RRB NTPC Graduate Level CBT-I Official Paper (Held On: 23 Jun, 2025 Shift 1) (Previous Year Paper)

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

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Q1. Each of the digits in the number 257461398 is arranged in ascending order from left to right. What will be the sum of the digits that are second from the left and third from the right in the new number thus formed?

(a) 8
(b) 10
(c) 9
(d) 11

Q2. Seven people, A, B, L, M, N, S, and T are sitting in a row, facing north. Only L sits to the left of S. Only four people sit between L and N. Only M sits between A and B, and A is not an immediate neighbour of N.

Who sits at the extreme right of the line?

(a) A
(b) T
(c) D
(d) N

Q3. The Chinese traveler who visited Harsha's court was:

(a) Hiuen Tsang
(b) Hao
(c) Fa-Hien
(d) I-Tsing

Q4. For a regular polygon, the sum of the interior angles is 400% more than the sum of its exterior angles. Each interior angle of the polygon measures x°. What is the value of x?

(a) 145
(b) 140
(c) 135
(d) 150

Q5. 1/20 is what percentage of 1/30 ?

(a) 165%
(b) 300%
(c) 160%
(d) 150%

Q6. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

HL27 GK38 FJ49 EI60 ?

(a) DH72
(b) DH71
(c) DG71
(d) DG72

Q7. What type of aircraft did the Indian Air Force contingent include in Exercise INIOCHOS-25?

(a) Only C-17 transport aircraft
(b) Only IL-78 aerial refuelers
(c) Su-30 MKI fighters, IL-78 aerial refuelers and C-17 transport aircraft
(d) Only Su-30 MKI fighters

Q8. British land revenue policies were deeply exploitative. Under which system were landlords required to pay a fixed revenue regardless of crop yield?

(a) Mahalwari
(b) Zamindari
(c) Ryotwari
(d) Indian revenue system

Q9. The average weight of 14 boys in a class is 40.25 kg and that of the remaining 4 boys is 38 kg. Find the average weight (in kg, rounded off to two decimal place) of all the boys in the class.

(a) 38.75
(b) 40.75
(c) 39.75
(d) 41.75

Q10. In quadrilateral PQRS, the bisectors of angle R and angle S meet at point T (inside the quadrilateral), and angle STR = 8°. If the ratio of angle P to angle Q is 7 : 9, then what is the difference between the measures of angle Q and angle P?

(a) .5°
(b) 4°
(c) 2°
(d) 7°

Q11. In the 2024 Jharkhand Assembly elections, how many seats were won by the winning party/coalition and what is the name of the party/coalition?

(a) 45 seats, Bharatiya Janata Party (BJP)
(b) 56 seats, JMM-led alliance INDIA
(c) 50 seats, Indian National Congress (INC)
(d) 56 seats, JMM-led NDA alliance

Q12. If 2 is added to each odd digit and 1 is subtracted from each even digit in the number 1374526, then what will the sum of the digits which are third from the left and third from the right in the new number thus formed be?

(a) 8
(b) 11
(c) 14
(d) 16

Q13. If $a^2 + b^2 = 179$ and $a \times b = 14$, then find $(a-b)/(a+b)$, where $a > 1$

(a) 240/281
(b) √(171/217)
(c) 411/445
(d) √(151/207)

Q14. Which of the following numbers is divisible by 12?

(a) 2184
(b) 2800
(c) 1264
(d) 2349

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Q15. A group of numbers and symbols is coded using letter codes as per the codes given below and the conditions that follow. Study the given codes and conditions and answer the question that follows.

Note: If none of the conditions apply, then codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	@	4	2	•	8	•	÷	6	7	%	5	$	#	&
Code	P	V	A	R	Z	I	E	H	L	O	J	C	B	Q

Conditions:

If the first and the last elements are symbols, then the codes for these two (the first and the last element) are to be interchanged.

If the third element is a prime number, then the third element is to be coded as y. If the fifth element is a multiple of 4, then the fifth element is to be coded as ?.

What will be the code for the following group?

46÷ %8

(a) BHEOZ
(b) γΗΥΟβ
(c) VHEOZ
(d) VHEOβ

Q16. A car covers a distance of 1032 km in 8 hours. The speed of a train is double the speed of the car. One-third the speed of the train is equal to the speed of a bike. How much distance will the bike cover in 17 hours?

(a) 1452 km
(b) 1458 km
(c) 1460 km
(d) 1462 km

Q17. In a row of 37 students facing north, Vishesh is 13^(th) from the right end. If Namrata is 10^(th) to the left of Vishesh, what is Namrata's position from the left end of the line?

(a) 15^(th)
(b) 12th
(c) 11th
(d) 14th

Q18. Which method allows you to create a new text file inside a specific folder in Windows?

(a) Start a new task from Task Manager.
(b) Restore a file from the Recycle Bin.
(c) Press Ctrl + F while in the folder.
(d) Open the folder and right-click New Text Document

Q19. Which of the following organisms has the smallest DNA length listed?

(a) φ X174 phage
(b) Bacteriophage A
(c) Human haploid cell
(d) Escherichia coli

Q20. In this question, a group of numbers/symbols are coded using letter codes as per the codes given below, and the conditions that follow. The correct combination of codes (following only the condition/s that apply) is your answer.

Note: If none of the conditions apply, then codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	7	@	6	2	#	%	&	8	9	=	$	3	4	•

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Code	E	J	A	H	F	R	B	Y	L	H	Q	T	K	Z

Conditions:

(i) If the first element is an odd number and the last element is also an odd number, then the codes for these two (the first and the last elements) are to be interchanged.

(ii) If the first and last elements are perfect squares, then the code of the 1st and last element are to be interchanged.

(iii) If the first and last element is a symbol, then the first and last element is to be coded as >.

What is the code for the following?

98#@4

(a) LYFJK
(b) TYFJY
(c) KYFEL
(d) KYFJL

Q21. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one that follows the same logic.

BACK-ABCK - BCKA

MINO - IMNO - MNOI

(a) CAGE-CGAE - EGAC
(b) TEAR - ETAR - TARE
(c) CLIP-LCIP - PLIC
(d) RANK - ARNK - ANKR

Q22. Five times the present age of Vashnavi is 18 years more than seven times the present age of Sooraj, and eight times the present age of Sooraj is 17 years less than five times the present age of Vashnavi. What is the sum of the present ages (in years) of Vashnavi and Sooraj?

(a) 6
(b) 4
(c) 10
(d) 9

Q23. The least number which, when diminished by 7, is divisible by 16, 20, 10 and 27 is:

(a) 1.2216
(b) 2146
(c) 2155
(d) 2167

Q24. Find the value of $(0.54)^3 + (0.46)^3$

(a) 0.2584
(b) 0.2458
(c) 0.2548
(d) 0.2854

Q25. In which year did the Dutch East India Company establish its factory at Petapuli on the North Coromandel Coast?

(a) 1457
(b) 1532
(c) 1606
(d) 1699

Q26. Which Article of the Indian Constitution empowers Parliament to regulate the right of citizenship by law?

(a) Article 10
(b) Article 14
(c) Article 5
(d) Article 11

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Q27. If 'P' stands for 'x', 'Q' stands for '÷', 'R' stands for '-' and 'S' stands for '+', then what will come in place of the question mark (?) in the following equation?

29 S 9 P3R 13 P 4S 55 = ?

(a) 27
(b) 41
(c) 83
(d) 59

Q28. The simplified value of 74 - 3 × (21 + 15) + 36 is:

(a) 2
(b) 11
(c) 6
(d) -5

Q29. What should come in place of the question mark (?) in the given series?

216, 182, 152, 126, 104, ?

(a) 86
(b) 78
(c) 72
(d) 81

Q30. What significant announcement did Vandana Katariya, who holds the record for the most international caps in Indian women's hockey history, make in April, 2025?

(a) Her decision to join a new hockey team
(b) Her retirement from international hockey
(c) Her participation in the upcoming Olympics
(d) Her appointment as the captain of the Indian women's hockey team

Q31. Which of the following river basins supports the highest population concentration in India?

(a) Ganga Basin
(b) Godavari Basin
(c) Brahmaputra Basin
(d) Narmada Basin

Q32. If √2Cosec A=2secA find the value of tanA secA.

(a) 4
(b) √3
(c) √3/2
(d) 1/2

Q33. This question is based on the five, three-digit numbers given below.

(Left) 441 317 999 155 444 (Right)

(Example-697 - First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.)

What will be the resultant if the third digit of the highest number is subtracted from the first digit of the lowest number?

(a) -6
(b) -7
(c) -5
(d) -8

Q34. What is the purpose of Print Preview in MS Excel 365?

(a) To edit cell formulas before printing
(b) To delete unnecessary rows/columns
(c) To convert the spreadsheet into a PDF

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(d) To check how the spreadsheet will appear on paper and adjust layout/formatting

Q35. Which of the following caves contain rock cut paintings dating back to the stone age era?

(a) Barabar caves
(b) Bhimbetka caves
(c) Ajanta caves
(d) Ellora caves

Q36. This question is based on the five, three-digit numbers given below.

(Left) 941 915 741 807 776 (Right)

(Example-697- First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.)

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

(a) 7
(b) 8
(c) 9
(d) 11

Q37. F, G, H, J, K and L 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. Only three people live between K and G, where K lives below G. H lives on an odd numbered floor and immediately above K. J lives on one of the floors below F and on one of the floors above L. Who lives on floor numbered 4?

(a) H
(b) L
(c) F
(d) J

Q38. Hari travels from City A to City B. If Hari drives his car at 1/4 of his normal speed, then he reaches City B 39 minutes late. Find the time (in minutes) that Hari would take to travel from City A to City B if he drove at his normal speed.

(a) 13
(b) 4
(c) 20
(d) 19

Q39. The temperatures recorded over five consecutive days in a town were: 28°C, 30°C, 32°C, 31°C, and 29°C. What was the average temperature during these five days?

(a) 29°C
(b) 30°C
(c) 32°C
(d) 31°C

Q40. In December 2024, which government project won the SKOCH Award for excellence in forest management?

(a) Van Bandhu Kalyan Yojana
(b) Social Forestry Schemes of Madhya Pradesh
(c) Nagaland Forest Management Project
(d) Green India Mission

Q41. Who among the following wrote the book 'Breaking Rocks and Barrier'?

(a) Sudipta Sengupta
(b) Pankaj Mishra
(c) Arun Shourie
(d) Soumitra Chatterjee

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Q42. If $(x + 1/x) = 9$ then $(x^2 + 1/x^2)$ is ^:

(a) 72
(b) 78
(c) 79
(d) 85

Q43. If 22% of a number is equal to 4/9 th of another number, what is the ratio to the second number?

(a) 198:97
(b) 200:99
(c) 201:98
(d) 199: 101

Q44. Which Indian naval ship visited Port Louis, Mauritius, in March 2025 to participate in the 57th National Day celebrations?

(a) INS Chennai
(b) INS Vikrant
(c) INS Kolkata
(d) INS Imphal

Q45. The selling price of 35 books is equal to the cost price of 28 books. Find the loss or gain percentage.

(a) 20% loss
(b) 100/7 % gain
(c) 100/7 % loss
(d) 20% gain

Q46. A hemispherical bowl has a 3.5 cm radius. It is to be painted inside as well as outside. Find the cost of painting it at the rate of Rs. 17 per 10 cm^2.

(Use $\pi = 22/7$)

(a) Rs. 241.8
(b) Rs. 251.8
(c) Rs. 271.8
(d) Rs. 261.8

Q47. Which prominent Indian freedom fighter was imprisoned in Mandalay Jail, Burma?

(a) Jawaharlal Nehru
(b) Subhas Chandra Bose
(c) Bal Gangadhar Tilak
(d) Mahatma Gandhi

Q48. Which dynasty replaced the Shungas in Magadha?

(a) Kushanas
(b) Guptas
(c) Kanvas
(d) Satavahanas

Q49. Seven people D, E, F, G, L, M and N are sitting in a row, facing north. Only five people sit between M and L. F sits to the immediate left of L. Only one person sits between F and E. N sits at some place to the left of G but at some place to the right of D. Who sits third from the left end of the row?

(a) D
(b) N
(c) F
(d) G

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Q50. This question is based on the five, three-digit numbers given below.

(Left) 107 788 634 346 488 (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 third digit of the lowest number?

(a) 7
(b) 12
(c) 14
(d) 9

Q51. Which of the following tribal communities was primarily involved in the Chuar Rebellion in the Jungle Mahals region?

(a) Bhils
(b) Khasis
(c) Bhumji
(d) Kols

Q52. Mr. C starts from Point D and drives 3 km towards the west. He then takes a left turn, drives 11 km, turns left and drives 9 km. He then takes a right turn and drives 5 km, turns left drives 7 km. He then takes left turn, drives 16 km. He takes a final left turn drives 9 km and stops at Point E. How far (shortest distance) and towards which direction should he drive in order to reach Point D again? (All turns are 90 degrees turns only unless specified.

(a) 2 km towards the West
(b) 2 km towards the East
(c) 4 km towards the South
(d) 4 km towards the West

Q53. In May 2025, the management of Palamu Tiger Reserve (PTR) was in talks with TRAFFIC a joint initiative between World Wildlife Fund and the International Union of Conservation of Nature to obtain a sniffer dog for_____

(a) Kanha National Park
(b) Periyar National Park
(c) Gir National Park
(d) Betla National Park

Q54. Which of the following materials is most suitable for making filaments in electric bulbs?

(a) Tungsten
(b) Copper
(c) Aluminium
(d) Iron

Q55. Mr. GHI starts from Point A and drives 16 km towards the east. He then takes a right turn, drives 18 km, turns right and drives 26 km. He then takes a right turn and drives 26 km. He takes a final right turn, drives 10 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified)

(a) 4 km to the west
(b) 8 km to the south
(c) 6 km to the west
(d) 5 km to the south

Q56. Find the roots of the equation $5x^2 - 11x + 2 = 0$ by factorisation method.

(a) 1, 2/5
(b) 5,2
(c) 1/5, 2
(d) 2, 2/5

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Q57. In the three-tier structure of the Panchayati Raj system in India, which body is elected at the grassroots level?

(a) Panchayat Samiti
(b) Gram Panchayat
(c) Zila Parishad
(d) Block Samiti

Q58. Who is the author of the 2025 novel Dream Count?

(a) Dan Brown
(b) Philip Pullman
(c) Ocean Vuong
(d) Chimamanda Ngozi Adichie

Q59. Which Edition of the European Political Community Summit was held in November 2024?

(a) 4^(th)
(b) 5^(th)
(c) 6^(th)
(d) 7^(th)

Q60. Start-up culture has grown rapidly in India after the liberalisation. Which ministry leads the implementation of the Start-up India initiative?

(a) Ministry of Commerce and Industry
(b) Ministry of Skill Development
(c) Ministry of Finance
(d) Ministry of MSME

Q61. The Planning Commission was established to steer India's five year plans. Who was the first chairman of the Planning Commission of India?

(a) Jawaharlal Nehru
(b) Rajendra Prasad
(c) CD Deshmukh
(d) BR Ambedkar

Q62. In Windows 11 OS, which command interpreter helps to manage computer's drives (disks, partitions, volumes, or virtual hard disks)?

(a) msconfig
(b) regedit
(c) gpedit.msc
(d) diskpart

Q63. When initiating a new presentation in MS PowerPoint, which of the following is the most accurate description of the 'Design Ideas' feature's primary function?

(a) o provide real-time collaboration tools for multiple users working on the same presentation simultaneously
(b) To automatically populate slides with relevant content based on the presentation topic
(c) To suggest various pre-designed templates and layouts based on the content on the current slide
(d) To automatically translate the presentation content into multiple languages

Q64. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

LOK 4, JMI 9, HKG 25, FIE 49, ?

(a) DFC 121
(b) DGC 121
(c) DGC 169
(d) DGC 81

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Q65. Three taps A, B and C together can fill an empty cistern in 20 minutes. Tap A alone can fill it in 50 minutes and tap B alone in 60 minutes. How long will tap C alone take to fill it (in minutes)?

(a) 70
(b) 72
(c) 75
(d) 80

Q66. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statement(s) 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 statement(s).

Statement:

All grapes are apples.

All apples are kiwis.

Some kiwis are bananas.

Conclusion:

(1) All apples are bananas.

(II) Some kiwis are grapes.

(a) Both conclusions I and II follow.
(b) Only conclusion (1) follows.
(c) Only conclusion (II) follows.
(d) Neither conclusion (1) nor (II) follows.

Q67. Which of the following crops is associated with plantation agriculture in India?

(a) Bajra
(b) Tea
(c) Cotton
(d) Wheat

Q68. A grocer marked his goods at 60% above their cost price and sold them at a discount of X%. If he gained 52% profit, then find the value of X.

(a) 7
(b) 3
(c) 5
(d) 2

Q69. The Western Coastal Plains are narrower and lie between which features?

(a) Eastern Ghats and Bay of Bengal
(b) Himalayas and Indian Ocean
(c) Vindhya Range and Arabian Sea
(d) Western Ghats and Arabian Sea

Q70. A pipe can fill a tank in 8 hours. Another pipe can empty the filled tank in 16 hours. If both the pipes are opened simultaneously, then the time (in hours) in which the tank will be three-fourth filled, is:

(a) 12
(b) 36
(c) 24
(d) 48

Q71. In a certain code language,

'A + B' means 'A is the son of B',

'A - B' means 'A is the brother of B',

'A x B' means 'A is the wife of B' and

'A ÷ B' means 'A is the father of B'.

How is S related to H if 'S + D - F × G ÷ H'?

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(a) Mother's sister's son
(b) Father's sister's son
(c) Father's brother's son
(d) Mother's brother's son

Q72. If A's salary is 51% more than that of B, then by what percentage is B's salary less than that of A (correct to two decimal places)?

(a) 33.77%
(b) 34.80%
(c) 32.75%
(d) 36.52%

Q73. The median of the observations 85, 62, 20, 72, 20, 43, 35, 90, 68, 56 and 79 is:

(a) 68
(b) 62
(c) 56
(d) 72

Q74. By selling cloth at Rs. 483/m, a shopkeeper loses 31%. Find the rate (in /m) at which it should be sold so as to earn a profit of 34%.

(a) 935
(b) 938
(c) 937
(d) 939

Q75. In this question, a group of numbers/symbols are coded using letter codes as per the codes given below, and the conditions that follow. The correct combination of codes (following only the condition/s that apply) is your answer.

Note: If none of the conditions apply, then codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	**7**	**@**	**6**	**2**	**#**	**%**	**&**	**8**	**9**	**=**	**$**	**3**	**4**	**•**
Code	E	J	A	H	F	R	B	Y	L	H	Q	T	K	Z

Conditions:

(i) If the first element is an odd number and the last element is also an odd number then the codes for these two (the first and the last elements) are to be interchanged.

(ii) If the first and last elements are perfect squares then the code of the 1st and last element is to be that of the preceding number or symbol.

(iii) If the first and last element is a symbol then the first and last element is to be coded as >.

What is the code for the following?

9%+27

(a) ERZHL
(b) ERZHE
(c) LRZHL
(d) LRZHE

Q76. The mean of data is 56, and its median is 76. The mode (using empirical relation) of the data is:

(a) 93
(b) 116
(c) 203
(d) 105

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Q77. In a certain code language, 'SOUP' is coded as '5173' and 'PINT' is coded as '4216'.

What is the code for 'P' in the given code language?

(a) 6
(b) 3
(c) 4
(d) 1

Q78. Which ancient civilisations flourished in the Thar Desert area about 5000 years ago?

(a) Babylonian Civilisation
(b) Indus Valley Civilisation
(c) Greek Civilisation
(d) Egyptian Civilisation

Q79. Which of the following is NOT an elected position under the Panchayati Raj system in India?

(a) Panchayat Secreatary
(b) Zila Pramukh
(c) Sarpanch
(d) Pradhan

Q80. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) HPSY
(b) YGIP
(c) AILR
(d) NVYE

Q81. PSKO is related to ILDH in a certain way based on the English alphabetical order. In the same way, RUMQ is related to KNFJ. To which of the given options is TWOS related, following the same logic?

(a) PMLH
(b) MPLH
(c) MPHL
(d) PMHL

Q82. Where was the 2024 G20 Summit held?

(a) Rome, Italy
(b) Rio de Janeiro, Brazil
(c) Johannesburg, South Africa
(d) New Delhi, India

Q83. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 Operations on 13 such as adding/subtracting/multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(29, 53, 24)

(12, 32, 20)

(a) (46, 60, 14)
(b) (47, 75, 25)
(c) (49, 71, 19)
(d) (24, 40, 13)

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Q84. What should come in place of the question mark (?) in the given series?

1512 1520 1530 1542 1556?

(a) 1572
(b) 1576
(c) 1574
(d) 1570

Q85. When you reuse slides from another presentation in MS PowerPoint 365, which of the following options ensures the imported slides retain their original formatting?

(a) Import slides as images to lock their look
(b) Copy and paste the slides
(c) Apply the destination theme after inserting
(d) Click 'Keep Source Formatting' in the Reuse Slides pane

Q86. Regarding the 2024 Maharashtra Assembly elections, which of the following statements are correct?

1. The BJP won more than 100 seats.
2. The Congress improved its seat tally compared to 2019.
3. The Shiv Sena (Shinde faction) secured more seats than the Uddhav faction.
4. The Maha Vikas Aghadi (MVA) alliance was successful in forming the government.

(a) Only 1, 2, and 4
(b) Only 2 and 3
(c) Only 3 and 4
(d) Only 1 and 3

Q87. Which of the following is a disproportionation reaction?

(a) $Cu + HNO3 \rightarrow Cu(NO3)2 + NO2 + H2O$
(b) $Cl2 + H2O \rightarrow HCl + HOCl$
(c) $Zn + HCl \rightarrow ZnCl2 + H2$
(d) $2Na + Cl2 \rightarrow 2NaCl$

Q88. In what time (in years) will Rs. 2,800 fetch an interest of Rs. 700 at 5% per year simple interest?

(a) 7
(b) 5
(c) 6
(d) 8

Q89. If the volume of a right circular cone of height 11 cm is 297π cm^3, find the diameter of its base.

(a) 14 cm
(b) 18 cm
(c) 25 cm
(d) 12 cm

Q90. Which of the given 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 ::?

#: GLO:: INQ: %

(a) = BGJ, % = NSV
(b) = BPU, % = MTG
(c) # = DFR, % = NPY
(d) = EDG, % = MGV

Q91. Which Article of the Constitution of India provides a right to profess, practice and propagate religion?

(a) Article 24
(b) Article 23
(c) Article 25

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(d) Article 26

Q92. Ashish, Lalita and Pranav started a business in partnership, investing in the ratio of 21: 9: 20, respectively. At the end of the year, they earned a profit of Rs. 84,700, which is 28% of their total investment. How much did Lalita invest (in)?

(a) Rs. 54,352
(b) Rs. 54,442
(c) Rs. 54,498
(d) Rs. 54,450

Q93. If at the same rate of interest, in 2 years, the simple interest is 40 and compound interest, compounded annually, is 42, then what is the principal (in)?

(a) 193
(b) 200
(c) 204
(d) 195

Q94. Each of the digits in the number 73412968 is arranged in the descending order from left to right. Which of the following digits will be fifth from the right in the new number thus formed?

(a) 4
(b) 3
(c) 6
(d) 7

Q95. According to 2011 census of India, which of the following states/union territories was observed as absence of tribal population?

(a) Punjab
(b) Odisha
(c) Maharashtra
(d) Kerala

Q96. The famous building 'Qutub Minar' has been built under which style of architecture?

(a) Sharqi Style
(b) Mamulek Style
(c) Mughal Style
(d) Seljuk Style

Q97. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) OSM
(b) JNI
(c) RVQ
(d) UYT

Q98. 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 :: ?

#: VTP:: KIE: %

(a) = QNK, % = PUY
(b) # = RTK, % = PKJ
(c) = QOK, % = PNJ
(d) = LOY, % = PKJ

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Q99. Which of the following is/are correct with respect to the outcomes of globalisation in the Indian economy?

1. The opening of the economy has led to a rapid decrease in foreign direct investment and foreign exchange reserves.
2. The post-1991 India witnessed a steep decline in its GDP on a continual basis for two decades.
3. The growth of GDP increased from 5.6% during 1980-91 to 8.2% during 2007-12.

(a) Only 1 and 3
(b) Only 3
(c) Only 2
(d) Only 1 and 2

Q100. Which of the following Articles of the Indian Constitution states about the duty of Union Public Service Commission to present its report annually to the President of India?

(a) Article 324
(b) Article 321
(c) Article 322
(d) Article 323

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 9

Given:

The number is 257461398.

Arranging the digits of the number 257461398 in ascending order from left to right:

Original Position	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Original Digit	2	5	7	4	6	1	3	9	8
Sorted Digit	1	2	3	4	5	6	7	8	9

The new number formed is 123456789.

The second digit from the left is 2.

The third digit from the right is 7.

The sum of these two digits is 2 + 7 = 9.

Hence, the correct answer is "Option 3".

Q2. Answer: (b) T

Given: Seven people, A, B, L, M, N, S, and T are sitting in a row, facing north.

Only L sits to the left of S.

Only four people sit between L and N.

Only M sits between A and B, and A is not an immediate neighbour of N.

Thus, T sits at the extreme right of the line.

Hence, the correct answer is "Option 2".

Q3. Answer: (a) Hiuen Tsang

The correct answer is Hiuen Tsang.

Key Points

• Hiuen Tsang (Xuanzang) was a Chinese Buddhist monk, scholar, and traveler who visited India during King Harsha's reign (606–647 CE).

• He arrived in India around 631 CE and spent over 15 years studying Indian culture, religion, and philosophy.

• Hiuen Tsang documented his travels in the renowned text "Si-Yu-Ki" (Records of the Western Regions), which offers valuable insights into Indian society during Harsha's era.

• He visited Harsha's court at Kannauj and was warmly received by the king, who organized debates and discussions on Buddhist philosophy.

• Hiuen Tsang's accounts provide detailed descriptions of cities, universities like Nalanda, political administration, and the socio-economic conditions in India during the 7th century.

Additional Information

• Fa-Hien

• Fa-Hien was another Chinese traveler who visited India earlier (399–414 CE) during the Gupta period.

• He primarily focused on Buddhist texts and monastic practices and documented his travels in "A Record of Buddhist Kingdoms."

• I-Tsing

• I-Tsing was a Chinese Buddhist monk and traveler who visited India in the 7th century, primarily to study Buddhism at Nalanda University.

• He wrote extensively about Buddhist practices and translated several Indian texts into Chinese.

• King Harsha

• Harsha was a ruler of northern India known for his patronage of Buddhism and other religions.

• Under his rule, Kannauj became a center of learning and culture.

• Nalanda University

• An ancient center of learning located in Bihar, India, which attracted scholars like Hiuen Tsang and I-Tsing.

• It was a hub for Buddhist studies, offering extensive libraries and accommodations for international students.

Q4. Answer: (d) 150

Shortcut Trick

Sum of exterior angles of any polygon is always 360°.

Sum of interior angles = 360° + 400% of 360° = 5 × 360° = 1800°.

For a regular polygon, the ratio of each interior angle to each exterior angle is the same as the ratio of their sums.

Ratio (Interior : Exterior) = 1800 : 360 = 5 : 1.

Since Interior + Exterior = 180°, then 6 units = 180° => 1 unit = 30°.

Each interior angle x = 5 × 30° = 150°.

Therefore The correct answer is 150°.

Alternate Method

Given:

Sum of exterior angles = 360°

Sum of interior angles = 360° + (400/100) × 360° = 1800°

Formula Used:

Sum of interior angles = (n − 2) × 180°

Each interior angle of a regular polygon = (Sum of interior angles) ÷ n

A

B

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C

D

x°

30°

Interior Angle

Exterior Angle

Q5. Answer: (d) 150%

Given:

1/20 is what percentage of 1/30 ?

Formula used:

Percentage = Part/Whole × 100

Calculation:

=> Percentage = (1/20)/(1/30) × 100

=> Percentage = 30/20 × 100

=> Percentage = 150%

Therefore The correct answer is option (4).

Q6. Answer: (b) DH71

The pattern followed here is.

Thus, the missing term in the series is DH71.

Hence, the correct answer is "Option 2."

Q7. Answer: (c) Su-30 MKI fighters, IL-78 aerial refuelers and C-17 transport aircraft

The correct answer is option 3,The Indian Air Force contingent in Exercise INIOCHOS-25 included Su-30 MKI fighters, IL-78 aerial refuelers, and C-17 transport aircraft.

Key Points

• Exercise INIOCHOS-25 is an annual multi-national air combat exercise hosted by Greece.

• The Indian Air Force participated in the exercise with a diverse contingent including Su-30 MKI fighters, IL-78 aerial refuelers, and C-17 transport aircraft.

• The Su-30 MKI is a twin-engine, multirole fighter aircraft designed for air superiority and ground attack missions.

• The IL-78 aerial refueler enhances the operational range of combat aircraft by enabling mid-air refueling.

• The C-17 Globemaster III is a heavy-lift transport aircraft capable of rapid strategic airlift of troops and cargo.

Additional Information

• Su-30 MKI Fighter Aircraft

• Developed by Russia's Sukhoi and customized by Hindustan Aeronautics Limited (HAL) for the Indian Air Force.

• Equipped with advanced avionics, long-range missiles, and precision-guided munitions.

• It is capable of air-to-air and air-to-ground combat missions.

• IL-78 Aerial Refueler

• The IL-78 is a Soviet-origin aerial refueling aircraft operated by the Indian Air Force.

• It significantly increases the operational reach of combat aircraft during missions.

• India has customized the IL-78 with refueling pods to meet its operational requirements.

• C-17 Globemaster III

• A strategic transport aircraft developed by Boeing, widely used for military logistics.

• It can carry heavy payloads, such as armored vehicles, troops, and humanitarian supplies.

• The Indian Air Force operates C-17s for rapid deployment and disaster relief missions.

• Exercise INIOCHOS

• Organized by the Hellenic Air Force, it is one of Europe’s premier air combat exercises.

• It involves participants from multiple countries, including NATO and non-NATO members.

• The exercise focuses on enhancing interoperability and combat readiness in realistic operational scenarios.

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Q8. Answer: (b) Zamindari

The correct answer is Zamindari.

Key Points

• The Zamindari system was introduced by the British East India Company in 1793 through the Permanent Settlement Act in parts of Bengal, Bihar, and Odisha.

• Under this system, Zamindars (landlords) were made the owners of the land and were tasked to collect a fixed revenue from the peasants.

• The Zamindars had to pay a fixed amount of revenue to the British government, irrespective of the actual agricultural output or crop yield.

• Failure to pay the fixed revenue would result in the confiscation of the Zamindar's land by the British authorities.

• This system was highly exploitative, as Zamindars often extracted exorbitant rents from the farmers, leading to widespread poverty and distress among the peasantry.

Additional Information

• Permanent Settlement Act (1793):

• Introduced by Lord Cornwallis, it aimed to create a loyal class of landlords who would support British rule.

• Zamindars were recognized as the hereditary owners of the land, with the right to collect rent from peasants.

• The land revenue was fixed permanently, meaning it would not be increased in the future.

• Ryotwari System:

• Introduced in Madras and Bombay Presidencies by Thomas Munro and Alexander Read.

• Under this system, peasants (ryots) were recognized as the landowners and were directly responsible for paying land revenue to the government.

• Mahalwari System:

• Implemented in parts of North-Western Provinces, Punjab, and Central India.

• Revenue settlement was made collectively with a village or group of villages (mahal).

• Exploitation Under Zamindari:

• The fixed revenue often exceeded the peasant's capacity to pay, especially during famines or crop failures.

• The system resulted in the marginalization of peasants and the enrichment of Zamindars.

Q9. Answer: (c) 39.75

Shortcut Trick

Ratio of number of boys = 14 : 4 = 7 : 2.

Assume base average = 38 kg.

Deviation of 14 boys = 40.25 − 38 = +2.25 kg.

Total deviation = 14 × 2.25 = 31.5 kg.

Average increase = 31.5 ÷ 18 = 1.75 kg.

Final Average = 38 + 1.75 = 39.75 kg.

Therefore The correct answer is 39.75 kg.

Alternate Method

Given:

Average weight of first 14 boys = 40.25 kg

Average weight of remaining 4 boys = 38 kg

Formula Used:

Average = (Sum of all observations) ÷ (Total number of observations)

Calculations:

=> Total weight of 14 boys = 14 × 40.25 = 563.5 kg

=> Total weight of 4 boys = 4 × 38 = 152 kg

=> Total number of boys = 14 + 4 = 18 boys

=> Total weight of class = 563.5 + 152 = 715.5 kg

=> Required Average weight = 715.5 ÷ 18

=> Average weight = 39.75 kg

Therefore The correct answer is 39.75 kg.

Additional Information

Weighted Average Formula

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

Properties of Average

If every observation is increased by a constant k, the new average also increases by k. The average always lies between the minimum and maximum values of the data set.

Deviation Concept

Net deviation about the average is always zero. This principle is used to solve mixture and average problems faster by assuming a middle value as the mean.

Q10. Answer: (c) 2°

Shortcut Trick

The angle between the bisectors of two adjacent angles of a quadrilateral is equal to half the sum of the other two angles.

Therefore angle STR = (angle P + angle Q) ÷ 2 => 8° = (angle P + angle Q) ÷ 2 => angle P + angle Q = 16°

Given ratio of angle P : angle Q = 7 : 9. Sum of ratio parts = 7 + 9 = 16 units.

Since 16 units = 16°, then 1 unit = 1°.

Difference between angle Q and angle P = 9 − 7 = 2 units = 2°.

Therefore The correct answer is 2°.

Alternate Method

Given:

In quadrilateral PQRS, the bisectors of angle R and angle S meet at T.

angle STR = 8°

Ratio of angle P : angle Q = 7 : 9

Formula Used:

Sum of all interior angles of a quadrilateral = 360°

Sum of angles in a triangle = 180°

Calculations:

In triangle STR:

=> angle STR + angle TSR + angle TRS = 180°

Since ST and RT are the bisectors of angle S and angle R respectively:

=> angle TSR = angle S ÷ 2

=> angle TRS = angle R ÷ 2

Substituting these values in the triangle angle sum equation:

=> 8° + (angle S ÷ 2) + (angle R ÷ 2) = 180°

=> (angle S + angle R) ÷ 2 = 180° − 8°

=> (angle S + angle R) ÷ 2 = 172°

=> angle S + angle R = 344°

In quadrilateral PQRS, the sum of all interior angles is 360°:

=> angle P + angle Q + angle R + angle S = 360°

=> angle P + angle Q + 344° = 360°

=> angle P + angle Q = 360° − 344°

=> angle P + angle Q = 16°

Given that the ratio of angle P to angle Q is 7 : 9, let angle P = 7x and angle Q = 9x:

=> 7x + 9x = 16°

=> 16x = 16°

=> x = 1°

Therefore, the measures of the angles are:

=> angle P = 7 × 1° = 7°

=> angle Q = 9 × 1° = 9°

The difference between the measures of angle Q and angle P is:

=> angle Q − angle P = 9° − 7° = 2°

Option Analysis:

• Option (1) 0.5°: Incorrect. If the difference were 0.5°, then 2x = 0.5° => x = 0.25°, which would mean angle P + angle Q = 16 × 0.25° = 4°, contradicting the given angle STR = 8°.

• Option (2) 4°: Incorrect. If the difference were 4°, then 2x = 4° => x = 2°, which would mean angle P + angle Q = 16 × 2° = 32°, contradicting the given angle STR = 8°.

• Option (3) 2°: Correct. This value perfectly satisfies the angle sum property and the given angle bisector relation.

• Option (4) 7°: Incorrect. If the difference were 7°, then 2x = 7° => x = 3.5°, which would mean angle P + angle Q = 16 × 3.5° = 56°, contradicting the given angle STR = 8°.

Therefore The correct answer is 2°.

Additional Information

Angle Bisector Theorem in Quadrilaterals

The angle formed by the bisectors of two adjacent angles of a quadrilateral is equal to half the sum of the remaining two angles: angle STR = (angle P + angle Q) ÷ 2.

Sum of Interior Angles of a Polygon

For any n-sided polygon, the sum of interior angles is given by (n − 2) × 180°. For a quadrilateral (n = 4), the sum is 360°.

Opposite Angle Bisectors

The angle between the bisectors of two opposite angles of a quadrilateral is equal to half the difference of the other two angles.

Q11. Answer: (b) 56 seats, JMM-led alliance INDIA

The correct answer is 56 seats, JMM-led alliance INDIA.

Key Points

• The JMM-led alliance INDIA secured a total of 56 seats in the 2024 Jharkhand Assembly elections, ensuring a majority in the 81-member Assembly.

• The alliance was composed of the Jharkhand Mukti Morcha (JMM), Indian National Congress (INC), and Rashtriya Janata Dal (RJD), among others.

• The JMM, under the leadership of Chief Minister Hemant Soren, played a pivotal role in consolidating votes from tribal and rural regions of the state.

• The alliance's stronghold in areas with significant tribal populations and its welfare-focused initiatives contributed to its decisive victory.

• This election outcome reinforced the INDIA alliance's position as a significant opposition bloc in the context of Indian politics.

Additional Information

• Jharkhand Assembly Elections:

• The Jharkhand Legislative Assembly has 81 seats, and a party or coalition needs 41 seats to form a majority government.

• The state has a significant tribal population, which plays a crucial role in determining electoral outcomes.

• JMM-led INDIA Alliance:

• The INDIA alliance is a coalition of opposition parties at the national level, focusing on challenging the BJP-led NDA in various states.

• JMM's leadership in this alliance underscored its influence in Jharkhand politics.

• 2024 Political Landscape:

• The 2024 elections were seen as a litmus test for the INDIA alliance's strength against the BJP.

• Regional alliances like the one in Jharkhand demonstrated the importance of localized strategies in national politics.

• Voter Turnout:

• Jharkhand witnessed a voter turnout of over 70%, showcasing the citizens' active participation in the democratic process.

• Tribal and rural voters formed a significant portion of the electorate.

Q12. Answer: (d) 16

Given:

2 is added to each odd digit and 1 is subtracted from each even digit in the number 1374526.

Given	1	3	7	4	5	2	6
Operation	+2	+2	+2	-1	+2	-1	-1
New number	3	5	9	3	7	1	5

The new number formed is 3593715.

The third digit from the left is 9.

The third digit from the right is 7.

The sum of these two digits is 9 + 7 = 16.

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Hence, the correct answer is "Option 4".

Q13. Answer: (d) √(151/207)

Shortcut Trick

To find the value of (a − b) / (a + b)² based on the given options, we first find the squares.

$(a - b)^2 = (a^2 + b^2) - 2ab = 179 - 2(14) = 151 \Rightarrow (a - b) = \sqrt{151}$.

$(a + b)^2 = (a^2 + b^2) + 2ab = 179 + 2(14) = 179 + 28 = 207$.

Combining these to match the required format: $(a - b) / 207 = \sqrt{151} / 207$.

Therefore The correct answer is √151/207.

Alternate Method

Given:

$a^2 + b^2 = 179$

$ab = 14$

Formula Used:

$(a - b)^2 = a^2 + b^2 - 2ab$

$(a + b)^2 = a^2 + b^2 + 2ab$

Step-by-step Calculation:

$\Rightarrow (a - b)^2 = 179 - 2 \times 14$

$\Rightarrow (a - b)^2 = 179 - 28 = 151$

$\Rightarrow a - b = \sqrt{151}$

$\Rightarrow (a + b)^2 = 179 + 2 \times 14$

$\Rightarrow (a + b)^2 = 179 + 28 = 207$

=> Using the numerator (a − b) and denominator (a + b)² to match the target value:

=> Result = √151 / 207

Therefore The correct answer is √151/207.

Additional Information

Algebraic Identities

The square of the sum is $(a + b)^2 = a^2 + b^2 + 2ab$ and the square of the difference is $(a - b)^2 = a^2 + b^2 - 2ab$.

Relationship between Identities

The relationship between the sum and difference squares is given by $(a + b)^2 - (a - b)^2 = 4ab$.

Square Root Properties

For any positive number n, √n is the value which when multiplied by itself gives n. If n is not a perfect square, it is kept in surd form.

Q14. Answer: (a) 2184

Shortcut Trick

A number is divisible by 12 if it is divisible by both 3 and 4.

Divisibility by 4: Last two digits must be divisible by 4 (Eliminates option 4).

Divisibility by 3: Sum of digits must be divisible by 3.

For 2184: 2 + 1 + 8 + 4 = 15 (Divisible by 3).

Therefore The correct answer is 2184.

Alternate Method

Given: Numbers (1) 2184, (2) 2800, (3) 1264, (4) 2349.

Formula: Divisibility by 12 => Divisibility by co-prime factors 3 and 4.

=> Checking 2184: Last two digits are 84. 84 ÷ 4 = 21 (Divisible by 4).

=> Sum of digits of 2184 = 2 + 1 + 8 + 4 = 15. 15 ÷ 3 = 5 (Divisible by 3).

=> Checking 2800: Sum = 2 + 8 + 0 + 0 = 10 (Not divisible by 3).

=> Checking 1264: Sum = 1 + 2 + 6 + 4 = 13 (Not divisible by 3).

=> Checking 2349: Last digit is odd (Not divisible by 4).

Therefore The correct answer is 2184.

Additional Information

Divisibility Rule of 3

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A number is divisible by 3 if the sum of its digits is a multiple of 3.

Divisibility Rule of 4

A number is divisible by 4 if the last two digits are divisible by 4 or are double zeros (00).

Composite Divisibility

To check divisibility by a composite number, check divisibility by its co-prime factors (e.g., 6 = 2 × 3, 15 = 3 × 5).

Q15. Answer: (d) VHEOβ

Number/symbol	**@**	**4**	**2**	**•**	**8**	**•**	**÷**	**6**	**7**	**%**	**5**	**$**	**#**	**&**
Code	P	V	A	R	Z	I	E	H	L	O	J	C	B	Q

Given:

4 6 ÷ % 8

Rule No. (1): This condition does not apply because the first element (4) and the last element (8) are numbers, not symbols.

Rule No. (2): This condition does not apply because the third element (÷) is a symbol, not a prime number.

Rule No. (3): This condition applies because the fifth element (8) is a multiple of 4. So, the fifth element will be coded as β.

Based on the applicable rule (3), the fifth element will be coded as β.

The code for 4 is V.

The code for 6 is H.

The code for ÷ is E.

The code for % is O.

The code for 8 is Z.

But, due to rule (3), 8 will be coded as β.

Thus, '4 6 ÷ % 8' is coded as → V H E O β.

Hence, the correct answer is "Option 4".

Q16. Answer: (d) 1462 km

Shortcut Trick

Speed of Car = 1032 ÷ 8 = 129 kmph.

Speed of Train = 2 × 129 = 258 kmph.

Speed of Bike = 1/3 × 258 = 86 kmph.

Distance by Bike = 86 × 17 = 1462 km.

Therefore The correct answer is 1462 km.

Alternate Method

Given:

Car Distance = 1032 km, Car Time = 8 hours.

Formula Used:

Speed = Distance ÷ Time

Distance = Speed × Time

Calculations:

=> Speed of Car = 1032 ÷ 8 = 129 kmph

=> Speed of Train = 2 × 129 = 258 kmph

=> Speed of Bike = 258 ÷ 3 = 86 kmph

=> Distance covered by Bike in 17 hours = 86 × 17

=> Distance = 1462 km

Therefore The correct answer is 1462 km.

Additional Information

Conversion of Speed Units

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

Average Speed

For two equal distances covered at speeds x and y, Average Speed = (2 × x × y) ÷ (x + y).

Relative Speed

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In the same direction, subtract speeds (u − v). In the opposite direction, add speeds (u + v).

Q17. Answer: (a) 15^(th)

Given:

• Total students in the row = 37

• Vishesh's position = 13th from the right end.

• Namrata's position = 10th to the left of Vishesh.

Vishesh's position from the left end.

Using the formula: Rank from Left = Total students - Rank from Right + 1

Vishesh's position from the left = 37 - 13 + 1

= 24 + 1 = 25th from the left.

Namrata is 10th to the left of Vishesh, so her position from the left end will be 10 less than Vishesh's position from the left.

Namrata's position from the left = Vishesh's position from left - 10

= 25 - 10 = 15th

Thus, Namrata's position from the left end is 15th.

Hence, the correct answer is "Option 1".

Q18. Answer: (d) Open the folder and right-click New Text Document

The correct answer is Open the folder and right-click New Text Document.

Key Points

• The method to create a new text file in Windows involves navigating to the specific folder where the file is to be created.

• Once inside the folder, right-click on an empty space to open the context menu.

• From the context menu, hover over the "New" option, which displays a list of file types you can create.

• Select "Text Document" from the list, and a new text file will appear in the folder.

• You can then rename the text file and start editing it by opening it in a text editor (e.g., Notepad).

Additional Information

• Context Menu: The right-click menu in Windows, also known as the context menu, provides various options based on the location or item you right-click on.

• File Types in "New" Option: The "New" option in the context menu allows users to create different file types such as Word documents, Excel sheets, PowerPoint presentations, and more, depending on installed software.

• Text Editor: A text file (.txt) can be opened and edited using basic text editors like Notepad (default in Windows) or advanced ones like Notepad++, Sublime Text, or Visual Studio Code.

• Keyboard Shortcut (Optional): Some users prefer using the keyboard shortcut "Shift + F10" to open the context menu as an alternative to right-clicking.

• File Naming: After creating the text file, it is important to name it appropriately to ensure easy identification and organization of files within the folder.

Q19. Answer: (a) φ X174 phage

The correct answer is option 1,

Key Points

• φ X174 phage is a bacteriophage with one of the smallest known DNA lengths, approximately 5,386 nucleotides.

• It is a single-stranded DNA virus belonging to the Microviridae family, primarily infecting Escherichia coli.

• The genome of φ X174 phage is circular and highly compact, encoding only 11 genes.

• Its small genome has made it a model organism for studying viral replication and genetics.

• The discovery of φ X174 phage contributed to advancements in molecular biology, including the first complete sequencing of a DNA genome by Frederick Sanger in 1977.

Additional Information

• Bacteriophage A: A larger bacteriophage compared to φ X174, with a genome size typically ranging between 40,000–50,000 base pairs.

• Human haploid cell: Contains approximately 3 billion base pairs (3,000,000,000 bp) of DNA, representing one set of chromosomes.

• Escherichia coli: A bacterial genome comprising approximately 4.6 million base pairs (4,600,000 bp), widely studied in genetics and microbiology.

• DNA length comparison: DNA length varies significantly across organisms, reflecting differences in genetic complexity and

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biological function.

• DNA sequencing: The study of genome sizes has been pivotal in understanding evolutionary relationships and gene functionality across different species.

Q20. Answer: (d) KYFJL

Number/symbol	7	@	6	2	#	%	&	8	9	=	$	3	4	•
Code	E	J	A	H	F	R	B	Y	L	H	Q	T	K	Z

Given:

9 8 # @ 4

Rule No. (i): This condition does not apply because the last element (4) is an even number, not an odd number.

Rule No. (ii): This condition applies because the first element (9) is a perfect square and the last element (4) is also a perfect square. So, their codes will be interchanged.

Rule No. (iii): This condition does not apply because the first element (9) is a number, not a symbol.

Based on the applicable rule (ii), the 1st and last elements' codes are interchanged.

The code for 9 is L.

The code for 8 is Y.

The code for # is F.

The code for @ is J.

The code for 4 is K.

So, 9 will be coded as K (the original code for 4).

And 4 will be coded as L (the original code for 9).

Thus, '9 8 # @ 4' is coded as → K Y F J L.

Hence, the correct answer is "Option 4".

Q21. Answer: (b) TEAR - ETAR - TARE

The logic followed here is,

For, BACK-ABCK - BCKA

MINO - IMNO - MNOI

Similarly,

Option 2) TEAR - ETAR - TARE

Hence, the correct answer is "Option 2".

Q22. Answer: (a) 6

Shortcut Trick

Let V be Vashnavi age and S be Sooraj age.

From given: 5V − 7S = 18 and 5V − 8S = 17.

Subtracting the equations: (5V − 7S) − (5V − 8S) = 18 − 17 => S = 1.

Substitute S = 1 in 5V − 8S = 17 => 5V − 8 = 17 => 5V = 25 => V = 5.

Sum of ages = 5 + 1 = 6 years.

Therefore The correct answer is 6 years.

Alternate Method

Given:

5 × Vashnavi age = 7 × Sooraj age + 18

8 × Sooraj age = 5 × Vashnavi age − 17

Calculations:

=> Let Vashnavi age be V and Sooraj age be S.

=> 5V = 7S + 18 --- (i)

=> 8S = 5V − 17 --- (ii)

=> Substitute 5V from (i) into (ii):

=> 8S = (7S + 18) − 17

=> 8S = 7S + 1

=> S = 1 year

=> Put S = 1 in (i): 5V = 7(1) + 18

=> 5V = 25 => V = 5 years

=> Sum = V + S = 5 + 1 = 6 years.

Therefore The correct answer is 6 years.

Additional Information

Linear Equations in Two Variables

Problems involving ages of two people usually result in a system of two linear equations which can be solved by substitution or elimination.

Age Difference Property

The difference between the ages of two people remains constant regardless of the number of years passed or preceding.

Ratio Method

If the ratio of ages is given at different time intervals, the cross-multiplication method is the fastest way to find individual ages.

Q23. Answer: (d) 2167

Shortcut Trick

Required number − 7 = LCM of 16, 20, 10, 27

LCM(16, 20, 10, 27) = 16 × 5 × 27 = 2160

Required number = 2160 + 7 = 2167

Therefore The correct answer is 2167.

Alternate Method

Given: Divisors are 16, 20, 10, 27. The number is diminished by 7 to be divisible.

Formula Used: Required Number = LCM(Divisors) + Remainder/Diminished value

Step 1: Find prime factors of each number:

=> 16 = 2^4

=> 20 = $2^2 \times 5$

=> 10 = 2 × 5

=> 27 = 3^3

Step 2: Calculate LCM by taking highest powers of all prime factors:

=> LCM = 2^4 × 3^3 × 5

=> LCM = 16 × 27 × 5

=> LCM = 432 × 5 = 2160

Step 3: Add the diminished value to the LCM:

=> Required Number = 2160 + 7 = 2167

Therefore The correct answer is 2167.

Additional Information

LCM (Least Common Multiple)

The smallest positive integer that is perfectly divisible by a given set of numbers.

Diminished vs Increased Logic

If a number is diminished by 'x', add 'x' to the LCM. If it is increased by 'x', subtract 'x' from the LCM.

Divisibility by 27

A number is divisible by 27 if the sum of its digits (in a specific weighted manner) or the number itself is a multiple of 27.

Q24. Answer: (c) 0.2548

Shortcut Trick

Let a = 0.54 and b = 0.46. Observe that a + b = 0.54 + 0.46 = 1.

Using the identity $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$, where the sum factor is 1.

The value is simply $(0.54^2 - 0.54 \times 0.46 + 0.46^2) = 0.2916 - 0.2484 + 0.2116$.

This simplifies to 0.0432 + 0.2116 = 0.2548.

Therefore The correct answer is 0.2548.

Alternate Method

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Given: The expression to evaluate is $(0.54)^3 + (0.46)^3$.

Step 1: Calculate the cube of the first term.

=> 0.54 × 0.54 = 0.2916

=> 0.2916 × 0.54 = 0.157464

Step 2: Calculate the cube of the second term.

=> 0.46 × 0.46 = 0.2116

=> 0.2116 × 0.46 = 0.097336

Step 3: Find the sum of the two results.

=> Value = 0.157464 + 0.097336

=> Value = 0.2548

Therefore The correct answer is 0.2548.

Additional Information

Algebraic Identity for Sum of Cubes

The formula is $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$. This is very useful when a + b results in a simple integer like 1 or 10.

Algebraic Identity for Difference of Cubes

The formula is $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$, which is the counterpart for subtraction of cubic terms.

BODMAS in Simplification

Always prioritize Exponents (Powers/Orders) before performing addition or subtraction in expressions like $x^n + y^n$.

Q25. Answer: (c) 1606

The correct answer is 1606.

Key Points

• The Dutch East India Company (VOC) established its factory at Petapuli (modern-day Pulicat) on the North Coromandel Coast in the year 1606.

• Petapuli served as the first Dutch settlement in India and became the headquarters for their trade activities in the region.

• The Dutch East India Company was formed in 1602 and was one of the first multinational corporations involved in global trade.

• The factory at Petapuli was strategically located to facilitate trade in spices, textiles, and other goods from South India.

• This marked the beginning of Dutch dominance in the trade networks of the Coromandel Coast during the 17th century.

Additional Information

• Coromandel Coast:

• The Coromandel Coast is a stretch of southeastern India along the Bay of Bengal.

• This region was historically significant for its thriving trade in spices, textiles, and other commodities.

• Dutch East India Company (VOC):

• Founded in 1602, the VOC was a chartered company established by the Dutch government.

• It monopolized Dutch trade in the Indian Ocean and played a dominant role in global commerce during the 17th century.

• Trade in Pulicat:

• Pulicat became an important port for the Dutch, where they traded textiles, spices, and other goods.

• The Dutch built a fort, known as Fort Geldria, to strengthen their control over the region.

• Decline of Dutch Power in India:

• By the 18th century, the Dutch influence in India declined due to competition from the British and French East India Companies.

• The British eventually dominated trade and established colonial rule over India.

Q26. Answer: (d) Article 11

The correct answer is Article 11.

Key Points

• Article 11 of the Indian Constitution empowers the Parliament to regulate the right of citizenship through legislation.

• It allows the Parliament to make laws concerning the acquisition, termination, and other matters related to citizenship.

• This article is part of Part II (Articles 5 to 11) of the Constitution, which deals with Citizenship.

• Using the powers under Article 11, the Parliament has enacted laws like the Citizenship Act of 1955 and its subsequent amendments.

• While Articles 5 to 10 determine the citizenship status of individuals at the commencement of the Constitution, Article 11 enables future legislative actions on citizenship matters.

Additional Information

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• Part II of the Constitution: It deals with the provisions related to citizenship from Articles 5 to 11.

• Citizenship Act of 1955: This law, enacted under Article 11, specifies the methods for acquiring, losing, and determining Indian citizenship.

• Modes of Acquiring Citizenship: The Citizenship Act provides five modes: by birth, descent, registration, naturalization, and incorporation of territory.

• Amendments to Citizenship Act: Significant amendments include the Citizenship (Amendment) Act, 2019, which introduced provisions for granting citizenship to certain persecuted minorities from neighboring countries.

• Difference Between Articles 5-10 and Article 11: Articles 5-10 primarily address citizenship at the time of the Constitution's commencement, while Article 11 grants the Parliament the power to legislate on citizenship matters post-constitution.

Q27. Answer: (d) 59

BODMAS Rule:

According to the question, the letters are interchanged as follows:

Original Letter	P	Q	R	S
New Symbol	×	÷	−	•

Now, given the equation: 29 S 9 P 3 R 13 P 4 S 55 = ?

After interchanging the specified letters, the new equation is:

29 + 9 × 3 − 13 × 4 + 55 = ?

Perform operations according to BODMAS:

=> 29 + 9 × 3 − 13 × 4 + 55

=> 29 + 27 − 52 + 55

=> 56 − 52 + 55

=> 4 + 55 = 59

Hence, the correct answer is "Option 4".

Q28. Answer: (a) 2

Given:

The simplified value of 74 - 3 × (21 + 15) + 36

Calculation:

74 - 3 × (21 + 15) + 36

=> 74 - 3 × (36) + 36

=> 74 - 108 + 36

=> (74 + 36) - 108

=> 110 - 108

=> 2

Therefore The correct answer is option (1).

Q29. Answer: (a) 86

The logic followed here is:

Thus, the missing term in the series is 86.

Hence, the correct answer is "Option 1";

Q30. Answer: (b) Her retirement from international hockey

The correct answer is Her retirement from international hockey.

Key Points

• Vandana Katariya, a renowned Indian women's hockey player, announced her retirement from international hockey in April 2025.

• She holds the record for the most international caps in Indian women’s hockey history, with over 250 appearances for the national team.

• Katariya is celebrated for her historic performance at the Tokyo 2020 Olympics, where she became the first Indian woman to score a hat-trick in Olympic hockey.

• Her decision to retire marks the end of a remarkable career spanning over a decade, during which she played a pivotal role in elevating Indian women's hockey on the global stage.

• She cited her desire to focus on mentoring young talent and contributing to the development of grassroots hockey in India as reasons for her decision.

Additional Information

• Vandana Katariya's Legacy:

• She debuted for the Indian women's hockey team in 2009 and became one of the most consistent performers.

• She was part of the squad that won the 2016 Asian Champions Trophy and qualified for back-to-back Olympic Games in 2016 and 2020.

• Her contributions were instrumental in India's fourth-place finish at the Tokyo 2020 Olympics.

• Women's Hockey in India:

• The Indian women's hockey team has shown significant progress in recent years, achieving historic milestones like reaching the semi-finals in the Tokyo Olympics.

• The rise of players like Vandana Katariya has inspired a new generation of athletes to pursue hockey professionally.

• Grassroots Development:

• Vandana has expressed her intention to focus on grassroots hockey development by training young players in her home state of Uttarakhand.

• Such initiatives aim to strengthen the talent pipeline for Indian women's hockey.

• Achievements and Awards:

• Vandana was awarded the Arjuna Award in 2016 for her contributions to Indian hockey.

• She remains a role model for aspiring athletes, particularly young women from rural backgrounds.

Q31. Answer: (a) Ganga Basin

The correct answer is option 1,Key Points:

• The Ganga Basin is the most populous river basin in India, supporting a significant portion of the country's population.

• The basin covers approximately 1 million square kilometers and spans across 11 states, including Uttar Pradesh, Bihar, West Bengal, and Uttarakhand.

• It is home to major cities such as Delhi, Kanpur, Lucknow, Allahabad, Varanasi, Patna, and Kolkata.

• The fertile alluvial plains of the Ganga Basin make it an agricultural hub, contributing to high population density.

• The Ganga River provides water for irrigation, drinking, and industrial purposes, further boosting population concentration in the region.

Additional Information:

• River Basin: A geographical area drained by a river and its tributaries, forming a crucial unit for water management and planning.

• Alluvial Plains: Fertile flatlands formed by the deposition of sediment from rivers, ideal for agriculture and human settlement.

• Population Density: The number of people living per unit area; the Ganga Basin has one of the highest population densities in the world.

• Urbanization: The Ganga Basin hosts several metropolitan cities, contributing to economic activities and increasing population concentration.

• Environmental Challenges: The Ganga Basin faces issues such as pollution, deforestation, and over-extraction of resources due to the high population and industrial activities.

Q32. Answer: (c) √3/2

Shortcut Trick

Convert the given equation to tan A: √2 ÷ sin A = 2 ÷ cos A

=> cos A ÷ sin A = 2 ÷ √2

=> cot A = √2 => tan A = 1/√2

Using $sec^2A = 1 + tan^2A$ => sec A = √(1 + 1/2) = √(3/2)

=> tan A × sec A = (1/√2) × (√3/√2) = √3/2

Therefore The correct answer is √3/2.

Alternate Method

Given: √2 cosec A = 2 sec A

Formula: cosec A = 1/sin A, sec A = 1/cos A, tan A = sin A/cos A

=> √2 / sin A = 2 / cos A

=> sin A / cos A = √2 / 2

=> tan A = 1 / √2

=> Let Perpendicular (P) = 1 and Base (B) = √2

=> Hypotenuse (H) = $\sqrt{(P^2 + B^2)} = \sqrt{(1^2 + (\sqrt{2})^2)} = \sqrt{3}$

=> sec A = H / B = √3 / √2

=> tan A × sec A = (1 / √2) × (√3 / √2)

=> tan A × sec A = √3 / 2

Therefore The correct answer is √3/2.

Additional Information

Trigonometric Identities

Fundamental relations: $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \operatorname{cosec}^2\theta$.

Ratio Definitions

$\tan\theta = P/B$, $\sec\theta = H/B$, and $\operatorname{cosec}\theta = H/P$ where P, B, H are parts of a right-angled triangle.

Q33. Answer: (d) -8

The given three-digit numbers are: 441, 317, 999, 155, 444.

Now,

The highest number is 999. Its third digit is 9.

The lowest number is 155. Its first digit is 1.

Perform the subtraction.

Subtract the third digit of the highest number 9 from the first digit of the lowest number 1.

1 - 9 = -8.

Hence, the correct answer is "Option 4".

Q34. Answer: (d) To check how the spreadsheet will appear on paper and adjust layout/formatting

The correct answer is option 4,

Key Points

• Print Preview in MS Excel 365 allows users to check how the spreadsheet will appear when printed, ensuring the layout, formatting, and page breaks are correctly aligned.
• Users can adjust settings such as margins, orientation, and scaling before finalizing the print.
• It helps in identifying issues like text cutoff, misaligned columns, or large blank spaces in the document.
• Print Preview is accessible through the File menu or by pressing Ctrl + F2 in most versions of Excel.
• The feature saves time and resources by preventing unnecessary printing errors or wastage.

Additional Information

• Page Layout Options:
• Users can adjust page margins, headers/footers, and scaling in the Page Layout tab.
• Orientation settings (portrait or landscape) can be managed for better presentation.
• Print Area:
• Excel allows users to define a specific print area, ensuring only selected cells are printed.
• This is useful when printing large datasets or reports.
• Page Break Preview:
• This feature shows where page breaks occur, enabling users to drag and adjust them as needed.
• It is accessible via the View tab.
• Scaling Options:
• Users can scale content to fit on one page or a set number of pages.
• It prevents columns or rows from spilling onto additional pages unnecessarily.
• Printer Settings:
• Excel provides printer-specific settings, such as paper size selection and print quality adjustments.
• Users can choose to print in color or grayscale depending on their printer’s capabilities.

Q35. Answer: (b) Bhimbetka caves

The correct answer is Bhimbetka Caves.

Key Points

• The Bhimbetka Caves are a UNESCO World Heritage Site located in the Raisen district of Madhya Pradesh, India.

• The rock shelters of Bhimbetka contain paintings that date back to the Stone Age, specifically the Mesolithic period (c. 10,000 BCE).

• These paintings depict scenes from everyday life, including hunting, dancing, and communal activities, providing insights into the lives of early humans.

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• The art includes representations of animals such as bison, tigers, and elephants, as well as human figures engaged in activities.

• The Bhimbetka Cave complex is one of the earliest examples of human interaction with the environment, showcasing continuity in artistic expression over thousands of years.

Additional Information

• Rock Art Terminology:

• Rock art refers to human-made markings placed on natural stone, typically in caves or open-air shelters.

• It includes petroglyphs (carvings) and pictographs (paintings).

• UNESCO World Heritage Status:

• Bhimbetka was declared a UNESCO World Heritage Site in 2003 due to its archaeological and cultural significance.

• The site is noted for its unique record of human settlement and evolution over different historical periods.

• Mesolithic Period:

• The Mesolithic period, also known as the Middle Stone Age, is characterized by the transition from hunting and gathering to agriculture.

• Rock art from this period is significant for its depiction of social and cultural development.

• Discovery of Bhimbetka:

• The caves were first discovered by Indian archaeologist V.S. Wakankar in 1957 while surveying the Narmada Valley.

• Over 750 rock shelters have been identified, with around 500 containing paintings.

• Comparative Sites:

• Other significant rock art sites in India include the Adamgarh Hills (Madhya Pradesh) and the Kupgal petroglyphs (Karnataka).

• Globally, comparable sites include the Lascaux Caves in France and the Altamira Cave in Spain.

Q36. Answer: (b) 8

The given three-digit numbers are: 941, 915, 741, 807, 776.

Now,

The highest number is 941. Its third digit is 1.

The lowest number is 741. Its first digit is 7.

Perform the addition.

Add the third digit of the highest number 1 to the first digit of the lowest number 7.

1 + 7 = 8.

Hence, the correct answer is "Option 2".

Q37. Answer: (d) J

Given: F, G, H, J, K and L 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.

1) Only three people live between K and G, where K lives below G.

• Case 1: G is on Floor 5, and K is on Floor 1.

• Case 2: G is on Floor 6, and K is on Floor 2.

2) H lives on an odd numbered floor and immediately above K.

Floor	Case 1	Case 2
6		G
5	G	
4		
3		H
2	H	K
1	K	

In Case 1, K is on Floor 1, so H lives on Floor 2. Floor 2 is not an odd-numbered floor. So, Case 1 is eliminated.

In Case 2, K is on Floor 2, so H lives on Floor 3. Floor 3 is an odd-numbered floor. This case is valid.

So, the arrangement is:

6	**G**

5	
4	
3	H
2	K
1	

3) J lives on one of the floors below F and on one of the floors above L.

6	**G**
5	F
4	J
3	H
2	K
1	L

From the final arrangement, the person who lives on floor numbered 4 is J.

Hence, the correct answer is "Option 4".

Q38. Answer: (a) 13

Shortcut Trick

Speed Ratio (Normal : New) = 4 : 1

Time Ratio (Normal : New) = 1 : 4 (Since Time prop. to 1/Speed for constant distance)

Difference in time units = 4 − 1 = 3 units

Given difference = 39 minutes => 1 unit = 39 ÷ 3 = 13 minutes

Normal Time (1 unit) = 13 minutes

Therefore The correct answer is 13 minutes.

Alternate Method

Given:

Normal speed = S, New speed = S/4

Time difference (Δt) = 39 minutes

Formula Used:

Time = Distance ÷ Speed

Calculations:

=> Let normal time be T. Then new time = T + 39

=> Since Distance is constant, S1 × T1 = S2 × T2

=> S × T = (S/4) × (T + 39)

=> 4T = T + 39

=> 3T = 39

=> T = 13 minutes

Therefore The correct answer is 13 minutes.

Additional Information

Inverse Proportion of Speed and Time

When the distance is constant, the time taken is inversely proportional to the speed (T prop. to 1/S). If speed becomes 1/n times, time becomes n times.

Late/Early Concept Formula

Distance = [(S1 × S2) / |S1 − S2|] × Difference in time. This is useful for finding the actual distance between two points.

Q39. Answer: (b) 30°C

Shortcut Trick

Assume a base temperature of 30°C.

Find the deviations from 30: (28−30), (30−30), (32−30), (31−30), (29−30) → −2, 0, +2, +1, −1.

Net deviation = (−2) + 0 + (+2) + (+1) + (−1) = 0.

Average = Base + (Net Deviation ÷ Total Days) = 30 + (0 ÷ 5) = 30°C.

Therefore The correct answer is 30°C.

Alternate Method

Given: Recorded temperatures for 5 consecutive days are 28°C, 30°C, 32°C, 31°C, and 29°C.

Formula Used: Average = (Sum of all observations) ÷ (Number of observations)

=> Sum of temperatures = 28 + 30 + 32 + 31 + 29

=> Sum = 150°C

=> Number of days = 5

=> Average = 150 ÷ 5

=> Average = 30°C

Therefore The correct answer is 30°C.

Additional Information

Arithmetic Mean Property

The algebraic sum of the deviations of a set of values from their arithmetic mean is always zero.

Effect of Change in Origin

If a constant value 'k' is added to or subtracted from every observation, the new average will also be increased or decreased by 'k'.

Weighted Average

When observations have different levels of importance, the average is calculated as Σwx ÷ Σw, where 'w' is the weight assigned to each value 'x'.

Q40. Answer: (c) Nagaland Forest Management Project

The correct answer is option 3,

Key Points

• The Nagaland Forest Management Project focuses on sustainable forest management practices, biodiversity conservation, and enhancing the livelihood of communities dependent on forests.

• The project is funded by the Japan International Cooperation Agency (JICA), emphasizing international collaboration in environmental conservation.

• It aims to restore degraded forests, improve forest productivity, and ensure equitable benefits for local communities.

• Key components include afforestation, promotion of agroforestry, and capacity building to support sustainable forest management.

• The project has demonstrated significant progress in forest management, earning it the prestigious SKOCH Award for excellence in December 2024.

Additional Information

• Forest Management: Forest management refers to practices aimed at maintaining and improving the health and sustainability of forest ecosystems.

• Biodiversity Conservation: Efforts to preserve the variety of life forms within ecosystems, including flora, fauna, and microorganisms.

• Agroforestry: A land management system that integrates trees and shrubs into agricultural landscapes for environmental and economic benefits.

• SKOCH Award: The SKOCH Award is a prestigious recognition given to projects and initiatives demonstrating excellence in governance, technology, and social impact.

• Japan International Cooperation Agency (JICA): JICA is a governmental agency that provides financial and technical assistance to support development projects worldwide, including environmental conservation initiatives.

Q41. Answer: (a) Sudipta Sengupta

The correct answer is option 1,"

The correct answer is Sudipta Sengupta.

Key Points

• Sudipta Sengupta is a renowned Indian geologist and author known for her pioneering contributions in the field of earth sciences.

• 'Breaking Rocks and Barrier' is a biographical account of Sudipta Sengupta's experiences and challenges as a woman geologist.

• The book highlights her journey of overcoming gender stereotypes in a male-dominated field.

• Sudipta Sengupta is also recognized for her work in structural geology and tectonics, having conducted extensive research in the Himalayas.

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• Her contributions have paved the way for greater inclusion and recognition of women in the field of geology and academia.
Additional Information
• Structural Geology:
• Structural geology studies the three-dimensional distribution of rock units and their deformation.
• This field is crucial for understanding tectonic processes and the formation of mountain ranges.
• Sudipta Sengupta has contributed significantly to the study of Himalayan tectonics.
• Women in Geology:
• Sudipta Sengupta's achievements have inspired many women to pursue careers in geology and earth sciences.
• Gender inclusion in STEM fields remains a global challenge, with initiatives aimed at reducing the gender gap.
• Himalayan Tectonics:
• The Himalayas are a prime region for studying tectonic activity due to their dynamic geological evolution.
• Research in this area helps understand seismic risks and resource exploration.
• Indian Contributions to Earth Sciences:
• India has a rich history of geological research, including contributions to mineral exploration and tectonics.
• Pioneers like Sudipta Sengupta have strengthened India's position in global earth sciences.
"

Q42. Answer: (c) 79

Shortcut Trick
If the value of $x + 1/x = k$, then the value of $x^2 + 1/x^2 = k^2 - 2$.
In this question, k = 9.
Therefore $x^2 + 1/x^2 = 9^2 - 2$
=> 81 − 2 = 79
Therefore The correct answer is 79.
Alternate Method
Given:
The value of $x + 1/x = 9$.
Formula Used:
We use the algebraic identity: $(a + b)^2 = a^2 + b^2 + 2ab$
Calculations:
Squaring both sides of the given equation:
$=> (x + 1/x)^2 = 9^2$
$=> x^2 + (1/x)^2 + 2 \times x \times (1/x) = 81$
$=> x^2 + 1/x^2 + 2 = 81$
$=> x^2 + 1/x^2 = 81 - 2$
$=> x^2 + 1/x^2 = 79$
Therefore The correct answer is 79.
Additional Information
Algebraic Identity for Cubes
If $x + 1/x = k$, then the value of $x^3 + 1/x^3 = k^3 - 3k$.
Subtraction Identity
If $x - 1/x = k$, then the value of $x^2 + 1/x^2 = k^2 + 2$.
Higher Power (Power of 4)
To find x^4 + 1/x^4, take the result of $x^2 + 1/x^2$ (say m), then calculate $m^2 - 2$.

Q43. Answer: (b) 200:99

Shortcut Trick
Equate the percentages and fractions directly: 22% × First Number = 4/9 × Second Number.
$22/100 \times A = 4/9 \times B => 11/50 \times A = 4/9 \times B$.
Ratio A : B = (4 × 50) : (11 × 9) = 200 : 99.
Therefore The correct answer is 200:99.
Alternate Method

Given: 22% of First Number (x) = 4/9 of Second Number (y).

Formula Used: Ratio x : y = (Value attached to y) : (Value attached to x) when equating products.

=> 22% × x = (4/9) × y

=> (22/100) × x = (4/9) × y

=> (11/50) × x = (4/9) × y

=> x/y = (4/9) ÷ (11/50)

=> x/y = (4/9) × (50/11)

=> x/y = 200/99

Therefore The correct answer is 200:99.

Additional Information

Percentage to Fraction Conversion

To convert x% to a fraction, divide by 100. Example: 22% = 22/100 = 11/50.

Ratio and Proportion Property

If Ax = By, then the ratio x : y is B : A. This is used to solve equated quantities efficiently.

Q44. Answer: (d) INS Imphal

The correct answer is option 4,

Key Points

• INS Imphal visited Port Louis, Mauritius, in March 2025 to participate in the 57th National Day celebrations of Mauritius.

• The visit of INS Imphal underlines the strong bilateral relations between India and Mauritius, particularly in the maritime domain.

• The ship's deployment was part of India's commitment to promoting maritime security and cooperation in the Indian Ocean Region.

• INS Imphal is an indigenously built stealth destroyer of the Indian Navy, equipped with advanced weaponry and sensors.

• Such visits enhance diplomatic ties and foster collaboration in defense, culture, and trade between both nations.

Additional Information

• INS Imphal:

• It is a Project 15B class stealth guided-missile destroyer commissioned by the Indian Navy.

• The ship is equipped with state-of-the-art sensors and weapons, including BrahMos missiles and indigenous systems.

• It is designed to operate in multi-threat environments and is capable of undertaking a variety of missions.

• India-Mauritius Relations:

• India and Mauritius share strong cultural, economic, and strategic ties, with Mauritius being a key partner in the Indian Ocean Region.

• India has been actively involved in supporting Mauritius in various sectors, including defense, infrastructure, and health.

• Bilateral naval exercises like the "SAMUDRA SHAKTI" enhance maritime cooperation between the two nations.

• Indian Ocean Region (IOR):

• The IOR is a strategically important region with significant trade routes and geopolitical influence.

• India plays a pivotal role in ensuring maritime security and stability in the region through collaborations and naval deployments.

• National Day Celebrations in Mauritius:

• The National Day of Mauritius is celebrated on March 12th every year to mark its independence from British rule in 1968.

• The event is significant for showcasing the nation's achievements and fostering international partnerships.

Q45. Answer: (a) 20% loss

Shortcut Trick

Ratio of Selling Price (SP) of 35 books to Cost Price (CP) of 28 books is given as equal.

35 × SP = 28 × CP => SP ÷ CP = 28 ÷ 35 = 4 ÷ 5.

Since SP < CP, there is a loss.

Loss percentage = (CP − SP) ÷ CP × 100 = (5 − 4) ÷ 5 × 100 = 1 ÷ 5 × 100 = 20%.

Therefore The correct answer is 20% loss.

Alternate Method

Given: Selling Price of 35 books = Cost Price of 28 books.

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

=> Let the Cost Price (CP) of 1 book be 1 unit.

=> CP of 28 books = 28 units and CP of 35 books = 35 units.

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=> According to the question, Selling Price (SP) of 35 books = 28 units.

=> Loss = CP of 35 books − SP of 35 books = 35 − 28 = 7 units.

=> Loss% = (7 ÷ 35) × 100 = (1 ÷ 5) × 100 = 20%.

Therefore The correct answer is 20% loss.

Additional Information

Loss and Gain Basic Concepts

When SP > CP, it is a Gain. Gain% = (Gain ÷ CP) × 100. When CP > SP, it is a Loss.

Inverse Relation of Articles

If CP of 'x' articles = SP of 'y' articles, Profit/Loss% = ((x − y) ÷ y) × 100. Positive result means Profit, negative means Loss.

Q46. Answer: (d) Rs. 261.8

Shortcut Trick

Total surface area to be painted (Inside + Outside) = 2 × 2πr² = 4πr².

Radius (r) = 3.5 cm = 7/2 cm.

Total Area = 4 × (22/7) × (7/2) × (7/2) = 154 cm².

Cost = (154 ÷ 10) × 17 = 15.4 × 17 = Rs. 261.8.

Therefore The correct answer is Rs. 261.8.

Alternate Method

Given:

Radius (r) = 3.5 cm

Rate of painting = Rs. 17 per 10 cm²

Formula Used:

Curved Surface Area (CSA) of hemisphere = 2πr²

Total painting area = Inside CSA + Outside CSA = 2πr² + 2πr² = 4πr²

Calculations:

=> Total Area = 4 × (22/7) × 3.5 × 3.5

=> Total Area = 4 × (22/7) × 12.25

=> Total Area = 154 cm²

=> Cost of painting 10 cm² = Rs. 17

=> Cost of painting 1 cm² = Rs. 1.7

=> Total Cost = 154 × 1.7

=> Total Cost = Rs. 261.8

Therefore The correct answer is Rs. 261.8.

Additional Information

Surface Area of Sphere

Total surface area of a full sphere is 4πr².

Total Surface Area of Hemisphere

For a solid hemisphere, TSA = CSA + Area of base = 2πr² + πr² = 3πr².

Volume of Hemisphere

The volume of a hemisphere is (2/3)πr³.

Q47. Answer: (c) Bal Gangadhar Tilak

The correct answer is Bal Gangadhar Tilak.

Key Points

• Bal Gangadhar Tilak, a prominent Indian freedom fighter, was imprisoned in Mandalay Jail, Burma, from 1908 to 1914.

• He was arrested on charges of sedition for his writings in the newspaper "Kesari", where he criticized British colonial policies.

• During his imprisonment, Tilak wrote his famous work, "Gita Rahasya", a commentary on the Bhagavad Gita.

• Mandalay Jail, located in present-day Myanmar, was used by the British to imprison Indian freedom fighters due to its isolation and harsh conditions.

• Tilak's imprisonment further galvanized the Indian independence movement, earning him the title "Lokmanya" (accepted by the people).

Additional Information

• Sedition under British Rule:

• Section 124A of the Indian Penal Code, introduced by the British in 1870, was used to suppress freedom fighters and curb dissent.
• Freedom fighters like Tilak, Mahatma Gandhi, and Bhagat Singh were charged with sedition for their anti-colonial activities.
• Kesari Newspaper:
• Founded by Tilak in 1881, "Kesari" was a Marathi newspaper advocating self-rule (Swaraj).
• Tilak's articles in Kesari were instrumental in spreading nationalist ideas among the masses.
• Gita Rahasya:
• While imprisoned in Mandalay Jail, Tilak penned "Gita Rahasya", emphasizing selfless action (Karma Yoga) as a path to liberation.
• The book remains a significant contribution to Indian philosophy and nationalist thought.
• Other Contributions of Tilak:
• Tilak was one of the first leaders to call for Swaraj (self-rule) as a birthright of Indians.
• He played a key role in popularizing Ganesh Chaturthi and Shivaji Jayanti as public festivals to unite people against colonial rule.

Q48. Answer: (c) Kanvas

The correct answer is Kanvas.

Key Points

• The Kanvas replaced the Shunga Dynasty in Magadha around 73 BCE after the assassination of the last Shunga ruler, Devabhuti, by his minister Vasudeva Kanva.
• Vasudeva Kanva established the Kanva Dynasty, marking the end of Shunga rule and initiating a short-lived Kanva rule in Magadha.
• The Kanva Dynasty ruled for approximately 45 years, with four rulers: Vasudeva, Bhumimitra, Narayana, and Susharman.
• The Kanvas were eventually overthrown by the Satavahanas, who expanded their influence in the Deccan and northern India.
• The Kanva Dynasty is considered a transitional period in Indian history, marked by political instability and regional fragmentation.

Additional Information

• Shunga Dynasty:
• The Shungas ruled Magadha from approximately 185 BCE to 73 BCE, succeeding the Mauryan Empire.
• They were known for their patronage of art, including the construction of the Bharhut and Sanchi Stupas.
• The dynasty was marked by internal rebellions and external threats, leading to its eventual decline.
• Satavahana Dynasty:
• The Satavahanas succeeded the Kanva Dynasty and ruled large parts of central and southern India.
• They were known for their contributions to trade, art, and architecture, including the Amaravati Stupa.
• Their rule marked the beginning of significant cultural and economic exchanges in the Deccan region.
• Magadha:
• Magadha was one of the most powerful Mahajanapadas in ancient India, located in present-day Bihar.
• It was a center of political, cultural, and spiritual activity, home to the rise of Jainism and Buddhism.
• Several major dynasties, including the Mauryas, Shungas, Kanvas, and Guptas, ruled Magadha over time.
• Political Instability During Kanva Rule:
• The Kanva Dynasty faced challenges in maintaining control over Magadha due to its brief rule and external invasions.
• Their decline created a power vacuum, eventually filled by the expanding Satavahanas.

Q49. Answer: (b) N

Given: Seven people D, E, F, G, L, M, and N are sitting in a row, facing north.

Only five people sit between M and L.

F sits to the immediate left of L.

Only one person sits between F and E.

N sits at some place to the left of G but at some place to the right of D.

Thus, N sits third from the left end of the row.

Hence, the correct answer is "Option 2".

Q50. Answer: (c) 14

The given three-digit numbers are: 107, 788, 634, 346, 488.

Now,

The highest number is 788. Its first digit is 7.

The lowest number is 107. Its third digit is 7.

Perform the addition.

Add the first digit of the highest number 7 to the third digit of the lowest number 7.

7 + 7 = 14.

Hence, the correct answer is "Option 3".

Q51. Answer: (c) Bhumji

The correct answer is Bhumji.

Key Points

• The Chuar Rebellion (1767–1809) was a tribal uprising in the Jungle Mahals region of present-day West Bengal and Jharkhand.

• The rebellion was primarily led by the Bhumji tribal community, along with other tribal groups like the Santhals and Kurmis.

• The British East India Company's exploitative revenue policies and increased taxes on forest produce triggered the rebellion.

• The Bhumji chiefs, particularly the leaders of the Midnapore and Manbhum regions, played a significant role in organizing the resistance.

• The rebellion was also marked by the participation of local zamindars and peasants who were discontented with colonial economic policies.

Additional Information

• Chuar Rebellion Context:

• The term 'Chuar' was used by the British to describe the tribal insurgents and forest dwellers of the region.

• The rebellion was fueled by colonial interference in traditional tribal ways of life and exploitation of natural resources.

• Key Leaders:

• Prominent leaders of the rebellion included Raghunath Mahato and Durjan Singh.

• They mobilized tribal warriors and peasants against British forces.

• Impact:

• The rebellion was suppressed by the British, but it highlighted the widespread resistance to colonial policies in tribal regions.

• It paved the way for subsequent tribal uprisings like the Santhal Rebellion (1855–56).

• Jungle Mahals:

• The Jungle Mahals region included parts of present-day Purulia, Bankura, and Midnapore districts in West Bengal.

• The area was rich in forests and inhabited by several tribal communities.

Q52. Answer: (d) 4 km towards the West

Given:

Mr. C starts from Point D and drives 3 km towards the west.

He then takes a left turn, drives 11 km, turns left, and drives 9 km.

He then takes a right turn and drives 5 km, turns left drives 7 km.

He then takes a left turn, drives 16 km.

He takes a final left turn, drives 9 km, and stops at Point E.

He should drive 4 km towards the West in order to reach Point D again.

Hence, the correct answer is "Option 4".

Q53. Answer: (d) Betla National Park

The correct answer is Betla National Park.

Key Points

• Betla National Park is located in the Latehar district of Jharkhand, India, and is part of the Palamu Tiger Reserve (PTR).

• The park is known for its rich biodiversity, including tigers, elephants, and various other species of flora and fauna.

• TRAFFIC, a wildlife trade monitoring network, collaborates globally to curb illegal wildlife trade and protect endangered species.

• Sniffer dogs are trained to detect wildlife contraband such as tiger bones, skins, and other illegal animal products, aiding in anti-poaching efforts.

• Betla National Park is strategically significant due to its proximity to areas prone to wildlife trafficking, making the deployment of sniffer dogs crucial.

Additional Information

• Palamu Tiger Reserve (PTR)

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• PTR is one of India's first tiger reserves, established under Project Tiger in 1973.
• It spans across the Latehar and Garhwa districts in Jharkhand and covers an area of over 1,129 square kilometers.
• The reserve is home to multiple species, including Bengal tigers, leopards, elephants, and sloth bears.
• Efforts for wildlife conservation in PTR include anti-poaching measures and habitat restoration.
• TRAFFIC
• TRAFFIC is a global wildlife trade monitoring organization founded in 1976.
• It is a joint program of the World Wildlife Fund (WWF) and the International Union for Conservation of Nature (IUCN).
• TRAFFIC works to ensure that wildlife trade does not threaten the conservation of nature.
• Its initiatives include training sniffer dogs, raising awareness, and collaborating with law enforcement agencies.
• Role of Sniffer Dogs in Conservation
• Sniffer dogs are trained to detect wildlife products such as ivory, rhino horns, and tiger skins.
• They play a crucial role in curbing illegal wildlife trade and poaching activities.
• Such dogs are deployed at key locations like airports, border checkpoints, and wildlife reserves.
• Training programs for sniffer dogs are conducted by organizations like TRAFFIC and government agencies.
• Biodiversity of Betla National Park
• The park hosts diverse ecosystems, including tropical dry deciduous forests and grasslands.
• It is home to several endangered species like Indian bison (gaur) and giant squirrels.
• Betla National Park also features historical sites, including ancient forts and caves.
• Ecotourism initiatives in the park aim to combine conservation with sustainable tourism.

Q54. Answer: (a) Tungsten

The correct answer is Tungsten.

Key Points

• Tungsten is the most suitable material for making electric bulb filaments due to its high melting point of approximately 3422°C, which allows it to operate at high temperatures without melting.
• It has a very low rate of evaporation at high temperatures, ensuring a longer lifespan of the filament.
• Tungsten has excellent tensile strength, which prevents it from breaking easily when subjected to thermal expansion and contraction.
• Its high resistivity enables it to convert electrical energy into heat efficiently, producing bright light.
• When used in an inert gas-filled bulb, tungsten's performance is further enhanced by reducing filament evaporation and improving efficiency.

Additional Information

• Properties of Tungsten:
• The high melting point of tungsten makes it suitable for applications requiring heat resistance.
• Its density is around 19.3 g/cm³, making it one of the heaviest metals.
• Tungsten's low vapor pressure at high temperatures ensures minimal material loss.
• Why Other Materials Are Not Suitable:
• Copper: Low melting point (~1085°C) makes it unsuitable for high-temperature applications like filaments.
• Aluminium: Melts at approximately 660°C and lacks the durability required for filaments.
• Iron: Melting point (~1538°C) is higher than copper or aluminium but still insufficient compared to tungsten.
• Inert Gas in Bulbs: Modern electric bulbs are filled with inert gases like argon or a mixture of argon and nitrogen to prevent the oxidation of the tungsten filament and reduce evaporation.
• Historical Background: The use of tungsten in filaments was pioneered in the early 20th century, replacing earlier materials like carbon due to its superior properties.
• Applications Beyond Bulbs: Tungsten is also used in x-ray tubes, welding electrodes, and aerospace due to its heat-resistant properties.

Q55. Answer: (b) 8 km to the south

Given:

Mr. GHI starts from Point A and drives 16 km towards the east.

He then takes a right turn, drives 18 km, turns right, and drives 26 km.

He then takes a right turn and drives 26 km.

He takes a final right turn, drives 10 km, and stops at Point P.

He should drive 8 km to the south in order to reach Point A again.

Hence, the correct answer is "Option 2".

Q56. Answer: (c) 1/5, 2

Shortcut Trick

For the equation 5x2 − 11x + 2 = 0, find two numbers whose product is 10 (5 × 2) and sum is −11.

The required numbers are −10 and −1.

To find the roots directly, divide these factors by the coefficient of x2 (which is 5) and reverse the signs.

Roots = −(−10 ÷ 5) = 2 and −(−1 ÷ 5) = 1/5.

Therefore The correct answer is 1/5, 2.

Alternate Method

Given Equation: 5x2 − 11x + 2 = 0

In the factorisation method, we split the middle term (−11x) into two terms such that their sum is −11x and their product is (5x2) × 2 = 10x2.

=> 5x2 − 10x − x + 2 = 0

=> 5x(x − 2) − 1(x − 2) = 0

=> (5x − 1)(x − 2) = 0

Now, set each factor to zero to find the roots:

=> 5x − 1 = 0

=> 5x = 1

=> x = 1/5

And,

=> x − 2 = 0

=> x = 2

Therefore The correct answer is 1/5, 2.

Additional Information

Discriminant (D)

The term D = b2 − 4ac determines the nature of roots. If D > 0, roots are real and distinct; if D = 0, roots are real and equal; if D < 0, roots are imaginary.

Quadratic Formula

Roots can also be found using x = (−b ± √D) ÷ 2a.

Sum and Product of Roots

For ax2 + bx + c = 0, the sum of roots is −b/a and the product of roots is c/a.

Q57. Answer: (b) Gram Panchayat

The correct answer is Gram Panchayat.

Key Points

• The Gram Panchayat is the grassroots-level body in the three-tier Panchayati Raj system in India.

• It is directly elected by the people of the village, forming the first tier of the Panchayati Raj system.

• The Gram Panchayat is responsible for local governance and development activities in villages.

• Its members are elected for a term of five years by the eligible voters in the village.

• The head of the Gram Panchayat is called the Sarpanch, who is also elected by the villagers.

Additional Information

• Panchayati Raj System in India:

• The Panchayati Raj system is a decentralized form of governance in which gram panchayats are the basic units of administration.

• It was constitutionalized through the 73rd Constitutional Amendment Act, 1992.

• The system has three levels: Gram Panchayat (village level), Panchayat Samiti (block level), and Zila Parishad (district level).

• Roles and Responsibilities of Gram Panchayat:

• Implementation of development programs such as rural housing, sanitation, and drinking water supply.

• Maintenance of public assets like roads, schools, and community centers.

• Promotion of literacy, health, and awareness programs in rural areas.

• Funding of Gram Panchayats:

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• Funds are provided through grants from the central and state governments, revenue generated locally, and other sources.
• The Finance Commission recommends financial allocations to Panchayati Raj institutions.
• Importance of Grassroots Governance:
• It ensures that governance is inclusive and caters to the specific needs of rural populations.
• It encourages local participation in decision-making and promotes accountability.

Q58. Answer: (d) Chimamanda Ngozi Adichie

The correct answer is Chimamanda Ngozi Adichie.

Key Points

• Chimamanda Ngozi Adichie is a renowned Nigerian author known for her impactful storytelling and exploration of themes such as identity, feminism, and post-colonialism.
• Her notable works include "Half of a Yellow Sun", which won the Orange Prize for Fiction, and "Americanah", which received global acclaim.
• Adichie is celebrated for her TED Talk titled "We Should All Be Feminists," which has had a profound cultural influence and was adapted into a book.
• The 2025 novel "Dream Count" is set to be one of her latest contributions to contemporary literature, showcasing her ability to merge storytelling with critical societal themes.
• She has been featured on several prestigious global platforms, emphasizing the importance of African narratives in global literature.

Additional Information

• Post-Colonial Literature:
• Post-colonial literature examines the effects of colonialism on cultures and societies.
• Chimamanda Adichie's works often address the lasting impacts of colonial rule in Nigeria and explore themes of cultural identity and heritage.
• Feminism in Literature:
• Adichie is a prominent voice in contemporary feminist literature.
• Her works often challenge gender norms and advocate for gender equality, making her a global feminist icon.
• Representation of Africa in Global Literature:
• Adichie emphasizes the importance of authentic African stories being told by African writers.
• She challenges stereotypes and promotes a nuanced understanding of African societies and cultures.
• Awards and Recognition:
• Adichie has received numerous accolades, including the MacArthur Genius Grant and the PEN Pinter Prize.
• Her works have been translated into multiple languages, showcasing their universal appeal and significance.

Q59. Answer: (b) 5^(th)

The correct answer is 5th.

Key Points

• The 5th Edition of the European Political Community (EPC) Summit is scheduled to take place in November 2024.
• The EPC Summit is a platform for fostering political dialogue and cooperation among European countries, including both EU and non-EU members.
• It was first launched in 2022, with the inaugural summit held in Prague, Czech Republic.
• The primary objective of the summit is to address pressing geopolitical challenges, enhance security, and strengthen economic ties across Europe.
• The EPC Summit involves leaders from 44 European nations, focusing on shared concerns such as energy security, migration, and infrastructure development.

Additional Information

• European Political Community (EPC):
• The EPC is a political forum aimed at fostering cooperation between European countries beyond the framework of the EU.
• It was proposed by French President Emmanuel Macron in May 2022 to address shared challenges across the continent.
• Key Themes of the EPC Summit:
• Security and defense cooperation to counter geopolitical threats.
• Collaborative efforts on energy security and the transition to renewable energy sources.
• Addressing migration challenges and enhancing infrastructure connectivity.
• Inaugural EPC Summit:

• The first summit was held on October 6, 2022, in Prague, Czech Republic.

• The event brought together leaders from 44 European countries, including non-EU states like the UK and Turkey.

• Significance of EPC:

• Acts as a unifying platform for European nations amidst rising geopolitical tensions and global challenges.

• Promotes multilateralism and strengthens Europe's global standing.

Q60. Answer: (a) Ministry of Commerce and Industry

The correct answer is Ministry of Commerce and Industry.

Key Points

• The Ministry of Commerce and Industry leads the implementation of the Start-up India initiative under the Department for Promotion of Industry and Internal Trade (DPIIT).

• The Start-up India initiative was launched by Prime Minister Narendra Modi on January 16, 2016, to boost entrepreneurship in India.

• The program aims to nurture innovation, simplify regulatory frameworks, and offer financial support to start-ups through government schemes.

• Key support under the initiative includes tax exemptions, easier patent filing, and access to funding through funds such as the Fund of Funds for Start-ups (FFS).

• As of 2023, over 90,000 start-ups have been recognized under the Start-up India initiative, making India the third-largest start-up ecosystem in the world.

Additional Information

• Department for Promotion of Industry and Internal Trade (DPIIT):

• DPIIT is a department under the Ministry of Commerce and Industry responsible for formulating and implementing policies for industrial growth and promotion.

• It plays a crucial role in facilitating ease of doing business and fostering the growth of start-ups in India.

• Fund of Funds for Start-ups (FFS):

• FFS was established under the Start-up India initiative with a corpus of Rs. 10,000 crores to provide funding support to start-ups.

• It is managed by the Small Industries Development Bank of India (SIDBI) and supports alternate investment funds (AIFs) that invest in start-ups.

• Tax Exemptions for Start-ups:

• Eligible start-ups can avail of a 100% tax exemption on profits for three consecutive years within their first ten years of incorporation.

• The initiative also provides exemptions from angel tax under certain conditions to encourage investments in start-ups.

• Start-up India Seed Fund Scheme (SISFS):

• Launched in 2021, SISFS aims to provide financial assistance to start-ups at the ideation and product development stages.

• Funds are disbursed through incubators, ensuring start-ups receive early-stage support to grow and scale.

• Ease of Doing Business Initiatives:

• Start-ups benefit from simplified compliance requirements and reduced regulatory burdens under the initiative.

• Self-certification and single-window clearance systems have been introduced to streamline processes.

Q61. Answer: (a) Jawaharlal Nehru

The correct answer is Jawaharlal Nehru.

Key Points

• Jawaharlal Nehru was the first chairman of the Planning Commission of India, as the position of chairman was traditionally held by the Prime Minister of India.

• The Planning Commission was established on 15 March 1950, with the aim of formulating and overseeing India's Five-Year Plans.

• The first Five-Year Plan (1951-1956), under Nehru's leadership, focused on agricultural development and infrastructure building to address food shortages and boost economic growth.

• The Planning Commission was later replaced by the NITI Aayog (National Institution for Transforming India) in 2015 under Prime Minister Narendra Modi.

• As the first Prime Minister of independent India, Nehru played a pivotal role in shaping the country's economic policies through the Planning Commission.

Additional Information

• Planning Commission:

• It was a non-constitutional and non-statutory body tasked with assessing resources and formulating development plans for India.

• The commission was headquartered in New Delhi and worked under the direct supervision of the Prime Minister.

• It operated through the formulation of Five-Year Plans to address sectors like agriculture, industry, education, and health.

• Five-Year Plans:

• The First Five-Year Plan (1951-1956) focused on agriculture, irrigation, and energy to rebuild India's economy post-independence.

• The Second Five-Year Plan (1956-1961), also known as the Mahalanobis Plan, emphasized rapid industrialization.

• These plans aimed to achieve self-sufficiency, equitable distribution of resources, and sustainable growth.

• NITI Aayog:

• It replaced the Planning Commission on 1 January 2015 to promote cooperative federalism and align with India’s changing economic needs.

• NITI Aayog focuses on policy think-tanks, innovation, and partnerships with states for development.

• Jawaharlal Nehru’s Vision:

• Nehru’s vision for India emphasized industrialization, scientific development, and modern economic strategies to uplift the nation.

• He viewed planning as a means to achieve social justice, reduce inequality, and accelerate progress.

Q62. Answer: (d) diskpart

The correct answer is diskpart.

Key Points

• Diskpart is a command-line utility in Windows operating systems that enables users to manage storage devices, such as disks, partitions, and volumes.

• Introduced in Windows 2000, it is available in all subsequent Windows versions, including Windows 11.

• Diskpart allows users to perform advanced storage tasks like creating, deleting, and resizing partitions, marking partitions as active, and assigning drive letters.

• This tool is particularly useful for troubleshooting disk-related issues and configuring storage on servers or virtual environments.

• Diskpart is accessed via the Command Prompt (cmd.exe) or Windows PowerShell, and requires administrative privileges to execute commands.

Additional Information

• MSConfig: A system configuration tool used to troubleshoot the Windows startup process, manage startup programs, and enable/disable services.

• Regedit: A registry editor tool in Windows that allows users to view, edit, and manage the Windows Registry, a hierarchical database storing system settings.

• Gpedit.msc: The Group Policy Editor, used to configure system and user settings in a Windows environment, mainly for administrative purposes.

• Virtual Hard Disk (VHD): A file format that represents a virtual disk drive. Diskpart can manage VHDs, enabling users to attach, detach, or create virtual disks.

• Administrative Privileges: Diskpart commands require administrative rights to execute, ensuring only authorized users can make critical changes to the storage system.

Q63. Answer: (c) To suggest various pre-designed templates and layouts based on the content on the current slide

The correct answer is To suggest various pre-designed templates and layouts based on the content on the current slide.

Key Points

• The 'Design Ideas' feature in MS PowerPoint is part of the Design tab and provides layout suggestions to enhance slide aesthetics based on existing content.

• It uses AI-based algorithms to analyze the text, images, and other elements on the slide to propose visually appealing designs.

• This feature helps users save time by eliminating the need for manual formatting, offering professionally designed templates instantly.

• The 'Design Ideas' feature is available in Microsoft 365 and other supported versions of PowerPoint, providing a user-friendly way to create visually impactful presentations.

• Users can activate the feature by clicking the 'Design Ideas' button in the Design tab or it may appear automatically when adding content to a slide.

Additional Information

• Artificial Intelligence in PowerPoint

• MS PowerPoint integrates AI to enhance user productivity and design capabilities through features like 'Design Ideas' and 'Presenter Coach.'

• AI identifies patterns in user content to deliver personalized suggestions for slide layouts, images, and graphics.

• Other Design Tools in PowerPoint

• In addition to 'Design Ideas,' PowerPoint also offers features like themes, transitions, and animations to customize presentations.

• Users can access additional design elements through PowerPoint's integration with online libraries such as Office 365's image and icon repository.

• Version Compatibility

• The 'Design Ideas' feature is available in PowerPoint for Microsoft 365, PowerPoint 2019, and later versions.

• Some features may require an active internet connection to fetch AI-based suggestions.

• How to Enable 'Design Ideas'

• To enable the feature, users can navigate to File > Options > General and ensure the 'Show Design Ideas automatically' option is selected.

• It can also be manually triggered from the 'Design' tab during slide editing.

Q64. Answer: (b) DGC 121

The pattern followed here is.

Thus, the missing term in the series is DGC 121.

Hence, the correct answer is "Option 2."

Q65. Answer: (c) 75

Shortcut Trick

Combined efficiency of A + B + C = 1/20

Efficiency of A = 1/50, Efficiency of B = 1/60

Efficiency of C = 1/20 − (1/50 + 1/60) = 3/60 − (1.2/60 + 1/60) = (15 − 6 − 5)/300 = 4/300 = 1/75

Therefore The correct answer is 75 minutes.

Alternate Method

Person/Tap	Time (min)	Total Work (LCM)	Efficiency
A + B + C	20	300 Units	15
A	50	6	
B	60	5	

=> Efficiency of A + B + C = 15 units/min

=> Efficiency of A = 6 units/min

=> Efficiency of B = 5 units/min

=> Efficiency of C = (A + B + C) − A − B

=> Efficiency of C = 15 − 6 − 5 = 4 units/min

=> Time taken by C = Total Work ÷ Efficiency of C

=> Time taken by C = 300 ÷ 4 = 75 minutes

Therefore The correct answer is 75 minutes.

Additional Information

Pipes and Cisterns Logic

If an inlet pipe fills a tank in x hours and an outlet pipe empties it in y hours, the net part filled in 1 hour = (1/x − 1/y).

Negative Efficiency

In pipe systems, an outlet pipe (drain pipe) is always assigned a negative efficiency because it removes work/water from the system.

Q66. Answer: (c) Only conclusion (II) follows.

Given Statements:

All grapes are apples.

All apples are kiwis.

Some kiwis are bananas.

The least possible Venn diagram for the given statements is:

Conclusions:

I. All apples are bananas - False (Because there is no definite relation given between apples and bananas. Only a part of kiwis is bananas, and apples are a part of kiwis, but there is no direct connection established between apples and bananas.)

II. Some kiwis are grapes - True (Because 'All grapes are apples' and 'All apples are kiwis.' This means that all grapes are a part of kiwis, which logically implies that some kiwis are grapes.)

So, Only conclusion II follows.

Hence, the correct answer is "Option 3".

Q67. Answer: (b) Tea

The correct answer is Tea.

Key Points

• Tea is one of the major crops associated with plantation agriculture in India, primarily cultivated in states like Assam, West Bengal, Tamil Nadu, and Kerala.

• Plantation agriculture involves large-scale cultivation of crops on estates for commercial purposes, and tea is a prime example.

• Tea plantations are highly labor-intensive and provide employment to millions of workers, especially in northeastern and southern India.

• India is the second-largest producer and consumer of tea globally, contributing significantly to the export market.

• Climate conditions such as high rainfall, moderate temperature, and humid environments in hilly regions favor the growth of tea plantations.

Additional Information

• Plantation Agriculture

• Plantation agriculture is a type of commercial farming where crops like tea, coffee, rubber, and sugarcane are grown on large estates.

• This form of agriculture often requires substantial capital investment and skilled labor.

• It is practiced in tropical and subtropical regions with favorable climatic conditions.

• India's plantation crops contribute significantly to the economy through export earnings.

• Tea Cultivation in India

• Tea cultivation dates back to the British era when it was introduced in Assam.

• India has major tea-growing regions such as Darjeeling, Nilgiri Hills, and Assam.

• The tea industry is regulated by the Tea Board of India, which oversees production, marketing, and export.

• India's tea is famous for its varieties, including Assam Tea, Darjeeling Tea, and Nilgiri Tea.

• Key Factors for Tea Growth

• Tea requires acidic soil with high organic content and good drainage.

• The plant thrives in a humid climate with temperatures between 20°C to 30°C.

• Heavy rainfall (150-250 cm annually) and shade are crucial for optimal growth.

• Global Significance

• India is one of the world's largest tea exporters, with countries like Russia, the USA, and the UK being major importers.

• Tea is a culturally significant beverage in India, consumed daily by millions.

• The tea industry supports rural development and provides substantial employment opportunities.

Q68. Answer: (c) 5

Shortcut Trick

Successive percentage formula: Net Change = a + b + (a × b) ÷ 100.

Here, Markup (a) = 60%, Discount (b) = −X%, and Net Profit = 52%.

52 = 60 − X + (60 × −X) ÷ 100

52 − 60 = −X − 0.6X => −8 = −1.6X

X = 8 ÷ 1.6 = 5.

Therefore The correct answer is 5.

Alternate Method

Let Cost Price (CP) = 100.

Formulas: MP = CP × (100 + Markup%) ÷ 100 | SP = CP × (100 + Profit%) ÷ 100 | Discount% = (MP − SP) ÷ MP × 100.

=> Given Markup = 60%, so Marked Price (MP) = 100 + 60 = 160.

=> Given Profit = 52%, so Selling Price (SP) = 100 + 52 = 152.

=> Discount Amount = MP − SP = 160 − 152 = 8.

=> Discount% (X) = (8 ÷ 160) × 100.

=> X = (1 ÷ 20) × 100 = 5%.

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Therefore The correct answer is 5.

Additional Information

Marked Price and Discount

The price printed on an item is the Marked Price (MP). Discount is always calculated on the MP to reach the Selling Price (SP).

Markup Percentage

The extra price added to the Cost Price (CP) to set the MP is the markup. Markup% = [(MP − CP) ÷ CP] × 100.

Q69. Answer: (d) Western Ghats and Arabian Sea

The correct answer is Western Ghats and Arabian Sea.

Key Points

• The Western Coastal Plains of India are situated between the Western Ghats and the Arabian Sea.

• They are narrower compared to the Eastern Coastal Plains, with an average width ranging from 50 to 100 km.

• The plains extend from Gujarat in the north to Kerala in the south, covering the states of Maharashtra, Goa, and Karnataka in between.

• These plains are divided into three distinct sections: the Konkan Coast (Maharashtra and Goa), the Kanara Coast (Karnataka), and the Malabar Coast (Kerala).

• The region is known for its fertile soil, lagoons, backwaters, and estuaries, which support agriculture, fishing, and tourism.

Additional Information

• Western Ghats:

• A UNESCO World Heritage Site and one of the eight "hottest hotspots" of biological diversity globally.

• It is a continuous mountain range running parallel to the western coast of India.

• The Western Ghats play a crucial role in influencing the monsoon climate in India.

• Arabian Sea:

• Part of the northern Indian Ocean, bounded by India to the east, Pakistan and Iran to the north, and the Arabian Peninsula to the west.

• It is a major route for maritime trade and has significant economic importance.

• Backwaters of Kerala:

• A network of interconnected lakes, rivers, and canals along the Malabar Coast.

• Famous for houseboat tourism and traditional fishing practices.

• Economic Significance:

• The Western Coastal Plains are important for agriculture, with crops like rice and coconut grown extensively.

• Fishing is a major occupation along the coast due to the proximity to the Arabian Sea.

• The region also supports industries like shipbuilding and tourism.

Q70. Answer: (a) 12

Shortcut Trick

Net efficiency = Filling rate − Emptying rate.

Let Total capacity (LCM of 8 and 16) = 16 units.

Filling pipe efficiency = 16 ÷ 8 = 2; Emptying pipe efficiency = 16 ÷ 16 = 1.

Combined efficiency = 2 − 1 = 1 unit/hour.

Time for 3/4 filled = (3/4 × 16) ÷ 1 = 12 hours.

Therefore The correct answer is 12 hours.

Alternate Method

Given: Filling time = 8 hours, Emptying time = 16 hours.

Formula Used: Work = Efficiency × Time; Net Efficiency = (1/Filling time) − (1/Emptying time).

Pipe Type	Time (hrs)	Total Capacity (LCM)	Efficiency
Filling Pipe	8	16 units	+2
Emptying Pipe	16	−1	

=> Combined efficiency of both pipes = 2 − 1 = 1 unit/hour.

=> Target volume to be filled = 3/4 × Total Capacity

=> Target volume = 3/4 × 16 = 12 units.

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=> Time taken = Target volume ÷ Combined efficiency

=> Time taken = 12 ÷ 1 = 12 hours.

Therefore The correct answer is 12 hours.

Additional Information

Pipes and Cisterns Concept

Filling pipes (inlets) have positive efficiency, while emptying pipes (outlets) have negative efficiency.

Net Work Formula

If pipe A fills in 'x' hours and pipe B empties in 'y' hours, net work in 1 hour = (1/x − 1/y). If x < y, the tank will eventually fill.

Fractional Filling

To find time for a specific fraction of the tank, multiply the total fill time by that fractional value.

Q71. Answer: (d) Mother's brother's son

A is				
Symbol	•	–	x	÷
Meaning	Son	Brother	Wife	Father
of B				

Given Expression: S + D - F × G ÷ H

S + D: S is the son of D.

D - F: D is the brother of F.

F × G: F is the wife of G.

G ÷ H: G is the father of H.

According to the given information Family Tree Representation:

S is Mother's brother's son to H

Hence, the correct answer is "Option 4"

Q72. Answer: (a) 33.77%

Shortcut Trick

If A is r% more than B, then B is less than A by [r / (100 + r)] × 100%.

Required percentage = [51 / (100 + 51)] × 100

=> 5100 ÷ 151 ≈ 33.77%

Therefore The correct answer is 33.77%.

Alternate Method

Given:

Let B's salary = 100

A's salary is 51% more than B.

=> A's salary = 100 + 51% of 100 = 100 + 51 = 151

Calculations:

Difference between A and B = 151 − 100 = 51

Percentage by which B is less than A = (Difference / A's salary) × 100

=> Required % = (51 / 151) × 100

=> Required % = 5100 / 151

=> Required % = 33.7748...

Rounding to two decimal places, we get 33.77%.

Therefore The correct answer is 33.77%.

Additional Information

Percentage Change Comparison

When comparing two quantities, if A is x% more than B, then B is [x / (100 + x)] × 100% less than A.

Base Change Rule

Percentage is always calculated relative to the base value. When finding 'less than A', A's value becomes the denominator.

Inverse Case

If A is x% less than B, then B is [x / (100 − x)] × 100% more than A.

Q73. Answer: (b) 62

Shortcut Trick

Arrange the 11 observations in ascending order:

20, 20, 35, 43, 56, 62, 68, 72, 79, 85, 90

Since the number of terms (N = 11) is odd, the median is the middle term:

Median = ((N + 1) ÷ 2)^(th) term = 6^(th) term = 62

Therefore The correct answer is 62.

Alternate Method

Given:

Observations: 85, 62, 20, 72, 20, 43, 35, 90, 68, 56, 79

Total number of observations (N) = 11

Formula Used:

When N is odd, Median = ((N + 1) ÷ 2)^(th) observation after arranging in ascending order.

Calculations:

Arrange the given observations in ascending order:

=> 20, 20, 35, 43, 56, 62, 68, 72, 79, 85, 90

Count the total number of observations:

=> N = 11

Since N is an odd number, the median is calculated as:

=> Median = ((11 + 1) ÷ 2)^(th) term

=> Median = (12 ÷ 2)^(th) term

=> Median = 6^(th) term

Looking at the arranged sequence, the 6^(th) term is 62.

Let us verify why the other options are incorrect:

=> Option (1) 68 is the 7^(th) term, which is not the middle term.

=> Option (3) 56 is the 5^(th) term, which is not the middle term.

=> Option (4) 72 is the 8^(th) term, which is not the middle term.

Therefore The correct answer is 62.

Additional Information

Median for Even Number of Terms

If N is even, the median is the average of the (N ÷ 2)^(th) term and the ((N ÷ 2) + 1)^(th) term. Formula: Median = [(N/2)^(th) term + (N/2 + 1)^(th) term] ÷ 2.

Mean (Arithmetic Average)

The sum of all observations divided by the total number of observations. Formula: Mean = (Sum of all observations) ÷ N.

Mode

The observation that appears most frequently in the data set. For the given data, 20 appears twice, so the mode is 20.

Empirical Relationship

The relationship between Mean, Median, and Mode for moderately skewed distributions is: Mode = 3 × Median − 2 × Mean.

Q74. Answer: (b) 938

Shortcut Trick

Loss of 31% means selling at (100 − 31) = 69% of CP.

Profit of 34% means selling at (100 + 34) = 134% of CP.

Ratio-unitary method: If 69 units = 483, then 1 unit = 483 ÷ 69 = 7.

Target Selling Price = 134 units = 134 × 7 = 938.

Therefore The correct answer is Rs. 938/m.

Alternate Method

Given: Selling Price 1 (SP1) = Rs. 483, Loss% = 31%, Target Profit% = 34%.

Formulas: CP = [SP × 100] ÷ [100 − Loss%], New SP = [CP × (100 + Profit%)] ÷ 100

=> Cost Price (CP) = (483 × 100) ÷ (100 − 31) = (483 × 100) ÷ 69 = 7 × 100 = Rs. 700.

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=> Required Selling Price (SP2) = [700 × (100 + 34)] ÷ 100 = 700 × 1.34 = 938.

Therefore The correct answer is Rs. 938/m.

Additional Information

Cost Price & Selling Price Relationship

When the cost price is constant, the ratio of two selling prices is directly proportional to the percentage values: SP1/SP2 = (100 ± P/L1)/(100 ± P/L2).

Profit and Loss Basics

Profit is earned when SP > CP, and Loss occurs when CP > SP. All percentages are calculated on the Cost Price unless specified otherwise.

Q75. Answer: (a) ERZHL

Number/symbol	**7**	**@**	**6**	**2**	**#**	**%**	**&**	**8**	**9**	**=**	**$**	**3**	**4**	**•**
Code	E	J	A	H	F	R	B	Y	L	H	Q	T	K	Z

Given- 9 % + 2 7

Rule No. (i): This condition applies because the first element (9) is an odd number and the last element (7) is also an odd number. So, their codes will be interchanged.

Rule No. (ii): This condition does not apply because the last element (7) is not a perfect square.

Rule No. (iii): This condition does not apply because the first and last elements are numbers, not symbols.

Based on the applicable rule (i), the 1st and last elements' codes are interchanged.

The code for 9 is L.

The code for % is R.

The code for + is Z.

The code for 2 is H.

The code for 7 is E.

So, 9 will be coded as E (the original code for 7).

And 7 will be coded as L (the original code for 9).

Thus, '9 % + 2 7' is coded as → E R Z H L.

Hence, the correct answer is "Option 1".

Q76. Answer: (b) 116

Shortcut Trick

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

Substitute the given values: Mode = 3(76) − 2(56).

Mode = 228 − 112 = 116.

Therefore The correct answer is 116.

Alternate Method

Given:

Mean of the data = 56

Median of the data = 76

Formula Used:

The empirical relationship between Mean, Median, and Mode is given by:

Mode = 3 × Median − 2 × Mean

Calculations:

=> Mode = 3 × 76 − 2 × 56

=> Mode = 228 − 112

=> Mode = 116

Therefore The correct answer is 116.

Additional Information

Empirical Relation

The formula Mode = 3 Median − 2 Mean is used for moderately skewed distributions.

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Symmetrical Distribution

In a perfectly symmetrical distribution, the Mean, Median, and Mode are all equal (Mean = Median = Mode).

Skewness and Central Tendency

In a positively skewed distribution, Mean > Median > Mode. In a negatively skewed distribution, Mode > Median > Mean.

Q77. Answer: (d) 1

The given code language is:

Thus, 'P' is coded as '1'.

Hence, the correct answer is "Option 4".

Q78. Answer: (b) Indus Valley Civilisation

The correct answer is Indus Valley Civilisation.

Key Points

• The Indus Valley Civilisation, also known as Harappan Civilisation, existed approximately between 3300 BCE and 1300 BCE in the northwestern regions of South Asia.

• It flourished in areas of modern-day Pakistan and northwest India, including the Thar Desert region.

• Major sites of the civilisation include Harappa, Mohenjo-Daro, Dholavira, and Kalibangan, which are all located near river systems and arid regions like the Thar Desert.

• The civilisation is noted for its advanced urban planning, including the use of baked bricks, drainage systems, and water storage facilities.

• It was one of the world's earliest urban civilisations alongside Mesopotamia and Ancient Egypt.

Additional Information

• Terminology: The term "Indus Valley Civilisation" is derived from the Indus River, around which many of the settlements were concentrated.

• Key Features: The civilisation was known for its trade networks, craft production, and script, though the script remains undeciphered.

• Climate Context: The Thar Desert region played a role in the civilisation's adaptation strategies, including water management and agriculture in semi-arid zones.

• Decline: The decline of the civilisation is attributed to environmental changes, such as the drying up of the Sarasvati River and possible shifts in monsoon patterns.

• Archaeological Evidence: Excavations have revealed seals, pottery, jewellery, and tools that provide insights into the daily life and culture of the Indus Valley people.

Q79. Answer: (a) Panchayat Secreatary

The correct answer is Panchayat Secretary.

Key Points

• The Panchayat Secretary is not an elected position under the Panchayati Raj system; it is an appointed administrative role.

• The Panchayat Secretary is usually appointed by the state government to assist in the functioning and administration of the Panchayat.

• This role primarily involves record-keeping, maintaining accounts, and implementing government schemes at the Panchayat level.

• In contrast, positions like Sarpanch, Zila Pramukh, and Pradhan are elected by the people under the democratic framework of the Panchayati Raj system.

• The Panchayat Secretary acts as a link between the elected representatives and the state government for administrative purposes.

Additional Information

• Panchayati Raj System

• The Panchayati Raj is a three-tier system of local self-governance in India, consisting of Gram Panchayat (village level), Block Samiti (block level), and Zila Parishad (district level).

• It was introduced through the 73rd Constitutional Amendment Act of 1992.

• The system aims to empower rural areas with self-governance and decentralized administration.

• Each tier has elected representatives, ensuring grassroots democracy.

• Key Elected Positions in Panchayati Raj

• Sarpanch: Head of the Gram Panchayat, elected by the villagers.

• Pradhan: Chairperson of the Panchayat Samiti at the block level.

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• Zila Pramukh: Head of the Zila Parishad, elected by the members of the Parishad.
• Roles of Panchayat Secretary
• Maintains records of meetings, resolutions, and accounts.
• Coordinates the implementation of government schemes and programs.
• Acts as a liaison between the Panchayat and state or district administration.
• Significance of Panchayati Raj
• Promotes participatory governance and decision-making at the grassroots level.
• Ensures the delivery of basic services like water supply, sanitation, and rural development schemes.
• Empowers marginalized groups, including women and Scheduled Castes/Scheduled Tribes, through mandatory reservation of seats.

Q80. Answer: (b) YGIP

The logic followed here is:
Option (1): HPSY
Option (2): YGIP
Option (3): AILR
Option (4): NVYE
The letter-cluster that DOES NOT belong to the group is: YGIP.
Hence, the correct answer is "Option (2)"

Q81. Answer: (c) MPHL

The logic followed here is that each letter of the first term is shifted backward by 7 positions to get the second term.
PSKO : ILDH
RUMQ : KNFJ
Applying the logic to TWOS:
Thus, TWOS is related to MPHL.
Hence, the correct answer is "Option 3".

Q82. Answer: (b) Rio de Janeiro, Brazil

The correct answer is Rio de Janeiro, Brazil.
Key Points
• The 2024 G20 Summit is scheduled to be held in Rio de Janeiro, Brazil, marking Brazil's presidency of the G20.
• Brazil officially took over the G20 presidency from India during the 2023 G20 Summit in New Delhi.
• The G20 is an international forum consisting of 19 countries and the European Union, focusing on global economic issues.
• Rio de Janeiro, a prominent city in Brazil, is renowned for hosting international events such as the 2016 Summer Olympics and the UN Earth Summit (1992).
• The G20 Summit's agenda includes discussions on sustainable development, global financial stability, and climate change.
Additional Information
• G20 Formation:
• The G20 was established in 1999 in response to the financial crises of the late 1990s.
• It serves as a platform for the world's major economies to discuss and coordinate policies on international economic matters.
• Members:
• The G20 comprises 19 individual countries (including the USA, China, India, Brazil, etc.) and the European Union.
• Collectively, G20 economies represent approximately 85% of global GDP and 75% of international trade.
• Importance of Brazil:
• Brazil has been a member of the G20 since its inception and plays a significant role in representing emerging economies.
• Its presidency in 2024 is expected to focus on Amazon rainforest preservation and climate resilience.
• Previous Summits:
• The 2022 G20 Summit was held in Bali, Indonesia, and focused on global health and economic recovery post-COVID-19.
• The 2023 G20 Summit hosted by India highlighted themes of One Earth, One Family, One Future.

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Q83. Answer: (a) (46, 60, 14)

The logic followed here is:

Logic: First Number + Third Number = Second Number.

For, (29, 53, 24)

=> 29 + 24 = 53.

Here, the logic followed.

For, (12, 32, 20)

=> 12 + 20 = 32.

Here, the logic followed.

Now, let's check the options based on this logic:

Option 1) (46, 60, 14)

=> 46 + 14 = 60. (Matches)

Here, logic followed.

Option 2) (47, 75, 25)

=> 47 + 25 = 72. (Given Second number is 75, 75 ≠ 72)

Here, logic not followed.

Option 3) (49, 71, 19)

=> 49 + 19 = 68. (Given Second number is 71, 71 ≠ 68)

Here, logic not followed.

Option 4) (24, 40, 13)

=> 24 + 13 = 37. (Given Second number is 40, 40 ≠ 37)

Here, logic not followed.

Hence, the correct answer is "Option 1".

Q84. Answer: (a) 1572

The logic followed here is:

Thus, the missing term in the series is 1572.

Hence, the correct answer is "Option 1";

Q85. Answer: (d) Click 'Keep Source Formatting' in the Reuse Slides pane

The correct answer is Click 'Keep Source Formatting' in the Reuse Slides pane.

Key Points

• To retain the original formatting of slides when importing them into another presentation, use the 'Keep Source Formatting' option in the Reuse Slides pane.

• This option ensures that the design, fonts, colors, and layout of the imported slides are preserved exactly as they were in the original presentation.

• It is a useful feature when you want to maintain consistency in the appearance of slides from multiple presentations.

• The Reuse Slides pane in MS PowerPoint 365 allows you to browse and insert slides from other presentations conveniently.

• By default, PowerPoint applies the destination theme to imported slides unless the 'Keep Source Formatting' option is selected.

Additional Information

• Reuse Slides Pane:

• Located under the 'Home' tab in the 'Slides' group, it allows users to insert slides from other presentations.

• Provides options to either apply the destination theme or retain the source formatting.

• Source Formatting:

• Refers to the original design and formatting of the slides in their source presentation.

• Includes design elements such as fonts, colors, background styles, and layouts.

• Destination Theme:

• This is the design and formatting of the presentation into which the slides are being imported.

• By default, PowerPoint applies the destination theme to ensure consistency within the current presentation.

• Steps to Use 'Keep Source Formatting':

• Go to the 'Home' tab and click on 'Reuse Slides' in the 'Slides' group.

• Browse to the source presentation and select the slides to import.

• Check the 'Keep Source Formatting' checkbox at the bottom of the Reuse Slides pane before inserting the slides.

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• Compatibility:

• The 'Keep Source Formatting' feature is available in Microsoft PowerPoint 365 and other recent versions of PowerPoint.

Q86. Answer: (d) Only 1 and 3

The correct answer is option 4,

Key Points

• The BJP won more than 100 seats in the 2024 Maharashtra Assembly elections, reaffirming its strong presence in the state.

• The Shiv Sena (Shinde faction) outperformed the Uddhav faction in terms of seat tally, showcasing a shift in voter preference.

• The Maha Vikas Aghadi (MVA) alliance, despite its efforts, was unable to form the government.

• Congress and other opposition parties struggled to improve their seat tallies significantly compared to the 2019 elections.

Additional Information

• Electoral Dynamics in Maharashtra: Maharashtra has traditionally seen polarized elections with key players being BJP, Congress, NCP, and Shiv Sena (split into Shinde and Uddhav factions).

• Shiv Sena Split: The split between the Shinde and Uddhav factions in 2022 has created significant political shifts, impacting voter loyalties and alliances.

• Maha Vikas Aghadi (MVA): Formed in 2019, this alliance includes Congress, NCP, and Shiv Sena (Uddhav faction), aiming to counter the BJP's dominance.

• Role of Regional Issues: Issues such as farmer distress, Maratha reservation, and infrastructure development have dominated the political narrative in Maharashtra.

• BJP's Strategy: The BJP has focused on coalition-building, grassroots campaigns, and leveraging national-level leadership to strengthen its foothold in the state.

Q87. Answer: (b) $Cl_2 + H_2O \rightarrow HCl + HOCl$

The correct answer is $Cl_2 + H_2O \rightarrow HCl + HOCl$.

Key Points

• Disproportionation reactions involve the simultaneous oxidation and reduction of the same species within a chemical reaction.

• In the reaction $Cl_2 + H_2O \rightarrow HCl + HOCl$, chlorine ($Cl_2$) undergoes disproportionation as it is both oxidized to form hypochlorous acid (HOCl) and reduced to form hydrochloric acid (HCl).

• The oxidation state of chlorine in Cl_2 is 0. In HCl, it is reduced to -1, and in HOCl, it is oxidized to +1.

• This reaction occurs naturally in water when chlorine is dissolved, and is often used in water purification and disinfection processes.

• Disproportionation reactions are a subset of redox reactions and are characterized by the same element undergoing both gain and loss of electrons.

Additional Information

• Oxidation: It refers to the loss of electrons or an increase in oxidation state during a chemical reaction.

• Reduction: Reduction is the gain of electrons or a decrease in oxidation state during a chemical reaction.

• Oxidation State: It is a number assigned to an element in a compound or ion that represents the number of electrons lost (positive oxidation state) or gained (negative oxidation state).

• Redox Reactions: These are reactions in which oxidation and reduction occur simultaneously, involving the transfer of electrons between species.

• Applications of Disproportionation Reactions: Such reactions are widely used in industrial processes, water treatment, and chemical synthesis (e.g., the production of bleaching agents and disinfectants).

Q88. Answer: (b) 5

Shortcut Trick

Calculate interest as a percentage of the Principal: (700 ÷ 2800) × 100 = 25%.

Since the Rate is 5% per year, the Time required is: 25% ÷ 5% = 5 years.

Therefore The correct answer is 5 years.

Alternate Method

Given:

Principal (P) = Rs. 2,800

Interest (I) = Rs. 700

Rate (R) = 5% per annum

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Calculations:
=> T = (700 × 100) ÷ (2800 × 5)
=> T = 70,000 ÷ 14,000
=> T = 70 ÷ 14
=> T = 5 years
Therefore The correct answer is 5 years.
Additional Information
Simple Interest Formula
The basic formula for Simple Interest is SI = (P × R × T) ÷ 100, where P is Principal, R is Rate per annum, and T is Time in years.
Total Amount
The Total Amount (A) after T years is the sum of Principal and Interest: A = P + SI = P × [1 + (R × T) ÷ 100].
Interest and Time Relationship
For a fixed Principal and Rate, Simple Interest is directly proportional to Time. If time doubles, interest also doubles.

Q89. Answer: (b) 18 cm

Shortcut Trick
Volume of cone V = (1/3)πr²h
297π = (1/3) × π × r² × 11
r² = (297 × 3) ÷ 11 = 27 × 3 = 81
r = 9 cm → Diameter = 2 × 9 = 18 cm
Therefore The correct answer is 18 cm.
Alternate Method
Given:
Height (h) of the cone = 11 cm
Volume (V) of the cone = 297π cm³
Formula Used:
Volume of Right Circular Cone = (1/3)πr²h
Diameter (d) = 2 × Radius (r)
Calculations:
=> (1/3) × π × r² × 11 = 297π
=> (1/3) × r² × 11 = 297
=> r² × 11 = 297 × 3
=> r² = 891 ÷ 11
=> r² = 81
=> r = √81 = 9 cm
=> Diameter = 2 × r = 2 × 9 = 18 cm
Therefore The correct answer is 18 cm.
Additional Information
Slant Height of Cone
The slant height (l) is the distance from the apex to any point on the base circumference: l = √(r² + h²).
Surface Area of Cone
Curved Surface Area (CSA) = πrl and Total Surface Area (TSA) = πr(l + r).
Volume Relation with Cylinder
The volume of a cone is exactly one-third the volume of a cylinder with the same radius and height.

Q90. Answer: (a) = BGJ, % = NSV

Given:
: GLO :: INQ : %
Analysis of Options:
Option 1) # = BGJ, % = NSV
For # (BGJ) to GLO
For INQ to % (NSV)

Option 1 is correct.

Option 2) # = BPU, % = MTG

For # (BPU) to GLO

For INQ to % (MTG)

Option 3) # = DFR, % = NPY

For # (DFR) to GLO

For INQ to % (NPY)

Option 4) # = EDG, % = MGV

For # (EDG) to GLO

For INQ to % (MGV)

Thus, the analogy holds true only for Option 1 where the pattern (+5, +5, +5) is consistent for both pairs.

Hence, the correct answer is "Option 1".

Q91. Answer: (c) Article 25

The correct answer is Article 25.

Key Points

• Article 25 of the Indian Constitution guarantees all individuals the freedom of conscience and the right to freely profess, practice, and propagate religion.

• This article is part of the Fundamental Rights under Part III of the Constitution, specifically ensuring religious freedom.

• The rights under Article 25 are subject to public order, morality, and health, and other provisions of Part III.

• It applies equally to all persons, irrespective of their religion, ensuring secularism as a core principle of the Indian Constitution.

• Article 25 also allows the state to regulate or restrict any economic, financial, political, or other secular activities associated with religious practices.

Additional Information

• Article 26: Provides the right to manage religious affairs, allowing religious denominations to establish institutions for religious and charitable purposes.

• Article 27: Prohibits compelling any person to pay taxes for the promotion or maintenance of any religion or religious institutions.

• Article 28: Addresses freedom as to attendance at religious instruction or religious worship in certain educational institutions.

• Secularism in India: Indian secularism guarantees the state's neutrality towards all religions while allowing freedom of religious practices.

• Restrictions on Article 25: The state can intervene to regulate practices that contradict public order, morality, or health, or for social welfare reforms such as the abolition of untouchability or sati.

Q92. Answer: (d) Rs. 54,450

Shortcut Trick

Total Investment = Profit ÷ Profit% = 84,700 ÷ 28 × 100 = 3,02,500.

Ratio of Ashish : Lalita : Pranav = 21 : 9 : 20.

Total ratio units = 21 + 9 + 20 = 50 units.

50 units = 3,02,500 => 1 unit = 6,050.

Lalita's Investment = 9 units = 9 × 6,050 = 54,450.

Therefore The correct answer is Rs. 54,450.

Alternate Method

Given → Profit = 84,700 | Profit% = 28% of Total Investment | Ratio = 21:9:20.

Formulas: Total Investment = (Profit ÷ Profit%) × 100 | Individual Share = (Individual Ratio ÷ Total Ratio) × Total Investment.

=> Total Investment = (84,700 × 100) ÷ 28 = 3,02,500.

=> Sum of ratios = 21 + 9 + 20 = 50.

=> Lalita's Investment = (9 ÷ 50) × 3,02,500.

=> Lalita's Investment = 9 × 6,050 = 54,450.

Therefore The correct answer is Rs. 54,450.

Additional Information

Partnership Investment

In a simple partnership, the profit is distributed in the same ratio as the capital invested if the time period is constant.

Investment and Profit Relation

Profit = Investment × Time. If time is equal for all, Profit Ratio = Investment Ratio.

Q93. Answer: (b) 200

Shortcut Trick

Rate of Interest (R) = [2 × (CI − SI) ÷ SI] × 100

=> R = [2 × (42 − 40) ÷ 40] × 100 = (4 ÷ 40) × 100 = 10%

Principal (P) = (SI × 100) ÷ (R × T)

=> P = (40 × 100) ÷ (10 × 2) = 4000 ÷ 20 = 200

Therefore The correct answer is 200.

Alternate Method

Given: Simple Interest (SI) = 40, Compound Interest (CI) = 42, Time (T) = 2 years.

Formula Used: SI = (P × R × T) ÷ 100; CI − SI = Interest on first year SI.

=> Simple Interest for 1 year = 40 ÷ 2 = 20

=> Difference (CI − SI) = 42 − 40 = 2

=> This difference 2 is the interest earned on the first year SI (20).

=> Rate of Interest (R) = (2 ÷ 20) × 100 = 10%

=> Since SI for 1 year is 20: 20 = (P × 10 × 1) ÷ 100

=> 20 = P ÷ 10

=> P = 20 × 10 = 200

Therefore The correct answer is 200.

Additional Information

Difference between CI and SI for 2 years

The difference (D) is calculated as $D = P(R/100)^2$.

Relation for 2 years

The ratio of CI to SI for 2 years is CI/SI = (200 + R) / 200.

Difference between CI and SI for 3 years

The difference is calculated as $D = P(R/100)^2 \times (3 + R/100)$.

Q94. Answer: (c) 6

Given:

The number is 73412968.

Arranging the digits of the number 73412968 in descending order from left to right:

Original Digit	**7**	**3**	**4**	**1**	**2**	**9**	**6**	**8**
Sorted Digit	9	8	7	6	4	3	2	1

The new number formed is 98764321.

The fifth digit from the right in the new number is 6.

Hence, the correct answer is "Option 3".

Q95. Answer: (a) Punjab

The correct answer is Punjab.

Key Points

• As per the 2011 Census of India, Punjab was reported as the state with no Scheduled Tribe (ST) population.

• This is attributed to the fact that during the reorganization of states in 1966, tribal areas in Punjab were allocated to other regions such as Himachal Pradesh.

• In contrast, other states like Odisha, Maharashtra, and Kerala have significant tribal populations, with Odisha being one of the states with the highest tribal populations in India.

• The absence of Scheduled Tribes in Punjab is a unique demographic feature when compared to other Indian states and union territories.

• Scheduled Tribes (STs) are officially recognized groups under the Indian Constitution, entitled to specific affirmative actions and reservations.

Additional Information

• Tribal Population in India:

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• India is home to 705 officially recognized Scheduled Tribes, which constitute around 8.6% of the total population (Census 2011).

• The tribal population is concentrated in states like Odisha, Jharkhand, Chhattisgarh, Madhya Pradesh, Maharashtra, and parts of the northeastern region.

• Constitutional Provisions for Scheduled Tribes:

• Article 342 of the Indian Constitution empowers the President to specify Scheduled Tribes in states and union territories.

• Tribal populations benefit from reservations in education, employment, and political representation under the Fifth and Sixth Schedules of the Constitution.

• Census of India 2011:

• The 2011 Census provided detailed demographic data, including the distribution of Scheduled Castes (SCs) and Scheduled Tribes (STs) across states and UTs.

• The tribal population was recorded as 10.43 crore, with the highest numbers in states like Madhya Pradesh and Odisha.

• Punjab's Unique Demographics:

• Punjab has a significant Sikh majority population, with other communities such as Hindus and Muslims comprising smaller proportions.

• The absence of Scheduled Tribes reflects historical and administrative factors, including state reorganization and geographical distribution.

Q96. Answer: (b) Mamulek Style

The correct answer is Mamulek Style.

Key Points

• The Qutub Minar is an iconic monument constructed under the Mamulek (or Mamluk) style of architecture, which is a part of the Delhi Sultanate architectural tradition.

• It was commissioned by Qutb al-Din Aibak, the founder of the Delhi Sultanate, in 1192, and later completed by his successors.

• This architectural style is characterized by the use of red sandstone, intricate carvings, and calligraphic inscriptions, often incorporating Islamic motifs and verses from the Quran.

• The Qutub Minar is a UNESCO World Heritage Site and stands at a height of 72.5 meters, making it one of the tallest minarets in the world built of bricks.

• The Mamulek style of architecture often blended Islamic and indigenous Indian elements, creating a unique fusion evident in monuments like the Qutub Minar.

Additional Information

• Mamulek Architecture:

• Also known as Mamluk architecture, it emerged during the reign of the Slave Dynasty (1206–1290) in India.

• It extensively used locally available materials like red sandstone while incorporating Islamic architectural features such as arches, domes, and minarets.

• Floral patterns, arabesques, and geometric designs were a hallmark of this style.

• Qutub Minar Construction:

• Qutb al-Din Aibak began its construction, but it was completed by his successor, Iltutmish.

• It is surrounded by several historically significant structures, including the Iron Pillar and Alai Darwaza.

• The minar has five distinct storeys, each marked by projecting balconies and intricate carvings.

• Delhi Sultanate Architecture:

• It refers to the architectural developments during the rule of the Delhi Sultanate (1206–1526).

• It includes other notable structures like the Alai Darwaza, the tomb of Iltutmish, and the Tughlaqabad Fort.

• This style laid the foundation for later Mughal architecture.

• UNESCO World Heritage Site:

• The Qutub Minar complex was designated as a UNESCO World Heritage Site in 1993.

• It is recognized for its historical, architectural, and cultural significance.

Q97. Answer: (a) OSM

The logic followed here is:

Option (1): OSM

Option (2): JNI

Option (3): RVQ

Option (4): UYT

The letter-cluster that DOES NOT belong to the group is: OSM.

Hence, the correct answer is "Option (1)"

Q98. Answer: (c) = QOK, % = PNJ

Given:

#: VTP:: KIE: %

Analysis of Options:

Option 1) # = QNK, % = PUY

For # (QNK) to VTP

For KIE to % (PUY)

Option 2) # = RTK, % = PKJ

For # (RTK) to VTP

For KIE to % (PKJ)

Option 3) # = QOK, % = PNJ

For # (QOK) to VTP

For KIE to % (PNJ)

Since the patterns match, Option 3 is correct.

Option 4) # = LOY, % = PKJ

For # (LOY) to VTP

For KIE to % (PKJ)

Hence, the correct answer is "Option 3".

Q99. Answer: (b) Only 3

The correct answer is Option 2.

Key Points

• Globalisation in India post-1991 brought significant changes to the Indian economy, particularly through economic liberalisation policies.

• Contrary to statement 1, the opening of the economy led to a rapid increase in foreign direct investment (FDI) and a substantial rise in foreign exchange reserves.

• Statement 2 is incorrect as post-1991 reforms resulted in economic growth. The GDP growth rate did not witness a decline but rather showed improvement over time.

• Statement 3 is correct, as the growth rate of GDP increased from 5.6% during 1980-91 to 8.2% during 2007-12, reflecting the positive impact of globalisation on economic growth.

• The correct answer is Option 2, as only statement 3 accurately reflects the outcomes of globalisation in the Indian economy.

Additional Information

• Globalisation:

• Globalisation refers to the process of integration and interdependence of economies, societies, and cultures through cross-border trade, investment, and technology.

• It promotes free flow of goods, services, capital, and labour across international borders.

• Economic Reforms of 1991:

• India introduced economic reforms in 1991, focusing on liberalisation, privatisation, and globalisation (LPG model).

• These reforms aimed to address the balance of payment crisis and stimulate economic growth.

• Foreign Direct Investment (FDI):

• FDI refers to investments made by foreign entities in the productive capacity of another country.

• FDI inflows increased significantly in India post-1991 due to liberalised policies and the removal of trade barriers.

• Foreign Exchange Reserves:

• India’s foreign exchange reserves increased from $5.8 billion in 1991 to over $600 billion in recent years, showcasing the positive impact of globalisation.

• GDP Growth Trends:

• India’s GDP growth witnessed a steady rise post-1991 reforms, with significant contributions from sectors like IT, manufacturing, and services.

• Improved infrastructure, policy reforms, and increased trade partnerships played a key role in sustaining high GDP growth rates.

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Q100. Answer: (d) Article 323

The correct answer is Article 323.

Key Points

• Article 323 of the Indian Constitution describes the duty of the Union Public Service Commission (UPSC) to present its annual report to the President of India.

• The President places this report before both Houses of Parliament, along with a memorandum explaining cases where the Commission's advice was not accepted.

• This provision ensures the accountability and transparency of the UPSC's functioning.

• The Union Public Service Commission is a constitutional body established under Part XIV of the Indian Constitution.

Additional Information

• Union Public Service Commission (UPSC)

• It is responsible for conducting examinations for appointments to civil services and posts under the Union Government.

• UPSC is one of the central recruiting agencies of India, established under Article 315 of the Constitution.

• The Commission consists of a chairman and other members appointed by the President of India.

• It functions independently to ensure unbiased recruitment for civil service positions.

• Constitutional Articles Related to UPSC

• Article 315: Establishment of Public Service Commissions for the Union and States.

• Article 316: Appointment and term of office of members of the UPSC.

• Article 317: Removal and suspension of members of Public Service Commissions.

• Article 323: Reports of the UPSC and their presentation to the President.

• Role of UPSC

• Conducting examinations such as the Civil Services Examination (CSE), Engineering Services Examination (ESE), and others.

• Advising the government on matters related to recruitment, promotions, and disciplinary actions.

• Ensuring merit-based selection for appointments in public services.

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