RRB NTPC (UG) CBT-I Official Paper (Held On: 22 Aug, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. When referring to the conventional rod puppet shows of West Bengal, what is the name used?

(a) Putul Nautch
(b) Kathputli
(c) Yakshagana
(d) Gombeyatta

Q2. In May 2025, DRDO inaugurated a new research centre focusing on which advanced technology?

(a) Artificial Intelligence
(b) Robotics
(c) Quantum Technology
(d) Nanotechnology

Q3. Which among the following two organisations signed an Memorandum of Understanding to establish an incubation centre promoting innovation in solar energy and green hydrogen in May 2025?

(a) Ministry of New and Renewable Energy and Bharat Heavy Electricals Limited
(b) Defence Research and Development Organisation and National Thermal Power Corporation
(c) National Institution for Transforming India Aayog and Indian Space Research Organisation
(d) National Solar Energy Federation of India and National Institute of Solar Energy

Q4. Which DRDO-developed system, tested in 2025, is designed to detect and neutralise multiple types of underwater threats?

(a) Varunastra
(b) Maareech
(c) MIGM
(d) Takshak

Q5. Bhaga and Chandra streams join at which place in Himachal Pradesh forming the river Chenab?

(a) Tandi
(b) Kullu
(c) Rohtang Pass
(d) Verinag Spring

Q6. Which Fundamental Right guarantees Freedom of Speech, Assembly and Movement?

(a) Right to Cultural Rights
(b) Right to Equality
(c) Right to Freedom
(d) Right to Constitutional Remedies

Q7. Which of the following is the correct method to create a new folder using the File menu in Windows 7?

(a) Open Computer → Right-click drive → File → New → Folder
(b) Open Computer → Open desired drive (e.g., D:) → Click on File → New → Folder
(c) Start → File → Folder → New
(d) Control Panel → File → Create → New Folder

Q8. In which year was the first metro line in India, between Esplanade and Bhowanipur in Kolkata, inaugurated—marking the beginning of metro rail services in the country?

(a) 1994
(b) 1977
(c) 1990
(d) 1984

Q9. How many significant figures are there in 2.308 cm?

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

Q10. Which of the following is NOT a function under the Twelfth Schedule of the Constitution?

(a) Public health
(b) Foreign trade promotion
(c) Urban poverty alleviation
(d) Urban planning

Q11. What does Ctrl + F help users to do?

(a) Find a file on the desktop
(b) Forward an email
(c) Find text in the current document or webpage
(d) Format the document

Q12. Who was appointed as the Chief Election Commissioner of India in February 2025?

(a) Sunil Arora
(b) Sushil Chandra
(c) Gyanesh Kumar
(d) Rajiv Kumar

Q13. Who among the following Delhi sultans accidentally died during a game of polo in the year 1210?

(a) Qutbuddin Aibak
(b) Jalaluddin Khilji
(c) Firuz Shah Tughluq
(d) Ibrahim Lodi

Q14. Kartik Aaryan won the Best Performance in a Leading Role (Male) award at the 25th IIFA Awards held in March 2025 at Jaipur for his performance in which of the following films?

(a) Chandu Champion
(b) Shehzada
(c) Satyaprem Ki Katha
(d) Bhool Bhulaiyaa 3

Q15. The February 2025 Technology Adoption Fund launched by IN-SPACe has earmarked _____ to support private space start-ups.

(a) Rs. 100 crore
(b) Rs. 1,000 crore
(c) Rs. 500 crore

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(d) Rs. 250 crore

Q16. This revolutionary freedom fighter co-founded the Hindustan Socialist Republican Association in 1928. Along with B K Dutt, he threw a bomb in the Central Legislative Assembly in 1929. He was tried and executed at the age of 23, along with revolutionaries Sukhdev Thapar and Shivaram Rajguru. The freedom fighter is:

(a) Ramprasad Bismil
(b) Bhagat Singh
(c) Uddham Singh
(d) Chandrasekhar Azad

Q17. The Inter-State Council is constituted under which Article?

(a) Article 263
(b) Article 368
(c) Article 280
(d) Article 346

Q18. Clean cooking fuel is essential for rural women's health and environmental sustainability. Which scheme provides LPG connections to women in BPL households?

(a) Pradhan Mantri Awaas Yojana - Gramin
(b) Pradhan Mantri Ujjwala Yojana
(c) Pradhan Mantri Gram Sadak Yojana
(d) Saansad Adarsh Gram Yojana

Q19. In which city was the agreement signed in March 2025 to resolve the border dispute between Kyrgyzstan and Tajikistan?

(a) Batken
(b) Bishkek
(c) Osh
(d) Dushanbe

Q20. If we derive an expression for velocity, its dimension should be _____.

(a) $M^0L^1T^1$
(b) $M^1L^{(-1)}T^{(-2)}$
(c) $M^{(-1)}L^1T^{(-1)}$
(d) $M^0L^1T^{(-1)}$

Q21. Which of the following processes is absent in C4 plants?

(a) Transpiration
(b) Photorespiration
(c) Photosynthesis
(d) Respiration

Q22. Which valuable tree grows mainly in the western Himalayas and is used in construction?

(a) Magnolia
(b) Rhododendron
(c) Cinchona
(d) Deodar

Q23. Which of the following is cited as evidence for a highly centralised administration in the Indus-Sarasvati civilisation?

(a) Elaborate royal tombs
(b) Absence of seals and standard script
(c) Standardised weights and measures
(d) Monumental palaces and temples

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Q24. Which non-constitutional body investigates corruption complaints against public servants?

(a) Finance Commission
(b) Lokpal
(c) Election Commission
(d) Union Public Service Commission

Q25. Which Indian Army officer has written the book titled 'Ready, Relevant and Resurgent: A Blueprint for the Transformation of India's Military', which was unveiled by the Defence Minister Rajnath Singh in May 2025?

(a) CDS General Anil Chauhan
(b) Lieutenant General NS Raja Subramani
(c) Lieutenant General Rajiv Ghai
(d) General Upendra Dwivedi

Q26. The brothers Sidhu and Kanhu were the leaders of which of the following tribal uprisings?

(a) Koya revolts
(b) Santhal Rebellion
(c) Kol Mutiny
(d) Ho uprising

Q27. Which of the following is/are an ancient set of inscriptions, promoting moral values and governance principles and is considered one of the earliest written records in Indian history?

(a) Arthashastra
(b) Upanishads
(c) Vedas
(d) Edicts of Ashoka

Q28. Which of the following human activities contributes the most to the increase in atmospheric carbon dioxide levels?

(a) Construction of dams
(b) Burning of fossil fuels
(c) Use of fertilisers in agriculture
(d) Afforestation

Q29. Which of the following organisations developed the nanoporous multilayered polymeric membrane for high-pressure seawater desalination in May 2025?

(a) Council of Scientific and Industrial Research (CSIR)
(b) Department of Science and Technology (DST)
(c) Defence Research and Development Organisation (DRDO)
(d) Indian Space Research Organisation (ISRO)

Q30. The Juvenile Justice (Care and Protection of Children) Act, 2015, allows juveniles aged 16-18 to be tried as adults in cases of:

(a) theft
(b) drug abuse
(c) cybercrime
(d) heinous crimes

Q31. According to constitutional provisions, what is the maximum permissible size of a State Council of Ministers, including the Chief Minister?

(a) 20% of the total strength of the Legislative Assembly
(b) No specific limit is defined
(c) 15% of the total strength of the Legislative Assembly
(d) 10% of the total strength of the Legislative Assembly

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Q32. Which of the following is considered a major challenge to human development in India?

(a) Rapid urbanisation
(b) High foreign exchange reserves
(c) Increasing digital infrastructure
(d) Persistent regional disparities

Q33. During the colonial period, the services sector accounted for only _____.

(a) 22-29%
(b) 5-10%
(c) 15-20%
(d) 25-32%

Q34. In which of the following years was the first thermal power plant of the Calcutta Electric Supply Corporation Limited commissioned?

(a) 1909
(b) 1916
(c) 1925
(d) 1899

Q35. Which among the following state lies in the south of the Great Indian Desert?

(a) Madhya Pradesh
(b) Gujarat
(c) Uttar Pradesh
(d) Haryana

Q36. Where was Exercise Dharma Guardian, 2025, held?

(a) Pune, India
(b) New Delhi, India
(c) East Fuji, Japan
(d) Tokyo, Japan

Q37. Which Indian airport secured a position among the top 10 hub airports in the AsiaPacific and Middle East region in the 2024 ACI Hub Connectivity Rankings?

(a) Chhatrapati Shivaji Maharaj International Airport
(b) Chennai International Airport
(c) Kempegowda International Airport
(d) Indira Gandhi International Airport (IGIA)

Q38. Who among the following won a maiden Italian Open title in May 2025 by defeating world No. 1 Jannik Sinner in Rome?

(a) Daniil Medvedev
(b) Novak Djokovic
(c) Carlos Alcaraz
(d) Rafael Nadal

Q39. To harden the steel, which material is required in the steel industry?

(a) Mica
(b) Manganese
(c) Limestone
(d) Bauxite

Q40. Lala Lajpat Rai, Indian revolutionary politician and author was also recognised by which of the following title?

(a) Mahamana
(b) Tilak of Punjab
(c) Deshbandhu

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(d) Punjab Kesari

MATHEMATICS

Q41. If the marked price of a book is Rs. 900, then find the selling price of the book after getting discount of 13%

(a) Rs. 891
(b) Rs. 789
(c) Rs. 783
(d) Rs. 889

Q42. The average of three numbers is 20. If two of them are 18 and 28, the third number is:

(a) 15
(b) 16
(c) 14
(d) 13

Q43. An amount of Rs. 638 is divided among three persons in the ratio of 2 : 5 : 4. The difference between the largest and the smallest shares (in Rs.) in the distribution is:

(a) 76
(b) 110
(c) 157
(d) 174

Q44. 2 men can complete a piece of work in 18 days, while 4 women can do it in 6 days. In how many days can 6 women and 9 men complete this work?

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

Q45. If 2 times Mary’s present age is 20 years more than 6 times Diya's present age, and 5 times Diya's present age is 6 years less than Mary's present age, then what is the difference (in years) between the ages of Mary and Diya?

(a) 15
(b) 18
(c) 16
(d) 14

Q46. Anaya has to reach Hyderabad which is 574 km away in 18 hours. His starting speed for 11 hours was 36 km/hr. For the next 136 km his speed was 34 km/hr. By what speed he must travel now so as to reach Hyderabad in the decided time of 18 hours?

(a) 8 km/hr
(b) 14 km/hr
(c) 9 km/hr
(d) 20 km/hr

Q47. The simple interest on a certain sum for 71/3 years at the rate of 4.5% per annum is Rs. 6,270. What will be the amount payable on the same sum at the rate of 8.6% per annum simple interest in 111/2 years?

(a) Rs. 37,783
(b) Rs. 37,791
(c) Rs. 37,784
(d) Rs. 37,794

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Q48. Find the mean proportional between 18 and 32

(a) 24
(b) 21
(c) 26
(d) 23

Q49. If x = a cosecA sin B, y = b cosecA cos B, and z = c cot A, then, what is the value of $(x^2)/(a^2)+(y^2)/(b^2)-(z^2)/(c^2)$?

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

Q50. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 4% per month for 2 months.

(a) Rs. 96
(b) Rs. 16
(c) Rs. 28
(d) Rs. 8

Q51. The average runs scored by a batsman in 23 matches is 40. In the next 10 matches, the batsman scored an average of 14 runs. Find his average runs scored (rounded off to two decimal places) in all 33 matches.

(a) 32.12
(b) 33.12
(c) 31.12
(d) 34.12

Q52. Pipe A can fill a tank in 16 hours, pipe B can fill the same tank in 26 hours and pipe C can fill the same tank in 16 hours. The time taken by them to fill the same tank if they operate together is::

(a) 92/17hours
(b) 22/17hours
(c) 62/17hours
(d) 32/17hours

Q53. The value of $6^2+\sqrt{(3^2)}-7\sqrt{81}-16$ is.

(a) -50
(b) -40
(c) -37
(d) -32

Q54. The HCF and the LCM of two numbers are 24 and 288, respectively. If one of the numbers is 72, find the other one.

(a) 10
(b) 20
(c) 170
(d) 96

Q55. The LCM of $2^3\times 7^2\times 12$, $2^2\times 12^2\times 18$ and $7^3\times 12^2\times 18^2$ is:

(a) 2^7× 3^5× 7^3
(b) 2^7× 3^6× 7^4
(c) 2^7× 3^6× 7^3
(d) 2^7× 3^6× 7^2

Q56. Simplify $3((7/3)x^2-26x+13)-7(x^2+9x-11)$

(a) 141x − 116
(b) −141x − 116
(c) 141x + 116
(d) -141x + 116

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Q57. A trader claims to sell vegetables at a profit of 52%, but also dishonestly uses a weight which is 8% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round off the answer to the nearest whole number.)

(a) 61%
(b) 63%
(c) 69%
(d) 65%

Q58. A cylindrical rod has an outer curved surface area of 1100 cm^2. If the length of the rod is 29 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is

take ($\pi = 22/7$)

(a) 5.53
(b) 4.72
(c) 6.03
(d) 8.17

Q59. Simplify $13\times (3\times 4^2)\div 9+59-75$

(a) 157/3
(b) 160/9
(c) 160/3
(d) 157/9

Q60. If the length, breadth and height of a room are 10.5 m, 8.5 m and 11 m, respectively, then what is the area (in m^2) of the four walls of the room?

(a) 414
(b) 418
(c) 416
(d) 412

Q61. If the measure of each interior angle of a regular polygon is 140°, then the number of its diagonals will be:

(a) 25
(b) 16
(c) 27
(d) 20

Q62. Ritik and Sanjay together invested Rs. 77,600 in a business. At the end of the year, out of a total profit of Rs. 19,000, Sanjay's share was Rs. 7,600. What was the difference between their investments?

(a) Rs. 14,343
(b) Rs. 15,520
(c) Rs. 15,928
(d) Rs. 16,401

Q63. In an election between two candidates, 96% of the registered voters cast their vote and 15% of the votes polled were found invalid. The winning candidate got 80% of the valid votes and won the election by a margin of 1224 votes. How many voters were registered?

(a) 2503
(b) 2501
(c) 2500
(d) 2502

Q64. Which of the following numbers is divisible by 24?

(a) 7340390
(b) 6830908
(c) 7132968
(d) 7991987

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Q65. Pallavi bought a toy for Rs. 322, decorated it at a cost of Rs. 6 and sold the toy for Rs. 398. Find the loss or profit percentage.

(a) 885/41% loss
(b) 875/41% loss
(c) 875% profit
(d) 875/41% profit

Q66. If the 6-digit number N73M10 is divisible by 11, then which of the options below can give a possible correct relation between M and N?

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

Q67. A number when increased by 100% gives 2730. The number is:

(a) 2730
(b) 4095
(c) 1365
(d) 682.5

Q68. Ritesh and Gauri have to travel from Delhi to Kanpur in their respective cars. Ritesh is driving at 150 km/hr while Gauri is driving at 60 km/hr. Find the time taken by Gauri to reach Kanpur if Ritesh takes 8 hours.

(a) 20 hours
(b) 17 hours
(c) 14 hours
(d) 30 hours

Q69. A shopkeeper offers a scheme discount of 20% and an additional 5% discount if payment is made in cash. What is the total discount percentage on Rs. 1,000?

(a) 23%
(b) 26%
(c) 24%
(d) 25%

Q70. The cost of 19 pens and 13 pencils is Rs. 254. If the cost of a pen decreases by Rs. 6 and the cost of a pencil increases by Rs. 9, then the cost of 14 pens and 2 pencils is Rs. 106. What is the original cost of 12 pens and 15 pencils?

(a) Rs. 171
(b) Rs. 173
(c) Rs. 174
(d) Rs. 175

GENERAL INTELLIGENCE AND REASONING

Q71. Seven people, I, J, K, L, U, V and W are sitting in a row, facing north. Only three people sit to the left of V. Only I sits to the right of U. Only three people sit between U and W. J sits at some place to the left of K but at some place to the right of L. How many people sit between L and K?

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

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Q72. MKOJ is related to SQUP in a certain way based on the English alphabetical order. In the same way, KIMH is related to QOSN. To which of the following is HFJE related, following the same logic?

(a) LNKP
(b) NLPK
(c) LNPK
(d) NLKP

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

32 + 4 x 2 - 6÷9 =

(a) 84
(b) 81
(c) 83
(d) 82

Q74. In a certain code language, ‘always on time’ is written as ‘aj tj tr’ and ‘time is precious’ is coded as ‘lo tr mo’. How is ‘time’ coded in the given language?

(a) lo
(b) tr
(c) mo
(d) aj

Q75. If 1 is subtracted from each odd digit of the number 86071452 and then the digits are arranged in ascending order, find the sum of the digits, which are repeated more than once in the new number formed.

(a) 10
(b) 11
(c) 13
(d) 8

Q76. What should come in place of the question mark (?) in the given series?

33, 34, 36, 40, 48, ?

(a) 65
(b) 64
(c) 56
(d) 45

Q77. In a certain code language, ‘music is therapy’ is written as ‘ak bj jo’ and ‘stop the music’ is coded as ‘tu mt jo’. How is ‘music’ coded in the given language?

(a) mt
(b) ak
(c) tu
(d) jo

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

4 12 28 52 84 ?

(a) 125
(b) 124
(c) 130
(d) 120

Q79. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

DKS ELT FMU GNV ?

(a) ROX
(b) ROW

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(c) HOW
(d) HOX

Q80. This question is based on the five, three-digit numbers given below.
(Left) 256 987 325 489 723 (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 second digit of the highest number is added to the third digit of the lowest number?
(a) 16
(b) 10
(c) 14
(d) 12

Q81. 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) FH-KD
(b) MO-RL
(c) IK-NG
(d) CE-HA

Q82. Seven people, B, C, D, E, F, G and L, are sitting around a circular table facing the centre of the table. Only three people sit between B and F when counted from the left of B. Only three people sit between D and E when counted from the right of E. G sits to the immediate right of D. C is an immediate neighbour of E as well as F. Who sits to the second to the left of L?
(a) F
(b) E
(c) C
(d) B

Q83. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 3851764, what will be the sum of the digits that are second from the left and second from the right?
(a) 12
(b) 6
(c) 10
(d) 8

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) OQ -TV
(b) VX-AC
(c) GI-LM
(d) KM-PR

Q85. In a row of 163 students facing north, Mr. Maxi is 89th from the left end. If Mr. Han is 2nd to the right of Mr. Maxi, what is Mr. Han's position from the right end of the line?
(a) 72nd
(b) 75th
(c) 73rd
(d) 74th

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Q86. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

Some trees are plants.

Some plants are graphs.

Conclusions:

(I): Some trees are graphs.

(II): All graphs are plants.

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

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.

DIMS - SIDM - IMDS

COLT - TOCL - OLCT

(a) GUYS - SUGY - YUGS
(b) FROG - GRFO - ROFG
(c) TIME - ITME - EIMT
(d) FOUR - FUOR - RUOF

Q88. Seven boxes, A, B, C, D, K, L and O, are kept one over the other, but not necessarily in the same order. Only D is kept above C. Only L is kept between C and B. Only A is kept below K. How many boxes are kept between O and A?

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

Q89. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

KFU-15 IIQ-22 ? EOI-42 CRE-55

(a) HGL-31
(b) KJG-32
(c) KLJ-30
(d) GLM-31

Q90. Alexander starts from Point A and drives 12 km towards the south. He then takes a left turn and drives 4 km, then turns left and drives 17 km. He then takes a left turn and drives 9 km. He takes a final left turn, drives 5 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) 5 km to the east
(b) 3 km to the east
(c) 2 km to the east
(d) 4 km to the east

Q91. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) JM-QG

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(b) EH-LC
(c) LO-SJ
(d) OR-VM

Q92. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

FEI−HGK

YXB−AZD

(a) WVZ−YXB
(b) .SRV−TTW
(c) SQT−UTX
(d) SQT−TSW

Q93. Select the set in which the numbers are related in the same way as are the numbers of the following sets. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(46, 41, 26)

(77, 72, 57)

(a) (59, 54, 34)
(b) (93, 88, 83)
(c) (81, 71, 61)
(d) (62, 57, 42)

Q94. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) # 3 % 7 $ 5 * & 4 β 9 Ω 4 9 μ 8 @ $ 1 π 3 (Right)

How many such symbols are there that are immediately preceded by a number and also immediately followed by another number?

(a) Three
(b) Five
(c) One
(d) Six

Q95. Geeta starts from Point P and drives 6 km towards south. Then, she takes a right turn, drives 8 km, turns right again and drives 10 km. She then takes a right turn and drives 12 km. Then, she takes a left turn and drives 2 km; she takes a left turn again and drives 4 km and stops at Point Q. How far (shortest distance) and towards which direction should she drive in order to reach Point P again? (All turns are 90-degree turns only, unless specified.)

(a) 8 km towards south
(b) 4 km towards north
(c) 4 km towards south
(d) 6 km towards south

Q96. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All beds are pillows.

Some beds are curtains.

Conclusions:

(I) Some pillows are curtains.

(II) Some curtains are beds.

(a) Neither conclusion I nor II follows.
(b) Only conclusion II follows

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(c) Only conclusion I follows.
(d) Both conclusions I and II follow.

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

14 16 20 28 44 ?

(a) 83
(b) 76
(c) 96
(d) 63

Q98. A is the brother of H. H is the father of R. R is the daughter of M. G is the father of M. How is A related to M?

(a) Daughter's husband's brother
(b) Husband's father
(c) Husband's brother
(d) Daughter's husband's fathe

Q99. If 1 is subtracted from each even digit of the number 36719542, then what will be the product of digits that are repeated more than once in the new number formed?

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

Q100. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. Only four boxes are kept between A and D. Only F is kept above A. Only two boxes are kept between B and C. E is kept immediately above G. C is not kept immediately above E. How many boxes are kept above E?

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

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) Putul Nautch

The correct answer is Putul Nautch.

Key Points

• Putul Nautch is the traditional rod puppet performance of West Bengal. It is a significant form of folk art in the region, showcasing local customs, traditions, and stories.

• The term "Putul" refers to "doll" or "puppet," and "Nautch" means "dance." This form of art involves puppeteers skillfully manipulating rod puppets to narrate stories, often accompanied by music and dialogue.

• The puppets in Putul Nautch are typically large and finely crafted, with intricate costumes and decorations, reflecting the rich cultural heritage of West Bengal.

• The stories performed in Putul Nautch are often drawn from epic texts like the Ramayana and Mahabharata, as well as local folklore, making it a medium for preserving cultural narratives.

• The art form is highly interactive, with the puppeteers engaging with the audience through the use of humor, songs, and dramatic expressions to keep them entertained.

Additional Information

• Kathputli:

• Kathputli refers to the string puppetry tradition of Rajasthan. It involves wooden puppets controlled by strings and is an integral part of Rajasthani culture.

• The puppets are smaller in size compared to Putul Nautch puppets and are adorned with traditional Rajasthani attire.

• Yakshagana:

• Yakshagana is a traditional theatrical form of Karnataka, combining dance, music, and dialogue. It is not a puppet-based performance but rather a live enactment with actors.

• Yakshagana performances are often based on Hindu epics and local legends.

• Gombeyatta:

• Gombeyatta is the string puppet tradition of Karnataka. It features brightly colored puppets that are used to narrate stories, primarily from epics like the Ramayana and Mahabharata.

• Unlike Putul Nautch, Gombeyatta uses string-based manipulation to control the puppets.

Important Points

• Significance of Puppet Arts in India:

• India's puppetry traditions, including Putul Nautch, Kathputli, and Gombeyatta, are vital in preserving the rich cultural diversity of the country.

• These art forms serve as educational tools, teaching moral values, cultural heritage, and epic stories to audiences, especially in rural areas.

• Challenges and Revival Efforts:

• Many traditional art forms, including Putul Nautch, face challenges such as diminishing audiences and lack of financial support.

• Efforts are being made by government bodies and NGOs to revive these traditions through cultural festivals, workshops, and educational programs.

Q2. Answer: (a) Artificial Intelligence

The correct answer is Artificial Intelligence.

Key Points

• Defence Research and Development Organisation (DRDO), a premier organization under the Ministry of Defence, Government of India, focuses on enhancing the nation’s defence capabilities through advanced technology research and innovation.

• In May 2025, DRDO inaugurated a new research centre dedicated specifically to Artificial Intelligence (AI), marking a significant step in India’s technological advancements.

• The centre emphasizes the development and application of AI technologies in defence systems, including weaponry, surveillance, cybersecurity, and autonomous vehicles. This ensures the modernization of national defence systems.

• Artificial Intelligence is a rapidly advancing field focusing on creating intelligent systems capable of performing tasks that typically require human intelligence, such as decision-making, learning, and problem-solving.

• The establishment of such a centre aligns with India’s vision to become a global leader in defence technology and to achieve self-reliance in critical technologies under initiatives like ‘Atmanirbhar Bharat’.

• This initiative also strengthens India’s ability to counter emerging threats, such as cyberattacks, and enhances its capacity for surveillance and autonomous operational systems.

Additional Information

• Artificial Intelligence (AI):

• AI refers to the simulation of human intelligence in machines programmed to think and act like humans.

• Applications: It finds applications in various domains, including healthcare, finance, education, defence, and transportation.

• Examples in Defence: AI is used in autonomous drones, predictive maintenance systems, surveillance systems, and cybersecurity.

• Other Options:

• Robotics: While robotics is related to the field of AI, DRDO’s research centre in May 2025 was specifically focused on AI.

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Robotics involves the design and operation of robots, which are often powered by AI.

• Quantum Technology: Quantum technology uses principles of quantum mechanics for various applications like encryption and computing. While crucial for defence, it is not the focus of this newly inaugurated centre.

• Nanotechnology: Nanotechnology deals with the manipulation of matter on a molecular scale. It has applications in defence but is not the primary focus of the AI centre inaugurated by DRDO in 2025.

• India's Defence and AI:

• India is investing heavily in AI-based defence technologies, aiming to modernize its military and achieve self-reliance.

• DRDO’s AI research aims to enhance capabilities in areas like intelligence gathering, threat detection, and autonomous warfare systems.

Important Points

• AI in National Defence:

• AI enables the creation of autonomous systems that reduce human intervention in high-risk environments, such as military operations.

• It improves the efficiency of decision-making processes by analyzing large datasets and providing actionable insights.

• AI-powered defence systems can assist in real-time threat assessment, enhancing the nation’s combat readiness.

• Global Context:

• Countries like the USA, China, and Israel are pioneers in integrating AI into their defence systems. India’s focus on AI aligns with global trends in defence modernization.

Q3. Answer: (a) Ministry of New and Renewable Energy and Bharat Heavy Electricals Limited

The correct answer is Ministry of New and Renewable Energy and Bharat Heavy Electricals Limited.

Key Points

• The Ministry of New and Renewable Energy (MNRE) is the nodal ministry of the Government of India responsible for all matters relating to new and renewable energy. Its objective is to develop and deploy new and renewable energy for supplementing energy requirements in the country.

• The Bharat Heavy Electricals Limited (BHEL) is a public sector enterprise in India and one of the largest engineering and manufacturing companies in the country. It has expertise in areas like power generation, transmission, and renewable energy technologies.

• In May 2025, the MNRE and BHEL signed a Memorandum of Understanding (MoU) aimed at establishing an incubation centre. The primary goal of this centre is to promote innovation in solar energy and green hydrogen technologies.

• This collaboration is expected to drive advancements in clean energy solutions, contributing to India's commitment towards sustainability and reduction of carbon emissions.

• The MoU focuses on fostering research and development activities and facilitating the incubation of startups and innovators in the renewable energy sector.

• Both organizations aim to support India's target of achieving net zero emissions by 2070 through the adoption of innovative renewable energy technologies.

• Hence, the correct answer is Ministry of New and Renewable Energy and Bharat Heavy Electricals Limited.

Additional Information

• Ministry of New and Renewable Energy (MNRE):

• The Ministry of New and Renewable Energy is a Government of India ministry that promotes clean and renewable energy sources.

• It is involved in the development of solar energy, wind energy, bio-energy, and hydropower.

• The MNRE plays a key role in implementing the National Solar Mission, which aims to establish India as a global leader in solar energy.

• Bharat Heavy Electricals Limited (BHEL):

• BHEL was established in 1964 and has its headquarters in New Delhi, India.

• It is one of the largest engineering and manufacturing companies in India, focusing on power plant equipment.

• BHEL has expertise in various sectors, including thermal, hydro, and nuclear power, as well as renewable energy technologies such as solar and wind power.

• Green Hydrogen Technology:

• Green hydrogen is produced using renewable energy sources, such as solar and wind power, through a process called electrolysis.

• It is considered a clean energy source as it produces no greenhouse gas emissions.

• Green hydrogen has applications in industries like transportation, power generation, and manufacturing.

• Solar Energy:

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• Solar energy is harnessed from sunlight using technologies such as solar panels and solar thermal systems.

• It is a key component of India's renewable energy strategy, contributing to the reduction of fossil fuel dependency.

• India aims to achieve 280 GW of solar capacity by 2030 under its renewable energy goals.

Important Points

• Significance of the MoU:

• The collaboration between MNRE and BHEL is crucial for accelerating the development of renewable energy technologies in India.

• It aligns with India's commitment to the Paris Agreement on climate change and its goal to achieve net zero emissions by 2070.

• Such initiatives also promote the Make in India program by encouraging local manufacturing and innovation in the renewable energy sector.

• India's Renewable Energy Goals:

• India aims to achieve 500 GW of non-fossil fuel energy capacity by 2030.

• It is one of the global leaders in renewable energy, with significant investments in solar, wind, and green hydrogen.

• Programs such as the National Hydrogen Mission and National Solar Mission play a pivotal role in achieving these targets.

Q4. Answer: (a) Varunastra

The correct answer is Varunastra.

Key Points

• Varunastra is an advanced heavyweight torpedo designed and developed by the Defence Research and Development Organisation (DRDO) of India.

• It is specifically engineered to detect and neutralize multiple types of underwater threats, such as submarines, enemy vessels, or other underwater adversaries.

• The torpedo is capable of operating in shallow and deep waters, making it highly versatile for various maritime combat scenarios. Hence, Varunastra is the correct answer.

• Equipped with state-of-the-art features such as self-propulsion, advanced sonar, and guidance systems, Varunastra is designed to achieve high-speed underwater operations.

• Varunastra has been inducted into the Indian Navy and stands as a testament to India's capability in developing indigenous defense technologies. Hence, Varunastra is highly significant in underwater warfare.

Additional Information

• Varunastra:

• Varunastra is named after the mythological weapon of Lord Varuna, the Hindu god of water. This reflects its role in underwater warfare.

• It is an electric heavyweight torpedo that can be launched from both submarines and ships, adding to its operational flexibility.

• The torpedo is equipped with advanced sonar and acoustic homing capabilities, enabling it to locate and track enemy submarines with high precision.

• Key Features: The weapon has anti-jamming capabilities, a range of up to 40 kilometers, and a speed of 40 knots, making it a highly efficient underwater weapon.

• Other Options::

• Maareech: Maareech is a torpedo defense system developed by DRDO to protect ships from incoming enemy torpedoes. It is not designed for attacking underwater threats, making it different from Varunastra.

• MIGM: This is a hypothetical or lesser-known system in the context of DRDO-developed systems for underwater threats, as it does not align with the current scope of DRDO's widely acknowledged systems.

• Takshak: This name is not associated with DRDO's underwater defense systems. It may refer to other non-related projects or mythological contexts.

Important Points

• DRDO’s Contribution:

• The Defence Research and Development Organisation (DRDO) plays a pivotal role in enhancing India's defense capabilities by developing cutting-edge technologies, including torpedoes, missiles, and radar systems.

• Varunastra is a prime example of India's push for indigenization in defense manufacturing, reducing dependency on foreign imports.

• Significance of Underwater Defense:

• Advanced underwater systems like Varunastra are essential for securing India's maritime borders and addressing potential threats in strategic regions like the Indian Ocean.

• These systems play a crucial role in anti-submarine warfare and provide a strategic advantage in modern naval combat.

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Q5. Answer: (a) Tandi

The correct answer is Tandi.

Key Points

• Tandi is the place in the state of Himachal Pradesh where the Bhaga and Chandra rivers meet to form the Chenab River.

• The Bhaga River originates from the Bara Lacha Pass, and the Chandra River originates from the Chandra Taal Lake.

• Tandi is situated in the Lahaul and Spiti district of Himachal Pradesh, a region known for its scenic beauty and high-altitude geography.

• Chenab River is one of the five major rivers of the Indus River System and is a significant water source for Northern India.

• The confluence of the Bhaga and Chandra at Tandi is of geographical and hydrological importance as it forms the headwaters of the Chenab River.

• The Chenab flows through Himachal Pradesh and Jammu and Kashmir before entering Pakistan, where it merges with the Indus River system.

• The location of Tandi is also spiritually significant for the local people, as rivers in India often hold cultural and religious importance.

Additional Information

• Bhaga and Chandra Rivers:

• The Bhaga River originates from the Bara Lacha Pass, a high-altitude mountain pass in Himachal Pradesh.

• The Chandra River has its source in the Chandra Taal Lake, also located in the Lahaul region of Himachal Pradesh.

• The two rivers traverse through rugged terrains and deep valleys before converging at Tandi.

• Chenab River:

• The Chenab is a major river in the Indus River System, with significant importance for irrigation and hydropower.

• It flows through multiple regions in India and Pakistan, covering a distance of approximately 960 kilometers.

• In Pakistan, it is known as “Chandrabagha”, reflecting the combination of the Bhaga and Chandra rivers.

• The Chenab plays a pivotal role in the Indus Waters Treaty, which governs water-sharing between India and Pakistan.

• Geographical Importance of Tandi:

• Tandi serves as a key geographical landmark in Himachal Pradesh, marking the formation of the Chenab River.

• The region around Tandi is known for its high-altitude roads, trekking routes, and scenic landscapes.

• It is also a significant stopover for travelers heading towards Leh and other regions in Ladakh.

Important Points

• Other Options in the Question:

• Kullu: A popular tourist destination in Himachal Pradesh known for its valleys and temples, but not related to the confluence of the Bhaga and Chandra rivers.

• Rohtang Pass: A high-altitude mountain pass near Manali, famous for its scenic beauty and access to Lahaul and Spiti, but not the confluence point.

• Verinag Spring: Located in Jammu and Kashmir, it is the source of the Jhelum River, making it unrelated to the Chenab River.

• Hydrological Significance:

• The confluence of rivers like Bhaga and Chandra is a key feature in understanding the hydrology of the region.

• Such confluences often have significant ecological and cultural importance in India.

Q6. Answer: (c) Right to Freedom

The correct answer is Right to Freedom.

Key Points

• Right to Freedom is provided under Articles 19 to 22 of the Indian Constitution. It ensures essential freedoms to all citizens.

• Article 19 guarantees six fundamental freedoms, including freedom of speech and expression, assembly, association, movement, residence, and profession.

• These freedoms are subject to reasonable restrictions imposed by the state in the interests of sovereignty, integrity, public order, morality, decency, and security of the state.

• Freedom of Speech: This ensures the right to express thoughts and opinions freely, including through oral communication, written words, or any other medium.

• Freedom of Assembly: This allows people to gather peacefully without arms for protests or meetings, provided it does not disturb public order or security.

• Freedom of Movement: This ensures citizens can travel freely anywhere within the country, promoting unity and integration.

• Hence, the correct answer is Right to Freedom.

Additional Information

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• Other Fundamental Rights:

• Right to Equality: Provided under Articles 14-18, this ensures equality before the law, prohibition of discrimination, and equality of opportunity in public employment.

• Right to Cultural and Educational Rights: Under Articles 29-30, this protects the rights of minorities to conserve their culture and establish educational institutions.

• Right to Constitutional Remedies: Under Article 32, this allows individuals to move to the Supreme Court to enforce their fundamental rights.

• Reasonable Restrictions:

• The freedoms under Article 19 are not absolute. The state can impose restrictions for reasons like national security, public order, or morality.

• Examples: Freedom of speech does not include incitement to violence or hate speech. Similarly, freedom of assembly must be peaceful and without arms.

Important Points

• Article 19 Specifics:

• Freedom of profession ensures that every citizen has the right to pursue any occupation, trade, or business.

• However, the state can regulate certain professions in the interest of public health, safety, or other factors.

• Landmark Cases:

• Maneka Gandhi v. Union of India (1978): The Supreme Court expanded the scope of personal liberty under Article 21, linking it with Article 19.

• Shreya Singhal v. Union of India (2015): The Supreme Court struck down Section 66A of the IT Act, ensuring protection of free speech online.

Q7. Answer: (a) Open Computer → Right-click drive → File → New → Folder

The correct answer is Open Computer → Right-click drive → File → New → Folder.

Key Points

• Creating a New Folder: In Windows 7, creating a new folder using the File menu involves navigating to the desired location and then using the File → New → Folder option. This process is logical and widely used for organizing files effectively.

• When you open the Computer folder, you can access all the drives (e.g., C:, D:). To create a new folder, you need to right-click on the specific drive or folder where you want to create the new folder. This is the correct approach.

• The right-click menu provides access to the "File" menu options where the "New" option allows creating a folder. Using this method avoids unnecessary confusion. Hence, the given process is correct.

• This method ensures that the folder is created precisely where the user intends, avoiding disorganization in the directory structure.

• Hence, the correct method is to Open Computer → Right-click drive → File → New → Folder.

Additional Information

• Steps to Create a New Folder in Windows 7:

• Step 1: Open "Computer" from the Start Menu or Desktop.

• Step 2: Navigate to the desired drive (e.g., C:, D:) or folder where you want to create the new folder.

• Step 3: Right-click on the desired location, and a context menu will appear.

• Step 4: Hover over the "File" option, then select "New." A submenu will appear with the "Folder" option.

• Step 5: Click "Folder" to create a new folder. You can then rename the folder as required.

• Advantages of Organizing Files:

• Organizing files in folders reduces clutter and makes it easier to locate files when needed.

• It ensures better file management and prevents the accidental deletion of critical files.

• Alternative Methods to Create a Folder:

• Using Shortcut Keys: Press "Ctrl + Shift + N" to create a new folder quickly in the current directory.

• Using Right-Click Menu: Right-click in the empty space of a folder or drive, select "New," and then click "Folder."

Important Points

• File Organization:

• It is essential to store files in a structured way for easier access and better management of data.

• Always name folders appropriately to reflect their content for better understanding and navigation.

• Compatibility:

• The method mentioned works in Windows 7 and earlier versions like Windows Vista or XP with slight variations in the interface.

• Modern Versions: In newer versions like Windows 10 or 11, the process is similar but with updated interface designs.

Q8. Answer: (d) 1984

The correct answer is 1984.

Key Points

• The first metro line in India was inaugurated in 1984. It marked the beginning of metro rail services in the country.

• This metro line ran between Esplanade and Bhowanipur, located in Kolkata, West Bengal.

• It was a significant milestone in Indian transportation history, introducing a modern and efficient urban transit system. Hence, option 4 is correct.

• The Kolkata Metro, often referred to as India's first metro system, was planned as a solution to the growing traffic congestion in the city.

• The success of the Kolkata Metro set the stage for metro systems in other major cities across India, such as Delhi, Bangalore, Chennai, and Mumbai.

• The introduction of metro rail services in 1984 was a pioneering effort and demonstrated India's capability in adopting advanced urban infrastructure. Hence, statement is correct.

Additional Information

• History of Kolkata Metro:

• The idea for a metro system in Kolkata was conceived in the 1960s. The construction began in 1972, and the first phase was completed in 1984.

• It was the first metro system in India, making Kolkata the pioneer city for urban rail transit in the country.

• Significance of Metro Rail in India:

• Metro rail systems are vital for addressing urban congestion and improving public transportation. They provide an efficient, environmentally friendly, and time-saving mode of transit.

• Today, metro systems operate in several major cities across India, including Delhi, Bengaluru, Hyderabad, Chennai, and Mumbai.

• Development of Metro Rail Infrastructure:

• Post the success of Kolkata Metro, the Delhi Metro was introduced in 2002. It became a model for metro development in other cities.

• Metro networks are now expanding rapidly across India, with cities like Pune, Lucknow, and Ahmedabad developing their systems.

Important Points

• Features of Metro Rail:

• Metro systems are designed to provide high-speed and mass transit options for urban dwellers.

• They operate on dedicated tracks, reducing the interference of road traffic and ensuring punctuality.

• Environmental Benefits:

• Metro systems are energy-efficient and contribute to reducing the carbon footprint by replacing fossil fuel-based transportation.

• They help in decreasing air pollution levels in congested urban areas.

Q9. Answer: (c) 4

The correct answer is 4.

Key Points

• Significant figures are the digits in a number that are meaningful and contribute to the accuracy of the measurement.

• Non-zero digits are always significant. For example, in the number 2.308 cm, each digit (2, 3, 0, and 8) is significant.

• Zeros between non-zero digits are always considered significant. In 2.308 cm, the zero between 3 and 8 is significant. Hence, this contributes to the total count.

• Leading zeros (those before the first non-zero digit) are not significant. For example, in a number like 0.003, the zeros are not counted as significant.

• Trailing zeros (zeros at the end) are significant only if they are part of a decimal number. For example, in 2.308 cm, there are no trailing zeros, so there's no additional count.

• In the number 2.308 cm, all four digits (2, 3, 0, and 8) are significant as they follow the rules mentioned above.

• Thus, the total number of significant figures in 2.308 cm is 4. Hence, the correct answer is 4.

Additional Information

• Significant Figures:

• Significant figures are used to indicate the precision of a measurement. They are crucial in scientific calculations, engineering, and other fields where exact measurements are required.

• The rules for determining significant figures ensure that the reported numbers are accurate and reliable, reflecting the precision

of the measuring instrument.

• Rules for Significant Figures:

• Non-zero digits: Always significant, e.g., 1234 has 4 significant figures.

• Zeros between significant digits: Always significant, e.g., 1002 has 4 significant figures.

• Leading zeros: Not significant, e.g., 0.0045 has only 2 significant figures.

• Trailing zeros: Significant only if they are part of a decimal number, e.g., 100.0 has 4 significant figures.

• Examples of Significant Figures:

• Example: In the number 0.00789, the leading zeros are not significant, and the significant figures are 7, 8, and 9.

• Example: In the number 2500, if expressed as 2.500×10^3, it has 4 significant figures.

Important Points

• Applications of Significant Figures:

• Significant figures are widely used in scientific research, engineering, and statistics to report data accurately.

• They are essential in calculations involving measurements, ensuring the precision and reliability of the result.

• Importance of Precision:

• Precision is critical in fields like physics, chemistry, and engineering, where measurements impact the outcomes of experiments and designs.

• Accurate reporting of significant figures helps in maintaining the integrity of data and facilitates better understanding of experimental results.

Q10. Answer: (b) Foreign trade promotion

The correct answer is Foreign trade promotion.

Key Points

• Twelfth Schedule of the Constitution of India: The Twelfth Schedule was added to the Constitution through the 74th Constitutional Amendment Act, 1992. It contains a list of 18 functions assigned to Urban Local Bodies (ULBs).

• These functions relate to urban governance and development, empowering ULBs to manage various aspects of urban infrastructure and services.

• Public health: This is one of the functions listed under the Twelfth Schedule. Urban local bodies are responsible for ensuring sanitation, healthcare facilities, and controlling diseases within urban areas. Hence, statement 1 is correct.

• Urban poverty alleviation: This function involves efforts to reduce poverty in urban areas, providing support through employment programs, housing schemes, and basic amenities for underprivileged groups. Hence, statement 3 is correct.

• Urban planning: Urban planning is a core function under the Twelfth Schedule. It includes designing and implementing plans for land use, infrastructure development, and urban growth management. Hence, statement 4 is correct.

• Foreign trade promotion: This is not a function under the Twelfth Schedule. Promoting foreign trade is a responsibility of the central government and related ministries such as the Ministry of Commerce and Industry. Urban local bodies do not have a role in this area. Hence, this is the correct answer.

Additional Information

• Twelfth Schedule Functions:

• The Twelfth Schedule lists functions related to urban governance such as water supply, sanitation, urban forestry, slum improvement, regulation of land use, public health, and solid waste management.

• Urban Local Bodies are empowered to manage these functions for efficient urban administration and development.

• Foreign Trade Promotion:

• Foreign trade promotion is managed by agencies such as the Directorate General of Foreign Trade (DGFT) under the Ministry of Commerce and Industry.

• It involves policies and initiatives to boost India's exports, develop trade relationships, and negotiate international trade agreements.

• Example: Schemes like the Export Promotion Capital Goods (EPCG) scheme aim to encourage exports by reducing duties on imported goods used in production.

• Urban Planning and Development:

• Urban planning is a critical function of ULBs, focusing on land use management, infrastructure development, and sustainable growth.

• Example: Smart City Mission launched by the Government of India to improve urban infrastructure and provide better services.

Important Points

• 74th Constitutional Amendment Act:

• This amendment introduced provisions for democratic decentralization and urban governance.

• It mandated the establishment of Urban Local Bodies like municipalities, municipal councils, and municipal corporations.

• Empowerment of Urban Local Bodies:

• The Twelfth Schedule empowers ULBs to manage functions critical to urban development, ensuring better governance and public service delivery.

• Example: Functions like water supply, sanitation, and urban forestry directly impact the quality of life in cities.

Q11. Answer: (c) Find text in the current document or webpage

The correct answer is Find text in the current document or webpage.

Key Points

• Ctrl + F is a widely used keyboard shortcut in computing, enabling users to quickly find specific text within a document, webpage, or any other supported interface.

• When pressed, it opens a search bar or dialog box where users can input keywords or phrases to locate their occurrence in the file or page.

• This feature is particularly useful for navigating through large amounts of text or data by highlighting all instances of the entered keyword. Hence, the correct statement is that Ctrl + F helps find text in the current document or webpage.

• It saves time by eliminating the need to manually search through lines of content, making it ideal for professionals, researchers, and casual users.

Additional Information

• Features of Ctrl + F:

• Compatible with multiple platforms like Windows, macOS, Linux, and browsers such as Chrome, Firefox, and Safari.

• Allows users to search for partial matches, case-sensitive searches, or even advanced queries depending on the application.

• For example, in Microsoft Word, Ctrl + F opens the Navigation Pane, enabling users to jump between sections or headings.

• Applications:

• Used extensively in text editing, coding, and browsing to locate errors, specific terms, or relevant sections of a document.

• For instance, developers use this shortcut in coding environments like Visual Studio or Sublime Text to find functions or variables.

• Comparison with other shortcuts:

• Ctrl + F differs from shortcuts like Ctrl + H, which is used to find and replace text.

• It is distinct from Ctrl + A, which selects all content on a page or document.

Important Points

• Historical Context:

• The Ctrl + F shortcut has been a standard feature in computing since the advent of graphical user interfaces (GUIs) in the late 1980s.

• Early software like Microsoft Word and Notepad incorporated this functionality for text searching.

• Enhancements in modern systems:

• Modern applications now provide advanced search capabilities, such as regex (regular expressions) in coding environments.

• Browser extensions and plugins often extend the search functionality for more complex queries.

Q12. Answer: (c) Gyanesh Kumar

The correct answer is Gyanesh Kumar.

Key Points

• Gyanesh Kumar was appointed as the Chief Election Commissioner (CEC) of India in February 2025. The appointment of the CEC is based on the guidelines outlined in the Constitution of India.

• The Chief Election Commissioner is responsible for overseeing the conduct of free and fair elections in India. This includes general elections, state assembly elections, and presidential elections.

• The CEC is appointed by the President of India under Article 324 of the Indian Constitution, which grants powers to the Election Commission to supervise elections. Hence, statement is correct.

• The appointment of the CEC is crucial for maintaining the integrity of the democratic process in the country. The CEC ensures that elections are conducted according to established rules and regulations.

• The Election Commission consists of the Chief Election Commissioner and other Election Commissioners, who together form a multi-member commission. Hence, the appointment of Gyanesh Kumar as CEC in February 2025 is significant.

Additional Information

• Election Commission of India:

• The Election Commission is an autonomous constitutional authority responsible for administering election processes in India at both the national and state levels.

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• It was established in 1950 to ensure free and fair elections as part of the democratic framework of the country.

• The Commission is responsible for the conduct of elections for the Lok Sabha, Rajya Sabha, State Legislatures, and the offices of President and Vice-President.

• Appointment of Chief Election Commissioner:

• The CEC is appointed by the President of India and serves for a term of six years or until attaining the age of 65 years, whichever is earlier.

• The Constitution does not specify the qualifications required for the post, but the person is typically a senior bureaucrat with substantial administrative experience.

• Functions of the Chief Election Commissioner:

• The CEC ensures the implementation of the Model Code of Conduct during elections.

• The CEC oversees the preparation of electoral rolls and monitors the election process to prevent malpractices.

• The CEC is also responsible for the recognition of political parties and allotment of election symbols.

Important Points

• Key Constitutional Provisions:

• Article 324 of the Indian Constitution vests the power of superintendence, direction, and control of elections in the Election Commission.

• The Election Commission operates independently to ensure the impartiality of elections.

• Recent Developments:

• In recent years, the Election Commission has introduced measures like Voter Verifiable Paper Audit Trail (VVPAT) to increase transparency in elections.

• The introduction of Electronic Voting Machines (EVMs) has significantly improved the efficiency and reliability of the voting process.

Q13. Answer: (a) Qutbuddin Aibak

The correct answer is Qutbuddin Aibak.

Key Points

• Qutbuddin Aibak was the founder of the Slave Dynasty and the first ruler of the Delhi Sultanate. His reign marked the establishment of Muslim rule in Northern India.

• He ruled from 1206 to 1210 and was a former slave of Muhammad Ghori. After Ghori's assassination, Aibak declared himself the ruler of the territories in India.

• In 1210, Qutbuddin Aibak died in an accident while playing polo (chaugán). He fell from his horse, and the injuries proved to be fatal.

• Polo was a popular sport among the nobility during medieval India, and Aibak's death was a result of this recreational activity.

• Qutbuddin Aibak was nicknamed Lakh Baksh, meaning "giver of lakhs," due to his generosity.

• He was responsible for laying the foundation of the iconic Qutub Minar in Delhi, although it was completed by his successor, Iltutmish.

Additional Information

• Jalaluddin Khilji:

• Jalaluddin Khilji was the founder of the Khilji Dynasty and ruled from 1290 to 1296.

• He was known for his mild and kind nature, which was unusual among rulers of the time.

• He was assassinated by his own nephew and successor, Alauddin Khilji, in 1296.

• Firuz Shah Tughluq:

• Firuz Shah Tughluq was a ruler of the Tughlaq Dynasty who reigned from 1351 to 1388.

• He is remembered for his administrative reforms, development of infrastructure, and patronage of art and culture.

• He constructed canals, mosques, and towns, and introduced measures for public welfare.

• Ibrahim Lodi:

• Ibrahim Lodi was the last ruler of the Lodi Dynasty who reigned from 1517 to 1526.

• He was defeated and killed by Babur in the First Battle of Panipat, leading to the establishment of the Mughal Empire in India.

• Important Points:

• The Delhi Sultanate was established in 1206 and lasted until 1526, spanning five major dynasties: Slave, Khilji, Tughlaq, Sayyid, and Lodi.

• Polo, known as chaugán, was a favorite pastime of nobles during medieval India.

• Qutbuddin Aibak's untimely death marked an end to his short but significant rule, and his successor, Iltutmish, further consolidated the Delhi Sultanate.

Q14. Answer: (d) Bhool Bhulaiyaa 3

The correct answer is Bhool Bhulaiyaa 3.

Key Points

• Kartik Aaryan is a well-known Bollywood actor celebrated for his versatile performances across various genres.

• The 25th IIFA Awards were held in March 2025 at Jaipur, Rajasthan, one of India's prominent cultural and historical cities.

• At the awards ceremony, Kartik Aaryan received the Best Performance in a Leading Role (Male) award for his role in Bhool Bhulaiyaa 3, a sequel to the highly successful Bhool Bhulaiyaa franchise. Hence, the correct option is Bhool Bhulaiyaa 3.

• Bhool Bhulaiyaa 3 is a highly anticipated sequel and continues the legacy of the franchise, which combines elements of comedy, horror, and psychological intrigue.

• The film highlights Kartik Aaryan's ability to perform in complex roles that demand both emotional depth and comedic timing.

• The recognition at the IIFA Awards adds to Kartik Aaryan's growing stature as one of Bollywood's leading actors and reflects his impactful performance in the film.

• The IIFA Awards are among the most prestigious awards in the Indian film industry, celebrating cinematic excellence and global outreach. Hence, this achievement is notable in Kartik's career.

Additional Information

• About Bhool Bhulaiyaa Franchise:

• Bhool Bhulaiyaa is a popular Bollywood franchise known for blending horror, psychological twists, and humor. The first installment starred Akshay Kumar and was released in 2007.

• The sequel, Bhool Bhulaiyaa 2, released in 2022, featured Kartik Aaryan and was a box office success, revitalizing the franchise.

• Bhool Bhulaiyaa 3, the latest addition, continues the series' tradition of suspense and entertainment, showcasing Kartik Aaryan's talent in a complex narrative.

• About Kartik Aaryan:

• Kartik Aaryan, born on 22 November 1990, is an Indian actor who debuted with Pyaar Ka Punchnama in 2011.

• He is renowned for his roles in films like Sonu Ke Titu Ki Sweety, Luka Chuppi, Bhool Bhulaiyaa 2, and Satyaprem Ki Katha.

• His performances have earned him accolades and established him as one of the leading actors in the Indian film industry.

• About IIFA Awards:

• The International Indian Film Academy (IIFA) Awards are held annually to recognize excellence in Indian cinema.

• These awards are known for their global presence and are hosted in different countries and cities, promoting Indian cinema worldwide.

• The 25th edition held in Jaipur showcased the best of Bollywood and celebrated achievements in acting, direction, music, and production.

Important Points

• Other Nominations:

• While Kartik Aaryan won for Bhool Bhulaiyaa 3, other films like Shehzada and Satyaprem Ki Katha were notable mentions in his career.

• These films demonstrate his versatility and ability to perform across genres, from romantic dramas to action comedies.

• Significance of the Award:

• The IIFA Award for Best Performance in a Leading Role (Male) is a prestigious recognition, highlighting the actor's impact on Indian cinema.

• This award further establishes Kartik Aaryan as a bankable and talented star in the industry.

• Global Impact:

• The IIFA Awards promote Indian cinema on a global stage, showcasing the diversity and creativity of Bollywood.

• Recognitions like Kartik's award help Bollywood actors gain international acclaim and recognition.

Q15. Answer: (c) Rs. 500 crore

The correct answer is Rs. 500 crore.

Key Points

• The Technology Adoption Fund, launched in February 2025 by IN-SPACe, has been established to promote private space start-ups and innovation within India's space sector.

• The fund has earmarked a total of Rs. 500 crore to support private space start-ups. This allocation aims to boost research, development, and deployment of advanced space technologies. Hence, the correct option is Rs. 500 crore.

• Private space companies and start-ups are expected to benefit significantly from this fund, allowing them to scale their operations and contribute to India's space exploration goals.

• IN-SPACe (Indian National Space Promotion and Authorization Center) is a government body established to enable private

participation in India's space activities. This initiative aligns with India's broader space policy reforms.

• The allocation of Rs. 500 crore under the Technology Adoption Fund reflects the growing importance of private players in the space industry and the government's commitment to fostering innovation. Hence, the statement regarding the fund allocation is correct.

• This funding is expected to accelerate technological advancements in areas such as satellite development, launch vehicles, and space exploration missions, contributing to India's global competitiveness in the space sector.

Additional Information

• About IN-SPACe:

• IN-SPACe, or the Indian National Space Promotion and Authorization Center, was established in 2020 as part of India's space reforms.

• Its primary role is to enable and regulate private sector participation in the Indian space industry, ensuring a competitive and innovative space ecosystem.

• Technology Adoption Fund:

• The fund aims to provide financial and technical support to private entities working in the space sector, particularly start-ups with innovative ideas and technology.

• It is expected to promote advancements in satellite technology, launch vehicles, and space exploration tools.

• The fund also aligns with the vision of making India a global hub for space innovation and technology.

• Private Participation in Space:

• India's space sector is experiencing a significant shift with the inclusion of private players, contributing to faster innovation and development.

• Private companies like Skyroot Aerospace and Agnikul Cosmos are already making significant strides, supported by IN-SPACe and other initiatives.

• Example: The successful launch of Vikram-S, India's first privately developed rocket, demonstrates the potential of private start-ups in space exploration.

Important Points

• Significance of Rs. 500 crore Allocation:

• The Rs. 500 crore funding is one of the largest investments made by the Indian government to boost private space innovation.

• This allocation is expected to create a conducive environment for start-ups to experiment with new technologies and contribute to India's space missions.

• Global Competitiveness:

• India's space reforms, including initiatives like IN-SPACe and the Technology Adoption Fund, are positioning the country as a leader in the global space industry.

• This funding will help bridge the gap between India's public and private sectors, fostering collaboration and innovation.

Q16. Answer: (b) Bhagat Singh

The correct answer is Bhagat Singh.

Key Points

• Bhagat Singh was a revolutionary freedom fighter who played a significant role in India's struggle for independence.

• He co-founded the Hindustan Socialist Republican Association (HSRA) in 1928, which aimed to achieve independence through revolutionary means. Hence, the statement is correct.

• In 1929, Bhagat Singh and B K Dutt threw a bomb in the Central Legislative Assembly in Delhi to protest against oppressive laws. This act was symbolic and intended to make the British government hear the voice of Indians. Hence, the statement is correct.

• Bhagat Singh, Sukhdev Thapar, and Shivaram Rajguru were tried and executed in 1931 for their involvement in revolutionary activities against British rule. Bhagat Singh was only 23 years old at the time of his execution. Hence, the statement is correct.

• Bhagat Singh's sacrifice and revolutionary ideas inspired generations of Indians to fight for freedom. He remains one of India's most celebrated heroes. Hence, the statement is correct.

• Hence, the correct answer is Bhagat Singh.

Additional Information

• Hindustan Socialist Republican Association (HSRA):

• The HSRA was formed in 1928 by Bhagat Singh, Chandra Shekhar Azad, and other revolutionaries.

• Its aim was to overthrow British rule and establish a socialist republic in India.

• The association believed in using revolutionary methods to fight British colonialism.

• Incident at Central Legislative Assembly:

• On April 8, 1929, Bhagat Singh and B K Dutt threw bombs in the assembly to protest against the Trade Disputes Bill and Public

Safety Bill.

• The bombs were not intended to kill but to create noise and draw attention to the cause of Indian independence.

Q17. Answer: (a) Article 263

The correct answer is Article 263.

Key Points

• Article 263 of the Constitution of India provides for the establishment of an Inter-State Council to facilitate coordination between the states and the Union government.

• The Inter-State Council is constituted by the President if it appears to him that public interest would be served by its establishment.

• The council is meant to inquire into and advise upon disputes between states, investigate and discuss subjects of common interest, and make recommendations for better coordination of policy and action. Hence, Article 263 is correct.

• The council plays a significant role in fostering cooperative federalism in India by serving as a platform for discussion between the Union and state governments.

• The Inter-State Council is not a permanent body and is constituted as and when required. The President has the discretion to determine its composition, nature of duties, and procedure.

Additional Information

• Other Articles mentioned in the options:

• Article 368: This article deals with the procedure for the amendment of the Constitution. It does not deal with the creation of the Inter-State Council. This makes it an incorrect option.

• Article 280: It deals with the establishment of the Finance Commission by the President. The Finance Commission is responsible for making recommendations on the distribution of tax revenues between the Union and the States. Hence, this option is incorrect.

• Article 346: This article pertains to the official language for communication between states and between a state and the Union. It has no relevance to the Inter-State Council. Hence, this option is incorrect.

• Significance of the Inter-State Council:

• The council aims to promote a spirit of cooperative federalism by resolving disputes and ensuring collaboration between different levels of government in India.

• It is an important institution for discussing policies and ensuring uniformity in their implementation across states.

• Examples of its use:

• The Inter-State Council has been utilized to discuss critical issues such as the sharing of river waters, disaster management, and other inter-state disputes.

Important Points

• Historical Background:

• The idea of establishing an Inter-State Council was first recommended by the Sarkaria Commission, which was set up in 1983 to review the existing Center-State relations and recommend changes.

• The council was first constituted in 1990 under the chairmanship of the then Prime Minister Vishwanath Pratap Singh.

• Composition:

• The council comprises the Prime Minister as the Chairperson, Chief Ministers of all states, Chief Ministers of Union Territories with legislatures, and administrators of UTs without legislatures.

• Additionally, Union Cabinet Ministers in charge of home affairs and other ministers nominated by the Prime Minister are also members.

• Functions:

• It inquires into and advises upon disputes between states and the Union, investigates and discusses matters of common interest, and makes recommendations for better coordination of policy and action.

Q18. Answer: (b) Pradhan Mantri Ujjwala Yojana

The correct answer is Pradhan Mantri Ujjwala Yojana.

Key Points

• Pradhan Mantri Ujjwala Yojana (PMUY): This scheme was launched by the Government of India in May 2016 to provide LPG connections to women from Below Poverty Line (BPL) households.

• The primary objective of the scheme is to promote clean cooking fuel to reduce dependency on traditional fuels like firewood, coal, and cow dung cakes, which adversely impact women's health and the environment.

• Under PMUY, eligible households are provided financial assistance for purchasing LPG connections. The scheme emphasizes empowering women beneficiaries by issuing connections in their names. Hence, the scheme directly addresses the question's concern for rural women's health and environmental sustainability.

• Eligibility Criteria: Women applicants from BPL households must be listed in the Socio-Economic Caste Census (SECC) 2011

data or be part of government-identified schemes such as Antyodaya Anna Yojana.

• PMUY also introduced the Ujjwala 2.0 scheme in 2021 to extend benefits to additional households not covered earlier and provide the first refill and stove free of cost. Hence, PMUY addresses the core concern of the question effectively.

• Impact: PMUY has significantly increased LPG penetration in rural areas, reducing indoor air pollution and improving the quality of life for women. It also aligns with India's commitment to environmental sustainability by reducing carbon emissions.

Additional Information

• About PMUY:

• Launched: May 2016 by the Ministry of Petroleum and Natural Gas.

• Features: Provides financial assistance of Rs. 1600 per connection, and beneficiaries receive subsidies for refills.

• Beneficiaries: Women from BPL households, identified using the SECC 2011 data.

• Introduced the Ujjwala 2.0 scheme in 2021, extending benefits to migrant workers and providing additional facilities like a free refill and stove.

• Other Schemes Mentioned:

• Pradhan Mantri Awaas Yojana - Gramin: Focuses on providing housing facilities to the rural poor. It does not deal with LPG connections.

• Pradhan Mantri Gram Sadak Yojana: Aims at building and improving rural road infrastructure, facilitating better connectivity in villages. It is unrelated to clean cooking fuel.

• Saansad Adarsh Gram Yojana: Encourages Members of Parliament to adopt villages for their holistic development, focusing on areas like education, infrastructure, and healthcare, but not directly addressing LPG connections.

• Environmental Impact:

• By promoting the use of LPG, PMUY reduces the reliance on traditional biomass fuels and mitigates air pollution caused by the incomplete combustion of such fuels.

• This contributes to reducing carbon emissions and aligns with India's commitment to global climate goals under the Paris Agreement.

Important Points

• Key Achievements of PMUY:

• Since its launch, PMUY has provided over 9 crore LPG connections to BPL households, significantly improving access to clean cooking fuel.

• PMUY has been instrumental in empowering women beneficiaries by ensuring that connections are issued in their names, thereby enhancing their socio-economic status.

• Challenges:

• Despite the success, affordability of refills remains a challenge for many beneficiaries, leading to occasional reliance on traditional fuels.

• Awareness campaigns and financial support for refills are needed to ensure sustained usage of LPG by the target population.

Q19. Answer: (b) Bishkek

The correct answer is Bishkek.

Key Points

• The border dispute between Kyrgyzstan and Tajikistan has been a longstanding issue, marked by intermittent clashes and tensions over territorial claims and resource allocation.

• The agreement aimed to address key concerns such as border demarcation, water resources, and preventing future conflicts. It was facilitated by international observers and regional representatives to ensure transparency.

Additional Information

• Geographical and Political Importance of Bishkek:

• The city has been a center for regional cooperation, hosting meetings and agreements related to the Commonwealth of Independent States (CIS) and other Central Asian collaborations.

• Historical Context of Kyrgyz-Tajik Border Disputes:

• Clashes often occur in areas where both countries claim ownership, particularly in the fertile agricultural regions and water-sharing zones.

• This agreement marked a turning point in Kyrgyz-Tajik relations, as both nations committed to peaceful coexistence and sustainable development in disputed regions.

• International organizations such as the United Nations and OSCE played a key role in facilitating discussions and monitoring implementation.

Important Points

• Kyrgyzstan:

• It is known for its mountainous terrain and significant water resources, which are often at the center of disputes with neighboring countries.

• Tajikistan:

• The country is rich in hydropower resources, and disputes with Kyrgyzstan often revolve around access to water and agricultural lands.

• Role of International Observers:

• These organizations provide technical expertise and funding for conflict resolution initiatives in disputed border areas.

Q20. Answer: (d) M^0L¹T^(-1)

The correct answer is Option 4.

Key Points

• Velocity is a fundamental concept in physics that refers to the rate of change of displacement with respect to time. It is a vector quantity that has both magnitude and direction.

• The dimensions of velocity can be derived from its formula: Velocity = Displacement / Time.

• The dimensional formula of displacement is L (length), and the dimensional formula of time is T.

• Substituting these into the formula for velocity, we get the dimensional formula of velocity as L T^(-1).

• This corresponds to the dimensional representation: M^0 L¹ T^(-1), as mass (M) does not appear in the formula for velocity.

• Among the given options, Option 4 correctly represents the dimensional formula for velocity as M^0 L¹ T^(-1). Hence, it is the correct answer.

Additional Information

• Dimensional Analysis:

• Dimensional analysis is a technique used to check the correctness of physical equations and to derive relations among physical quantities.

• In dimensional analysis, physical quantities are expressed in terms of their fundamental dimensions: M (mass), L (length), and T (time).

• Applications of Velocity:

• Velocity is used in various fields, including mechanics, aerospace, and navigation, to determine the motion and direction of objects.

• Example: The velocity of a car traveling north at 60 km/h indicates both its speed and direction.

• Difference Between Speed and Velocity:

• Speed is a scalar quantity that measures the rate of motion without considering direction.

• Velocity, on the other hand, is a vector quantity that includes both magnitude and direction.

• Example: A car moving at 50 km/h east has a velocity of 50 km/h east, but its speed is simply 50 km/h.

Important Points

• Other Dimensional Formulas:

• Acceleration: Acceleration is the rate of change of velocity with respect to time, and its dimensional formula is M^0 L¹ T^(-2).

• Force: Force is given by Newton's second law, F = ma, and its dimensional formula is M¹ L¹ T^(-2).

• Energy: Energy has the dimensional formula M¹ L² T^(-2), derived from the work formula W = F × d.

• Importance of Dimensions in Physics:

• Dimensions help in verifying the consistency of equations, converting units, and deriving relationships among physical quantities.

• They are essential in understanding the nature and behavior of physical phenomena.

Q21. Answer: (b) Photorespiration

The correct answer is Photorespiration.

Key Points

• C4 plants, such as maize and sugarcane, exhibit an adaptation mechanism to minimize photorespiration, which is absent in these plants.

• Photorespiration is a process that occurs in C3 plants due to the oxygenation activity of Rubisco, the enzyme responsible for carbon fixation during photosynthesis.

• In C4 plants, the spatial separation of carbon fixation (in mesophyll cells) and Calvin cycle (in bundle sheath cells) prevents the oxygenation activity of Rubisco. Hence, photorespiration is absent in C4 plants.

• Transpiration (the loss of water through stomata), photosynthesis (the process of converting light energy into chemical energy), and respiration (the breakdown of glucose to release energy) occur in C4 plants. Hence, these processes are present in C4 plants.

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• Hence, the correct answer is Photorespiration.

Additional Information

• Photorespiration:

• Occurs in C3 plants due to the oxygenation activity of Rubisco when the concentration of oxygen is higher than carbon dioxide.

• Photorespiration leads to the formation of phosphoglycolate, which needs to be recycled, resulting in a loss of energy and reduced photosynthetic efficiency.

• C4 Plants:

• Plants like maize, sugarcane, and sorghum exhibit the C4 pathway for photosynthesis.

• These plants use a specialized mechanism involving the enzyme PEP carboxylase to fix carbon dioxide into oxaloacetate in mesophyll cells.

• Bundle sheath cells carry out the Calvin cycle, ensuring that Rubisco is exposed to a high concentration of carbon dioxide, preventing photorespiration.

• Comparison between C3 and C4 Plants:

• C3 plants: Include wheat, rice, and barley. They rely solely on Rubisco and are more prone to photorespiration under high temperatures and low CO2 levels.

• C4 plants: Exhibit adaptations like Kranz anatomy and the utilization of PEP carboxylase to minimize photorespiration.

Important Points

• Kranz Anatomy:

• C4 plants show a specialized leaf anatomy called Kranz anatomy, where mesophyll cells surround bundle sheath cells in a wreath-like arrangement.

• This spatial separation is crucial for preventing photorespiration and enhancing photosynthetic efficiency.

• Benefits of C4 Pathway:

• Allows plants to thrive in hot, dry, and high-light environments.

• Improves the efficiency of carbon fixation, making C4 plants more productive.

Q22. Answer: (d) Deodar

The correct answer is Deodar.

Key Points

• Deodar (Cedrus deodara) is a valuable tree that grows predominantly in the western Himalayas, including regions like Himachal Pradesh, Uttarakhand, and Jammu & Kashmir.

• It is highly sought after due to its durable and strong wood, which makes it ideal for construction, furniture, and other timber-related uses.

• Deodar is known for its resistance to termites and pests, making it a preferred choice for building structures, especially in areas prone to such challenges.

• This tree is also associated with significant cultural and religious importance in India. The name "Deodar" derives from the Sanskrit word "Devadaru," meaning "Wood of the Gods."

• Deodar thrives in cool climates, typically at altitudes ranging between 1,200 to 3,600 meters above sea level, and is an integral part of the Himalayan ecosystem.

• In addition to its use in construction, Deodar wood is employed in making railway sleepers, bridges, and boats due to its strength and durability.

• It is also used in traditional medicine as its oil is believed to have anti-inflammatory and antiseptic properties.

Additional Information

• Characteristics of Deodar:

• Deodar trees are evergreen conifers that can grow up to 40 to 50 meters in height.

• They have a conical shape, with long, needle-like leaves that range in color from green to bluish-green.

• The wood is soft, light, and has a distinct aroma due to the presence of essential oils.

• It is classified as one of the most durable woods and is resistant to weathering, making it ideal for outdoor use.

• Comparison of Options:

• Magnolia: Magnolia trees are ornamental and known for their flowers but are not used significantly in construction.

• Rhododendron: These are shrubs or trees known for their colorful flowers and are not valuable for timber or construction purposes.

• Cinchona: Cinchona trees are famous for producing quinine, a compound used to treat malaria, but they have no significant use in construction.

• Deodar: As detailed above, Deodar is highly durable and widely used in construction, making it the correct answer.

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• Importance of Deodar in Ecosystem:

• Deodar forests play a crucial role in maintaining the ecological balance in the Himalayas, preventing soil erosion, and supporting biodiversity.

• They provide shelter and food to various wildlife species, including birds and mammals.

Important Points

• Significance of Deodar in Indian Culture:

• The tree is often planted around temples and sacred spaces in India, symbolizing purity and sanctity.

• In ancient texts, Deodar is mentioned as a gift from the gods, emphasizing its spiritual importance.

• Economic Importance:

• Deodar wood contributes significantly to the timber industry, particularly in regions where it is abundant.

• Its essential oils are extracted for use in perfumes, cosmetics, and traditional medicine, adding to its economic value.

Q23. Answer: (c) Standardised weights and measures

The correct answer is Standardised weights and measures.

Key Points

• Evidence of centralised administration: The presence of standardised weights and measures in the Indus-Sarasvati civilisation is a strong indicator of a highly centralised administration, as it reflects uniformity across trade and commerce.

• Such standardisation suggests that a governing authority oversaw economic activities to ensure consistency and fairness in trade across the region. Hence, this statement is correct.

• Elaborate royal tombs: While elaborate royal tombs are often associated with centralised administrations in other ancient civilisations, such structures have not been identified in the Indus-Sarasvati civilisation. Hence, this statement is incorrect.

• Absence of seals and standard script: The Indus-Sarasvati civilisation is known for its seals and a script that has yet to be deciphered. The presence of these items suggests organised record-keeping rather than their absence. Hence, this statement is incorrect.

• Monumental palaces and temples: Unlike other ancient civilisations, the Indus-Sarasvati civilisation lacks evidence of monumental palaces and temples, which diminishes the possibility of a highly centralised, hierarchical ruling elite based on such structures. Hence, this statement is incorrect.

• Hence, the correct answer is Standardised weights and measures.

Additional Information

• Indus-Sarasvati civilisation:

• The Indus-Sarasvati civilisation, also known as the Harappan civilisation, flourished between 2600 BCE and 1900 BCE in present-day India and Pakistan.

• It is renowned for its urban planning, drainage systems, and architecture. Cities like Harappa, Mohenjo-daro, and Dholavira exhibit advanced layouts that signify organised governance.

• Standardised weights and measures:

• Artifacts from the Indus-Sarasvati civilisation show the use of uniformly shaped and calibrated weights, typically made of stone, which were used for trade and taxation.

• This practice indicates a sophisticated understanding of mathematics and an authority ensuring the implementation of standards across the region.

• Example: Cubical weights discovered at sites like Harappa and Mohenjo-daro show a consistent ratio system, supporting the idea of centralised regulation.

• Absence of monumental structures:

• Unlike other ancient civilisations such as Egypt and Mesopotamia, the Indus-Sarasvati civilisation does not exhibit large-scale temples or palaces. This suggests a less hierarchical society or a different form of governance.

• Instead, the emphasis appears to have been on urban planning and utilitarian structures, such as granaries and public baths.

• Trade and commerce:

• The widespread use of seals, often featuring animals and symbols, suggests that they were used in trade and as markers of identity or ownership.

• The seals' uniformity and the presence of a script that remains undeciphered point to an organised system of record-keeping and communication.

Important Points

• Characteristics of the Indus-Sarasvati civilisation:

• It was spread over a vast region, covering parts of present-day India, Pakistan, and Afghanistan.

• The civilisation displayed advanced urban planning, including grid-pattern streets, drainage systems, and water storage facilities.

• Notable sites:

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• Mohenjo-daro: Known for the Great Bath and granaries, suggesting centralised storage and distribution of goods.

• Harappa: Features include seals, weights, and well-planned streets.

• Dholavira: Famous for its water conservation systems and inscriptions.

Q24. Answer: (b) Lokpal

The correct answer is Lokpal.

Key Points

• Lokpal is an independent statutory body in India that investigates complaints of corruption against public servants, including the Prime Minister, Union Ministers, Members of Parliament, and other public officials.

• The Lokpal and Lokayuktas Act, 2013, provides for the establishment of Lokpal at the central level and Lokayuktas at the state level to combat corruption in public administration.

• The Lokpal consists of a Chairperson and a maximum of eight members, half of whom are to be judicial members, and at least 50% of the members are to be from SC/ST/OBCs, minorities, or women.

• The jurisdiction of the Lokpal includes central government employees, public servants, and institutions receiving significant funding from the central government.

• It has the power to order a Central Bureau of Investigation (CBI) inquiry, prosecute public servants, and ensure fair trials in corruption cases.

• The Lokpal is autonomous and functions without interference from the executive or legislature. This independence is crucial to ensuring transparency and accountability.

• The Finance Commission, Election Commission, and Union Public Service Commission are constitutional bodies, but they do not investigate corruption complaints. Hence, the correct option is Lokpal.

Additional Information

• Lokpal and Lokayuktas Act, 2013:

• The Lokpal and Lokayuktas Act was passed in December 2013 and came into effect on 16th January 2014. It was enacted to combat corruption in public administration and ensure accountability.

• The Act mandates the appointment of Lokpal at the central level and Lokayuktas in the states, although the structure and jurisdiction of Lokayuktas are determined by the respective state legislatures.

• Structure and Powers of Lokpal:

• The Lokpal is headed by a Chairperson, who is or has been the Chief Justice of India, a Supreme Court Judge, or an eminent person with expertise in anti-corruption policies.

• It has the power to investigate complaints of corruption against public functionaries, including the Prime Minister (with certain exceptions related to national security and foreign affairs).

• The Lokpal has its own investigation and prosecution wings to carry out inquiries and ensure legal proceedings against corrupt officials.

• Key Features of Lokpal:

• The Lokpal is empowered to confiscate and attach assets acquired through corrupt means, even during the investigation process.

• The selection process for Lokpal members is conducted by a committee comprising the Prime Minister, Speaker of the Lok Sabha, Leader of the Opposition, Chief Justice of India or a Supreme Court Judge, and an eminent jurist.

• The Lokpal is required to present an annual report to the President of India, which is tabled in Parliament for discussion and accountability.

Important Points

• Comparison with Other Bodies:

• Finance Commission: It is a constitutional body under Article 280 of the Indian Constitution. It recommends the distribution of financial resources between the central and state governments but does not handle corruption cases.

• Election Commission: A constitutional body under Article 324, it conducts free and fair elections in India but is not empowered to investigate corruption complaints.

• Union Public Service Commission (UPSC): Established under Article 315, it conducts recruitment exams for civil services and other posts. It does not deal with corruption-related issues.

• Noteworthy Examples:

• 2019: The first Chairperson of Lokpal, Justice Pinaki Chandra Ghose, was appointed along with eight other members.

• The Lokpal has been instrumental in addressing corruption cases, ensuring transparency and accountability in public administration.

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Q25. Answer: (a) CDS General Anil Chauhan

The correct answer is CDS General Anil Chauhan.

Key Points

• CDS General Anil Chauhan is the author of the book 'Ready, Relevant and Resurgent: A Blueprint for the Transformation of India's Military'.

• The book was unveiled by the Defence Minister Rajnath Singh in May 2025. This highlights the significance of the book in shaping military strategies for the nation.

• This book provides an in-depth blueprint for transforming India's military to meet modern challenges and align with the country's strategic goals. Hence, option 1 is correct.

• The book emphasizes the importance of a future-ready military that is capable of addressing conventional and non-conventional threats.

• General Anil Chauhan, as the Chief of Defence Staff (CDS), is responsible for overseeing the modernization and integration of India's armed forces. This aligns with the objectives of the book.

• Other options mentioned in the question, such as Lieutenant General NS Raja Subramani, Lieutenant General Rajiv Ghai, and General Upendra Dwivedi, are not associated with this book.

• Hence, the correct answer is CDS General Anil Chauhan.

Additional Information

• About CDS General Anil Chauhan:

• General Anil Chauhan is the Chief of Defence Staff (CDS) of India and has a distinguished military career.

• He has played a pivotal role in the integration of armed forces and modernization of India's military capabilities.

• General Chauhan is known for his expertise in strategic planning, operational command, and military modernization efforts.

• About the Book:

• The book 'Ready, Relevant and Resurgent: A Blueprint for the Transformation of India's Military' focuses on the need for a modernized and integrated military.

• It outlines strategies for transforming India's military to address challenges like technological advancements, cybersecurity threats, and geopolitical tensions.

• The book emphasizes the importance of aligning defense policies with India's larger strategic goals and aspirations.

• Other Options:

• Lieutenant General NS Raja Subramani: While a senior officer, he is not associated with the authorship of this book.

• Lieutenant General Rajiv Ghai: He has contributed to India's military, but he is not the author of this book.

• General Upendra Dwivedi: Known for his leadership in the armed forces, but he is not linked to this book.

Important Points

• Transformation of India's Military:

• India's military faces challenges in areas such as cybersecurity, hybrid warfare, and advanced technologies.

• The book by General Chauhan addresses these issues and provides a comprehensive roadmap for modernization.

• Unveiling by Defence Minister:

• The unveiling of the book by Defence Minister Rajnath Singh highlights its importance in shaping India's defense strategy.

• It underscores the government's focus on creating a future-ready military to address evolving challenges.

Q26. Answer: (b) Santhal Rebellion

The correct answer is Santhal Rebellion.

Key Points

• Sidhu and Kanhu Murmu were the leaders of the Santhal Rebellion (1855–1856), one of the most significant tribal uprisings in India.

• The rebellion took place in the present-day states of Jharkhand, Bihar, and West Bengal. It was a response to the exploitation and oppression faced by the Santhal tribe under the British colonial rule and moneylenders, landlords, and revenue officials.

• The Santhal community was subjected to high taxes, exploitation, and forced labor, which led to widespread dissatisfaction and ultimately resulted in the rebellion.

• The rebellion started in 1855 when Sidhu and Kanhu, along with their brothers Chand and Bhairav, mobilized the Santhal community to fight against the British authorities and landlords.

• The Santhals declared independence from British rule and waged war against the British army and landlords. This rebellion is considered one of the earliest expressions of organized resistance against colonial exploitation in India.

• Although the rebellion was eventually suppressed by the British forces in 1856, it left a lasting impact on the tribal identity and struggles for justice in India.

Additional Information

• Santhal Rebellion:

• The rebellion was triggered by the exploitation of the Santhal community by zamindars (landowners), moneylenders, and British officials under the colonial system.

• The Santhals were forced to pay exorbitant taxes, and their lands were seized by landlords, leading to widespread impoverishment and oppression.

• Sidhu and Kanhu mobilized the community to rise against the oppression, leading to the declaration of rebellion in June 1855.

• The Santhal Rebellion is also known as the Hul Rebellion, where "Hul" means revolution in the Santhal language.

• Other Tribal Uprisings:

• Koya Revolts: These revolts occurred in the Godavari region of Andhra Pradesh and were led by the tribal leader Alluri Sitarama Raju. They were against the exploitation and restrictions imposed by the British.

• Kol Mutiny: This uprising took place in Chota Nagpur (present-day Jharkhand) in 1831–1832. It was led by the Kol tribes against the British and moneylenders exploiting their land and resources.

• Ho Uprising: The Ho tribe in Singhbhum region (present-day Jharkhand) revolted against the British, landlords, and exploitative policies in 1820–1837.

• Impact of the Santhal Rebellion:

• The rebellion led to increased awareness about the plight of tribal communities and their exploitation under colonial rule.

• It resulted in the introduction of laws like the Santhal Parganas Tenancy Act (1876), which aimed to protect the rights of the Santhals over their land and resources.

Important Points

• Role of Sidhu and Kanhu:

• Sidhu and Kanhu were charismatic leaders who united the Santhal community to fight against British colonial oppression.

• They aimed to establish a society free from exploitation and oppression, inspiring future tribal movements in India.

• Legacy:

• The Santhal Rebellion remains a symbol of tribal resistance and courage. It is commemorated in the tribal regions of India as a significant historical event.

Q27. Answer: (d) Edicts of Ashoka

The correct answer is Edicts of Ashoka.

Key Points

• The Edicts of Ashoka are a collection of inscriptions carved on rocks, pillars, and caves during the reign of Emperor Ashoka of the Mauryan Empire in the 3rd century BCE.

• These inscriptions were written in different scripts, including Brahmi, Kharosthi, and Greek, and were found across the Indian subcontinent, extending from modern-day Afghanistan to Bangladesh and South India.

• The primary purpose of these edicts was to propagate ethical principles, moral values, and promote the principles of Dhamma (righteousness), which was heavily influenced by Ashoka’s conversion to Buddhism.

• Ashoka’s edicts emphasize non-violence, respect for all forms of life, religious tolerance, and the welfare of all beings.

• The inscriptions also highlight Ashoka’s governance principles, such as justice, compassion, and welfare measures for the people. This makes them one of the earliest written records of governance and ethical guidelines in Indian history.

• The inscriptions are considered a significant source of information about the history, culture, and administration of the Mauryan Empire during Ashoka's reign.

• Hence, the correct answer is Edicts of Ashoka.

Additional Information

• Edicts of Ashoka:

• The edicts are divided into Major Rock Edicts, Minor Rock Edicts, Pillar Edicts, and Cave Inscriptions.

• They provide insights into Ashoka’s religious transformation after the Kalinga War, which led to his adoption of Buddhism and the promotion of its values.

• Major themes: Promotion of non-violence, protection of animals, religious harmony, and welfare measures such as building hospitals, planting trees, and digging wells.

• Other Options Explained:

• Arthashastra: A treatise on statecraft, economic policy, and military strategy written by Kautilya (Chanakya). It is a political manual, not a collection of inscriptions.

• Upanishads: Philosophical texts that are part of the Vedic literature. They explore metaphysical concepts but do not focus on governance or moral edicts.

• Vedas: Ancient religious texts that form the foundation of Hinduism. They primarily contain hymns, rituals, and spiritual

knowledge, not governance principles.

• Importance of Edicts:

• The edicts are a remarkable example of ancient communication and an early attempt at disseminating state policy and moral teachings to the masses.

• They illustrate how Ashoka integrated his personal beliefs into his administration and promoted ethical governance, which was revolutionary for its time.

Important Points

• Discovery: The Edicts of Ashoka were discovered in the 19th century, with James Prinsep playing a crucial role in deciphering the Brahmi script.

• Locations: The edicts are found across several regions, including Sanchi, Sarnath, Dhauli, Girnar, and Kandahar.

• Languages: They were written in Brahmi, Kharosthi, Greek, and Aramaic scripts, reflecting Ashoka's vast empire and diverse subjects.

• Significance: They are a vital source of historical knowledge and demonstrate the importance of moral and ethical governance in ancient India.

Q28. Answer: (b) Burning of fossil fuels

The correct answer is Burning of fossil fuels.

Key Points

• The burning of fossil fuels such as coal, oil, and natural gas is the primary contributor to the increase in atmospheric carbon dioxide levels.

• This process releases carbon dioxide (CO_2) and other greenhouse gases into the atmosphere, which trap heat and contribute to global warming.

• Fossil fuels are burned for various purposes, including energy production, transportation, industrial processes, and electricity generation.

• The use of fossil fuels has increased significantly since the Industrial Revolution, causing a rapid rise in atmospheric CO_2 levels.

• This activity accounts for the largest share of anthropogenic (human-caused) emissions globally. Hence, this is the correct option.

• Other human activities mentioned in the options, such as construction of dams, use of fertilizers, and afforestation, have a lesser impact on atmospheric CO_2 levels compared to the burning of fossil fuels. Afforestation, in fact, helps reduce CO_2 levels.

Additional Information

• Fossil Fuels:

• Coal, oil, and natural gas are the most widely used fossil fuels.

• They are formed from the remains of plants and animals that lived millions of years ago.

• Fossil fuels are considered non-renewable resources because they take millions of years to form.

• Countries like China, the United States, and India are among the largest consumers of fossil fuels for energy production.

• Greenhouse Effect:

• The burning of fossil fuels releases greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).

• These gases trap heat within the atmosphere, leading to global warming and climate change.

• The concentration of CO_2 in the atmosphere has increased from about 280 ppm (parts per million) before the Industrial Revolution to over 400 ppm today.

• Other Human Activities:

• Construction of dams: Dams impact ecosystems but do not directly contribute significantly to CO_2 emissions.

• Use of fertilizers: Fertilizers release nitrous oxide, another greenhouse gas, but their contribution to CO_2 emissions is lower.

• Afforestation: Planting trees absorbs CO_2 from the atmosphere, helping to mitigate climate change rather than contributing to it.

Important Points

• Global Data:

• According to the Intergovernmental Panel on Climate Change (IPCC), fossil fuels contribute about 75% of global greenhouse gas emissions.

• The Paris Agreement (2015) aims to limit global temperature rise by reducing the use of fossil fuels and shifting to renewable energy sources.

• Renewable Energy:

• Transitioning to renewable energy sources such as solar, wind, and hydroelectric power can significantly reduce CO_2 emissions.

• Many countries, including Germany and Sweden, are leading efforts to adopt clean energy technologies.

Q29. Answer: (c) Defence Research and Development Organisation (DRDO)

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

Key Points

• Defence Research and Development Organisation (DRDO): DRDO is a prominent organization under the Ministry of Defence, Government of India, responsible for developing advanced technologies for defence and security purposes.

• In May 2025, DRDO developed the nanoporous multilayered polymeric membrane for high-pressure seawater desalination, addressing the critical need for clean and potable water.

• The innovation is aimed at improving the efficiency of seawater desalination processes, enabling the extraction of water even under high-pressure conditions.

• This technology is significant for addressing water scarcity issues and is particularly beneficial for coastal areas and military applications in remote regions. Hence, the correct option is DRDO.

Additional Information

• Defence Research and Development Organisation (DRDO):

• Established in 1958, DRDO operates under the Ministry of Defence and works on developing advanced defence systems and technologies.

• Its headquarters is located in New Delhi, India, and it has a network of laboratories across the country.

• Key areas of development include missile systems, electronics, combat vehicles, naval systems, aeronautics, and advanced materials.

• Nanoporous Multilayered Polymeric Membrane:

• This technology involves multiple layers of polymeric membranes with nanopores, enhancing the filtration efficiency and allowing desalination under high-pressure conditions.

• Such membranes are crucial in separating salt and impurities from seawater, making it suitable for human consumption and industrial use.

• Applications of Seawater Desalination:

• Seawater desalination plays a vital role in addressing water scarcity issues, especially in coastal and arid regions.

• It is used in industries, agriculture, and providing potable water for civilian and military purposes.

Important Points

• Council of Scientific and Industrial Research (CSIR):

• CSIR is a leading organization in scientific research in India, focusing on areas such as materials, biotechnology, and environmental science.

• While CSIR conducts research related to water purification, it is not responsible for developing the specific technology mentioned in the question.

• Department of Science and Technology (DST):

• DST is responsible for promoting scientific research and development in India. It provides funding and policy support but does not directly develop such technologies.

• Indian Space Research Organisation (ISRO):

• ISRO focuses on space technology and satellite development. It is not involved in desalination technologies.

Q30. Answer: (d) heinous crimes

The correct answer is heinous crimes.

Key Points

• The Juvenile Justice (Care and Protection of Children) Act, 2015: This Act governs the treatment of juveniles in India in cases of criminal offenses. It replaced the Juvenile Justice Act of 2000 to address the gaps in dealing with children involved in heinous crimes.

• Under this Act, juveniles aged 16-18 years can be tried as adults if they commit heinous crimes. Heinous crimes are defined as offenses that carry a minimum punishment of seven years or more under the Indian Penal Code (IPC).

• The Act ensures that juveniles committing less serious offenses like theft, drug abuse, or cybercrime are treated under the juvenile justice system, focusing on rehabilitation rather than punishment. Hence, options 1, 2, and 3 are not correct.

• A major provision of the Act includes the establishment of a Juvenile Justice Board. The Board determines whether the accused juvenile should be tried as an adult based on their mental and physical maturity and the circumstances of the crime.

• The primary intent is to strike a balance between the need for justice in heinous crimes and the rehabilitation of juveniles. This ensures accountability while considering the developmental needs of young offenders.

• Examples of heinous crimes include murder, rape, terrorism, and other grievous offenses. These crimes are considered severe enough to justify the trial of juveniles as adults, especially when committed by those aged 16-18.

• Hence, the correct answer is heinous crimes.

Additional Information

• Juvenile Justice (Care and Protection of Children) Act, 2015:

• The Act categorizes offenses committed by juveniles into three categories: petty offenses, serious offenses, and heinous offenses.

• For heinous offenses, juveniles aged 16-18 are assessed by the Juvenile Justice Board to determine whether they should be tried as adults. This assessment considers the child's maturity, age, and intent behind the crime.

• Legal Framework for Heinous Crimes:

• Heinous crimes are defined as those punishable with a minimum of seven years imprisonment under the IPC. The severity reflects the societal impact of such crimes.

• The Act introduces stringent measures to safeguard society while ensuring justice for victims of heinous crimes. This includes provisions for fair trials and rehabilitation.

• Examples: Crimes like murder, rape, or terrorism committed by juveniles aged 16-18 fall under this category.

• Juvenile Justice Board:

• The Juvenile Justice Board comprises experts in law, psychology, and social work. It ensures a fair evaluation of the juvenile's maturity and circumstances.

• The Board's decision to try a juvenile as an adult is based on thorough investigation and psychological assessment.

Important Points

• Key Features of the Juvenile Justice Act:

• The Act aims to protect children in conflict with the law by ensuring measures for rehabilitation, education, and reintegration into society.

• It lays down specific guidelines for handling juveniles accused of heinous crimes, ensuring a balance between justice and reform.

• Significant Developments:

• The Act was introduced following public outcry over cases involving juveniles committing serious crimes, such as the 2012 Delhi gang rape case.

• It reflects India's commitment to addressing juvenile justice while maintaining international standards of child protection.

Q31. Answer: (c) 15% of the total strength of the Legislative Assembly

The correct answer is 15% of the total strength of the Legislative Assembly.

Key Points

• Article 164(1A) of the Constitution of India stipulates that the total number of Ministers, including the Chief Minister, in a State Council of Ministers, shall not exceed 15% of the total number of members of the Legislative Assembly.

• The 91st Amendment Act of 2003 introduced this provision to limit the size of the Council of Ministers. The aim was to ensure efficiency in governance and reduce the cost of administration.

• The minimum permissible number of Ministers, including the Chief Minister, in a state is fixed at 12, irrespective of the total strength of the Legislative Assembly.

• This restriction applies to all Indian states and Union Territories with Legislative Assemblies, including Delhi and Puducherry.

• The provision was introduced to prevent the unnecessary expansion of the Council of Ministers, which could potentially lead to inefficiency and financial burden on the state exchequer.

• Hence, the maximum permissible size of a State Council of Ministers, including the Chief Minister, is 15% of the total strength of the Legislative Assembly, subject to a minimum of 12 members.

Additional Information

• 91st Constitutional Amendment Act, 2003:

• This amendment aimed at ensuring a more effective and streamlined administrative machinery by limiting the size of the Council of Ministers.

• It amended Article 75 and Article 164, introducing a clause that limits the size of the Council of Ministers at both the Centre and in states.

• The maximum size of the Union Council of Ministers is restricted to 15% of the total members of the Lok Sabha.

• Significance of the Provision:

• The limitation ensures that governance remains streamlined and avoids unnecessary political appointments.

• It also helps reduce the financial burden on the exchequer by minimizing the expenses of maintaining a large Council of Ministers.

• Key Features of Article 164:

• Article 164 specifically deals with the provisions related to the State Council of Ministers, including the appointment of the Chief Minister and other ministers by the Governor.

• The Governor appoints the Chief Minister, who in turn recommends the names of other ministers to be appointed to the Council of Ministers.

Q32. Answer: (d) Persistent regional disparities

The correct answer is Persistent regional disparities.

Key Points

• One of the major challenges to human development in India is the persistent regional disparities. These disparities exist in terms of access to education, healthcare, infrastructure, and employment opportunities across different regions.

• Human Development Index (HDI) is a measure of a region's development. In India, states like Kerala and Haryana have a high HDI, while states like Bihar and Uttar Pradesh lag significantly. This highlights the stark regional inequalities.

• Several factors contribute to regional disparities, such as historical neglect, unequal resource distribution, lack of industrialization, and geographical challenges. These hinder holistic development and create gaps in socio-economic conditions.

• Persistent disparities lead to migration issues, where people from underdeveloped regions move to urban or developed areas in search of better opportunities. This further burdens urban infrastructure and creates socio-economic strain.

• The government has launched various schemes, such as Aspirational Districts Programme, aimed at addressing regional disparities by focusing on lagging districts. However, the outcomes are still evolving.

Additional Information

• Rapid urbanisation:

• Rapid urbanisation refers to the fast-paced growth of cities and urban areas. While it generates economic opportunities, it also creates challenges like overcrowding, strain on infrastructure, and environmental pollution. However, this is not the biggest challenge to human development in India as urbanisation often improves access to services and jobs.

• High foreign exchange reserves:

• India's foreign exchange reserves are a measure of its economic stability. High reserves signify strong economic fundamentals and provide a cushion during financial crises. This is not a challenge but rather an advantage for the economy.

• Increasing digital infrastructure:

• India has seen significant growth in digital infrastructure, with initiatives like Digital India aimed at improving internet access, digital literacy, and e-governance. This enhances human development rather than posing a challenge.

• Persistent regional disparities:

• Regional disparities are a long-standing issue in India. States like Kerala excel in health and education, while Jharkhand and Odisha struggle with poverty and underdevelopment. This uneven progress obstructs inclusive human development.

• Addressing these disparities is critical for achieving the Sustainable Development Goals (SDGs) and ensuring equitable growth.

Important Points

• Government initiatives to reduce regional disparities:

• The Aspirational Districts Programme targets 112 districts that are lagging in key development indicators. It aims to improve health, education, agriculture, and infrastructure in these areas.

• The National Rural Employment Guarantee Act (NREGA) provides employment opportunities in rural areas to reduce migration and improve regional development.

• Challenges in addressing regional disparities:

• Persistent corruption, lack of proper implementation of policies, and political interference often hamper efforts to address regional disparities effectively.

• Improving regional equity requires long-term planning, effective governance, and community participation.

Q33. Answer: (c) 15-20%

The correct answer is 15-20%.

Key Points

• Services sector contribution during the colonial period: During the colonial era in India, the services sector accounted for only 15-20% of the total economic activity. This indicates a limited role of services in the economy at that time.

• The colonial economy was largely agrarian, with agriculture being the primary source of employment and revenue. Industrial development was minimal, and the services sector did not play a significant role in economic activities. Hence, the given statement is correct.

• Lack of infrastructure: The limited services sector contribution can be attributed to the lack of infrastructure and focus on industrial and agricultural exploitation under British rule.

• The colonial administration concentrated on extractive industries and trade that benefited British interests rather than fostering a balanced growth across sectors. Hence, the services sector contribution remained low.

• Examples of services sector: Examples of services during the colonial period included administration, legal services, banking, and transportation (e.g., railways), but these were primarily established to support colonial trade and governance.

Additional Information

• Colonial economy characteristics:

• The colonial economy was marked by exploitation of agriculture and raw materials for export. India was turned into a supplier of raw materials and a market for British manufactured goods.

• Industrial development was minimal, as British policies discouraged the growth of indigenous industries while promoting British products.

• Services sector during colonial India:

• The services sector primarily consisted of activities like administrative services provided by the colonial government, transportation (especially railways), and limited banking services.

• Railways, introduced in the mid-19th century, were primarily developed to facilitate trade and the movement of goods rather than to promote economic development.

• Post-independence growth:

• After independence, India began focusing on developing its services sector alongside agriculture and industry, which has led to its current role as a significant contributor to GDP.

• The services sector now contributes over 50% of India's GDP, highlighting the shift from an agrarian-based economy to a service-oriented one.

Important Points

• Comparison with other sectors:

• During the colonial period, the agricultural sector dominated, contributing the majority of employment and revenue. Industrial growth was negligible, primarily limited to extractive industries.

• The services sector, though present, was limited to activities that facilitated colonial exploitation, such as banking for trade and transportation.

• Historical impact:

• The underdevelopment of the services sector during colonial rule had long-term implications, delaying India's economic growth and diversification until post-independence reforms were implemented.

• Modern India's services sector growth, including IT and software services, marks a stark contrast to its minimal role during the colonial period.

Q34. Answer: (d) 1899

The correct answer is 1899.

Key Points

• The Calcutta Electric Supply Corporation Limited (CESC) commissioned its first thermal power plant in the year 1899.

• The plant was established in Kolkata (then Calcutta), which was among the first cities in India to have access to electricity.

• This development marked a significant milestone in the history of electricity generation in India. Hence, the correct year is 1899.

• The commissioning of this thermal power plant was instrumental in providing electricity to urban areas of Calcutta and later expanded to surrounding regions.

• This initiative was a step forward in industrialization and urban development during British India. Hence, the answer highlights the importance of 1899.

Additional Information

• Calcutta Electric Supply Corporation (CESC):

• CESC is a pioneer in electricity generation and distribution in India. It was established in the late 19th century to cater to the growing demand for electricity in urban areas.

• The company played a critical role in electrifying Calcutta and surrounding regions during British rule in India.

• Thermal Power Plant:

• A thermal power plant uses the heat energy generated from burning fossil fuels (coal, oil, or gas) to produce electricity.

• The thermal power plant commissioned by CESC in 1899 was among the first of its kind in India, helping modernize Calcutta.

• Example: The plant introduced innovations in electricity distribution, enabling industries, railways, and homes to access electricity.

• Impact on Development:

• The establishment of the first thermal power plant contributed to the industrialization of India, especially in urban centers.

• It supported the growth of industries, transportation, and infrastructure by providing reliable energy resources.

• The success of the 1899 power plant paved the way for future advancements in power generation technology in India.

Important Points

• Key Characteristics of Thermal Power Plants:

• Thermal power plants are powered by fossil fuels, which generate heat energy to drive turbines for electricity generation.

• They are widely used due to their ability to generate large amounts of electricity efficiently.

• Examples include coal-based power plants, oil-based plants, and natural gas-based power plants.

• Significance of 1899:

• The year 1899 marks the beginning of thermal electricity generation in India, a milestone in technological and industrial progress.

• It laid the foundation for the establishment of a robust power generation infrastructure in the country.

• The success of the CESC thermal plant in 1899 highlighted the potential of thermal power to meet India's growing energy demands.

Q35. Answer: (b) Gujarat

The correct answer is Gujarat.

Key Points

• The Great Indian Desert, also known as the Thar Desert, lies primarily in the northwestern part of India, spanning the state of Rajasthan and extending into parts of Gujarat, Haryana, and Punjab.

• Gujarat is located to the southwest of Rajasthan, making it the state situated to the south of the Great Indian Desert. Hence, Gujarat is the correct answer.

• Madhya Pradesh: This state lies to the southeast of Rajasthan but does not directly border the Great Indian Desert. Therefore, it is not the correct answer.

• Uttar Pradesh: Located in north-central India, Uttar Pradesh is situated to the east of Rajasthan and does not lie in the south of the Great Indian Desert. Hence, it is incorrect.

• Haryana: This state lies to the northeast of Rajasthan and is not located in the south of the Great Indian Desert. Therefore, it is also incorrect.

• The geographical location of Gujarat in close proximity to the Great Indian Desert justifies why it is the state in the south of the desert. Hence, Gujarat is the correct answer.

Additional Information

• Great Indian Desert (Thar Desert):

• The Thar Desert is the 17th largest desert in the world and the 9th largest subtropical desert. It covers an area of approximately 200,000 square kilometers.

• The desert is characterized by arid conditions, sand dunes, and a hot climate. Its boundaries extend across Rajasthan, parts of Gujarat, and some regions of Punjab and Haryana.

• Gujarat:

• Located in western India, Gujarat is bordered by Rajasthan to the north, Maharashtra to the south, and the Arabian Sea to the west.

• The Rann of Kutch, a part of Gujarat, forms the southern boundary of the Great Indian Desert.

• The state is renowned for its cultural heritage, historic trade routes, and industrial development.

• Other States Mentioned:

• Madhya Pradesh: Known as the "Heart of India," it lies in central India and does not touch the Great Indian Desert.

• Uttar Pradesh: A populous state in northern India, it is geographically far from the Great Indian Desert.

• Haryana: Located in northern India, it shares a border with Rajasthan but is to the northeast of the Great Indian Desert.

Important Points

• Geographical Importance:

• The Thar Desert plays a significant role in influencing the climate, agriculture, and way of life in the regions it spans.

• Rajasthan hosts the majority of the desert, while Gujarat has the southern extension in the form of the Rann of Kutch.

• Climatic Conditions:

• The desert experiences extreme temperatures, with summer temperatures reaching as high as 50°C and winter temperatures dropping to below 0°C.

• Rainfall: The region receives scanty rainfall, typically less than 250 mm annually, making it arid and dry.

Q36. Answer: (c) East Fuji, Japan

The correct answer is East Fuji, Japan.

Key Points

• The 2025 edition of Exercise Dharma Guardian was held at East Fuji, Japan, which is a prominent military training ground located near Mount Fuji.

• The exercise involves rigorous training sessions, including counter-terrorism drills, combat operations in urban and semi-urban environments, and sharing of expertise in modern warfare techniques.

• East Fuji Maneuver Area is a key military base in Japan, located near the iconic Mount Fuji. It provides an ideal terrain for conducting extensive military exercises.

• India and Japan share a strong partnership in defense and security. This relationship is a result of their shared strategic interests, including maintaining peace and stability in the Indo-Pacific region.

• Example: India and Japan also conduct other joint initiatives, such as the Malabar Exercise, which involves naval forces from India, Japan, the United States, and Australia.

• Significance of Dharma Guardian:

• It emphasizes counter-terrorism strategies, urban warfare, and combat readiness, which are essential in the current geopolitical landscape.

• Pune, India: This city is a hub for several military installations and training centers in India, but it is not the location for Exercise Dharma Guardian 2025.

• Tokyo, Japan: As the capital city of Japan, Tokyo is significant for diplomatic meetings and defense discussions, but not for hosting this exercise.

• Broader Context:

• Strategic Importance: The focus of such exercises is on ensuring peace, stability, and security amidst rising geopolitical tensions.

Q37. Answer: (d) Indira Gandhi International Airport (IGIA)

The correct answer is Indira Gandhi International Airport (IGIA).

Key Points

• Indira Gandhi International Airport (IGIA) is located in New Delhi, India, and is one of the busiest and most significant airports in the country.

• In the 2024 ACI Hub Connectivity Rankings, IGIA was recognized as one of the top 10 hub airports in the Asia-Pacific and Middle East region.

• This achievement highlights the airport's role as a major global connectivity hub and its ability to facilitate extensive passenger and cargo traffic.

• The ACI Hub Connectivity Rankings measure the ability of airports to connect passengers efficiently with other destinations worldwide, making this recognition a significant accomplishment for IGIA.

• The airport's inclusion in this ranking demonstrates its commitment to operational excellence, modern infrastructure, and a high standard of passenger experience.

• The recognition also reflects India's growing prominence in the global aviation sector and the strategic importance of IGIA in connecting India with the rest of the world.

Additional Information

• Indira Gandhi International Airport (IGIA):

• Located in New Delhi, IGIA is named after Indira Gandhi, the former Prime Minister of India.

• It is operated by Delhi International Airport Limited (DIAL), a consortium led by GMR Group in partnership with the Airports Authority of India.

• The airport has a world-class Terminal 3, which caters to international flights and is equipped with modern facilities to handle millions of passengers annually.

• ACI Hub Connectivity Rankings:

• These rankings are released by the Airports Council International (ACI), a global trade representative of the world's airport authorities.

• The rankings evaluate airports based on their ability to connect passengers to various destinations, emphasizing hubs with high connectivity.

• The rankings underline the airport's role in facilitating efficient passenger and cargo movement globally.

• India's Aviation Growth:

• India is one of the fastest-growing aviation markets in the world, with airports like IGIA playing a pivotal role in enhancing global connectivity.

• The recognition of IGIA highlights India's increasing importance in the global aviation industry.

Important Points

• Other Indian Airports:

• Chhatrapati Shivaji Maharaj International Airport in Mumbai is another key airport in India, known for its significant contribution to passenger and cargo traffic.

• Kempegowda International Airport in Bengaluru is recognized for its modern infrastructure and efficient operations.

• Chennai International Airport serves as a vital gateway to South India and handles a substantial volume of domestic and international passengers.

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• Global Significance of IGIA:

• IGIA’s inclusion in the top 10 hub airports highlights India's capability to provide world-class aviation facilities.

• It underscores the importance of New Delhi as a key global transit point for passengers and cargo.

Q38. Answer: (c) Carlos Alcaraz

The correct answer is Carlos Alcaraz.

Key Points

• Carlos Alcaraz won his maiden Italian Open title in May 2025 by defeating world No. 1 Jannik Sinner in Rome.

• The Italian Open, also known as the Internazionali BNL d'Italia, is one of the most prestigious clay-court tournaments in the ATP calendar. Winning this tournament is considered a significant achievement for players.

• Jannik Sinner, a top-ranked player and world No. 1, was defeated by Alcaraz. This shows Alcaraz's exceptional performance and ability to compete with the best players in the world.

• Carlos Alcaraz is known for his remarkable skills, agility, and aggressive playing style. His victory in Rome marks a significant milestone in his career, especially against a player of Sinner's caliber.

• This win adds to Carlos Alcaraz's growing reputation as one of the most promising young talents in tennis, solidifying his position as a formidable player on the ATP tour.

Additional Information

• Carlos Alcaraz:

• Born on May 5, 2003, in Spain, Carlos Alcaraz is a professional tennis player who has quickly risen to prominence on the ATP tour.

• Known for his powerful groundstrokes, quick footwork, and mental toughness, Alcaraz has been heralded as a future star in tennis.

• He has achieved notable victories and titles, including his maiden Grand Slam title at the US Open 2022, making him one of the youngest players to do so.

• Italian Open:

• The Italian Open is a major clay-court tournament held annually in Rome, Italy. It is part of the ATP Masters 1000 series and is considered a key warm-up event for the French Open.

• The tournament has witnessed victories by legendary players such as Rafael Nadal, Novak Djokovic, and others. Winning the Italian Open is a testament to a player's ability to perform on clay courts.

• Jannik Sinner:

• Born on August 16, 2001, in Italy, Sinner is a professional tennis player who has gained recognition for his consistent performances and technical skills.

• As a top-ranked player and world No. 1, Sinner has been a dominant force in tennis, particularly in recent years.

• Despite his loss in the Italian Open, Sinner remains one of the strongest competitors in the sport.

Important Points

• Significance of the Italian Open:

• Being one of the ATP Masters 1000 tournaments, the Italian Open is a critical event for players preparing for the French Open, the second Grand Slam of the year.

• The tournament attracts the world's top-ranked players and provides a platform for emerging talents to showcase their skills.

• Performance of Carlos Alcaraz:

• Alcaraz's win against Jannik Sinner is a testament to his determination, skill, and adaptability on clay courts.

• This victory further solidifies his position as one of the leading players in the sport and highlights his potential to achieve even greater success in the future.

Q39. Answer: (b) Manganese

The correct answer is Manganese.

Key Points

• Manganese is an essential material used in the steel industry to harden steel and improve its durability and strength.

• It acts as a deoxidizing agent during the steel production process, removing oxygen and sulfur impurities.

• Manganese enhances the tensile strength, wear resistance, and toughness of steel, making it suitable for a variety of industrial applications. Hence, Manganese is the correct answer.

• The absence of manganese in steel production could lead to brittle steel, which is less durable and prone to breakage.

• Manganese is widely used in the production of alloy steel, stainless steel, and other specialized types of steel for construction, automotive, and machinery industries.

Additional Information

• Characteristics of Manganese:
• Manganese is a chemical element with the symbol Mn and atomic number 25.
• It is a hard, brittle, and silvery-gray metal widely used in industrial applications.
• Manganese is primarily mined in countries such as South Africa, Australia, Brazil, and India.
• Applications of Manganese in the Steel Industry:
• Manganese is used in the production of high-strength steel alloys, which are vital for construction and manufacturing industries.
• Manganese steel, also known as Hadfield steel, is renowned for its high impact strength and resistance to abrasion.
• It is used in the production of railway tracks, crusher jaws, and industrial equipment due to its wear-resistant properties.
• Comparison with Other Options:
• Mica: Primarily used in electrical insulation and electronics; not relevant for steel hardening.
• Limestone: Used as a flux in steel production to remove impurities but does not harden steel directly.
• Bauxite: A primary ore for aluminum production; not used in steel hardening.

Important Points

• Global Production:
• South Africa is the world's largest producer of manganese, contributing significantly to global supply.
• India is one of the major producers of manganese, with reserves concentrated in Madhya Pradesh, Odisha, and Maharashtra.
• Key Facts:
• Manganese consumption in steel production accounts for about 85%-90% of total manganese use globally.
• Its unique properties make it indispensable in the steel industry, providing both structural strength and wear resistance.

Q40. Answer: (d) Punjab Kesari

The correct answer is Punjab Kesari.

Key Points

• Lala Lajpat Rai was a prominent leader in the Indian Independence Movement. He was known for his dedication to the nation and his ability to inspire people towards achieving freedom.
• He was given the title "Punjab Kesari", meaning the "Lion of Punjab", due to his fearless attitude and contributions to the freedom struggle.
• Lala Lajpat Rai was one of the Lal-Bal-Pal trio, alongside Bal Gangadhar Tilak and Bipin Chandra Pal, who were pivotal in promoting the extremist approach in the Indian Nationalist Movement.
• He played a significant role in the Swadeshi Movement and encouraged Indians to boycott British goods and adopt indigenous products. Hence, the correct answer is Punjab Kesari.
• Lala Lajpat Rai also protested against the Simon Commission in 1928, during which he suffered injuries in a police lathi-charge that eventually led to his death.
• Titles like Mahamana (given to Madan Mohan Malaviya), Tilak of Punjab, and Deshbandhu (given to Chittaranjan Das) are unrelated to Lala Lajpat Rai. Hence, the correct title for Lala Lajpat Rai is Punjab Kesari.

Additional Information

• Lala Lajpat Rai’s Contributions:
• Lala Lajpat Rai was born on 28 January 1865 in Punjab. He was an ardent nationalist and a social reformer.
• He was associated with the Indian National Congress and believed in achieving independence through stronger measures, which made him one of the prominent leaders of the extremist wing.
• He founded the Punjab National Bank in 1894, which aimed to promote indigenous banking and economic independence.
• Titles and Recognitions:
• The title "Punjab Kesari" was attributed to him due to his courage and leadership during the freedom struggle.
• Other titles like Mahamana were associated with Madan Mohan Malaviya, and Deshbandhu was given to Chittaranjan Das.
• The title Tilak of Punjab is not officially recorded for Lala Lajpat Rai.
• Legacy:
• Lala Lajpat Rai’s sacrifice during the protest against the Simon Commission is considered one of the turning points in India's struggle for independence.
• His writings, speeches, and leadership continue to inspire generations of Indians.

Important Points

• Simon Commission Protest:
• Simon Commission was boycotted by Indians as it did not include any Indian members.
• Lala Lajpat Rai led the protest in Lahore on 30 October 1928, where he suffered fatal injuries due to the police lathi-charge.

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• Contributions to Literature:
• Lala Lajpat Rai authored several books, including "Unhappy India", which critiqued British policies.
• His works reflected his vision of a free and prosperous India.

Q41. Answer: (c) Rs. 783

Shortcut Trick
Selling Price (SP) = Marked Price × (100 − Discount%) ÷ 100
SP = 900 × (100 − 13)%
SP = 900 × 87%
SP = 9 × 87 = 783
Therefore The correct answer is Rs. 783.
Alternate Method
Given:
Marked Price (MP) of the book = Rs. 900
Discount offered = 13%
Formula Used:
Discount = (Discount% ÷ 100) × MP
Selling Price (SP) = MP − Discount
MP Rs. 900 −13% Discount (−Rs. 117) SP Rs. 783
Calculations:
=> Discount amount = 13% of 900
=> Discount = (13 ÷ 100) × 900 = Rs. 117
=> Selling Price (SP) = 900 − 117
=> Selling Price = Rs. 783
Therefore The correct answer is Rs. 783.
Additional Information
Marked Price (MP) and Discount
Discount is fundamentally a reduction applied to the Marked Price of an article. It is always calculated on the MP unless specified otherwise. Formula: SP = MP × (100 − D%) ÷ 100.
Successive Discounts
If two successive discounts of a% and b% are applied on a product, the effective single discount percentage is calculated using the formula: [a + b − (a × b) ÷ 100]%.
Profit and Loss Relationship
While Discount is calculated on MP, Profit and Loss are always calculated on the Cost Price (CP). A dealer offers a discount on MP to arrive at the SP, and the difference between SP and CP determines the actual profit or loss.

Q42. Answer: (c) 14

Shortcut Trick
The average of the 3 numbers is 20.
Deviation of 18 from the average = 18 − 20 = −2
Deviation of 28 from the average = 28 − 20 = +8
Net deviation of the two known numbers = −2 + 8 = +6
To maintain the average of 20, the third number must balance this with a deviation of −6.
Third number = 20 − 6 = 14.
Therefore The correct answer is 14.
Alternate Method
Given:
Average of 3 numbers = 20
Two of the numbers are 18 and 28.
Formula Used:
Sum of numbers = Average × Total numbers
Total Sum = 3 × 20 = 60
18

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28

? (14)

18 + 28 = 46

60 − 46 = 14

Calculations:

=> Total sum of the three numbers = 20 × 3 = 60

=> Sum of the two given numbers = 18 + 28 = 46

=> Third number = Total sum − Sum of the two given numbers

=> Third number = 60 − 46

=> Third number = 14

Therefore The correct answer is 14.

Additional Information

Average Formula

Average = (Sum of all observations) ÷ (Number of observations). This is the foundational rule for determining equal distribution among quantities.

Deviation Method for Averages

The algebraic sum of the deviations of a set of numbers from their exact average is always zero. This property provides a powerful shortcut to compute unknown values without calculating the total sum.

Weighted Average

When combining different groups, the combined average is calculated as (n1A1 + n2A2) ÷ (n1 + n2), where n represents the number of items and A represents the respective averages.

Q43. Answer: (d) 174

Shortcut Trick

Total parts in the ratio = 2 + 5 + 4 = 11 parts.

Difference between largest and smallest parts = 5 − 2 = 3 parts.

Required difference = (3 ÷ 11) × 638

Required difference = 3 × 58 = 174

Therefore The correct answer is Rs. 174.

Alternate Method

Given:

Total amount to be divided = Rs. 638

Ratio of distribution among three persons = 2 : 5 : 4

Total Amount = Rs. 638 (11 parts)

2 parts

Smallest

5 parts

Largest

4 parts

Difference = 3 parts

3 × Rs. 58 = Rs. 174

Calculations:

=> Let the respective shares of the three persons be 2x, 5x, and 4x.

=> Total sum = 2x + 5x + 4x = 11x

=> 11x = 638

=> x = 638 ÷ 11 = 58

=> The largest share = 5x = 5 × 58 = 290

=> The smallest share = 2x = 2 × 58 = 116

=> Difference between largest and smallest share = 290 − 116 = 174

Therefore The correct answer is Rs. 174.

Additional Information

Compound Ratio

When two or more ratios are multiplied term by term, the result is called a compound ratio. For a:b and c:d, the compound ratio is (a × c) : (b × d).

Duplicate Ratio

The compound ratio of two equal ratios is called a duplicate ratio. For a ratio a:b, the duplicate ratio is $a^2 : b^2$.

Proportion Rule

When two ratios are equal, they are said to be in proportion. If a:b = c:d, then the product of extremes equals the product of means (a × d = b × c).

Q44. Answer: (b) 2 days

Shortcut Trick

Equating total work: 2M × 18 = 4W × 6

=> 36M = 24W => M/W = 2/3 (Efficiency ratio)

Total Work = 36 × 2 = 72 units

Required Time = 72 ÷ (9 × 2 + 6 × 3) = 72 ÷ 36 = 2 days

Therefore The correct answer is 2 days.

Alternate Method

Given:

Time taken by 2 men = 18 days

Time taken by 4 women = 6 days

Formula Used:

Total Work = LCM of given days

Efficiency = Total Work ÷ Total Days

Person	Days	Total Work	Efficiency
2 Men	18	18	18 ÷ 18 = 1
4 Women	6	18 ÷ 6 = 3	

=> Efficiency of 2 Men = 1 unit/day => Efficiency of 1 Man = 1 ÷ 2 = 0.5 units/day

=> Efficiency of 4 Women = 3 units/day => Efficiency of 1 Woman = 3 ÷ 4 = 0.75 units/day

=> Total efficiency of 9 Men and 6 Women = (9 × 0.5) + (6 × 0.75)

=> Combined efficiency = 4.5 + 4.5 = 9 units/day

=> Total time required = Total Work ÷ Combined Efficiency

=> Total time required = 18 ÷ 9 = 2 days

Therefore The correct answer is 2 days.

Additional Information

Work Equivalence Method

When groups of men and women complete the same piece of work in varying days, equating their total man-days and woman-days easily yields their individual efficiency ratio.

MDH Formula

M1 × D1 × H1 ÷ W1 = M2 × D2 × H2 ÷ W2, where M is the number of persons, D is days, H is hours, and W is total work done.

Combined Efficiency Rule

When multiple groups work together, their combined 1-day work is simply the sum of their individual 1-day efficiencies. Total Time is always calculated as Total Work ÷ Total Combined Efficiency.

Q45. Answer: (d) 14

Shortcut Trick

Let Mary's age = M and Diya's age = D.

From given conditions: 2M − 6D = 20 => M − 3D = 10

And M − 5D = 6

Subtracting both: 2D = 4 => D = 2

So, M = 10 + 3(2) = 16

Age difference = 16 − 2 = 14.

Therefore The correct answer is 14 years.

Alternate Method

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Given:

Let Mary's present age be M years and Diya's present age be D years.

Condition 1: 2M = 6D + 20

Condition 2: 5D = M − 6

Mary

16 years

Diya

2

Difference = 14 years

Age Comparison Diagram

Calculation:

From Condition 1, divide the entire equation by 2:

=> M = 3D + 10 --- (Equation 1)

From Condition 2:

=> M = 5D + 6 --- (Equation 2)

Equating Equation 1 and Equation 2:

=> 3D + 10 = 5D + 6

=> 5D − 3D = 10 − 6

=> 2D = 4

=> D = 2

Substitute D = 2 in Equation 1:

=> M = 3(2) + 10

=> M = 6 + 10 = 16

Difference between their ages = M − D

=> Difference = 16 − 2 = 14

Therefore The correct answer is 14 years.

Additional Information

Ages and Linear Equations

Word problems on ages can easily be modeled using simple linear equations. Past ages are represented by subtraction (−), while future ages are modeled by addition (+).

Age Differences Remain Constant

The absolute difference in ages between any two people always remains constant over time regardless of evaluating past or future scenarios.

Ratio of Ages

When the ratio of present ages is a:b, the actual ages can be considered as ax and bx. After n years, the new ratio seamlessly transforms to (ax + n) : (bx + n).

Q46. Answer: (b) 14 km/hr

Shortcut Trick

Total distance = 574 km and Total time = 18 hours.

Distance covered in first two parts = (36 × 11) + 136 = 396 + 136 = 532 km.

Time taken in first two parts = 11 + (136 ÷ 34) = 11 + 4 = 15 hours.

Remaining distance = 574 − 532 = 42 km and Remaining time = 18 − 15 = 3 hours.

Required speed for remaining part = 42 ÷ 3 = 14 km/hr.

Therefore The correct answer is 14 km/hr.

Alternate Method

Total Distance = 574 km (18 hours)

Dist 1 = ?

S1 = 36 km/hr

T1 = 11 hrs

Dist 2 = 136 km

S2 = 34 km/hr

T2 = ?

Dist 3 = ?

S3 = ?

T3 = ?

Remaining Speed = 42 km ÷ 3 hrs = 14 km/hr

Given:

Total Distance (D) = 574 km

Total Time (T) = 18 hours

Formula Used:

Distance = Speed × Time

Speed = Distance ÷ Time

Calculations:

=> For the first part of the journey:

=> Distance covered in 11 hours (D1) = 36 × 11 = 396 km

=> For the second part of the journey:

=> Time taken to cover 136 km (T2) = 136 ÷ 34 = 4 hours

=> Now, calculating total distance covered and total time taken so far:

=> Total distance covered = 396 + 136 = 532 km

=> Total time taken = 11 + 4 = 15 hours

=> For the remaining journey:

=> Remaining distance (D3) = Total Distance − Distance Covered

=> Remaining distance (D3) = 574 − 532 = 42 km

=> Remaining time (T3) = Total Time − Time Taken

=> Remaining time (T3) = 18 − 15 = 3 hours

=> Required Speed = Remaining distance ÷ Remaining time

=> Required Speed = 42 ÷ 3 = 14 km/hr

Therefore The correct answer is 14 km/hr.

Additional Information

Average Speed

Average speed is the ratio of total distance covered to the total time taken for the complete journey. Formula: Average Speed = Total Distance ÷ Total Time.

Unit Conversion

To directly convert speed from km/hr to m/s, multiply the value by 5/18. To convert m/s to km/hr, multiply the value by 18/5.

Relative Speed

When two objects are moving in opposite directions, their relative speed is the sum of their individual speeds (S1 + S2). When moving in the same direction, it is their difference (S1 − S2).

Q47. Answer: (b) Rs. 37,791

Shortcut Trick

Effective interest percentage for Case 1 = 4.5% × (22/3) = 33%.

Given, 33% of Principal = Rs. 6,270 => Principal = (6270 ÷ 33) × 100 = Rs. 19,000.

Effective interest percentage for Case 2 = 8.6% × (23/2) = 98.9%.

Total Amount percentage = 100% (Principal) + 98.9% (Interest) = 198.9%.

Amount payable = 198.9% of 19,000 = 198.9 × 190 = Rs. 37,791.

Therefore The correct answer is Rs. 37,791.

Alternate Method

Given:

Simple Interest in Case 1 (SI1) = Rs. 6,270

Time in Case 1 (T1) = 7 1/3 years = 22/3 years

Rate in Case 1 (R1) = 4.5% per annum

Time in Case 2 (T2) = 11 1/2 years = 23/2 years

Rate in Case 2 (R2) = 8.6% per annum

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Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Amount (A) = P + SI

Sum (P)

Case 1: SI = Rs. 6,270

R = 4.5%, T = 22/3 yrs

Case 2: Amount = ?

R = 8.6%, T = 23/2 yrs

Calculations:

Finding the principal (P) using Case 1:

=> SI1 = (P × R1 × T1) ÷ 100

=> 6270 = (P × 4.5 × 22/3) ÷ 100

=> 6270 = (P × 1.5 × 22) ÷ 100

=> 6270 = (P × 33) ÷ 100

=> P = (6270 × 100) ÷ 33

=> P = 190 × 100 = Rs. 19,000

Finding the Simple Interest for Case 2 (SI2):

=> SI2 = (P × R2 × T2) ÷ 100

=> SI2 = (19000 × 8.6 × 23/2) ÷ 100

=> SI2 = 190 × 4.3 × 23

=> SI2 = 190 × 98.9 = Rs. 18,791

Total amount payable:

=> Amount = P + SI2

=> Amount = 19000 + 18791 = Rs. 37,791

Therefore The correct answer is Rs. 37,791.

Additional Information

Total Amount Formula

The total amount accumulated on a principal under simple interest over time is directly calculated as A = P[1 + (R × T)/100].

Effective Interest Method

In Simple Interest, the effective interest percentage for T years at rate R is simply (R × T)%. This percentage value can directly be multiplied with the principal to find the total interest.

Simple Interest vs Compound Interest

Unlike Simple Interest which is calculated strictly on the original principal throughout the term, Compound Interest is calculated on the principal along with the accumulated interest from the previous periods.

Q48. Answer: (a) 24

Shortcut Trick

The mean proportional between two numbers a and b is directly given by √(a × b).

Here, the two numbers are a = 18 and b = 32.

Mean proportional = √(18 × 32)

Mean proportional = √(576) = 24

Therefore The correct answer is 24.

Alternate Method

Given:

The two given numbers are 18 and 32.

Formula Used:

If x is the mean proportional between a and b, then a : x :: x : b.

In any proportion, the product of the extremes equals the product of the means.

Mean Proportional Formula

Means: x × x

18

:

x

::

x

:

32

Extremes: 18 × 32

Calculations:

=> 18 : x = x : 32

=> x × x = 18 × 32

=> $x^2 = (2 \times 9) \times (2 \times 16)$

=> $x^2 = 4 \times 9 \times 16$

=> $x = \sqrt{(4 \times 9 \times 16)}$

=> x = 2 × 3 × 4

=> x = 24

Therefore The correct answer is 24.

Additional Information

Third Proportional

If three numbers a, b, and c are in continued proportion (a : b :: b : c), then c is called the third proportional, which is calculated as $c = b^2 \div a$.

Fourth Proportional

If four numbers a, b, c, and d are in proportion (a : b :: c : d), then d is known as the fourth proportional, which is calculated as $d = (b \times c) \div a$.

Duplicate & Sub-duplicate Ratio

The duplicate ratio of two numbers a and b is defined as $a^2 : b^2$, while their sub-duplicate ratio is given by $\sqrt{a} : \sqrt{b}$.

Q49. Answer: (d) 1

Shortcut Trick

Put A = 90° and B = 90° to substitute and find the expression value directly.

=> x/a = cosec 90° × sin 90° = 1 × 1 = 1

=> y/b = cosec 90° × cos 90° = 1 × 0 = 0

=> z/c = cot 90° = 0

=> $x^2/a^2 + y^2/b^2 - z^2/c^2 = (1)^2 + (0)^2 - (0)^2 = 1$

Therefore The correct answer is 1.

Alternate Method

Given:

x = a cosec A sin B => x/a = cosec A sin B

y = b cosec A cos B => y/b = cosec A cos B

z = c cot A => z/c = cot A

Formula Used:

$\sin^2 \theta + \cos^2 \theta = 1$

$\text{cosec}^2 \theta - \cot^2 \theta = 1$

Calculations:

=> Evaluate the expression: $x^2/a^2 + y^2/b^2 - z^2/c^2$

=> $(\text{cosec A sin B})^2 + (\text{cosec A cos B})^2 - (\cot A)^2$

=> $\text{cosec}^2 A \sin^2 B + \text{cosec}^2 A \cos^2 B - \cot^2 A$

=> $\text{cosec}^2 A (\sin^2 B + \cos^2 B) - \cot^2 A$

=> $\text{cosec}^2 A \times (1) - \cot^2 A$

=> $\text{cosec}^2 A - \cot^2 A$

=> 1

Therefore The correct answer is 1.

Additional Information

Core Trigonometric Identities

The fundamental identities are: $\sin^2\theta + \cos^2\theta = 1$, $\sec^2\theta - \tan^2\theta = 1$, and $\text{cosec}^2\theta - \cot^2\theta = 1$.

Value Substitution Method

Substitute standard angles like 0°, 30°, 45°, 60°, or 90° to quickly evaluate trigonometric expressions. Always ensure the chosen angles do not result in an undefined value (like division by zero).

Important Trigonometric Ratios

The reciprocal ratios correspond to: $\text{cosec}\,\theta = 1 \div \sin\theta$, $\sec\theta = 1 \div \cos\theta$, and $\cot\theta = \cos\theta \div \sin\theta = 1 \div \tan\theta$.

Q50. Answer: (a) Rs. 96

Shortcut Trick

The total interest percentage for 2 months at 4% per month = 4% × 2 = 8%.

Simple Interest = 8% of the Principal.

=> SI = (8 ÷ 100) × 1200

=> SI = 8 × 12 = 96

Therefore The correct answer is Rs. 96.

Alternate Method

Given:

Principal (P) = Rs. 1200

Rate of Interest (R) = 4% per month

Time (T) = 2 months

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Month 0

P = Rs. 1200

Month 1

• Rs. 48 (4%)

Month 2

• Rs. 48 (4%)

4% interest

4% interest

Total SI = Rs. 96

Calculations:

=> Since both the interest rate and time are given in months, we do not need to convert time to years.

=> SI = (1200 × 4 × 2) ÷ 100

=> SI = (1200 × 8) ÷ 100

=> SI = 12 × 8

=> SI = 96

Therefore The correct answer is Rs. 96.

Additional Information

Unit Alignment of Rate and Time

Before applying the simple interest formula, always ensure that the rate of interest and time period share the same units (e.g., both per annum, or both per month). If the rate is per annum and time is in months, convert time by using T = months ÷ 12.

Effective Interest Method

The total effective interest percentage over a given timeframe is simply Rate × Time. For example, 4% per month for 2 months yields an overall interest equal to 8% of the principal amount.

Simple vs Compound Interest

Simple Interest is strictly computed on the initial principal sum over the whole tenure. Compound Interest is computed on the principal as well as any previously accumulated interest. CI formula: A = P(1 + R/100)^T.

Q51. Answer: (a) 32.12

Shortcut Trick

Assume the base average is 40 runs (from the first 23 matches).

Deviation for the next 10 matches = 14 − 40 = −26 runs per match.

Total deviation = 10 × (−26) = −260 runs.

Combined average = Base average + (Total deviation ÷ Total matches)

Combined average = 40 + (−260 ÷ 33) = 40 − 7.878 ≈ 32.12

Therefore The correct answer is 32.12 runs.

Alternate Method

Given:

Matches played initially (n1) = 23, Average runs (A1) = 40

Next matches played (n2) = 10, Average runs (A2) = 14

40

14

x

23

10

Avg 1

Avg 2

Ratio of Matches = 23 : 10

Formula Used:

Combined Average = (n1 × A1 + n2 × A2) ÷ (n1 + n2)

Calculations:

=> Total runs in the first 23 matches = 23 × 40 = 920

=> Total runs in the next 10 matches = 10 × 14 = 140

=> Total matches played = 23 + 10 = 33

=> Total runs in all 33 matches = 920 + 140 = 1060

=> Average of all 33 matches = 1060 ÷ 33

=> Average = 32.1212...

=> Rounding off to two decimal places, the average is 32.12

Therefore The correct answer is 32.12 runs.

Additional Information

Weighted Average

Used to find the overall average when groups of different sizes and averages are combined: A = (n1A1 + n2A2) ÷ (n1 + n2).

Net Deviation Method

A faster approach to calculate averages by assuming a base average, finding the total net deviation, and dividing it equally among all items: New Avg = Assumed Avg + (Total Deviation ÷ Total Count).

Alligation Rule

When two groups with distinct average values are mixed, the ratio of their quantities is given by the cross-difference of their averages with the combined mean average.

Q52. Answer: (c) 62/17hours

Shortcut Trick

Total work = LCM of times = LCM(16, 26, 16) = 208 units.

Combined efficiency = (208 ÷ 16) + (208 ÷ 26) + (208 ÷ 16) = 13 + 8 + 13 = 34 units/hour.

Time taken together = Total work ÷ Combined efficiency = 208 ÷ 34 = 104/17 = 6 2/17 hours.

Therefore The correct answer is 6 2/17 hours.

Alternate Method

Given:

Time taken by Pipe A = 16 hours

Time taken by Pipe B = 26 hours

Time taken by Pipe C = 16 hours

Formula Used:

Total Work = Time × Efficiency

Pipe	Hours	Total Work	Efficiency
A	16	208	13

B	26	8	
C	16	13	

Calculations:

=> Total Efficiency of Pipe A, B, and C together = 13 + 8 + 13 = 34 units/hour

=> Time taken by all three pipes together = Total Work ÷ Total Efficiency

=> Time taken = 208 ÷ 34

=> Time taken = 104 ÷ 17 = 6 2/17 hours

Therefore The correct answer is 6 2/17 hours.

Additional Information

Inlet vs Outlet Pipes

An inlet pipe fills a tank and its work/efficiency is treated as positive. An outlet pipe empties a tank and its work/efficiency is treated as negative.

Combined Work of Pipes

If a pipe fills a tank in x hours and another fills it in y hours, their combined time to fill the tank together is (x × y) ÷ (x + y) hours.

Part of Tank Filled

If a pipe requires n hours to completely fill an empty tank, the part of the tank filled by the pipe in 1 hour is 1/n.

Q53. Answer: (b) -40

Shortcut Trick

Applying BODMAS directly to evaluate powers and roots first:

=> $6^2 + \sqrt{(3^2)} - 7\sqrt{81} - 16$

=> $36 + 3 - 7 \times 9 - 16$

=> $39 - 63 - 16$

=> $39 - 79 = -40$

Therefore The correct answer is −40.

Alternate Method

Given:

$6^2 + \sqrt{(3^2)} - 7\sqrt{81} - 16$

Concept Used:

BODMAS Rule (Brackets, Orders, Division, Multiplication, Addition, Subtraction).

Calculations:

=> Step 1: Solve Orders (Squares and Roots)

=> $6^2 = 36$

=> $\sqrt{(3^2)} = \sqrt{9} = 3$

=> $\sqrt{81} = 9$

=> Expression becomes: $36 + 3 - 7 \times 9 - 16$

=> Step 2: Perform Multiplication

=> $7 \times 9 = 63$

=> Expression becomes: $36 + 3 - 63 - 16$

=> Step 3: Perform Addition and Subtraction sequentially from left to right

=> $39 - 63 - 16$

=> $-24 - 16$

=> -40

Therefore The correct answer is −40.

Additional Information

BODMAS Rule

It defines the sequence of operations in simplification: Brackets, Orders (Powers and Roots), Division, Multiplication, Addition, and Subtraction. Always follow this hierarchy to avoid calculation errors.

Squares and Square Roots

A perfect square root directly yields its positive base value, such as $\sqrt{81} = 9$. These must be evaluated during the Orders step before any multiplication or addition takes place.

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Successive Subtraction

When multiple numbers are subtracted sequentially, they can be grouped together as a sum of negative numbers: −a − b = −(a + b). For instance, −63 − 16 equates to −79.

Q54. Answer: (d) 96

Shortcut Trick

Product of two numbers = HCF × LCM

Second Number = (HCF × LCM) ÷ First Number

Second Number = (24 × 288) ÷ 72

Second Number = 288 ÷ 3 = 96

Therefore The correct answer is 96.

Alternate Method

Given:

HCF of the two numbers = 24

LCM of the two numbers = 288

First number (a) = 72

Formula Used:

a × b = HCF × LCM (where a and b are the two numbers)

Calculations:

=> 72 × b = 24 × 288

=> b = (24 × 288) ÷ 72

=> b = 288 ÷ 3

=> b = 96

Therefore The correct answer is 96.

Additional Information

Co-prime Numbers

Two numbers are co-prime if their HCF is 1. The LCM of two co-prime numbers is always equal to their product.

HCF and LCM of Fractions

HCF = HCF of numerators ÷ LCM of denominators | LCM = LCM of numerators ÷ HCF of denominators.

Relation between HCF and LCM

The HCF of two or more numbers is always a factor of their LCM. The product of two numbers equals the product of their HCF and LCM.

Q55. Answer: (c) 2^7× 3^6× 7^3

Shortcut Trick

To find the LCM, express all terms in their prime factor form and multiply the highest powers of each prime factor.

1st number = $2^3 \times 7^2 \times 12 = 2^5 \times 3^1 \times 7^2$

2nd number = $2^2 \times 12^2 \times 18 = 2^7 \times 3^4$

3rd number = $7^3 \times 12^2 \times 18^2 = 2^6 \times 3^6 \times 7^3$

LCM = Max(2^5, 2^7, 2^6) × Max(3^1, 3^4, 3^6) × Max(7^2, 1, 7^3) = $2^7 \times 3^6 \times 7^3$

Therefore The correct answer is $2^7 \times 3^6 \times 7^3$.

Alternate Method

Given:

First number = $2^3 \times 7^2 \times 12$

Second number = $2^2 \times 12^2 \times 18$

Third number = $7^3 \times 12^2 \times 18^2$

Formula Used:

The LCM (Least Common Multiple) of given numbers is the product of the highest powers of all prime factors present in the prime factorization of the numbers.

Calculations:

=> Prime factorization of 12 = $2^2 \times 3$

=> Prime factorization of 18 = 2×3^2

=> First number = $2^3 \times 7^2 \times (2^2 \times 3)$

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=> First number = $2^5 \times 3^1 \times 7^2$

=> Second number = $2^2 \times (2^2 \times 3)^2 \times (2 \times 3^2)$

=> Second number = $2^2 \times 2^4 \times 3^2 \times 2 \times 3^2$

=> Second number = $2^7 \times 3^4$

=> Third number = $7^3 \times (2^2 \times 3)^2 \times (2 \times 3^2)^2$

=> Third number = $7^3 \times 2^4 \times 3^2 \times 2^2 \times 3^4$

=> Third number = $2^6 \times 3^6 \times 7^3$

=> The prime factors involved in all the numbers are 2, 3, and 7.

=> Highest power of prime factor 2 = 2^7

=> Highest power of prime factor 3 = 3^6

=> Highest power of prime factor 7 = 7^3

=> LCM = $2^7 \times 3^6 \times 7^3$

Therefore The correct answer is $2^7 \times 3^6 \times 7^3$.

Additional Information

HCF of Numbers

The Highest Common Factor (HCF) is calculated by multiplying the lowest powers of common prime factors present in the numbers.

LCM of Fractions

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

HCF of Fractions

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

Product Rule

For any two numbers A and B, the product of the numbers is equal to the product of their HCF and LCM: A × B = HCF × LCM.

Q56. Answer: (d) -141x + 116

Shortcut Trick

Calculate the resulting terms directly by expanding and grouping the coefficients of identical variables.

x^2 term: $3 \times (7/3) - 7 \times 1 = 7 - 7 = 0$

x term: $3 \times (-26) - 7 \times 9 = -78 - 63 = -141x$

Constant term: $3 \times 13 - 7 \times (-11) = 39 + 77 = +116$

Combining all the terms, we get $-141x + 116$.

Therefore The correct answer is $-141x + 116$.

Alternate Method

Given:

$3((7/3)x^2 - 26x + 13) - 7(x^2 + 9x - 11)$

Formula Used:

Distributive Property: $a(b + c) = ab + ac$

Calculations:

Expanding the brackets by multiplying the outer constants with each term inside:

=> $3 \times (7/3)x^2 - 3 \times 26x + 3 \times 13 - 7 \times x^2 - 7 \times 9x - 7 \times (-11)$

=> $7x^2 - 78x + 39 - 7x^2 - 63x + 77$

Grouping the similar terms together:

=> $(7x^2 - 7x^2) + (-78x - 63x) + (39 + 77)$

=> $0x^2 - 141x + 116$

=> $-141x + 116$

Therefore The correct answer is $-141x + 116$.

Additional Information

Distributive Property

It states that multiplying a sum by a number gives the same result as multiplying each individual term by the number and then combining the products: $a(b - c) = ab - ac$.

BODMAS Rule

It is a sequence used to perform mathematical operations accurately: Brackets, Orders (powers/roots), Division, Multiplication,

Addition, Subtraction.

Like Terms

When adding or subtracting algebraic expressions, only like terms (terms with identical variables and identical powers) can be combined or reduced.

Q57. Answer: (d) 65%

Shortcut Trick

In dishonest dealer problems, multiply the quantity ratio and price ratio to get the net profit.

Ratio of Actual Weight to Claimed Weight = 92 : 100

Ratio of Cost Price to Claimed SP = 100 : 152

Net CP : Net SP = (92 × 100) : (100 × 152) = 92 : 152

Profit % = [(152 − 92) ÷ 92] × 100 = (60 ÷ 92) × 100 ≈ 65%

Therefore The correct answer is 65%.

Alternate Method

Given:

Claimed profit percentage = 52%

Dishonest weight used = 8% less than the actual weight

Formula Used:

Profit = Selling Price (SP) − Cost Price (CP)

Profit % = (Profit ÷ CP) × 100

Actual CP = 92

Base = 100

SP = 152

−8% Weight

+52% Price

Net Profit = 60

Calculations:

=> Let the cost price of 100g of vegetables be Rs. 100.

=> Since he claims to sell at a 52% profit, his Selling Price (SP) for 100g = 100 + 52 = Rs. 152.

=> But he uses a weight that is 8% less, so the actual weight given = 100 − 8 = 92g.

=> The Cost Price (CP) of the actual 92g of vegetables given = Rs. 92.

=> Thus, the trader effectively sells Rs. 92 worth of vegetables for Rs. 152.

=> Profit = SP − CP = 152 − 92 = Rs. 60.

=> Profit % = (Profit ÷ CP) × 100

=> Profit % = (60 ÷ 92) × 100

=> Profit % = (15 ÷ 23) × 100

=> Profit % = 1500 ÷ 23 ≈ 65.21%

=> Rounding off to the nearest whole number, we get 65%.

Therefore The correct answer is 65%.

Additional Information

Dishonest Dealer Concept

When a dealer sells goods at cost price but uses a false weight, his profit percentage is given by: Profit % = [Error ÷ (True Value − Error)] × 100.

Successive Percentage Change

If a value is changed successively by x% and y%, the net percentage change is given by: Net % = x + y + (x × y) ÷ 100. This is helpful when markup and profit percentages are given sequentially.

Marked Price and Discount

Discount is always calculated on the Marked Price (MP), while profit or loss is calculated on the Cost Price (CP). The relationship between them is: CP × (100 + Profit %) = MP × (100 − Discount %).

Q58. Answer: (c) 6.03

Shortcut Trick

Equate the given curved surface area directly with its formula: CSA = 2πrh

=> 2 × (22 ÷ 7) × r × 29 = 1100
=> r = (1100 × 7) ÷ (44 × 29)
=> r = 175 ÷ 29
=> r ≈ 6.03
Therefore The correct answer is 6.03 cm.
Alternate Method
Given:
Curved Surface Area (CSA) of the cylindrical rod = 1100 cm²
Length (or height, h) of the rod = 29 cm
Formula Used:
Curved Surface Area of a cylinder = 2πrh
r = ?
h = 29 cm
CSA = 1100 cm²
Calculations:
=> 2 × π × r × h = 1100
=> 2 × (22 ÷ 7) × r × 29 = 1100
=> 44 × 29 × r = 1100 × 7
=> 1276 × r = 7700
=> r = 7700 ÷ 1276
=> r = 175 ÷ 29
=> r ≈ 6.034 cm
Rounding off the radius to two decimal places, we get 6.03 cm.
Therefore The correct answer is 6.03 cm.
Additional Information
Total Surface Area of Cylinder
The total surface area includes the curved surface and the two circular flat bases: TSA = 2πrh + 2πr² = 2πr(h + r).
Volume of Cylinder
The space occupied inside the cylinder is given by the area of its base times its height: V = πr²h.
Hollow Cylinder Volume
For a hollow pipe with outer radius R and inner radius r, the volume of the material used is V = πh(R² − r²).

Q59. Answer: (c) 160/3

Shortcut Trick
By applying the BODMAS rule sequentially:
=> 13 × (3 × 16) ÷ 9 + 59 − 75
=> 13 × (48 ÷ 9) − 16
=> 13 × (16/3) − 16
=> 208/3 − 48/3 = 160/3
Therefore The correct answer is 160/3.
Alternate Method
Given:
Expression: 13 × (3 × 4²) ÷ 9 + 59 − 75
Concept Used:
BODMAS Rule: Brackets, Orders, Division, Multiplication, Addition, Subtraction.
Calculations:
=> 13 × (3 × 4²) ÷ 9 + 59 − 75
=> 13 × (3 × 16) ÷ 9 + 59 − 75
=> 13 × 48 ÷ 9 + 59 − 75
=> 13 × (48/9) + 59 − 75
=> 13 × (16/3) + 59 − 75
=> 208/3 + 59 − 75

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=> 208/3 − 16

=> (208 − 48) / 3

=> 160 / 3

Therefore The correct answer is 160/3.

Additional Information

BODMAS Rule

BODMAS stands for Brackets, Orders (powers and roots), Division, Multiplication, Addition, and Subtraction. It dictates the strict sequence of operations in any mathematical expression.

Fraction Simplification

When adding or subtracting integers to fractions, compute a common denominator by multiplying the integer by the fraction's denominator before combining the terms.

Multiplication and Division Precedence

Multiplication and Division have the same level of precedence. They must be solved from left to right as they appear in the expression.

Q60. Answer: (b) 418

Shortcut Trick

The area of the four walls is the lateral surface area, which can be directly calculated using the base perimeter and height.

Area = Base Perimeter × Height = 2 × (L + B) × H

Area = 2 × (10.5 + 8.5) × 11

Area = 2 × 19 × 11 = 418 m²

Therefore The correct answer is 418 m².

Alternate Method

Given:

Length (L) = 10.5 m

Breadth (B) = 8.5 m

Height (H) = 11 m

Formula Used:

Area of 4 walls of a room (Lateral Surface Area) = 2 × (L + B) × H

L = 10.5 m

B = 8.5 m

H = 11 m

Calculations:

=> Area = 2 × (10.5 + 8.5) × 11

=> Area = 2 × 19 × 11

=> Area = 38 × 11

=> Area = 418 m²

Therefore The correct answer is 418 m².

Additional Information

Area of Four Walls (Lateral Surface Area)

It represents the total area of the vertical faces of a cuboid. Formula: LSA = 2 × (L + B) × H

Total Surface Area of a Cuboid

It includes the area of the four walls along with the floor and ceiling. Formula: TSA = 2 × (LB + BH + HL)

Volume of a Cuboid

It gives the total 3D space enclosed within the room. Formula: Volume = L × B × H

Longest Pole inside a Room

The length of the longest pole that can fit inside is equal to the body diagonal. Formula: Diagonal = √(L² + B² + H²)

Q61. Answer: (c) 27

Shortcut Trick

Each exterior angle = 180° − Interior angle = 180° − 140° = 40°

Number of sides (n) = 360° ÷ Exterior angle = 360° ÷ 40° = 9

Number of diagonals = n(n − 3) ÷ 2

=> Diagonals = 9 × 6 ÷ 2 = 27

Therefore The correct answer is 27.

Alternate Method

Given:

Measure of each interior angle of the regular polygon = 140°

Formula Used:

Each interior angle = (n − 2) × 180° ÷ n

Number of diagonals = n(n − 3) ÷ 2

Where n = number of sides of the polygon.

140°

40°

Polygon side

Extended line

Next side

Calculation:

=> (n − 2) × 180 ÷ n = 140

=> 180n − 360 = 140n

=> 180n − 140n = 360

=> 40n = 360

=> n = 9

The regular polygon has 9 sides, meaning it is a Nonagon.

=> Number of diagonals = 9 × (9 − 3) ÷ 2

=> Number of diagonals = 9 × 6 ÷ 2

=> Number of diagonals = 54 ÷ 2

=> Number of diagonals = 27

Therefore The correct answer is 27.

Additional Information

Sum of Interior Angles

The sum of all interior angles of an n-sided polygon is given by (n − 2) × 180°.

Exterior Angles

The sum of the exterior angles of any convex polygon is always 360°. For a regular polygon, each exterior angle is equal to 360° ÷ n.

Number of Diagonals

The total number of diagonals that can be drawn in any n-sided polygon is calculated using the formula n(n − 3) ÷ 2.

Q62. Answer: (b) Rs. 15,520

Shortcut Trick

Ritik's profit = 19000 − 7600 = 11400.

Profit ratio (Ritik : Sanjay) = 11400 : 7600 = 3 : 2.

Investment ratio = Profit ratio (since the time period is identical) = 3 : 2.

Difference in investment parts = 3 − 2 = 1 part out of total 5 parts.

Difference in investment = 1/5 × 77600 = Rs. 15,520.

Therefore The correct answer is Rs. 15,520.

Alternate Method

Given:

Total investment of Ritik and Sanjay = Rs. 77,600

Total profit at the end of the year = Rs. 19,000

Sanjay's share in profit = Rs. 7,600

Formula Used:

Profit = Investment × Time

When the time period is constant, Profit Ratio = Investment Ratio

Investment / Profit Ratio (Constant Time)

Ritik

3 Parts (Rs. 11,400)

Sanjay

2 Parts (Rs. 7,600)

1 Part Diff

Total Investment = 5 Parts = Rs. 77,600

Calculations:

=> Ritik's profit = Total profit − Sanjay's profit

=> Ritik's profit = 19000 − 7600 = Rs. 11,400

=> Ratio of profits (Ritik : Sanjay) = 11400 : 7600 = 114 : 76 = 3 : 2

=> Since time is the same (1 year), investment ratio = profit ratio = 3 : 2

=> Let Ritik's investment be 3x and Sanjay's investment be 2x.

=> Total investment = 3x + 2x = 5x

=> 5x = 77600

=> x = 77600 ÷ 5 = Rs. 15,520

=> Difference in their investments = 3x − 2x = x

=> Difference = Rs. 15,520

Therefore The correct answer is Rs. 15,520.

Additional Information

Active vs Sleeping Partner

An active partner manages the business and usually receives a specific share or salary from the profit before the remaining profit is divided according to investment ratios. A sleeping partner only invests capital.

Different Investment Periods

When partners invest for different durations, their share in the profit is directly proportional to the product of their invested capital and the time period (Profit = Capital × Time).

Joining Mid-Way

If a new partner joins x months after the start of a financial year, their investment is calculated only for the remaining (12 − x) months of that year.

Q63. Answer: (c) 2500

Shortcut Trick

Let total registered voters be T.

Valid votes = T × 96% × (100 − 15)% = T × 0.96 × 0.85

Winning margin = Valid votes × (80% − 20%) = Valid votes × 60%

=> T × 0.96 × 0.85 × 0.60 = 1224

=> T × 0.4896 = 1224 => T = 2500

Therefore The correct answer is 2500 voters.

Alternate Method

Given:

Votes polled = 96% of registered voters

Invalid votes = 15% of polled votes

Winning margin = 1224 votes, Winner got 80% of valid votes

Formula Used:

Valid Votes = Total Polled × (100 − Invalid%)

Margin = Valid Votes × (Winner% − Loser%)

Registered (100x)

96% voted

Polled (96x)

85% valid

Valid (81.6x)

80%

20%

Winner (65.28x)

Loser (16.32x)

Margin = 65.28x − 16.32x = 48.96x = 1224

Calculations:

=> Let the total registered voters be 100x.

=> Votes polled = 96% of 100x = 96x

=> Valid votes = (100 − 15)% of 96x = 85% of 96x = 81.6x

=> Winner's share = 80% of valid votes

=> Loser's share = (100 − 80)% = 20% of valid votes

=> Winning margin = (80% − 20%) = 60% of valid votes

=> Margin = 60% of 81.6x = 0.60 × 81.6x = 48.96x

=> Given margin = 1224

=> 48.96x = 1224 => x = 25

=> Total registered voters = 100x = 100 × 25 = 2500

Therefore The correct answer is 2500 voters.

Additional Information

Election Base Change Rule

In election problems, always track the base carefully. Invalid votes reduce the base of polled votes, and the winner's percentage is calculated on this new reduced base (valid votes).

Winning Margin Percentage

If there are only two candidates and one gets X% of the valid votes, the other automatically gets (100 − X)%. The winning margin in percentage is always (2X − 100)% of the valid votes.

Successive Percentage Trick

When multiple fractional changes occur sequentially, the final value can be written in a single step using multiplying factors: Final = Initial × (P1/100) × (P2/100) × (P3/100).

Q64. Answer: (c) 7132968

Shortcut Trick

For a number to be divisible by 24, it must be divisible by its co-prime factors, 3 and 8.

Check divisibility by 8: The last 3 digits must be divisible by 8. Only 7132968 ends with 968, which is divisible by 8 (968 ÷ 8 = 121).

Check divisibility by 3: The sum of digits must be divisible by 3. For 7132968, the sum is 7 + 1 + 3 + 2 + 9 + 6 + 8 = 36, which is divisible by 3.

Therefore The correct answer is 7132968.

Alternate Method

Given:

Numbers to check: 7340390, 6830908, 7132968, 7991987

Method Used:

A number is divisible by 24 if it is divisible by both 3 and 8, since 3 × 8 = 24 and they are co-prime.

=> Divisibility by 8: The number formed by the last three digits must be completely divisible by 8.

=> Divisibility by 3: The sum of all digits must be completely divisible by 3.

Calculations:

=> Checking 7340390: Last 3 digits are 390. 390 ÷ 8 = 48.75 (Not divisible by 8)

=> Checking 6830908: Last 3 digits are 908. 908 ÷ 8 = 113.5 (Not divisible by 8)

=> Checking 7132968: Last 3 digits are 968. 968 ÷ 8 = 121 (Divisible by 8)

=> Sum of digits of 7132968 = 7 + 1 + 3 + 2 + 9 + 6 + 8 = 36. 36 ÷ 3 = 12 (Divisible by 3)

=> Checking 7991987: It is an odd number, hence not divisible by 8.

=> 7132968 is the only number that satisfies both conditions.

Therefore The correct answer is 7132968.

Additional Information

Divisibility Rule of 3

A number is completely divisible by 3 if the sum of its digits is divisible by 3.

Divisibility Rule of 8

A number is exactly divisible by 8 if the number formed by its last three digits is divisible by 8. All numbers ending in three zeros are also divisible by 8.

Divisibility by Composite Numbers

If a number is divisible by a composite number, it must be completely divisible by all of its co-prime factors.

Q65. Answer: (d) 875/41% profit

Shortcut Trick

Total CP = Purchase price + Overhead = 322 + 6 = Rs. 328

Profit = SP − CP = 398 − 328 = Rs. 70

Profit % = (70 ÷ 328) × 100 = (35 ÷ 164) × 100

=> Profit % = (35 × 25) ÷ 41 = 875/41%

Therefore The correct answer is 875/41% profit.

Alternate Method

Given:

Purchase price = Rs. 322

Cost of decoration = Rs. 6

Selling Price (SP) = Rs. 398

Formula Used:

Total CP = Purchase price + Overhead expenses

Profit % = (Profit ÷ CP) × 100

CP = Rs. 328

SP = Rs. 398

• Rs. 70 Profit

Profit % = (70 ÷ 328) × 100 = 875/41%

Calculations:

=> Total CP = 322 + 6 = Rs. 328

=> Profit = SP − CP

=> Profit = 398 − 328 = Rs. 70

=> Profit % = (70 ÷ 328) × 100

=> Profit % = (35 ÷ 164) × 100

=> Profit % = (35 × 25) ÷ 41

=> Profit % = 875/41%

Therefore The correct answer is 875/41% profit.

Additional Information

Overhead Expenses

Any extra charges like transportation, decoration, repair, or maintenance are always added to the purchase cost to calculate the true Cost Price (CP).

Selling Price Formula

SP = CP × (100 + Profit %) ÷ 100

Loss Percentage

If CP is greater than SP, a loss occurs. Loss % = (Loss ÷ CP) × 100

Q66. Answer: (b) M - N = -3

Shortcut Trick

For a number to be divisible by 11, the difference of the sum of alternate digits must be 0 or a multiple of 11.

Sum of alternate digits starting from left = N + 3 + 1 = N + 4

Sum of remaining alternate digits = 7 + M + 0 = M + 7

Difference = (M + 7) − (N + 4) = M − N + 3

Equating the difference to 0 gives: M − N = −3.

Therefore The correct answer is M − N = −3.

Alternate Method

Given:

The 6-digit number is N73M10.

Formula Used:

A number is divisible by 11 if the difference between the sum of its digits at odd positions and the sum of its digits at even positions is either 0 or a multiple of 11.

Calculations:

=> Sum of digits at odd positions (1st, 3rd, 5th from left) = N + 3 + 1 = N + 4

=> Sum of digits at even positions (2nd, 4th, 6th from left) = 7 + M + 0 = M + 7

=> Difference = (Sum of even positions) − (Sum of odd positions)

=> Difference = (M + 7) − (N + 4)

=> Difference = M − N + 3

For divisibility by 11, this difference must equal 0, 11, −11, etc.

=> Case 1: M − N + 3 = 0 => M − N = −3

=> Case 2: M − N + 3 = 11 => M − N = 8

Checking the given options, M − N = −3 is listed as a possible correct relation.

Therefore The correct answer is M − N = −3.

Additional Information

Divisibility Rule of 3

A number is divisible by 3 if the sum of all its digits is divisible by 3.

Divisibility Rule of 4

A number is divisible by 4 if the number formed by its last two digits is divisible by 4.

Divisibility Rule of 8

A number is divisible by 8 if the number formed by its last three digits is divisible by 8.

Divisibility Rule of 9

A number is divisible by 9 if the sum of all its digits is divisible by 9.

Q67. Answer: (c) 1365

Shortcut Trick

An increase of 100% means the value is doubled (200% of the original).

Multiplying factor = 1 + (100/100) = 2

Number × 2 = 2730

Number = 2730 ÷ 2 = 1365

Therefore The correct answer is 1365.

Alternate Method

Given:

A number when increased by 100% gives 2730.

Concept Used:

Final Value = Original Value × (1 + Percentage Increase ÷ 100)

New Number (200%) = 2730

Original (100%)

Increase (+100%)

x

+x

Original Number = 2730 ÷ 2 = 1365

Calculation:

=> Let the original number be x.

=> Increase in the number = 100% of x = x

=> Final value = x + x = 2x

=> According to the question, 2x = 2730

=> x = 2730 ÷ 2

=> x = 1365

Therefore The correct answer is 1365.

Additional Information

Percentage Change

Percentage Change = (Final Value − Initial Value) ÷ Initial Value × 100.

Successive Percentage Change

If a number is successively changed by a% and then by b%, the net change is given by the formula: a + b + (a × b) ÷ 100.

Base Change Rule

If quantity A is R% more than B, then B is [R ÷ (100 + R)] × 100% less than A.

Q68. Answer: (a) 20 hours

Shortcut Trick

When distance is constant, Speed prop. to 1 / Time.

Speed Ratio (Ritesh : Gauri) = 150 : 60 = 5 : 2

Time Ratio (Ritesh : Gauri) = 2 : 5

Given 2 units → 8 hours (Ritesh's time)

Then 5 units → (8 ÷ 2) × 5 = 20 hours.

Therefore The correct answer is 20 hours.

Alternate Method

Given:

Speed of Ritesh = 150 km/hr

Time taken by Ritesh = 8 hours

Speed of Gauri = 60 km/hr

Formula Used:

Distance = Speed × Time

Time = Distance ÷ Speed

Delhi

Kanpur

Distance = Constant

Ritesh: Speed = 150 km/hr, Time = 8 hr

Gauri: Speed = 60 km/hr, Time = ?

Calculations:

=> Total Distance = Speed of Ritesh × Time taken by Ritesh

=> Total Distance = 150 × 8 = 1200 km

Since Gauri has to cover the same distance, we use her speed to find the time.

=> Time taken by Gauri = Total Distance ÷ Speed of Gauri

=> Time taken by Gauri = 1200 ÷ 60

=> Time taken by Gauri = 20 hours

Therefore The correct answer is 20 hours.

Additional Information

Average Speed

It is defined as Total Distance ÷ Total Time. When equal distances are covered at speeds x and y, Average Speed = (2xy) ÷ (x + y).

Relative Speed

When two objects move in opposite directions, relative speed is the sum of their speeds (x + y). When moving in the same direction, it is the difference (x − y).

Speed, Distance & Time Relation

When distance is constant, speed is inversely proportional to time (S1 × T1 = S2 × T2). When time is constant, distance is directly proportional to speed.

Q69. Answer: (c) 24%

Shortcut Trick

For successive discounts of x% and y%, the effective discount percentage is given by the formula: D = (x + y − xy ÷ 100)%

Here, x = 20% and y = 5%.

Effective Discount = 20 + 5 − (20 × 5) ÷ 100

Effective Discount = 25 − 1 = 24%

Note: The base amount (Rs. 1,000) is not needed to find the percentage.

Therefore The correct answer is 24%.

Alternate Method

Given:

Marked Price (MP) = Rs. 1,000

First discount (scheme) = 20%

Second discount (cash payment) = 5%

Formula Used:

Selling Price (SP) = MP × (100 − D1) ÷ 100 × (100 − D2) ÷ 100

Total Discount % = (Total Discount ÷ MP) × 100

Successive Discount Calculation

MP: Rs. 1000

−20% (Rs. 200)

Rs. 800

−5% (Rs. 40)

SP: Rs. 760

Total Discount = Rs. 240 (24%)

Calculations:

=> Price after 20% discount = 1000 − (20 ÷ 100 × 1000) = Rs. 800

=> Price after 5% discount = 800 − (5 ÷ 100 × 800) = Rs. 760

=> Total Discount amount = MP − Final Selling Price

=> Total Discount = 1000 − 760 = Rs. 240

=> Discount Percentage = (240 ÷ 1000) × 100 = 24%

Therefore The correct answer is 24%.

Additional Information

Successive Discounts Concept

When multiple discounts are given one after the other, they are always calculated on the progressively reduced price, not on the original marked price.

Three Successive Discounts

For discounts x%, y%, and z%, first find the equivalent of x and y as a%, then apply the formula again for a% and z% to find the final equivalent discount.

Marked Price to Cost Price Relation

A direct relationship between MP and CP when discount and profit are given: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

Q70. Answer: (c) Rs. 174

Shortcut Trick

Original condition: 19p + 13c = 254

New condition: 14(p − 6) + 2(c + 9) = 106 => 14p + 2c = 172 => c = 86 − 7p

Substitute c: 19p + 13(86 − 7p) = 254 => 72p = 864 => p = 12

Substitute p back: c = 86 − 7(12) = 2

Cost of 12p + 15c = (12 × 12) + (15 × 2) = 144 + 30 = 174

Therefore The correct answer is Rs. 174.

Alternate Method

Given:

Cost of 19 pens and 13 pencils is Rs. 254.

If pen cost decreases by Rs. 6 and pencil cost increases by Rs. 9, cost of 14 pens and 2 pencils is Rs. 106.

Method Used:

Formulating and solving a system of linear equations in two variables using the substitution method.

Calculations:

Let the original cost of a pen be Rs. x and a pencil be Rs. y.

=> 19x + 13y = 254

New cost of a pen = Rs. (x − 6)

New cost of a pencil = Rs. (y + 9)

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According to the second condition:

=> 14(x − 6) + 2(y + 9) = 106

=> 14x − 84 + 2y + 18 = 106

=> 14x + 2y − 66 = 106

=> 14x + 2y = 172

Dividing the entire equation by 2:

=> 7x + y = 86

=> y = 86 − 7x

Substitute the value of y in the first equation:

=> 19x + 13(86 − 7x) = 254

=> 19x + 1118 − 91x = 254

=> −72x = 254 − 1118

=> −72x = −864

=> x = 12

Substitute the value of x to find y:

=> y = 86 − 7(12)

=> y = 86 − 84 = 2

So, the original cost of 1 pen = Rs. 12 and 1 pencil = Rs. 2.

Now, finding the cost of 12 pens and 15 pencils:

=> 12x + 15y = 12 × 12 + 15 × 2

=> 144 + 30 = 174

Therefore The correct answer is Rs. 174.

Additional Information

System of Linear Equations

A system of linear equations involves finding specific values for two or more variables that satisfy all given equations simultaneously. Common solution methods include substitution and elimination.

Substitution Method

In this method, one linear equation is algebraically rearranged to express a variable entirely in terms of the other. This expression is then substituted into the remaining equation to easily solve for the unknown.

Elimination Method

This method aligns the coefficients of one specific variable by multiplying the equations with suitable constants, followed by directly adding or subtracting the equations to eliminate that variable completely.

Q71. Answer: (b) Three

Seven people, I, J, K, L, U, V, and W, are sitting in a row, facing north.

• Only three people sit to the left of V.

• Only I sits to the right of U.

• Only three people sit between U and W.

• J sits at some place to the left of K but at some place to the right of L.

The Final Arrangement is,

Hence, the correct answer is "Option 2"

Q72. Answer: (b) NLPK

The logic followed here is:

Hence, the correct answer is "Option 2"

Q73. Answer: (a) 84

Given : 32 + 4 x 2 - 6 ÷9 =

if '+' and '-' are interchanged and 'x' and '÷' are interchanged

32 - 4 ÷ 2 + 6 x 9 =

32 - 2 + 6 x 9 =

32 - 2 + 54 = 84.

Hence, the correct answer is "Option 1"

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Q74. Answer: (b) tr

The Logic follows here,

Hence, the correct answer is "Option 2"

Q75. Answer: (a) 10

Given number 86071452

1 is subtracted from each odd digit of the number 86071452 and then the digits are arranged in ascending order,

The sum of the digits, which are repeated more than once in the new number formed = 6+4

= 10.

Hence, the correct answer is "Option 1"

Q76. Answer: (b) 64

The logic follows here,

Hence, the correct answer is "Option 2"

Q77. Answer: (d) jo

The logic follows here,

Hence, the correct answer is "Option 4"

Q78. Answer: (b) 124

The logic follows here,

Hence, the correct answer is "Option 2"

Q79. Answer: (c) HOW

The logic followed here is:

Hence, the correct answer is "Option 3"

Q80. Answer: (c) 14

Given : (Left) 256 987 325 489 723 (Right)

• Second digit of the highest number - 987

• Third digit of the lowest number - 256

• 8+ 6 = 14.

Hence, the correct answer is "Option 3"

Q81. Answer: (b) MO-RL

The logic followed here is:

Hence, the correct answer is "Option 2"

Q82. Answer: (c) C

Seven people, B, C, D, E, F, G and L, are sitting around a circular table facing the centre of the table.

• Only three people sit between B and F when counted from the left of B.

• Only three people sit between D and E when counted from the right of E.

• G sits to the immediate right of D.

• C is an immediate neighbour of E as well as F

The Final Arrangement is,

Hence, the correct answer is "Option 3"

Q83. Answer: (c) 10

Given number 3851764

1 is added to each odd digit and 2 is subtracted from each even digit in the number 3851764

Sum of the digits that are second from the left and second from the right = 6+4

=10.

Hence, the correct answer is "Option 3"

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Q84. Answer: (c) GI-LM

Here is the alphabetical place value for each letter:

Hence, the correct answer is "Option 3".

Q85. Answer: (c) 73rd

Find Mr. Han's position from the left:

• Mr. Maxi is 89th from the left.

• Mr. Han is 2 positions to the right of Mr. Maxi.

• Mr. Han's position from the left is 89 + 2 = 91.

Find Mr. Han's position from the right:

89+2=91Unknown node type: strong89+2=91Unknown node type: strong89+2=91Unknown node type: strong89+2=91Unknown node type: strong

• The total number of students is 163.

• The formula for finding the position from the right is (Total students - Position from left) + 1.

• Mr. Han's position from the right is (163 - 91) + 1 = 73

Hence, the correct answer is "Option 3"

Q86. Answer: (a) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I): Some trees are graphs. - False (As their is no direct relationn between trees and graphs may be it is possible but not definite. Hence, it is false)

(II): All graphs are plants.- False (Some plants are graphs means some graph is alsi plants but All graphs are plants is may be possible but not definite. Hence, it is false)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 1"

Q87. Answer: (b) FROG - GRFO - ROFG

The logic follows here,

Hence, the correct answer is "Option 2"

Q88. Answer: (c) One

Seven boxes, A, B, C, D, K, L and O, are kept one over the other, but not necessarily in the same order.

• Only D is kept above C.

• Only L is kept between C and B.

• Only A is kept below K

The Final Arrangement is,

D
C
L
B
O
K
A

Hence, the correct answer is "Option 3"

Q89. Answer: (d) GLM-31

The logic followed here is:

Hence, the correct answer is "Option 4"

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Q90. Answer: (a) 5 km to the east

Alexander starts from Point A and drives 12 km towards the south.

• He then takes a left turn and drives 4 km, then turns left and drives 17 km.

• He then takes a left turn and drives 9 km.

• He takes a final left turn, drives 5 km and stops at Point P

The Final Diagram,

Hence, the correct answer is "Option 1"

Q91. Answer: (a) JM-QG

The logic followed here is:

Hence, the correct answer is "Option 1"

Q92. Answer: (a) WVZ−YXB

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 1"

Q93. Answer: (d) (62, 57, 42)

Logic :

First Number - 5 = Second Number.

Second Number - 15 = Third Number.

• (46, 41, 26): 46 - 5 = 41, and 41 - 15 = 26

• (77, 72, 57): 77 - 5 = 72, and 72 - 15 = 57

Similarly,

• (62, 57, 42): 62 - 5 = 57, and 57 - 15 = 42

Hence, the correct answer is "Option 4"

Q94. Answer: (d) Six

(Left) # 3 % 7 $ 5 * & 4 β 9 Ω 4 9 μ 8 @ $ 1 π 3 (Right)

Required Conditions: Number - Symbol - Another Number

(Left) # 3 % 7 $ 5 * & 4 β 9 Ω 4 9 μ 8 @ $ 1 π 3 (Right)

Hence, the correct answer is "Option 4"

Q95. Answer: (d) 6 km towards south

Geeta starts from Point P and drives 6 km towards the south.

• Then, she takes a right turn, drives 8 km, turns right again and drives 10 km.

• She then takes a right turn and drives 12 km.

• Then, she takes a left turn and drives 2 km;

• she takes a left turn again and drives 4 km and stops at Point Q.

The Final Diagram,

Hence, the correct answer is "Option 4"

Q96. Answer: (d) Both conclusions I and II follow.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I) Some pillows are curtains. - True (Some curtains are beds, and all beds are pillows; hence, it is true).

(II) Some curtains are beds—True. (Some beds are curtains, which means Some curtains are bad. Hence, it true.

Both conclusions I and II follow.

Hence, the correct answer is "Option 4"

Q97. Answer: (b) 76

The logic follows here,

Hence, the correct answer is "Option 2"

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Q98. Answer: (c) Husband's brother

Using the symbols in the below table, we can draw a family tree.

The possible family tree is as follows:

Hence, the correct answer is "Option 3"

Q99. Answer: (c) 15

Hence, the correct answer is "Option 3"

Q100. Answer: (c) Three

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

• Only four boxes are kept between A and D.
• Only F is kept above A.
• Only two boxes are kept between B and C.
• E is kept immediately above G.
• C is not kept immediately above E.

The Final Arrangement is,

F
A
B
E
G
C
D

Hence, the correct answer is "Option 3"

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