 = 4/5 × 100 = 80%.

Therefore The correct answer is 80% gain.

Additional Information

Cost Price and Selling Price Relation

When the quantity of items for CP and SP are different, equate the values to find the ratio of SP/CP to determine profit or loss percentage.

Profit vs Loss Percentage

If SP > CP, it is a Gain. If CP > SP, it is a Loss. Both are always calculated on the Cost Price (CP) unless stated otherwise.

Q59. Answer: (c) 27, 17

Shortcut Trick

Identify pairs from options whose sum is 44 and LCM is 459.

Option 1: 20 + 24 = 44, but LCM ends in 0 (since 20 is a multiple of 10). Incorrect.

Option 3: 27 + 17 = 44. Since 17 is a prime number, LCM = 27 × 17 = 459. Correct.

Therefore The correct answer is 27, 17.

Alternate Method

Given: Sum of two numbers (x + y) = 44, LCM(x, y) = 459.

Formula: For any two numbers, Product = HCF × LCM. Also, if HCF = 1, Product = LCM.

=> Let the numbers be x and y.

=> x + y = 44

=> Factorizing 459: 459 = 3 × 3 × 3 × 17 = 27 × 17

=> Check the sum of factors: 27 + 17 = 44

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=> Since the sum matches the given condition, the numbers are 27 and 17.

Therefore The correct answer is 27, 17.

Additional Information

LCM and HCF Relationship

For any two numbers a and b, a × b = HCF(a, b) × LCM(a, b).

Co-prime Numbers

If two numbers are co-prime, their HCF is 1 and their LCM is simply the product of the two numbers.

Quadratic Approach

If sum S and product P (assuming HCF=1) are known, numbers are roots of $t^2 - St + P = 0$.

Q60. Answer: (b) 147

Shortcut Trick

The average of the first n odd natural numbers is always equal to n.

Here, the total number of terms n = 147.

Therefore Average = 147.

Therefore The correct answer is 147.

Alternate Method

Given:

Number of terms (n) = 147

Formula Used:

1. Sum of first n odd natural numbers = n^2
2. Average = Sum of observations ÷ Total number of observations
3. n^(th) odd number = 2n − 1

Calculations:

=> Sum of first 147 odd numbers = 147^2

=> Average = $147^2 \div 147$

=> Average = 147

OR using AP properties:

=> First term (a) = 1

=> Last term (l) = 2 × 147 − 1 = 293

=> Average = (First term + Last term) ÷ 2

=> Average = (1 + 293) ÷ 2 = 294 ÷ 2 = 147

Therefore The correct answer is 147.

Additional Information

Average of First n Even Numbers

The average of the first n even natural numbers is always (n + 1). For example, the average of 2, 4, 6 is (3 + 1) = 4.

Sum of First n Natural Numbers

The sum of first n natural numbers is given by [n(n + 1)] ÷ 2, and their average is (n + 1) ÷ 2.

Sum of First n Squares

The sum of squares of the first n natural numbers is [n(n + 1)(2n + 1)] ÷ 6.

Q61. Answer: (a) 527 km/hr

Shortcut Trick

Total distance = 843 km, Total time = 11 hours.

First part: 34 × 4 = 136 km in 4 hours.

Second part: 180 km in 180 ÷ 30 = 6 hours.

Remaining distance = 843 − (136 + 180) = 527 km.

Remaining time = 11 − (4 + 6) = 1 hour.

Required speed = 527 ÷ 1 = 527 km/hr.

Therefore The correct answer is 527 km/hr.

Alternate Method

Given:

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Total Distance = 843 km, Total Time = 11 hours.
Phase 1: Speed1 = 34 km/hr, Time1 = 4 hours.
Phase 2: Distance2 = 180 km, Speed2 = 30 km/hr.
Calculations:
=> Distance1 = Speed1 × Time1 = 34 × 4 = 136 km.
=> Time2 = Distance2 ÷ Speed2 = 180 ÷ 30 = 6 hours.
=> Total Distance Covered = 136 + 180 = 316 km.
=> Total Time Elapsed = 4 + 6 = 10 hours.
=> Remaining Distance = 843 − 316 = 527 km.
=> Remaining Time = 11 − 10 = 1 hour.
=> Required Speed = Remaining Distance ÷ Remaining Time = 527 ÷ 1 = 527 km/hr.
Therefore The correct answer is 527 km/hr.
Additional Information
Basic Speed Formula
Speed is defined as the distance covered per unit time. Formula: Speed = Distance ÷ Time.
Average Speed
For a journey with different speeds and distances, Average Speed = Total Distance ÷ Total Time.
Unit Conversion
To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q62. Answer: (c) 162

Shortcut Trick
Let the second number be 1 unit.
Then the first number is 5 units.
Product = 5 × 1 = 5 square units = 3645.
1 square unit = 3645 ÷ 5 = 729 => 1 unit = √729 = 27.
Sum = (5 + 1) units = 6 units = 6 × 27 = 162.
Therefore The correct answer is 162.
Alternate Method
Given:
Product of two positive numbers = 3645
First number = 5 × Second number
Let the second number be x.
Then the first number = 5x.
=> 5x × x = 3645
=> $5x^2 = 3645$
=> $x^2 = 3645 \div 5$
=> $x^2 = 729$
=> $x = \sqrt{729} = 27$
=> First number = 5 × 27 = 135
=> Sum = 135 + 27 = 162
Therefore The correct answer is 162.
Additional Information
Square Roots
It is helpful to memorize squares up to 30; for example, $25^2 = 625$, $26^2 = 676$, and $27^2 = 729$.
Ratio and Product Relationship
If two numbers are in ratio a:b and their product is P, then the constant $x = \sqrt{(P \div (ab))}$.
Positive Numbers Constraint
Since the question specifies positive numbers, we only consider the positive square root of x^2.

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Q63. Answer: (d) 1/57

Shortcut Trick

Combined efficiency of A and B = 1/9 + 1/19 = 28/171 per day.

Work done in 6 days = 6 × (28/171) = 2 × (28/57) = 56/57.

Work left = 1 − 56/57 = 1/57.

Therefore The correct answer is 1/57.

Alternate Method

Given: Time taken by A = 9 days, Time taken by B = 19 days. Working period = 6 days.

Formula Used: Total Work = LCM of individual days; Efficiency = Total Work ÷ Days.

Person	Days	Total Work	Efficiency
A	9	171	19
B	19	9	

=> Total Efficiency of (A + B) = 19 + 9 = 28 units/day

=> Work completed in 6 days = 28 × 6 = 168 units

=> Remaining work = Total Work − Completed Work = 171 − 168 = 3 units

=> Fraction of work left = Remaining Work ÷ Total Work = 3/171

=> 3/171 = 1/57

Therefore The correct answer is 1/57.

Additional Information

Work and Efficiency Relation

Efficiency is inversely proportional to the time taken to complete a work. If a person completes work in 'n' days, their 1-day work (efficiency) is 1/n.

Combined Work Formula

If two people A and B can finish a work in 'x' and 'y' days respectively, they together finish it in (xy)/(x + y) days.

Remaining Work Calculation

If the fraction of work completed is 'w', then the fraction of work left is always (1 − w).

Q64. Answer: (c) Rs. 7,120

Shortcut Trick

Given: 8 A = 3 B = 6 C.

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

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

Total units = 3 + 8 + 4 = 15 units ≡ Rs. 35,600.

A share = (3/15) × 35,600 = (1/5) × 35,600 = Rs. 7,120.

Therefore The correct answer is Rs. 7,120.

Alternate Method

Given: Total amount = Rs. 35,600 | 8A = 3B = 6C.

Formula: Share of X = (Ratio of X / Total Ratio Sum) × Total Amount

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

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

=> A : B : C = 1/8 : 1/3 : 1/6

=> LCM of 8, 3, 6 is 24. Multiply each term by 24.

=> A : B : C = 3 : 8 : 4

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

=> Share of A = (3 / 15) × 35,600

=> Share of A = 1/5 × 35,600 = 7,120

Therefore The correct answer is Rs. 7,120.

Additional Information

Inverse Proportion in Ratios

When quantities are given as n1A = n2B = n3C, the ratio A : B : C is found by taking the reciprocal of the coefficients: 1/n1 : 1/n2 : 1/n3.

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Compound Ratio

The compound ratio of two or more ratios is obtained by multiplying the antecedents together and the consequents together.

Proportional Division

To divide a quantity S in ratio a:b:c, the parts are [a/(a+b+c)]×S, [b/(a+b+c)]×S, and [c/(a+b+c)]×S.

Q65. Answer: (b) 72

Shortcut Trick

For two numbers a and b, the mean proportional is √(a × b).

Here, a = 324 and b = 16.

Mean proportional = √(324 × 16) = √324 × √16 = 18 × 4 = 72.

Therefore The correct answer is 72.

Alternate Method

Given: First number (a) = 324, Second number (b) = 16.

Formula Used: If x is the mean proportional between a and b, then a : x :: x : b.

=> $x^2 = 324 \times 16$

=> $x = \sqrt{(324 \times 16)}$

=> $x = 18 \times 4$

=> $x = 72$

Therefore The correct answer is 72.

Additional Information

Third Proportional

The third proportional of two numbers a and b is defined as c such that a : b :: b : c, given by $c = b^2/a$.

Fourth Proportional

For three numbers a, b, and c, the fourth proportional d is calculated as a : b :: c : d, where d = (b × c)/a.

Duplicate Ratio

The duplicate ratio of a : b is $a^2 : b^2$, while the sub-duplicate ratio is √a : √b.

Q66. Answer: (a) 16/9

Given:

5/3+(1/(1+2/7))-2/3

Formula Used:

Simplify the inner fraction first

Add and subtract rational numbers

Calculation:

=> 1+2/7=9/7

=> 1/(9/7)=7/9

=> 5/3-2/3=3/3=1

=> 1+7/9=9/9+7/9=16/9

Therefore The correct answer is 16/9.

Q67. Answer: (d) 5

Shortcut Trick

Check the unit digit of the number 481355.

If the unit digit is 0 or 5, the number is divisible by 5.

Unit digit of 481355 is 5.

Therefore The correct answer is 5.

Alternate Method

Given: Number = 481355

Divisibility Rules:

=> Divisibility by 3: Sum of digits (4+8+1+3+5+5) = 26. Since 26 is not divisible by 3, the number is not divisible by 3.

=> Divisibility by 6: A number must be divisible by both 2 and 3. 481355 is odd, so not divisible by 2 or 6.

=> Divisibility by 5: The last digit is 5, so it is divisible by 5.

=> Divisibility by 15: Needs divisibility by both 3 and 5. Since it is not divisible by 3, it is not divisible by 15.

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Therefore The correct answer is 5.

Additional Information

Divisibility by 2

A number is divisible by 2 if its last digit is even (0, 2, 4, 6, or 8).

Divisibility by 9

A number is divisible by 9 if the sum of its digits is divisible by 9.

Divisibility by 10

A number is divisible by 10 if its unit digit is 0.

Q68. Answer: (d) 288

Shortcut Trick

Effective Rate of Interest for the entire duration = Rate × Time

=> Effective % = 16% × 4.5 = 72%

Simple Interest = 72% of Rs. 400 = 72 × 4 = Rs. 288

Therefore The correct answer is Rs. 288.

Alternate Method

Given:

Principal (P) = Rs. 400

Rate of Interest (R) = 16% per annum

Time period (T) = 4.5 years

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Calculations:

=> SI = (400 × 16 × 4.5) ÷ 100

=> SI = 4 × 16 × 4.5

=> SI = 64 × 4.5

=> SI = Rs. 288

Therefore The correct answer is Rs. 288.

Additional Information

Total Amount (A)

The total sum returned after the time period is called the Amount. Formula: A = Principal + Simple Interest.

Constant Interest

In Simple Interest, the interest remains the same for every year because it is always calculated on the original Principal.

Effective Rate Method

For quick calculations, multiply the rate (R) and time (T) to find what percentage of the Principal is the total Interest.

Q69. Answer: (c) 51.4

Shortcut Trick

Assume an assumed mean of 50 kg.

Calculate deviations: (40−50), (49−50), (56−50), (74−50), (38−50) → −10, −1, +6, +24, −12.

Sum of deviations = −10 − 1 + 6 + 24 − 12 = +7.

Average deviation = 7 ÷ 5 = 1.4.

Actual Average = Assumed Mean + Average Deviation = 50 + 1.4 = 51.4 kg.

Therefore The correct answer is 51.4 kg.

Alternate Method

Given:

Weights of five members: 40 kg, 49 kg, 56 kg, 74 kg, and 38 kg.

Formula Used:

Average = (Sum of all observations) ÷ (Total number of observations)

Calculations:

=> Sum of weights = 40 + 49 + 56 + 74 + 38

=> Sum of weights = 257 kg

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=> Number of members = 5
=> Average weight = 257 ÷ 5
=> Average weight = 51.4 kg
Therefore The correct answer is 51.4 kg.
Additional Information
Properties of Averages
If each observation is increased or decreased by a constant value 'k', the average also increases or decreases by 'k'.
Sum of Deviations
The sum of the deviations of all the observations from their arithmetic mean is always zero.
Combined Average Formula
If two groups have sizes n1 and n2 with averages A1 and A2, then the combined average = (n1A1 + n2A2) ÷ (n1 + n2).

Q70. Answer: (c) 31.25

Given:
65% of 65
(1)/(5) of 55
Formula Used:
Percentage × Total = Value
Fraction × Total = Value
Difference = Greater Value - Smaller Value
Calculation:
=> 65% of 65 = (65 ÷ 100) × 65
=> 65 ÷ 100 = 0.65
=> 0.65 × 65 = 42.25
=> (1)/(5) of 55 = (1 ÷ 5) × 55
=> 1 ÷ 5 = 0.2
=> 0.2 × 55 = 11
=> Difference = 42.25 - 11 = 31.25
Therefore The correct answer is 31.25.

Q71. Answer: (b) 9

Given : DRAG' is coded as '5824' and 'GRAM' is coded as '4592'
DRAG' '5824'
'GRAM' '4592'
code for 'M' is 9.
Hence, the correct answer is "Option 2"

Q72. Answer: (c) 1

'EARS' is coded as '1357' and 'SOUP' is coded as '2146'.
'EARS' '1357'
'SOUP' '2146'.
Code for S is 1.
Hence, the correct answer is "Option 3"

Q73. Answer: (c) BIE

The pattern followed here is
Hence, the correct answer is "Option 3"

Q74. Answer: (c) 10

Given : (Left) 625 247 156 289 362 (Right)
Resultant if the third digit of the highest number is added to the second digit of the lowest number
625, 156 = 5 + 5 = 10.
Hence, the correct answer is "Option 3"

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Q75. Answer: (a) 96

Given : 19 + 40 − 8 × 2 ÷ 1 = ?

'−' and '÷' are interchanged and '×' and '+' are interchanged

Here, we use the BODMAS table given below:

After Interchanged :

19 × 40 ÷ 8 + 2 - 1 = ?

19 × 5 + 2 - 1 = ?

95 + 2 - 1 = ?

96.

Hence, the correct answer is "Option 1"

Q76. Answer: (a) 4

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

• No box is kept above G.

• Only three boxes are kept between G and B.

• Only one box is kept between F and D.

• D is kept immediately above B.

• Only four boxes are kept between F and E.

• A is kept at some place above C

The Final Arrangement is,

G
F
A
D
B
C
E

Hence, the correct answer is "Option 1"

Q77. Answer: (c) LO-QI

The logic followed here is:

Hence, the correct answer is "Option 3"

Q78. Answer: (a) 105.5

• 121 → 117.9 (−3.1)

• 117.9 → 114.8 (−3.1)

• 114.8 → 111.7 (−3.1)

• 111.7 → 108.6 (−3.1)

The pattern is subtract 3.1 each time.

So the next term is:

108.6 − 3.1 = 105.5

Hence, the correct answer is "Option 1"

Q79. Answer: (b) VEN -10

The logic followed here is:

Hence, the correct answer is "Option 2"

Q80. Answer: (a) Three

Given number 4512689

Ascending order from left to right.

Hence, the correct answer is "Option 1"

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Q81. Answer: (c) 3

Given : (Left) % € 9 2 5 * $ € © @ % % 1 7 $ * @ 6 7 3 & * (Right)

Required Conditions: Number - Symbol - Symbol

(Left) % € 9 2 5 * $ € © @ % % 1 7 $ * @ 6 7 3 & * (Right)

Hence, the correct answer is "Option 3"

Q82. Answer: (c) X

Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

• Only three boxes are kept above V.

• Only one box is kept between F and V.

• Only three boxes are kept between F and U.

• U is kept at some place above V.

• E is kept immediately below U.

• G is kept at one of the places above X.

• W is not kept immediately above or below F

The Final Arrangement is,

W
U
E
V
G
F
X

Hence, the correct answer is "Option 3"

Q83. Answer: (c) Only conclusion (II) follows.

The least possible Venn diagram is given according to the given information.

Conclusions:

(I) Some pants are coats.- False (As their is no direct relation between pants and coats. Some pants are coats is may be possible but not definite. Hence it is false.)

(II) Some sweaters are pants. - True (Some pants are sweaters.Some sweaters are pants is true)

Only conclusion (II) follows.

Hence, the correct answer is "Option 3"

Q84. Answer: (b) FI-BC

The logic followed here is:

Hence, the correct answer is "Option 2"

Q85. Answer: (d) EH-GK

The logic follows here,

Hence, the correct answer is "Option 4"

Q86. Answer: (c) N

L, M, N, O, Q, R, and S are sitting around a circular table facing the centre of the table.

• S sits fourth to the left of O.

• R sits fourth to the right of M.

• Only two people sit between O and M when counted from the left of O.

• L is not an immediate neighbour of R or O.

• N is not an immediate neighbour of L.

• The Final Arrangement is,

Hence, the correct answer is "Option 3"

Q87. Answer: (d) DUST - UDST - TSUD

The logic follows here,

Hence, the correct answer is "Option 4"

Q88. Answer: (b) J

H, I, J, K, U, V and W are sitting around a circular table facing the centre of the table.

• Only I sits between V and H.

• H sits third to the left of K.

• W sits to the immediate left of K.

• J is not an immediate neighbour of H.

The Final Diagram,

Hence, the correct answer is "Option 2"

Q89. Answer: (a) Mother's mother

Preparing the family tree diagram by using the following symbols:

As per the given information:

Hence, the correct answer is "Option 1"

Q90. Answer: (d) 35

Here, we use the BODMAS table given below:

Given:

56 × 8 − 13 ÷ 3 + 11 = ?

+' and '−' are interchanged and '×' and '÷' are interchanged

56 ÷ 8 + 13 × 3 − 11 = ?

7 + 13 × 3 − 11 = ?

7 + 39 − 11 = ?

46 − 11 = ?

35.

Hence, the correct answer is "Option 4"

Q91. Answer: (b) 400

The logic follows here,

Hence, the correct answer is "Option 2"

Q92. Answer: (d) 58

Laksh's rank from the top = 44

Laksh's rank from the bottom = 15

Total number of students in the class = Laksh's rank from the top + Laksh's rank from the bottom - 1

= 44 +15 - 1 → 58

Hence, the correct answer is "Option 4"

Q93. Answer: (a) Only conclusion (I) follows.

The least possible Venn diagram will be as follows:

Conclusions:

I. No Trucks are Tractors. - True (All Tractors are Buses.No Buses are Trucks.Hence, it is True)

II. Some Trucks are Tractors. - False (As their is no direct relation between Trucks and Tractors may be it is possible but not definite. Hence, it is false)

Only conclusion (I) follows.

Hence, the correct answer is "Option 1"

Q94. Answer: (a) 44

The logic follows here,

Hence, the correct answer is "Option 1"

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Q95. Answer: (a) 6 km to the west

• Shreyas starts from Point A and drives 9 km towards the north.
• He then takes a left turn and drives 6 km, then turns left and drives 13 km.
• He then takes a left turn and drives 12 km.
• He takes a final left turn, drives 4 km and stops at Point P.
The Final Duagram,
Hence, the correct answer is "Option 1"

Q96. Answer: (d) HLRQ

The logic followed here is:
Hence, the correct answer is "Option 4"

Q97. Answer: (d) 17

Given : 7 − 4 + 15 ÷ 52 × 13 = ?
• means −, − means ×, × means ÷ and ÷ means +,
7 × 4 − 15 + 52 ÷ 13 = ?
7 × 4 − 15 + 4 = ?
28 + 4 − 15 = ?
17.
Hence, the correct answer is "Option 4"

Q98. Answer: (b) 83, 171

Logic : (First Number x 2) + 5 = Second Number.
Similarly,
Hence, the correct answer is "Option 2"

Q99. Answer: (a) 4 km towards the west

• Anil starts from Point A and drives 7 km towards the south.
• He then takes a right turn, drives 5 km, turns right and drives 2 km.
• He then takes a right turn and drives 9 km.
• He takes a final left turn, drives 5 km and stops at Point F
The Final Diagram,
Hence, the correct answer is "Option 1".

Q100. Answer: (d) MHYV

Here is the alphabetical place value for each letter:
Hence, the correct answer is "Option 4".

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