RRB NTPC Graduate Level CBT-I Official Paper (Held On: 09 Jun, 2025 Shift 1) (Previous Year Paper)

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

Take this paper as a timed mock test

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Scan the QR code or click the link to open it.

Q1. In MS Word, which command allows users to duplicate a selected block of text and place the copy at a different location within the same document or another document?

(a) Cut
(b) Drag and Drop
(c) Copy and Paste
(d) Paste Special

Q2. How many total islands/islets/rocky outcrops are there in the Andaman & Nicobar Islands as per the Andaman and Nicobar Administration?

(a) 742
(b) 836
(c) 1002
(d) 612

Q3. Which Indian Constitutional Amendment Act has NOT amended anything in the Directive Principles of the State Policy?

(a) 86^(th) Amendment Act
(b) 48^(th) Amendment Act
(c) 42^(nd) Amendment Act
(d) 97^(th) Amendment Act

Q4. In India, which region is NOT suitable for tube-well irrigation due to non-alluvial tracts?

(a) Western Uttar Pradesh
(b) Plateau regions
(c) Coastal Plains
(d) Punjab

Q5. A water tank can be filled in 29 minutes by using 23 pipes of the same capacity. In how many minutes (rounded off to two decimal places) will the water tank be filled if we use 47 pipes of the same capacity as above?

(a) 17.43
(b) 14.19
(c) 21.97
(d) 24.44

Q6. Which country lies to the east of Arunachal Pradesh?

(a) Bhutan
(b) Bangladesh
(c) China
(d) Myanmar

Q7. Which organisation does the Ministry of Rural Development cooperate with for rural development in Asia and the Pacific?

(a) Asian Development Bank (ADB)
(b) World Bank
(c) Centre on Integrated Rural Development for Asia and Pacific (CIRDAP)
(d) African-Asian Rural Development Organization (AARDO)

Q8. Babita travels a certain distance at a speed of 11 km/hr and double the earlier distance at 44 km/hr. She then returns to the starting point through the same route. If her average speed for the entire journey is 34 km/hr, then what is her speed (in km/hr) for the return journey?

(a) 79
(b) 76.8
(c) 70
(d) 74.8

Q9. 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.)

(33, 429, 13)

(44, 220, 5)

(a) (20, 363, 18)
(b) (4, 23, 5)
(c) (43, 903, 21)
(d) (30, 363, 12)

Q10. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster)

(a) CG - LP
(b) QS - OQ
(c) SU - QS
(d) MO - KM

Q11. P, Q, R, S, T, U and V are sitting around a circular table facing the centre. Only one person sits between P and V when counted from the right of P. Only one person sits between V and U. Only one person sits between P and Q. Only two people sit between R and U. Only one person sits between T and Q. How many people sit between S and P when counted from the left of S?

(a) 3
(b) 0
(c) 2
(d) 5

Q12. group of numbers/symbols is coded using letter codes as per the codes given below and the conditions that follow. If none of the conditions apply, then codes for the respective number/symbol to be followed directly as given in the table.

Number/Symbol	**8**	**9**	**@**	**&**	**5**	**7**	**2**	**%**	**1**	**3**	**Δ**	**4**	**6**
Code	L	C	Z	N	D	W	A	P	R	T	F	B	K

Conditions:

(i) If the first element is a symbol and the last a number, the codes for these two (the first and the last elements) are to be interchanged.

(ii) If the first element is an odd number and the last an even number, the first and last elements are to be coded as ©.

(iii) If both the second and third elements are perfect squares, the third element is to be coded as the code for the second element.

What will be the code for the following group?

7 6 @ 1 3 &

(a) W K Z R T W
(b) W K R Z T N
(c) N K Z R T N
(d) W K Z R T N

Q13. A person saves 40% of his income. If his expenditure is Rs. 960, then his income (in Rs.) is:

(a) 576
(b) 1,640
(c) 384
(d) 1,600

Q14. Kapil starts from point A and drives 9 km towards west. He then takes a right turn, drives 1 km, turns right and drives 5 km. He then takes a left turn and drives 3 km. He then takes a left turn and drive 5 km. He then takes a right turn and drives 8 km. He takes a final right turn, drives 9 km and stops at point P. How far (shortest distance) and towards which direction should he drive in order to reach point A again (all turns are 90° turns only unless specified)?

(a) 12 km north
(b) 11 km north
(c) 10 km south
(d) 12 km south

Q15. If goods are purchased at Rs. 450 and 1/3 are sold at a loss of 10%, at what gain percentage should the remainder be sold so as to gain 20% on the whole transaction?

(a) 35 %
(b) 32 %
(c) 26 %
(d) 28 %

Q16. 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 ::?

: QVR :: CHD : %

(a) = LJM, % = NHG
(b) = GYT, % = NYU
(c) = PMM, % = JUY
(d) = LQM, % = HMI

Q17. In MS Word, which feature allows users to set the margins of a document, affecting the space between the text and the edges of the page?

(a) Margins
(b) Page Borders
(c) Page Size
(d) Page Layout

Q18. In one of his famous works, Yahya bin Ahmad Sirhindi claims that the founder of _____ was a descendant of the Prophet.

(a) Ghaznavid Dynasty
(b) Tughlaq Dynasty
(c) Sayyid Dynasty
(d) Ghurid Dynasty

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Q19. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

36 ÷ 15 − 175 × 5 + 11 =?

(a) 524
(b) 484
(c) 464
(d) 564

Q20. In March 2025, which health milestone was remembered on National Vaccination Day?

(a) Launch of COVID Vaccine
(b) National Vax Mission
(c) Pulse Polio First Dose
(d) Polio Eradication Drive

Q21. In a certain code language, 'how are you' is coded as 'jp zl rc' and 'are they coming' is coded as 'zl qn bt'. How is 'are' coded in the given language?

(a) qn
(b) jp
(c) zl
(d) bt

Q22. 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 ::?

: QYE :: BHP : %

(a) = GEU, % = RNF
(b) = WKK, % = LBZ
(c) = LBZ, % = GEU
(d) = RNF, % = WKK

Q23. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

NQ31, MP40, LO49, KN58, ?

(a) JN67
(b) JM67
(c) JN66
(d) JM66

Q24. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

KF-MH-OQ

ID-KF-MO

(a) GB-ID-KM
(b) HB-ID-KN
(c) HB-IC-KN
(d) GB-ID-KN

Q25. During the 2025 demonstration, which types of drones were successfully destroyed by DRDO's DEW Mk-II(A)?

(a) Helicopter drones
(b) Underwater drones
(c) Racing drones
(d) Fixed-wing UAVs and Swarm drones

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Q26. Find roots of $5m^2 + 18m + 16 = 0$

(a) 8/5 and 2
(b) • 8/5 and 4
(c) • 8/5 and -2
(d) 8/5 and -4

Q27. Rishi has Rs. 1,612 with him. He divided it amongst his sons Shan and Piyush and asked them to invest it at 8% rate of interest per annum, compounded annually. It was seen that Shan and Piyush got the same amount after 19 and 20 years, respectively. How much (in Rs.) did Rishi give to Shan?

(a) Rs. 875
(b) Rs. 837
(c) Rs. 687
(d) Rs. 775

Q28. Simplify : 81 + 76/2 + 42 - 86

(a) 85
(b) 72
(c) 81
(d) 75

Q29. Which authority decides citizenship for people in newly added territories?

(a) Union Government
(b) Election Commission
(c) Supreme Court
(d) State Government

Q30. A shopkeeper marked his goods at X% above their cost price and sold them at a discount of 10%. If he gained 71% profit, then find the value of X.

(a) 89
(b) 91
(c) 90
(d) 92

Q31. 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.

BAIL - ALIB - LIAB

DEAF - EFAD - FAED

(a) MEAN - MAEN - NAEM
(b) LEAN - ELAN - NEAL
(c) BOLD - ODLB - DLOB
(d) GOLD - ODLG - LGOD

Q32. X is directly proportional to A^2 and A is inversely proportional to Y. If X is 97 when Y is 6, find X when Y is 2.

(a) 875
(b) 873
(c) 871
(d) 872

Q33. The 'Tirabhukti' mentioned in Gupta inscriptions corresponds to present-day _____.

(a) Madhya Pradesh
(b) Odisha
(c) Bihar
(d) Bengal

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Q34. Which country became the first in Africa to be acknowledged by the World Health Organization (WHO) for eliminating onchocerciasis (river blindness) in early 2025?

(a) Niger
(b) Italy
(c) South Africa
(d) Botswana

Q35. Which country ranked highest overall in the Climate Change Performance Index 2025?

(a) Germany
(b) Denmark
(c) Sweden
(d) France

Q36. Which of the following is NOT an industrial corridor planned under the Government of India's infrastructure initiatives?

(a) Vizag-Chennai Industrial Corridor
(b) Kolkata-Lucknow Industrial Corridor
(c) Chennai-Bengaluru Industrial Corridor
(d) Delhi-Mumbai Industrial Corridor

Q37. Kavish ranked 38^(th) from the top and 15^(th) from the bottom in his class. How many students are there in his class?

(a) 50
(b) 51
(c) 53
(d) 52

Q38. If the volume of a right circular cone of height 30 cm is 160π cm^3, find the diameter of its base.

(a) 7 cm
(b) 16 cm
(c) 13 cm
(d) 8 cm

Q39. While covering a distance of 54 km, a man noticed that after cycling for 1 hour 15 minutes, the distance covered by him was 7/9 of the remaining distance. What was his speed (in km/hr)?

(a) 18.7
(b) 19.9
(c) 18.9
(d) 19.5

Q40. The female counterpart of the male Bhangra is called:

(a) Ghoomar
(b) Kalbelia
(c) Garba
(d) Giddha

Q41. The value of $3 + \tan^2\theta + \cot^2\theta - \sec^2\theta \operatorname{cosec}^2\theta$ is:

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

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Q42. The ratio of the lengths of two corresponding sides of two similar triangles is 15 : 14. The ratio of the areas of these two triangles, in the order mentioned, is:

(a) 226 : 197
(b) 15 : 14
(c) 225 : 196
(d) 15√15 : 14

Q43. In November 2024, India and Singapore conducted a joint military exercise named Agni Warrior 2024. Where was this exercise held?

(a) Devlali, Maharashtra
(b) Jaisalmer, Rajasthan
(c) Pulgaon, Maharashtra
(d) Babina, Uttar Pradesh

Q44. How many molecules are present in 2 moles of CO2?

(a) 6.022×10^{23}
(b) 3.011×10^{23}
(c) 12.044 × 10^(24)
(d) 1.2044 × 10^(24)

Q45. Vijay's salary was first reduced by 16% and subsequently raised by 11%. What percentage was his final salary lower compared to his initial salary?

(a) 6.76%
(b) 16%
(c) 11%
(d) 1.76%

Q46. What is the mean of the following distribution?

Marks	14	26	44	61	84
No. of Students	91	78	95	36	98

(a) 45
(b) 54
(c) 69
(d) 46

Q47. Which of the following statements accurately reflect the outcomes of the 2024 Jammu and Kashmir Assembly elections?

1. The Congress-JKNC alliance secured a majority with 48 seats.
2. The BJP emerged as the single largest party with 29 seats.
3. Voter turnout was recorded at 63.88%, showing a significant rise compared to the recently concluded Lok Sabha election.
4. The newly elected assembly holds full legislative powers equivalent to other Indian states.

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

Q48. What should come in place of the question mark (?) in the given series?

401 400 397 392 385 ?

(a) 376
(b) 375
(c) 374
(d) 372

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Q49. If '−' means '÷', '÷' means '×', '×' means '+' and '+' means '−', then what will come in place of the question mark (?) in the following equation?

5 × 39 ÷ 1407 − 3 + 11562 = ?

(a) 6734
(b) 1120
(c) 3426
(d) 9074

Q50. The fraction equivalent to 8.27272... is:

(a) 84/17
(b) 83/12
(c) 89/8
(d) 91/11

Q51. What was the Total Fertility Rate (TFR) in India as per the latest National Family Health Survey - 5 (2019-21)?

(a) 2.1
(b) 2.3
(c) 2.0
(d) 2.2

Q52. This question is based on the five, three-digit numbers given below.

(Left) 535 647 232 804 152 (Right)

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

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

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

(a) 2
(b) 1
(c) 3
(d) 5

Q53. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All jams are bands.

All bands are sacks.

No sack is a can.

Conclusions:

(I) No jam is a can.

(II) Some sacks are jams.

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

Q54. What is the primary role of the Gram Panchayat in the Panchayati Raj System in India?

(a) To manage urban infrastructure
(b) To conduct provincial elections, helping the Election Commission
(c) To act as the judicial forum for local disputes
(d) To serve as the executive body of village self-government

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Q55. Deepesh has 168 litres of Oil A and 234 litres of Oil B. He fills a number of identical containers with the two types of oil in a manner that each container has only one type of oil, and all containers are completely filled. What can be the maximum volume (in litres) of each container that Deepesh uses, so that all the oil that Deepesh has, of both the types, can be poured into these containers?

(a) 5
(b) 10
(c) 14
(d) 6

Q56. If x - 1/x = 3, then the value of x^4 + 1/(x^4) is:

(a) 176
(b) 119
(c) 196
(d) 19

Q57. Bholanath Singh was the leader of which of the following revolts?

(a) Tamar Revolt
(b) Wahabi Movement
(c) Santhal Revolt
(d) Farazi Movement

Q58. The ratio of incomes of Seema and Darshan is 7 : 8. They save Rs. 15,000 and Rs. 9,000, respectively. If the ratio of their expenditures is 11 : 16, then what is the total expenditure (in Rs.) of Seema and Darshan?

(a) 64,125
(b) 68,000
(c) 63,000
(d) 64,000

Q59. A new mutation allows Plasmodium falciparum to exit the liver without maturing into merozoites. What would be the immediate consequence?

(a) Immediate immune response and clearance
(b) Increased severity of disease
(c) Absence of RBC rupture and reduced clinical symptoms
(d) Direct infection of alveoli

Q60. In March 2025, NITI Aayog released the 'Future Front: Quarterly Frontier Tech Insights' report. What is the primary focus of this report?

(a) Reviewing the performance of state-run healthcare programs
(b) Analysing the impact of climate change on coastal regions
(c) Assessing India's agricultural productivity trends
(d) Evaluating advancements and investments in quantum computing technologies

Q61. In which of the following dance forms vocal music is not used?

(a) Chhau
(b) Bharatanatyam
(c) Odissi
(d) Kathak

Q62. What was the theme of Expo 2025 in Osaka, Japan?

(a) Better City, Better Life
(b) Connecting Minds, Creating the Future
(c) Designing Future Society for Our Lives
(d) Feeding the Planet, Energy for Life

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Q63. A man bought 8 shirts at Rs. 550 each,10 pants at Rs. 1,000 each and 12 pairs of shoes at Rs. 850 each pair. What is the average expenditure per article?

(a) Rs. 836
(b) Rs. 826
(c) Rs. 840
(d) Rs. 820

Q64. If 3 times the mother's present age is 36 years more than 5 times her daughter's age, and 3 times the daughter's age is 4 years less than the mother's age, then what is the difference (in years) between the present ages of the mother and the daughter?

(a) 13
(b) 16
(c) 18
(d) 20

Q65. The length, width and height of a cuboid are in the ratio 10 : 17 : 14, and its total surface area is 1096 cm^2. Find the length (in cm) of the cuboid.

(a) 5
(b) 17
(c) 10
(d) 1

Q66. Rakesh invests a sum of Rs. 5,000 and Shivam invests a sum of Rs. 9,000 at the same rate of simple interest per annum. If, at the end of 3 years, Shivam gets Rs. 360 more interest than Rakesh, then find the rate of interest per annum (in percentage).

(a) 5%
(b) 3%
(c) 1%
(d) 2%

Q67. F is the brother of G.

G is the husband of H.

H is the daughter of I.

I is the wife of J.

How is F related to J?

(a) Daughter's husband's brother
(b) Brother
(c) Daughter's husband's father
(d) Father

Q68. What name do the Jarawa tribe use to refer to their home in the Andaman Islands?

(a) Rangbang
(b) Morung
(c) Chaddhas
(d) Gitiora

Q69. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) EH - BE
(b) GJ - DG
(c) RK - JH
(d) PS - MP

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Q70. The Chuar Rebellion, which emerged as a culmination of the economic grievances of ordinary peasants and hereditary workers, reached its peak during which of the following years?

(a) 1901-02
(b) 1710-11
(c) 1857-58
(d) 1798-99

Q71. The value of $17^3 - 10^2 + (26/13)^2 - 12 + 20 \times 12 =$

(a) 5045
(b) 5055
(c) 5046
(d) 5040

Q72. What is the purpose of creating subfolders when organizing files?

(a) To group related files together for better management
(b) To change file extensions
(c) To reduce the file size
(d) To automatically back up files to the cloud

Q73. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 8271634, how many digits will appear more than once in the new number thus formed?

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

Q74. The original price of a music set is Rs. 8,000. The price is decreased by 12% and then raised by 25%. What is its new price (in Rs.)?

(a) 9,300
(b) 8,300
(c) 8,800
(d) 8,100

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

(a) 2 km to the east
(b) 1 km to the west
(c) 2 km to the west
(d) 3 km to the west

Q76. The average weight of A, B and C is 45 kg. If the average weight of A and B is 40 kg and that of B and C is 42 kg, then the weight of B (in kg) is:

(a) 19
(b) 44
(c) 29
(d) 39

Q77. Which bank of India will mark its 90^(th) anniversary in 2025?

(a) Punjab National Bank
(b) State Bank of India
(c) Indian Bank
(d) Reserve Bank of India

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Q78. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

NTZ LRX JPV HNT ?

(a) RFL
(b) FLR
(c) FRL
(d) RLF

Q79. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 4 6 & 8 $ 7 & 3 9 # % 4 6 @ £ 5 Ω 9 # 1 * 7 (Right)

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

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

Q80. NASA astronaut Sunita Williams returned to Earth in March 2025 after her mission aboard a SpaceX capsule. How much time had she spent in space?

(a) 502 days
(b) 608 days
(c) 578 days
(d) 212 days

Q81. What type of farming is practised in hill regions by cutting slopes into steps?

(a) Extensive farming
(b) Mixed farming
(c) Wetland farming
(d) Terrace farming

Q82. Which languages were added to the Eighth Schedule by the 71^(st) Amendment Act, 1992?

(a) Sindhi, Tamil and Urdu
(b) Konkani, Manipuri and Nepali
(c) Kannada, Telugu and Marathi
(d) Bodo, Santhali and Maithili

Q83. What are the wavelength and type of the laser used in a standard CD-ROM drive?

(a) 400 nm; blue laser
(b) 650 nm; red laser
(c) 850 nm; near-infrared laser
(d) 780 nm; infrared laser

Q84. A can lay a railway track between two given stations in 8 days and B can do the same job in 24 days. With the help of C, they can do the job in 3 days. C alone can do the job in:

(a) 8 days
(b) 7 days
(c) 9 days
(d) 6 days

Q85. What is the primary function of Alt + Tab in most modern operating systems?

(a) Minimises the active window
(b) Opens a new tab in the current application
(c) Opens Task Manager directly
(d) Switches between open applications

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Q86. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 5673128, what will be the difference between the digits which are third from the left and second from the right in the new number thus formed?

(a) 9
(b) 7
(c) 8
(d) 6

Q87. F, G, H, I, J, K and X are sitting around a circular table facing the centre of the table. H sits to the immediate right of F. Only three people sit between H and G when counted from the left of H. X sits third to the right of F. I sits to the immediate right of K. How many people sit between J and K when counted from the left of K?

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

Q88. In a certain code language, 'FUSE' is coded as '3517' and 'SING' is coded as '2458'. What is the code for 'S' in the given code language?

(a) 1
(b) 2
(c) 8
(d) 5

Q89. Select the number from among the given options that can replace the question mark (?) in the following series.
29 33 41 53 ? 89 113

(a) 71
(b) 79
(c) 63
(d) 69

Q90. Some marbles are to be packed in four boxes, A, B, C and D, in the proportion of 6 : 3 : 7 : 5. If box B has 400 less marbles than box D, then how many marbles are there in total in all the boxes?

(a) 4100
(b) 4000
(c) 4200
(d) 3900

Q91. The arithmetic mean of the observations 79, 92, 39, 57, 91, 28, 74, 90 and 44 is:

(a) 66
(b) 71
(c) 61
(d) 59

Q92. Which statement is correct with reference to artificially produced elements?

(a) They are short-lived.
(b) They are found in all groups of the table.
(c) They are long-lived.
(d) They are stable like natural elements.

Q93. In November 2024, the birth anniversary of the tribal leader Birsa Munda was celebrated as:

(a) Adivasi Swabhiman Diwas
(b) Janjatiya Gaurav Divas
(c) Tribal Freedom Day
(d) Vanvasi Diwas

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Q94. What prompted changes in the State Co-operative Societies Acts?

(a) Limited number of societies
(b) Political interests
(c) Poor quality of functioning
(d) Rise in taxes

Q95. For a regular polygon, the sum of the interior angles is 250% more than the sum of its exterior angles. Each interior angle of the polygon measures x°. What is the value of x?

(a) 140
(b) 145
(c) 150
(d) 120

Q96. The first armed tribal rebellion against the British is considered to have taken place in:

(a) 1795
(b) 1800
(c) 1768
(d) 1784

Q97. Refer to the following letter and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 7 * £ 5 8 $ 7 3 * 9 & % 4 6 @ 9 # 1 & 3 Ω (Right)

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

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

Q98. A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. The product of floors on which F and D live is 15. E lives immediately above C .The sum of floors on which A and D live is 7. What is the sum of floors on which A and E live?

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

Q99. What is the target length for the development of a national highway network in India by 2025?

(a) 1 lakh km
(b) 2 lakh km
(c) 1.5 lakh km
(d) 2.5 lakh km

Q100. M, N, O, P, Y and Z live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. Only M lives above N. Z lives immediately below N. Only P lives below O. Who lives on floor numbered 3?

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

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) Copy and Paste

The correct answer is Copy and Paste.

Key Points

• Copy and Paste is a widely used command in MS Word and other text editing software to duplicate text and place it in another location within the document or across documents.

• Users can select the text, right-click to copy, and then paste it at the desired location using the right-click menu or shortcut keys (Ctrl+C and Ctrl+V).

• This command allows users to retain the original text while creating a duplicate copy, ensuring no data is lost.

• Copy and Paste is applicable to not just text but also images, tables, and other elements in MS Word.

• It simplifies repetitive tasks and enhances productivity by eliminating the need for retyping or recreating content.

Additional Information

• Cut vs. Copy:

• The Cut command (Ctrl+X) removes the selected text or object from its original location and allows it to be pasted elsewhere.

• Copy (Ctrl+C), on the other hand, creates a duplicate while leaving the original content intact.

• Drag and Drop Functionality:

• Users can drag selected text or objects and drop them into a new location within the same document.

• This method is quick but lacks the precision of Copy and Paste for cross-document transfers.

• Paste Special:

• Paste Special allows users to control the formatting of copied content when pasting.

• For example, users can paste as plain text, formatted text, or in other specified formats.

• Shortcut Keys in MS Word:

• Common shortcuts include Ctrl+C (Copy), Ctrl+V (Paste), Ctrl+X (Cut), and Ctrl+Z (Undo).

• These shortcuts are designed to enhance user efficiency and streamline text manipulation tasks.

• Clipboard Functionality:

• The Clipboard temporarily stores copied or cut items, allowing users to paste them multiple times.

• In MS Word, the Clipboard can hold multiple items, offering extended flexibility for editing tasks.

Q2. Answer: (b) 836

The correct answer is 836.

Key Points

• The Andaman and Nicobar Islands are a group of islands located in the Bay of Bengal, consisting of a total of 836 islands/islets/rocky outcrops as per the Andaman and Nicobar Administration.

• The archipelago is divided into two groups: the Andaman Islands (north) and the Nicobar Islands (south).

• These islands are known for their rich biodiversity, unique flora and fauna, and strategic importance for India's maritime boundaries.

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• Of the 836 islands, only a fraction are inhabited, while the majority remain pristine and untouched.

• These islands form a vital ecological hotspot and are protected under various environmental laws and conservation programs.

Additional Information

• Geographical Significance

• The Andaman and Nicobar Islands lie at the juncture of the Bay of Bengal and the Andaman Sea, making them strategically important for India's defense and trade.

• They act as a natural barrier to the Indian coastline, protecting it from potential threats and offering a vantage point for maritime surveillance.

• Biodiversity

• The islands are part of the Indo-Malayan eco-zone, hosting a variety of endemic species, including rare birds, reptiles, and marine life.

• The tropical rainforests here support diverse ecosystems, with mangroves playing a key role in stabilizing coastal environments.

• Tribes of the Islands

• The islands are home to indigenous tribes such as the Great Andamanese, Onge, Jarwa, and Sentinelese.

• These tribes have distinct cultural practices and lifestyles, and efforts are made to preserve their heritage and isolation.

• Tourism and Conservation

• The islands are a popular tourist destination, known for their beaches, coral reefs, and adventure activities like scuba diving.

• Significant areas are designated as protected zones, such as the Mahatma Gandhi Marine National Park, to conserve the delicate ecosystems.

Q3. Answer: (b) 48^(th) Amendment Act

The correct answer is 48th Amendment Act.

Key Points

• The 48th Amendment Act of 1984 did not amend any provisions related to the Directive Principles of State Policy (DPSP).

• This amendment was enacted to extend the President's Rule in the state of Punjab beyond the one-year limit prescribed under Article 356(5) of the Indian Constitution.

• It dealt specifically with the political situation in Punjab and had no relevance to the Directive Principles of State Policy.

• In contrast, amendments like the 42nd Amendment Act and 86th Amendment Act directly addressed and modified provisions of the DPSP.

• The 42nd Amendment Act, for instance, added new principles, while the 86th Amendment Act integrated the right to education for children under Article 21A, influencing related DPSPs.

Additional Information

• Directive Principles of State Policy (DPSP):

• Enshrined in Part IV (Articles 36-51) of the Indian Constitution, DPSPs aim to establish a welfare state by guiding the government in policy-making.

• They are non-justiciable, meaning they cannot be enforced in a court of law, but they are fundamental in governance.

• Examples include provisions for social welfare, equitable distribution of resources, and environmental conservation.

• 42nd Amendment Act (1976):

• Known as the "Mini-Constitution," it made significant changes to the DPSP.

• Added Articles 39A (Equal justice and free legal aid), 43A (Workers' participation in management), and 48A (Protection of the environment).

• Shifted the focus towards socialism and environmental sustainability.

• 86th Amendment Act (2002):

• Introduced Article 21A, making the right to education a fundamental right for children aged 6 to 14 years.

• Modified Article 45 under DPSP to focus on early childhood care for children below six years.

• 97th Amendment Act (2011):

• Added a new DPSP under Article 43B, emphasizing the promotion of cooperative societies.

• Aimed to strengthen cooperative movements in India by ensuring their democratic functioning.

Q4. Answer: (b) Plateau regions

The correct answer is Plateau regions.

Key Points

• Plateau regions in India, such as the Deccan Plateau, are characterized by hard rock formations and non-alluvial soil, making them unsuitable for tube-well irrigation.

• Tube-well irrigation requires soft, porous, and permeable alluvial soil to facilitate water extraction, which is not present in plateau regions.

• These regions often lack sufficient groundwater recharge due to rocky terrain and limited aquifer systems.

• In contrast, regions like Punjab, Western Uttar Pradesh, and Coastal Plains have fertile alluvial soil and abundant groundwater, making them ideal for tube-well irrigation.

• Farmers in plateau regions primarily depend on rainfall or surface water sources such as tanks, reservoirs, and rivers for irrigation.

Additional Information

• Alluvial Soil and Irrigation:

• Alluvial soil is formed by river deposits and is rich in nutrients, making it fertile and ideal for agriculture.

• Its porous structure allows easy water percolation, which facilitates the use of tube-well irrigation.

• Groundwater and Aquifers:

• Groundwater is stored in aquifers, which are layers of permeable rock or sediment that can hold and transmit water.

• Plateau regions typically have fractured or impermeable rocks that hinder groundwater storage and extraction.

• Deccan Plateau Characteristics:

• It is composed of igneous and metamorphic rocks, which are hard and non-porous.

• These features limit the region's ability to support groundwater-based irrigation systems like tube-wells.

• Alternative Irrigation in Plateau Regions:

• Farmers rely on surface irrigation methods such as canals, tanks, and rainwater harvesting to meet their agricultural water needs.

• Government initiatives promote micro-irrigation techniques like drip and sprinkler systems to optimize water use in these areas.

• Indian Irrigation Practices:

• Approximately 48% of India's net sown area relies on irrigation, with tube-wells being a major source in alluvial regions.

• Regions unsuitable for tube-well irrigation often implement watershed development projects to improve water availability.

Q5. Answer: (b) 14.19

Shortcut Trick

Apply the Inverse Proportion rule: M1 × T1 = M2 × T2

Here, 23 pipes × 29 minutes = 47 pipes × Time

Time = (23 × 29) ÷ 47 = 667 ÷ 47

Time ≈ 14.19 minutes

Therefore The correct answer is 14.19 minutes.

Alternate Method

Given:

Initial number of pipes (M1) = 23

Initial time (T1) = 29 minutes

Final number of pipes (M2) = 47

Formula Used:

Total Work = Number of Pipes × Time taken

Calculations:

=> Total capacity of tank = 23 × 29 units

=> Total capacity = 667 units

=> Time taken by 47 pipes = Total capacity ÷ Number of pipes

=> Time = 667 ÷ 47

=> Time = 14.19148...

=> Time ≈ 14.19 minutes (rounded off to two decimal places)

Therefore The correct answer is 14.19 minutes.

Additional Information

Inverse Variation

In Pipes and Cisterns, the number of pipes is inversely proportional to the time taken to fill the tank (if all pipes have the same efficiency).

Chain Rule Formula

The general formula is M1D1H1/W1 = M2D2H2/W2, where M is efficiency/pipes, D is days/minutes, and W is work/capacity.

Q6. Answer: (d) Myanmar

The correct answer is Myanmar.

Key Points

• Arunachal Pradesh is located in the northeastern region of India, sharing its eastern border with Myanmar.

• The border between Arunachal Pradesh and Myanmar is demarcated by the India-Myanmar International Boundary.

• The border region is characterized by dense forests and mountainous terrain, making it strategically and geographically significant.

• Arunachal Pradesh also shares international borders with China to the north and Bhutan to the west, but Myanmar lies directly to its east.

• This area includes tribal communities and is part of the larger Indo-Burma biodiversity hotspot.

Additional Information

• Bordering States and Countries:

• Arunachal Pradesh shares its borders with three countries: China, Bhutan, and Myanmar.

• It also shares state borders with Assam and Nagaland within India.

• McMahon Line:

• The McMahon Line is the de facto boundary between India and China in Arunachal Pradesh.

• This line is a source of territorial disputes between India and China.

• Tribal Diversity:

• Arunachal Pradesh is home to numerous indigenous tribes, including the Adi, Nyishi, Apatani, and Mishmi tribes.

• These tribes have unique cultures, traditions, and languages.

• Strategic Importance:

• Arunachal Pradesh holds strategic importance for India due to its location at the tri-junction of India, China, and Myanmar.

• It is critical for India's border security and regional connectivity initiatives.

Q7. Answer: (c) Centre on Integrated Rural Development for Asia and Pacific (CIRDAP)

The correct answer is Centre on Integrated Rural Development for Asia and Pacific (CIRDAP).

Key Points

• The Ministry of Rural Development in India collaborates with the Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) to advance rural development initiatives in the Asia-Pacific region.

• CIRDAP was established in 1979 at the initiative of the Food and Agriculture Organization (FAO) of the United Nations to promote integrated rural development.

• The organization has its headquarters in Dhaka, Bangladesh, and works with member countries to strengthen rural development policies and practices.

• India is a founding member of CIRDAP and actively contributes to its programs focusing on poverty alleviation, sustainable agriculture, and rural infrastructure development.

• CIRDAP functions as a platform for knowledge-sharing, capacity-building, and technical cooperation among its 15 member countries, including India, Bangladesh, Sri Lanka, and others.

Additional Information

• CIRDAP Member Countries

• CIRDAP has 15 member countries, which include Afghanistan, Bangladesh, Bhutan, India, Indonesia, Iran, Laos, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam.

• These countries collaborate on rural development strategies and share best practices to improve living conditions in rural areas.

• Integrated Rural Development

• Integrated rural development involves a holistic approach to improving economic, social, and environmental conditions in rural areas.

• It focuses on sectors such as agriculture, education, health, infrastructure, and community participation to ensure sustainable development.

• Role of FAO

• The Food and Agriculture Organization (FAO) of the United Nations was instrumental in the establishment of CIRDAP, emphasizing its commitment to eradicating hunger and promoting rural development globally.

• FAO continues to provide technical support and guidance to CIRDAP and its member countries.

• India and CIRDAP

• India's Ministry of Rural Development plays a pivotal role in supporting CIRDAP by offering expertise, resources, and research inputs.

• India often hosts training programs, workshops, and conferences under the aegis of CIRDAP to foster regional cooperation in rural development.

Q8. Answer: (d) 74.8

Shortcut Trick

Assume initial distance is 44 km (LCM of 11 and 44).

Total Distance = 44 (forward 1) + 88 (forward 2) + 132 (return) = 264 km.

Total Time = Total Distance ÷ Average Speed = 264 ÷ 34 = 132/17 hours.

Forward Time = (44/11) + (88/44) = 4 + 2 = 6 hours.

Return Speed = 132 ÷ (132/17 − 6) = 132 ÷ (30/17) = 132 × 17 ÷ 30 = 74.8 km/hr.

Therefore The correct answer is 74.8 km/hr.

Alternate Method

Given: Forward speed 1 = 11 km/hr, Forward speed 2 = 44 km/hr, Avg Speed = 34 km/hr.

Formula Used: Average Speed = Total Distance ÷ Total Time

=> Let first distance be D. Second distance = 2D. Total return distance = 3D.

=> Total Distance = D + 2D + 3D = 6D.

=> Total Time = (D/11) + (2D/44) + (3D/V) = (4D+2D)/44 + 3D/V = 6D/44 + 3D/V = 3D/22 + 3D/V.

=> 34 = 6D ÷ (3D/22 + 3D/V) = 6D ÷ [3D(1/22 + 1/V)]

=> 34 = 2 ÷ ((V + 22) / 22V)

=> 34 = 44V ÷ (V + 22)

=> 34(V + 22) = 44V => 34V + 748 = 44V

=> 10V = 748 => V = 74.8 km/hr.

Therefore The correct answer is 74.8 km/hr.

Additional Information

Average Speed Formula

For different distances d1, d2, d3... with speeds s1, s2, s3..., Average Speed = (Σd) ÷ (Σd/s).

Special Case: Equal Distances

When two equal distances are covered at speeds a and b, the average speed is (2ab) ÷ (a + b).

Unit Conversion

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

Q9. Answer: (c) (43, 903, 21)

The logic followed here is:

(33, 429, 13) → 33 × 13 = 429

And,

(44, 220, 5) → 44 × 5 = 220

So, checking each option one by one:

Option 1) (20, 363, 18) → 20 × 18 = 360 ≠ 363

Option 2) (4, 23, 5) → 4 × 5 = 20 ≠ 23

Option 3) (43, 903, 21) → 43 × 21 = 903

Option 4) (30, 363, 12) → 30 × 12 = 360 ≠ 363

Hence, "Option 3" is the correct answer.

Q10. Answer: (a) CG - LP

The logic followed here is:

Option 1) CG - LP

Option 2) QS - OQ

Option 3) SU - QS

Option 4) MO - KM

Thus, out of all 'CG - LP' is the odd one out.

Hence, "Option 1" is the correct answer.

Q11. Answer: (d) 5

Given: P, Q, R, S, T, U and V are sitting around a circular table facing the centre.

1) Only one person sits between P and V when counted from the right of P.

2) Only one person sits between V and U.

3) Only one person sits between P and Q.

4) Only two people sit between R and U.

5) Only one person sits between T and Q.

After positioning T only one position is left which will be occupied by the only person left i.e. S.

Thus, five sit between S and P when counted from the left of S.

Hence, "Option 4" is the correct answer.

Q12. Answer: (d) W K Z R T N

Given Table:

Number/Symbol	**8**	**9**	**@**	**&**	**5**	**7**	**2**	**%**	**1**	**3**	**Δ**	**4**	**6**
Code	L	C	Z	N	D	W	A	P	R	T	F	B	K

According to the given condition:

Rule no.	**Condition**	**Result**
(i)	First element is a symbol and the last a number	Codes for these two are to be interchanged
(ii)	First element is an odd number and the last an even number	First and last elements are to be coded as ©
(iii)	Both the second and third elements are perfect squares	Third element is to be coded as the code for the second element

Given: 7 6 @ 1 3 &

Here, no rule applies here.

7 → coded as W

6 → coded as K

@ → coded as Z

1 → coded as R

3 → coded as T

& → coded as N

So, 7 6 @ 1 3 & → Coded as W K Z R T N

Hence, "Option 4" is the correct answer.

Q13. Answer: (d) 1,600

Shortcut Trick

Savings = 40% => Expenditure = 100% − 40% = 60%

60% units = Rs. 960

1% unit = 960 ÷ 60 = 16

100% units (Income) = 16 × 100 = Rs. 1600

Therefore The correct answer is Rs. 1600.

Alternate Method

Given:

Savings percentage = 40%

Expenditure = Rs. 960

Formula Used:

Income = Expenditure + Savings

Calculations:

=> Let the total income be Rs. x.

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=> Savings = 40% of x
=> Expenditure = Income − Savings
=> Expenditure = 100% − 40% = 60% of x
=> 60/100 × x = 960
=> 0.6x = 960
=> x = 960 ÷ 0.6
=> x = 1600
Therefore The correct answer is Rs. 1600.
Additional Information
Percentage Change
To calculate percentage change, use the formula: (Change ÷ Original Value) × 100.
Income Components
In most aptitude problems, Income is always considered as the sum of Expenditure and Savings (I = E + S).
Base Value
Income is generally treated as the base (100%) when calculating percentage savings or percentage expenditure.

Q14. Answer: (d) 12 km south

Given:
Kapil starts from point A and drives 9 km towards west.
He then takes a right turn, drives 1 km, turns right and drives 5 km.
He then takes a left turn and drives 3 km.
He then takes a left turn and drive 5 km.
He then takes a right turn and drives 8 km.
He takes a final right turn, drives 9 km and stops at point P.
Thus, Kapil should drive 12 km (1 km + 3 km + 8 km) in the south direction in order to reach point A again.
Hence, "Option 4" is the correct answer.

Q15. Answer: (a) 35 %

Shortcut Trick
Assume the total quantity is 3 units. 1 unit is sold at 10% loss (−10%).
To get a 20% gain on the whole transaction (3 units), total profit needed = 3 × 20% = 60%.
Remaining units = 3 − 1 = 2 units.
Profit needed from remaining units = Total Profit − Profit/Loss already made = 60% − (−10%) = 70%.
Gain percentage on remainder = 70% ÷ 2 = 35%.
Therefore The correct answer is 35%.
Alternate Method
Given: Total CP = Rs. 450 | Loss on 1/3^(rd) part = 10% | Overall Gain = 20%.
Formulas: Profit = SP − CP | SP = CP × (100 + P%) ÷ 100 | SP = CP × (100 − L%) ÷ 100.
=> Total SP required = 450 × (120 ÷ 100) = Rs. 540.
=> CP of 1/3^(rd) goods = 450 × (1 ÷ 3) = Rs. 150.
=> SP of 1/3^(rd) goods at 10% loss = 150 × (90 ÷ 100) = Rs. 135.
=> Remaining SP needed = 540 − 135 = Rs. 405.
=> CP of remaining 2/3^(rd) goods = 450 − 150 = Rs. 300.
=> Profit required on remaining = 405 − 300 = Rs. 105.
=> Profit % on remaining = (105 ÷ 300) × 100 = 35%.
Therefore The correct answer is 35%.
Additional Information
Weighted Average Method
For parts of goods, Overall % = (n1 × p1 + n2 × p2) ÷ (n1 + n2), where p is profit/loss %.
Profit and Loss on Parts
When the total CP is given but the question asks for a percentage, the actual CP value does not affect the final percentage result.

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Q16. Answer: (d) = LQM, % = HMI

The logic followed here is:

Given: # : QVR :: CHD : %

Option 1) # = LJM, % = NHG → LJM : QVR :: CHD : NHG

Option 2) # = GYT, % = NYU → GYT : QVR :: CHD : NYU

Option 3) # = PMM, % = JUY → PMM : QVR :: CHD : JUY

Option 4) # = LQM, % = HMI → LQM : QVR :: CHD : HMI

Hence, "Option 4" is the correct answer.

Q17. Answer: (a) Margins

The correct answer is Margins.

Key Points

• The Margins feature in MS Word allows users to set the blank space between the text and the edges of the page.

• Margins can be adjusted by navigating to Layout > Margins, where predefined options like Normal, Narrow, Wide, and custom settings are available.

• Changing the margins affects the document layout, helping users manage text density and page appearance efficiently.

• Proper margin settings are crucial for ensuring readability, consistency, and adherence to document formatting standards, such as those required for academic or professional submissions.

• MS Word allows users to set margins individually for each side of the page: top, bottom, left, and right.

Additional Information

• Page Layout Tab in MS Word:

• The Page Layout tab includes essential formatting options like Margins, Orientation, Size, Columns, and Page Borders.

• It enables users to customize the overall appearance and structure of the document.

• Other Margin Types:

• MS Word allows for the creation of gutter margins, which provide extra space for binding documents.

• Mirror margins are used for documents intended for double-sided printing, ensuring symmetry between facing pages.

• Document Orientation:

• Orientation options (Portrait and Landscape) can complement margin settings to optimize document appearance.

• Portrait orientation is vertical, while Landscape orientation is horizontal.

• Page Borders vs. Margins:

• While margins define blank space around text, Page Borders add decorative or functional lines around the page’s edges.

• Page Borders are customizable under the Design tab in MS Word.

• Importance of Margins:

• Proper margins improve visual appeal and help maintain a professional appearance in documents.

• They are crucial for printing, ensuring text does not get cut off or overlap binding areas.

Q18. Answer: (c) Sayyid Dynasty

The correct answer is Sayyid Dynasty.

Key Points

• The Sayyid Dynasty ruled the Delhi Sultanate from 1414 to 1451 CE and was established after the decline of the Tughlaq Dynasty.

• Yahya bin Ahmad Sirhindi, in his famous work Tarikh-i-Mubarak Shahi, claimed that the founder of the Sayyid Dynasty, Khizr Khan, was a descendant of the Prophet Muhammad.

• Khizr Khan was appointed as the governor of Multan by Timur (Tamerlane) and later established his rule in Delhi in 1414 CE.

• The dynasty is called "Sayyid" due to the belief that its rulers were Sayyids, descendants of the Prophet Muhammad, which is a title signifying high religious and social status in Islamic tradition.

• After Khizr Khan, his successors, including Mubarak Shah, Muhammad Shah, and Ala-ud-Din Alam Shah, ruled until the dynasty was overthrown by the Lodi Dynasty in 1451 CE.

Additional Information

• Delhi Sultanate

• The Delhi Sultanate refers to a series of Muslim dynasties that ruled over large parts of India from 1206 to 1526 CE.

• The Sultanate saw five main dynasties: Slave (Mamluk), Khilji, Tughlaq, Sayyid, and Lodi dynasties.

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• The Sayyid Dynasty was the fourth dynasty of the Delhi Sultanate.

• Khizr Khan

• Khizr Khan was the founder of the Sayyid Dynasty and ruled from 1414 to 1421 CE.

• He did not assume the title of Sultan and continued to acknowledge the suzerainty of Timur's successors in Central Asia.

• He focused on consolidating power in Delhi and surrounding areas rather than expanding the empire.

• Significance of Sayyid Title

• The title "Sayyid" denotes a person who claims direct lineage to the Prophet Muhammad through his grandsons Hasan and Husayn.

• This lineage is considered sacred in Islamic culture and conveys religious and social prestige.

• Decline of the Sayyid Dynasty

• The Sayyid Dynasty faced continuous challenges, including revolts and weakened central authority.

• The last ruler, Ala-ud-Din Alam Shah, voluntarily abdicated the throne in favor of Bahlul Lodi in 1451 CE, marking the end of the dynasty.

Q19. Answer: (d) 564

Given: 36 ÷ 15 − 175 × 5 + 11 = ?

According to the question, after '+' and '−' are interchanged and '×' and '÷' are interchanged:

36 ÷ 15 − 175 × 5 + 11 = ? => 36 × 15 + 175 ÷ 5 − 11 = ?

=> 36 × 15 + 175 ÷ 5 − 11 = ?

=> 36 × 15 + 35 − 11 = ?

=> 540 + 35 − 11 = ?

=> 575 − 11 = ?

=> 564 = ?

Hence, "Option 4" is the correct answer.

Q20. Answer: (c) Pulse Polio First Dose

The correct answer is Pulse Polio First Dose.

Key Points

• National Vaccination Day is observed in India on 16th March every year.

• It was initiated to commemorate the first-ever administration of the Oral Polio Vaccine (OPV) in India on 16 March 1995.

• The Pulse Polio Immunization (PPI) program was launched in 1995 with the aim of eradicating polio in India by vaccinating all children under the age of five.

• The program became one of the most successful vaccination initiatives, leading to India being declared polio-free by the World Health Organization (WHO) in 2014.

• This milestone is remembered annually to raise awareness about the importance of vaccination in preventing diseases.

Additional Information

• Pulse Polio Immunization Program

• Launched in 1995 under the Global Polio Eradication Initiative (GPEI).

• It involved administering two drops of the Oral Polio Vaccine (OPV) to children under five, irrespective of their previous vaccination status.

• The program focused on high-risk areas and rapid response to polio outbreaks.

• It played a crucial role in achieving a polio-free status for India, certified by WHO in 2014.

• Global Polio Eradication Initiative (GPEI)

• A public-private partnership launched in 1988 with the goal of eradicating polio worldwide.

• Key partners include WHO, UNICEF, Rotary International, CDC, and the Bill & Melinda Gates Foundation.

• Since its launch, the number of polio cases globally has decreased by over 99%.

• Importance of Vaccination

• Vaccination is one of the most effective ways to prevent infectious diseases.

• It helps develop immunity by mimicking an infection without causing illness.

• Mass vaccination campaigns like Pulse Polio have saved millions of lives worldwide.

• Eradication of Polio in India

• India reported its last polio case in January 2011 in West Bengal.

• On 27 March 2014, WHO certified the Southeast Asia Region, including India, as polio-free.

• India's success was attributed to strong government commitment, community participation, and support from global health organizations.

Q21. Answer: (c) zl

According to the given information,

Thus, 'are' is coded as 'zl'.

Hence, "Option 3" is the correct answer.

Q22. Answer: (c) = LBZ, % = GEU

The logic followed here is:

Given: # : QYE :: BHP : %

Option 1) # = GEU, % = RNF → GEU : QYE :: BHP : RNF

Option 2) # = WKK, % = LBZ → WKK : QYE :: BHP : LBZ

Option 3) # = LBZ, % = GEU → LBZ : QYE :: BHP : GEU

Option 4) # = RNF, % = WKK → RNF : QYE :: BHP : WKK

Hence, "Option 3" is the correct answer.

Q23. Answer: (b) JM67

The logic followed here is:

Hence, "Option 2" is the correct answer.

Q24. Answer: (a) GB-ID-KM

The logic followed here is:

Given:

KF-MH-OQ

And,

ID-KF-MO

Similarly,

Option 1) GB-ID-KM

Hence, "Option 1" is the correct answer.

Q25. Answer: (d) Fixed-wing UAVs and Swarm drones

The correct answer is Fixed-wing UAVs and Swarm drones.

Key Points

• The Defence Research and Development Organisation (DRDO) successfully demonstrated the Directed Energy Weapon (DEW) Mk-II(A) during trials in 2025.

• The DEW Mk-II(A) effectively neutralized Fixed-wing Unmanned Aerial Vehicles (UAVs) and Swarm drones, showcasing its operational capabilities against advanced aerial threats.

• The system employs laser-based technology to disable or destroy aerial targets by disrupting their onboard electronics or structure.

• These trials highlighted India’s advancements in non-kinetic warfare technologies, positioning DRDO among the global leaders in Directed Energy Weapons development.

• The DEW Mk-II(A) was specifically designed to counter emerging threats from drones, which are increasingly being used in military and surveillance applications.

Additional Information

• Directed Energy Weapons (DEWs):

• DEWs are a class of weapons that emit energy in a focused direction to damage or disable targets.

• Common types of DEWs include laser weapons, microwave weapons, and particle beam weapons.

• They offer advantages such as precision targeting, minimal collateral damage, and low operational costs once deployed.

• Fixed-wing UAVs:

• Fixed-wing UAVs are unmanned aerial systems that use wings like traditional airplanes for flight.

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• They are commonly used for surveillance, reconnaissance, and delivery applications due to their long flight range and efficiency.
• Swarm Drones:
• Swarm drones refer to a coordinated group of drones that operate together to achieve a common objective.
• These are often used for military operations, search-and-rescue missions, and surveillance.
• Swarm drones leverage artificial intelligence and communication systems to coordinate their movements.
• India’s DEW Program:
• India has been developing Directed Energy Weapons under DRDO’s Advanced Weapons and Technology program.
• These systems are part of the country’s effort to counter modern threats like drones, missiles, and other aerial platforms.
• Global DEW Development:
• Countries such as the USA, China, and Russia are actively developing DEWs for military applications.
• These weapons are considered critical for next-generation warfare due to their ability to neutralize high-speed and agile threats.

Q26. Answer: (c) • 8/5 and -2

Shortcut Trick

To find the roots of 5m2 + 18m + 16 = 0, identify two numbers with product (5 × 16) = 80 and sum = 18.

The numbers are 10 and 8.

Shortcut: Divide these numbers by the coefficient of m2 (5) and reverse their signs.

Roots = −(10/5) and −(8/5) => −2 and −8/5.

Therefore The correct answer is −8/5 and −2.

Alternate Method

Given: The quadratic equation is 5m2 + 18m + 16 = 0.

Formula: We use the factorisation method by splitting the middle term.

=> 5m2 + 10m + 8m + 16 = 0

=> 5m(m + 2) + 8(m + 2) = 0

=> (5m + 8)(m + 2) = 0

Setting each factor to zero:

=> 5m + 8 = 0 => m = −8/5

=> m + 2 = 0 => m = −2

The roots of the equation are −8/5 and −2.

Therefore The correct answer is −8/5 and −2.

Additional Information

Discriminant and Nature of Roots

For ax2 + bx + c = 0, the discriminant D = b2 − 4ac determines the nature of roots. If D > 0, roots are real and distinct; if D = 0, roots are real and equal.

Sum and Product of Roots

The Sum of roots (α + β) = −b/a and the Product of roots (αβ) = c/a.

Quadratic Formula

Roots can also be found using x = [−b ± √(b2 − 4ac)] / 2a.

Q27. Answer: (b) Rs. 837

Shortcut Trick

Ratio of Shan's share (S) to Piyush's share (P) is given by (1 + R/100)^(Δt) : 1.

Here, difference in time (Δt) = 20 − 19 = 1 year and Rate (R) = 8%.

Ratio S : P = $(1 + 8/100)^1$: 1 => 108 : 100 => 27 : 25.

Total units = 27 + 25 = 52 units → Rs. 1,612.

1 unit = 1612 ÷ 52 = Rs. 31.

Shan's share = 27 × 31 = Rs. 837.

Therefore The correct answer is Rs. 837.

Alternate Method

Given:

Total Principal = Rs. 1,612 | Rate (R) = 8% p.a.

Time for Shan (n1) = 19 years | Time for Piyush (n2) = 20 years.

Formula Used:

Amount (A) = $P(1 + R/100)^n$

Let the amount given to Shan be S and to Piyush be P.

=> S(1 + 8/100)^(19) = P(1 + 8/100)^(20)

=> S = P(1 + 8/100)^(20−19)

=> S = P(108/100)

=> S/P = 27/25

=> S = [27 / (27 + 25)] × 1612

=> S = (27 / 52) × 1612

=> S = 27 × 31

=> S = Rs. 837

Therefore The correct answer is Rs. 837.

Additional Information

Compound Interest Ratio Rule

When a sum is divided such that amounts are equal after T1 and T2 years, the ratio of shares is (1 + R/100)^(T2−T1) : 1.

Effective Rate for CI

For a rate R% for 2 years, the effective rate is R + R + (R×R)/100 %.

Successive Percentage Change

Compound interest is essentially a successive percentage increase on the principal amount every year.

Q28. Answer: (d) 75

Given:

Simplify: 81 + (76)/(2) + 42 - 86

Formula used:

Basic arithmetic operations

Calculation:

=> 81 + (76)/(2) + 42 - 86

=> 81 + 38 + 42 - 86

=> 81 + 38 - 44

=> 75

Therefore The correct answer is option (4).

Q29. Answer: (a) Union Government

The correct answer is Union Government.

Key Points

• The Union Government is responsible for deciding citizenship in newly added territories to India as per the provisions of the Constitution and relevant laws.

• Article 11 of the Indian Constitution empowers Parliament to regulate the right of citizenship by law.

• The Citizenship Act of 1955, enacted by the Union Government, lays out the legal framework for acquiring, renouncing, and determining citizenship in India.

• In cases where new territories are added to India, the Union Government decides citizenship based on the provisions outlined in the Citizenship Act.

• International agreements or treaties governing territorial addition may also influence citizenship decisions, which are implemented by the Union Government.

Additional Information

• Article 5-11 of the Indian Constitution:

• These articles govern citizenship provisions in India.

• Article 11 explicitly empowers Parliament to make laws regulating citizenship.

• The Citizenship Act, 1955:

• It is the primary law governing citizenship in India.

• It includes provisions for citizenship by birth, descent, registration, naturalization, and incorporation of territory.

• Incorporation of Territory:

• When a new territory is added to India, its residents may be granted Indian citizenship based on legal provisions.

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• The Union Government decides the criteria and implementation process for granting citizenship.
• International Treaties and Agreements:
• Territorial additions often occur due to international agreements or treaties.
• The Union Government ensures compliance with these agreements while determining citizenship for affected residents.
• Judicial Oversight:
• In case of disputes or challenges, the Supreme Court of India may interpret constitutional provisions related to citizenship.
• However, the primary authority remains with the Union Government.

Q30. Answer: (c) 90

Shortcut Trick
Use the relationship: (100 + Profit%) ÷ (100 − Discount%) = MP ÷ CP.
Given Profit = 71% and Discount = 10%.
MP ÷ CP = (100 + 71) ÷ (100 − 10) = 171 ÷ 90 = 19 ÷ 10.
Marked up value = 19 − 10 = 9 units on a base of 10.
Markup percentage X = (9 ÷ 10) × 100 = 90%.
Therefore The correct answer is 90.
Alternate Method
Given → Discount = 10%, Profit = 71%, Markup = X%.
Formulas: SP = CP × (100 + Profit%) ÷ 100 | SP = MP × (100 − Discount%) ÷ 100.
=> Let Cost Price (CP) be 100.
=> Since gain is 71%, Selling Price (SP) = 100 + 71 = 171.
=> Discount is 10%, so SP = 90% of Marked Price (MP).
=> 171 = 0.90 × MP => MP = 171 ÷ 0.9 = 190.
=> Markup (X) = MP − CP = 190 − 100 = 90.
=> Since CP was 100, the markup percentage X = 90%.
Therefore The correct answer is 90.
Additional Information
Markup and Discount Relation
The effective percentage change can be calculated using the formula: Net % = a + b + (ab ÷ 100), where 'a' is markup % and 'b' is discount % (negative).
Marked Price (MP)
MP is the price printed on the label. Discount is always calculated on MP, while Profit/Loss is calculated on CP.

Q31. Answer: (c) BOLD - ODLB - DLOB

The logic followed here is:
Given:
BAIL - ALIB - LIAB
And,
DEAF - EFAD - FAED
Similarly,
Option 3) BOLD - ODLB - DLOB

Hence, "Option 3" is the correct answer.

Q32. Answer: (b) 873

Shortcut Trick
Given: X prop. to A^2 and A prop. to 1/Y.
Combining these, X prop. to $(1/Y)^2$ => X prop. to $1/Y^2$.
Relationship: $X1 \times Y1^2 = X2 \times Y2^2$.
$97 \times 6^2 = X2 \times 2^2$ => $97 \times 36 = X2 \times 4$.
X2 = 97 × 9 = 873.
Therefore The correct answer is 873.

Alternate Method

Given: X1 = 97, Y1 = 6, Y2 = 2.

Formula Used: $X = k/Y^2$ or $X1Y1^2 = X2Y2^2$

=> X prop. to A^2 and A prop. to $1/Y$ => A^2 prop. to $1/Y^2$

=> Therefore, X prop. to $1/Y^2$

=> $97 = k / 6^2$

=> $k = 97 \times 36$

=> $X2 = k / 2^2$

=> $X2 = (97 \times 36) \div 4$

=> $X2 = 97 \times 9 = 873$

Therefore The correct answer is 873.

Additional Information

Direct Proportionality

If y prop. to x, then y = kx. The ratio y/x remains constant for all pairs of variables.

Inverse Proportionality

If y prop. to 1/x, then xy = k. The product of the two variables remains constant.

Joint Variation

When a variable depends on two or more other variables, such as z prop. to xy, leading to z = kxy.

Q33. Answer: (c) Bihar

The correct answer is Bihar.

Key Points

• 'Tirabhukti' is an ancient term mentioned in Gupta inscriptions referring to a region in present-day Bihar.

• The term is derived from Sanskrit, where 'Tira' means bank and 'Bhukti' means enjoyment or territory, signifying a region associated with riverbanks.

• This region was strategically important during the Gupta Empire due to its fertile plains and proximity to the Ganges River.

• Historical records suggest that 'Tirabhukti' was part of the administrative structure of the Gupta dynasty, which divided its empire into several provinces or 'Bhuktis.'

• Prominent cities in the region during the Gupta period include Pataliputra (modern-day Patna) and Vaishali.

Additional Information

• Gupta Empire:

• The Gupta Empire (circa 320-550 CE) is considered a golden age of Indian culture, art, science, and literature.

• It was marked by significant advancements in mathematics, astronomy, and medicine.

• The administrative divisions of the empire included provinces called 'Bhuktis,' which were further subdivided into districts called 'Vishayas.'

• Pataliputra:

• Located in modern-day Patna, Pataliputra was a major political and cultural center during the Gupta period.

• It served as the capital of several ancient Indian dynasties, including the Mauryas and the Guptas.

• Vaishali:

• An ancient city in Bihar, Vaishali was significant during the Gupta period and earlier.

• It is known for its connection to Buddhism and Jainism, with Lord Mahavira spending much of his life there.

• Gupta Inscriptions:

• These inscriptions provide critical insights into the administrative, social, and economic structure of the Gupta Empire.

• They are primarily written in Sanskrit and often carved on stone and metal surfaces.

Q34. Answer: (a) Niger

The correct answer is Niger.

Key Points

• Niger became the first African country to be acknowledged by the World Health Organization (WHO) for successfully eliminating onchocerciasis (river blindness) in early 2025.

• The WHO recognition came after Niger conducted extensive public health campaigns aimed at eradicating the disease, which is caused by the parasitic worm Onchocerca volvulus.

• The elimination was achieved through sustained mass drug administration (MDA) programs using ivermectin, a drug that targets

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the parasite and interrupts its transmission cycle.

• This achievement highlights Niger's commitment to combating neglected tropical diseases (NTDs) and improving public health infrastructure.

• Onchocerciasis primarily affects communities living near fast-flowing rivers in sub-Saharan Africa, leading to severe itching, skin lesions, and in extreme cases, blindness.

Additional Information

• Onchocerciasis (River Blindness):

• It is a neglected tropical disease caused by the parasite Onchocerca volvulus, which is transmitted to humans through the bites of infected blackflies (genus Simulium).

• Symptoms include severe itching, skin changes, and visual impairment that can lead to permanent blindness.

• The disease predominantly affects rural communities in Africa but also occurs in some regions of Latin America and Yemen.

• Ivermectin:

• Ivermectin is an antiparasitic medication that has been instrumental in controlling and eradicating onchocerciasis.

• It works by killing the microfilariae (larval stage of the parasite), thereby reducing transmission and disease progression.

• WHO's mass drug administration programs distribute ivermectin free of cost in endemic regions.

• Neglected Tropical Diseases (NTDs):

• NTDs are a group of diseases that disproportionately affect impoverished populations in tropical and subtropical regions.

• Examples include onchocerciasis, lymphatic filariasis, leprosy, and schistosomiasis.

• Global initiatives such as WHO’s NTD Roadmap aim to eliminate or control these diseases by 2030.

• Global Health Impact:

• Eliminating onchocerciasis in Niger sets a precedent for other African nations to strengthen their disease elimination efforts.

• It aligns with the Sustainable Development Goals (SDGs), particularly SDG 3, which focuses on ensuring healthy lives and promoting well-being for all.

Q35. Answer: (b) Denmark

The correct answer is Denmark.

Key Points

• Denmark has been consistently leading global climate change rankings due to its strong policies and commitment to achieving carbon neutrality by 2050.

• The country excels in renewable energy use, particularly wind energy, which contributes significantly to its electricity generation.

• Denmark’s ambitious climate policies include the Climate Act, which legally binds the country to reduce greenhouse gas emissions by 70% by 2030 (compared to 1990 levels).

• Its high ranking in the Climate Change Performance Index 2025 is attributed to its proactive measures in renewable energy, energy efficiency, and international cooperation on climate issues.

• The Climate Change Performance Index evaluates countries based on greenhouse gas emissions, renewable energy, energy use, and climate policy, with Denmark scoring high across all categories.

Additional Information

• Climate Change Performance Index (CCPI):

• The CCPI is an independent monitoring tool used to track the climate protection performance of 60 countries and the European Union.

• The index is jointly published by Germanwatch, the NewClimate Institute, and the Climate Action Network (CAN).

• It evaluates countries based on four key categories: greenhouse gas emissions (40%), renewable energy (20%), energy use (20%), and climate policy (20%).

• The CCPI aims to enhance transparency in international climate politics and encourage countries to adopt stronger climate measures.

• Denmark's Renewable Energy Leadership:

• Denmark is a global leader in wind energy, with wind turbines accounting for over 40% of its electricity production.

• The country has invested heavily in offshore wind farms and plans to build artificial energy islands to harness more renewable energy.

• Denmark’s energy transition is supported by governmental policies and public-private partnerships in the green energy sector.

• Paris Agreement:

• An international treaty adopted in 2015 to combat climate change by limiting global warming to well below 2°C above pre-industrial levels, aiming for 1.5°C.

• Countries are required to submit nationally determined contributions (NDCs) outlining their climate action plans.

• Denmark's commitment to the Paris Agreement is reflected in its ambitious national targets and initiatives to reduce emissions.

• Carbon Neutrality:

• Carbon neutrality, also known as net-zero emissions, refers to achieving a balance between emitted and absorbed greenhouse gases.

• Denmark aims to become carbon neutral by 2050, with interim targets like the 70% reduction in emissions by 2030.

• The country is adopting technologies such as carbon capture and storage (CCS) and increasing its reliance on renewable energy to meet these goals.

Q36. Answer: (b) Kolkata-Lucknow Industrial Corridor

The correct answer is Kolkata-Lucknow Industrial Corridor.

Key Points

• The Kolkata-Lucknow Industrial Corridor is not an officially planned industrial corridor under the Government of India's infrastructure initiatives.

• Key industrial corridors currently planned include the Delhi-Mumbai Industrial Corridor (DMIC), Chennai-Bengaluru Industrial Corridor (CBIC), and Vizag-Chennai Industrial Corridor (VCIC).

• The industrial corridors aim to enhance economic growth, create jobs, and strengthen infrastructure by connecting key cities and manufacturing hubs.

• The DMIC project is one of the largest infrastructure initiatives, spanning six states and focusing on high-tech industrial zones.

• Other planned corridors include the Amritsar-Kolkata Industrial Corridor (AKIC) and the Bengaluru-Mumbai Industrial Corridor (BMIC), which are integral to India's economic strategy.

Additional Information

• Delhi-Mumbai Industrial Corridor (DMIC)

• A flagship project aimed at developing an industrial zone across six states in India.

• It spans approximately 1,500 km between Delhi and Mumbai, focusing on manufacturing and logistics.

• DMIC is expected to boost GDP growth and generate millions of jobs.

• Vizag-Chennai Industrial Corridor (VCIC)

• Part of the East Coast Economic Corridor (ECEC), connecting Andhra Pradesh and Tamil Nadu.

• It aims to enhance manufacturing competitiveness and create economic opportunities along the eastern coastline.

• Chennai-Bengaluru Industrial Corridor (CBIC)

• Links Chennai and Bengaluru to facilitate industrial development, particularly in the automotive and electronics sectors.

• Focuses on creating high-quality infrastructure and promoting investments.

• Industrial Corridor Concept

• Industrial corridors are regions planned for economic development through industrialization and infrastructure connectivity.

• They aim to attract foreign direct investment (FDI) and promote domestic manufacturing under initiatives like "Make in India."

Q37. Answer: (d) 52

Given: Kavish ranked 38th from the top and 15th from the bottom in his class.

Kavish's rank from the top = 38th

Kavish's rank from the bottom = 15th

Total number of students in the class = Kavish's rank from the top + Kavish's rank from the bottom - 1

= 38 + 15 - 1 → 52^(nd)

Hence, "Option 4" is the correct answer.

Q38. Answer: (d) 8 cm

Shortcut Trick

Volume of Cone = (1/3) × π × r^2 × h

160π = (1/3) × π × r^2 × 30

160 = 10 × r^2 => r^2 = 16 => r = 4 cm

Diameter = 2 × r = 2 × 4 = 8 cm

Therefore The correct answer is 8 cm.

Alternate Method

Given:

Height (h) of the cone = 30 cm

Volume (V) of the cone = 160π cm^3

Formula Used:

Volume of a right circular cone = $(1/3)\pi r^2 h$

Calculations:

=> $160\pi = (1/3) \times \pi \times r^2 \times 30$

=> $160 = 10 \times r^2$

=> $r^2 = 160 / 10$

=> $r^2 = 16$

=> $r = \sqrt{16} = 4$ cm

=> Diameter (d) = 2 × radius (r)

=> $d = 2 \times 4 = 8$ cm

Therefore The correct answer is 8 cm.

Additional Information

Slant Height of Cone

The slant height (l) is given by the relation $l = \sqrt{(r^2 + h^2)}$.

Curved Surface Area (CSA)

The CSA of a right circular cone is given by the formula $\pi \times r \times l$.

Total Surface Area (TSA)

The TSA of a cone includes the base area: $TSA = \pi rl + \pi r^2 = \pi r(l + r)$.

Q39. Answer: (c) 18.9

Shortcut Trick

Ratio of Covered Distance to Remaining Distance = 7 : 9.

Total distance ratio = 7 + 9 = 16 units → 54 km.

Covered distance = (7 ÷ 16) × 54 = 23.625 km.

Time = 1 hour 15 minutes = 1.25 hours.

Speed = 23.625 ÷ 1.25 = 18.9 km/hr.

Therefore The correct answer is 18.9 km/hr.

Alternate Method

Given: Total distance = 54 km, Time = 1 hour 15 minutes.

Formula Used: Speed = Distance ÷ Time

=> Let Remaining Distance be 'x' km.

=> Distance Covered = (7/9) × x

=> Total Distance = x + (7x/9) = 16x/9

=> 16x/9 = 54

=> x = (54 × 9) ÷ 16 = 30.375 km (Remaining)

=> Distance Covered = 54 − 30.375 = 23.625 km

=> Time = 1 + (15/60) = 1.25 hours

=> Speed = 23.625 ÷ 1.25 = 18.9 km/hr

Therefore The correct answer is 18.9 km/hr.

Additional Information

Time Conversion

To convert minutes to hours, divide by 60. For example, 15 minutes = 15/60 = 0.25 hours.

Ratio Application

If a part is a fraction (a/b) of the remaining, the total is represented by (a + b) units.

Average Speed

Average Speed = Total Distance Covered ÷ Total Time Taken.

Q40. Answer: (d) Giddha

The correct answer is Giddha.

Key Points

• Giddha is a traditional folk dance performed by women in Punjab, India.

• It is considered the female counterpart of Bhangra, which is primarily performed by men.

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• Giddha is characterized by vibrant costumes, rhythmic clapping, and lively singing of folk songs known as boliyan.
• The dance portrays various themes such as social issues, daily life, and playful teasing, making it a celebration of Punjabi culture.
• Giddha does not rely on instrumental music; instead, participants sing while clapping to maintain rhythm.
Additional Information
• Bhangra:
• Bhangra is a folk dance originating from Punjab, performed by men to celebrate harvest festivals.
• It involves vigorous movements, including jumps and spins, accompanied by the sound of dhol drums.
• Bhangra has gained popularity worldwide and is frequently performed at cultural events.
• Boliyan:
• Boliyan are short, traditional Punjabi folk songs sung during dances like Giddha and Bhangra.
• They often convey emotions, humor, and themes of daily life or social issues.
• Costumes in Giddha:
• Women wear colorful Punjabi suits, adorned with heavy jewelry and accessories.
• The attire reflects the rich cultural heritage of Punjab.
• Regional Folk Dances of India:
• Ghoomar: A traditional dance from Rajasthan performed by women in circular movements.
• Kalbelia: A folk dance of the Kalbelia community in Rajasthan, known for its serpent-like movements.
• Garba: A Gujarati folk dance performed during Navratri celebrations.

Q41. Answer: (d) 1

Shortcut Trick
Put θ = 45° directly into the expression.
=> 3 + $\tan^2 45° + \cot^2 45° - \sec^2 45° \operatorname{cosec}^2 45°$
=> $3 + 1^2 + 1^2 - (\sqrt{2})^2 \times (\sqrt{2})^2$
=> 3 + 1 + 1 − 2 × 2 = 5 − 4 = 1
Therefore The correct answer is 1.
Alternate Method
Given:
Expression: $3 + \tan^2 \theta + \cot^2 \theta - \sec^2 \theta \operatorname{cosec}^2 \theta$
Formula Used:
$1 + \tan^2 \theta = \sec^2 \theta$
$1 + \cot^2 \theta = \operatorname{cosec}^2 \theta$
$\sec^2 \theta \operatorname{cosec}^2 \theta = \sec^2 \theta + \operatorname{cosec}^2 \theta$
Calculations:
=> $3 + \tan^2 \theta + \cot^2 \theta - \sec^2 \theta \operatorname{cosec}^2 \theta$
We can rewrite 3 as 1 + 1 + 1:
=> $1 + (1 + \tan^2 \theta) + (1 + \cot^2 \theta) - \sec^2 \theta \operatorname{cosec}^2 \theta$
=> $1 + \sec^2 \theta + \operatorname{cosec}^2 \theta - \sec^2 \theta \operatorname{cosec}^2 \theta$
Since $\sec^2 \theta \operatorname{cosec}^2 \theta = \sec^2 \theta + \operatorname{cosec}^2 \theta$:
=> $1 + (\sec^2 \theta + \operatorname{cosec}^2 \theta) - (\sec^2 \theta + \operatorname{cosec}^2 \theta)$
=> 1
Therefore The correct answer is 1.
Additional Information
Trigonometric Identities
The three fundamental Pythagorean identities are $\sin^2 \theta + \cos^2 \theta = 1$, $1 + \tan^2 \theta = \sec^2 \theta$, and $1 + \cot^2 \theta = \operatorname{cosec}^2 \theta$.
Product to Sum Identity
The identity $\sec^2 \theta \operatorname{cosec}^2 \theta = \sec^2 \theta + \operatorname{cosec}^2 \theta$ is extremely useful for simplifying complex trigonometric algebraic expressions.

Q42. Answer: (c) 225 : 196

Shortcut Trick
For any two similar triangles, the ratio of their areas is always equal to the square of the ratio of their corresponding sides.

Given the ratio of corresponding sides = 15 : 14

Therefore Ratio of their areas = $15^2 : 14^2 = 225 : 196$

Therefore The correct answer is 225 : 196.

Alternate Method

Given:

The ratio of the lengths of two corresponding sides of two similar triangles = 15 : 14

Formula Used:

According to the Area of Similar Triangles Theorem, if two triangles are similar, then the ratio of the areas of both triangles is proportional to the square of the ratio of their corresponding sides:

$Area1 \div Area2 = (Side1 \div Side2)^2$

Calculations:

Let the two similar triangles be Triangle 1 and Triangle 2.

Let the corresponding sides of the two triangles be s1 and s2 respectively.

$\Rightarrow s1 : s2 = 15 : 14$

Let the areas of the two triangles be A1 and A2 respectively.

Using the theorem of similar triangles:

$\Rightarrow A1 \div A2 = (s1 \div s2)^2$

$\Rightarrow A1 \div A2 = (15 \div 14)^2$

$\Rightarrow A1 \div A2 = 15^2 \div 14^2$

$\Rightarrow A1 \div A2 = 225 \div 196$

$\Rightarrow A1 : A2 = 225 : 196$

Option Analysis:

Option (1) 226 : 197 is incorrect because it does not represent the squares of 15 and 14.

Option (2) 15 : 14 is incorrect because it represents the ratio of the sides, not the ratio of the areas.

Option (3) 225 : 196 is correct because it is the exact ratio of the squares of the corresponding sides ($15^2 : 14^2$).

Option (4) $15\sqrt{15} : 14$ is incorrect because it does not follow the square relation of similar triangles.

Therefore The correct answer is 225 : 196.

Additional Information

Ratio of Perimeters of Similar Triangles

The ratio of the perimeters of two similar triangles is equal to the ratio of their corresponding sides (s1 : s2).

Ratio of Altitudes and Medians

The ratio of corresponding altitudes, medians, and angle bisectors of two similar triangles is also equal to the ratio of their corresponding sides.

Area of Similar Triangles Theorem

If $\Delta ABC \approx \Delta PQR$, then $Area(\Delta ABC) \div Area(\Delta PQR) = (AB \div PQ)^2 = (BC \div QR)^2 = (AC \div PR)^2$.

Q43. Answer: (a) Devlali, Maharashtra

The correct answer is Devlali, Maharashtra.

Key Points

• The joint military exercise "Agni Warrior 2024" was conducted between India and Singapore in November 2024.

• The exercise was held at the Devlali Field Firing Ranges in Maharashtra, India.

• Agni Warrior is a bilateral artillery exercise aimed at enhancing interoperability and sharing expertise between the two nations' armed forces.

• The exercise involves training on advanced artillery systems, simulation exercises, and live firing drills.

• It is part of the ongoing defense cooperation and long-standing strategic partnership between India and Singapore.

Additional Information

• Devlali Field Firing Ranges

• Located in Maharashtra, India, Devlali is one of the oldest military centers in India, established by the British in 1861.

• It is a key location for artillery training and testing due to its expansive area and infrastructure.

• India-Singapore Defense Relations

• India and Singapore have a strong defense partnership, with regular joint exercises in all three domains: army, navy, and air force.

• Key exercises include SIMBEX (navy), Bold Kurukshetra (army), and Joint Staff Talks.
• Artillery Modernization in India
• India has been modernizing its artillery systems with platforms like the K9 Vajra, M777 Howitzer, and Dhanush.
• These advancements aim to enhance India's long-range precision strike capabilities.
• Significance of Joint Military Exercises
• Joint exercises like Agni Warrior improve mutual trust and understanding between countries.
• They also enhance operational readiness and technical expertise in handling modern weapon systems.

Q44. Answer: (d) 1.2044 × 10^(24)

The correct answer is 1.2044 × 1024.

Key Points

• The number of molecules in a substance is calculated using Avogadro's number (6.022 × 10^{23} molecules/mol).
• In this question, we are given 2 moles of CO2.
• To find the number of molecules, multiply the number of moles by Avogadro's number: 2 × 6.022 × 10^{23} = 12.044 × 10^{23} = 1.2044 × 10^(24) molecules.
• Hence, 12.044 × 10^{23} molecules are present in 2 moles of CO2.
• This calculation is based on the fundamental concept of mole and Avogadro's constant.

Additional Information

• Avogadro's Number:
• Avogadro's number (6.022 × 10^{23}) represents the number of particles (atoms, molecules, or ions) in one mole of a substance.
• It is a fundamental constant in chemistry.
• Mole Concept:
• A mole is a unit in chemistry used to express amounts of a chemical substance.
• One mole of any substance contains exactly 6.022 × 10^{23} particles.
• Carbon Dioxide (CO2):
• It is a molecule composed of one carbon atom and two oxygen atoms.
• It is a major greenhouse gas and is essential for the process of photosynthesis in plants.
• Applications of Avogadro's Number:
• Used to calculate the number of particles in a given amount of substance.
• Helps in determining molar mass and molecular formulas in stoichiometry.

Q45. Answer: (a) 6.76%

Shortcut Trick

Apply the Successive Percentage formula: a + b + (a × b)/100

Here, a = −16% (reduction) and b = +11% (increase).

Net change = −16 + 11 + (−16 × 11)/100 = −5 − 1.76 = −6.76%.

The negative sign indicates that the final salary is lower.

Therefore The correct answer is 6.76%.

Alternate Method

Given: Initial reduction = 16%, Subsequent increase = 11%.

=> Let the initial salary be 100.

=> Salary after 16% reduction = 100 − 16 = 84.

=> Salary after 11% increase = 84 + (11% of 84) = 84 + 9.24 = 93.24.

=> Total decrease = 100 − 93.24 = 6.76.

=> Percentage lower = (6.76 / 100) × 100 = 6.76%.

Therefore The correct answer is 6.76%.

Additional Information

Successive Percentage Formula

For two successive changes of x% and y%, the net effective change is given by [x + y + (xy/100)]%.

Base Value Change

In percentage problems, 100 is often the best assumed base value to simplify calculations as percentage values directly represent absolute values.

Net Decrease vs Net Increase

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If the final result of the successive formula is positive, it indicates a net increase; if negative, it indicates a net decrease or lower value.

Q46. Answer: (a) 45

Shortcut Trick

Assume the Mean (A) is 44.

Calculate deviations (d = x − A): −30, −18, 0, 17, 40.

Calculate net deviation (Σfd): 91(−30) + 78(−18) + 95(0) + 36(17) + 98(40) = 398.

Total frequency (Σf) = 91 + 78 + 95 + 36 + 98 = 398.

Mean = A + (Σfd ÷ Σf) = 44 + (398 ÷ 398) = 45.

Therefore The correct answer is 45.

Alternate Method

Given: Marks (x) and Number of Students (f).

Formula: Mean (x) = $\Sigma f_i x_i \div \Sigma f_i$

=> Total Students (Σf) = 91 + 78 + 95 + 36 + 98 = 398

Q47. Answer: (a) Only 1 and 3

The correct answer is Only 1 and 3.

Key Points

• The Congress-Jammu and Kashmir National Conference (JKNC) alliance secured a majority with 48 seats, making them the key power holders in the 2024 Assembly elections.

• Voter turnout in the 2024 Jammu and Kashmir Assembly elections was recorded at 63.88%, reflecting a significant increase compared to the voter turnout in the most recent Lok Sabha elections.

• The BJP did not emerge as the single largest party, as the Congress-JKNC alliance surpassed its seat count.

• The newly elected assembly in Jammu and Kashmir does not hold full legislative powers equivalent to other Indian states, as Jammu and Kashmir remains a Union Territory after the abrogation of Article 370 in August 2019.

• Statements 1 and 3 are correct, accurately reflecting the outcomes of the 2024 elections.

Additional Information

• Jammu and Kashmir Assembly: After the abrogation of Article 370 in 2019, Jammu and Kashmir was reorganized into two Union Territories: Jammu and Kashmir, and Ladakh.

• Congress-JKNC Alliance: Historically, both parties have played significant roles in the political landscape of Jammu and Kashmir, often aligning to counter BJP influence in the region.

• Voter Turnout Trends: An increase in voter turnout signifies heightened political engagement and interest among citizens, often influenced by key local and national issues.

• BJP Performance: The BJP has historically aimed to expand its influence in Jammu and Kashmir, but in the 2024 Assembly elections, it fell short in securing a majority.

• Union Territory Status: Jammu and Kashmir continues to function under a Union Territory framework, meaning its legislative assembly has limited powers compared to full-fledged states like Maharashtra or Tamil Nadu.

Q48. Answer: (a) 376

The logic followed here is:

Hence, the correct answer is "Option 1".

Q49. Answer: (a) 6734

Decoding signs:

Sign	•	÷	×	•
Stands For	÷	×	•	•

Given: 5 × 39 ÷ 1407 − 3 + 11562 = ?

5 × 39 ÷ 1407 − 3 + 11562 = ? => 5 + 39 × 1407 ÷ 3 - 11562 = ?

=> 5 + 39 × 1407 ÷ 3 - 11562 = ?

=> 5 + 39 × 469 - 11562 = ?

=> 5 + 18291 - 11562 = ?

=> 18296 - 11562 = ?

=> 6734 = ?

Hence, "Option 1" is the correct answer.

Q50. Answer: (d) 91/11

Shortcut Trick

For a recurring decimal like 8.2727..., let x = 8.2727...

Write as integer + fraction: 8 + 0.2727...

Shortcut for 0.ab... = ab/99: 0.2727... = 27/99

Simplified fraction: 8 + 3/11 = (88 + 3) / 11 = 91/11

Therefore The correct answer is 91/11.

Alternate Method

Given: Decimal value = 8.272727...

Formula Used: Conversion of non-terminating repeating decimal to vulgar fraction.

=> Let x = 8.272727... (Equation 1)

=> Multiplying Equation 1 by 100:

=> 100x = 827.272727... (Equation 2)

=> Subtracting Equation 1 from Equation 2:

=> 100x − x = 827.272727... − 8.272727...

=> 99x = 819

=> x = 819 ÷ 99

=> Dividing both numerator and denominator by 9:

=> x = 91/11

Therefore The correct answer is 91/11.

Additional Information

Pure Recurring Decimals

A decimal in which all digits after the decimal point repeat. Example: 0.aaaa... = a/9 or 0.abab... = ab/99.

Mixed Recurring Decimals

A decimal where some digits after the decimal point do not repeat and some do. Example: 0.abcbc... = (abc − a) / 990.

Rational Number Property

Every recurring decimal is a rational number and can be expressed in the form p/q, where q ≠ 0.

Q51. Answer: (c) 2.0

The correct answer is 2.0.

Key Points

• The Total Fertility Rate (TFR) in India as per the National Family Health Survey - 5 (2019-21) is 2.0, which is below the replacement level of fertility (2.1).

• This marks a significant decline from the TFR of 2.2 reported during NFHS-4 (2015-16).

• The TFR decline is an indicator of increasing awareness about family planning and better access to contraceptive methods.

• The survey also highlights that urban areas have a lower TFR (1.6) compared to rural areas (2.1).

• State-specific trends reveal that several states, including Kerala, Tamil Nadu, and Punjab, have achieved TFR levels below replacement.

Additional Information

• Total Fertility Rate (TFR):

• TFR is defined as the average number of children a woman would have during her lifetime.

• It is a key demographic indicator used to assess population growth and replacement levels.

• The replacement level of fertility is generally considered to be 2.1 children per woman, which ensures stable population levels.

• National Family Health Survey (NFHS):

• NFHS is a nationwide survey conducted by the Ministry of Health and Family Welfare, Government of India, in collaboration with the International Institute for Population Sciences (IIPS).

• It provides essential data on health, nutrition, family planning, and demographic indicators.

• NFHS surveys play a crucial role in policy formulation and program implementation.

• Factors influencing TFR:

• Improved access to family planning methods and contraceptives.

• Better education levels, especially among women.

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• Economic development and urbanization.
• Awareness campaigns and healthcare outreach programs.
• Implications of a declining TFR:
• A declining TFR can lead to an aging population, reducing the workforce over time.
• It emphasizes the need for sustainable population policies and economic adjustments.
• Balanced demographic shifts are essential for long-term socio-economic stability.

Q52. Answer: (a) 2

Given: (Left) 535 647 232 804 152 (Right)

According to the question:

Given numbers	535	647	232	804	152
Arranged in ascending order	152	232	535	647	804

Second digit of the highest number → 804 → 0

Third digit of the lowest number → 152 → 2

Thus, the resultant if second digit of the highest number is subtracted from the third digit of the lowest number will be → 0 + 2 = 2

Hence, "Option 1" is the correct answer.

Q53. Answer: (b) Both conclusions (I) and (II) follow.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I) No jam is a can → Follow (As all jams are bands, all bands are sacks and no sack is a can. As whole jams comes in bands which whole comes in snacks which cannot be can, therefore it is true.)

(II) Some sacks are jams → Follow (As most buildings are papers and all papers are frogs. As whole jams comes in bands which whole comes in snacks, therefore it is true.)

Therefore Here, Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 2".

Q54. Answer: (d) To serve as the executive body of village self-government

The correct answer is To serve as the executive body of village self-government.

Key Points

• The Gram Panchayat is the basic unit of local self-governance in rural India under the Panchayati Raj system.
• It acts as the executive body responsible for implementing development programs and schemes for the welfare of the village.
• Key responsibilities include maintaining village infrastructure, sanitation, water supply, and public health.
• Gram Panchayats are headed by the elected representative known as the Sarpanch, assisted by other members.
• It also plays a role in ensuring community participation and governance at the grassroots level.

Additional Information

• Panchayati Raj System:
• It is a three-tier system of governance comprising Gram Panchayat (village level), Panchayat Samiti (block level), and Zila Parishad (district level).
• It was institutionalized through the 73rd Constitutional Amendment Act of 1992.
• This system aims to decentralize governance and enhance democratic participation at the grassroots level.
• Funding of Gram Panchayats:
• Gram Panchayats receive funds through taxes, government grants, and contributions from villagers.
• Central and state governments provide financial assistance under schemes like Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).
• Sarpanch:
• The Sarpanch is the elected head of the Gram Panchayat and acts as the primary decision-maker and representative.
• They are responsible for presiding over meetings and ensuring the execution of resolutions passed by the Panchayat.
• Gram Sabha:
• The Gram Sabha consists of all registered voters in the village and serves as the general assembly of the village.
• It plays a crucial role in decision-making and oversight of the Gram Panchayat's activities.

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Q55. Answer: (d) 6

Shortcut Trick

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

Quantity of Oil A = 168 litres

Quantity of Oil B = 234 litres

Difference = 234 − 168 = 66 litres

HCF must be a factor of 66. Factors are 1, 2, 3, 6, 11, 22, 33, 66. Checking 6: 168/6 = 28 and 234/6 = 39. Both are divisible.

Therefore The correct answer is 6 litres.

Alternate Method

Given: Volume of Oil A = 168 litres; Volume of Oil B = 234 litres.

Formula: Maximum capacity of container = HCF of (Volume A, Volume B).

=> Prime factorization of 168 = $2^3 \times 3 \times 7$

=> Prime factorization of 234 = $2 \times 3^2 \times 13$

=> HCF (168, 234) = $2^1 \times 3^1$

=> HCF = $2 \times 3 = 6$

Therefore The correct answer is 6 litres.

Additional Information

Highest Common Factor (HCF)

The greatest number that divides two or more numbers without leaving a remainder. It is also known as GCD (Greatest Common Divisor).

Number of Containers

If the question asks for the minimum number of containers, divide the total volume by the HCF. Total containers = (168/6) + (234/6) = 28 + 39 = 67.

LCM vs HCF

Use HCF when dividing or partitioning into equal parts. Use LCM when finding a common multiple or meeting point in time/distance.

Q56. Answer: (b) 119

Shortcut Trick

If $x - 1/x = k$, then $x^2 + 1/x^2 = k^2 + 2$.

Given $k = 3 \Rightarrow x^2 + 1/x^2 = 3^2 + 2 = 11$.

For higher power, $x^4 + 1/x^4 = (x^2 + 1/x^2)^2 - 2$.

Therefore $x^4 + 1/x^4 = 11^2 - 2 = 121 - 2 = 119$.

Therefore The correct answer is 119.

Alternate Method

Given: $x - 1/x = 3$

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

=> Squaring both sides of $x - 1/x = 3$:

=> $(x - 1/x)^2 = 3^2$

=> $x^2 + 1/x^2 - 2 \times x \times (1/x) = 9$

=> $x^2 + 1/x^2 - 2 = 9$

=> $x^2 + 1/x^2 = 11$

=> Now, squaring both sides of $x^2 + 1/x^2 = 11$:

=> $(x^2 + 1/x^2)^2 = 11^2$

=> $x^4 + 1/x^4 + 2 \times x^2 \times (1/x^2) = 121$

=> $x^4 + 1/x^4 + 2 = 121$

=> $x^4 + 1/x^4 = 121 - 2 = 119$

Therefore The correct answer is 119.

Additional Information

Algebraic Reciprocal Identities

If $x + 1/x = k$, then $x^2 + 1/x^2 = k^2 - 2$. This is used when the starting sign is positive.

Power Relation

To find x^4 + 1/x^4, we always square the expression for $x^2 + 1/x^2$ and subtract 2, regardless of the original sign of $(x \pm 1/x)$.

General Form for x^n

The process of successive squaring allows finding values for x^2, x^4, x^8, and so on, by iterating the $k^2 - 2$ or $k^2 + 2$ logic.

Q57. Answer: (a) Tamar Revolt

The correct answer is Tamar Revolt.

Key Points

• Bholanath Singh was a key leader of the Tamar Revolt, which took place in the late 18th century and early 19th century.

• The Tamar Revolt was primarily led by the tribal communities in the Chotanagpur region, located in present-day Jharkhand.

• The revolt was triggered by the imposition of oppressive taxes and exploitation by the British East India Company and local landlords (zamindars).

• Bholanath Singh played an instrumental role in organizing the tribal resistance to safeguard their autonomy and traditional rights over their lands.

• The Tamar Revolt is considered one of the prominent tribal uprisings against colonial oppression in India.

Additional Information

• Tribal Uprisings in India:

• Tribal revolts like the Tamar Revolt were often fueled by the British policies of land revenue, deforestation, and interference in traditional tribal practices.

• Other notable tribal uprisings include the Santhal Revolt (1855-56), led by Sidhu and Kanhu, and the Munda Rebellion (1899-1900), led by Birsa Munda.

• Causes of Tribal Revolts:

• Imposition of land taxes and seizure of tribal lands by colonial authorities.

• Exploitation by zamindars, moneylenders, and traders in tribal regions.

• Suppression of tribal customs, religious practices, and community autonomy.

• British Revenue Policies:

• The Permanent Settlement system introduced by Lord Cornwallis in 1793 often favored landlords and left the tribal population vulnerable to exploitation.

• Shifting cultivation, a traditional practice of many tribal groups, was curtailed under British forest policies.

• Impact of Tribal Revolts:

• These uprisings highlighted the resistance of tribal communities to colonial exploitation and the need to address their grievances.

• Many tribal revolts were brutally suppressed, but they inspired later nationalist movements and reforms in tribal policies.

Q58. Answer: (a) 64,125

Shortcut Trick

Apply the Cross-Multiplication Method on Income, Expenditure, and Savings.

Income ratio (7 : 8) and Expenditure ratio (11 : 16) with Savings (15,000 : 9,000).

Cross product 1: (7 × 16) − (8 × 11) = 112 − 88 = 24 units.

Cross product 2: (11 × 9,000) − (16 × 15,000) = 99,000 − 240,000 = 141,000 (absolute value).

24 units => Rs. 141,000 => 1 unit = Rs. 5,875. Seema income = 7 × 5,875 = Rs. 41,125; Darshan income = 8 × 5,875 = Rs. 47,000.

Total Expenditure = (41,125 − 15,000) + (47,000 − 9,000) = 26,125 + 38,000 = Rs. 64,125.

Therefore The correct answer is Rs. 64,125.

Alternate Method

Given: Ratio of Income = 7 : 8, Ratio of Expenditure = 11 : 16, Savings = Rs. 15,000 and Rs. 9,000.

Formula Used: Income − Savings = Expenditure

=> Let the Incomes of Seema and Darshan be 7x and 8x.

=> (7x − 15,000) ÷ (8x − 9,000) = 11 ÷ 16

=> 16 × (7x − 15,000) = 11 × (8x − 9,000)

=> 112x − 240,000 = 88x − 99,000

=> 24x = 141,000

=> x = 141,000 ÷ 24 = 5,875

=> Seema's Expenditure = 7(5,875) − 15,000 = 41,125 − 15,000 = Rs. 26,125

=> Darshan's Expenditure = 8(5,875) − 9,000 = 47,000 − 9,000 = Rs. 38,000

=> Total Expenditure = 26,125 + 38,000 = Rs. 64,125

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Therefore The correct answer is Rs. 64,125.

Additional Information

Income, Expenditure and Savings Relationship

The fundamental relation is Income = Expenditure + Savings. If any two components or their ratios are given, the third can be calculated using algebraic or cross-product methods.

Cross-Multiplication Method

This is used when an initial ratio changes to a new ratio after specific additions or subtractions. Difference in cross products of ratios = Difference in cross products of values.

Ratio and Proportion Basics

A ratio a : b implies that the quantities can be represented as ax and bx. Proportions allow comparing two ratios as a/b = c/d.

Q59. Answer: (c) Absence of RBC rupture and reduced clinical symptoms

The correct answer is Absence of RBC rupture and reduced clinical symptoms.

Key Points

• Plasmodium falciparum typically matures into merozoites in the liver, which then invade red blood cells (RBCs), causing cyclic RBC rupture and fever episodes.

• The mutation described prevents the parasite from maturing into merozoites, halting its ability to infect RBCs and thereby reducing the hallmark symptoms of malaria, including fever and anemia.

• Without RBC invasion and rupture, the immune response to Plasmodium falciparum remains subdued, as the primary triggers of inflammation (hemozoin release and debris from lysed RBCs) are absent.

• This mutation would likely decrease the severity of clinical malaria, as the parasite would fail to propagate significantly within the host.

• The life cycle of Plasmodium falciparum is disrupted, limiting its ability to cause systemic disease and reducing overall parasitemia levels in the host.

Additional Information

• Plasmodium falciparum Life Cycle:

• Plasmodium falciparum is a protozoan parasite that causes malaria in humans.

• The life cycle involves two hosts: humans (intermediate host) and Anopheles mosquitoes (definitive host).

• In humans, sporozoites enter the liver, mature into merozoites, and then infect RBCs, leading to clinical symptoms.

• Red Blood Cell (RBC) Invasion:

• Merozoites infect RBCs, multiply asexually, and rupture them, releasing toxins such as hemozoin, which trigger fever and immune responses.

• This RBC destruction leads to anemia and other complications in malaria patients.

• Malarial Symptoms:

• Classic symptoms of malaria include fever, chills, sweats, headaches, and muscle pain, which are directly linked to RBC rupture.

• Severe cases can lead to cerebral malaria, organ failure, and death.

• Mutation Impact:

• The described mutation disrupts the parasite’s liver stage progression, preventing it from becoming infectious to RBCs.

• This reduces the parasite’s capacity to cause systemic disease and limits its ability to spread.

• Malaria Control Efforts:

• Global initiatives like insecticide-treated nets, antimalarial drugs, and vaccines (e.g., RTS,S/AS01) aim to reduce malaria incidence and mortality.

• Understanding genetic mutations in Plasmodium species can contribute to developing new therapeutic strategies.

Q60. Answer: (d) Evaluating advancements and investments in quantum computing technologies

The correct answer is Evaluating advancements and investments in quantum computing technologies.

Key Points

• The 'Future Front: Quarterly Frontier Tech Insights' report by NITI Aayog primarily focuses on advancements in quantum computing technologies.

• Quantum computing leverages principles of quantum mechanics to perform computations far beyond traditional computing capabilities.

• The report aims to evaluate investments, technological progress, and applications in quantum computing within India and globally.

• India has been actively working on quantum technologies through initiatives such as the National Quantum Mission, launched in 2023.

• Quantum computing is expected to revolutionize sectors such as cryptography, material science, artificial intelligence, and drug discovery.

Additional Information

• Quantum Computing:

• Quantum computing uses quantum bits (qubits) instead of classical bits for processing information.

• Qubits can exist in multiple states simultaneously due to the principle of superposition.

• Quantum entanglement enables qubits to be interconnected, allowing faster and more complex computations.

• National Quantum Mission:

• India launched the National Quantum Mission in 2023 to accelerate quantum research and development.

• The mission aims to develop 50-qubit quantum computers and advanced quantum communication systems by 2030.

• It also focuses on skill development and collaboration with global institutions.

• Applications of Quantum Computing:

• Quantum computing has potential applications in cryptography, enhancing data security.

• It aids in solving complex problems in fields like drug discovery and material science.

• It is also being explored for applications in machine learning and artificial intelligence.

• Global Efforts in Quantum Computing:

• Countries like the US, China, and the EU have invested heavily in quantum research.

• Leading companies like IBM, Google, and Microsoft are developing cutting-edge quantum computing systems.

• International collaboration is key to advancing quantum technologies globally.

Q61. Answer: (a) Chhau

The correct answer is Chhau.

Key Points

• Chhau is a traditional Indian dance form primarily performed in the states of Odisha, West Bengal, and Jharkhand.

• Unlike many other classical Indian dance forms, Chhau does not use vocal music during performances.

• The music accompanying Chhau performances is primarily instrumental and consists of traditional Indian instruments such as dhol, dhamsa, and shehnai.

• Chhau is characterized by its martial movements, masks (in certain variants), and themes often derived from Indian mythology.

• This dance form is known for its vigorous and dramatic movements, making it distinct from other Indian classical dances like Bharatanatyam, Kathak, and Odissi which incorporate vocal music.

Additional Information

• Bharatanatyam

• A classical dance form from Tamil Nadu, Bharatanatyam heavily incorporates vocal music alongside instrumental music.

• The themes often revolve around spiritual ideas, stories from Hindu mythology, and devotional content.

• It uses intricate hand gestures (mudras) and facial expressions to narrate stories.

• Odissi

• Originating from Odisha, Odissi is one of the oldest classical dance forms in India.

• It is performed to both vocal and instrumental music, often based on compositions of Jayadeva's "Gita Govinda."

• Odissi emphasizes fluid movements and tribhangi (three-bend posture).

• Kathak

• A classical dance form from northern India, Kathak incorporates vocal music and instrumental tabla and sitar performances.

• The dance form is characterized by intricate footwork and spins.

• Its themes often include storytelling from epics like the Mahabharata and Ramayana.

• Traditional Indian Instruments in Dance Forms

• Dhol: A percussion instrument used in Chhau performances.

• Shehnai: A wind instrument that provides melody in many Indian traditional performances.

• Tabla: A pair of drums often used in classical Indian music.

Q62. Answer: (c) Designing Future Society for Our Lives

The correct answer is Designing Future Society for Our Lives.

Key Points

• The theme for Expo 2025 in Osaka, Japan, is "Designing Future Society for Our Lives", emphasizing innovative solutions for global challenges.

• Expo 2025 will aim to explore sustainable development goals (SDGs) and address pressing global issues such as health, environment, and technology.
• It will be held on Yumeshima Island, Osaka, from April 13 to October 13, 2025.
• The event is expected to attract over 28 million visitors from around the world, fostering cultural and technological exchange.
• The Expo is being organized by the Bureau International des Expositions (BIE), the intergovernmental organization responsible for overseeing world exhibitions.
Additional Information
• World Expos:
• World Expos, also known as World Fairs, are large international exhibitions showcasing achievements in science, technology, art, and culture.
• The first World Expo was held in London in 1851, called "The Great Exhibition."
• They are organized by the Bureau International des Expositions (BIE) and occur every five years.
• Osaka's Role in Expo History:
• Osaka previously hosted the Expo 1970, which was the first World Expo held in Japan.
• The theme of Expo 1970 was "Progress and Harmony for Mankind."
• It attracted 64 million visitors, making it one of the most successful Expos in history.
• Sustainable Development Goals (SDGs):
• Expo 2025 aligns with the United Nations' 17 Sustainable Development Goals, promoting global collaboration for a better future.
• Key focus areas include climate action, health and well-being, and technological advancements.
• Yumeshima Island:
• Yumeshima is a man-made island in Osaka Bay, chosen as the venue for Expo 2025.
• It is being developed as a hub for innovation, sustainability, and tourism.
• The island will also host integrated resort facilities, including casinos, after the Expo.

Q63. Answer: (d) Rs. 820

Shortcut Trick
Assumed Mean = 800
Net Deviation = 8×(550−800) + 10×(1000−800) + 12×(850−800)
Net Deviation = −2000 + 2000 + 600 = +600
Average Adjustment = 600 ÷ (8 + 10 + 12) = 600 ÷ 30 = +20
Actual Average = 800 + 20 = Rs. 820
Therefore The correct answer is Rs. 820.
Alternate Method
Given: 8 shirts @ Rs. 550, 10 pants @ Rs. 1000, 12 shoes @ Rs. 850.
Formula: Average Expenditure = (Total Cost of all articles) ÷ (Total Number of articles)
Rs. 550
8 Shirts
Rs. 1000
10 Pants
Rs. 850
12 Shoes
Avg: Rs. 820
=> Total Cost of Shirts = 8 × 550 = Rs. 4,400
=> Total Cost of Pants = 10 × 1,000 = Rs. 10,000
=> Total Cost of Shoes = 12 × 850 = Rs. 10,200
=> Total Expenditure = 4,400 + 10,000 + 10,200 = Rs. 24,600
=> Total Number of Articles = 8 + 10 + 12 = 30
=> Average Expenditure = 24,600 ÷ 30 = Rs. 820
Therefore The correct answer is Rs. 820.
Additional Information
Weighted Average Formula
When items have different quantities, Average = (n1x1 + n2x2 + ... + n_kx_k) ÷ (n1 + n2 + ... + n_k).

Deviation Method

Calculated as: Assumed Average + (Sum of individual deviations from assumed average ÷ Total count).

Combined Average

If average of group A is x and group B is y, the combined average lies strictly between x and y.

Q64. Answer: (b) 16

Shortcut Trick

Let Mother = M and Daughter = D.

From 2nd condition: M − 3D = 4 => M = 3D + 4.

Substitute in 1st condition: 3(3D + 4) = 5D + 36 => 9D + 12 = 5D + 36.

4D = 24 => D = 6 years and M = 3(6) + 4 = 22 years.

Difference = 22 − 6 = 16 years.

Therefore The correct answer is 16 years.

Alternate Method

Given:

Condition 1: 3 × Mother's age = 5 × Daughter's age + 36

Condition 2: 3 × Daughter's age = Mother's age − 4

=> 3M − 5D = 36 ... (i)

=> M − 3D = 4 ... (ii)

Multiply equation (ii) by 3:

=> 3M − 9D = 12 ... (iii)

Subtract (iii) from (i):

=> (3M − 5D) − (3M − 9D) = 36 − 12

=> 4D = 24

=> D = 6 years

Substitute D = 6 in (ii):

=> M − 3(6) = 4

=> M − 18 = 4

=> M = 22 years

Age Difference = M − D = 22 − 6 = 16 years.

Therefore The correct answer is 16 years.

Additional Information

Linear Equations in Two Variables

Problems involving two people's ages often lead to a system of two equations that can be solved using substitution or elimination methods.

Constant Age Difference

The difference between the ages of two individuals remains constant regardless of how many years pass or go back in time.

Ratio of Ages

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

Q65. Answer: (c) 10

Shortcut Trick

Ratio of length : width : height = 10 : 17 : 14

Let common factor be x. Then TSA = 2(10x×17x + 17x×14x + 14x×10x) = 1096

=> 2(170x^2 + 238x^2 + 140x^2) = 1096 => 548x^2 = 548 => x = 1

Length = 10 × 1 = 10 cm

Therefore The correct answer is 10 cm.

Alternate Method

Given: Ratio of dimensions = 10 : 17 : 14, Total Surface Area = 1096 cm^2

Formula Used: Total Surface Area of Cuboid = 2(lb + bh + hl)

=> Let l = 10x, b = 17x, and h = 14x

=> 2[(10x × 17x) + (17x × 14x) + (14x × 10x)] = 1096

=> $2[170x^2 + 238x^2 + 140x^2] = 1096$

=> $2[548x^2] = 1096$

=> $1096x^2 = 1096$

=> $x^2 = 1 \Rightarrow x = 1$

=> Length = 10 × 1 = 10 cm

Therefore The correct answer is 10 cm.

Additional Information

Volume of Cuboid

The space occupied by a cuboid is calculated as Length × Width × Height (l × b × h).

Diagonal of a Cuboid

The longest rod that can be placed inside a cuboid is $\sqrt{(l^2 + b^2 + h^2)}$.

Lateral Surface Area (LSA)

The area of the four side walls is given by the formula 2h(l + b).

Q66. Answer: (b) 3%

Shortcut Trick

Difference in Principal = Rs. 9,000 − Rs. 5,000 = Rs. 4,000

Interest difference for 3 years = Rs. 360

Interest difference for 1 year = 360 ÷ 3 = Rs. 120

Rate of Interest = (Interest difference for 1 year ÷ Principal difference) × 100

Rate % = (120 ÷ 4,000) × 100 = 3%

Therefore The correct answer is 3%.

Alternate Method

Given:

Principal of Rakesh (P_R) = Rs. 5,000

Principal of Shivam (P_S) = Rs. 9,000

Time (T) = 3 years

Interest difference = Rs. 360

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Calculations:

=> Interest for Shivam − Interest for Rakesh = 360

=> [(9000 × R × 3) ÷ 100] − [(5000 × R × 3) ÷ 100] = 360

=> 270R − 150R = 360

=> 120R = 360

=> R = 360 ÷ 120

=> R = 3%

Therefore The correct answer is 3%.

Additional Information

Simple Interest Relationship

When time and rate are constant, the difference in interest is directly proportional to the difference in principal: $\Delta SI = (\Delta P \times R \times T) \div 100$.

Effective Rate of Interest

The effective rate for a period is R × T. In this case, the total effective percentage difference is (3 × R)%, which applied to the principal difference gives the total interest difference.

Comparison of SI and CI

Simple Interest remains constant every year on the original principal, whereas Compound Interest is calculated on the accumulated amount (Principal + previous Interest).

Q67. Answer: (a) Daughter's husband's brother

Given:

1) F is the brother of G.

2) G is the husband of H.

3) H is the daughter of I.

4) I is the wife of J.

Thus, F is J's daughter's husband's brother.

Hence, the correct answer is "Option 1".

Q68. Answer: (c) Chaddhas

The correct answer is Chaddhas.

Key Points

• The Jarawa tribe inhabits parts of the Andaman Islands, primarily in the South and Middle Andaman region.

• They refer to their home or territory as "Chaddhas." This term is intrinsic to their language and cultural identity.

• The Jarawas are one of the indigenous groups in the Andaman Islands, known for their traditional hunter-gatherer lifestyle.

• Efforts to preserve the autonomy and culture of the Jarawa tribe have been made by restricting external interference in their designated areas.

• The tribe's language and customs are unique and are critical to their understanding of the world around them, including their connection to their land, "Chaddhas."

Additional Information

• Jarawa Tribe:

• The Jarawas are believed to have migrated to the Andaman Islands around 26,000 years ago.

• They are classified as a Particularly Vulnerable Tribal Group (PVTG) under Indian law.

• They primarily rely on hunting, fishing, and gathering for sustenance, staying largely isolated from modern civilization.

• Andaman Islands:

• The Andaman Islands are an archipelago in the Bay of Bengal, forming part of the Indian Union Territory of Andaman and Nicobar Islands.

• The islands are home to several indigenous tribes, including the Great Andamanese, Onge, and Sentinelese.

• Conservation Efforts:

• The Indian government has implemented policies to protect the Jarawas, including the establishment of the Jarawa Tribal Reserve.

• Tourism and other activities in their regions are heavily regulated to reduce external influence and exploitation.

• Languages of the Andaman Tribes:

• The languages spoken by the indigenous tribes, such as the Jarawas, are unique and are part of the Ongan language family.

• These languages are unwritten and transmitted orally, making cultural preservation crucial for their survival.

Q69. Answer: (c) RK - JH

The logic followed here is:

Option 1) EH - BE

Option 2) GJ - DG

Option 3) RK - JH

Option 4) PS - MP

Thus, out of all 'RK - JH' is the odd one out.

Hence, "Option 3" is the correct answer.

Q70. Answer: (d) 1798-99

The correct answer is 1798-99.

Key Points

• The Chuar Rebellion was a series of uprisings by the tribal communities, primarily the Chuar and Bhumij tribes, in Bengal and Bihar against British colonial rule.

• The rebellion occurred due to severe economic grievances, including the imposition of heavy land revenue and exploitation by British officials.

• The peak of the Chuar rebellion was witnessed during the years 1798-99, when widespread unrest impacted regions such as Midnapore and Jungle Mahal.

• British policies, such as the Permanent Settlement Act of 1793, further alienated the tribal population by depriving them of their traditional rights to land and forest resources.

• The rebellion was ultimately suppressed through military interventions and administrative measures by the British.

Additional Information

• Permanent Settlement Act (1793):

• Implemented by Lord Cornwallis, this act introduced the zamindari system of land revenue collection.

• It fixed the revenue payable by zamindars permanently, depriving the tribal communities of their customary land rights.

• Jungle Mahal:

• A region in Bengal that included parts of present-day West Bengal, Odisha, and Jharkhand.

• The area was historically inhabited by tribal communities such as the Bhumij and Chuar.

• Tribal Uprisings:

• In the 18th and 19th centuries, several tribal rebellions occurred due to British exploitation, including the Santhal Rebellion (1855-56) and the Kol Rebellion (1831-32).

• These uprisings highlighted the socio-economic struggles faced by tribal populations under colonial rule.

• Colonial Economic Policies:

• British colonial policies disrupted the traditional tribal economy, leading to widespread poverty and dispossession.

• Heavy land taxes and restrictions on forest use exacerbated the grievances of tribal communities.

Q71. Answer: (a) 5045

Given:

The value of $17^3 - 10^2 + ((26)/(13))^2 - 12 + 20 \times 12 = ?$

Formula used:

Follow the BODMAS rule (Bracket, Order, Division/Multiplication, Addition/Subtraction)

Calculation:

$17^3 = 4913$

$10^2 = 100$

$(26 \div 13)^2 = 2^2 = 4$

$20 \times 12 = 240$

=> $4913 - 100 + 4 - 12 + 240$

=> $4913 - 100 - 8 + 240$

=> $4913 + 132$

=> 5045

Therefore The correct answer is option (1).

Q72. Answer: (a) To group related files together for better management

The correct answer is To group related files together for better management.

Key Points

• Subfolders help in organizing files systematically, allowing users to group related files together for efficient management.

• They make it easier to locate and access files, especially when dealing with large volumes of data.

• Subfolders contribute to improved workflow by reducing clutter and ensuring proper categorization of files.

• They enable users to implement hierarchical structures, ensuring logical arrangements of data within directories.

• By grouping files in subfolders, users can also assign specific permissions or access control to protect sensitive information.

Additional Information

• File Organization

• File organization refers to the systematic arrangement of files and folders for easy access and management.

• Common methods include categorization by file type, date, project, or purpose.

• Proper organization reduces the risk of losing important files and enhances productivity.

• Directory Hierarchy

• A directory hierarchy is the structure of folders and subfolders within a computer's file system.

• It allows users to create a parent-child relationship among folders for better logical arrangements.

• This hierarchy is crucial for maintaining organization and accessing files efficiently.

• Access Control

• Access control refers to the ability to manage permissions for users to access specific files or folders.

• By using subfolders, administrators can restrict access to sensitive files.

• Common methods include password protection, encryption, or role-based permissions.

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• File Management Tools

• Modern operating systems offer file management tools, such as Windows File Explorer and macOS Finder, for managing subfolders effectively.

• These tools allow users to search, rename, move, and organize files quickly.

• Third-party applications like Google Drive and Dropbox also provide advanced file organization options.

Q73. Answer: (c) Two

Given number: 8271634

According to the question,

Number given	8	2	7	1	6	3	4
Odd digit → (+1) Even digit → (-2)	(-2)	(-2)	(+1)	(+1)	(-2)	(+1)	(-2)
Resultant number	6	0	8	2	4	4	2

So, digits that appeared more than once in the new number thus formed → 2 and 4 = Two

Hence, "Option 3" is the correct answer.

Q74. Answer: (c) 8,800

Shortcut Trick

Successive percentage change method:

Final Price = Original Price × (100 − 12)/100 × (100 + 25)/100

Final Price = 8000 × 0.88 × 1.25

Final Price = 8000 × 1.1 = 8800

Therefore The correct answer is Rs. 8,800.

Alternate Method

Given:

Original Price = Rs. 8,000

First change = 12% decrease

Second change = 25% increase

Calculations:

=> Price after 12% decrease = 8000 − (12/100 × 8000)

=> Price after 12% decrease = 8000 − 960 = Rs. 7,040

=> New price after 25% increase = 7040 + (25/100 × 7040)

=> New price after 25% increase = 7040 + 1760

=> New Price = Rs. 8,800

Therefore The correct answer is Rs. 8,800.

Additional Information

Successive Percentage Formula

The effective percentage change for two successive changes of a% and b% is given by [a + b + (ab/100)]%.

Net Change Application

In this case: a = −12 and b = +25. Net % change = −12 + 25 + [(−12 × 25)/100] = 13 − 3 = 10% increase.

Base Value Rule

Always calculate the second percentage change on the updated value, not the original base value, unless specified.

Q75. Answer: (c) 2 km to the west

Given:

Prakesh starts from point A and drives 11 km towards the south.

He then takes a right turn, drives 7 km, turns right and drives 13 km.

He then takes a right turn and drives 9 km.

He takes a final right turn, drives 2 km and stops at point P

Thus, Prakesh should drive 2 km (9 km - 7 km) in the west direction in order to reach point A again.

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Hence, "Option 3" is the correct answer.

Q76. Answer: (c) 29

Shortcut Trick

Weight of B = [2 × (Avg of A & B) + 2 × (Avg of B & C)] − [3 × (Avg of A, B & C)]

=> Weight of B = [2 × 40 + 2 × 42] − [3 × 45]

=> Weight of B = [80 + 84] − 135

=> Weight of B = 164 − 135 = 29 kg

Therefore The correct answer is 29 kg.

Alternate Method

Given:

Average weight of A, B, and C = 45 kg

Average weight of A and B = 40 kg

Average weight of B and C = 42 kg

Formula Used:

Total Sum = Average × Number of items

Calculations:

=> Total Weight (A + B + C) = 45 × 3 = 135 kg --- (1)

=> Total Weight (A + B) = 40 × 2 = 80 kg --- (2)

=> Total Weight (B + C) = 42 × 2 = 84 kg --- (3)

=> Adding (2) and (3): (A + B) + (B + C) = 80 + 84

=> A + 2B + C = 164 kg --- (4)

=> Subtracting (1) from (4): (A + 2B + C) − (A + B + C) = 164 − 135

=> Weight of B = 29 kg

Therefore The correct answer is 29 kg.

Additional Information

Average of Group

If the average of n items is x, then the Total Sum is n × x. If one item is shared between two overlapping subgroups, the value of that item equals the sum of the subgroups minus the total sum.

Net Deviation Method

The sum of deviations of all observations from the mean is always zero. This property is used to find missing values in a data set when the average is known.

Weighted Average

When combining two groups with averages A1 and A2 and sizes n1 and n2, the Combined Average = (n1A1 + n2A2) ÷ (n1 + n2).

Q77. Answer: (d) Reserve Bank of India

The correct answer is Reserve Bank of India.

Key Points

• The Reserve Bank of India (RBI) was established on April 1, 1935, under the Reserve Bank of India Act, 1934.

• The RBI is India's central bank, responsible for regulating the country's monetary policy, currency issuance, and financial stability.

• It initially started its operations in Kolkata but was permanently shifted to Mumbai in 1937.

• The Reserve Bank of India will complete 90 years of establishment in 2025.

• The RBI's primary functions include controlling inflation, managing foreign exchange, and regulating banks and non-banking financial companies.

Additional Information

• History of RBI

• The RBI was conceptualized based on the recommendations of the Hilton Young Commission.

• It was initially established as a private entity but was nationalized in 1949.

• RBI's Governance Structure

• The RBI is governed by a central board of directors, which includes government-appointed officials and experts.

• The Governor of RBI serves as the chief executive officer and represents the bank.

• Key Functions of RBI

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• Formulating and implementing monetary policy to maintain price stability and economic growth.
• Issuing and managing India's currency under the Currency and Coinage Act.
• Regulating and supervising banks and financial institutions to ensure financial stability.
• Maintaining foreign exchange reserves and managing exchange rates.
• Important Milestones
• The RBI played a critical role in the economic reforms of 1991 that liberalized India's economy.
• In recent years, it has introduced various digital initiatives like the Unified Payments Interface (UPI) for promoting financial inclusion.

Q78. Answer: (b) FLR

The logic followed here is:

Hence, "Option 2" is the correct answer.

Q79. Answer: (c) Two

Given series: (Left) 4 6 & 8 $ 7 & 3 9 # % 4 6 @ £ 5 Ω 9 # 1 * 7 (Right)

According to the question, such numbers which are immediately preceded by a symbol and also immediately followed by another number:

Required condition: Symbol - Number - Another Number

(Left) 4 6 & 8 $ 7 & 3 9 # % 4 6 @ £ 5 Ω 9 # 1 * 7 (Right)

Thus, there are two such numbers which are immediately preceded by a symbol and also immediately followed by another number.

Hence, "Option 3" is the correct answer.

Q80. Answer: (b) 608 days

The correct answer is 608 days.

Key Points

• Sunita Williams, a NASA astronaut of Indian origin, has spent a cumulative 608 days in space over the course of her missions.
• She held the record for the most spaceflight time by a woman until it was surpassed by Peggy Whitson in 2017.
• Her most recent mission aboard a SpaceX capsule concluded in March 2025, marking her return to Earth.
• Sunita Williams has participated in two long-duration missions aboard the International Space Station (ISS), namely Expeditions 14/15 and 32/33.
• She is one of the most experienced astronauts in NASA's history and has conducted seven spacewalks totaling 50 hours and 40 minutes.

Additional Information

• SpaceX Crew Dragon:
• SpaceX's Crew Dragon is a spacecraft designed to transport astronauts to and from the ISS.
• It is part of NASA's Commercial Crew Program, which aims to enable private companies to provide human spaceflight services.
• Sunita Williams was part of one of the Crew Dragon missions, showcasing advancements in commercial spaceflight.
• International Space Station (ISS):
• The ISS is a modular space station in low Earth orbit, serving as a laboratory for scientific research and international collaboration.
• It has been continuously inhabited since November 2000, with astronauts from various countries contributing to its operations.
• Sunita Williams' missions aboard the ISS focused on scientific experiments, maintenance, and outreach activities.
• Spacewalks:
• A spacewalk, or Extravehicular Activity (EVA), is when an astronaut exits a spacecraft to work in space.
• Sunita Williams has performed seven spacewalks, placing her among the most experienced astronauts in this domain.
• Her spacewalks include tasks such as repairing equipment and installing components on the ISS.
• NASA's Human Spaceflight Program:
• NASA has been at the forefront of human space exploration since the Apollo program in the 1960s.
• Programs such as the Space Shuttle, ISS, and Artemis are key milestones in NASA's efforts to explore space.
• Sunita Williams' contributions to human spaceflight have been a significant part of NASA's achievements.

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Q81. Answer: (d) Terrace farming

The correct answer is Terrace farming.

Key Points

• Terrace farming is an agricultural method where sloped lands are cut into a series of steps or terraces to create flat surfaces for cultivation.

• This method is widely practised in hilly or mountainous regions to prevent soil erosion and water runoff.

• It allows farmers to maximize arable land in regions with steep gradients and helps in water conservation by reducing surface runoff.

• Terrace farming is commonly found in areas like the Himalayan region, Southeast Asia, and the Andes.

• It is particularly suited for crops such as rice, wheat, and maize, which require level surfaces and controlled water flow.

Additional Information

• Soil Erosion Prevention: Terrace farming reduces the speed of water flow on slopes, minimizing soil erosion and preserving fertile topsoil.

• Water Management: The terraces act as water catchment areas, enabling better water retention and distribution for crops.

• Challenges: The construction and maintenance of terraces can be labor-intensive and expensive.

• Regions Practicing Terrace Farming: Notable examples include the rice terraces of the Philippines (e.g., Banaue Rice Terraces) and the Andes Mountains in South America.

• Climate Adaptation: This technique is also a sustainable farming method that supports agriculture in challenging terrains and climates.

Q82. Answer: (b) Konkani, Manipuri and Nepali

The correct answer is Konkani, Manipuri and Nepali.

Key Points

• The 71st Amendment Act of 1992 added three languages—Konkani, Manipuri, and Nepali—to the Eighth Schedule of the Indian Constitution.

• The Eighth Schedule initially included 14 languages, but subsequent amendments increased the number to the current total of 22.

• These three languages were added to recognize and promote linguistic diversity and cultural heritage in India.

• The amendment reflects the government's commitment to safeguarding minority languages and ensuring their representation in governance and education.

• With the inclusion of these languages, the Eighth Schedule serves as a framework for developing official language policies at both the state and national levels.

Additional Information

• Eighth Schedule of the Constitution:

• The Eighth Schedule lists the languages recognized by the Constitution of India for official purposes.

• It originally included 14 languages, but subsequent amendments have expanded the list to 22 languages.

• Languages included in the Eighth Schedule are eligible for development under the aegis of the government.

• 71st Amendment Act, 1992:

• It was enacted by the Parliament of India to amend the Constitution.

• The primary purpose was to include Konkani, Manipuri, and Nepali in the Eighth Schedule.

• This amendment underscores the importance of linguistic diversity in India's multicultural society.

• Significance of Scheduled Languages:

• Scheduled languages receive recognition and support for their preservation and development.

• They play a vital role in governance, education, and cultural identity.

• Languages in the Eighth Schedule can be used for official communication at the state and central levels.

• Linguistic Amendments in India:

• India has witnessed multiple constitutional amendments to recognize and support regional languages.

• For example, Sindhi was added by the 21st Amendment Act in 1967, and Bodo, Dogri, Maithili, and Santali were added by the 92nd Amendment Act in 2003.

• These amendments reflect the dynamic and evolving nature of India's linguistic landscape.

Q83. Answer: (d) 780 nm; infrared laser

The correct answer is 780 nm; infrared laser.

Key Points

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• Standard CD-ROM drives use infrared lasers with a wavelength of 780 nm to read data encoded on the discs.
• The laser interacts with the reflective surface of the CD, detecting pits and lands that represent binary data.
• The 780 nm wavelength is optimal for CDs due to the size of the pits and the design of the disc structure.
• Infrared lasers are not visible to the human eye but are highly effective for reading older optical media formats such as CDs.
• Other optical storage devices like DVDs and Blu-ray discs use lasers with shorter wavelengths, enabling higher data storage capacities.

Additional Information

• Laser Wavelengths in Optical Media:
• DVDs: Use red lasers with a wavelength of approximately 650 nm, allowing higher data density compared to CDs.
• Blu-ray discs: Use blue lasers with a wavelength of 405 nm, enabling even greater storage capacity due to smaller pits.
• Working Principle of Optical Drives:
• Data is stored on optical discs in the form of microscopic pits and lands.
• The laser beam reads these patterns by detecting changes in reflectivity.
• The reflected signal is converted into electrical signals, which are interpreted as binary data.
• Infrared Radiation:
• Infrared radiation is electromagnetic radiation with wavelengths longer than visible light but shorter than microwaves.
• It is widely used in communication devices, remote controls, and optical media systems.
• Evolution of Optical Media:
• CDs were introduced in the 1980s as a digital replacement for analog audio storage.
• DVDs and Blu-ray discs followed, offering higher capacities for video and data storage.
• With the advent of solid-state drives (SSDs) and cloud storage, optical media usage has significantly declined.

Q84. Answer: (d) 6 days

Shortcut Trick

Total Work = LCM(8, 24, 3) = 24 units.

Efficiency of A = 3, B = 1, and (A + B + C) = 8.

Efficiency of C = 8 − (3 + 1) = 4.

Time taken by C = 24 ÷ 4 = 6 days.

Therefore The correct answer is 6 days.

Alternate Method

Given: Time taken by A = 8 days, B = 24 days, and (A + B + C) = 3 days.

Person	Days	Total Work	Efficiency
A	8	24	3
B	24	1	
A + B + C	3	8	

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

=> Efficiency of C = 8 − 3 − 1 = 4 units/day

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

=> Time taken by C = 24 ÷ 4 = 6 days

Therefore The correct answer is 6 days.

Additional Information

Total Work Formula

Total Work is always considered as the LCM of the individual number of days to simplify efficiency calculations.

Efficiency Relationship

Efficiency is inversely proportional to Time. If time increases, efficiency decreases for the same amount of work (E = W ÷ T).

Combined Work

If individuals work together, their efficiencies are added to find the combined rate of work per day.

Q85. Answer: (d) Switches between open applications

The correct answer is Switches between open applications.

Key Points

• The Alt + Tab keyboard shortcut is widely used to switch between open applications in modern operating systems like Windows, macOS, and Linux.
• Pressing Alt + Tab displays a task switcher interface, showing thumbnails or icons of currently running applications.
• Users can hold the Alt key and repeatedly press Tab to cycle through the open applications.
• This feature improves productivity and multitasking by allowing quick navigation between multiple tasks without using the mouse.
• It is supported by most graphical user interfaces (GUIs) and is a fundamental feature of modern operating systems.
Additional Information
• Task Switcher:
• The Task Switcher is a graphical interface activated by Alt + Tab, displaying all running applications for easy navigation.
• It allows users to preview minimized or background applications before switching to them.
• Alt + Shift + Tab:
• This variation of the shortcut allows users to cycle through open applications in the reverse order.
• It is useful for quickly returning to the previous application without scrolling through all open tasks.
• Other Useful Shortcuts:
• Ctrl + Tab: Switches between tabs within the same application (e.g., in web browsers or text editors).
• Windows + Tab: Opens the Task View interface in Windows, providing a broader overview of open applications and virtual desktops.
• Cross-Platform Usage:
• While Alt + Tab is commonly associated with Windows, macOS uses Command + Tab for similar functionality.
• Linux-based systems also support Alt + Tab, depending on the desktop environment (e.g., GNOME, KDE).

Q86. Answer: (c) 8

Given number: 5673128

According to the question,

Number given	5	6	7	3	1	2	8
Odd digit → (+1) Even digit → (-2)	(+1)	(-2)	(+1)	(+1)	(+1)	(-2)	(-2)
Resultant number	6	4	8	4	2	0	6

So, difference between the digits which are third from the left and second from the right in the new number thus formed → (8 - 0) = 8

Hence, "Option 3" is the correct answer.

Q87. Answer: (a) Two

Given: F, G, H, I, J, K and X are sitting around a circular table facing the centre of the table.

1) H sits to the immediate right of F.

2) Only three people sit between H and G when counted from the left of H.

3) X sits third to the right of F.

4) I sits to the immediate right of K.

After positioning X, K and I only one position is left which will be occupied by the only person left i.e. J.

Thus, two people sit between J and K when counted from the left of K.

Hence, "Option 1" is the correct answer.

Q88. Answer: (d) 5

According to the given information,

Thus, 'S' is coded as '5'.

Hence, "Option 4" is the correct answer.

Q89. Answer: (d) 69

The logic followed here is:

Hence, the correct answer is "Option 4".

Q90. Answer: (c) 4200

Shortcut Trick

Ratio of marbles in Box A : Box B : Box C : Box D = 6 : 3 : 7 : 5.

Difference between Box D and Box B in units = 5 − 3 = 2 units.

Given, 2 units = 400 marbles => 1 unit = 200 marbles.

Total units = 6 + 3 + 7 + 5 = 21 units.

Total marbles = 21 × 200 = 4200.

Therefore The correct answer is 4200 marbles.

Alternate Method

Given: Ratio = 6 : 3 : 7 : 5; Difference (D − B) = 400.

Formula: Total = Sum of ratio parts × (Value of one part).

=> Let the number of marbles in boxes A, B, C, and D be 6x, 3x, 7x, and 5x respectively.

=> According to the question: 5x − 3x = 400

=> 2x = 400

=> x = 200

=> Total marbles = 6x + 3x + 7x + 5x = 21x

=> Total marbles = 21 × 200 = 4200

Therefore The correct answer is 4200 marbles.

Additional Information

Ratio and Proportion

If a quantity is divided in the ratio a : b : c : d, then the parts are ax, bx, cx, and dx where x is the common multiplier.

Difference Rule

The difference between two parts in a ratio is proportional to the difference in their ratio units. (Value Difference ÷ Ratio Difference) gives the value of 1 unit.

Sum of Ratios

The total quantity is always the product of the sum of ratio terms and the value of a single unit.

Q91. Answer: (a) 66

Shortcut Trick

Let the assumed mean be 60.

Calculate deviations from 60: +19, +32, −21, −3, +31, −32, +14, +30, −16.

Sum of deviations = 19 + 32 − 21 − 3 + 31 − 32 + 14 + 30 − 16 = +54.

Average deviation = 54 ÷ 9 = +6.

Actual Arithmetic Mean = 60 + 6 = 66.

Therefore The correct answer is 66.

Alternate Method

Given:

Observations = 79, 92, 39, 57, 91, 28, 74, 90, 44

Total count (n) = 9

Formula Used:

Arithmetic Mean = Sum of all observations ÷ Total number of observations

Calculations:

=> Sum = 79 + 92 + 39 + 57 + 91 + 28 + 74 + 90 + 44

=> Sum = 594

=> Arithmetic Mean = 594 ÷ 9

=> Arithmetic Mean = 66

Therefore The correct answer is 66.

Additional Information

Properties of Arithmetic Mean

The sum of the deviations of all items from their arithmetic mean is always zero, i.e., $\Sigma(x_i - \text{Mean}) = 0$.

Effect of Operations

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

Weighted Arithmetic Mean

When observations have different importance, it is calculated as: Mean = $\Sigma(w_i \times x_i) \div \Sigma w_i$.

Q92. Answer: (a) They are short-lived.

The correct answer is They are short-lived.

Key Points

• Artificially produced elements are generally radioactive and have unstable nuclei, leading to their short-lived existence.

• These elements decay quickly into more stable elements by emitting radiation, which contributes to their short half-lives.

• They are primarily synthesized in laboratories or nuclear reactors through nuclear reactions such as bombardment of lighter elements with neutrons or high-energy particles.

• Many artificially produced elements, such as Technetium (Tc), Promethium (Pm), and all transuranium elements (elements beyond Uranium in the periodic table), exhibit this characteristic.

• Their short lifespans make them unsuitable for naturally occurring abundance, and they are typically absent in the Earth's crust.

Additional Information

• Artificial Elements:

• These are elements not found naturally but produced artificially in laboratories.

• Examples include Plutonium (Pu), Americium (Am), and Curium (Cm), among others.

• Radioactivity:

• Radioactive elements emit radiation due to the instability of their atomic nuclei.

• This process includes alpha, beta, and gamma radiation emissions.

• Transuranium Elements:

• These are elements with atomic numbers greater than 92 (the atomic number of Uranium).

• All transuranium elements are synthetic and exhibit radioactive properties.

• Applications of Artificial Elements:

• Used in medical imaging and cancer treatment (e.g., Technetium-99m).

• Act as fuel in nuclear reactors (e.g., Plutonium-239).

• Have industrial applications, such as in smoke detectors (e.g., Americium-241).

• Half-life:

• The half-life of a radioactive element is the time it takes for half of the radioactive nuclei in a sample to decay.

• Artificially produced elements often have extremely short half-lives compared to naturally occurring ones.

Q93. Answer: (b) Janjatiya Gaurav Divas

The correct answer is Janjatiya Gaurav Divas.

Key Points

• Janjatiya Gaurav Divas is observed to commemorate the birth anniversary of tribal freedom fighter Birsa Munda, a revered leader in India's independence movement.

• Birsa Munda, born on 15 November 1875, played a key role in leading tribal communities against British colonial rule and exploitation in the late 19th century.

• The Government of India officially declared 15th November as Janjatiya Gaurav Divas in 2021 to honor the contributions of tribal leaders and communities to the nation's history and culture.

• The day is marked by various events and activities across the country, focusing on tribal heritage, culture, and recognition of their role in India's freedom struggle.

• Birsa Munda's legacy is celebrated as a symbol of tribal pride, resilience, and the fight against oppression and injustice.

Additional Information

• Birsa Munda:

• Birsa Munda was a tribal freedom fighter, religious leader, and folk hero from the Munda tribe in present-day Jharkhand.

• He led the Munda Rebellion (also known as the Ulgulan movement) against the British colonial government and exploitative landlords.

• Birsa Munda advocated for the rights of tribal people and sought to protect their land, culture, and identity.

• He passed away at the young age of 25 on June 9, 1900, but his contributions remain deeply impactful.

• Significance of Tribal Heritage:

• India is home to over 700 tribal groups, each with unique languages, cultures, and traditions.

• Tribal communities constitute approximately 8.6% of India's population, according to the 2011 Census.

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• Recognizing tribal contributions helps preserve their heritage and promotes inclusivity in national narratives.

• Government Initiatives for Tribal Welfare:

• The Ministry of Tribal Affairs oversees programs and schemes aimed at improving the socio-economic conditions of tribal communities.

• Key initiatives include the Vanbandhu Kalyan Yojana, Pradhan Mantri Van Dhan Yojana, and the establishment of Eklavya Model Residential Schools.

• Other Observances:

• India celebrates various days to honor freedom fighters and leaders, such as Gandhi Jayanti, Sardar Patel Jayanti, and Ambedkar Jayanti.

• Janjatiya Gaurav Divas adds to this list by recognizing the contributions of tribal leaders and their impact on India's history.

Q94. Answer: (c) Poor quality of functioning

The correct answer is Poor quality of functioning.

Key Points

• The changes in the State Co-operative Societies Acts were prompted by the poor quality of functioning of several co-operative societies.

• Many co-operative societies faced issues like inefficiency, mismanagement, and lack of accountability, which necessitated reforms in their governance structures.

• The poor performance of co-operative societies led to inadequate service delivery to their members and stakeholders.

• To address these challenges, the State Co-operative Societies Acts were modified to introduce measures such as better financial monitoring, improved governance, and stricter audit processes.

• These reforms aimed to restore trust and improve the operational efficiency of co-operative societies across the states.

Additional Information

• Co-operative Societies:

• Co-operative societies are organizations formed by individuals with a common interest, primarily to meet their economic, social, and cultural needs.

• They are governed by the Co-operative Societies Act, 1912, and respective State Acts.

• Their core principles include voluntary membership, democratic decision-making, and equitable distribution of benefits.

• Common Issues in Co-operative Societies:

• Lack of professionalism and skilled management often results in inefficient operations.

• Instances of corruption and political interference have led to misuse of resources.

• Inadequate financial oversight and poor audit mechanisms result in fraudulent practices.

• Reforms in Co-operative Sector:

• Efforts like the 97th Constitutional Amendment Act, 2011, sought to improve transparency and democratic governance in co-operatives.

• Provisions were added to ensure regular elections, proper audits, and member empowerment.

• State-level reforms often focus on reducing political interference and improving operational efficiency.

• Role of NABARD:

• The National Bank for Agriculture and Rural Development (NABARD) provides financial and technical support to co-operative institutions.

• It also works on capacity building and institutional strengthening of co-operatives.

Q95. Answer: (a) 140

Shortcut Trick

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

Sum of interior angles = 360° + 250% of 360° = 3.5 × 360° = 1260°.

Using the formula (n − 2) × 180° = 1260° => n − 2 = 7 => n = 9.

For a regular polygon, each interior angle x = 1260° ÷ 9 = 140°.

Therefore The correct answer is 140°.

Alternate Method

Given: Sum of interior angles is 250% more than the sum of exterior angles.

Formula Used: Sum of interior angles = (n − 2) × 180°; Sum of exterior angles = 360°.

=> Sum of exterior angles = 360°

=> Sum of interior angles = 360° + (250/100) × 360°

=> Sum of interior angles = 360° + 900° = 1260

Q96. Answer: (d) 1784

The correct answer is 1784.

Key Points

• The first armed tribal rebellion against British rule in India is considered to be the Tamar Rebellion of 1784.

• This rebellion was led by the Tamar tribe in the Chotanagpur region (present-day Jharkhand).

• The Tamar tribes revolted against the exploitative policies of the British, especially related to land revenue and forced labor.

• It marked the beginning of resistance movements by tribal communities, which continued with uprisings like the Kol Rebellion (1831) and the Santhal Rebellion (1855).

• Tribal resistance was fueled by the disruption of traditional lifestyles, exploitation by landlords, and the introduction of new laws and systems by the British administration.

Additional Information

• Tamar Rebellion:

• It was one of the earliest tribal revolts in India, occurring in 1784.

• The rebellion was triggered by the British policies of heavy taxation and forced labor (begar).

• The leaders of the rebellion used traditional tribal warfare tactics against the British forces.

• Kol Rebellion (1831-1832):

• Led by the Kol tribes in the Chotanagpur region.

• It was an uprising against the British and moneylenders who exploited tribal land and resources.

• Santhal Rebellion (1855-1856):

• Also known as the Santhal Hul, this revolt was led by Sidhu and Kanhu Murmu.

• The Santhals revolted against the oppressive policies of the British and the zamindars.

• Impact of Tribal Revolts:

• These uprisings highlighted the plight of tribal communities under British rule.

• They are significant for understanding the early resistance movements in India.

Q97. Answer: (c) Two

Given series: (Left) 7 * £ 5 8 $ 7 3 * 9 & % 4 6 @ 9 # 1 & 3 Ω (Right)

According to the question, such symbols which are immediately preceded by a symbol and also immediately followed by a number:

Required condition: Symbol - Symbol - Number

(Left) 7 * £ 5 8 $ 7 3 * 9 & % 4 6 @ 9 # 1 & 3 Ω (Right)

Thus, there are two such symbols which are immediately preceded by a symbol and also immediately followed by a number.

Hence, "Option 3" is the correct answer.

Q98. Answer: (b) 6

Given: A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6.

1) The product of floors on which F and D live is 15.

2) The sum of floors on which A and D live is 7.

Floor	Person	
	Case 1	Case 2
6		
5	F	D
4	A	
3	D	F
2		A
1		

3) E lives immediately above C.

As there is no possible position for E in case 2, therefore is eliminated

After positioning E and C only one position is left which will be occupied by the only person left i.e. B.

Floor	Person
	Case 1
6	B
5	F
4	A
3	D
2	E
1	C

Thus, the sum of floors on which A and E live is 6.

Hence, "Option 2" is the correct answer.

Q99. Answer: (b) 2 lakh km

The correct answer is 2 lakh km.

Key Points

• The Government of India has set a target to develop a 2 lakh km national highway network by 2025 under its infrastructure development plan.

• The initiative is part of the Bharatmala Pariyojana, launched to improve road connectivity across India.

• It aims to enhance the efficiency of freight and passenger movement through the development of economic corridors, inter-corridors, feeder routes, and border roads.

• This ambitious project focuses on reducing travel time, fuel consumption, and logistics costs, contributing to India's economic growth.

• The Ministry of Road Transport and Highways (MoRTH) is overseeing the implementation of this target.

Additional Information

• Bharatmala Pariyojana:

• Bharatmala Pariyojana is a centrally-sponsored road and highway development initiative launched in 2017.

• The scheme focuses on building a robust highway infrastructure, including economic corridors, rural roads, and expressways.

• A budget of approximately Rs. 5.35 lakh crore was allocated for the first phase of Bharatmala Pariyojana.

• The program is expected to cover around 34,800 km of roads in Phase I.

• Economic Corridors:

• Economic corridors are routes designed to facilitate efficient movement of goods and services across regions.

• They link production centers, markets, and ports to boost trade and industrial growth.

• The development of such corridors under Bharatmala aims to reduce logistics costs and enhance supply chain efficiency.

• National Highway Authority of India (NHAI):

• NHAI is an autonomous agency under MoRTH responsible for the development, maintenance, and management of India's national highways.

• It plays a pivotal role in implementing large-scale highway projects, including Bharatmala Pariyojana.

• NHAI uses innovative financing methods, such as toll-operate-transfer (TOT) and hybrid annuity models, to fund infrastructure projects.

• Future Impacts:

• The expansion of the national highway network will significantly reduce travel time and improve connectivity in remote areas.

• It is expected to boost tourism, trade, and industrial growth across the country.

• The project will create thousands of jobs and contribute to India's GDP growth.

Q100. Answer: (a) Y

Given: M, N, O, P, Y and Z live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6.

1) Only M lives above N.

2) Z lives immediately below N.

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Floor	Person
6	M
5	N
4	Z
3	
2	
1	

3) Only P lives below O.

After positioning O and P only one position is left which will be occupied by the only person left i.e. Y.

Floor	Person
6	M
5	N
4	Z
3	Y
2	O
1	P

Thus, Y lives on floor numbered 3.

Hence, "Option 1" is the correct answer.

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