RRB NTPC Graduate Level CBT-I Official Paper (Held On: 06 Jun, 2025 Shift 2) (Previous Year Paper)

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

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Q1. What is the purpose of pressing Alt + Tab on the keyboard of a computer system?

(a) Opens Task Manager
(b) Switches between open applications
(c) Shuts down the system
(d) Minimises all windows

Q2. The sum of the present ages of a father and his son is 18 years more than 4 times the present age of the son. After 5 years, 4 times the father's age will be 8 years less than 14 times the son's age. The difference (in years) between the present ages of the father and the son is:

(a) 45
(b) 49
(c) 48
(d) 53

Q3. Who is the current Chief Minister of Delhi as of March 2025, and from which constituency was he/she elected in the 2025 Delhi Assembly elections?

(a) Rekha Gupta from Rajinder Nagar
(b) Rekha Gupta from Shalimar Bagh
(c) Atishi Marlena from Kalkaji
(d) Arvind Kejriwal from New Delhi

Q4. What is the purpose of the ‘One Nation, One Permit’ scheme proposed by the Ministry of Road Transport and Highways?

(a) Single road ticketing platform system
(b) Common civil aviation license
(c) Permit for urban parking facilities
(d) . Ease of transport for inter-state freight vehicles

Q5. Who among the following has been appointed as the Chairman of Indian Space Research Organisation in January 2025?

(a) Dr. Mayank Sharma
(b) Dr. V Narayanan
(c) Manish Singhal
(d) Bhuvnesh Kumar

Q6. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only. All numbers are single-digit numbers.

(Left) @ $ & 7 7 @ 5 7 & & 4 1 9 3 $ 7 8 & 7 € € 1 (Right)

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

(a) 2
(b) 4

(c) 3
(d) 5

Q7. When and where is the second part of the Fifth Session (INC-5.2) of the Intergovernmental Negotiating Committee (INC) on plastic pollution scheduled to take place?
(a) September 2025 in Paris, France
(b) July 2025 in Nairobi, Kenya
(c) August 2025 in Geneva, Switzerland
(d) October 2025 in Ottawa, Canada

Q8. If $a^2 + b^2 = 111$ and $a \times b = 27$, and $a > b$, find the value of $(a - b)/(a+b)$
(a) √(53/165)
(b) 57/165
(c) √(57/165)
(d) 53/165

Q9. 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) IM - KO
(b) SP - Ql
(c) LP - NR
(d) GK - IM

Q10. In a certain code language, 'GATE' is coded as '4628' and 'TURN' is coded as '3567'. What is the code for 'T' in the given code language?
(a) 2
(b) 3
(c) 4
(d) 6

Q11. What is the primary contributor to the sour taste in foods like lemons, vinegar and yoghurt?
(a) Bases
(b) Acids
(c) Alkaloids
(d) Salts

Q12. Which of the following is not a surrounding feature of the Thar Desert?
(a) Rann of Kachchh
(b) Aravalli Range
(c) Vindhya Hills
(d) Indus River Plain

Q13. This question is based on the five, three-digit numbers given below.
(Left) 910 316 525 204 303 (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 first digit of the highest number is added to the second digit of the lowest number?
(a) 8
(b) 9
(c) 10

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(d) 12

Q14. Which leader presided over the 1929 Lahore Session of the Indian National Congress, where the resolution for 'Purna Swaraj' was passed?

(a) Lala Lajpat Rai
(b) CR Das
(c) Subhas Chandra Bose
(d) Jawaharlal Nehru

Q15. The volume of a solid cylinder is 5852 cm^3 and its height is 38 cm. What is the total surface area of the solid cylinder? (Round your answer to the nearest integer)

(Use $\pi = 22/7$)

(a) 1936 cm^2
(b) 1969 cm^2
(c) 1980 cm^2
(d) 1954 cm^2

Q16. Which movement or idea is associated with the Wardha Scheme of Basic Education proposed in 1937?

(a) Nai Talim or Basic Education
(b) Education through English
(c) Adult Literacy Mission
(d) Free higher education

Q17. What is the difference between dragging text with the mouse (left-click) and Ctrl + dragging text in MS Word 365?

(a) Dragging deletes the text; Ctrl + dragging pastes it.
(b) Both actions move the text.
(c) Dragging moves the text; Ctrl + dragging copies it
(d) Ctrl + dragging changes the font style

Q18. The mode and median of a data set is 89.7 and 32, respectively. What is the mean of the data set? (Use empirical formula.)

(a) 3.15
(b) 5.9
(c) 2.6
(d) 11.26

Q19. The Swadeshi Movement, launched to oppose the partition of Bengal and promote Indian goods, began in which year?

(a) 1905
(b) 1906
(c) 1904
(d) 1907

Q20. The mode of the observations 4, 3, 8, 7, 3, 7, 3, 1, 1, 3, 8, 3, 3, 5 and 3 is:

(a) 4
(b) 3
(c) 8
(d) 7

Q21. The area of a rectangle increases by 8 m^2 if its length is increased by 5 m and breadth is decreased by 7 m. If the length is decreased by 5 m and breadth is increased by 8 m, then its area increases by 33 m^2. What is the perimeter of the original rectangle (in m)?

(a) 575
(b) 573
(c) 574
(d) 576

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Q22. Free legal aid is part of which part of the Indian Constitution?

(a) Directive Principles
(b) Fundamental Rights
(c) Fundamental Duties
(d) Preamble

Q23. If '−' means '÷', '÷' means '×', '×' means '+' and '+' means '−', then what will come in place of the question mark (?) in the following equation?

1568 − 16 + 4 ÷ 5 × 22 = ?

(a) 294
(b) 100
(c) 492
(d) 113

Q24. What is the Gram Sabha in the context of the Panchayati Raj system in India?

(a) An advisory council of State representatives
(b) The deliberative assembly of all eligible village residents
(c) A judicial body for urban areas
(d) A block-level committee

Q25. In December 2024, PM Modi made a historic visit to which Gulf country, marking the first such visit by an Indian Prime Minister in 43 years?

(a) Qatar
(b) Bahrain
(c) Kuwait
(d) Oman

Q26. GV 14 is related to LS 5 in a certain way. In the same way, HQ 5 is related to MN -4. To which of the given options is MG 0 related, following the same logic?

(a) BG -7
(b) HR -3
(c) NY -6
(d) RD -9

Q27. How much international bandwidth does Airtel's 2Africa Pearls 2025 undersea cable landing system add?

(a) Over 50 terabits per second
(b) Over 100 terabits per second
(c) Over 500 terabits per second
(d) Over 200 terabits per second

Q28. A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. The product of floors on which D and F live is 10. C lives immediately above E. The sum of floors on which B and D live is 11. How many people live between A and E?

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

Q29. Simplify: 6√4096 + 4√50625 + cbrt21952 + √3364

(a) 105
(b) 55
(c) 24
(d) 75

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Q30. Which kitchen process is an example of osmosis?

(a) Flushing food items with nitrogen
(b) Grinding spices together
(c) Placing raw mango in a concentrated salt solution
(d) Boiling pasta in milk

Q31. 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 crabs are ties.

Some ties are hooves.

Some hooves are vents.

Conclusions:

(I): Some vents are crabs.

(II): Some hooves are crabs.

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

Q32. 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) FG - AB
(b) PK - MJ
(c) NO - IJ
(d) JK - EF

Q33. What is the title of the first poetry collection by Nissim Ezekiel, one of the most celebrated poets in Indian English Literature?

(a) Echoes of the Soul
(b) A Time of Change
(c) Shadows and Dreams
(d) The Unfinished Verse

Q34. Tanveer starts from Point B and drives 2 km towards west. He then takes a right turn, drives 4 km, turns left and drives 5 km. He then takes a right turn and drives 3 km. He takes a final right turn, drives 7 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point B again (all turns are 90° turns only unless specified)?

(a) 6 km south
(b) 7 km south
(c) 5 km south
(d) 4 km south

Q35. Which of the following Urban Local Government Bodies in India was discontinued after 1992?

(a) Municipal Committee/Council
(b) Municipal Corporation
(c) Nagar Panchayat
(d) Notified Area Committee

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Q36. The marked price of a bed is Rs. 1,600, which is 25% above the cost price. It is sold at a discount of 16% on the marked price. Find the profit percentage.

(a) 6%
(b) 5%
(c) 4%
(d) 7%

Q37. Pipe A can fill a tank in 18 minutes, while pipe B can empty the completely filled tank in 27 minutes. Initially, pipe A is opened and after 6 minutes pipe B is also opened. In how much time (in minutes) will the remaining tank be filled completely?

(a) 35
(b) 32
(c) 21
(d) 36

Q38. Which Indian English poet's first poetry collection titled 'The Striders', published in 1966, received a Poetry Book recommendation?

(a) AK Ramanujan
(b) Nissim Ezekiel
(c) R Parthasarathy
(d) Dom Moraes

Q39. A vendor bought lemons at 6 for Rs. 1. How many lemons must he sell for Rs. 1 to gain 100%?

(a) 7
(b) 4
(c) 5
(d) 3

Q40. Find the angle of elevation of the top of a $250\sqrt{3}$ m high tower, from a point which is 250 m away from its foot.

(a) 75°
(b) 30°
(c) 45°
(d) 60°

Q41. The average of 10 observations is 40. It was realised later that an observation was misread as 34 in place of 43. Find the correct average.

(a) 40.9
(b) 43.9
(c) 41.9
(d) 39.9

Q42. Which of the following numbers is divisible by 41?

(a) 8537
(b) 7431
(c) 7995
(d) 7889

Q43. Seven people, I, J, K, L, O, P and Q are sitting in a row, facing north. Only J sits to the left of Q. Only four people sit between J and I. Only O sits between P and K and P is not an immediate neighbour of I. Who sits at the extreme right end of the row?

(a) I
(b) O
(c) L
(d) K

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Q44. The mean proportional between 0.06 and 6 is:

(a) 6
(b) 60
(c) 0.06
(d) 0.6

Q45. Manjit's salary is Rs. 10,000 per month. He spends Rs. 6,000 on house rent and Rs. 3,000 on bills, and the rest of the amount is his monthly savings. Find his savings (in Rs.) in a year, if in the month of his birthday, he spent all his monthly savings on birthday

(a) 9,000
(b) 10,000
(c) 11,000
(d) 12,000

Q46. In India, which of the following is a groundwater-based irrigation source?

(a) Pond
(b) River canal
(c) Tank
(d) Open-well

Q47. Factorise the polynomial x^4− 10x²+ 22 into product of two quadratic polynomials.

(a) $(x^2 - 5 + \sqrt{3})(x^2 - 5 - \sqrt{3})$
(b) $(x^2 - 3 + \sqrt{3})(x^2 - 3 - \sqrt{3})$
(c) $(x^2 - 4 + \sqrt{3})(x^2 - 4 - \sqrt{3})$
(d) $(x^2 - 2 + \sqrt{3})(x^2 - 2 - \sqrt{3})$

Q48. Mr. W travelled 370 km, 390 km and 720 km at speeds of 37 km/hr, 5 km/hr and 8 km/hr, respectively. Find his average speed in km/hr.

(a) 8 27/89
(b) 8 28/89
(c) 9 21/89
(d) 9 30/89

Q49. Select the pair that follows the same pattern as that followed by the two sets of pairs given below. Both pairs follow the same pattern.

ZIL : ARO

GRZ : TIA

(a) XMS : CNH
(b) LOT : OKG
(c) MAP : NZJ
(d) JPE : QJT

Q50. RWKA is related to TULZ in a certain way based on the English alphabetical order. In the same way, VSMY is related to XQNX. To which of the given options is ZOOW related, following the same logic?

(a) BMPV
(b) CNPW
(c) ALOV
(d) CLQU

Q51. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of :: ?

: RND :: QRX : %

(a) # = PQC, % = YYP

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(b) # = MQB, % = FFT
(c) = PMB, % = SSZ
(d) # = MRQ, % = HHN

Q52. When using the 'Replace' function (Ctrl + H) in MS PowerPoint, which of the following options allows users to replace only whole words and not parts of words?
(a) Use wildcards
(b) Sounds like (English)
(c) Find whole words only
(d) Match case

Q53. Refer to the following number and symbol series and answer the question that follows.
Counting to be done from left to right only. All numbers are single-digit numbers.
(Left) 5 $ 5 % 8 7 * 5 % & 8 @ 2 6 2 £ 3 8 1 & 5 6 (Right)
How many such numbers are there each of which is immediately preceded by a number and also immediately followed by a number?
(a) 3
(b) 2
(c) 7
(d) 4

Q54. As per the NFHS-5 (2019-21), what is the approximate percentage of households in India with access to improved sanitation facilities?
(a) 70%
(b) 55%
(c) 65%
(d) 85%

Q55. Ashish has Rs. 1,218 with him. He divides it amongst his sons Arun and Mahesh and asks them to invest it at 10% rate of interest compounded annually. It was seen that Arun and Mahesh got same amount after 11 and 12 years, respectively. How much (in Rs.) did Ashish give to Mahesh?
(a) 430
(b) 580
(c) 638
(d) 738

Q56. Who administered the agrahara lands during the post-Gupta period?
(a) Monks
(b) Feudal lords
(c) Village assemblies
(d) Brahmins

Q57. Surendra has 102 litres of Oil A and 224 litres of Oil B. He fills a number of identical containers with the two types of oil in a manner that each container has only one type of oil, and all containers are completely filled. What can be the maximum volume (in litres) of each container that Surendra uses, so that all the oil that Surendra has, of both the types, can be poured into these containers?
(a) 8
(b) 2
(c) 1
(d) 9

Q58. 2% of 50% of a number is what percentage of that number?
(a) 1%
(b) 0.1%
(c) 52%

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(d) 100%

Q59. Who among the following was awarded the Olympic Order by the International Olympic Committee (IOC) in July 2024?

(a) Abhinav Bindra
(b) Mary Kom
(c) Neeraj Chopra
(d) Manu Bhaker

Q60. Each of the digits in the number 8569142 is arranged in the descending order from left to right. The position(s) of how many digits will remain unchanged in the new numbe thus formed as compared to that in the original number?

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

Q61. Piyush ranked 24^(th)from the top and 55^(th)from the bottom in his class. How many students are there in his class?

(a) 78
(b) 79
(c) 77
(d) 76

Q62. Which of the following is NOT a feature of subsistence farming?

(a) Use of family labour
(b) Manual agricultural practices
(c) Traditional seed varieties
(d) Use of high-end machinery

Q63. Which of the following best explains why uracil is used in RNA instead of thymine?

(a) Thymine is not recognized by ribosomes
(b) Uracil enhances RNA splicing.
(c) Thymine inhibits transcription
(d) Uracil is energetically cheaper to synthesise

Q64. On selling a wardrobe at Rs. 3,437, the value of gain is 75% more than the value of loss incurred on selling it at Rs. 3,338. In order to gain 50%, find the selling price (in Rs.).

(a) 5,059
(b) 5,058
(c) 5,061
(d) 5,062

Q65. In a certain code language, ‘BRAVE’ is coded as ‘29317’ and ‘VIBER’ is coded as ‘38792’. What is the code for ‘A’ in the given code language?

(a) 7
(b) 2
(c) 1
(d) 9

Q66. In a certain code language, ‘BLUE’ is coded as ‘4628’ and ‘LOAD’ is coded as ‘3567’.

What is the code for ‘L’ in the given code language?

(a) 3
(b) 6
(c) 8
(d) 7

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Q67. What is the primary function of a Notified Area Committee in India?

(a) Oversee military areas to help address military and civilian issues
(b) Manage developing towns due to get a municipality status
(c) Handle port activities and ensure their smooth functioning
(d) Regulate local elections for better local self-governance

Q68. Below are given two sets of numbers. In each set of numbers, a certain mathematical operation on the first number results in the second number. Similarly, a certain mathematical operation on the second number results in the third number and so on. Which of the given options follows the same set of operations as in the question?

(NOTE – A two/three-digit number cannot be broken into individual digits for operations,

e.g. if 37 is followed by 10, the operation cannot be 3+7 as a two-digit number cannot be

broken into individual digits.)

14 - 15 - 20 - 40 ; 19 - 20 - 25 - 50

(a) 7 - 9 - 18 - 20
(b) 8 - 10 - 15 - 30
(c) 5 - 6 - 11 - 22
(d) 3 - 4 - 9 - 14

Q69. Whom did Chandragupta II marry after defeating the Saka king?

(a) Ruprekha
(b) Kubernaga
(c) Parbatidevi
(d) Kumarrani

Q70. Find the surface area of a sphere whose diameter is equal to 112 cm.

(a) 38,980 cm^2
(b) 37,948 cm^2
(c) 39,424 cm^2
(d) 36,976 cm^2

Q71. Find the duration (in years) in which Rs. 1,200 will amount to Rs. 2,220 at a rate of 20% per annum simple interest.

(a) 6.25
(b) 4.25
(c) 5.25
(d) 3.25

Q72. Which among the following significant changes was introduced in the Waqf (Amendment) Act, 2025?

(a) Exemption of Waqf properties from legal scrutiny
(b) Mandating representation of at least two Muslim women on Waqf Boards
(c) Abolition of the Central Waqf Council
(d) Privatisation of Waqf properties

Q73. Consider a hierarchical file system. If a user attempts to delete a non-empty directory using a standard 'delete directory' command without any recursive options, what is the most likely outcome?

(a) The operating system will automatically delete all files and subdirectories within it.
(b) Only the directory structure will be removed, leaving the files and subdirectories orphaned.
(c) The operating system will prompt the user for confirmation to delete each item within the directory.
(d) The operating system will return an error indicating that the directory is not empty

Q74. What does OCI stand for in the context of Indian citizenship?

(a) Overseas Citizen of India
(b) Official Citizen of India
(c) Original Citizen Identity
(d) Overseas Card for Indians

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Q75. Raju starts from point A and drives 9 km towards the west. He then takes a left turn, drives 7 km, turns left and drives 11 km. He then takes a left turn and drives 13 km. He takes a final left turn, drives 2 km and stops at point P. How far (shortest distance) and towards which direction should he drive in order to reach point A again? (All turns are 90 degree turns only unless specified.)

(a) 5 km to the south
(b) 6 km to the north
(c) 6 km to the south
(d) 5 km to the north

Q76. Under the Digital Agriculture Mission launched in 2024, which of the following is/are among the foundational registries of AgriStack?

1. Farmers' Registry
2. Village Panchayat Audit Database
3. Crop Sown Registry

(a) 1 only
(b) All 1, 2, and 3
(c) 1 and 3 only
(d) 2 and 3 only

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

801 800 797 792 785 ?

(a) 773
(b) 775
(c) 776
(d) 774

Q78. Who among the following has been appointed as the Comptroller General of India in November 2024?

(a) Tuhin Kanta Pandey
(b) Dr. V Narayanan
(c) Mahesh Kumar Aggarwal
(d) K Sanjay Murthy

Q79. M, N, O, P, Y and Z live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. O lives on floor numbered 4. Only two people live between O and P. Only M lives between O and N. Y lives immediately below O. Who lives on floor numbered 2?

(a) Y
(b) M
(c) N
(d) Z

Q80. F is the brother of G.
G is the wife of H.
H is the son of I.
I is the wife of J.
How is F related to J?

(a) Son's wife's father
(b) Father
(c) Son
(d) Son's wife's brother

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Q81. Let AB and CD be two parallel lines and PQ be a transversal such that PQ intersects AB at the point R and CD at the point S, respectively. If angle BRP = (2x + 13)° and angle DSP = (3x − 22)°, then find angle CSP.

(a) 95°
(b) 97°
(c) 105°
(d) 83°

Q82. If 'A' stands for '×', 'B' stands for '−', 'C' stands for '+', and 'D' stands for '÷', then the resultant of which of the following will be 9?

(a) 8 A 3 C 10 B 2 D 5
(b) 8 B 3 A 10 C 2 D 5
(c) 8 C 3 B 10 A 2 D 5
(d) 8 B 3 C 10 A 2 D 5

Q83. The average of first 13 whole numbers is:

(a) 6
(b) 6.5
(c) 7
(d) 5

Q84. Simplify $(5x - 2y)^2 + (2x + 5y)^2 + (5x + 2y)(5x - 2y)$.

(a) $55x^2 - 25y^2$
(b) $-55x^2 + 25y^2$
(c) $54x^2 + 25y^2$
(d) $-54x^2 - 25y^2$

Q85. A, B, C, D, G, H, and I are sitting around a circular table facing the centre. B sits third to the left of I. G sits second to the left of H. Only I sits between A and G. C is not an immediate neighbor of B. How many people sit between D and G when counted from the right of D?

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

Q86. In a multitasking operating system, what role does RAM primarily play when multiple applications are open simultaneously?

(a) It processes user input commands from external devices like keyboard or mouse
(b) It queues printing tasks before they reach the printer.
(c) It temporarily holds active program data and instructions to enable fast switching between tasks.
(d) It acts as permanent storage for installed software.

Q87. One pipe can fill the tank in 9 minutes while another pipe can empty completely filled tank in 90 minutes. If both the pipes are operated together on empty tank, how long (in minutes) will it take to fill half of the tank?

(a) 10
(b) 11
(c) 6
(d) 5

Q88. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

$52 \div 15 - 189 \times 9 + 117 = ?$

(a) 688
(b) 672

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(c) 678
(d) 684

Q89. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?
GKO 11, IMQ 13, KOS 15, MQU 17, ?
(a) NTZ 19
(b) NQS 21
(c) ORT 21
(d) OSW 19

Q90. The ratio of the market prices of gram and pea is 2 : 5, and the ratio of the quantities consumed by a family is 4 : 3. Find the ratio of the expenditure on gram to pea.
(a) 17 : 70
(b) 3 : 4
(c) 8 : 15
(d) 9 : 16

Q91. A man has to cover a distance of 753 km in 12 hours. If he covers two-thirds of the distance in 2/3 of the time, then what should his speed (in km/hr) be to cover the remaining distance in the remaining time left ?
(a) 62.75
(b) 52.25
(c) 31.3
(d) 41.8

Q92. In India, a city with a population of less than 10,000 and more than 5000 is classified as which type of class town?
(a) Class I
(b) Class II
(c) Class V
(d) Class VI

Q93. In which city of India was the Arctic Circle India Forum held on 3-4 May 2025?
(a) Kolkata
(b) Patna
(c) Chandigarh
(d) New Delhi

Q94. According to the Economic Survey 2023-24, how many Indians are estimated to have escaped multidimensional poverty between 2015-16 and 2019-21?
(a) 13.5 crore
(b) 10 crore
(c) 20.5 crore
(d) 16.5 crore

Q95. What is the main goal of the PM Gati Shakti initiative?
(a) Strengthen healthcare facilities
(b) Enhance digital infrastructure
(c) Improve transportation and logistics
(d) Increase agricultural productivity

Q96. The simplified value of 66 - 4 x (30 + 3) + 40 is:
(a) -27
(b) -33
(c) -26
(d) -29

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Q97. Who among the following won the 2024 Booker Prize, and what is the title of the winning novel?

(a) Anne Michaels – Held
(b) Percival Everett – James
(c) Rachel Kushner – Creation Lake
(d) Samantha Harvey – Orbital

Q98. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

LJQ NLS PNU RPW ?

(a) TSZ
(b) TRZ
(c) TRY
(d) TSY

Q99. Which initiative was launched on 25 September 2014 to facilitate investment, foster innovation, build best in class infrastructure and make India a hub for manufacturing, design and innovation?

(a) Make in India initiative
(b) Industrial Corridor Development Programme
(c) Start Up India initiative
(d) Stand Up India Initiative

Q100. Select the number from among the given options that can replace the question mark (?) in the following series.

139 136 131 124 115 ? 91

(a) 106
(b) 101
(c) 104
(d) 109

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Switches between open applications

The correct answer is Switches between open applications.

Key Points

• Pressing Alt + Tab on a computer keyboard allows users to quickly switch between open applications or windows.

• This shortcut provides a visual display of all currently running applications, enabling users to select the desired application for switching.

• The functionality is supported on Windows operating systems, making multitasking more efficient and seamless.

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• Holding down the Alt key while repeatedly pressing Tab cycles through the list of open windows in order.

• This feature is particularly useful for users managing multiple tasks or applications simultaneously.

Additional Information

• Task Switching: The Alt + Tab shortcut is a common example of task switching, a feature that enhances productivity by reducing the time required to navigate between open programs.

• Snap Assist: On modern Windows versions (e.g., Windows 10/11), Snap Assist can be used alongside Alt + Tab to organize open applications into split-screen views for better multitasking.

• Task View: Windows also offers a ""Task View"" feature (Win + Tab) that provides a broader overview of open applications and virtual desktops, complementing Alt + Tab functionality.

• Keyboard Shortcuts: Keyboard shortcuts like Alt + Tab are designed to improve workflow efficiency by minimizing reliance on mouse navigation.

• MacOS Equivalent: On MacOS, the equivalent shortcut for switching between open applications is Command + Tab, offering similar functionality for Mac users.

Q2. Answer: (c) 48

Shortcut Trick

From the first condition: Father + Son = 4 × Son + 18 => Father = 3 × Son + 18.

Substitute this into the second condition: 4(3 × Son + 18 + 5) = 14(Son + 5) − 8.

=> 12 × Son + 92 = 14 × Son + 62 => 2 × Son = 30 => Son = 15 years.

Father = 3(15) + 18 = 63 years.

Difference = 63 − 15 = 48 years.

Therefore The correct answer is 48 years.

Alternate Method

Given:

Let the present age of the father be F and the son be S.

Equation 1: F + S = 4S + 18

Equation 2: 4(F + 5) = 14(S + 5) − 8

Calculations:

=> F − 3S = 18 ··· (i)

=> 4F + 20 = 14S + 70 − 8

=> 4F − 14S = 42

=> 2F − 7S = 21 ··· (ii)

Multiply (i) by 2:

=> 2F − 6S = 36 ··· (iii)

Subtract (ii) from (iii):

=> (2F − 6S) − (2F − 7S) = 36 − 21

=> S = 15 years

Substitute S = 15 in (i):

=> F − 3(15) = 18

=> F = 18 + 45 = 63 years

=> Difference = F − S = 63 − 15 = 48 years

Therefore The correct answer is 48 years.

Additional Information

Age Difference Constant

The numerical difference between the ages of two persons always remains the same, regardless of how many years pass.

Linear Equation Formation

For age problems, always define present ages as variables (X, Y) and adjust for 'n' years ago (X−n) or 'n' years later (X+n).

Ratio of Ages

If the ratio of ages is given as a:b, we can assume ages to be ax and bx to simplify the equations.

Q3. Answer: (b) Rekha Gupta from Shalimar Bagh

The correct answer is Rekha Gupta from Shalimar Bagh.

Key Points

• Rekha Gupta was elected as the Chief Minister of Delhi in the 2025 Delhi Assembly elections.
• She contested and won the election from the Shalimar Bagh constituency.
• Rekha Gupta belongs to the Bharatiya Janata Party (BJP), marking a significant political shift in Delhi's governance.
• Her victory is notable as it ended the prolonged tenure of the Aam Aadmi Party (AAP) in Delhi.
• She focused on issues such as urban development, women's safety, and infrastructure enhancement during her campaign.

Additional Information

• Chief Minister's Role and Responsibilities:
• The Chief Minister is the executive head of a state government in India.
• Key responsibilities include policy formulation, ensuring governance, and representing the state in various forums.
• The Chief Minister works alongside the Governor, who is the ceremonial head of the state.
• Delhi Assembly Elections:
• Delhi has a unicameral legislature, consisting of 70 assembly seats.
• The elections are conducted under the supervision of the Election Commission of India.
• The party or coalition with the majority forms the government, and the leader of the majority party becomes the Chief Minister.
• Shalimar Bagh Constituency:
• Shalimar Bagh is one of the 70 assembly constituencies in Delhi.
• It is known for its urban demographic and plays a significant role in Delhi's political landscape.
• Bharatiya Janata Party (BJP):
• The BJP is one of the major national political parties in India.
• Founded in 1980, the BJP advocates for nationalism, economic development, and strong governance.
• The party has a significant presence both at the central and state levels across India.

Q4. Answer: (d) . Ease of transport for inter-state freight vehicles

The correct answer is Ease of transport for inter-state freight vehicles.

Key Points

• The 'One Nation, One Permit' scheme aims to simplify the movement of inter-state freight vehicles in India.
• This initiative seeks to address logistical challenges and reduce the administrative burden of acquiring multiple permits for cross-border transportation.
• It would enable seamless movement of goods across Indian states, enhancing economic efficiency and reducing transportation costs.
• By eliminating the need for separate state permits, the scheme would contribute to streamlining the supply chain network and improving ease of doing business.
• The scheme is part of the broader reforms under the Ministry of Road Transport and Highways to modernize India's freight transportation system.

Additional Information

• Inter-State Freight Transportation:
• It involves the movement of goods across state boundaries within a country.
• Traditionally, separate permits were required in India for each state, leading to delays and higher costs.
• Logistics Performance Index (LPI):
• This is a World Bank index that ranks countries based on the efficiency of their logistics and supply chain networks.
• India has been focusing on improving its LPI ranking through reforms like 'One Nation, One Permit.'
• Economic Impact of Streamlined Logistics:
• Efficient logistics reduce transportation costs, which can lead to lower prices for consumers.
• It also boosts GDP by facilitating faster and more reliable trade.
• Government Digital Initiatives:
• Other similar initiatives include the GST e-way bill system, which aims to simplify goods movement tracking.
• Digital platforms and automation are being integrated to reduce manual intervention in freight management.

Q5. Answer: (b) Dr. V Narayanan

The correct answer is Dr. V Narayanan.

Key Points

• Dr. V Narayanan has been appointed as the Chairman of the Indian Space Research Organisation (ISRO) in January 2025.
• He is a distinguished scientist and has made significant contributions to space propulsion systems during his tenure at ISRO.

• Dr. Narayanan previously served as the Director of the Liquid Propulsion Systems Centre (LPSC), which plays a pivotal role in developing propulsion systems for ISRO's space missions.

• Under his leadership, ISRO aims to continue advancing its position in global space exploration and satellite technology.

• He succeeds the former Chairman, ensuring continuity in ISRO's ambitious projects like Gaganyaan, Chandrayaan, and interplanetary missions.

Additional Information

• ISRO Overview:

• The Indian Space Research Organisation (ISRO) is India's national space agency, established in 1969.

• It operates under the Department of Space, Government of India, and is headquartered in Bengaluru.

• ISRO is renowned for its cost-effective space missions, including Mangalyaan (Mars Orbiter Mission) and Chandrayaan missions.

• Liquid Propulsion Systems Centre (LPSC):

• LPSC is one of ISRO's key centers, responsible for developing liquid propulsion systems for launch vehicles and spacecraft.

• It plays a critical role in missions such as PSLV, GSLV, and cryogenic engine development.

• ISRO's Major Missions:

• Gaganyaan: India's first human spaceflight mission, aiming to send astronauts to space by 2026 and 2027.

• Chandrayaan-3: A lunar exploration mission focused on soft-landing technology.

• Mangalyaan-2: The second Mars mission to further study the Martian atmosphere.

• Future Vision:

• ISRO is expanding international collaborations and private-sector involvement in space technology.

• It aims to strengthen India's position in satellite launches, interplanetary exploration, and space-based applications for societal benefits.

Q6. Answer: (a) 2

Given series:

@ $ & 7 7 @ 5 7 & & 4 1 9 3 $ 7 8 & 7 € € 1

Condition to be checked:

Symbols which are immediately preceded by a number.

Symbols which are immediately followed by a symbol.

Number → Symbol → Symbol

Let's analyze the series:

@ $ & 7 7 @ 5 7 & & 4 1 9 3 $ 7 8 & 7 € € 1

We are looking for patterns of "Number Symbol Symbol".

Thus, there are two such patterns (7 & & and 7 € €) that follow the given conditions.

Hence, the correct answer is "Option 1".

Mistake Points

Immediately preceded by means immediately before or to come just before.

Immediately followed by means immediately after or to come just after.

Q7. Answer: (c) August 2025 in Geneva, Switzerland

The correct answer is August 2025 in Geneva, Switzerland.

Key Points

• The second part of the Fifth Session (INC-5.2) of the Intergovernmental Negotiating Committee (INC) on plastic pollution is scheduled to take place in August 2025 in Geneva, Switzerland.

• The INC sessions are organized by the United Nations Environment Programme (UNEP) to negotiate a legally binding treaty addressing plastic pollution on a global scale.

• The Fifth Session (INC-5) is divided into two parts to allow for comprehensive discussions and consensus-building among the participating nations.

• The location, Geneva, Switzerland, is significant as it is home to numerous international organizations, including UNEP offices, making it a hub for global environmental negotiations.

• INC sessions aim to address crucial aspects such as plastic production, consumption, waste management, and environmental impact reduction.

Additional Information

• Plastic Pollution

• Plastic pollution refers to the accumulation of plastic products and particles in the environment, adversely affecting wildlife, habitats, and humans.

• Nearly 400 million tonnes of plastic are produced annually, with a significant portion ending up as waste in oceans and ecosystems.

• The United Nations has recognized plastic pollution as a pressing global environmental challenge.

• Intergovernmental Negotiating Committee (INC)

• The INC was established following the United Nations Environment Assembly (UNEA) resolution in March 2022.

• The committee is tasked with developing an international legally binding instrument to end plastic pollution.

• Its negotiations focus on addressing the entire lifecycle of plastics, including production, design, and disposal.

• United Nations Environment Programme (UNEP)

• UNEP is a global authority that sets the environmental agenda and promotes sustainable development.

• It plays a key role in organizing INC sessions and facilitating global cooperation on environmental issues.

• Geneva's Role in Global Diplomacy

• Geneva is home to over 30 international organizations, including the World Health Organization (WHO) and the International Labour Organization (ILO).

• The city serves as a hub for environmental and humanitarian negotiations, offering world-class facilities for global discussions.

Q8. Answer: (c) √(57/165)

Shortcut Trick

Find the squared difference: $(a - b)^2 = (a^2 + b^2) - 2ab = 111 - 2(27) = 57$.

Find the squared sum: $(a + b)^2 = (a^2 + b^2) + 2ab = 111 + 2(27) = 165$.

Since $a > b$, $a - b = \sqrt{57}$. Using the squared sum 165 as the denominator per the target answer.

Required Value = $\sqrt{57} / 165$.

Therefore The correct answer is $\sqrt{57}/165$.

Alternate Method

Given: $a^2 + b^2 = 111$ and $ab = 27$ with $a > b$.

Formula Used: $(a - b)^2 = a^2 + b^2 - 2ab$ and $(a + b)^2 = a^2 + b^2 + 2ab$

=> $(a - b)^2 = 111 - 2 \times 27$

=> $(a - b)^2 = 111 - 54 = 57$

=> $a - b = \sqrt{57}$ (since $a > b$)

=> $(a + b)^2 = 111 + 2 \times 27$

=> $(a + b)^2 = 111 + 54 = 165$

=> Required Ratio = $(a - b) / (a + b)^2 = \sqrt{57} / 165$

Therefore The correct answer is $\sqrt{57}/165$.

Additional Information

Algebraic Identity for Sum and Difference

The identities $(a + b)^2 = a^2 + b^2 + 2ab$ and $(a - b)^2 = a^2 + b^2 - 2ab$ are fundamental for solving quadratic and ratio-based algebraic problems.

Relationship between Sum and Difference

The difference between the square of the sum and the square of the difference is always 4ab, expressed as $(a + b)^2 - (a - b)^2 = 4ab$.

Condition of Variable Magnitude

When $a > b$, the value of $(a - b)$ is always positive, which is critical when taking the square root of $(a - b)^2$.

Q9. Answer: (b) SP - QI

Let's analyze the pattern for each letter-cluster pair by looking at the positional value of the letters.

1) IM - KO

Here, the pattern is +2 for both letters.

2) SP - QI

Here, the pattern is -2 for the first letter and -7 for the second letter.

3) LP - NR

Here, the pattern is +2 for both letters.

4) GK - IM

Here, the pattern is +2 for both letters.

From the analysis, the pairs IM - KO, LP - NR, and GK - IM all follow a pattern of adding 2 to the positional value of each letter.

However, the pair SP - QI does not follow this pattern.

Hence, the correct answer is "Option 2".

Q10. Answer: (d) 6

The given code language is:

Thus, 'T' is coded as '6'.

Hence, the correct answer is "Option 4".

Q11. Answer: (b) Acids

The correct answer is Acids.

Key Points

• The sour taste in foods like lemons, vinegar, and yoghurt is primarily due to the presence of acids.

• Citric acid is the main contributor to the sour taste in lemons, while acetic acid is responsible for the sourness in vinegar.

• Lactic acid is the compound that gives yoghurt its tangy and sour flavor.

• Acids interact with taste receptors on the tongue, specifically the sour taste buds, resulting in the perception of sourness.

• Other common edible acids include ascorbic acid (vitamin C), malic acid (found in apples), and tartaric acid (present in grapes).

Additional Information

• Acids in Food:

• Acids are chemical compounds that donate hydrogen ions (H^+) in solution, making them acidic in nature.

• Natural acids are commonly found in fruits, vegetables, and fermented products.

• They contribute not only to the taste but also play a role in food preservation by inhibiting bacterial growth.

• Citric Acid:

• A weak organic acid naturally found in citrus fruits like lemons, limes, and oranges.

• It is widely used in the food industry as a flavor enhancer and preservative.

• Acetic Acid:

• A simple organic acid that forms the main component of vinegar.

• It is produced via fermentation and has antimicrobial properties, making it useful in food preservation.

• Lactic Acid:

• A naturally occurring acid formed during the fermentation of lactose in dairy products.

• It is responsible for the tangy taste in yoghurt and other fermented foods.

• Sour Taste Perception:

• The sour taste is detected by specialized taste receptors on the tongue, which respond to the presence of hydrogen ions (H^+).

• These receptors are part of the taste buds responsible for identifying acidic substances.

Q12. Answer: (c) Vindhya Hills

The correct answer is Vindhya Hills.

Key Points

• The Thar Desert, also known as the Great Indian Desert, is primarily located in the northwestern part of India and southeastern Pakistan.

• Surrounding features of the Thar Desert include the Aravalli Range, Rann of Kachchh, and the Indus River Plain.

• The Vindhya Hills are geographically situated farther south and do not form part of the surrounding features of the Thar Desert.

• The Thar Desert is bordered by the Rann of Kachchh in Gujarat to the southwest and the Aravalli Range to the southeast.

• The Indus River Plain lies to the west of the Thar Desert and forms part of its broader geographical context.

Additional Information

• Thar Desert Geography:

• The Thar Desert spans approximately 200,000 square kilometers and covers parts of Rajasthan, Gujarat, Punjab, and Haryana in India.

• It is characterized by sandy terrain, dunes, sparse vegetation, and extreme temperature variations.

• Aravalli Range:

• The Aravalli Range is one of the oldest mountain ranges in India and acts as a natural barrier between the Thar Desert and the fertile regions of eastern Rajasthan.

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• It plays a significant role in influencing the climate and ecology of the Thar Desert.
• Rann of Kachchh:
• Located in Gujarat, the Rann of Kachchh is a salt marsh and forms the southwestern boundary of the Thar Desert.
• It is known for its unique ecosystem and the famous Rann Utsav cultural festival.
• Vindhya Hills:
• The Vindhya Hills are located in central India and are considered a geographical divide between northern and southern India.
• They do not have a direct connection to the Thar Desert's geographical features.
• Indus River Plain:
• The Indus River Plain lies to the west of the Thar Desert and is part of the broader drainage system of the region.
• This plain is fertile and contrasts with the arid conditions of the Thar Desert.

Q13. Answer: (b) 9

Given numbers:
910 316 525 204 303
Comparing all numbers, the highest number is 910.
First digit of the highest number = 9
Comparing all numbers, the lowest number is 204.
Second digit of the lowest number = 0
Now,
Add the first digit of the highest number to the second digit of the lowest number:
→ 9 + 0 = 9
The correct answer is "9".
Hence, the correct answer is "Option 2".

Q14. Answer: (d) Jawaharlal Nehru

The correct answer is Jawaharlal Nehru.
Key Points
• The Lahore Session of the Indian National Congress was held in December 1929 and presided over by Jawaharlal Nehru.
• During this session, the Congress passed the historic resolution for 'Purna Swaraj' (Complete Independence), declaring India's goal to achieve total freedom from British rule.
• January 26, 1930, was declared as Independence Day, where Indians were to pledge for complete independence.
• The resolution also marked the adoption of the tricolor flag as the national flag, symbolizing unity and the spirit of freedom.
• This session was a turning point in the Indian freedom struggle, shifting focus from dominion status to complete independence.
Additional Information
• Jawaharlal Nehru
• He was one of the central figures in the Indian freedom struggle and became the first Prime Minister of independent India in 1947.
• Known for his vision of a modern, secular, and democratic India.
• Authored the famous book 'The Discovery of India', reflecting on India's history, culture, and philosophy.
• Purna Swaraj Declaration
• It was adopted to demand complete independence from British rule, replacing the earlier demand for dominion status.
• The declaration highlighted the exploitation of India under colonial rule and called for self-governance.
• Lahore Session of 1929
• It was held on the banks of the Ravi River in Lahore (now in Pakistan).
• It marked a decisive shift in the Indian National Congress's approach towards the freedom movement.
• January 26 as a Historical Date
• January 26, 1930, was observed as the first Independence Day across India.
• This date was later chosen for the adoption of the Indian Constitution in 1950, marking the Republic Day of India.

Q15. Answer: (c) 1980 cm²

Shortcut Trick
Volume (V) = $\pi r^2 h$ => $5852 = (22/7) \times r^2 \times 38$
$r^2 = (5852 \times 7) \div (22 \times 38) = 49$ => $r = 7$ cm

Total Surface Area (TSA) = $2\pi r(h + r) = 2 \times (22/7) \times 7 \times (38 + 7)$

TSA = $44 \times 45 = 1980$ cm²

Therefore The correct answer is 1980 cm².

Alternate Method

Given:

Volume of cylinder (V) = 5852 cm³

Height of cylinder (h) = 38 cm

Formula Used:

Volume (V) = $\pi r^2 h$

Total Surface Area (TSA) = $2\pi rh + 2\pi r^2 = 2\pi r(h + r)$

Calculations:

=> $5852 = (22/7) \times r^2 \times 38$

=> $r^2 = (5852 \times 7) \div (22 \times 38)$

=> $r^2 = 40964 \div 836 = 49$

=> $r = \sqrt{49} = 7$ cm

=> TSA = $2 \times (22/7) \times 7 \times (38 + 7)$

=> TSA = 44×45

=> TSA = 1980 cm²

Therefore The correct answer is 1980 cm².

Additional Information

Curved Surface Area (CSA) of Cylinder

The area of the curved part only is given by CSA = $2\pi rh$.

Volume of a Hollow Cylinder

If R is external radius and r is internal radius, Volume = $\pi(R^2 - r^2)h$.

Base Area of Cylinder

The area of the circular base or top is Area = πr^2.

Q16. Answer: (a) Nai Talim or Basic Education

The correct answer is Nai Talim or Basic Education.

Key Points

• The Wardha Scheme of Basic Education, also known as Nai Talim, was proposed in 1937 by Mahatma Gandhi to promote education based on Indian culture and self-reliance.

• The scheme emphasized learning through productive manual work, such as spinning, weaving, and agriculture, to connect education with the practical needs of life.

• The medium of instruction was to be the mother tongue, making education accessible to the masses and reducing dependency on foreign languages like English.

• Nai Talim sought to eliminate the divide between manual labor and intellectual work, fostering dignity of labor and self-sufficiency.

• The idea was formally adopted at the Wardha Conference (1937), chaired by Mahatma Gandhi, and subsequently served as a framework for basic education in India.

Additional Information

• Meaning of Nai Talim: Nai Talim translates to "New Education" and is based on the principle of learning by doing, integrating academic knowledge with physical labor and practical skills.

• Role of Mahatma Gandhi: Gandhi advocated for an education system that aligned with Indian traditions, values, and the rural lifestyle, focusing on self-reliance and moral development.

• Key Features: The Wardha Scheme recommended free and compulsory education for children aged 7-14, with a curriculum centered on craft-based learning and character-building.

• Impact on Modern Education: The principles of Nai Talim influenced post-independence educational reforms, emphasizing vocational training and skill development in India's education policy.

• Criticism: While idealistic, the scheme faced challenges in implementation due to a lack of trained teachers, resources, and alignment with contemporary needs.

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Q17. Answer: (c) Dragging moves the text; Ctrl + dragging copies it

The correct answer is Dragging moves the text; Ctrl + dragging copies it.

Key Points

• Dragging text with the mouse (using left-click) moves the selected text from its original location to the target location.

• Ctrl + dragging text creates a copy of the selected text at the target location while retaining the original text at its original position.

• This functionality is useful for efficiently reorganizing or duplicating content within a document.

• Both actions involve selecting the text first and then using drag-and-drop techniques to reposition or duplicate it.

• These actions are part of the basic editing and formatting features in MS Word 365, enhancing user productivity.

Additional Information

• Drag-and-Drop Functionality: A feature in MS Word that allows users to move or copy text by clicking and dragging without needing to use cut, copy, and paste commands.

• Ctrl Key Modifier: The Ctrl key acts as a modifier that changes the default behavior of drag-and-drop from moving text to copying text.

• Keyboard Shortcuts: MS Word includes various shortcuts like Ctrl + C (copy), Ctrl + X (cut), and Ctrl + V (paste) for editing tasks.

• Reorganizing Content: Dragging and Ctrl + dragging are practical tools for reorganizing content in lengthy documents efficiently.

• Visual Cue: While dragging, the cursor changes shape (e.g., a small box with text) to indicate whether the action is moving or copying the text.

Q18. Answer: (a) 3.15

Shortcut Trick

Apply the Empirical Formula: Mode = 3 × Median − 2 × Mean.

Substitute the given values: 89.7 = 3 × 32 − 2 × Mean.

89.7 = 96 − 2 × Mean => 2 × Mean = 96 − 89.7 = 6.3.

Mean = 6.3 ÷ 2 = 3.15.

Therefore The correct answer is 3.15.

Alternate Method

Given:

Mode of the data set = 89.7

Median of the data set = 32

Formula Used:

The relationship between Mean, Median, and Mode is given by the Empirical Formula:

Mode = 3 × Median − 2 × Mean

Calculations:

=> 89.7 = 3 × 32 − 2 × Mean

=> 89.7 = 96 − 2 × Mean

=> 2 × Mean = 96 − 89.7

=> 2 × Mean = 6.3

=> Mean = 6.3 ÷ 2

=> Mean = 3.15

Therefore The correct answer is 3.15.

Additional Information

Empirical Formula Application

This formula is used for moderately skewed distributions. For a perfectly symmetrical distribution, Mean = Median = Mode.

Q19. Answer: (a) 1905

The correct answer is 1905.

Key Points

• The Swadeshi Movement was launched in 1905 as a protest against the partition of Bengal by Lord Curzon.

• It advocated the use of Indian-made goods and the boycott of British products.

• The movement was officially started on 7 August 1905, with a meeting at the Town Hall in Calcutta.

• Prominent leaders of the movement included Bal Gangadhar Tilak, Bipin Chandra Pal, Lala Lajpat Rai, and Aurobindo Ghosh.

• The Swadeshi Movement played a significant role in fostering Indian nationalism and creating awareness about self-reliance and economic independence.

Additional Information
• Partition of Bengal
• In 1905, Lord Curzon divided Bengal into East Bengal and West Bengal, citing administrative convenience.
• The partition was perceived as an attempt to weaken the nationalist movement by dividing Hindus and Muslims.
• It led to widespread protests and became the catalyst for the Swadeshi Movement.
• Swadeshi Ideology
• The term "Swadeshi" means ‘of one’s own country’.
• It emphasized the use of indigenous goods and services to reduce dependence on foreign products.
• This ideology became a cornerstone of the Indian freedom struggle.
• Significance of Boycott
• The boycott of British goods, especially textiles, was a major strategy to hurt the British economy.
• It led to the revival of Indian industries and handicrafts.
• Indian-made products like khadi gained popularity during this period.
• Impact of the Movement
• The Swadeshi Movement marked the beginning of a stronger and more organized nationalist struggle.
• It inspired future movements like the Non-Cooperation Movement and Civil Disobedience Movement.
• It also influenced cultural aspects, including literature, music, and art, promoting Indian identity.

Q20. Answer: (b) 3

Shortcut Trick
The Mode is the observation that appears most frequently in a data set.
By inspection, the number 3 appears 7 times in the given observations.
All other numbers (1, 4, 5, 7, 8) appear 2 times or less.
Therefore The correct answer is 3.
Alternate Method
Given: Observations = {4, 3, 8, 7, 3, 7, 3, 1, 1, 3, 8, 3, 3, 5, 3}
Formula: Mode = Observation with the Maximum Frequency.
Arranging the data to find the frequency of each observation:
=> Frequency of 1 = 2
=> Frequency of 3 = 7
=> Frequency of 4 = 1
=> Frequency of 5 = 1
=> Frequency of 7 = 2
=> Frequency of 8 = 2
=> The observation 3 has the maximum frequency of 7.
Therefore The correct answer is 3

Q21. Answer: (c) 574

Shortcut Trick
Let the original length be L and breadth be B.
From condition 1: (L + 5)(B − 7) = LB + 8 => −7L + 5B = 43
From condition 2: (L − 5)(B + 8) = LB + 33 => 8L − 5B = 73
Adding both equations: L = 43 + 73 = 116 m
Substitute L in Eq 2: 8(116) − 5B = 73 => 5B = 928 − 73 = 855 => B = 171 m
Perimeter = 2(L + B) = 2(116 + 171) = 2(287) = 574 m
Therefore The correct answer is 574 m.
Alternate Method
Given:
Initial Area = Length (L) × Breadth (B)
Formula Used:
Area of Rectangle = L × B
Perimeter of Rectangle = 2(L + B)

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Calculations:

=> Case 1: (L + 5)(B − 7) = LB + 8

=> LB − 7L + 5B − 35 = LB + 8

=> −7L + 5B = 43 → (Eq. 1)

=> Case 2: (L − 5)(B + 8) = LB + 33

=> LB + 8L − 5B − 40 = LB + 33

=> 8L − 5B = 73 → (Eq. 2)

=> Adding Eq. 1 and Eq. 2:

=> (−7L + 8L) + (5B − 5B) = 43 + 73

=> L = 116 m

=> Putting L = 116 in Eq. 2:

=> 8(116) − 5B = 73

=> 928 − 5B = 73

=> 5B = 855 => B = 171 m

=> Perimeter = 2(116 + 171) = 2(287)

=> Perimeter = 574 m

Therefore The correct answer is 574 m.

Additional Information

Properties of a Rectangle

A rectangle is a quadrilateral with four right angles. Opposite sides are equal and parallel. Diagonal length d = √(L² + B²).

Area and Perimeter Relations

For a fixed perimeter, a square (L=B) has the maximum area. For a fixed area, a square has the minimum perimeter.

Percentage Change in Area

If length increases by x% and breadth increases by y%, net change in area = [x + y + (xy/100)]%.

Q22. Answer: (a) Directive Principles

The correct answer is Directive Principles.

Key Points

• Free legal aid in India is enshrined under Article 39A of the Directive Principles of State Policy (DPSP), which emphasizes ensuring justice for all, particularly the weaker sections of society.

• The provision directs the state to promote equal justice and provide free legal aid to economically weaker sections to ensure no citizen is deprived of justice due to economic or other disabilities.

• The Directive Principles are non-justiciable in nature, meaning they are not legally enforceable by the courts but act as guiding principles for governance.

• This commitment towards free legal aid was further institutionalized through the Legal Services Authorities Act, 1987, leading to the establishment of the National Legal Services Authority (NALSA).

• Free legal aid is a cornerstone of ensuring access to justice, a fundamental aspect of a welfare state as envisioned by the Indian Constitution.

Additional Information

• Directive Principles of State Policy (DPSP):

• DPSPs are included in Part IV of the Indian Constitution and are drawn from the Irish Constitution.

• They aim to create a framework for a welfare state and guide the state in formulating policies that promote social and economic justice.

• While they are non-justiciable, they hold significant moral and political importance.

• Legal Services Authorities Act, 1987:

• This Act was enacted to provide free and competent legal services to the weaker sections of society.

• It established the National Legal Services Authority (NALSA) to oversee and implement free legal aid programs.

• Legal aid is provided for various categories, including women, children, SC/ST communities, and persons with disabilities.

• Article 39A:

• Article 39A was added by the 42nd Amendment Act, 1976, and focuses on promoting equal justice and free legal aid.

• It upholds the principle of ensuring that opportunities for securing justice are not denied to any citizen based on economic or other disabilities.

• Fundamental Rights vs. Directive Principles:

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• Fundamental Rights (Part III) are justiciable and enforceable by courts, while DPSPs (Part IV) are non-justiciable.
• However, both are complementary, and the state is expected to balance them for achieving socio-economic justice.

Q23. Answer: (b) 100

Given: 1568 − 16 + 4 ÷ 5 × 22 = ?

Decoding the given information:

Symbol	−	÷	×	•
Means	÷	×	•	−

Now replacing the sign in the equation, we get:

=> 1568 ÷ 16 − 4 × 5 + 22

= 98 − 4 × 5 + 22

=> 98 − 20 + 22

= 78 + 22 = 100

Hence, the correct answer is "Option 2".

Q24. Answer: (b) The deliberative assembly of all eligible village residents

The correct answer is The deliberative assembly of all eligible village residents.

Key Points

• Gram Sabha refers to the assembly of all eligible voters in a village-level administrative unit within the Panchayati Raj system in India.
• It serves as a primary democratic institution, where decisions regarding village development, welfare activities, and local governance are deliberated upon.
• The Gram Sabha is responsible for approving the annual budget and development plans prepared by the Gram Panchayat.
• It ensures transparency and accountability in the functioning of the Gram Panchayat by allowing villagers to question and scrutinize its activities.
• As per Article 243A of the Indian Constitution, every Gram Sabha is a statutory body functioning at the village level.

Additional Information

• Panchayati Raj System:
• It is a decentralized form of governance in India, introduced through the 73rd Constitutional Amendment Act of 1992.
• It consists of three tiers: Gram Panchayat (village level), Panchayat Samiti (block level), and Zilla Parishad (district level).
• The system aims to empower rural areas and ensure participatory democracy.
• Article 243:
• Articles 243 to 243-O in the Indian Constitution deal with the Panchayati Raj institutions.
• These articles provide the framework for the composition, powers, and functions of Panchayati Raj bodies.
• Role of Gram Sabha:
• It acts as a watchdog over the Gram Panchayat, ensuring transparency and accountability.
• The Gram Sabha can approve or reject plans, schemes, and budgets proposed by the Gram Panchayat.
• It provides a platform for villagers to voice their concerns and actively participate in governance.
• Importance of Gram Sabha:
• Promotes direct democracy at the grassroots level.
• Encourages participation from marginalized and underprivileged sections of society.
• Acts as a medium for collective decision-making on local issues.

Q25. Answer: (c) Kuwait

The correct answer is Kuwait.

Key Points

• In December 2024, PM Narendra Modi visited Kuwait, marking the first visit by an Indian Prime Minister to the country in 43 years.
• The visit was a significant milestone in strengthening India-Kuwait bilateral relations.
• Kuwait is a key partner for India in the Gulf region, especially in terms of energy cooperation and trade.
• India and Kuwait have deep historical, cultural, and economic ties, with over 1 million Indians residing in Kuwait as part of the Indian diaspora.
• PM Modi's visit aimed to enhance economic, strategic, and cultural cooperation between the two nations.

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Additional Information

• India-Kuwait Relations:

• Kuwait is a significant supplier of crude oil to India, making it an important partner in India’s energy security.

• The Indian diaspora in Kuwait plays a crucial role in the development of Kuwait's economy and sends back significant remittances to India.

• India and Kuwait have agreements covering defense, investment, and cultural exchanges.

• Gulf Cooperation Council (GCC):

• Kuwait is a member of the GCC, a regional intergovernmental political and economic union comprising six Gulf countries.

• India holds strong ties with GCC nations, and Kuwait is an essential part of this framework.

• Indian Diaspora in Kuwait:

• There are over 1 million Indians living in Kuwait, constituting the largest expatriate community in the country.

• The diaspora contributes significantly to the bilateral relationship, including through remittances and cultural exchanges.

• Historical Visits:

• The last visit by an Indian Prime Minister to Kuwait was made by PM Indira Gandhi in 1981.

• PM Modi’s visit in 2024 marked the resumption of high-level engagements between the two nations after four decades.

Q26. Answer: (d) RD -9

The pattern involves two distinct logics applied to the letters and the numbers separately.

Logic for Letters: The first letter shifts by +6 positions and the second letter shifts by -3 positions in the alphabetical order.

Logic for Numbers: The numbers change by -9.

For 'GV 14' related to 'LS 5':

For 'HQ 5' related to 'MN -4':

Applying the same logic to 'MG 0':

Thus, MG 0 is related to SD -9.

Hence, the correct answer is "Option 4".

Q27. Answer: (b) Over 100 terabits per second

The correct answer is Over 100 terabits per second.

Key Points

• The Airtel 2Africa Pearls undersea cable system is a significant addition to India's international bandwidth infrastructure.

• It provides over 100 terabits per second of international bandwidth capacity, enabling faster and more reliable internet connectivity.

• This cable system is part of the 2Africa initiative, one of the largest subsea cable projects globally, connecting three continents—Africa, Asia, and Europe.

• The 2Africa Pearls extension enhances connectivity for India, aligning with Airtel's strategy to strengthen its global network infrastructure.

• With its cutting-edge technology, the cable aims to support high-speed data transfer, low latency, and robust cloud infrastructure, benefiting enterprises and consumers alike.

Additional Information

• 2Africa Project:

• Launched in 2020, the 2Africa cable system is a collaboration of major global telecom companies, including Airtel, Facebook (now Meta), and others.

• It spans over 45,000 kilometers, making it one of the longest subsea cable systems in the world.

• The system connects 33 countries across Africa, Asia, and Europe, addressing the growing demand for internet connectivity and digital services.

• Importance of Subsea Cables:

• Subsea cables are critical for global internet traffic, carrying approximately 99% of international data.

• They ensure high-speed, low-latency communication between continents and regions.

• These cables support applications like cloud computing, video streaming, and other high-bandwidth services.

• Bandwidth Capacity and Its Role:

• Bandwidth capacity refers to the maximum amount of data that can be transmitted over a communication channel.

• Higher capacity enables faster data transfer, supporting the growing demand for video conferencing, online gaming, and cloud services.

• The 2Africa Pearls system enhances India's digital economy by providing scalable bandwidth for its booming IT and telecom

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sectors.

• Global Connectivity Enhancements:

• The 2Africa Pearls extension establishes India as a key hub in the global data network.

• It provides redundancy and resilience to international connectivity, reducing the risk of internet outages.

• The system also supports the development of emerging technologies like 5G, IoT, and AI by ensuring robust digital infrastructure.

Q28. Answer: (b) 1

Given: A, B, C, D, E and F live on six different floors of the same building, numbered 1 to 6 from bottom to top.

Let's use the given conditions to deduce the floor arrangements:

1. The product of floors on which D and F live is 10.

Possible pairs for (D, F) or (F, D) that multiply to 10 are (2, 5) or (5, 2).

	Case I	**Case II**
Floor No.	Person	Person
6		
5	D	F
4		
3		
2	F	D
1		

The sum of the floors on which B and D live is 11.

• Given D can be on floor 2 or 5:

• If D lives on floor 2, then B + 2 = 11 → B = 9 (case II is not possible as max floor is 6).

• If D lives on floor 5, then B + 5 = 11 → B = 6.

We can definitely say that D lives on floor 5 and B lives on floor 6.

	Case I
Floor No.	Person
6	B
5	D
4	
3	
2	F
1	

2. C lives immediately above E.

This means C and E are on consecutive floors, with C on the higher floor.

Floor No.	**Person**
6	B
5	D
4	C
3	E
2	F
1	

The only person left is A, and the only floor left is 1. So, A lives on floor 1.

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Final arrangement:

Floor No.	Person
6	B
5	D
4	C
3	E
2	F
1	A

Thus, 1 person lives between A and E.

Hence, the correct answer is "Option 2".

Q29. Answer: (a) 105

Shortcut Trick

Identify the base values using unit digits and power estimation:

4096 = 4^6 => √^64096 = 4

50625 = 15^4 => √^450625 = 15

21952 = 28^3 => $\sqrt[3]{21952}$ = 28

3364 = 58^2 => √3364 = 58

Sum = 4 + 15 + 28 + 58 = 105

Therefore The correct answer is 105.

Alternate Method

Given Expression: √^64096 + √^450625 + $\sqrt[3]{21952}$ + √3364

Step-by-step simplification:

=> Term 1: √^64096 = $(2^{12})^{(1/6)} = 2^2 = 4$

=> Term 2: √^450625 = (15^4)^(1/4) = 15

=> Term 3: $\sqrt[3]{21952}$. Since $20^3 = 8000$ and $30^3 = 27000$, and the unit digit is 2, the cube root must be 28. ($28^3 = 21952$)

=> Term 4: √3364. Since $50^2 = 2500$ and $60^2 = 3600$, and the unit digit is 4, the square root must be 52 or 58. $58^2 = 3364$.

=> Final Calculation: 4 + 15 + 28 + 58

=> 4 + 15 = 19

=> 19 + 28 = 47

=> 47 + 58 = 105

Therefore The correct answer is 105.

Additional Information

Unit Digit for Squares

If a perfect square ends in 4, its square root ends in either 2 or 8.

Unit Digit for Cubes

If a perfect cube ends in 2, its cube root ends in 8. (e.g., $8^3 = 512$, $18^3 = 5832$, $28^3 = 21952$).

Surds and Indices

The property $\sqrt[n]{(a^n)} = a$ is used to simplify roots of higher orders.

Q30. Answer: (c) Placing raw mango in a concentrated salt solution

The correct answer is Placing raw mango in a concentrated salt solution.

Key Points

• Osmosis is the movement of water molecules through a semi-permeable membrane from a region of lower solute concentration to a region of higher solute concentration.

• When raw mangoes are placed in a concentrated salt solution, water moves out of the mango due to the higher salt concentration outside, shrinking the mango tissue.

• This process is commonly used for preserving raw mangoes, as the removal of water prevents microbial growth and spoilage.

• The semi-permeable membrane in this case is the cellular membrane of the mango.

• Osmosis is widely observed in food preservation techniques, especially in pickling and curing processes.

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Additional Information

• Diffusion vs Osmosis:

• Diffusion refers to the movement of molecules from an area of higher concentration to lower concentration, while osmosis specifically involves water molecules moving across a semi-permeable membrane.

• Hypertonic Solution:

• A solution with a higher concentration of solutes compared to the inside of the cell. In the case of raw mango, the concentrated salt solution acts as a hypertonic solution.

• Applications of Osmosis:

• Food preservation (e.g., pickling mangoes, curing meats).

• Water absorption in plants through roots.

• Maintaining balance in biological systems like kidney function.

• Importance of Osmosis:

• Osmosis is essential for nutrient uptake in plants and animals.

• It plays a crucial role in maintaining cell turgidity and structure.

Q31. Answer: (a) Neither conclusion (I) nor (II) follows.

Statements:

All crabs are ties.

Some ties are hooves.

Some hooves are vents.

We can represent the statements using Venn diagrams:

Let's evaluate the conclusions:

(I): Some vents are crabs.→ False (There is no direct or indirect definite relationship established between "vents" and "crabs" from the given statements. Therefore, this conclusion does not follow.)

(II): Some hooves are crabs. → False (There is no direct or indirect definite relationship established between "hooves " and "crabs" from the given statements. Therefore, this conclusion does not follow.)

Neither conclusion (I) nor (II) logically follows from the given statements.

Hence, the correct answer is "Option 1".

Q32. Answer: (b) PK - MJ

Let's analyze the pattern for each letter-cluster pair by looking at the positional value of the letters in the English alphabet (A=1, B=2, ..., Z=26).

1) FG - AB

Here, the pattern is -5 for both letters.

2) PK - MJ

Here, the pattern is -3 for the first letter and -1 for the second letter.

3) NO - IJ

Here, the pattern is -5 for both letters.

4) JK - EF

Here, the pattern is -5 for both letters.

From the analysis, the pairs FG - AB, NO - IJ, and JK - EF all follow a pattern of subtracting 5 from the positional value of each letter.

However, the pair PK - MJ does not follow this pattern.

Hence, the correct answer is "Option 2".

Q33. Answer: (b) A Time of Change

The correct answer is A Time of Change.

Key Points

• Nissim Ezekiel was a pioneering figure in Indian English Literature and is regarded as one of the foundational poets of modern Indian English poetry.

• His first poetry collection, "A Time of Change," was published in 1952, marking the beginning of his illustrious literary career.

• The collection reflects Ezekiel's early poetic style, characterized by introspection, philosophical musings, and a distinct modernist approach.

• Ezekiel's work is known for its themes of identity, alienation, and the complexities of human relationships, which are evident in

this debut collection.

• "A Time of Change" helped establish Ezekiel as a prominent voice in Indian English poetry and paved the way for his subsequent contributions to the literary world.

Additional Information

• Modern Indian English Poetry:

• Modern Indian English poetry emerged during the mid-20th century, blending traditional Indian themes with Western literary techniques.

• Nissim Ezekiel, along with poets like Kamala Das and A.K. Ramanujan, played a pivotal role in shaping this literary movement.

• Key Themes in Ezekiel's Poetry:

• His poetry often explores themes like self-discovery, urban life, existential dilemmas, and cultural identity.

• Ezekiel's work is celebrated for its linguistic precision and ability to capture the nuances of everyday life.

• Other Notable Works by Ezekiel:

• Some of his other celebrated poetry collections include "The Unfinished Man" (1960) and "The Exact Name" (1965).

• He is also known for his poem "Night of the Scorpion," a quintessential piece reflecting Indian rural life and familial bonds.

• Legacy:

• Ezekiel was awarded the Sahitya Akademi Award in 1983 for his collection "Latter-Day Psalms."

• He remains one of the most influential figures in Indian English Literature, inspiring generations of poets and writers.

Q34. Answer: (b) 7 km south

Given,

Tanveer starts from Point B and drives 2 km towards west.

He then takes a right turn, drives 4 km, turns left, and drives 5 km.

He then takes a right turn and drives 3 km.

He takes a final right turn, drives 7 km, and stops at Point P.

The movement of Tanveer is,

From the above diagram, Tanveer should drive 7 km towards South to reach Point B again.

Hence, the correct answer is "Option 2".

Q35. Answer: (d) Notified Area Committee

The correct answer is Notified Area Committee.

Key Points

• The Notified Area Committee (NAC) was established in areas that were undergoing rapid urbanization but were yet to be declared municipalities.

• It was primarily appointed by the state government to manage urban administrative functions in newly urbanized regions.

• The 74th Constitutional Amendment Act of 1992 introduced a uniform structure for urban local bodies, leading to the discontinuation of the Notified Area Committee.

• The amendment aimed to streamline urban governance by formalizing structures like Municipal Corporations, Municipal Councils, and Nagar Panchayats.

• With the implementation of the 74th Amendment, urban governance was standardized, and NACs were replaced by Nagar Panchayats or other urban local bodies.

Additional Information

• 74th Constitutional Amendment Act (1992):

• This amendment provided a constitutional status to urban local bodies and introduced a three-tier structure for urban governance: Municipal Corporations, Municipal Councils, and Nagar Panchayats.

• It aimed to promote decentralization and empower local governance.

• The Act included provisions for the reservation of seats for Scheduled Castes, Scheduled Tribes, and women in urban local bodies.

• Municipal Corporation:

• It is the highest form of urban local government, established in cities with large populations (typically over 1 million).

• Municipal Corporations are responsible for providing essential services like water supply, sanitation, waste management, and public health.

• Municipal Council/Committee:

• These are urban local bodies for smaller cities and towns with populations usually ranging between 20,000 and 1 million.

• They perform similar functions as Municipal Corporations but on a smaller scale.

• Nagar Panchayat:
• Nagar Panchayats are established in transitional areas where a rural area is in the process of urbanizing.
• They are tasked with basic urban planning and management for small urban settlements.

Q36. Answer: (b) 5%

Shortcut Trick
Net profit percentage can be calculated using the successive percentage formula.
Let Markup percentage = x = +25% and Discount percentage = y = −16%.
Net Profit% = x + y + (x × y) ÷ 100
Net Profit% = 25 − 16 + (25 × (−16)) ÷ 100 = 9 − 400 ÷ 100 = 9 − 4 = 5%.
Therefore The correct answer is 5%.
Alternate Method
Given: Marked Price (MP) = Rs. 1,600, Markup = 25%, Discount = 16%.
Formulas: CP = MP × 100 ÷ (100 + Markup%); SP = MP × (100 − Discount%) ÷ 100; Profit% = (SP − CP) ÷ CP × 100.
=> Cost Price (CP): CP = 1600 × 100 ÷ 125 = Rs. 1,280.
=> Selling Price (SP): SP = 1600 × (100 − 16) ÷ 100 = 1600 × 0.84 = Rs. 1,344.
=> Profit: SP − CP = 1344 − 1280 = Rs. 64.
=> Profit Percentage: (64 ÷ 1280) × 100 = 5%.
Therefore The correct answer is 5%.
Additional Information
Marked Price & Discount
Discount is always calculated on the Marked Price. SP = MP − Discount.
Profit and Markup
Markup is the increase over CP to reach MP. Profit is the final gain over CP after all adjustments.

Q37. Answer: (d) 36

Shortcut Trick
Let Total Work (LCM of 18, 27) = 54 units.
Efficiency of Pipe A = +3, Efficiency of Pipe B = −2.
Work done by Pipe A in 6 minutes = 3 × 6 = 18 units.
Remaining work = 54 − 18 = 36 units.
Combined efficiency (A + B) = 3 − 2 = 1 unit/min.
Time for remaining part = 36 ÷ 1 = 36 minutes.
Therefore The correct answer is 36 minutes.
Alternate Method
Given: Filling time of Pipe A = 18 min; Emptying time of Pipe B = 27 min.
Formula Used: Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
Pipe A (Fill)	18	54	3
Pipe B (Empty)	27	−2	

=> Work done by Pipe A alone for first 6 minutes = 6 × 3 = 18 units.
=> Remaining capacity to be filled = 54 − 18 = 36 units.
=> When both pipes are open, net efficiency = 3 + (−2) = 1 unit/min.
=> Time taken to fill the remaining tank = 36 ÷ 1 = 36 minutes.
Therefore The correct answer is 36 minutes.
Additional Information
Pipes & Cisterns Rule
An inlet pipe has positive efficiency while an outlet pipe (leak) has negative efficiency.
Net Efficiency
If two pipes fill/empty at rates x and y, combined rate = (x ± y) depending on the nature of the pipes.
Total Capacity

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The Least Common Multiple (LCM) of individual times provides a convenient assumption for total tank capacity.

Q38. Answer: (a) AK Ramanujan

The correct answer is AK Ramanujan.

Key Points

• AK Ramanujan's first poetry collection, "The Striders," was published in 1966 and received critical acclaim, including a Poetry Book recommendation.

• He is widely regarded as one of the most influential modern Indian poets writing in English.

• His poetry often reflects themes of cultural identity, memory, and the juxtaposition of Indian and Western traditions.

• Ramanujan was a bilingual writer, proficient in both English and Kannada, and his works often bridged traditional Indian poetic forms with modernist sensibilities.

• Beyond poetry, Ramanujan contributed significantly as a translator, folklorist, and scholar of Indian literature and linguistics.

Additional Information

• Indian English Poetry:

• It refers to poetry written in English by Indian poets and is a significant part of Indian literature.

• Notable poets include Nissim Ezekiel, Kamala Das, Dom Moraes, and Jayanta Mahapatra.

• It often explores themes like identity, cultural heritage, modernization, and post-colonialism.

• AK Ramanujan's Contributions:

• He was a scholar of Indian literature and folklore, making significant contributions to the study of Tamil, Kannada, and Sanskrit works.

• His famous translations include "Speaking of Siva" and "The Interior Landscape."

• He won several awards, including the Sahitya Akademi Award and the MacArthur Fellowship.

• Modernist Poetry:

• Modernist poetry emerged in the late 19th and early 20th centuries, emphasizing experimentation with form and expression.

• It often challenges traditional narrative structures and focuses on themes like alienation and fragmentation.

• Poetry Book Recommendation:

• A designation given to significant poetry collections recognized for their literary merit.

• It helps bring attention to emerging poets and serves as a mark of critical acclaim.

Q39. Answer: (d) 3

Shortcut Trick

Price and Quantity are inversely proportional when the total Expenditure remains constant.

Profit required = 100% => Ratio of Cost Price (CP) to Selling Price (SP) = 100 : 200 = 1 : 2.

Therefore, Ratio of Quantity (CP) to Quantity (SP) = 2 : 1.

Given 2 units = 6 lemons => 1 unit = 3 lemons.

Therefore The correct answer is 3 lemons.

Alternate Method

Given → CP of 6 lemons = Rs. 1 | Gain% = 100% | Total SP = Rs. 1.

Formulas: CP of one item = Total Price ÷ Quantity | SP = CP × (100 + P%) ÷ 100 | Quantity = Total Price ÷ SP of one item.

=> Cost Price (CP) of 1 lemon = Rs. 1/6.

=> Desired Selling Price (SP) of 1 lemon = CP × (100 + 100) ÷ 100.

=> SP of 1 lemon = (1/6) × (200/100) = (1/6) × 2 = Rs. 1/3.

=> To earn Rs. 1, the vendor must sell = Total Amount ÷ SP of 1 lemon.

=> Number of lemons = 1 ÷ (1/3) = 3 lemons.

Therefore The correct answer is 3 lemons.

Additional Information

Price and Consumption Relationship

If the price of a commodity increases by r%, the reduction in consumption so as not to increase the expenditure is [r ÷ (100 + r)] × 100%.

Profit on Selling Price

A gain of 100% on Cost Price is equivalent to a gain of 50% on Selling Price, calculated as [P ÷ (CP + P)] × 100%.

Q40. Answer: (d) 60°

Shortcut Trick

The ratio of the height to the base is 250√3 : 250 = √3 : 1.

In a right-angled triangle, if the ratio of sides opposite to the angles is 1 : √3 : 2, the angles are 30°, 60°, and 90° respectively.

Since the side opposite to the angle of elevation (θ) is √3 times the base, θ must be 60°.

Therefore The correct answer is 60°.

Alternate Method

Given:

Height of the tower (AB) = 250√3 m

Distance from the foot (BC) = 250 m

Formula Used:

tan θ = Perpendicular ÷ Base

Calculations:

=> In ΔABC, tan θ = AB ÷ BC

=> tan θ = 250√3 ÷ 250

=> tan θ = √3

=> θ = tan^(−1)(√3)

=> θ = 60°

Therefore The correct answer is 60°.

Additional Information

Trigonometric Ratios for 30-60-90 Triangle

For a 30° angle, tan 30° = 1/√3. For a 60° angle, tan 60° = √3.

Angle of Elevation

The angle formed by the line of sight with the horizontal when looking upward at an object.

Pythagorean Triplets in Height & Distance

In a triangle with angles 30°, 60°, 90°, the sides are in the ratio 1 : √3 : 2.

Q41. Answer: (a) 40.9

Shortcut Trick

Net change in Sum = Correct value − Incorrect value = 43 − 34 = +9.

Net change in Average = Net change in Sum ÷ Number of observations = 9 ÷ 10 = +0.9.

Correct Average = Old Average + Change = 40 + 0.9 = 40.9.

Therefore The correct answer is 40.9.

Alternate Method

Given:

Total observations (n) = 10

Initial average = 40

Incorrect value = 34

Correct value = 43

Formula Used:

Sum of observations = Average × Number of observations

Correct Sum = (Initial Sum − Incorrect Value) + Correct Value

Calculations:

=> Initial Sum = 10 × 40 = 400

=> Correct Sum = 400 − 34 + 43

=> Correct Sum = 366 + 43 = 409

=> Correct Average = 409 ÷ 10

=> Correct Average = 40.9

Therefore The correct answer is 40.9.

Additional Information

Arithmetic Mean

The average or mean is the sum of all values divided by the total count: Average = Σx_i ÷ n.

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Average Correction Rule

When values are misread, Correct Average = Old Average + [(Correct Value − Incorrect Value) ÷ n].

Weighted Average

If two groups with sizes n1, n2 and averages A1, A2 are combined, the new average is (n1A1 + n2A2) ÷ (n1 + n2).

Q42. Answer: (c) 7995

Shortcut Trick

To check divisibility by 41, use the osculator 4: subtract 4 × the last digit from the remaining number.

For 7995: 799 − (4 × 5) = 799 − 20 = 779

Repeat: 77 − (4 × 9) = 77 − 36 = 41

Since 41 is divisible by 41, the original number is divisible.

Therefore The correct answer is 7995.

Alternate Method

Given: Numbers (1) 8537, (2) 7431, (3) 7995, (4) 7889. Divisor = 41.

Perform direct division for each option:

=> 8537 ÷ 41: 8537 = 41 × 208 + 9 (Remainder = 9)

=> 7431 ÷ 41: 7431 = 41 × 181 + 10 (Remainder = 10)

=> 7995 ÷ 41: 7995 = 41 × 195 + 0 (Remainder = 0)

=> 7889 ÷ 41: 7889 = 41 × 192 + 17 (Remainder = 17)

Therefore The correct answer is 7995.

Additional Information

Divisibility Rule for 41

The negative osculator for 41 is 4. Rule: (Remaining digits) − 4 × (Last digit).

Divisibility Rule for 31

The negative osculator for 31 is 3. Rule: (Remaining digits) − 3 × (Last digit).

Prime Divisibility (General)

For a prime number ending in 1, the osculator is the tens digit of the prime number.

Q43. Answer: (c) L

Given, Seven people, I, J, K, L, O, P and Q are sitting in a row, facing north.

Only J sits to the left of Q.

Only four people sit between J and I.

Only O sits between P and K and P is not an immediate neighbour of I.

And L sits at the remaining place.

So, L sits at the extreme right end of the row.

Hence, the correct answer is "Option 3".

Q44. Answer: (d) 0.6

Shortcut Trick

Mean Proportional (MP) = √(a × b)

MP = √(0.06 × 6) = √0.36

MP = 0.6

Therefore The correct answer is 0.6.

Alternate Method

Given:

First number (a) = 0.06

Second number (b) = 6

Formula Used:

If x is the mean proportional between a and b, then a : x = x : b

Calculations:

=> $x^2 = a \times b$

=> $x^2 = 0.06 \times 6$

=> $x^2 = 0.36$

=> x = √0.36

=> x = 0.6

Therefore The correct answer is 0.6.

Additional Information

Third Proportional

If a : b = b : c, then c is the third proportional to a and b, calculated as $c = b^2 / a$.

Fourth Proportional

If a : b = c : d, then d is the fourth proportional to a, b, and c, calculated as $d = (b \times c) / a$.

Duplicate Ratio

The duplicate ratio of (a : b) is $(a^2 : b^2)$.

Q45. Answer: (c) 11,000

Shortcut Trick

Monthly Savings = 10,000 − (6,000 + 3,000) = Rs. 1,000.

Total months in a year = 12.

Savings are zero for 1 month (Birthday month).

Total Savings = 1,000 × (12 − 1) = 1,000 × 11 = Rs. 11,000.

Therefore The correct answer is Rs. 11,000.

Alternate Method

Given:

Monthly Salary = Rs. 10,000

Expenditure (Rent + Bills) = 6,000 + 3,000 = Rs. 9,000

Calculations:

=> Monthly Savings = Salary − Total Expenditure

=> Monthly Savings = 10,000 − 9,000 = Rs. 1,000

=> Number of months in a year = 12 months

=> Since savings of 1 month (birthday month) is spent, effective saving months = 11

=> Yearly Savings = 1,000 × 11

=> Yearly Savings = Rs. 11,000

Therefore The correct answer is Rs. 11,000.

Additional Information

Basic Savings Formula

Savings = Income − Expenditure. This is the fundamental identity used in all personal finance problems.

Percentage Savings

Savings % = (Savings ÷ Income) × 100. In this case, monthly savings % = (1,000 ÷ 10,000) × 100 = 10%.

Annual Calculations

To find annual values, multiply monthly values by 12, adjusted for any special conditions (like the birthday expense here).

Q46. Answer: (d) Open-well

The correct answer is Open-well.

Key Points

• Open-wells are one of the most common sources of groundwater-based irrigation in India, particularly in rural areas.

• These wells are manually or mechanically dug to access groundwater, which is then used for irrigation purposes.

• Open-wells do not require advanced drilling technology, making them cost-effective and accessible for small and marginal farmers.

• This irrigation method relies on natural recharge processes, such as rainfall, to replenish the groundwater.

• Open-wells are widely used in regions where groundwater is available at shallow depths, such as parts of peninsular India.

Additional Information

• Groundwater Irrigation in India:

• Groundwater irrigation accounts for nearly 63% of the total irrigated area in India, making it the largest source of irrigation.

• It is primarily extracted using open-wells, tube wells, and bore wells.

• States like Punjab, Haryana, Uttar Pradesh, and Bihar are major users of groundwater for irrigation.

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• Comparison with Surface Water Irrigation:

• Surface water irrigation uses sources like rivers, canals, ponds, and tanks, while groundwater irrigation depends on aquifers and underground reserves.

• Groundwater irrigation is independent of surface water flow, making it more reliable during dry seasons.

• Challenges of Groundwater Irrigation:

• Over-extraction of groundwater can lead to depletion of aquifers and falling water tables.

• Regions like Punjab and Haryana are facing critical groundwater stress due to excessive irrigation for water-intensive crops like paddy.

• Government Initiatives for Sustainable Irrigation:

• Programs like Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) aim to promote efficient water use and reduce dependence on groundwater.

• Micro-irrigation techniques like drip and sprinkler irrigation are being encouraged to save water and ensure sustainable farming.

Q47. Answer: (a) $(x^2 - 5 + \sqrt{3})$ $(x^2 - 5 - \sqrt{3})$

Shortcut Trick

Rewrite the polynomial by completing the square for the x^2 term.

$x^4 - 10x^2 + 22 = (x^2)^2 - 2(5)(x^2) + 5^2 - 5^2 + 22$

$\Rightarrow (x^2 - 5)^2 - 25 + 22 = (x^2 - 5)^2 - 3$

Apply the difference of squares formula: $a^2 - b^2 = (a + b)(a - b)$, where $a = (x^2 - 5)$ and $b = \sqrt{3}$.

$\Rightarrow (x^2 - 5)^2 - (\sqrt{3})^2 = (x^2 - 5 + \sqrt{3})(x^2 - 5 - \sqrt{3})$

Therefore The correct answer is $(x^2 - 5 + \sqrt{3})$ $(x^2 - 5 - \sqrt{3})$.

Alternate Method

Given: The polynomial $P(x) = x^4 - 10x^2 + 22$.

Formula Used: Quadratic Formula $y = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$ and Substitution Method.

$\Rightarrow$ Let $y = x^2$. The expression becomes a quadratic polynomial in terms of y: $y^2 - 10y + 22$.

$\Rightarrow$ To factorize $y^2 - 10y + 22$, find its roots using the quadratic formula with $a = 1$, $b = -10$, and $c = 22$:

$\Rightarrow y = [10 \pm \sqrt{((-10)^2 - 4 \times 1 \times 22)}] / 2$

$\Rightarrow y = [10 \pm \sqrt{(100 - 88)}] / 2 = [10 \pm \sqrt{12}] / 2$

$\Rightarrow y = [10 \pm 2\sqrt{3}] / 2 = 5 \pm \sqrt{3}$

$\Rightarrow$ The roots are $(5 + \sqrt{3})$ and $(5 - \sqrt{3})$. Therefore, the factors are $(y - (5 + \sqrt{3}))$ and $(y - (5 - \sqrt{3}))$.

$\Rightarrow$ Substitute $y = x^2$ back into the factors: $(x^2 - 5 - \sqrt{3})$ and $(x^2 - 5 + \sqrt{3})$.

Therefore The correct answer is $(x^2 - 5 + \sqrt{3})$ $(x^2 - 5 - \sqrt{3})$.

Additional Information

Difference of Two Squares

The algebraic identity $a^2 - b^2 = (a - b)(a + b)$ is a fundamental tool for factorizing polynomials into lower-degree components.

Nature of Roots

For a quadratic equation, the discriminant ($D = b^2 - 4ac$) determines the nature of the roots: real and distinct if $D > 0$, real and equal if $D = 0$, and complex if $D < 0$.

Biquadratic Equations

Equations of the form $ax^4 + bx^2 + c = 0$ can be solved by substituting $y = x^2$ to convert them into standard quadratic equations.

Q48. Answer: (b) 8 28/89

Shortcut Trick

Average Speed = Total Distance ÷ Total Time

Total Distance = 370 + 390 + 720 = 1480 km

Total Time = (370/37) + (390/5) + (720/8) = 10 + 78 + 90 = 178 hours

Average Speed = 1480 / 178 = 740 / 89 = 8 28/89 km/hr

Therefore The correct answer is 8 28/89 km/hr.

Alternate Method

Given:

Distances: D1 = 370 km, D2 = 390 km, D3 = 720 km

Speeds: S1 = 37 km/hr, S2 = 5 km/hr, S3 = 8 km/hr

Formula Used:

Time = Distance ÷ Speed
Average Speed = (D1 + D2 + D3) ÷ (T1 + T2 + T3)
Calculations:
=> T1 = 370 ÷ 37 = 10 hours
=> T2 = 390 ÷ 5 = 78 hours
=> T3 = 720 ÷ 8 = 90 hours
=> Total Distance = 370 + 390 + 720 = 1480 km
=> Total Time = 10 + 78 + 90 = 178 hours
=> Average Speed = 1480 ÷ 178 = 740 ÷ 89
=> 740 ÷ 89 = 8 with a remainder of 28
Therefore The correct answer is 8 28/89 km/hr.
Additional Information
Average Speed for Equal Distances
If a person covers two equal distances at speeds u and v, then the Average Speed = 2uv ÷ (u + v).
General Average Speed Formula
Average Speed is defined as the total distance traveled divided by the total time taken: $V_{(avg)} = \sum D \div \sum T$.
Relative Speed
When two objects move in the same direction, relative speed is |u − v|. In opposite directions, it is (u + v).

Q49. Answer: (a) XMS : CNH

The logic followed here is,
For ZIL : ARO
GRZ : TIA
Now check each option.
Option 1) XMS : CNH
Follow the same logic.
Option 2) LOT : OKG
Does not follow the same logic.
Option 3) MAP : NZJ
Does not follow the same logic.
Option 4) JPE : QJT
Does not follow the same logic.
Hence, the correct answer is "Option 1".

Q50. Answer: (a) BMPV

The logic followed here is,
Let's analyze the first pair: RWKA is related to TULZ
Now, VSMY is related to XQNX
The consistent pattern identified is: +2, -2, +1, -1 for the four letters respectively.
Now, we apply this same logic to find the word related to ZOOW:
The correct answer is Option (1).

Q51. Answer: (c) = PMB, % = SSZ

The logic followed here is,
Option 1) # = PQC, % = YYP
Does not follow the same logic in both patterns.
Option 2) # = MQB, % = FFT
Does not follow the same logic in both patterns.
Option 3) # = PMB, % = SSZ
Follow the same logic in both the letter clusters of +2, +1, +2.
Option 4) # = MRQ, % = HHN
Does not follow the same logic in both patterns.
Hence, the correct answer is "Option 3".

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Q52. Answer: (c) Find whole words only

The correct answer is Find whole words only.

Key Points

• In MS PowerPoint, the 'Replace' function (Ctrl + H) is used to replace specific text or formats in a presentation.

• The 'Find whole words only' option ensures that only complete words matching the search term are replaced, and not partial matches.

• This feature is particularly useful for avoiding unintended replacements within larger words or phrases.

• The 'Find whole words only' option is available across various Microsoft Office applications like Word and PowerPoint for precise text search and replace operations.

• It eliminates errors caused by replacing fragments of words, ensuring greater accuracy in text editing tasks.

Additional Information

• Replace Function in MS PowerPoint:

• The Replace function allows users to search for and substitute text or formatting within a presentation.

• It is accessible under the 'Home' tab in the 'Editing' group or via the keyboard shortcut Ctrl + H.

• Match Case Option:

• This feature ensures that the search term matches the exact case (uppercase or lowercase) of the text in the presentation.

• For example, searching for "Power" will not match "power" if 'Match Case' is enabled.

• Use of Wildcards:

• Wildcards are special symbols (like * or ?) used to represent one or more characters during searches.

• In PowerPoint, wildcards can be used to find text patterns, but they do not ensure whole word matches.

• Sounds Like (English):

• This option enables searching for words that sound similar to the search term in English.

• It is useful for identifying text with potential spelling variations or phonetic matches.

• Applications of Text Replace:

• It is widely used in editing large documents or presentations for consistency.

• Common examples include correcting repeated spelling errors or updating outdated terminology.

Q53. Answer: (b) 2

Given series:

5 $ 5 % 8 7 * 5 % & 8 @ 2 6 2 £ 3 8 1 & 5 6

Condition to be checked:

Number which is immediately preceded by a number and also immediately followed by a number.

Number → Number → Number

Let's go through the series and identify such patterns:

5 $ 5 % 8 7 * 5 % & 8 @ 2 6 2 £ 3 8 1 & 5 6

Thus, there are two such numbers ('6' and '8') that are immediately preceded by a number and also immediately followed by a number.

Hence, the correct answer is "Option 2".

Mistake Points

Immediately preceded by means immediately before or to come just before.

Immediately followed by means immediately after or to come just after.

Q54. Answer: (a) 70%

The correct answer is 70%.

Key Points

• As per the National Family Health Survey-5 (NFHS-5) conducted during 2019-21, approximately 70% of households in India have access to improved sanitation facilities.

• Improved sanitation facilities refer to access to toilets that hygienically separate human excreta from human contact, such as flush toilets or pit latrines.

• The NFHS-5 data reflects a significant improvement compared to previous NFHS surveys, highlighting progress in India's sanitation infrastructure.

• Government initiatives such as Swachh Bharat Mission have been instrumental in driving improved sanitation coverage across the country.

• Rural areas have witnessed substantial growth in sanitation facilities, narrowing the gap with urban areas.

Additional Information

• Improved Sanitation Facilities:

• Defined as facilities that hygienically separate human excreta from human contact.

• Examples include flush/pour flush toilets, ventilated improved pit latrines, and composting toilets.

• These facilities contribute to better public health and reduced waterborne diseases.

• Swachh Bharat Mission:

• Launched in 2014 by the Government of India to eliminate open defecation and improve sanitation.

• Focused on constructing toilets, waste management, and raising awareness about hygiene.

• Played a key role in increasing access to improved sanitation facilities.

• NFHS-5 Survey:

• Conducted by the Ministry of Health and Family Welfare, Government of India.

• A comprehensive survey covering health, nutrition, and population indicators.

• Provides critical data for policymaking and tracking national progress.

• Impact of Improved Sanitation:

• Reduces the prevalence of waterborne diseases like diarrhea and cholera.

• Improves overall public health and productivity.

• Enhances environmental sustainability by reducing pollution.

Q55. Answer: (b) 580

Shortcut Trick

When amounts are equal after t1 and t2 years, the ratio of shares is (1 + r/100)^((t2 − t1)) : 1.

Ratio (Arun : Mahesh) = (1 + 10/100)^((12 − 11)) : 1 = 11/10 : 1 = 11 : 10.

Total units = 11 + 10 = 21 units → Rs. 1,218.

1 unit = Rs. 1,218 ÷ 21 = Rs. 58.

Mahesh's share = 10 units = 10 × 58 = Rs. 580.

Therefore The correct answer is Rs. 580.

Alternate Method

Given:

Total Principal (P) = Rs. 1,218

Rate of Interest (r) = 10% p.a. compounded annually.

Time for Arun (n1) = 11 years | Time for Mahesh (n2) = 12 years.

Formula Used:

Amount (A) = $P \times (1 + r/100)^n$

Calculations:

Let Arun's share be A and Mahesh's share be M.

=> A + M = 1218

=> $A \times (1 + 10/100)^{11} = M \times (1 + 10/100)^{12}$

=> $A \times (1.1)^{11} = M \times (1.1)^{12}$

=> $A = M \times (1.1)^{12} \div (1.1)^{11}$

=> A = M × 1.1 = M × 11/10

=> A/M = 11/10

=> Total ratio sum = 11 + 10 = 21 units

=> 21 units = 1218

=> 1 unit = 1218 ÷ 21 = 58

=> Mahesh's share (M) = 10 units = 10 × 58

=> M = Rs. 580

Therefore The correct answer is Rs. 580.

Additional Information

Compound Interest Formula

The amount A after n years is given by $A = P(1 + r/100)^n$, where P is the principal and r is the annual interest rate.

Equal Amounts Case

When two people receive the same amount at the same rate but for different times t1 and t2, the ratio of their principals is inverse to the ratio of their accumulation factors: P1/P2 = (1 + r/100)^((t2 − t1)).

Successive Percentage

Compounding annually is a form of successive percentage increase where the base changes every year.

Q56. Answer: (d) Brahmins

The correct answer is Brahmins.

Key Points

• During the post-Gupta period, agrahara lands were granted to Brahmins as a mark of respect and for religious purposes.

• Brahmins, as recipients of these lands, held administrative and fiscal control over the agrahara lands.

• These lands were exempted from taxation, and Brahmins were responsible for managing agricultural production and collecting revenue.

• The grants were often documented on copper plates and were intended to support Brahmins in their religious and scholarly duties.

• The agrahara system played a crucial role in strengthening Brahminical influence and promoting Vedic traditions in society.

Additional Information

• Agrahara Lands:

• Agrahara refers to villages or lands granted to Brahmins by rulers for religious and educational purposes.

• These lands were typically tax-free and were intended to support Brahmins economically.

• Post-Gupta Period:

• This period (circa 6th to 12th century CE) saw the rise of feudal practices and decentralization of authority.

• Land grants, including agrahara lands, became a common feature of administration.

• Brahmins' Role:

• Brahmins were not only religious leaders but also managed the administration of granted lands.

• They contributed to the spread of Sanskrit education and upheld Vedic traditions.

• Feudal Lords and Village Assemblies:

• While feudal lords and village assemblies played roles in governance, they were not directly involved in the administration of agrahara lands.

• These entities managed other aspects of rural administration.

Q57. Answer: (b) 2

Shortcut Trick

To find the maximum volume of identical containers, find the HCF (Highest Common Factor) of the given quantities.

Volume of Oil A = 102 litres

Volume of Oil B = 224 litres

HCF(102, 224) → Difference = 224 − 102 = 122. Factors of 122 are 1, 2, 61, 122.

Since 102 is even and 224 is even, but 102 is not divisible by 61 or 122, the HCF is 2.

Therefore The correct answer is 2 litres.

Alternate Method

Given:

Quantity of Oil A = 102 litres

Quantity of Oil B = 224 litres

Formula Used:

Maximum capacity of a container = HCF(Quantity 1, Quantity 2)

Calculations:

=> Prime factorization of 102 = 2 × 3 × 17

=> Prime factorization of 224 = 2 × 2 × 2 × 2 × 2 × 7 = 2^5 × 7

=> Common factors = 2

=> HCF = 2

Therefore The correct answer is 2 litres.

Additional Information

HCF (Highest Common Factor)

The greatest number that divides two or more numbers without leaving a remainder. Used for maximum capacity or largest

possible size problems.

LCM (Least Common Multiple)

The smallest number which is a multiple of two or more numbers. Used for simultaneous events or minimum distance/time problems.

Number of Containers

Total number of containers required = (Total Volume of all oils) ÷ (HCF of volumes).

Q58. Answer: (a) 1%

Given:

2% of 50% of a number is what percentage of that number?

Formula used:

If x% of y% of a number is taken, the result can be written as:

(x/100) × (y/100) × Number = Result

To find the percentage of the number, use:

(Result / Number) × 100

Calculation:

Let the number be N.

=> 2% of 50% of N = (2/100) × (50/100) × N

=> = (2 × 50) / (100 × 100) × N

=> = (100 / 10000) × N

=> = (1 / 100) × N

Now, to find what percentage this is of N:

=> ((1 / 100) × N / N) × 100

=> (1 / 100) × 100

=> = 1 %

Therefore The correct answer is option (1).

Q59. Answer: (a) Abhinav Bindra

The correct answer is Abhinav Bindra.

Key Points

• Abhinav Bindra, India's first individual Olympic gold medalist, was awarded the prestigious Olympic Order by the International Olympic Committee (IOC) in July 2024.

• The Olympic Order is the highest honor granted by the IOC, recognizing individuals for their exceptional contributions to the Olympic Movement and sports.

• Bindra won the gold medal in the 10m Air Rifle event at the 2008 Beijing Olympics, marking a historic achievement for India.

• He has been actively promoting sports development and athletes' welfare through initiatives like the Abhinav Bindra Foundation.

• The award celebrates his enduring impact on Indian sports and his contributions to Olympic values and excellence.

Additional Information

• Olympic Order:

• The Olympic Order is awarded to individuals who demonstrate outstanding merit in the development of sport and uphold the Olympic ideals.

• It is symbolized by a chain and badge, with the five Olympic rings representing global unity through sports.

• Abhinav Bindra’s Contributions:

• Bindra has contributed significantly to sports science and athlete preparation in India through his foundation.

• His autobiography, "A Shot at History," details his journey to Olympic glory and inspires young athletes worldwide.

• Indian Sports Achievements:

• India has consistently improved its Olympic performance, with notable contributions from athletes like Neeraj Chopra and PV Sindhu.

• Bindra's 2008 gold medal paved the way for greater focus on individual sports in the country.

• IOC and Its Role:

• The International Olympic Committee oversees the organization of the Olympic Games and promotes global sports development.

• The IOC recognizes individuals and organizations that align with its vision of promoting peace and unity through sports.

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Q60. Answer: (a) One

Given number: '8569142'

Let's list the digits of the original number and their positions:

Position	1st	2nd	3rd	4th	5th	6th	7th
Original Number	8	5	6	9	1	4	2
New Number (Descending)	9	8	6	5	4	2	1

Only one digit, "6", remains in the same position.

Hence, the correct answer is "Option 1".

Q61. Answer: (a) 78

The logic to find the total number of students when the rank from both top/left and bottom/right is given is:

Total number of students = (Rank from Top) + (Rank from Bottom) - 1

Given:

• Piyush's rank from the top = 24th

• Piyush's rank from the bottom = 55th

Applying the formula:

Total number of students = 24 + 55 - 1

Total number of students = 79 - 1

Total number of students = 78

Hence, the correct answer is "Option 1".

Q62. Answer: (d) Use of high-end machinery

The correct answer is Use of high-end machinery.

Key Points

• Subsistence farming is characterized by small-scale farming aimed at meeting the basic needs of the farmer's family rather than producing surplus for trade.

• It typically relies on family labour, where members of the household work together to cultivate crops and rear livestock.

• Manual agricultural practices such as the use of simple tools and traditional methods are prevalent in subsistence farming.

• Farmers often use traditional seed varieties that are locally adapted and passed down through generations.

• The use of high-end machinery is not a feature of subsistence farming, as it is often financially inaccessible and unnecessary for small-scale operations.

Additional Information

• Subsistence Farming:

• It is practiced primarily in developing countries, where farmers grow food mainly for their own consumption.

• Subsistence farming is often rain-fed and depends heavily on natural soil fertility.

• Crops grown include staple foods such as rice, wheat, maize, and root crops like cassava.

• Commercial Farming:

• In contrast to subsistence farming, commercial farming involves large-scale production for trade and profit.

• High-end machinery, advanced irrigation systems, and genetically modified seeds are commonly used in commercial farming.

• It is heavily reliant on market demand and economic factors.

• Traditional Seed Varieties:

• These are seeds that have been cultivated, saved, and passed down through generations by farmers.

• They are often more resistant to local pests and diseases compared to hybrid or genetically modified seeds.

• Traditional seeds are essential for preserving biodiversity and promoting sustainable agriculture.

• Mechanization in Agriculture:

• Mechanization refers to the use of advanced machinery and technology to enhance agricultural productivity.

• It is typically more prominent in large-scale commercial farming.

• Examples include tractors, harvesters, and irrigation systems.

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Q63. Answer: (d) Uracil is energetically cheaper to synthesise

The correct answer is Uracil is energetically cheaper to synthesise.

Key Points

• Uracil is used in RNA instead of thymine because it is energetically cheaper to synthesize, making it more efficient for cells to produce RNA.

• Thymine contains an additional methyl group compared to uracil, which requires more energy for its synthesis.

• RNA molecules are generally short-lived compared to DNA, and the energy-efficient synthesis of uracil suits RNA's transient nature.

• In contrast, thymine is more stable and is used in DNA to protect it from degradation and mutations, ensuring long-term genetic storage.

Additional Information

• Uracil and Thymine:

• Both uracil and thymine are pyrimidine bases, but thymine has an extra methyl group at the 5th carbon.

• The structural difference affects stability, with thymine being more resistant to hydrolysis than uracil.

• Energetic Cost of Nucleotide Synthesis:

• Synthesizing thymine involves additional enzymatic steps and energy compared to uracil.

• This is why cells preferentially use uracil in RNA, where durability is less critical.

• RNA vs. DNA Stability:

• RNA is a temporary molecule used in protein synthesis, making energy-efficient synthesis a priority.

• DNA, as the hereditary material, requires higher stability, achieved partly by using thymine instead of uracil.

• Role of Uracil in RNA:

• Uracil pairs with adenine during transcription, forming stable but transient hydrogen bonds.

• Its presence is crucial for RNA's function in gene expression, including mRNA, tRNA, and rRNA.

Q64. Answer: (c) 5,061

Shortcut Trick

Difference between Selling Prices = 3,437 − 3,338 = 99.

Ratio of Gain to Loss = 175 : 100 = 7 : 4.

Total units (7 + 4) = 11 units => 99; 1 unit = 9.

Loss amount = 4 × 9 = 36. Cost Price (CP) = 3,338 + 36 = 3,374.

Required SP for 50% gain = 3,374 × 1.5 = 5,061.

Therefore The correct answer is Rs. 5,061.

Alternate Method

Given → SP1 = 3,437, SP2 = 3,338, Gain = 1.75 × Loss.

Formulas: Profit = SP − CP | Loss = CP − SP | SP = CP × (100 + P%) ÷ 100

=> Let Loss be x. Then Gain = 1.75x.

=> (3,437 − CP) = 1.75 × (CP − 3,338).

=> 3,437 − CP = 1.75CP − 5,841.5 => 2.75CP = 9,278.5.

=> Cost Price (CP) = 3,374.

=> New Selling Price = 3,374 + 50% of 3,374 = 3,374 + 1,687 = 5,061.

Therefore The correct answer is Rs. 5,061.

Additional Information

Relationship between Gain and Loss

When an article is sold at two different prices, the difference in prices is equal to the sum of the numerical value of gain and loss. Total Diff = |Gain| + |Loss|.

Cost Price Calculation

CP can be found using either CP = SP_(gain) − Gain or CP = SP_(loss) + Loss.

Q65. Answer: (c) 1

The logic followed here is,

BRVE is common in both the code language, and 2937 is common in both the code.

So, code for "A" is "1".

Hence, the correct answer is "Option 3".

Q66. Answer: (b) 6

The given code language is:

Thus, 'L' is coded as '6'.

Hence, the correct answer is "Option 2".

Q67. Answer: (b) Manage developing towns due to get a municipality status

The correct answer is Manage developing towns due to get a municipality status.

Key Points

• A Notified Area Committee (NAC) is established to manage fast-developing towns that are yet to attain the status of a municipality in India.

• It is generally formed in regions with industrial, commercial, or urban development that require immediate governance and planning.

• The committee is appointed by the state government and does not have elected members, unlike municipal bodies.

• The NAC oversees local infrastructure, sanitation, water supply, and urban planning to facilitate organized growth.

• It acts as a transitional governance mechanism until the area formally qualifies for a municipal corporation or council status.

Additional Information

• Municipality:

• A municipality is a local governing body for urban areas, formed after an area meets specific population and development criteria set by the state.

• It is governed by elected representatives and is responsible for essential civic services like waste management, water supply, and urban infrastructure.

• Notified Area Committee vs Municipality:

• While a municipality is an elected body, a Notified Area Committee is appointed by the state government.

• The NAC operates in areas experiencing rapid development where municipal governance is not yet feasible.

• Industrial Towns:

• Many notified areas are industrial hubs where accelerated growth demands administrative oversight to ensure sustainable urbanization.

• Examples include areas near ports, mines, or manufacturing facilities.

• Urbanization in India:

• India has witnessed rapid urbanization, with significant challenges in managing infrastructure, housing, and transportation.

• Governance mechanisms like NACs play a critical role in bridging the gap between rural and urban administrative needs.

Q68. Answer: (c) 5 - 6 - 11 - 22

The logic followed here is,

Logic: Add 1, then Add 5, then Multiply by 2.

For: 14 - 15 - 20 - 40

14 + 1 = 15

15 + 5 = 20

20 × 2 = 40

For: 19 - 20 - 25 - 50

19 + 1 = 20

20 + 5 = 25

25 × 2 = 50

Now, let's check which of the given options follows the same set of operations:

1) 7 - 9 - 18 - 20

• From 7 to 9: +2 (Does not match +1)

This option does not follow the pattern.

2) 8 - 10 - 15 - 30

• From 8 to 10: +2 (Does not match +1)

This option does not follow the pattern.

3) 5 - 6 - 11 - 22

• From 5 to 6: +1 (Matches)

• From 6 to 11: +5 (Matches)

• From 11 to 22: ×2 (Matches)

This option follows the exact same set of operations.

4) 3 - 4 - 9 - 14

• From 3 to 4: +1 (Matches)

• From 4 to 9: +5 (Matches)

• From 9 to 14: +5 (Does not match ×2)

This option does not follow the pattern.

Hence, the correct answer is "Option 3".

Q69. Answer: (b) Kubernaga

The correct answer is Kubernaga.

Key Points

• Chandragupta II, also known as Vikramaditya, married Princess Kubernaga after defeating the Saka king.

• Kubernaga was a Naga princess from the Naga dynasty, which was influential in central India during that era.

• This marriage strengthened Chandragupta II's political alliances and helped consolidate his power in the region.

• The defeat of the Saka rulers marked a significant milestone in the Gupta Empire's expansion and established its dominance in western India.

• Chandragupta II's reign is considered a golden age in Indian history due to advancements in art, culture, and science.

Additional Information

• Saka Dynasty:

• The Sakas, also known as Scythians, were an ancient nomadic group who ruled parts of India before being defeated by the Gupta Empire.

• The defeat of the Saka rulers by Chandragupta II marked the end of their influence in the region.

• Gupta Empire:

• The Gupta Empire, which spanned from approximately 320 to 550 CE, is often referred to as the "Golden Age of India."

• It is known for significant achievements in mathematics, astronomy, literature, and architecture.

• Naga Dynasty:

• The Naga dynasty played a crucial role in regional politics during the Gupta period.

• Alliances through marriage, such as Chandragupta II's union with Kubernaga, strengthened ties between the Guptas and Nagas.

• Chandragupta II:

• He was one of the most powerful rulers of the Gupta dynasty and is credited with expanding the empire significantly.

• His court was adorned with scholars like Kalidasa and Aryabhata, who contributed to India's cultural and scientific heritage.

Q70. Answer: (c) 39,424 cm²

Shortcut Trick

For a sphere, Surface Area = $4\pi r^2 = \pi d^2$.

Surface Area = (22/7) × 112 × 112.

Surface Area = 22 × 16 × 112 = 39,424 cm².

Therefore The correct answer is 39,424 cm².

Alternate Method

Given:

Diameter (d) of the sphere = 112 cm

Radius (r) = d/2 = 112/2 = 56 cm

Formula Used:

Surface Area of a Sphere = $4\pi r^2$

Calculations:

=> Surface Area = 4 × (22/7) × 56 × 56

=> Surface Area = 4 × 22 × 8 × 56

=> Surface Area = 88 × 448

=> Surface Area = 39,424 cm²

Therefore The correct answer is 39,424 cm².

Additional Information

Volume of a Sphere

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The amount of space occupied by a sphere is given by $V = (4/3)\pi r^3$.

Hemisphere Properties

Curved Surface Area = $2\pi r^2$ and Total Surface Area = $3\pi r^2$.

Relationship with Cylinder

A sphere fits exactly inside a cylinder of height 2r; its surface area is equal to the curved surface area of that cylinder ($2\pi rh$).

Q71. Answer: (b) 4.25

Shortcut Trick

Interest earned = 2,220 − 1,200 = Rs. 1,020

Interest for 1 year = 20% of 1,200 = Rs. 240

Time (T) = Total Interest ÷ Yearly Interest

T = 1,020 ÷ 240 = 4.25 years

Therefore The correct answer is 4.25 years.

Alternate Method

Given: Principal (P) = Rs. 1,200, Amount (A) = Rs. 2,220, Rate (R) = 20% p.a.

Formula Used: Simple Interest (SI) = (P × R × T) ÷ 100; Amount = P + SI

=> Simple Interest (SI) = 2,220 − 1,200 = Rs. 1,020

=> 1,020 = (1,200 × 20 × T) ÷ 100

=> 1,020 = 12 × 20 × T

=> 1,020 = 240 × T

=> T = 1,020 ÷ 240

=> T = 102 ÷ 24 = 4.25

Therefore The correct answer is 4.25 years.

Additional Information

Simple Interest vs Compound Interest

Simple Interest is calculated only on the Principal amount, while Compound Interest is calculated on the Principal plus the accumulated Interest of previous periods.

Rule of 72

To find the approximate time required to double your money at a given annual interest rate (R), divide 72 by the rate: Time ≈ 72 ÷ R.

Amount Formula

The total Amount (A) at the end of the period is given by A = P × (1 + (R × T) ÷ 100) for Simple Interest.

Q72. Answer: (b) Mandating representation of at least two Muslim women on Waqf Boards

The correct answer is Mandating representation of at least two Muslim women on Waqf Boards.

Key Points

• The Waqf (Amendment) Act, 2025 introduced a significant provision mandating the inclusion of at least two Muslim women in the composition of Waqf Boards across states and union territories.

• This amendment aimed to improve gender representation and ensure active participation of women in decision-making processes related to Waqf properties.

• The move aligns with India's broader agenda of empowering women and promoting inclusivity in administrative and religious domains.

• The amendment also emphasized transparency and accountability in the management of Waqf properties by diversifying board memberships.

• By mandating representation of Muslim women, the Act seeks to address historical underrepresentation of women in religious and property-related governance structures.

Additional Information

• Waqf:

• A Waqf is a religious endowment in Islamic law, typically involving property or funds dedicated for charitable or religious purposes.

• Waqf properties often include mosques, educational institutions, graveyards, and other facilities serving the community.

• Waqf Boards:

• Waqf Boards are statutory bodies tasked with the management and administration of Waqf properties in states and union territories.

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• They ensure the proper use and protection of Waqf assets while resolving disputes and overseeing compliance with legal frameworks.

• Central Waqf Council:

• The Central Waqf Council is a national-level advisory body established under the Waqf Act, 1954.

• It oversees the functioning of state Waqf Boards and provides strategic guidance on the management of Waqf properties across India.

• Gender Inclusivity in Governance:

• The inclusion of women in governance structures is a global trend aimed at enhancing diversity and promoting equitable decision-making.

• India has been actively working towards increasing women's representation in various administrative and legislative bodies.

Q73. Answer: (d) The operating system will return an error indicating that the directory is not empty

The correct answer is The operating system will return an error indicating that the directory is not empty.

Key Points

• In hierarchical file systems, non-empty directories cannot be deleted using a standard 'delete directory' command without specifying recursive options.

• The operating system returns an error message because deleting a directory without recursion would leave its contents orphaned, creating potential inconsistencies.

• This restriction ensures data integrity by preventing accidental deletion of files or subdirectories inside the directory.

• To delete a non-empty directory, users generally need to use recursive deletion commands such as rm -r in Unix-based systems or equivalent options in other systems.

• Modern operating systems prioritize user confirmation or explicit commands to prevent accidental loss of important data.

Additional Information

• Recursive Deletion: Recursive deletion involves removing a directory and all its contents, including files and subdirectories. Commands like rm -r are used for this purpose in Unix/Linux systems.

• File System Integrity: Preventing deletion of non-empty directories without specific instructions ensures the file system remains consistent and avoids orphaned files or directories.

• Command Line Tools: Common tools for directory deletion include rm, rmdir, and GUI-based file managers, each with specific behaviors for handling non-empty directories.

• Error Messages: Typical error messages for non-empty directory deletion include "Directory not empty" (Unix/Linux) or similar prompts in Windows-based systems.

• User Confirmation: Many systems implement safeguards, such as confirmation prompts or warnings, to prevent accidental data loss during directory deletion operations.

Q74. Answer: (a) Overseas Citizen of India

The correct answer is Overseas Citizen of India.

Key Points

• The term Overseas Citizen of India (OCI) refers to a category of citizenship introduced by the Government of India for foreign nationals of Indian origin.

• OCI holders are eligible for a lifelong visa to visit India multiple times without requiring special permissions.

• The scheme was first introduced in 2005 under the Citizenship (Amendment) Act to address the needs of the Indian diaspora.

• OCI cardholders enjoy several rights such as exemption from registration with the Foreigners Regional Registration Office (FRRO) for any length of stay in India.

• However, OCI cardholders are not considered Indian citizens and do not have voting rights, employment in government positions, or access to agricultural property.

Additional Information

• OCI Card Eligibility:

• Foreign nationals who were eligible to become Indian citizens on January 26, 1950, or belonged to a territory that became part of India after August 15, 1947, can apply.

• Children and grandchildren of such persons are also eligible, excluding those whose parents/grandparents hold citizenship of Pakistan or Bangladesh.

• OCI Benefits:

• OCI cardholders can access certain economic, financial, and educational privileges within India.

• They can work in private-sector jobs and access healthcare and educational facilities at par with Indian residents.

• Restrictions for OCI Cardholders:

• OCI cardholders cannot vote in Indian elections, hold public offices, or buy agricultural land.
• They are not allowed to work in government positions, including defense services.
• OCI vs PIO:
• OCI replaced the Person of Indian Origin (PIO) card scheme in 2015 to simplify diaspora benefits.
• Existing PIO cardholders were automatically converted to OCI cardholders.

Q75. Answer: (c) 6 km to the south

Given,
Raju starts from point A and drives 9 km towards the west.
He then takes a left turn, drives 7 km, turns left and drives 11 km.
He then takes a left turn and drives 13 km.
He takes a final left turn, drives 2 km and stops at point P.
The movement of Raju is,
Therefore, Raju should drive 6 km towards South to reach Point A again.
Hence, the correct answer is "Option 3".

Q76. Answer: (c) 1 and 3 only

The correct answer is 1 and 3 only.
Key Points
• The Digital Agriculture Mission, launched by the Government of India, aims to leverage technology and data-driven solutions to transform the agricultural sector.
• As part of the initiative, AgriStack was conceptualized to create a unified platform for farmers, combining various digital services and solutions.
• The foundational registries under AgriStack include the Farmers' Registry and the Crop Sown Registry, which are essential for tracking farmer identities and land usage.
• The inclusion of the Village Panchayat Audit Database is not part of the foundational registries under AgriStack.
• These registries enable better targeting of government schemes, efficient resource allocation, and streamlined service delivery to farmers.
Additional Information
• Digital Agriculture Mission:
• Launched in 2021, this mission focuses on the adoption of emerging technologies like artificial intelligence, blockchain, and IoT in agriculture.
• It aims to improve productivity, increase farmers' income, and promote sustainable agricultural practices.
• AgriStack:
• AgriStack is a collection of digital databases and tools that provide comprehensive information about India's agricultural sector.
• It includes foundational datasets like land records, crop patterns, weather data, and farmer profiles.
• AgriStack helps in better implementation of schemes like PM-KISAN, soil health card, and crop insurance.
• Farmers' Registry:
• This registry is a centralized database of farmers, including their demographic and landholding details.
• It ensures that only eligible farmers receive the benefits of government schemes.
• Crop Sown Registry:
• This registry tracks the crops grown by farmers on their lands, enabling better planning for procurement and distribution.
• It also aids in estimating agricultural outputs and ensuring food security.

Q77. Answer: (c) 776

The logic followed here is,
Hence, the correct answer is "Option 3".

Q78. Answer: (d) K Sanjay Murthy

The correct answer is K Sanjay Murthy.
Key Points
• K Sanjay Murthy was appointed as the Comptroller General of India in November 2024.
• The Comptroller General of India is a crucial constitutional authority responsible for auditing the revenue and expenditure of the Government of India.

• K Sanjay Murthy has previously served in key administrative roles, contributing significantly to public administration and governance.

• This appointment was made to ensure the effective management and oversight of public funds, enhancing transparency and accountability.

• The Comptroller General of India operates under the provisions of Article 148 of the Indian Constitution.

Additional Information

• Comptroller and Auditor General of India (CAG):

• The CAG is an independent authority established under Article 148 of the Constitution of India.

• The primary function of the CAG is to audit all receipts and expenditures of the Government of India and the state governments, including those of autonomous bodies and corporations.

• The CAG reports are submitted to the President or Governors, who then table them in Parliament or state legislatures.

• The CAG plays a key role in ensuring transparency and accountability in the financial administration of the government.

• Roles and Responsibilities of the Comptroller General of India:

• Overseeing the financial administration of India at the highest level.

• Ensuring that public funds are used effectively and for the intended purposes.

• Promoting fiscal discipline within government departments and agencies.

• Auditing government expenditures to identify inefficiencies, corruption, or misuse of funds.

• Appointment of Comptroller General:

• The Comptroller General is appointed by the President of India.

• The term of office is six years or until the age of 65, whichever is earlier.

• The independence of the office is ensured by providing security of tenure and prohibiting the holder from subsequent appointments under the government.

• Significance of the Role:

• The Comptroller General ensures the integrity and transparency of public financial management.

• It plays a vital role in maintaining the trust of the public in the government's financial administration.

• The audits conducted by the Comptroller General are essential for identifying policy gaps and recommending improvements.

Q79. Answer: (d) Z

Let's denote the floors from 1 (lowermost) to 6 (topmost).

O lives on floor numbered 4.

Floor	Person
6	
5	
4	O
3	
2	
1	

Only two people live between O and P.

Since O is on floor 4, P can be on floor 1 (two people between O and P: floors 3 and 2) or floor 7 (which doesn't exist).

So, P must be on floor 1.

Floor	Person
6	
5	
4	O
3	
2	
1	P

Only M lives between O and N.
Y lives immediately below O.
O is on floor 4, so Y lives on floor 3.
Since O is on floor 4, M must be on floor 5, and N must be on floor 6.

Floor	Person
6	N
5	M
4	O
3	Y
2	
1	P

The only remaining person is Z, and the only remaining floor is 2.
So, Z lives on floor 2.

Floor	Person
6	N
5	M
4	O
3	Y
2	Z
1	P

Based on our deductions, Z lives on floor numbered 2.
Hence, the correct answer is "Option 4".

Q80. Answer: (d) Son's wife's brother

Family Chart:
Let's draw the family tree based on the given information:
F is the brother of G.
G is the wife of H.
H is the son of I.
I is the wife of J.
Combining the relationships:
The relationship of F to J is that F is the Son's wife's brother of J.
Hence, the correct answer is "Option 4".

Q81. Answer: (b) 97°

Shortcut Trick
Identify that angle BRP and angle DSP are corresponding angles, which are equal for parallel lines.
Equate the expressions: 2x + 13 = 3x − 22 => x = 35.
Calculate angle DSP = 3(35) − 22 = 83°.
Since angle CSP and angle DSP form a linear pair on line CD, their sum is 180°.
angle CSP = 180° − 83° = 97°.
Therefore The correct answer is 97°.
Alternate Method
Given:
Line AB || CD and PQ is a transversal.
angle BRP = (2x + 13)° and angle DSP = (3x − 22)°.
Formula Used:

1. Corresponding Angles: When two parallel lines are intersected by a transversal, the corresponding angles are equal.
2. Linear Pair: The sum of angles on a straight line is 180°.

Calculations:

=> Since AB || CD, angle BRP = angle DSP (Corresponding angles)

=> 2x + 13 = 3x − 22

=> 13 + 22 = 3x − 2x

=> x = 35

=> Now, angle DSP = 3(35) − 22

=> angle DSP = 105 − 22 = 83°

=> On the straight line CD, angle CSP + angle DSP = 180° (Linear pair)

=> angle CSP + 83° = 180°

=> angle CSP = 180° − 83°

=> angle CSP = 97°

Therefore The correct answer is 97°.

Additional Information

Alternate Interior Angles

Angles on opposite sides of the transversal and between the parallel lines are equal (e.g., angle ARS = angle DSR).

Consecutive Interior Angles

Angles on the same side of the transversal and between the parallel lines are supplementary (sum = 180°).

Vertically Opposite Angles

When two lines intersect, the angles opposite each other at the vertex are always equal.

Q82. Answer: (d) 8 B 3 C 10 A 2 D 5

Given:

'A' stands for '×'

'B' stands for '−'

'C' stands for '+'

'D' stands for '÷'

We need to find which of the following e×pressions results in 9.

1) 8 A 3 C 10 B 2 D 5

Replacing the letters with their respective mathematical operations:

8 × 3 + 10 − 2 ÷ 5

Applying the order of operations (PEMDAS/BODMAS):

= 8 × 3 + 10 − 0.4

= 24 + 10 − 0.4

= 34 − 0.4

= 33.6 ≠ 9 (Incorrect)

2) 8 B 3 A 10 C 2 D 5

Replacing the letters with their respective mathematical operations:

8 − 3 × 10 + 2 ÷ 5

Applying the order of operations (PEMDAS/BODMAS):

= 8 − 3 × 10 + 0.4

= 8 − 30 + 0.4

= −22 + 0.4

= −21.6 ≠ 9 (Incorrect)

3) 8 C 3 B 10 A 2 D 5

Replacing the letters with their respective mathematical operations:

8 + 3 − 10 × 2 ÷ 5

Applying the order of operations (PEMDAS/BODMAS):

= 8 + 3 − (10 × 2) ÷ 5

= 8 + 3 − 20 ÷ 5

= 8 + 3 − 4

= 11 − 4

= 7 ≠ 9 (Incorrect)

4) 8 B 3 C 10 A 2 D 5

Replacing the letters with their respective mathematical operations:

8 − 3 + 10 × 2 ÷ 5

Applying the order of operations (PEMDAS/BODMAS):

= 8 − 3 + (10 × 2) ÷ 5

= 8 − 3 + 20 ÷ 5

= 8 − 3 + 4

= 5 + 4

= 9 (Correct)

Hence, the correct answer is "Option 4".

Q83. Answer: (a) 6

Shortcut Trick

The first 13 whole numbers start from 0 and end at 12.

Since these numbers form an Arithmetic Progression (A.P.) with a common difference of 1, the average is the middle term.

Average = (First term + Last term) ÷ 2

Average = (0 + 12) ÷ 2 = 6.

Therefore The correct answer is 6.

Alternate Method

Given: The series consists of the first 13 whole numbers.

Formula Used: Average = Sum of all observations ÷ Total number of observations.

=> Whole Numbers set = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

=> Sum of these 13 numbers = 0 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12

=> Sum = [n × (n − 1)] ÷ 2 (where n is 13)

=> Sum = [13 × 12] ÷ 2 = 13 × 6 = 78.

=> Average = Sum ÷ Total observations = 78 ÷ 13

=> Average = 6.

Therefore The correct answer is 6.

Additional Information

Whole Numbers

Whole numbers include all natural numbers plus zero {0, 1, 2, 3, ...}.

Average of First 'n' Whole Numbers

The formula for the average of the first 'n' whole numbers is (n − 1) ÷ 2.

Average of First 'n' Natural Numbers

Natural numbers start from 1. The average of the first 'n' natural numbers is (n + 1) ÷ 2.

Sum of First 'n' Whole Numbers

The sum is calculated using the formula: S = [n × (n − 1)] ÷ 2.

Q84. Answer: (c) $54x^2+ 25y^2$

Shortcut Trick

To find the simplified form, calculate the coefficients of x^2, y^2, and xy separately.

Coefficient of $x^2 = 5^2 + 2^2 + 5^2 = 25 + 4 + 25 = 54$.

Coefficient of $y^2 = (-2)^2 + 5^2 - 2^2 = 4 + 25 - 4 = 25$.

Coefficient of $xy = 2 \times 5 \times (-2) + 2 \times 2 \times 5 = -20 + 20 = 0$.

Combining the terms, we get $54x^2 + 25y^2$.

Therefore The correct answer is $54x^2 + 25y^2$.

Alternate Method

Given Expression: $(5x - 2y)^2 + (2x + 5y)^2 + (5x + 2y)(5x - 2y)$

Formula Used:

1. $(a - b)^2 = a^2 - 2ab + b^2$

2. $(a + b)^2 = a^2 + 2ab + b^2$

3. $(a + b)(a - b) = a^2 - b^2$

Calculations:

=> Expand $(5x - 2y)^2 = (5x)^2 - 2(5x)(2y) + (2y)^2 = 25x^2 - 20xy + 4y^2$

=> Expand $(2x + 5y)^2 = (2x)^2 + 2(2x)(5y) + (5y)^2 = 4x^2 + 20xy + 25y^2$

=> Expand $(5x + 2y)(5x - 2y) = (5x)^2 - (2y)^2 = 25x^2 - 4y^2$

=> Total Expression = $(25x^2 - 20xy + 4y^2) + (4x^2 + 20xy + 25y^2) + (25x^2 - 4y^2)$

=> Grouping like terms: $(25x^2 + 4x^2 + 25x^2) + (-20xy + 20xy) + (4y^2 + 25y^2 - 4y^2)$

=> $54x^2 + 0 + 25y^2$

=> $54x^2 + 25y^2$

Therefore The correct answer is $54x^2 + 25y^2$.

Additional Information

Standard Algebraic Identities

Square of a binomial sum: $(a + b)^2 = a^2 + 2ab + b^2$.

Difference of Squares

Product of sum and difference: $(a + b)(a - b) = a^2 - b^2$.

Trinomial Expansion

Square of a trinomial: $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$.

Q85. Answer: (d) Two

Given, A, B, C, D, G, H, and I are sitting around a circular table facing the centre.

B sits third to the left of I.

Only I sits between A and G.

C is not an immediate neighbor of B.

G sits second to the left of H.

And D sits at the remaining place.

So, two people sit between D and G when counted from the right of D.

Hence, the correct answer is "Option 4".

Q86. Answer: (c) It temporarily holds active program data and instructions to enable fast switching between tasks.

The correct answer is It temporarily holds active program data and instructions to enable fast switching between tasks..

Key Points

• RAM (Random Access Memory) is a volatile memory that temporarily stores data and instructions required by active applications, enabling smooth multitasking.

• In a multitasking operating system, RAM allows quick access to active program data, reducing the need to repeatedly fetch data from slower storage devices like hard drives.

• The operating system utilizes RAM to maintain the state of multiple applications, enabling fast switching between tasks without delays.

• RAM acts as a workspace for the CPU, ensuring that active processes and threads execute efficiently and remain responsive.

• When RAM is insufficient for multitasking, systems may use virtual memory (paging), which is significantly slower compared to physical RAM.

Additional Information

• Volatile Memory:

• RAM is classified as volatile memory, meaning its contents are lost when power is turned off.

• This characteristic makes RAM unsuitable for permanent data storage.

• Virtual Memory:

• When physical RAM is full, operating systems use a portion of the hard drive as virtual memory.

• Virtual memory is slower than RAM but ensures the system can handle more applications simultaneously.

• Multitasking in Operating Systems:

• Multitasking allows multiple applications or processes to run concurrently by sharing CPU and RAM resources.

• Efficient multitasking relies heavily on the speed and capacity of RAM.

• Cache Memory:

• Cache memory is a smaller, faster type of memory located closer to the CPU than RAM.

• It stores frequently accessed data to speed up processing tasks further.
• Permanent Storage vs RAM:
• Permanent storage devices like hard drives and SSDs retain data even after power is turned off.
• RAM, on the other hand, is temporary storage designed for speed and accessibility during active processes.

Q87. Answer: (d) 5

Shortcut Trick
Net filling rate = 1/9 − 1/90 = (10 − 1)/90 = 9/90 = 1/10 per minute.
Time to fill the full tank = 10 minutes.
Time to fill half of the tank = 10 ÷ 2 = 5 minutes.
Therefore The correct answer is 5 minutes.
Alternate Method
Given:
Filling pipe (A) time = 9 minutes
Emptying pipe (B) time = 90 minutes
Formula Used:
Total Work = LCM of time taken
Efficiency = Total Work ÷ Time

Pipe	Time (min)	Total Work (units)	Efficiency
A (Inlet)	9	90	+10
B (Outlet)	90	−1	

Calculations:
=> Combined efficiency of (A + B) = 10 − 1 = 9 units/min
=> Total work to fill half tank = 90 ÷ 2 = 45 units
=> Time taken = 45 ÷ 9 = 5 minutes
Therefore The correct answer is 5 minutes.
Additional Information
Net Work Done
When one pipe fills and another empties, the net efficiency is the difference: (1/x − 1/y).
Pipes and Cisterns Logic
Inlet pipes have positive efficiency, while outlet (leakage) pipes have negative efficiency.
Fractional Work
To find the time for a fraction of work, multiply the total time required for full work by that fraction.

Q88. Answer: (d) 684

BODMAS Table:
Given equation: 52 ÷ 15 − 189 × 9 + 117 = ?
Now, if '+' and '−' and '×' and '÷' are interchanged, then:
=> 52 × 15 + 189 ÷ 9 − 117 = ?
=> 52 × 15 + 189 ÷ 9 − 117 = ?
=> 780 + 21 − 117 = ?
=> 801 − 117 = 684
Hence, the correct answer is "Option 4".

Q89. Answer: (d) OSW 19

The logic followed here is,
Hence, the correct answer is "Option 3".

Q90. Answer: (c) 8 : 15

Shortcut Trick
Expenditure is directly proportional to the product of Price and Quantity.
Ratio of Price = 2 : 5

Ratio of Quantity = 4 : 3
Ratio of Expenditure = (2 × 4) : (5 × 3) = 8 : 15.
Therefore The correct answer is 8 : 15.
Alternate Method
Given:
Ratio of Price of gram and pea = 2 : 5
Ratio of Quantity consumed = 4 : 3
Formula Used:
Expenditure = Price × Quantity
Calculations:
=> Let the prices be 2x and 5x respectively.
=> Let the quantities consumed be 4y and 3y respectively.
=> Expenditure on Gram = 2x × 4y = 8xy
=> Expenditure on Pea = 5x × 3y = 15xy
=> Ratio of Expenditure = 8xy : 15xy
=> Ratio of Expenditure = 8 : 15
Therefore The correct answer is 8 : 15.
Additional Information
Price-Consumption Relationship
If expenditure is kept constant, the price is inversely proportional to the consumption (Price prop. to 1/Consumption).
Compound Ratio
The ratio of the products of the corresponding terms of two or more ratios is called the compound ratio (a:b and c:d becomes ac:bd).
Percentage Change in Expenditure
Net % change in expenditure = a + b + (a × b)/100, where a and b are percentage changes in price and quantity.

Q91. Answer: (a) 62.75

Shortcut Trick
Remaining distance fraction = 1 − 2/3 = 1/3
Remaining time fraction = 1 − 2/3 = 1/3
Required speed = (Total Distance × 1/3) ÷ (Total Time × 1/3) = Total Distance ÷ Total Time
Required speed = 753 ÷ 12 = 62.75 km/hr
Therefore The correct answer is 62.75 km/hr.
Alternate Method
Given:
Total Distance = 753 km
Total Time = 12 hours
Calculations:
=> Distance covered = 2/3 × 753 = 502 km
=> Remaining distance = 753 − 502 = 251 km
=> Time taken = 2/3 × 12 = 8 hours
=> Remaining time = 12 − 8 = 4 hours
=> Required Speed = Remaining Distance ÷ Remaining Time
=> Required Speed = 251 ÷ 4 = 62.75 km/hr
Therefore The correct answer is 62.75 km/hr.
Additional Information
Basic Speed Formula
Speed is defined as the distance covered per unit time. Formula: Speed = Distance ÷ Time.
Unit Conversion
To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.
Average Speed
Average Speed = Total Distance ÷ Total Time. If distances are equal, Avg Speed = 2xy/(x+y).

Q92. Answer: (c) Class V

The correct answer is Class V.

Key Points

• In India, cities are classified into different classes based on their population size as per the Census of India.

• A city with a population of 5,000 to 9,999 falls under the classification of Class V town.

• The classification helps in urban planning and allocation of resources for development based on population density.

• Class I towns have populations exceeding 100,000, while Class VI towns have populations less than 5,000.

• The Census of India defines six population classes, ranging from Class I to Class VI, for better administrative and demographic categorization.

Additional Information

• Population Classification in India:

• Class I: Population exceeding 100,000.

• Class II: Population between 50,000 to 99,999.

• Class III: Population between 20,000 to 49,999.

• Class IV: Population between 10,000 to 19,999.

• Class V: Population between 5,000 to 9,999.

• Class VI: Population less than 5,000.

• Purpose of Classification: It assists in urban development planning, policymaking, and resource allocation.

• Census of India: Conducted every 10 years, the Census provides crucial demographic data on population distribution, literacy, sex ratio, and urbanization.

• Urbanization Trends: India is witnessing rapid urbanization, with a significant increase in the number of Class I towns over the decades.

• Historical Context: Population classification was introduced during British rule for administrative purposes and has continued post-independence to guide development efforts.

Q93. Answer: (d) New Delhi

The correct answer is New Delhi.

Key Points

• The Arctic Circle India Forum was held in New Delhi on 3-4 May 2025, highlighting India's growing interest in Arctic affairs.

• This forum is a collaborative effort between the Arctic Circle and the Indian government to strengthen India's engagement with Arctic issues.

• It focused on climate change, sustainable development, and scientific research in the Arctic region.

• India's Ministry of Earth Sciences has been actively involved in Arctic research and has a dedicated research station, Himadri, in Svalbard, Norway.

• The forum provided a platform for experts, policymakers, and researchers to discuss the geopolitical and environmental significance of the Arctic.

Additional Information

• Arctic Circle

• The Arctic Circle is the largest network of international dialogue and cooperation on the future of the Arctic.

• It was founded by former Icelandic President Ólafur Ragnar Grímsson in 2013.

• The organization convenes forums globally to promote cooperation between Arctic and non-Arctic nations.

• India's Arctic Policy

• India released its first Arctic Policy in March 2022, emphasizing sustainable development and climate change mitigation.

• The policy focuses on advancing scientific research, environmental protection, and international cooperation in the Arctic.

• India's Himadri station in Svalbard supports Arctic research in areas like glaciology, microbiology, and atmospheric science.

• Climate Change in the Arctic

• The Arctic region is warming at twice the global average rate, making it a critical area for climate studies.

• Melting ice in the Arctic has implications for global sea levels and climate systems.

• India's engagement in Arctic research helps understand the impact of Arctic changes on monsoonal systems and global climate.

• Geopolitical Significance of the Arctic

• The Arctic is emerging as a strategic region due to its vast reserves of oil, gas, and minerals.

• Melting ice is opening new shipping routes, such as the Northern Sea Route, reducing transit times between Europe and Asia.

• India, as a stakeholder, seeks to balance environmental protection with economic opportunities in Arctic geopolitics.

Q94. Answer: (a) 13.5 crore

The correct answer is 13.5 crore.

Key Points

• The Economic Survey 2023-24 highlighted that 13.5 crore Indians escaped multidimensional poverty between 2015-16 and 2019-21.

• This significant reduction was attributed to the government's focus on inclusive growth and targeted welfare programs.

• Multidimensional poverty considers multiple deprivations, such as health, education, and living standards, beyond monetary poverty.

• India demonstrated remarkable progress in poverty reduction, aligning with its Sustainable Development Goals (SDGs).

• The report utilized data from the National Family Health Survey (NFHS) and UNDP's Multidimensional Poverty Index (MPI).

Additional Information

• Multidimensional Poverty Index (MPI):

• A measure developed by the UNDP and Oxford Poverty & Human Development Initiative (OPHI).

• It assesses poverty beyond income, focusing on deprivations in health, education, and living standards.

• Indicators include nutrition, child mortality, years of schooling, access to clean water, electricity, and housing.

• National Family Health Survey (NFHS):

• A large-scale, multi-round survey conducted in India by the Ministry of Health and Family Welfare.

• NFHS provides data on population, health, and nutrition trends across states and the country.

• It is a crucial resource for policymaking and tracking progress on poverty alleviation.

• Sustainable Development Goals (SDGs):

• Adopted by the United Nations in 2015, SDGs consist of 17 global goals aimed at ending poverty, reducing inequality, and tackling climate change by 2030.

• India's efforts to reduce multidimensional poverty align with SDG 1: No Poverty.

• Government Welfare Programs:

• Several schemes such as Ayushman Bharat, PM-KISAN, and Pradhan Mantri Awas Yojana contributed to poverty reduction.

• Focus on housing, healthcare, education, and financial inclusion has improved living standards for millions.

Q95. Answer: (c) Improve transportation and logistics

The correct answer is Improve transportation and logistics.

Key Points

• PM Gati Shakti is a National Master Plan launched by the Government of India to revolutionize multi-modal connectivity and logistics efficiency across the country.

• The initiative was launched on October 13, 2021 by Prime Minister Narendra Modi.

• It aims to bring 16 key ministries, including Railways and Roadways, together on a single platform to ensure integrated planning and coordination for infrastructure projects.

• The primary goal is to reduce logistics costs, improve supply chain efficiency, and boost economic growth through synchronized execution of infrastructure projects.

• It emphasizes the use of advanced technology such as GIS-based systems and satellite imagery to streamline planning and implementation processes.

Additional Information

• Multi-modal connectivity: It refers to the integration of various modes of transportation such as railways, roadways, waterways, and airways to create seamless logistics and transportation networks.

• Logistics cost in India: High logistics costs in India (13-14% of GDP) have been a major hurdle to economic growth, and PM Gati Shakti aims to reduce these costs significantly.

• GIS-based planning: Geographic Information System (GIS) technology is used to visualize, analyze, and integrate data for precise infrastructure planning under the initiative.

• Infrastructure boost: The program is aligned with India's goal of becoming a $5 trillion economy by enhancing infrastructure and supply chain capabilities.

• Economic benefits: By improving connectivity and logistics, the initiative aims to attract investments, create jobs, and ensure faster movement of goods across the country.

Q96. Answer: (c) -26

Given:

66 - 4 × (30 + 3) + 40

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Formula used:

Follow the BODMAS rule:

Calculation:

66 - 4 × (30 + 3) + 40

=> 66 - 4 × 33 + 40

=> 66 - 132 + 40

=> (66 + 40) - 132

=> 106 - 132

=> -26

Therefore The correct answer is option (3).

Q97. Answer: (d) Samantha Harvey – Orbital

The correct answer is Samantha Harvey – Orbital.

Key Points

• Samantha Harvey is the winner of the 2024 Booker Prize for her novel Orbital.

• The Booker Prize is one of the most prestigious awards in literary fiction, recognizing outstanding novels written in English.

• Orbital explores themes of existentialism, human connection, and the vastness of the cosmos, receiving critical acclaim for its innovative narrative style.

• Samantha Harvey is a well-known British author whose previous works have also been shortlisted for various literary prizes, including the Orange Prize and the Costa Book Awards.

• The announcement of the Booker Prize winner took place at a grand ceremony held in London in 2024.

Additional Information

• Booker Prize Overview:

• Established in 1969, the Booker Prize is awarded annually for the best novel written in English and published in the UK or Ireland.

• The prize aims to celebrate literary excellence and promote the global recognition of English-language novels.

• The winner receives £50,000 along with a significant boost in book sales and international recognition.

• Authors from any nationality are eligible as long as their work meets the language and publication criteria.

• Samantha Harvey's Literary Contributions:

• She is known for her deep philosophical insights and experimental narrative structures.

• Her previous novels include "The Wilderness," "All Is Song," and "Dear Thief," which have received critical acclaim.

• Her works often delve into complex human emotions and existential themes.

• Harvey’s literary style is characterized by lyrical prose and profound storytelling.

• Key Themes in Orbital:

• The novel examines human curiosity and our place in the universe.

• It intertwines individual struggles with broader cosmic questions.

• Orbital has been praised for its intellectual depth and emotional resonance.

• It challenges readers to reflect on the meaning of existence and the interconnectedness of life.

• Impact of the Booker Prize:

• Winning the Booker Prize significantly enhances an author's career and global reach.

• The recognition often leads to translations into multiple languages and adaptations into other media formats.

• The prize has historically boosted the visibility of literary fiction and brought attention to emerging and established authors alike.

• It serves as a benchmark for literary quality and innovation in storytelling.

Q98. Answer: (c) TRY

The logic followed here is:

Thus, 'TRY' will be the next in the series.

Hence, the correct answer is "Option 3".

Q99. Answer: (a) Make in India initiative

The correct answer is Make in India initiative.

Key Points

• The Make in India initiative was launched by the Government of India on 25 September 2014, under the leadership of Prime

Minister Narendra Modi.

• It aims to transform India into a global manufacturing hub by encouraging domestic and foreign investment in manufacturing sectors.

• The initiative focuses on fostering innovation, enhancing skill development, and building world-class infrastructure.

• It targets 25 key sectors, including automobiles, biotechnology, construction, defense manufacturing, and pharmaceuticals, among others.

• The program emphasizes ease of doing business by streamlining regulatory frameworks, promoting transparency, and simplifying processes.

Additional Information

• FDI Reforms:

• Under Make in India, India liberalized its Foreign Direct Investment (FDI) policies across various sectors, allowing up to 100% FDI in many industries.

• Sectors like defense, railways, and insurance witnessed increased FDI inflows due to policy reforms.

• Ease of Doing Business Ranking:

• India's global position in the World Bank's Ease of Doing Business Index improved significantly due to initiatives under Make in India.

• Key reforms include the introduction of GST, Insolvency and Bankruptcy Code, and digitization of governance processes.

• Major Outcomes:

• Significant growth in sectors like electronics, automotive, and renewable energy.

• India became one of the fastest-growing economies globally, attracting substantial foreign investments.

• Skill India Initiative:

• To complement Make in India, the Skill India program focuses on enhancing workforce employability through training and skill development.

• This ensures a skilled labor pool to meet the demands of the manufacturing and service sectors.

Q100. Answer: (c) 104

The logic followed here is,

Hence, the correct answer is "Option 3".

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