RRB NTPC (Graduate) CBT-I Official Paper (Held On: 25 Mar, 2026 Shift 1) (Previous Year Paper)

RRB NTPC • 2026 • 100 questions • 90 minutes • Answer key and solutions

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Q1. What is the primary reason for the intensification of the monsoon trough over North India by the end of May?

(a) Shift in wind patterns
(b) Decrease in humidity
(c) Increase in atmospheric pressure
(d) High temperature in the region

Q2. In November 2025, Oman enhanced its global environmental leadership by joining which international council?

(a) UNEP Governing Council
(b) IUCN Council
(c) UNESCO Man and the Biosphere Council
(d) UNESCO World Heritage Committee

Q3. Find the mean proportional between 7.2 and 20.

(a) 11
(b) 8
(c) 10
(d) 12

Q4. Arvind starts from Point A and drives 25 km towards east. He then takes a right turn, drives 10 km, turns left and drives 20 km. He then takes a left turn and drives 10 km. He takes a final left turn, drives 12 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) 20 km towards north
(b) 10 km towards south
(c) 33 km towards west
(d) 25 km towards east

Q5. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All herbs are plant. Some plants are medicines. No medicine is a chemical.

Conclusions:

(I) No herb is a chemical.(II) Some medicines are herbs.

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

Q6. Which classification best describes a compiler based on its role in program translation?

(a) System software because it converts code for OS execution
(b) Application software because users launch it manually
(c) Application software because it edits documents
(d) It is a hardware abstraction layer

Q7. According to L. M. Singhvi, what are the Directive Principles of State Policy considered as?

(a) Fundamental Rights
(b) Life-giving provisions of the Constitution
(c) Legal Rights
(d) Moral Rights

Q8. Find the value of $(2 \tan 30°)/(1 + \tan^2 30°)$

(a) cos 30°
(b) cos 60°
(c) cos 90°
(d) cos 45°

Q9. In what duration (in years) will Rs. 8,400 fetch a simple interest of Rs. 840 at 5% per annum rate of interest?

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

Q10. _____ is the SI unit used for measuring thermodynamic temperature.

(a) Celsius
(b) Rankine
(c) Kelvin
(d) Fahrenheit

Q11. Many plants secrete a sticky milky fluid and use it for their defence mechanism. This fluid is known as _____.

(a) cell sap
(b) latex
(c) enzyme
(d) plant hormone

Q12. The areas of similar triangles triangle ABC and triangle PQR are 432 $cm^2$and 588 cm^2, respectively. If the longest side PR of triangle PQR is 56 cm, then find the longest side AC of triangle ABC.

(a) 52 cm
(b) 48 cm
(c) 24 cm
(d) 35 cm

Q13. Refer to the following letter, symbol series and answer the question. Counting to be done from left to right only

(Left) @ L € F J £ E # N K # * R P * D # X T * G N (Right)

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

(a) 3
(b) 4
(c) 6
(d) 5

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Q14. If $a = (3 + \sqrt{5})/(3 - \sqrt{5})$ and $b = (3 - \sqrt{5})/(3 + \sqrt{5})$, then find the value of $a^2 + b^2 + 3ab$.

(a) 98
(b) 50
(c) 78
(d) 42

Q15. The average of 7 numbers is 47. If each number is decreased by 7, what will the new average be?

(a) 47
(b) 40
(c) 7
(d) 33

Q16. A car covers one-fifth of the distance from A to B at the speed of 8 km/h, one-tenth of the distance at 25 km/h and the remaining at the speed of 20 km/h. Find the average speed of the whole journey.

(a) 17.225 km/h
(b) 14.225 km/h
(c) 12.625 km/h
(d) 15.625 km/h

Q17. The least common multiple of two numbers is 21 times the first number, and the highest common factor of the two numbers is a two-digit prime number. What is the least possible value of the second number?

(a) 147
(b) 231
(c) 273
(d) 357

Q18. What is the mean of the following distribution?

Marks	11	34	51	62	98
No. of Students	57	23	95	14	96

(a) 79
(b) 44
(c) 58
(d) 64

Q19. In a certain code language,

A + B means ‘A is the mother of B’
A – B means ‘A is the brother of B’
A x B means ‘A is the wife of B’
A % B means ‘A is the father of B’
A # B means ‘A is the daughter of B’
Based on the above, how is L related to E if ‘L # N – C # V x E’?

(a) Brother’s daughter
(b) Father’s mother
(c) Daughter’s son
(d) Son’s daughter

Q20. 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 is numbered 2, and so on till the topmost floor is numbered 6.

Only four people live below C. Only three people live above F. A lives immediately below E. D does not live above B.

How many people live below E?

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

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(d) Four

Q21. What did the term 'gopati' refer to in Early Vedic society?

(a) Chief who protects cows
(b) Priest who conducts rituals
(c) Warrior who leads battles
(d) Head of the family

Q22. S, T, U, V, E, F and G are sitting around a circular table facing the centre. Only two people sit between E and F when counted from the right of E. Only two people sit between F and T. Only three people sit between E and U. S sits to the immediate left of V. Who sits third to the left of G?

(a) S
(b) V
(c) F
(d) U

Q23. The 47th ASEAN Summit in October 2025 primarily focused on which of the following issues?

(a) Digital transformation
(b) Inclusivity & Sustainability
(c) Trade tariffs
(d) Food safety

Q24. KD 15 is related to PI 12 in a certain way. In the same way, NG 20 is related to SL 17. To which of the following is QJ 26 related, following the same logic?

(a) VN 24
(b) VO 23
(c) VM 23
(d) UO 24

Q25. 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 :: ?

: OYG :: TDL : %

(a) = GOY % = BLT
(b) = GQY % = BLT
(c) = GQY % = OLT
(d) = GQY % = BLI

Q26. Which Buddhist text, compiled around the 1st century CE, narrates stories of the Buddha's past lives?

(a) Jataka Tales
(b) Sutta Pitaka
(c) Dhammapada
(d) Vinaya Pitaka

Q27. Tea cultivation in India is mainly concentrated in which of the following regions?

(a) Aravali Hills
(b) Thar Desert
(c) Central Plateau
(d) North-Eastern Hills

Q28. A typist takes 40 minutes to type 10 pages. How many pages will he type in 88 minutes?

(a) 21
(b) 24
(c) 22
(d) 23

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Q29. In which of the following years was the School of Minerals, Metallurgical and Materials Engineering (SMMME) established at Bhubaneswar?

(a) 1995
(b) 1984
(c) 2002
(d) 2012

Q30. A and B complete a work in 22 days. If A alone can do it in 44 days, then B alone can do three-fourth of the same work in _____days.

(a) 132
(b) 33
(c) 66
(d) 99

Q31. If 2 is subtracted from each of the numerator and the denominator of a fraction a/b, it becomes 1/4.

If 17 is added to the numerator and 8 is added to the denominator of the original fraction, then the fraction becomes 7/7. What is the value of (4a - b)?

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

Q32. Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which is the one that 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) NR-OU
(b) FJ-IM
(c) CG-FJ
(d) AE-DH

Q33. The product of two consecutive natural numbers is 380. The greater of the two numbers is:

(a) 24
(b) 12
(c) 14
(d) 20

Q34. Which Mughal court historian authored the Akbarnāma, the official chronicle of Emperor Akbar’s reign?

(a) Ziauddin Barani
(b) Minhaj-i-Siraj
(c) Ferishta
(d) Abul Fazl

Q35. What should come in place of ‘?’ in the given series?

15 19 27 39 55 ?

(a) 75
(b) 76
(c) 74
(d) 72

Q36. During the 1990–91 balance of payments crisis, India’s foreign exchange reserves were sufficient to finance imports for only:

(a) three months
(b) two weeks
(c) one month
(d) one week

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Q37. Which award did Pandit Hariprasad Chaurasia receive in 1992 for his contribution to Indian music?

(a) Maharashtra Gaurav Puraskar
(b) Padma Bhushan
(c) Padma Shri
(d) Padma Vibhushan

Q38. Which of the following letter-number clusters will replace the question mark "?" in the given series to make it logically complete?

ERW 7, CPU 15, ANS 23, YLQ 31, ?

(a) WIM 38
(b) WJO 39
(c) VIN 39
(d) XJN 40

Q39. The phenomenon called _____ occurs when light passes from one transparent medium to another.

(a) scattering
(b) diffraction
(c) refraction
(d) reflection

Q40. Which of the following statements about ASCII is correct?

(a) ASCII is a type of local area network
(b) ASCII is a high-capacity optical disk format
(c) ASCII is used to store audio on a CD
(d) ASCII represents characters using numeric codes

Q41. Refer to the following letter, symbol series and answer the question. Counting to be done from left to right only.

(Left) A # G % C = + F * / D H : B - ? $ E ! I J (Right)

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

(a) FOUR
(b) TWO
(c) THREE
(d) ONE

Q42. The population of a village was 2,90,000. It increased by 10% in the first year and increased by 30% in the second year. Its population after two years is _____.

(a) 4,06,000
(b) 3,19,000
(c) 3,77,000
(d) 4,14,700

Q43. In a certain code language, 'HOUR' is coded as '3867' and 'HURT' is coded as '5836'. What is the code for 'T' in the given code language?

(a) 6
(b) 3
(c) 8
(d) 5

Q44. At approximately what depth inside the Earth is the boundary between the mantle and the core located?

(a) 4,900 km
(b) 1,900 km
(c) 3,900 km
(d) 2,900 km

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Q45. 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 is the one that does not belong to that group? (Note: The odd man out is not based on the number of consonants/vowels or their position in the letter cluster)

(a) ST-VW
(b) MN-PQ
(c) GH-JK
(d) DE-FG

Q46. Which of the following is NOT an impact of globalisation on Indian economy?

(a) Foreign direct investment (FDI) has been liberalised
(b) Two stage devaluation of the rupee by about twenty percent in July, 1991
(c) Introduction of a system of partial convertibility of the rupee
(d) Foreign institutional investments are made more restrictive for stability of the economy

Q47. According to the NIRF Rankings 2025 released in September 2025, which institute secured the top overall position?

(a) AIIMS Delhi
(b) IIT Bombay
(c) IIT Madras
(d) IISc Bengaluru

Q48. Refer to the following letter, symbol series and answer the question. Counting to be done from left to right only

(Left) £ D € U B & @ % © K C # T $ @ A # E D % * C (Right)

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

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

Q49. If the standard deviation of 11, 13, 15, 17,...., 71 is m, then find the integral part of m.

(a) 17
(b) 18
(c) 16
(d) 13

Q50. Below are given two sets of numbers. In each set of numbers, a certain mathematical operation on the first number results in the second number. Similarly, a certain mathematical operation on the second number results in the third number, and so on. Which of the given options follows the same set of operations as in the question?

(NOTE: A two-/three-digit number cannot be broken into individual digits for operations, e.g. if 37 is followed by 10, the operation cannot be 3 + 7, as a two-digit number cannot be broken into individual digits.)

50 – 10 – 5 – 15 ; 200 – 40 – 20 – 30

(a) 160 – 40 – 20 – 30
(b) 100 – 20 – 40 – 60
(c) 120 – 60 – 30 – 40
(d) 400 – 80 – 40 – 50

Q51. Which of the following cities did Vasco da Gama first reach in India after discovering the all-sea route from Europe?

(a) Surat
(b) Calicut
(c) Diu
(d) Goa

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Q52. The 97th Constitutional Amendment provided constitutional status to which of the following?

(a) District Planning Committees
(b) Market Regulatory Boards
(c) Cooperative Societies
(d) Metropolitan Councils

Q53. Find the solution of the following system of linear equations:

$2x + y + z = 25$

$x - 3y + 2z = 0$

$y - z = 6$

(a) x = 55/4, y = (-17)/4, z = 7/4
(b) x = 7/4, y = 55/4, z = (-17)/4
(c) x = 55/4, y = 7/4, z = (-17)/4
(d) x = (-17)/4, y = 55/4, z = 7/4

Q54. Simplify

$25 – 5.6 \div 7 + 1.6 \times 0.5$

(a) 23.4
(b) 5.6
(c) 0
(d) 25

Q55. Who was the first Portuguese Governor to implement the "Blue Water Policy" in India?

(a) Pedro Álvares Cabral
(b) Alfonso de Albuquerque
(c) Francisco de Almeida
(d) Vasco da Gama

Q56. In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Q. Five people – Pallavi, Shreya, Monika, Ritu, and Alka – are sitting in a straight line facing north.

Who is sitting at the extreme left end?

(I) Shreya sits immediately to the right of Pallavi.

(II) Monika sits immediately to the right of Shreya, and Ritu is not at any end.

(a) Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
(b) Data in Statement I alone is sufficient to answer the question while data in Statement II is not
(c) Both statements I and II together are NOT sufficient to answer the question
(d) Data in Statement II alone is sufficient to answer the question while data in Statement I is not

Q57. During 1991–92 to 1998–99, which industrial sector showed a clear decline in the average annual growth according to the Index of Industrial Production (IIP)?

(a) Manufacturing and Engineering
(b) Electricity and Utilities
(c) Basic and Capital Goods
(d) Mining and Quarrying

Q58. Find the sum of all the interior angles of a regular polygon of 6 sides.

(a) 600°
(b) 720°
(c) 680°
(d) 760°

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Q59. Harishika bought an article for Rs. 200 and sold it to Ritu at a loss of 30%. With this amount, Harishika bought another article and sold it at a gain of 75%. What is Harishika's overall gain percentage?

(a) 17.5%
(b) 24.5%
(c) 22.5%
(d) 19.4%

Q60. In 2025, which state government announced the creation of a new eco-sensitive zone around the Bannerghatta National Park?

(a) Karnataka
(b) Kerala
(c) Gujarat
(d) Madhya Pradesh

Q61. Kiran’s salary is Rs. 18000 per month. He spends Rs. 5000 on house rent, Rs. 3000 on bills and the rest of the amount is his monthly savings. Find his savings (in Rs.) in a year, if in the month of his birthday, he spent his complete monthly saving for birthday celebration.

(a) 120000
(b) 100000
(c) 110000
(d) 90000

Q62. Bhimbetka Paleolithic site is located near which river valley of India?

(a) Yamuna
(b) Narmada
(c) Ganga
(d) Satluj

Q63. 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. B lives on a floor which is a prime number. The product of the floors on which B and F live is 3. Only 2 people live above C. A lives immediately below E. How many people live above A?

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

Q64. COLD is related to GQHB in a certain way based on the English alphabetical order. In the same way, KSDZ is related to OUZX. To which of the following is SWVV related, following the same logic?

(a) WYRT
(b) VXQS
(c) UYSS
(d) XZSU

Q65. In which year did Mahatma Gandhi break the Salt Act at Dandi?

(a) 1929
(b) 1931
(c) 1928
(d) 1930

Q66. A shopkeeper purchased 60 dozens of articles at the rate of Rs. 474 per dozen. He sold each one of them at the rate of Rs. 79. What percentage profit did he make?

(a) 99%
(b) 100%
(c) 101%
(d) 102%

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Q67. 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 cats are dogs. Some cats are tigers. No tiger is a lion.

Conclusions:

(I) Some dogs are tigers.

(II) No cat is a lion.

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

Q68. Which two forms of energy together make up the total mechanical energy of an object?

(a) Electrical and chemical energy
(b) Light and heat energy
(c) Potential and kinetic energy
(d) Heat and sound energy

Q69. Each of X, Y, Z, A, B, C and D has an interview on a different day of the week starting on Monday and ending on Sunday of the same week. C has an interview on the last day of the week. Y has an interview on the first day of the week. Only three people have an interview between Y and D. Only one person has an interview between D and Z. X has an interview on one of the days after B but on one of the days before A. Who has an interview on Thursday?

(a) D
(b) X
(c) B
(d) A

Q70. Which of the following operations specifically relies on system software instead of application software to function properly?

(a) Allocating memory to programs
(b) Modifying a digital photo file
(c) Designing a presentation file
(d) Playing an audio or video file on System

Q71. Seven people F, G, H, I, V, W, and X are sitting around a circular table facing the centre of the table. I sits third to the right of G. Only two people sit between I and F. Only three people sit between G and V. H sits to the immediate left of W. Who sits fourth to the left of X?

(a) W
(b) I
(c) H
(d) F

Q72. In December 2025, which organization hosted the national stakeholder consultation on the High Seas Treaty (BBNJ) in Kochi, India?

(a) Food and Agriculture Organization
(b) Central Marine Fisheries Research Institute
(c) Ministry of Environment, Forest and Climate Change
(d) Indian Council of Agricultural Research

Q73. Arun has Rs. 1407 with him. He divides this amount between his two sons, Mahesh and Vijay, and asks them to invest their respective shares at a compound interest rate of 10% per annum, compounded annually. It is observed that Mahesh's investment amounts to the same value after 12 years as Vijay's investment does after 13 years. How much (in Rs.) did Arun give to Vijay?

(a) 737

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(b) 837
(c) 670
(d) 520

Q74. What is the primary objective of the UN80 Initiative launched by the UN Secretary-General in 2025?
(a) To expand military presence in conflict zones
(b) To create a new global currency
(c) To promote global tourism
(d) To improve efficiency and cost-effectiveness within the UN

Q75. What is the total number of languages listed under the 8th Schedule of the Constitution of India, as on 30 June 2024?
(a) 26
(b) 20
(c) 22
(d) 16

Q76. Evaluate: 16 + 18 ÷ 6 - 3 × 4
(a) 7
(b) 6
(c) 10
(d) 9

Q77. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘×’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘−’, then what will come in place of the question mark (?) in the following equation?
10 C 20 A 2 D 3 B 5 = ?
(a) 3
(b) 5
(c) 6
(d) 4

Q78. A shopkeeper fixes the marked price of an item at 150% above its cost price. What percentage of discount on the marked price should be allowed to gain 20%?
(a) 55%
(b) 52%
(c) 54%
(d) 49%

Q79. Which of the following reports of the Brundtland Commission (1987) defined the concept of sustainable development?
(a) Our Common Future
(b) Agenda 21
(c) Limits to Growth
(d) Silent Spring

Q80. A book published in 2025, authored by Narendra Modi and titled 'The Emergency Diaries – Years That Forged a Leader', is thematically associated with which of the following periods in Indian political history?
(a) 1962–1965
(b) 1989–1991
(c) 1975–1977
(d) 1969–1971

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Q81. In a certain code language,

A + B means 'A is the daughter of B'

A – B means 'A is the brother of B'

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

A ÷ B means 'A is the father of B'

Based on the above, how is D related to J if 'D + F ÷ G x H – J'?

(a) Wife's mother
(b) Brother's wife's sister
(c) Brother's wife's mother
(d) Wife's sister

Q82. In December 2025, which advanced brain stent was successfully trialed by AIIMS Delhi under the GRASSROOT trial?

(a) da Vinci
(b) Supernova stent
(c) Vikram-I
(d) OncoMark

Q83. A train of length 120 m travelling at 60 km/hr crosses another train travelling in the same direction at 24 km/hr in 30 seconds. What is the length (in m) of another train?

(a) 250
(b) 200
(c) 180
(d) 225

Q84. Article 243V of the Indian Constitution applies to disqualification for membership in which type of body?

(a) District Council
(b) State Legislature
(c) Panchayats
(d) Municipality

Q85. Select the set in which the numbers are related in the same way as are the numbers of the given sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits.)

(16, 6, 111)

(9, 14, 141)

(a) (15, 12, 200)
(b) (17, 8, 146)
(c) (12, 8, 96)
(d) (13, 10, 145)

Q86. Consider the following statements.

1. Article 13 provides for judicial review of both pre-constitutional and post-constitutional laws.

2. Article 13 declares that all laws inconsistent with or in derogation of the Fundamental Rights shall be null and void.

Which of the above statements is/are correct?

(a) Neither 1 nor 2
(b) 2 only
(c) 1 only
(d) Both 1 and 2

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Q87. What number will be in the place of x?

2.8 : 3.8 : : x : 5.7

(a) 4.2
(b) 5.1
(c) 3.6
(d) 4.8

Q88. Find the value of m, satisfying equation:

(12/9)^(19) × (9/12)^5 × (12/9)^8 = (9/12)^(6m + 11)

(a) -33/6
(b) -37/6
(c) -34/6
(d) -35/6

Q89. Which Article of the Indian Constitution empowers the Supreme Court to review any judgment pronounced or order made by it?

(a) Article 141
(b) Article 145
(c) Article 137
(d) Article 136

Q90. In the Windows Operating System, if a file named config.ini is located in the root directory of the main drive, what is the correct and complete absolute path to reference this file?

(a) config.ini
(b) C:\config.ini
(c) C:\Users\config.ini
(d) \config.ini

Q91. There are 42 members in group A, 31 members in group B and 32 members in group C. All the members of these groups went to a restaurant. The average amounts spent on each member of groups A, B and C are Rs. 335, Rs. 103 and Rs. 271, respectively. The overall average amount (in Rs.) spent per member is:

(a) 249
(b) 248
(c) 247
(d) 242

Q92. Water flows out through a circular pipe, whose internal diameter is 2 cm, at the rate of 4 metres per second into a cylindrical tank, the radius of whose base is 80 cm. By how much will the level of water rise in 24 minutes?

(a) 100 cm
(b) 90 cm
(c) 96 cm
(d) 91 cm

Q93. In a certain code language, ‘RUST’ is coded as ‘3519’ and ‘TEAM’ is coded as ‘8645’. What is the code for ‘T’ in that language?

(a) 8
(b) 4
(c) 5
(d) 9

Q94. What should come in place of ‘?’ in the given series?

33 40 54 75 103 ?

(a) 135
(b) 138
(c) 136

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(d) 134

Q95. A cylindrical rod has an outer curved surface area of 1300 cm^2. If the length of the rod is 60 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is:

Take $\pi = 22/7$

(a) 3.48
(b) 1.88
(c) 1.02
(d) 3.45

Q96. 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 its constituent digits.)

E.g. 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(79, 235, 32)

(87, 225, 42)

(a) (93, 185, 56)
(b) (83, 290, 45)
(c) (88, 280, 34)
(d) (77, 235, 32)

Q97. In the decision-making process of the GST Council, how is the voting power distributed between the Central Government and the State Governments?

(a) States alone = 1, Centre = 0
(b) Centre = 1/2, States = 1/2
(c) Centre = 2/3, States = 1/3
(d) Centre = 1/3, States = 2/3

Q98. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

WTW 84 XUX 93 YVY 102 ZWZ 111 ?

(a) AXA 120
(b) AWZ 119
(c) AJT 119
(d) AYZ 120

Q99. Which of the following is an example of a minor industrial region of India?

(a) Hugli region
(b) Brahmaputra valley
(c) Gujarat region
(d) Chota Nagpur region

Q100. Each of the digits in the number 54672139 is arranged in ascending order from left to right. What will be the sum of the digits which are third from the left and second from the right in the number thus formed?

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

ANSWER KEY

1	d	2	c	3	d	4	c	5	c	6	a	7	b	8	a	9	a	10	c
11	b	12	b	13	b	14	b	15	b	16	d	17	b	18	c	19	d	20	a

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

SOLUTIONS

Q1. Answer: (d) High temperature in the region

The correct answer is 'High temperature in the region'

Key Points

• High temperature in the region:

• The primary driver for the intensification of the monsoon trough over North India is the intense heating of the landmass during the summer months (April, May, and June).

• By the end of May, the sun shines almost directly over the Tropic of Cancer, leading to exceptionally high temperatures in the North and Northwest parts of the Indian subcontinent.

• As the air heats up, it becomes less dense and rises, creating a strong low-pressure zone known as the monsoon trough.

• This low-pressure area becomes so intense that it effectively "pulls" the moisture-laden trade winds from the Southern Hemisphere across the equator toward the Indian landmass.

Additional Information

• Shift in wind patterns:

• While a shift in wind patterns (from North-East to South-West) is a characteristic of the monsoon season, it is a consequence of the pressure gradient created by high temperatures, rather than the primary reason for the trough's intensification.

• The shift occurs because the winds move from high-pressure areas over the ocean toward the low-pressure trough over the land.

• Decrease in humidity:

• A decrease in humidity is incorrect because, as the monsoon trough intensifies and the monsoon winds approach, the humidity in the atmosphere actually increases significantly.

• Dry conditions precede the trough's peak, but the intensification of the trough itself is what eventually brings the moisture.

• Increase in atmospheric pressure:

• This is the opposite of what happens. A trough is, by definition, an elongated region of low atmospheric pressure.

• An increase in atmospheric pressure would lead to stable, clear weather and would prevent the onset of the monsoon.

Important Points

• The monsoon trough is essentially the regional manifestation of the Inter-Tropical Convergence Zone (ITCZ) shifting northward during the Northern Hemisphere summer.

• In summer, the ITCZ moves from the equator toward the Ganga plains, usually positioned around 20°N-25°N latitude by July.

• The position and strength of this trough determine the distribution and intensity of rainfall across North India.

• The Thar Desert and the surrounding regions of Pakistan and Northwest India act as the core center of this thermal low-pressure system.

Q2. Answer: (c) UNESCO Man and the Biosphere Council

The correct answer is 'UNESCO Man and the Biosphere Council'

Key Points

• In November 2025, Oman was elected to the UNESCO Man and the Biosphere (MAB) Council (Option 3), marking a significant step in its global environmental leadership.

• The election took place during the 43rd session of the UNESCO General Conference held in Samarkand, Uzbekistan.

• Oman secured a seat on the International Coordinating Council of the MAB Programme for the 2025–2029 term.

• Oman's election to this council highlights its commitment to biodiversity conservation and sustainable development in alignment with Oman Vision 2040.

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Additional Information

• UNEP Governing Council (United Nations Environment Assembly):

• The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda.

• While Oman participates in UNEA sessions, the specific landmark election in recent years concerning a high-level committee for heritage and environment conservation was for the UNESCO World Heritage Committee.

• IUCN Council:

• The International Union for Conservation of Nature (IUCN) is a membership union composed of both government and civil society organizations.

• The IUCN Council is the principal governing body of the organization between sessions of the World Conservation Congress.

• While Oman is an active member of the IUCN, its primary recent diplomatic win in the UN framework regarding "Committees" is centered on UNESCO.

• UNESCO Man and the Biosphere (MAB) Council:

• The MAB Programme is an intergovernmental scientific program that aims to establish a scientific basis for enhancing the relationship between people and their environments.

• Oman has been active in the MAB programme and has had sites designated as Biosphere Reserves, but the specific 2023-2025 timeline highlights the World Heritage Committee seat as the primary achievement.

Important Points

• Oman was elected during the 24th session of the General Assembly of States Parties to the World Heritage Convention held in Paris.

• The membership is a testament to Oman’s diverse heritage, which includes five sites already listed on the UNESCO World Heritage List, such as the Bahla Fort and the Land of Frankincense.

• Through this committee, Oman aims to contribute to the Global Strategy for a Representative, Balanced and Credible World Heritage List, particularly focusing on underrepresented regions and types of heritage.

• Oman's vision for 2040 emphasizes environmental sustainability and the preservation of national identity, which aligns perfectly with the goals of the World Heritage Committee.

Q3. Answer: (d) 12

Shortcut Trick

Mean proportional of a and b is √(a × b)

Given: a = 7.2, b = 20

Mean proportional = √(7.2 × 20)

Mean proportional = √144 = 12

Therefore Answer = 12

Alternate Method

Given:

First number (a) = 7.2

Second number (b) = 20

Formula used:

Mean Proportional between a and b is x, such that a : x :: x : b

x = √(a × b)

7.2 x 20 7.2 : x = x : 20 $x^2 = 7.2 \times 20$

Calculations:

Let the mean proportional be x.

=> $x^2 = 7.2 \times 20$

=> $x^2 = 144$

=> x = √144

=> x = 12

Therefore The correct answer is 12 (Option 4).

Additional Information

Third Proportional

For two numbers a and b, the third proportional c is given by a : b :: b : c, which means $c = b^2 \div a$.

Fourth Proportional

For three numbers a, b, and c, the fourth proportional d is given by a : b :: c : d, which means d = (b × c) ÷ a.

Duplicate Ratio

The duplicate ratio of a : b is the ratio of their squares, i.e., $a^2 : b^2$.

Compounded Ratio

For two ratios a : b and c : d, the compounded ratio is (a × c) : (b × d).

Q4. Answer: (c) 33 km towards west

Given:

Arvind starts from A and drives 25 km East.

He turns right → 10 km South.

He turns left → 20 km East.

He turns left → 10 km North.

He turns left → 12 km West and reaches P.

To reach A from P → move 33 km West.

Hence, the correct answer is Option 3.

Q5. Answer: (c) Neither conclusion (I) nor (II) follows.

Given Statements:

All herbs are plants.

Some plants are medicines.

No medicine is a chemical.

The least possible Venn diagram for the given statement is:

Conclusions:

I. No herb is a chemical - False (Because only medicines are not chemicals, and herbs are not definitely medicines, so herbs may or may not be chemicals).

II. Some medicines are herbs - False (Because there is no definite overlap given between herbs and medicines).

So, neither conclusion I nor II follows.

Hence, the correct answer is "Option 3".

Q6. Answer: (a) System software because it converts code for OS execution

The correct answer is 'System software because it converts code for OS execution'

Key Points

• Compiler as System Software:

• A compiler is a type of system software known as a language processor. Its primary role is to translate high-level programming language (source code) into machine-level language (object code) that the computer's processor can understand and execute.

• It is classified as system software because it provides the essential environment for other software to be developed and run. Without a compiler, programmers would have to write code in complex binary or assembly language for the operating system to process.

• Compilers perform a comprehensive analysis of the code, including lexical, syntax, and semantic analysis, to ensure the program follows the rules of the programming language before generating an executable file.

• Because it acts as a bridge between human-readable code and the hardware-operating system interface, it is an integral component of the system's software infrastructure.

Additional Information

• Application software because users launch it manually:

• This is incorrect because the method of launching a program (manual vs. automatic) does not define its classification. Application software is designed to perform specific tasks for the end-user (like browsing the web or calculating spreadsheets).

• While a developer may "launch" a compiler, its function is to serve the system and development process, not to provide an end-user service like entertainment or productivity.

• Application software because it edits documents:

• This is incorrect because compilers do not edit documents. Text editors or Word Processors are the tools used for editing files.

• A compiler takes an existing text file (source code) as input and transforms it into a different format (binary/machine code); it is a translator, not a document editor.

• Hardware abstraction layer:

• This is incorrect because a Hardware Abstraction Layer (HAL) is typically a part of the Operating System kernel that allows the OS to interact with different hardware without needing to know specific hardware details.

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• While a compiler helps code run on hardware, it is a tool used during the development phase, whereas a HAL is a layer active during the runtime of the operating system itself.

Important Points

• Software is generally divided into two main categories: System Software (OS, utilities, language translators) and Application Software (MS Office, Games, Browsers).

• Language Processors: There are three main types:

• Assembler: Converts assembly language to machine code.

• Compiler: Scans the entire program and translates it as a whole into machine code.

• Interpreter: Translates and executes the program line-by-line.

• A compiler reports all errors at the end of the scanning process, making it faster in terms of execution speed compared to an interpreter, although the initial compilation takes time.

Q7. Answer: (b) Life-giving provisions of the Constitution

The correct answer is 'Life-giving provisions of the Constitution'

Key Points

• Directive Principles of State Policy (DPSP):

• The Directive Principles of State Policy are enumerated in Part IV of the Constitution from Articles 36 to 51.

• L. M. Singhvi, a prominent Indian jurist and diplomat, described the Directive Principles as the "Life-giving provisions of the Constitution."

• This description emphasizes that these principles provide the soul and the fundamental philosophy for governance, aiming to create a welfare state.

• They are intended to be the basis of all executive and legislative action in the country, ensuring that the state strives to promote the welfare of the people by securing a social order characterized by justice—social, economic, and political.

• While not enforceable by courts, they are considered fundamental in the governance of the country.

Additional Information

• Fundamental Rights:

• Fundamental Rights are enshrined in Part III of the Constitution (Articles 12 to 35).

• Unlike DPSPs, Fundamental Rights are justiciable, meaning they are enforceable by the courts in case of violation.

• They aim at establishing political democracy in India by protecting the liberties and freedoms of citizens against arbitrary state action.

• Legal Rights:

• Legal rights are those rights that are recognized and protected by the ordinary law of the land.

• While all constitutional rights are legal rights, not all legal rights are constitutional or fundamental. For example, the Right to Property is a legal right under Article 300A, but it is no longer a Fundamental Right.

• Moral Rights:

• Moral rights are based on the general principles of ethics or conscience rather than law.

• Although DPSPs impose a moral obligation on the state to implement them, they are constitutional directives specifically meant for policy-making, distinguishing them from purely abstract moral rights.

Important Points

• The concept of DPSP was borrowed from the Irish Constitution, which had copied it from the Spanish Constitution.

• Dr. B.R. Ambedkar described these principles as 'Novel Features' of the Indian Constitution.

• Granville Austin described the Directive Principles and the Fundamental Rights together as the 'Conscience of the Constitution.'

• The main objective of DPSPs is to establish Social and Economic Democracy, whereas Fundamental Rights aim to establish Political Democracy.

• In the Minerva Mills case (1980), the Supreme Court held that the Indian Constitution is founded on the bedrock of the balance between Fundamental Rights and Directive Principles.

Q8. Answer: (a) cos 30°

Shortcut Trick

The expression $2 \tan \theta \div (1 + \tan^2 \theta)$ is the standard identity for $\sin 2\theta$.

Given $\theta = 30°$, the value is $\sin(2 \times 30°) = \sin 60°$.

Using the complementary angle property: $\sin 60° = \cos(90° - 60°) = \cos 30°$.

The calculated value matches Option (1).

Therefore Answer = cos 30°

Alternate Method
Given:
Trigonometric expression: (2 tan 30°) ÷ (1 + tan² 30°)
Formula used:
tan 30° = 1 ÷ √3
A B C 30° 1 (Perp) √3 (Base) 2 (Hyp) At θ = 30°: tan 30° = Perp/Base = 1/√3
Calculations:
Substitute the value of tan 30° into the expression:
=> [2 × (1/√3)] ÷ [1 + (1/√3)²]
=> (2/√3) ÷ (1 + 1/3)
=> (2/√3) ÷ (4/3)
=> (2/√3) × (3/4) = 6 ÷ (4√3) = 3 ÷ (2√3)
=> (√3 × √3) ÷ (2√3) = √3/2
=> We know that cos 30° = √3/2
Therefore The correct answer is Option (1).
Additional Information
Double Angle Identities
sin 2θ = 2 tan θ ÷ (1 + tan² θ). Similarly, cos 2θ = (1 − tan² θ) ÷ (1 + tan² θ) and tan 2θ = 2 tan θ ÷ (1 − tan² θ).
Complementary Angle Rule
Trigonometric ratios of complementary angles satisfy sin θ = cos(90° − θ). Example: sin 60° = cos 30° and sin 30° = cos 60°.
Standard Trigonometric Values
sin 60° = √3/2, cos 30° = √3/2, tan 30° = 1/√3, and tan 60° = √3.

Q9. Answer: (a) 2

Shortcut Trick
Total Interest % = (Interest ÷ Principal) × 100
Total Interest % = (840 ÷ 8400) × 100 = 10%
Time = Total Interest % ÷ Rate per annum
Time = 10% ÷ 5% = 2 years
Therefore Answer = 2
Alternate Method
Given:
Principal (P) = Rs. 8,400
Simple Interest (SI) = Rs. 840
Rate of Interest (R) = 5% per annum
Formula used:
SI = (P × R × T) ÷ 100
Where P = Principal, R = Rate, T = Time
Principal: Rs. 8,400 Rate: 5% p.a. Interest: Rs. 840 Time: T years Interest growth over time
Calculations:
Substituting the given values in the formula:
=> 840 = (8400 × 5 × T) ÷ 100
=> 840 = 84 × 5 × T
=> 840 = 420 × T
=> T = 840 ÷ 420
=> T = 2 years
Therefore The correct answer is 2.
Additional Information
Amount Formula
Total Amount (A) is the sum of Principal and Simple Interest: A = P + SI = P(1 + RT/100).
Rate Calculation
Rate of interest can be found using the rearranged formula: R = (SI × 100) ÷ (P × T).

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Constant Interest Property

In Simple Interest, the interest remains constant for every year as it is always calculated on the original Principal.

Principal Formula

The Principal can be calculated if SI, R, and T are known: P = (SI × 100) ÷ (R × T).

Q10. Answer: (c) Kelvin

The correct answer is 'Kelvin'

Key Points

• Kelvin (K):

• The Kelvin is the base unit of temperature in the International System of Units (SI), having the unit symbol K.

• It is used to measure thermodynamic temperature, which is an absolute scale where zero (0 K) represents absolute zero—the point at which all thermal motion of particles ceases.

• Unlike the Celsius and Fahrenheit scales, the Kelvin scale does not use "degrees" (°); it is simply referred to as Kelvin.

• The Kelvin scale is widely used in physical sciences and engineering because it provides a direct measurement of the energy content of a system.

• The relation between Kelvin and Celsius is defined by the formula: K = °C + 273.15.

Additional Information

• Celsius (°C):

• The Celsius scale is a derived unit of temperature in the SI system, primarily used for everyday weather and liquid measurements.

• It is based on the freezing point of water at 0°C and the boiling point at 100°C under standard atmospheric pressure.

• While it is widely used globally, it is not the standard SI unit for thermodynamic temperature.

• Fahrenheit (°F):

• The Fahrenheit scale is a temperature scale primarily used in the United States and some Caribbean countries.

• On this scale, the freezing point of water is 32°F and the boiling point is 212°F.

• It is not part of the SI system and is rarely used in scientific research.

• Rankine (°R):

• The Rankine scale is an absolute temperature scale that uses Fahrenheit degrees.

• Zero on the Rankine scale is absolute zero, but a Rankine degree is equal to one Fahrenheit degree.

• It is primarily used in certain engineering systems in the United States, but it is not an SI unit.

Important Points

• The Kelvin was originally defined based on the triple point of water (273.16 K), which is the temperature at which water exists simultaneously as a solid, liquid, and gas.

• In 2019, the definition of the Kelvin was updated to be based on the Boltzmann constant (k), which relates thermal energy to temperature.

• This change ensures that the unit is defined by a fundamental physical constant rather than an experimental measurement of a specific substance.

• The lowest possible temperature is 0 K, and there are no negative values on the Kelvin scale.

Q11. Answer: (b) latex

The correct answer is 'Latex'

Key Points

• Latex:

• Latex is a complex emulsion of proteins, alkaloids, starches, sugars, oils, tannins, resins, and gums that coagulates on exposure to air.

• It is secreted by specialized cells or vessels known as laticifers.

• In many plants, latex serves as a primary defence mechanism; it is sticky and can trap small insects, and it often contains toxic chemicals to deter herbivores.

• When a plant part is injured, latex flows out to seal the wound, protecting the plant from fungal and bacterial infections.

• Common examples of plants that produce latex include the rubber tree (Hevea brasiliensis), banyan, papaya, and milkweed.

Additional Information

• Cell Sap:

• Cell sap is the fluid found inside the large central vacuole of a plant cell.

• It consists of water, mineral salts, sugars, amino acids, and sometimes waste products.

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• Its primary role is to maintain turgor pressure within the cell to keep the plant upright and to serve as a storage reservoir for nutrients.

• Enzyme:

• Enzymes are biological catalysts, usually proteins, that speed up chemical reactions within the plant.

• While plants use enzymes for metabolic processes like photosynthesis and respiration, they are not characterized as a "sticky milky fluid" secreted for physical defense.

• Plant Hormone:

• Plant hormones (phytohormones) are signal molecules produced in extremely low concentrations that regulate growth and development.

• Examples include auxins, gibberellins, and abscisic acid.

• Unlike latex, hormones are chemical messengers that coordinate internal physiological activities rather than acting as a physical external secretion for defense.

Important Points

• The most commercially important latex is obtained from the Rubber tree, which is processed to make natural rubber.

• Latex can vary in color; while it is most commonly white (milky), it can also be yellow, orange, or even clear depending on the plant species.

• In some plants like Papaya, the latex contains an enzyme called papain, which is used commercially as a meat tenderizer and in medicine.

• Exposure to latex from certain plants can cause allergic reactions or skin irritation in humans due to the presence of alkaloids and specialized proteins.

Q12. Answer: (b) 48 cm

Shortcut Trick

Ratio of Areas = (Ratio of Corresponding Sides)²

Area(ΔABC) : Area(ΔPQR) = 432 : 588

Simplify ratio: 432 : 588 → 36 : 49 (dividing by 12)

Side ratio = √36 : √49 = 6 : 7

Given 7 units = 56 cm, then 1 unit = 8 cm

AC = 6 units = 6 × 8 = 48 cm

Therefore Answer = 48 cm

Alternate Method

Given:

Area of ΔABC = 432 cm², Area of ΔPQR = 588 cm², Side PR = 56 cm

Formula used:

Area1 ÷ Area2 = (Side1 ÷ Side2)²

B A C AC = ? Area = 432 cm² Q P R PR = 56 cm Area = 588 cm²

Calculations:

For similar triangles ΔABC and ΔPQR:

=> Area(ΔABC) ÷ Area(ΔPQR) = (AC ÷ PR)²

=> 432 ÷ 588 = (AC ÷ 56)²

=> 36 ÷ 49 = (AC ÷ 56)²

=> √(36 ÷ 49) = AC ÷ 56

=> 6 ÷ 7 = AC ÷ 56

=> AC = (6 × 56) ÷ 7

=> AC = 6 × 8 = 48 cm

Therefore The correct answer is 48 cm.

Additional Information

Ratio of Perimeters

The ratio of the perimeters of two similar triangles is equal to the ratio of their corresponding sides: P1 ÷ P2 = S1 ÷ S2.

Ratio of Altitudes and Medians

For similar triangles, the ratio of corresponding altitudes, medians, and angle bisectors is the same as the ratio of their corresponding sides.

AA Similarity Criterion

Two triangles are similar if two angles of one triangle are equal to two angles of the other triangle (AA property).

Basic Proportionality Theorem (BPT)

If a line is drawn parallel to one side of a triangle intersecting the other two sides, then it divides the two sides in the same ratio.

Q13. Answer: (b) 4

Given: (Left) @ L € F J £ E # N K # * R P * D # X T * G N (Right)

Now, Letters, which are immediately preceded by a letter and also immediately followed by a symbol.

So, Needed pattern is: Letter - Letter - Symbol.

(Left) @ L € F J £ E # N K # * R P * D # X T * G N (Right)

So, Only four letters satisfy the condition.

Hence, the correct answer is Option 2.

Q14. Answer: (b) 50

Shortcut Trick

Notice that a and b are reciprocals, so a × b = 1.

For a = (x + √y)/(x − √y), the sum a + b = 2(x² + y) ÷ (x² − y).

Substituting x = 3 and y = 5, we get a + b = 2(9 + 5) ÷ (9 − 5) = 28 ÷ 4 = 7.

The expression a² + b² + 3ab can be written as (a + b)² + ab.

Required value = 7² + 1 = 49 + 1 = 50.

Therefore Answer = 50

Alternate Method

Given:

a = (3 + √5) ÷ (3 − √5), b = (3 − √5) ÷ (3 + √5)

Formula used:

(a + b)² = a² + b² + 2ab

Calculations:

First, find the sum of a and b:

=> a + b = [(3 + √5)² + (3 − √5)²] ÷ [(3 − √5)(3 + √5)]

=> a + b = [(9 + 5 + 6√5) + (9 + 5 − 6√5)] ÷ (9 − 5)

=> a + b = 28 ÷ 4 = 7

Now, find the product of a and b:

=> ab = [(3 + √5) ÷ (3 − √5)] × [(3 − √5) ÷ (3 + √5)] = 1

Substitute these into the required expression:

=> a² + b² + 3ab = (a² + b² + 2ab) + ab

=> a² + b² + 3ab = (a + b)² + ab

=> Required value = 7² + 1 = 49 + 1 = 50

Therefore The correct answer is option (2).

Additional Information

Rationalization of Surds

To rationalize a denominator of the form (x − √y), multiply both numerator and denominator by its conjugate (x + √y).

Algebraic Identity for Sum of Squares

The expression a² + b² can always be expressed in terms of the sum and product as (a + b)² − 2ab.

Sum of Conjugate Fractions

For a = (x+√y)/(x−√y) and b = (x−√y)/(x+√y), the sum is simplified as a + b = 2(x² + y) ÷ (x² − y).

Q15. Answer: (b) 40

Shortcut Trick

In averages, if a constant value k is subtracted from each observation, the new average is simply (Old Average − k).

Old Average = 47

Decrease in each number (k) = 7

New Average = 47 − 7 = 40

Therefore Answer = 40

Alternate Method

Given:
Total numbers = 7
Original average = 47
Decrease in each number = 7
Formula used:
Sum of observations = Average × Number of observations
New Average = New Sum ÷ Number of observations
Old Avg (47) Each term decreased by 7 New Avg (40) Net Shift = −7
Calculations:
Sum of original 7 numbers = 47 × 7 = 329
=> Total decrease = 7 × 7 = 49
=> New sum of 7 numbers = 329 − 49 = 280
=> New average = 280 ÷ 7 = 40
Therefore The correct answer is 40.
Additional Information
Effect of Addition
If each number is increased by a constant k, the new average becomes (Old Average + k).
Effect of Multiplication
If each number is multiplied by a constant k, the new average becomes (Old Average × k).
Effect of Division
If each number is divided by a non-zero constant k, the new average becomes (Old Average ÷ k).
Average of First n Natural Numbers
The average of the first n natural numbers is given by the formula (n + 1) ÷ 2.

Q16. Answer: (d) 15.625 km/h

Shortcut Trick
Assume Total Distance = 1000 km (LCM of 5, 10 and speeds)
Part 1 (1/5 of 1000) = 200 km @ 8 km/h → Time = 200 ÷ 8 = 25 h
Part 2 (1/10 of 1000) = 100 km @ 25 km/h → Time = 100 ÷ 25 = 4 h
Part 3 (Remaining 700 km) @ 20 km/h → Time = 700 ÷ 20 = 35 h
Average Speed = Total Distance ÷ Total Time = 1000 ÷ (25 + 4 + 35)
Therefore Answer = 15.625 km/h
Alternate Method
Given:
Distance ratios: 1/5, 1/10, and remaining (1 − 1/5 − 1/10) = 7/10
Speeds: 8 km/h, 25 km/h, 20 km/h
Formula used:
Average Speed = Total Distance ÷ Total Time
Time = Distance ÷ Speed
1/5 dist 1/10 dist 7/10 dist 8 km/h 25 20 km/h Journey from A to B
Calculations:
Let total distance be D.
=> Total Time = (D/5 ÷ 8) + (D/10 ÷ 25) + (7D/10 ÷ 20)
=> Total Time = D/40 + D/250 + 7D/200
=> Taking LCM of 40, 250, 200 = 1000:
=> Total Time = (25D + 4D + 35D) ÷ 1000 = 64D/1000 = 8D/125
=> Average Speed = D ÷ (8D/125) = 125/8
=> Average Speed = 15.625 km/h
Therefore The correct answer is 15.625 km/h (Option 4).
Additional Information
Average Speed for Two Equal Distances
When a journey is divided into two equal distances covered at speeds x and y, the average speed = 2xy ÷ (x + y).

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Average Speed for Three Equal Distances

When a journey is divided into three equal distances covered at speeds x, y, and z, the average speed = 3xyz ÷ (xy + yz + zx).

Time Constant Case

If a person travels for equal time intervals at different speeds x and y, the average speed is simply the arithmetic mean: (x + y) ÷ 2.

Unit Conversions

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

Q17. Answer: (b) 231

Shortcut Trick

Logic: Product of two numbers = HCF × LCM

1^(st) Number × 2^(nd) Number = HCF × (21 × 1^(st) Number)

2^(nd) Number = 21 × HCF

Least 2-digit prime number (HCF) = 11

Least value of 2^(nd) Number = 21 × 11 = 231

Therefore Answer = 231

Alternate Method

Given:

LCM = 21 × 1^(st) Number

HCF = a two-digit prime number

Formula used:

Product of two numbers = HCF × LCM

Ratio: 21 HCF (Two-digit Prime) Second Number Structure Least 2-digit prime number = 11 Result = 21 × 11 = 231

Calculations:

Let the two numbers be n1 and n2.

=> LCM = 21 × n1

=> n1 × n2 = HCF × LCM

=> n1 × n2 = HCF × (21 × n1)

=> n2 = 21 × HCF

=> To find the least value of n2, we need the smallest two-digit prime number for HCF.

=> Two-digit prime numbers are 11, 13, 17, 19, ...

=> Smallest two-digit prime = 11

=> n2 = 21 × 11 = 231

Therefore The correct answer is 231.

Additional Information

Product Rule for Two Numbers

For any two numbers a and b, the relationship is a × b = HCF(a, b) × LCM(a, b).

Prime Numbers

A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself. The smallest two-digit prime is 11.

HCF and LCM Relation

The LCM of a set of numbers is always exactly divisible by their HCF. If LCM = k × HCF, then k is the product of the non-common factors of the numbers.

Coprime Numbers

Two numbers are said to be coprime or relatively prime if their highest common factor (HCF) is 1.

Q18. Answer: (c) 58

Shortcut Trick

Mean (μ) = ∑fx ÷ ∑f

Total Frequency (∑f) = 57 + 23 + 95 + 14 + 96 = 285

Sum of Products (∑fx) = (11 × 57) + (34 × 23) + (51 × 95) + (62 × 14) + (98 × 96)

∑fx = 627 + 782 + 4845 + 868 + 9408 = 16530

Mean = 16530 ÷ 285 = 58

Therefore Answer = 58

Alternate Method

Given:

Marks (x): 11, 34, 51, 62, 98

Number of Students (f): 57, 23, 95, 14, 96

Formula used:

Mean (μ) = ∑(f_i × x_i) ÷ ∑f_i

Calculations:

Step 1: Calculate the sum of frequencies (∑f)

=> ∑f = 57 + 23 + 95 + 14 + 96 = 285

Step 2: Calculate the sum of products of marks and students (∑fx)

=> (11 × 57) + (34 × 23) + (51 × 95) + (62 × 14) + (98 × 96)

=> 627 + 782 + 4845 + 868 + 9408 = 16530

Step 3: Apply the mean formula

=> Mean = 16530 ÷ 285

=> Mean = 58

Therefore The correct answer is 58.

Additional Information

Empirical Relation

For a moderately skewed distribution, Mode = 3 Median − 2 Mean.

Median for Ungrouped Data

It is the middle value when data is arranged in ascending order. If total frequency N is odd, Median = ((N+1)/2)^(th) term.

Mode

The value in the distribution that has the highest frequency. In this case, the mode is 98 (frequency 96).

Standard Deviation (σ)

σ = √[∑f(x − μ)² ÷ ∑f], which measures the dispersion of the data from the mean.

Q19. Answer: (d) Son’s daughter

Family Chart:

Decoding the Symbols:

Symbol	**•**	**–**	**x**	**%**	**#**
Meaning	Mother	Brother	Wife	Father	Daughter

Given: L # N – C # V x E

It means: L is daughter of N, N is brother of C, C is daughter of V, V is wife of E.

Thus, L is son’s daughter of E.

Hence, the correct answer is Option 4.

Q20. Answer: (a) One

Given: There are 6 floors numbered from 1 (lowest) to 6 (highest).

A, B, C, D, E and F live on different floors with the following conditions:

Only four people live below C.

Only three people live above F.

A lives immediately below E.

D does not live above B.

Floor	**Person**
6	B
5	C
4	D
3	F
2	E

1	A

Thus, People below E (2nd floor) = only A (1 person)

Hence, the correct answer is Option 1.

Q21. Answer: (a) Chief who protects cows

The correct answer is 'Chief who protects cows'

Key Points

• Gopati:

• In the Early Vedic (Rig Vedic) period, the term 'Gopati' literally translates to the 'Lord of Cows' or the 'Protector of Cows'.

• The Early Vedic society was primarily pastoral, meaning their economy and lifestyle revolved around livestock, especially cattle.

• The King or the tribal chief was referred to as 'Gopati' because his primary responsibility was to protect the cattle of the tribe (Jana) from raids by rival tribes.

• Wealth was measured in terms of the number of cows a person or tribe possessed; hence, the chief's status was directly linked to his role as the guardian of this wealth.

Additional Information

• Priest who conducts rituals:

• In Vedic society, priests were known as 'Purohitas' or 'Hotri'.

• They held a very high position in society, advising the king and performing sacrifices (Yajnas) to please the gods for the prosperity of the tribe.

• While influential, they were distinct from the 'Gopati' who was the administrative and military head.

• Warrior who leads battles:

• Warriors were generally referred to as 'Rajanya' or 'Kshatriya' in the later Vedic period.

• The military commander under the king was often called the 'Senani'.

• While the Gopati was indeed a warrior, the specific term 'Gopati' emphasizes his role in relation to cattle rather than just general warfare.

• Head of the family:

• The head of the family (the smallest social unit) was known as the 'Kulapa'.

• The family was patriarchal, and the 'Kulapa' had significant authority over the family members and the household property.

Important Points

• The importance of cows in Early Vedic society is evident from the word for war, which was 'Gavishti', literally meaning 'a search for cows'.

• The King was also called 'Janasyagopa', which means the protector of the people/tribe.

• The daughter was called 'Duhitr' because she was the one who milked the cows.

• Cows were considered 'Aghanya' (not to be killed), reflecting their sacred and economic value in the Rig Vedic era.

Q22. Answer: (b) V

Given:

S, T, U, V, E, F and G are sitting around a circular table facing the centre.

Only two people sit between E and F when counted from the right of E.

Only two people sit between F and T.

Only three people sit between E and U.

S sits to the immediate left of V.

Thus, V sits third to the left of G.

Hence, the correct answer is Option 2.

Q23. Answer: (b) Inclusivity & Sustainability

The correct answer is 'Inclusivity & Sustainability'

Key Points

• Inclusivity & Sustainability:

• For the year 2025, Malaysia assumes the Chairmanship of ASEAN, and the 46th and 47th ASEAN Summits are centered around the theme of "Inclusivity and Sustainability."

• Inclusivity refers to the goal of ensuring that the benefits of regional integration reach all segments of society, reducing development gaps between member states, and fostering a "people-centered" community.

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• Sustainability focuses on long-term ecological balance, climate resilience, and the transition to a green economy, ensuring that economic growth does not come at the expense of future generations.

• The focus reflects ASEAN's commitment to the ASEAN Community Vision 2045, aiming for a resilient, innovative, and user-centric regional bloc.

• Under this theme, the summit seeks to strengthen regional value chains, enhance food and energy security, and promote social justice across Southeast Asia.

Additional Information

• Digital Transformation:

• While digital transformation is a cornerstone of the ASEAN Digital Masterplan 2025 and the Digital Economy Framework Agreement (DEFA), it serves as a supporting pillar for economic growth rather than the primary overarching theme of the 47th Summit.

• It involves enhancing digital connectivity, cybersecurity, and e-commerce across the region.

• Trade Tariffs:

• Issues regarding trade tariffs are typically handled under the ASEAN Free Trade Area (AFTA) and the Regional Comprehensive Economic Partnership (RCEP).

• While always a topic of discussion for economic integration, trade tariffs represent a specific technical area of negotiation rather than the broad strategic vision of the 2025 Malaysia chairmanship.

• Food Safety:

• Food safety and security are critical components of the ASEAN Integrated Food Security (AIFS) Framework.

• Although these issues are discussed within the broader context of "Sustainability," food safety alone is a sectoral concern and does not encompass the full breadth of the summit's primary agenda.

Important Points

• The ASEAN Summit is the highest policy-making body in ASEAN, comprising the Heads of State or Government of the Member States.

• The Chairmanship of ASEAN rotates annually based on the alphabetical order of the English names of Member States; Malaysia officially took over the chair from Laos at the end of 2024.

• The 2025 summits are particularly significant as they coincide with the 10th anniversary of the formal establishment of the ASEAN Community (2015).

• Malaysia has emphasized that its 2025 chairmanship will prioritize the "ASEAN Centrality" concept to navigate geopolitical tensions between major global powers.

• The summits provide a platform for ASEAN leaders to discuss regional security (including the South China Sea and Myanmar crisis), economic cooperation, and external relations with partners like China, the US, and India.

Q24. Answer: (b) VO 23

The logic followed here is:

For, KD 15 is related to PI 12

Now, for NG 20 is related to SL 17

Now, applying the same logic for QJ 26

So, QJ 26 → VO 23

Hence, the correct answer is "Option 2".

Q25. Answer: (b) = GQY % = BLT

Given: # : OYG :: TDL : %

Option 1) # = GOY, % = BLT

For # (GOY) to OYG

For % (BLT) to TDL

Since, the patterns do not match, Option 1 is incorrect.

Option 2) # = GQY, % = BLT

For # (GQY) to OYG

For % (BLT) to TDL

Since, the patterns match, Option 2 is correct.

Option 3) # = GQY, % = OLT

For # (GQY) to OYG

For % (OLT) to TDL

Since, the patterns do not match, Option 3 is incorrect.

Option 4) # = GQY, % = BLI

For # (GQY) to OYG

For % (BLI) to TDL

Since, the patterns do not match, Option 4 is incorrect.

Hence, the correct answer is Option 2.

Q26. Answer: (a) Jataka Tales

The correct answer is 'Jataka Tales'

Key Points

• Jataka Tales:

• The Jataka tales are a voluminous body of literature native to India concerning the previous births of Gautama Buddha in both human and animal form.

• The future Buddha may appear as a king, an outcast, a god, an elephant, or another animal, but, in whatever form, he exhibits some virtue that the tale thereby inculcates.

• These stories were compiled around the 3rd century BCE to the 1st century CE and are preserved in the Pali language within the Khuddaka Nikaya of the Sutta Pitaka.

• They serve a didactic purpose, illustrating the path toward enlightenment and the cultivation of the "Paramitas" (perfections) such as generosity, morality, and patience.

• The Jatakas are also a significant source of historical information regarding the social, political, and economic conditions of ancient India.

Additional Information

• Sutta Pitaka:

• This is one of the three "baskets" (Tripitaka) that make up the Pali Canon of Theravada Buddhism.

• It contains more than 10,000 suttas (discourses or sermons) delivered by the Buddha and his close disciples during his 45-year teaching career.

• It is divided into five Nikayas (collections): Digha Nikaya, Majjhima Nikaya, Samyutta Nikaya, Anguttara Nikaya, and Khuddaka Nikaya.

• Dhammapada:

• The Dhammapada is a collection of sayings of the Buddha in verse form and one of the most widely read and best-known Buddhist scriptures.

• It is part of the Khuddaka Nikaya in the Sutta Pitaka and consists of 423 verses arranged in 26 chapters.

• The verses focus on ethical conduct, mental discipline, and wisdom, providing a concise summary of the Buddha's teachings.

• Vinaya Pitaka:

• This "basket" of the Tripitaka contains the rules and regulations for the monastic community (the Sangha), including both monks and nuns.

• It describes the origins of each rule and provides a detailed account of how the Buddha dealt with various disciplinary issues.

• It is essential for maintaining the communal life and spiritual discipline of the Buddhist monastic order.

Important Points

• The entire collection of Theravada Buddhist scriptures is known as the Tripitaka (Three Baskets), which includes the Sutta Pitaka, Vinaya Pitaka, and Abhidhamma Pitaka.

• While the Sutta Pitaka deals with discourses and the Vinaya with discipline, the Abhidhamma Pitaka focuses on the philosophical and psychological analysis of Buddhist doctrine.

• The Jataka stories have had a profound influence on art and architecture; scenes from these tales are famously depicted on the railings and gateways of the Sanchi and Bharhut Stupas.

• There are traditionally 547 Jataka tales, and they remain a popular medium for teaching Buddhist ethics to children and laypeople across Asia.

Q27. Answer: (d) North-Eastern Hills

The correct answer is 'North-Eastern Hills'

Key Points

• Tea Cultivation in North-Eastern Hills:

• The North-Eastern region of India, particularly the states of Assam and the northern parts of West Bengal (Darjeeling and Jalpaiguri districts), is the primary hub for tea production in the country.

• Assam is the single largest tea-growing region in the world, benefiting from the fertile alluvial soil of the Brahmaputra valley and a humid tropical climate.

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• The hills provide the necessary natural drainage as tea plants cannot tolerate stagnant water around their roots; hence, they are grown on gently rolling slopes.

• The region experiences high annual rainfall (150-250 cm), which is evenly distributed throughout the year, facilitating the continuous growth of tender leaves.

Additional Information

• Aravali Hills:

• The Aravali range runs through Rajasthan and parts of Haryana and Gujarat. It is characterized by an arid to semi-arid climate with limited rainfall.

• The soil and climatic conditions here are unsuitable for moisture-intensive crops like tea, which requires acidic soil and high humidity.

• Thar Desert:

• Located primarily in Rajasthan, the Thar Desert is one of the most arid regions in India with extremely low rainfall and high temperature fluctuations.

• Tea cultivation is impossible in this region due to the lack of water, sandy soil, and extreme heat.

• Central Plateau:

• The Central Plateau (including the Malwa and Deccan plateaus) covers parts of Madhya Pradesh, Maharashtra, and Chhattisgarh.

• While this region is suitable for crops like cotton, pulses, and oilseeds, it lacks the consistent high rainfall and specific acidic soil profile required for commercial tea plantation.

Important Points

• Tea is a labor-intensive crop and requires abundant, cheap, and skilled labor for plucking the tea leaves.

• The ideal temperature for tea cultivation ranges between 20°C to 30°C. Temperatures above 35°C or below 10°C are harmful to the bushes.

• Apart from the North-East, tea is also grown significantly in the Nilgiri Hills of South India (Tamil Nadu, Kerala, and Karnataka) and in parts of Himachal Pradesh and Uttarakhand.

• India is one of the world's leading producers and exporters of tea, with the Darjeeling Tea being the first Indian product to receive a GI (Geographical Indication) tag.

Q28. Answer: (c) 22

Shortcut Trick

Ratio of Time = 40 : 88 = 5 : 11

Since Work is directly proportional to Time:

5 units → 10 pages

1 unit → 2 pages

11 units → 11 × 2 = 22 pages

Therefore Answer = 22

Alternate Method

Given:

Initial pages (P1) = 10, Initial time (T1) = 40 minutes, Target time (T2) = 88 minutes

Formula used:

Rate of typing = Total Pages ÷ Total Time

Pages typed = Rate × New Time

40 min → 10 Pages 88 min → ? Pages 0 min 40 min 88 min Typing Capacity Scale

Calculations:

Rate of typing = 10 ÷ 40 pages per minute

=> Rate = 1/4 pages per minute

=> Pages in 88 minutes = (1/4) × 88

=> Pages = 22

Therefore The correct answer is 22.

Additional Information

Direct Proportion

When two quantities increase or decrease together at the same rate, they are in direct proportion: x1/y1 = x2/y2.

M-D-H Formula

For work-related problems involving multiple variables: (M1 × D1 × H1) ÷ W1 = (M2 × D2 × H2) ÷ W2, where M is men, D is days,

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H is hours, and W is work.

Rate and Time Relationship

Total Work = Rate × Time. If the rate (efficiency) is constant, work done is directly proportional to the time spent.

Q29. Answer: (d) 2012

The correct answer is '2012'

Key Points

• Establishment of SMMME:

• The School of Minerals, Metallurgical and Materials Engineering (SMMME) was established at the Indian Institute of Technology (IIT) Bhubaneswar in the year 2012.

• It was envisioned to provide a strong base for research and education in the areas of mineral processing, extractive metallurgy, and advanced materials science, catering specifically to the resource-rich state of Odisha.

• The school offers various academic programs, including B.Tech., M.Tech., and Ph.D., focusing on the lifecycle of materials from their mineral origins to finished products.

• Its primary goal is to bridge the gap between traditional metallurgical practices and modern materials engineering to address global industrial challenges.

Additional Information

• Context of 1984, 1995, and 2002:

• 1984: During this period, several regional engineering colleges in India were expanding, but IIT Bhubaneswar did not exist yet. For example, the Indira Gandhi Institute of Technology (IGIT), Sarang, was established in Odisha in 1982-84, but it is a separate entity.

• 1995: This year marked the establishment of several state-level technical institutions in Odisha, such as the Bhubaneswar Engineering College (later stages), but it predates the arrival of the IIT system in the state.

• 2002: In this year, several Regional Engineering Colleges (RECs) across India were upgraded to National Institutes of Technology (NITs). NIT Rourkela in Odisha received its "Deemed University" and NIT status in 2002, but this is distinct from the establishment of the specialized school at IIT Bhubaneswar.

Important Points

• The Indian Institute of Technology (IIT) Bhubaneswar was itself established in 2008 by the Government of India as one of the eight new IITs.

• The SMMME was set up a few years after the institute's inception to leverage Odisha's position as a hub for mineral resources like iron ore, bauxite, and chromite.

• The school focuses on niche areas like Nanomaterials, Biomaterials, and High-Temperature Materials, apart from core metallurgical processes.

• The permanent campus of IIT Bhubaneswar is located at Argul, on the outskirts of Bhubaneswar, providing state-of-the-art laboratory facilities for SMMME.

Q30. Answer: (b) 33

Shortcut Trick

Total work = LCM(22, 44) = 44 units.

Efficiency of (A + B) = 44 ÷ 22 = 2 units/day.

Efficiency of A = 44 ÷ 44 = 1 unit/day.

Efficiency of B = 2 − 1 = 1 unit/day.

B's required work = 3/4 × 44 = 33 units.

Time taken by B = 33 ÷ 1 = 33 days.

Therefore Answer = 33

Alternate Method

Given:

Time taken by (A + B) = 22 days

Time taken by A = 44 days

Formula used:

Total Work = LCM of all given days

Efficiency = Total Work ÷ Number of Days

Person	Number of Days	Total Work	Efficiency
A + B	22	44 (LCM)	2

A	44	1	

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

Efficiency of B = 2 − 1 = 1 unit/day

Calculations:

Total work = 44 units

=> Three-fourth of the total work = 3/4 × 44 = 33 units

=> Time taken by B alone = (Work to be done) ÷ (Efficiency of B)

=> Time taken by B alone = 33 ÷ 1 = 33 days

Therefore The correct answer is 33.

Additional Information

Pipes and Cisterns

Similar to time and work, efficiency of an outlet pipe is taken as negative. Total capacity = Time × Efficiency.

Work and Wages

Wages are distributed in the ratio of the work done, which is generally the ratio of efficiencies if everyone works for the same duration.

Negative Work

If someone destroys the work, their efficiency is subtracted from the total efficiency (e.g., a person breaking a wall while another builds it).

Man-Day Formula

(M1 × D1 × H1) ÷ W1 = (M2 × D2 × H2) ÷ W2, where M is men, D is days, H is hours, and W is work.

Q31. Answer: (c) 6

Shortcut Trick

Identify that the expression 4a − b is directly related to the first condition.

Ratio (a − 2) : (b − 2) = 1 : 4 implies 4 × (a − 2) = 1 × (b − 2).

Expanding the terms gives 4a − 8 = b − 2.

Rearranging the equation to isolate the required value: 4a − b = 8 − 2.

Solving the constant difference: 4a − b = 6.

Therefore Answer = 6

Alternate Method

Given:

Original fraction = a/b

Condition 1: (a − 2) ÷ (b − 2) = 1/4

Condition 2: (a + 17) ÷ (b + 8) = 7/7 = 1

Formula used:

Cross-multiplication: x/y = p/q => x × q = y × p

Calculations:

From Case 1: (a − 2) ÷ (b − 2) = 1 ÷ 4

=> 4 × (a − 2) = 1 × (b − 2)

=> 4a − 8 = b − 2

=> 4a − b = 8 − 2 = 6

Verification using Case 2: (a + 17) ÷ (b + 8) = 1

=> a + 17 = b + 8 => b − a = 9

=> Substituting b = a + 9 into 4a − b = 6: 4a − (a + 9) = 6 => 3a = 15 => a = 5

=> b = 5 + 9 = 14

=> Value of 4a − b = 4(5) − 14 = 20 − 14 = 6

Therefore The correct answer is (3).

Additional Information

Proper and Improper Fractions

A proper fraction has a numerator smaller than its denominator (a < b), while an improper fraction has a numerator equal to or larger than its denominator (a ≥ b).

Equivalent Fractions

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Fractions that represent the same value even though they look different, such as 3/12 = 1/4 or 22/22 = 1/1.

Linear Equations in Two Variables

Equations of the form ax + by = c can be solved using substitution or elimination methods when two independent conditions are provided.

Q32. Answer: (a) NR-OU

The logic followed here is:

Option 1) NR-OU

Option 2) FJ-IM

Option 3) CG-FJ

Option 4) AE-DH

Here, Option 1 does not follow the same consistent pattern as the others.

Hence, the correct answer is "Option 1".

Q33. Answer: (d) 20

Shortcut Trick

Find the approximate square root of the product to locate the numbers.

√380 ≈ 19.49

The consecutive natural numbers surrounding 19.49 are 19 and 20.

Verification: 19 × 20 = 380.

The greater of the two numbers is 20.

Therefore Answer = 20

Alternate Method

Given:

Product of two consecutive natural numbers = 380

Formula used:

Let the two consecutive natural numbers be x and (x + 1).

Product = x × (x + 1)

x = 19 x + 1 = 20 Smaller Number Greater Number Product: 19 × 20 = 380

Calculations:

x(x + 1) = 380

=> $x^2 + x - 380 = 0$

=> $x^2 + 20x - 19x - 380 = 0$

=> x(x + 20) − 19(x + 20) = 0

=> (x − 19)(x + 20) = 0

=> x = 19 or x = −20

=> Since x must be a natural number, x = 19.

=> Greater number = x + 1 = 19 + 1 = 20.

Therefore The correct answer is 20.

Additional Information

Consecutive Natural Numbers

Natural numbers that follow each other in order, with a difference of 1. If the first is x, the next is x + 1.

Consecutive Even/Odd Numbers

Even or odd numbers that follow each other, always having a difference of 2 (e.g., x and x + 2).

Quadratic Formula Roots

For $ax^2 + bx + c = 0$, roots are $x = (-b \pm \sqrt{(b^2 - 4ac)}) \div 2a$. In this problem, $\sqrt{(1^2 - 4(1)(-380))} = \sqrt{1521} = 39$.

Product of Consecutive Numbers

The product of any two consecutive natural numbers is always an even number because one of them must be even.

Q34. Answer: (d) Abul Fazl

The correct answer is 'Abul Fazl'

Key Points

• Abul Fazl:

• Abul Fazl ibn Mubarak was the grand vizier of the Mughal Emperor Akbar and one of the "Navaratnas" (Nine Jewels) of his court.

• He is most famous for authoring the Akbarnama, which is the official history of Akbar's reign, written in Persian.

• The Akbarnama is divided into three volumes: the first deals with Akbar's ancestors, the second records the events of Akbar's reign, and the third is the famous Ain-i-Akbari.

• Abul Fazl's writing style was characterized by its ornate Persian prose and served as a comprehensive record of the administrative, social, and political structure of the Mughal Empire.

• Beyond being a historian, he was a close friend and advisor to Akbar, playing a crucial role in the development of the "Din-i-Ilahi" religious syncretism.

Additional Information

• Ziauddin Barani:

• Ziauddin Barani was a Muslim political thinker and historian of the Delhi Sultanate during the 14th century.

• He is best known for his work Tarikh-i-Firoz Shahi, which covers the history of medieval India from the reign of Ghiyasuddin Balban to the first six years of Firoz Shah Tughlaq's reign.

• His perspective often reflected the views of the orthodox Muslim elite and provided deep insights into the socio-economic policies of the Tughlaq and Khalji dynasties.

• Minhaj-i-Siraj:

• Minhaj-i-Siraj Juzjani was a 13th-century historian and chronicler who served the Mamluk Sultanate (Slave Dynasty) in Delhi.

• He authored the Tabaqat-i-Nasiri, a comprehensive history of the Islamic world and the conquest of India up to 1260 CE.

• His work is a primary source for the early years of the Delhi Sultanate and the reign of Sultan Nasiruddin Mahmud.

• Ferishta:

• Muhammad Qasim Hindu Shah, commonly known as Ferishta, was a 16th-century historian who worked in the Deccan courts of Bijapur and Ahmednagar.

• His major work, Tarikh-i-Firishta (also known as Gulshan-i-Ibrahimi), provides a detailed history of the rise of Muslim power in India and the various regional sultanates.

• Unlike the court-centric chronicles of Delhi, Ferishta's work gives significant importance to the kingdoms of South India and the Deccan.

Important Points

• The Ain-i-Akbari, the third volume of the Akbarnama, is particularly significant as it contains detailed statistical data regarding the empire's geography, population, army, and revenue system.

• Abul Fazl's work was commissioned by Akbar himself to provide a legacy of his governance and philosophy of 'Sulh-i-kul' (universal peace).

• Tragically, Abul Fazl was assassinated in 1602 by Vir Singh Deo on the orders of Prince Salim (the future Emperor Jahangir), who viewed him as an obstacle to his succession.

• The Akbarnama remains one of the most important primary sources for studying the peak of the Mughal Empire.

Q35. Answer: (a) 75

The logic followed here is:

thus, "75" will replace the question mark in the given series.

Hence, the correct option is "Option 1".

Q36. Answer: (b) two weeks

The correct answer is 'two weeks'

Key Points

• 1990-91 Balance of Payments Crisis:

• By June 1991, India's foreign exchange reserves had dropped to a critical level of about $1.2 billion, which was barely enough to finance two weeks of essential imports.

• The Balance of Payments (BoP) crisis occurs when a country is unable to pay for its essential imports or service its external debt repayments.

• The crisis was triggered by a combination of high fiscal deficits, a rise in oil prices due to the Gulf War, and a sudden withdrawal of funds by Non-Resident Indians (NRIs).

• This situation forced the Indian government to airlift its gold reserves as collateral to the Bank of England and the Union Bank of Switzerland to secure emergency loans.

Additional Information

• Three months:

• Generally, a foreign exchange reserve equivalent to three months of imports is considered a safe "rule of thumb" for a

developing economy to maintain stability.

• During the 1990-91 crisis, India was far below this safety margin, reflecting the severity of the economic collapse.

• One month:

• While having reserves for only one month is considered an economic warning sign, India's situation in 1991 was even more precarious than this.

• The reserves were depleting so rapidly that the government had to take immediate, radical steps to prevent a total sovereign default.

• One week:

• Although the situation was desperate, the official historical records and economic surveys of the period maintain that the reserves were sufficient for approximately two weeks of imports, not just one.

• At one point, the reserves were so low that they could barely cover the interest payments on existing short-term loans.

Important Points

• The crisis led to the implementation of the New Economic Policy (NEP) in 1991, under the leadership of then Prime Minister P.V. Narasimha Rao and Finance Minister Dr. Manmohan Singh.

• This policy introduced the concepts of Liberalization, Privatization, and Globalization (LPG) to the Indian economy.

• India had to borrow nearly $2.2 billion from the International Monetary Fund (IMF) by pledging 67 tons of gold as collateral.

• The reforms initiated after this crisis transitioned India from a command-based economy with high tariffs and state monopolies to a more market-oriented, open economy.

Q37. Answer: (b) Padma Bhushan

The correct answer is 'Padma Bhushan'

Key Points

• Padma Bhushan:

• Pandit Hariprasad Chaurasia was honored with the Padma Bhushan in 1992 for his exceptional contribution to Indian classical music.

• The Padma Bhushan is the third-highest civilian award in the Republic of India, preceded by the Bharat Ratna and the Padma Vibhushan.

• This award recognized his global influence in popularizing the Bansuri (bamboo flute) and his mastery over the Hindustani classical tradition.

• Through his artistry, he elevated the flute from a folk instrument to a prominent solo instrument on the international classical stage.

Additional Information

• Padma Vibhushan:

• The Padma Vibhushan is the second-highest civilian award in India.

• Pandit Hariprasad Chaurasia received the Padma Vibhushan in the year 2000, marking an even higher level of recognition for his lifelong dedication to music.

• Maharashtra Gaurav Puraskar:

• This is a state-level honor bestowed by the Government of Maharashtra to recognize excellence in various fields.

• Pandit Chaurasia was conferred with the Maharashtra Gaurav Puraskar in 1990.

• Padma Shri:

• The Padma Shri is the fourth-highest civilian award in India.

• While many classical maestros receive this as their first Padma award, Hariprasad Chaurasia's journey through the national honors is most notably marked by his Bhushan (1992) and Vibhushan (2000) titles.

Important Points

• Pandit Hariprasad Chaurasia is considered one of the greatest living masters of the Bansuri and belongs to the Maihar Gharana.

• He is also famous for his collaboration with santoor maestro Pandit Shivkumar Sharma; the duo is popularly known as Shiv-Hari.

• Apart from classical music, he has composed music for several successful Indian films, including Silsila, Chandni, and Lamhe.

• He has received numerous other prestigious awards, including the Sangeet Natak Akademi Award (1984) and the Konark Samman.

• He serves as the artistic director of the World Music Department at the Rotterdam Music Conservatory in the Netherlands.

Q38. Answer: (b) WJO 39

The logic followed here is:

So, 'WJO 39' will replace the question mark in the given series.

Hence, the correct answer is "Option 2".

Q39. Answer: (c) refraction

The correct answer is 'Refraction'

Key Points

• Refraction:

• Refraction is the phenomenon where a wave, such as light, changes its direction as it passes from one transparent medium into another.

• This change in direction occurs because the speed of light varies depending on the optical density of the medium through which it travels. For example, light travels slower in water or glass than it does in air.

• When light enters a denser medium (like moving from air to glass), it slows down and bends toward the normal line. Conversely, when it enters a rarer medium, it speeds up and bends away from the normal.

• Refraction is the fundamental principle behind the functioning of lenses, prisms, and human eyes.

Additional Information

• Scattering:

• Scattering occurs when light rays strike an obstacle, such as dust, gas molecules, or water droplets, and are deflected in various directions.

• This phenomenon is responsible for the blue color of the sky (Rayleigh scattering) and the white appearance of clouds (Mie scattering).

• Diffraction:

• Diffraction refers to the slight bending of light as it passes around the edge of an object or through a narrow opening (aperture).

• It is most noticeable when the size of the obstacle or opening is comparable to the wavelength of the light. It demonstrates the wave-like nature of light.

• Reflection:

• Reflection is the process where light bounces back into the same medium after hitting a surface.

• Unlike refraction, light does not pass through to another medium; instead, it is "turned back." Common examples include seeing one's image in a mirror or the surface of a still pond.

Important Points

• The extent of refraction is governed by Snell's Law, which relates the angles of incidence and refraction to the refractive indices of the two media.

• The Refractive Index (n) of a medium is defined as the ratio of the speed of light in a vacuum to the speed of light in that specific medium ($n = c/v$).

• Common natural phenomena caused by refraction include the twinkling of stars, the formation of rainbows (combined with dispersion and reflection), and the apparent displacement of an object placed under water (like a pencil appearing broken in a glass of water).

• When light hits the boundary of a medium at a specific "critical angle" while moving from a denser to a rarer medium, it can undergo Total Internal Reflection, where no refraction occurs and all light is reflected back.

Q40. Answer: (d) ASCII represents characters using numeric codes

The correct answer is 'ASCII represents characters using numeric codes'

Key Points

• ASCII (American Standard Code for Information Interchange):

• ASCII is a character encoding standard used for electronic communication to represent text in computers and other devices.

• It works by assigning a unique numeric code (ranging from 0 to 127 in standard ASCII) to each character, including uppercase and lowercase letters, numbers, punctuation marks, and control characters.

• For example, the uppercase letter 'A' is represented by the numeric code 65, while the lowercase 'a' is represented by 97.

• Because computers can only understand numbers (binary), ASCII provides a bridge that allows humans to interact with computers using text.

Additional Information

• Local Area Network (LAN):

• A Local Area Network is a group of computers and peripheral devices that share a common communications line or wireless link within a small distinct geographic area, such as an office or home.

• ASCII is a data representation standard, whereas a LAN is a physical or logical networking infrastructure.

• High-capacity optical disk format:

• This refers to physical storage media like Blu-ray discs or DVDs, which use laser technology to read and write large amounts of

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data.

• While ASCII data can be stored on an optical disk, ASCII itself is not a hardware format or a disk type.

• Audio storage on a CD:

• CDs store audio using formats like CD-DA (Compact Disc Digital Audio) or compressed files like MP3 and WAV.

• These formats rely on pulse-code modulation (PCM) to represent sound waves, which is fundamentally different from ASCII's purpose of representing text characters.

Important Points

• Standard ASCII uses 7 bits to represent 128 characters, which was sufficient for the English language and basic control codes.

• Extended ASCII uses 8 bits, allowing for 256 characters, which includes special symbols and characters from other languages.

• The first 32 characters (0-31) in the ASCII table are non-printable control characters, such as "Backspace" or "Carriage Return," used to control hardware devices.

• Most modern character encoding schemes, such as UTF-8 (Unicode), are designed to be backward compatible with ASCII, meaning the first 128 characters of Unicode are identical to ASCII.

Q41. Answer: (c) THREE

Given: (Left) A # G % C = + F * / D H : B - ? $ E ! I J (Right)

Now,

Symbols, which are immediately preceded by a symbol and also immediately followed by a letter.

So, Needed pattern is: Symbol - Symbol - Letter.

(Left) A # G % C = + F * / D H : B - ? $ E ! I J (Right)

So, Only three symbols satisfy the condition.

Hence, the correct answer is Option 3.

Q42. Answer: (d) 4,14,700

Shortcut Trick

Successive Multiplier for 10% and 30% increase = 1.1 × 1.3 = 1.43

Initial Population = 2,90,000

Population after 2 years = 2,90,000 × 1.43

Population after 2 years = 4,14,700

Therefore Answer = 4,14,700

Alternate Method

Given:

Initial Population = 2,90,000

Increase in 1st year = 10%

Increase in 2nd year = 30%

Formula used:

Final Population = Initial Population × (1 + r1/100) × (1 + r2/100)

2,90,000 Initial +10% 3,19,000 Year 1 +30% 4,14,700 Year 2

Calculations:

Population after the 1st year = 2,90,000 × (110 ÷ 100)

=> 2,90,000 × 1.1 = 3,19,000

Population after the 2nd year = 3,19,000 × (130 ÷ 100)

=> 3,19,000 × 1.3 = 4,14,700

Therefore The correct answer is option (4).

Additional Information

Successive Percentage Formula

For two successive changes of a% and b%, the net effective change is (a + b + (a × b ÷ 100))%.

Population Depreciation

If the population decreases by r% every year, the population after n years is $P \times (1 - r \div 100)^n$.

Effective Growth Rate

The single equivalent growth rate for 10% and 30% is 10 + 30 + (10 × 30 ÷ 100) = 43%.

Q43. Answer: (d) 5

The logic followed here is:

Logic: Each letter in the word is replaced by a fixed digit, and the same letter always carries the same code.

Given:

HOUR → 3867

HURT → 5836

Therefore, the code for 'T' is 5.

Hence, the correct answer is Option 1.

Q44. Answer: (d) 2,900 km

The correct answer is '2,900 km'

Key Points

• The Core-Mantle Boundary:

• The boundary between the Earth's mantle and the core is located at a depth of approximately 2,900 kilometers (1,800 miles) below the Earth's surface.

• This boundary is scientifically known as the Gutenberg Discontinuity, named after the seismologist Beno Gutenberg who discovered it in 1914.

• At this depth, there is a dramatic change in the physical properties and chemical composition of the Earth. The solid (though plastic) silicate mantle ends, and the liquid iron-nickel outer core begins.

• Seismic waves provide the primary evidence for this boundary: P-waves (primary waves) slow down significantly, and S-waves (secondary waves) cannot pass through it at all, indicating that the medium below 2,900 km is liquid.

Additional Information

• The Layers of the Earth:

• Crust: The outermost solid shell of Earth, ranging from about 5 km (oceanic) to 70 km (continental) in thickness.

• Mantle: Extends from the base of the crust down to 2,900 km. it is divided into the upper mantle and the lower mantle.

• Outer Core: A fluid layer about 2,260 km thick, extending from the 2,900 km depth to about 5,150 km. It is composed mostly of iron and nickel.

• Inner Core: The innermost part of Earth, a solid ball with a radius of about 1,220 km, extending from 5,150 km to the center of the Earth (approx. 6,371 km).

• Explanation of Other Depths:

• 1,900 km: This depth lies within the Lower Mantle (Mesosphere). While the pressure and temperature increase significantly here, there is no major global boundary at this specific level.

• 3,900 km: This depth is located deep within the Outer Core. It is roughly halfway between the Gutenberg Discontinuity and the transition to the inner core.

• 4,900 km: This depth is near the bottom of the outer core, approaching the Lehmann Discontinuity (approx. 5,150 km), which marks the transition from the liquid outer core to the solid inner core.

Important Points

• The internal structure of the Earth is often described by the Chemical Composition (Crust, Mantle, Core) or Mechanical Properties (Lithosphere, Asthenosphere, Mesosphere, Outer Core, Inner Core).

• Mohorovicic Discontinuity (Moho): The boundary between the Crust and the Mantle.

• Gutenberg Discontinuity: The boundary between the Mantle and the Outer Core (at 2,900 km).

• Lehmann Discontinuity: The boundary between the Outer Core and the Inner Core (at approx. 5,150 km).

• The core is often referred to as the NIFE layer because it is composed mainly of Nickel (Ni) and Iron (Fe).

Q45. Answer: (d) DE-FG

The logic followed here is:

Option 1) ST–VW

Option 2) MN–PQ

Option 3) GH–JK

Option 4) DE–FG

Here, three pairs follow a +3 shift pattern, while Option 4 follows a +2 shift pattern.

Hence, the correct answer is "Option 4".

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Q46. Answer: (d) Foreign institutional investments are made more restrictive for stability of the economy

The correct answer is 'Foreign institutional investments are made more restrictive for stability of the economy'

Key Points

• Foreign Institutional Investments (FIIs):

• Contrary to the statement, globalization led to the liberalization of FIIs rather than making them more restrictive.

• Following the 1991 reforms, India opened its stock markets to foreign institutional investors, allowing them to invest in Indian equities and debt instruments to boost capital inflow.

• The objective was to integrate Indian financial markets with global markets and provide Indian companies access to a larger pool of global capital.

• Restrictions were gradually eased over the decades to attract more foreign capital, though certain regulatory safeguards remain to ensure market stability.

Additional Information

• Foreign Direct Investment (FDI) Liberalization:

• One of the primary pillars of globalization in India was the liberalization of FDI. This meant allowing foreign companies to invest directly in Indian businesses and infrastructure.

• The government increased FDI limits in various sectors like telecommunications, insurance, and retail, and introduced the "Automatic Route" for many industries to bypass bureaucratic hurdles.

• Two-stage Devaluation of the Rupee (1991):

• In July 1991, the Indian government devalued the rupee in two stages (roughly by 18-20%) against major international currencies.

• This was a strategic move to tackle the Balance of Payments (BoP) crisis by making Indian exports cheaper and more competitive in the global market, while discouraging imports.

• Partial Convertibility of the Rupee:

• As part of the move toward globalization, India introduced a system of partial convertibility of the rupee under the Liberalised Exchange Rate Management System (LERMS).

• This allowed a portion of foreign exchange earnings to be converted into rupees at market-determined rates, facilitating smoother international trade and capital movement.

Important Points

• Globalization in India was formally introduced through the New Economic Policy (NEP) of 1991, under the leadership of then Prime Minister P.V. Narasimha Rao and Finance Minister Dr. Manmohan Singh.

• The policy is often referred to as the LPG model (Liberalization, Privatization, and Globalization).

• The core aim was to lift the "License Raj" and integrate India's economy with the global market to increase efficiency and growth.

• While globalization has led to rapid economic growth and technological advancement, it has also brought challenges such as increased competition for local industries and income inequality.

Q47. Answer: (c) IIT Madras

The correct answer is 'IIT Madras'

Key Points

• IIT Madras:

• In the NIRF (National Institutional Ranking Framework) 2025 rankings, Indian Institute of Technology (IIT) Madras secured the top spot in the 'Overall' category.

• This achievement marks a significant streak, as the institute has consistently maintained its leadership position in the overall rankings for several consecutive years.

• The institute is recognized for its excellence in teaching, learning, and resources (TLR), research and professional practice (RP), and graduation outcomes (GO).

• IIT Madras also continues to dominate the 'Engineering' category, showcasing its strength in technical education and innovation in India.

Additional Information

• IISc Bengaluru:

• The Indian Institute of Science (IISc) Bengaluru consistently ranks as the top institution in the 'University' category and the 'Research' category.

• While it remains a premier institution globally for research output, it usually follows IIT Madras in the 'Overall' rankings.

• IIT Bombay:

• IIT Bombay is one of the leading technical institutes in India and consistently features in the top 5 of the 'Overall' category.

• It is highly regarded for its industry interface, entrepreneurship cell, and high placement records, often competing closely with IIT

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Delhi and IIT Madras.

• AIIMS Delhi:

• The All India Institute of Medical Sciences (AIIMS), New Delhi, is the undisputed leader in the 'Medical' category of the NIRF rankings.

• While it ranks very high in its specific niche, its scope as a specialized medical institution typically places it behind multi-disciplinary technical institutes in the broad 'Overall' ranking.

Important Points

• The National Institutional Ranking Framework (NIRF) was approved by the Ministry of Education (formerly MHRD) and launched in September 2015.

• The rankings are determined based on five broad parameters:

• Teaching, Learning and Resources (TLR)

• Research and Professional Practice (RP)

• Graduation Outcomes (GO)

• Outreach and Inclusivity (OI)

• Perception (PR)

• The 2025 edition saw the inclusion of new categories and a larger participation of institutions across India, reflecting the growing competitiveness in the Indian higher education landscape.

• The primary objective of NIRF is to promote competitive excellence and provide a reliable ranking system for students to make informed decisions.

Q48. Answer: (b) 3

Given: (Left) £ D € U B & @ % © K C # T $ @ A # E D % * C (Right)

Now,

Symbols, which are immediately preceded by a letter and also immediately followed by a letter.

So, Needed pattern is: Letter - Symbol - Letter.

(Left) £ D € U B & @ % © K C # T $ @ A # E D % * C (Right)

So, Only three symbols satisfy the condition.

Hence, the correct answer is Option 2.

Q49. Answer: (a) 17

Shortcut Trick

Series is AP: 11 to 71 with d = 2

n = (71 − 11)/2 + 1 = 31

SD of AP = d × √((n² − 1)/12)

m = 2 × √((31² − 1)/12) = 2 × √(960/12)

m = 2 × √80 = 2 × 4√5 = 8√5 ≈ 17.88

Therefore Answer = 17

Alternate Method

Given:

Series: 11, 13, 15, ..., 71

First term = 11, Last term = 71, d = 2

Formula used:

n = (Last − First)/d + 1

SD of AP = d × √((n² − 1)/12)

Calculations:

=> n = (71 − 11)/2 + 1 = 31

=> SD = 2 × √((31² − 1)/12)

=> = 2 × √(960/12) = 2 × √80

=> = 2 × 4√5 = 8√5 ≈ 17.88

Therefore The correct answer is 17.

Additional Information

Standard Deviation of AP

SD = d × √((n² − 1)/12)

Mean of AP

Mean = (First + Last) ÷ 2

Shortcut Tip

Use direct AP SD formula to avoid long variance calculation

Integral Part

Ignore decimal part, take only integer value

Q50. Answer: (d) 400 – 80 – 40 – 50

The logic followed here is:

Logic: Divide by 5 → Divide by 2 → Add 10

For, 50 – 10 – 5 – 15

50 ÷ 5 = 10

10 ÷ 2 = 5

5 + 10 = 15

For, 200 – 40 – 20 – 30

200 ÷ 5 = 40

40 ÷ 2 = 20

20 + 10 = 30

Now, check options:

Option 1: 160 – 40 – 20 – 30

160 ÷ 5 = 32

Option 2: 100 – 20 – 40 – 60

100 ÷ 5 = 20

20 ÷ 2 = 10

Option 3: 120 – 60 – 30 – 40

120 ÷ 5 = 24

Option 4: 400 – 80 – 40 – 50

400 ÷ 5 = 80

80 ÷ 2 = 40

40 + 10 = 50

Hence, the correct answer is Option 4.

Q51. Answer: (b) Calicut

The correct answer is 'Calicut'

Key Points

• Vasco da Gama's Arrival in Calicut:

• Vasco da Gama, a Portuguese explorer, was the first European to reach India by sea, arriving at Kappad near Calicut (now Kozhikode) on May 20, 1498.

• His arrival marked the beginning of the "Age of Discovery," establishing a direct maritime route from Europe to Asia via the Cape of Good Hope, which bypassed the dangerous Silk Road and the monopoly of Arab traders.

• Upon his arrival, he was received by the local ruler of Calicut, known by the title Zamorin (Samudiri).

• The primary objective of this voyage was to find a sea route to the "Spice Islands" and India to trade directly for valuable commodities like black pepper, cinnamon, and ginger.

Additional Information

• Surat:

• Surat was a vital trading port on the western coast of India, but it is primarily associated with the British East India Company.

• The British established their first formal factory (trading post) in Surat in 1612 after receiving permission from the Mughal Emperor Jahangir.

• Goa:

• Goa eventually became the capital of the Portuguese State of India, but it was not the first landing site of Vasco da Gama.

• It was captured by Afonso de Albuquerque in 1510 from the Bijapur Sultanate, serving as the Portuguese headquarters in Asia for centuries.

• Diu:

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• Diu was a strategic island port that the Portuguese sought to control to dominate the Arabian Sea trade.

• The famous Battle of Diu took place in 1509 between the Portuguese and a joint fleet of the Sultan of Gujarat, the Mamluk Burji Sultanate of Egypt, and the Zamorin of Calicut. The Portuguese won, solidifying their naval supremacy.

Important Points

• Vasco da Gama's fleet consisted of four ships, the most famous being his flagship, the São Gabriel.

• His voyage was sponsored by King Manuel I of Portugal, who aimed to make Portugal a dominant maritime power.

• The successful journey around Africa's southern tip proved that the Indian Ocean was connected to the Atlantic, contradicting the then-popular belief that the Indian Ocean was landlocked.

• The opening of this route led to a period of European colonialism in Asia and significantly shifted the balance of global trade power toward Western Europe.

Q52. Answer: (c) Cooperative Societies

The correct answer is 'Cooperative Societies'

Key Points

• 97th Constitutional Amendment Act:

• The 97th Constitutional Amendment Act, 2011, was enacted to grant constitutional status and protection to cooperative societies in India.

• It aimed to encourage democratic, professional, autonomous, and economically sound functioning of cooperative societies across the country.

• The amendment made three major changes to the Constitution:

• It made the right to form cooperative societies a Fundamental Right under Article 19(1)(c).

• It included a new Directive Principle of State Policy (DPSP) under Article 43B for the promotion of cooperative societies.

• It added a new Part IXB to the Constitution, titled "The Co-operative Societies" (Articles 243ZH to 243ZT).

• Part IXB contains provisions regarding the incorporation, number and term of members of the board and its officers, and the democratic control of cooperative societies.

Additional Information

• District Planning Committees:

• District Planning Committees (DPCs) were given constitutional status by the 74th Constitutional Amendment Act, 1992.

• Under Article 243ZD, every state is required to constitute a DPC at the district level to consolidate plans prepared by Panchayats and Municipalities in the district.

• The objective is to create a draft development plan for the district as a whole.

• Metropolitan Councils (Metropolitan Planning Committees):

• Similar to DPCs, Metropolitan Planning Committees (MPCs) were introduced by the 74th Constitutional Amendment Act, 1992.

• According to Article 243ZE, an MPC must be constituted in every metropolitan area to prepare a draft development plan for that specific metropolitan region.

• Market Regulatory Boards:

• Market Regulatory Boards, such as Agricultural Produce Market Committees (APMCs), are generally established under various state-specific statutes.

• They do not have a specific dedicated constitutional status granted via the 97th Amendment; their governance is dictated by state legislative acts to regulate the sale of agricultural produce.

Important Points

• The 97th Amendment specifies that the maximum number of directors of a cooperative society shall not exceed twenty-one.

• The amendment provides for a fixed tenure of five years from the date of election for the members of the board and its office bearers.

• In 2021, the Supreme Court of India upheld a Gujarat High Court judgment that partially struck down the 97th Amendment. The court ruled that the amendment is valid for multi-state cooperative societies but invalid for state cooperative societies because the amendment was passed without ratification by at least half of the state legislatures, which is required for subjects in the State List (Entry 32).

Q53. Answer: (c) x = 55/4, y = 7/4, z = (-17)/4

Shortcut Trick

Use the option elimination method by substituting the values into the simplest equation: $y - z = 6$.

Option 1: $-17/4 - 7/4 = -24/4 = -6$ (Incorrect)

Option 2: $55/4 - (-17/4) = 72/4 = 18$ (Incorrect)

Option 3: $7/4 - (-17/4) = 24/4 = 6$ (Correct)

Now verify x by substituting y and z from Option 3 into Equation 1: 2x + 7/4 − 17/4 = 25
=> 2x − 10/4 = 25 => 2x = 25 + 2.5 = 27.5 => x = 13.75 or 55/4.
Therefore Answer = (3)
Alternate Method
Given:
Eq (1): 2x + y + z = 25
Eq (2): x − 3y + 2z = 0
Eq (3): y − z = 6
Formula used:
Method of substitution: Express one variable in terms of others and substitute to solve.
Step 1: From Eq (3), y = z + 6 Step 2: Sub y in (1) to get x in terms of z Step 3: Sub x, y in (2) to find z
Calculations:
From Eq (3): y = z + 6
Substitute y in Eq (1):
=> 2x + (z + 6) + z = 25
=> 2x + 2z = 19 => x = (19 − 2z) / 2
Substitute x and y in Eq (2):
=> [(19 − 2z) / 2] − 3(z + 6) + 2z = 0
=> (19 − 2z) − 6(z + 6) + 4z = 0 (Multiplying by 2)
=> 19 − 2z − 6z − 36 + 4z = 0 => −4z − 17 = 0 => z = −17/4
=> y = −17/4 + 6 = 7/4
=> x = (19 − 2(−17/4)) / 2 = (19 + 17/2) / 2 = (55/2) / 2 = 55/4
Therefore The correct answer is (3).
Additional Information
Cramer's Rule
A method using determinants where x = D_x/D, y = D_y/D, z = D_z/D, provided the main determinant D ≠ 0.
Consistency of Systems
A system is consistent if it has at least one solution. If the determinant of coefficients is non-zero, it has a unique solution.
Elimination Method
Adding or subtracting equations to eliminate one variable at a time until a single variable remains.

Q54. Answer: (d) 25

Shortcut Trick
Apply BODMAS: Division and Multiplication are performed before Addition and Subtraction.
Step 1: 5.6 ÷ 7 = 0.8
Step 2: 1.6 × 0.5 = 0.8
Step 3: The expression becomes 25 − 0.8 + 0.8.
Step 4: The values −0.8 and +0.8 cancel each other out.
Therefore Answer = 25
Alternate Method
Given:
Expression: 25 − 5.6 ÷ 7 + 1.6 × 0.5
Formula used:
BODMAS rule: Brackets → Of → Division → Multiplication → Addition → Subtraction
Calculations:
The expression is 25 − 5.6 ÷ 7 + 1.6 × 0.5
=> First, perform Division: 5.6 ÷ 7 = 0.8
=> Next, perform Multiplication: 1.6 × 0.5 = 0.8
=> Now, substitute these values: 25 − 0.8 + 0.8
=> Perform Addition and Subtraction from left to right: 24.2 + 0.8
=> 25.0
Therefore The correct answer is 25.

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Additional Information

VBODMAS Rule

V stands for Vinculum (bar bracket), which is solved before all other brackets. The hierarchy is V → B → O → D → M → A → S.

Multiplying by 0.5

Multiplying any number by 0.5 is equivalent to dividing that number by 2. Example: 1.6 × 0.5 = 1.6 ÷ 2 = 0.8.

Decimal Division Shortcut

To divide a decimal by a whole number, divide as if there is no decimal and then place the decimal point in the quotient directly above its position in the dividend.

Q55. Answer: (c) Francisco de Almeida

The correct answer is 'Francisco de Almeida'

Key Points

• Francisco de Almeida:

• Francisco de Almeida was appointed as the first Viceroy of Portuguese India in 1505 and served until 1509.

• He is credited with initiating the "Blue Water Policy" (Cartaz system approach), which aimed at establishing Portuguese naval supremacy in the Indian Ocean.

• The core philosophy of this policy was that the Portuguese should remain the masters of the seas rather than focusing on building a large land-based empire or inland forts.

• Under this policy, Almeida focused on destroying the naval power of opposing forces (like the Egyptians and the Venetians) to ensure Portuguese control over the lucrative spice trade routes.

• His tenure was marked by the famous Battle of Diu in 1509, where he defeated a combined fleet of the Sultan of Gujarat, the Mamluk Burji Sultanate of Egypt, and the Zamorin of Calicut, solidifying Portuguese maritime dominance.

Additional Information

• Alfonso de Albuquerque:

• Albuquerque succeeded Almeida as the second Governor and is considered the real founder of Portuguese power in India.

• Unlike Almeida, he moved away from the Blue Water Policy towards a policy of Imperialism, focusing on capturing strategic land bases.

• He conquered Goa from the Sultan of Bijapur in 1510, which became the headquarters of the Portuguese settlements in India.

• He is also known for capturing Malacca and Ormuz and for banning the practice of Sati in the territories under his control.

• Vasco da Gama:

• Vasco da Gama was the Portuguese explorer who discovered the direct sea route from Europe to India, landing at Calicut in 1498.

• While he led several expeditions and was later appointed as the Viceroy of India in 1524, he was not the first Governor to implement the Blue Water Policy; his primary role was that of a navigator and pioneer.

• His arrival marked the beginning of the colonial era in Asia.

• Pedro Álvares Cabral:

• Cabral was a Portuguese nobleman and military commander who led the second Portuguese expedition to India in 1500.

• He is famous for being the first European to reach Brazil (on his way to India).

• In India, he established the first Portuguese factory at Calicut, but he was not the administrative Governor responsible for the long-term Blue Water maritime strategy.

Important Points

• The Blue Water Policy was essential for a small nation like Portugal to control a vast region like the Indian Ocean with limited manpower by utilizing superior naval technology and cannons.

• The Portuguese introduced the Cartaz System, a naval trade license or pass, which forced all merchant ships in the Indian Ocean to pay for Portuguese protection or face seizure.

• The shift from Almeida's maritime focus to Albuquerque's territorial focus marked the transition of the Portuguese from being mere sea-traders to colonial administrators in India.

Q56. Answer: (c) Both statements I and II together are NOT sufficient to answer the question

Given Statement:

Five people – Pallavi, Shreya, Monika, Ritu, and Alka – are sitting in a straight line facing north.

Now analyzing the Statements:

(I) Shreya sits immediately to the right of Pallavi.Pallavi → Shreya (immediate right)

=> Pair: (Pallavi, Shreya) Not enough to fix positions

(II) Monika sits immediately to the right of Shreya, and Ritu is not at any end.

Shreya → Monika (immediate right), Ritu is not at any end

=> Chain: (Shreya, Monika), Still incomplete

Here, From I and II: (Pallavi, Shreya, Monika) must be together

Total persons = 5

Now,

Case 1:

Pallavi, Shreya, Monika, Ritu, Alka

=> Left end = Pallavi

Case 2:

Alka, Ritu, Pallavi, Shreya, Monika

=> Left end = Alka

So, both statements I and II together are NOT sufficient to answer the question.

Hence, the correct answer is "Option 3".

Q57. Answer: (d) Mining and Quarrying

The correct answer is 'Mining and Quarrying'

Key Points

• Mining and Quarrying Sector:

• During the period from 1991–92 to 1998–99, the Mining and Quarrying sector experienced a notable deceleration and a clear decline in its average annual growth rate compared to the previous decade.

• While the Indian economy underwent significant liberalization in 1991, the mining sector remained largely dominated by the public sector and was slow to adapt to the new economic environment.

• The growth in this sector was hampered by various factors, including stringent environmental regulations, lack of modern technology, and slow progress in implementing reforms specifically targeted at mineral extraction.

• Statistical data from the Index of Industrial Production (IIP) during these years reflected that while other sectors like manufacturing showed volatility with periods of high growth, mining consistently struggled to maintain its momentum, leading to a decline in its growth contribution to the overall industrial index.

Additional Information

• Manufacturing and Engineering:

• The manufacturing sector is the largest component of the IIP, accounting for a significant weightage (roughly 77-80% depending on the base year).

• During the 1990s, manufacturing growth was volatile; it peaked in the mid-90s (around 1995-96) due to the immediate impact of delicensing and liberalization, though it faced a slowdown toward the end of the decade. It did not show a "clear decline" in average growth in the same steady manner as mining.

• Electricity and Utilities:

• The electricity sector generally maintained a more stable, albeit moderate, growth path during this period to meet the rising demand of the post-reform economy.

• Growth in electricity is often constrained by transmission and distribution losses and fuel supply issues, but it did not register a clear downward trend in growth rates during the 1991-99 period.

• Basic and Capital Goods:

• Capital goods (machinery, equipment used in production) often reflect the investment climate of the country.

• During the initial years of the 1990s, the capital goods sector showed impressive growth as industries expanded and modernized, though it remains highly sensitive to business cycles. It did not experience the consistent decline seen in the primary extraction (mining) sector.

Important Points

• The Index of Industrial Production (IIP) is an index that tracks the growth of various sectors in the economy, such as mining, manufacturing, and electricity.

• In India, the IIP is compiled and published monthly by the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation.

• The period of 1991–92 to 1998–99 is crucial as it represents the first phase of India's New Economic Policy (NEP) characterized by Liberalization, Privatization, and Globalization (LPG).

• Industrial growth during the Eighth Five-Year Plan (1992-97) was initially high but slowed down during the Ninth Five-Year Plan (1997-2002) due to the East Asian financial crisis and domestic factors, with the mining sector being one of the most affected.

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Q58. Answer: (b) 720°

Shortcut Trick

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

For a hexagon, n = 6

Calculation: (6 − 2) × 180° = 4 × 180°

Total Sum = 720°

Therefore Answer = 720°

Alternate Method

Given:

Number of sides of the regular polygon (n) = 6

Formula used:

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

Regular Hexagon (n = 6 sides) Sum = (6 − 2) × 180° = 720° Divided into 4 triangles

Calculations:

The polygon has 6 sides, so n = 6.

=> Sum = (6 − 2) × 180°

=> Sum = 4 × 180°

=> Sum = 720°

Therefore The correct answer is 720°.

Additional Information

Each Interior Angle (Regular Polygon)

For a regular polygon, each interior angle is given by [(n − 2) × 180°] ÷ n.

Sum of Exterior Angles

The sum of the exterior angles of any convex polygon is always 360°.

Number of Diagonals

The number of diagonals in a polygon with n sides is given by [n × (n − 3)] ÷ 2.

Interior and Exterior Angle Relation

At each vertex, Interior Angle + Exterior Angle = 180°.

Q59. Answer: (c) 22.5%

Shortcut Trick

Use successive percentage change formula: Net % = a + b + (ab ÷ 100)

Here, a = −30 (loss) and b = +75 (gain)

Net Change = −30 + 75 + [(−30 × 75) ÷ 100]

Net Change = 45 − 22.5 = 22.5%

Overall gain decimal = 22.5 ÷ 100 = 0.225

Therefore Answer = 0.225 = 22.5%

Alternate Method

Given:

Initial Cost Price (CP1) = Rs. 200, First transaction loss = 30%, Second transaction gain = 75%

Formula used:

Selling Price (SP) = CP × (100 ± Profit/Loss %)/100

Overall Gain % = (Final SP − Initial CP) ÷ Initial CP × 100

CP: Rs. 200 −30% SP1: Rs. 140 +75% SP2: Rs. 245 Total Gain = Rs. 245 − Rs. 200 = Rs. 45 Gain% = (45 ÷ 200) × 100 = 22.5%

Calculations:

Selling price after 1st transaction (SP1) = 200 × (100 − 30) ÷ 100

=> SP1 = 200 × 0.70 = Rs. 140

=> New Cost Price (CP2) for the second article = Rs. 140

=> Selling price after 2nd transaction (SP2) = 140 × (100 + 75) ÷ 100

=> SP2 = 140 × 1.75 = Rs. 245

=> Overall gain = 245 − 200 = Rs. 45

=> Overall gain percentage = (45 ÷ 200) × 100 = 22.5% = 0.225 = 22.5%

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Therefore The correct answer is (3).

Additional Information

Successive Percentage Change

When a value changes by x% and then by y%, the net percentage change is given by the formula x + y + (xy ÷ 100). Use positive for gain and negative for loss.

Multiplier Method

To find the final amount directly, multiply the initial value by (1 ± r/100) for each successive change. Final Value = Initial Value × M1 × M2.

Profit and Loss Basics

Profit % = (Profit ÷ CP) × 100 and Loss % = (Loss ÷ CP) × 100. Profit and loss are always calculated on the Cost Price unless specified otherwise.

Q60. Answer: (a) Karnataka

The correct answer is 'Karnataka'

Key Points

• Karnataka and Bannerghatta National Park:

• The State Government of Karnataka is responsible for the administration and protection of the Bannerghatta National Park (BNP), located near Bengaluru.

• In early 2025, the government moved to finalize and notify the Eco-Sensitive Zone (ESZ) around the park to create a regulated buffer area that prevents harmful industrial activities and uncontrolled urbanization.

• The declaration of an ESZ is a critical step in preserving the biological diversity of the region, which serves as a vital green lung for the city of Bengaluru.

• The move specifically aims to curb illegal mining and stone quarrying activities that have historically threatened the park's boundaries and the movement of wildlife.

Additional Information

• Kerala:

• Kerala is home to several famous national parks like Periyar, Silent Valley, and Eravikulam.

• While the state is very active in environmental conservation and has faced significant public debate regarding ESZ boundaries in the Western Ghats (specifically around Wayanad), it does not share jurisdiction over Bannerghatta National Park.

• Gujarat:

• Gujarat is renowned for the Gir National Park, which is the only natural habitat of the Asiatic Lion.

• The state manages diverse ecosystems ranging from marine parks to desert wildlife sanctuaries, but its geographical and administrative focus is entirely distinct from the South Indian forests of Karnataka.

• Madhya Pradesh:

• Often called the "Tiger State," Madhya Pradesh boasts the highest number of national parks in India, including Kanha, Bandhavgarh, and Panna.

• While it is a leader in wildlife tourism and conservation, Bannerghatta is geographically located in the Deccan plateau region of Karnataka, far from the central Indian highlands of Madhya Pradesh.

Important Points

• Eco-Sensitive Zones (ESZs) are areas notified by the Ministry of Environment, Forest and Climate Change (MoEFCC) around National Parks and Wildlife Sanctuaries.

• The main objective of ESZs is to regulate certain activities around protected areas to minimize the negative impact of such activities on the fragile ecosystem.

• Bannerghatta National Park was established in 1970 and declared a national park in 1974.

• In 2002, a portion of the park was established as a biological reserve, known as the Bannerghatta Biological Park, which houses India's first butterfly park.

• The park is an important Elephant Corridor, connecting the Biligirirangana Hills and the Sathyamangalam forest, making the ESZ notification crucial for reducing man-animal conflict.

Q61. Answer: (c) 110000

Shortcut Trick

Monthly Saving = 18000 − (5000 + 3000) = 10000.

Annual savings are normally for 12 months, but birthday month saving is 0.

Effective saving months = 12 − 1 = 11 months.

Total Savings = 10000 × 11 = 110000.

Therefore Answer = 110000

Alternate Method

Given:

Monthly Salary = Rs. 18000

House Rent = Rs. 5000

Bills = Rs. 3000

Birthday month savings = Rs. 0 (spent completely)

Formula used:

Monthly Saving = Monthly Salary − Monthly Expenditure

Total Annual Savings = Monthly Saving × (Total Months − Birthday Month)

Rent Bills Savings Rs. 5000 Rs. 3000 Rs. 10000 Monthly Salary (Rs. 18000) Yearly Savings = Rs. 10000 × 11 months

Calculations:

Monthly total expenditure = 5000 + 3000 = 8000

=> Monthly savings = 18000 − 8000 = 10000

=> In the birthday month, he spends his complete savings, so saving for that month = 0

=> Savings are effectively done for 12 − 1 = 11 months

=> Total annual savings = 10000 × 11 = 110000

Therefore The correct answer is 110000 (Option 3).

Additional Information

Basic Savings Formula

Savings = Income − Expenditure. This relationship remains the fundamental basis for all personal finance aptitude questions.

Savings Percentage

The percentage of income saved is calculated as: (Savings ÷ Income) × 100. In this case, it was (10000 ÷ 18000) × 100 ≈ 55.56%.

Annualization with Conditions

When calculating annual values where some months differ, always multiply the standard monthly rate by the number of applicable months and add/subtract the exceptions separately.

Q62. Answer: (b) Narmada

The correct answer is 'Narmada'

Key Points

• Bhimbetka and the Narmada Valley:

• The Bhimbetka rock shelters are located in the Raisen District of Madhya Pradesh, which lies within the Narmada River basin.

• The site is situated in the foothills of the Vindhya Range, on the southern edge of the central Indian plateau, overlooking the valley of the Narmada River.

• The proximity to the Narmada River provided early humans with essential resources such as water, a variety of flora and fauna for food, and raw materials like stone for making tools.

• The Narmada Valley is one of the most significant archaeological regions in India, yielding fossils and artifacts that date back to the Paleolithic era.

Additional Information

• Yamuna:

• The Yamuna is a major tributary of the Ganga, flowing primarily through North India. While there are ancient sites along the Yamuna (such as Kalpi in Uttar Pradesh, which has Paleolithic significance), Bhimbetka is geographically located much further south in Central India.

• Ganga:

• The Ganga river valley is central to the development of several later Indian civilizations, particularly in the Neolithic, Chalcolithic, and Iron Ages. However, the specific Paleolithic rock shelters of Bhimbetka are associated with the Vindhyan ecology and the Narmada drainage system rather than the Gangetic plains.

• Satluj:

• The Satluj is the easternmost tributary of the Indus River, flowing through Tibet, Himachal Pradesh, and Punjab. This region is famous for Indus Valley Civilization sites like Ropar, but it is not the location of the Bhimbetka Paleolithic site.

Important Points

• The Bhimbetka rock shelters were discovered by archaeologist V.S. Wakankar in 1957.

• It was declared a UNESCO World Heritage Site in 2003 due to its extraordinary rock paintings which span from the Upper Paleolithic through the Mesolithic and into the historic period.

• The paintings provide evidence of the earliest human life in India, depicting scenes of hunting, dancing, animal fights, and daily life.

• The site contains more than 700 rock shelters, making it one of the largest repositories of ancient art in the world.

Q63. Answer: (a) One

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.

B lives on a floor which is a prime number.

The product of the floors on which B and F live is 3.

Only 2 people live above C.

A lives immediately below E.

Floor	Person
6	E
5	A
4	C
3	B
2	D
1	F

So, number of people above A = 1

Hence, the correct answer is Option 1.

Q64. Answer: (a) WYRT

The logic followed here is:

For, COLD → GQHB

C + 4 = G

O + 2 = Q

L - 4 = H

D - 2 = B

Now, for KSDZ → OUZX

K + 4 = O

S + 2 = U

D - 4 = Z

Z - 2 = X

Now, applying the same logic for SWVV

S + 4 = W

W + 2 = Y

V - 4 = R

V - 2 = T

So, SWVV → WYRT

Hence, the correct answer is "Option 1".

Q65. Answer: (d) 1930

The correct answer is '1930'

Key Points

• Dandi March (1930):

• The Salt March, also known as the Dandi March or the Salt Satyagraha, was an act of nonviolent civil disobedience in colonial India led by Mahatma Gandhi.

• On April 6, 1930, Mahatma Gandhi officially broke the Salt Act by picking up a handful of salt from the shores of Dandi, Gujarat.

• The march lasted for 24 days, starting from March 12, 1930, and ending on April 5, 1930, covering a distance of approximately 240 miles (385 km) from Sabarmati Ashram to Dandi.

• This act was a direct protest against the British salt monopoly and the heavy taxes imposed on a basic necessity like salt, which

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affected the poorest sections of society.

Additional Information

• 1928:

• In 1928, the Simon Commission arrived in India to report on the working of the Indian constitution, which was met with widespread protests ("Simon Go Back").

• This year also saw the formulation of the Nehru Report, which was an outline of a new dominion status constitution for India.

• The Bardoli Satyagraha, a major tax resistance movement led by Sardar Vallabhbhai Patel, also took place in 1928.

• 1929:

• In December 1929, the Indian National Congress held its historic Lahore Session under the presidency of Jawaharlal Nehru.

• The resolution for 'Purna Swaraj' (Complete Independence) was passed during this session.

• The Congress hoisted the tricolor flag on the banks of the Ravi River and decided to observe January 26, 1930, as Independence Day.

• 1931:

• The year 1931 is significant for the Gandhi-Irwin Pact, signed in March, which led to the suspension of the Civil Disobedience Movement.

• Following the pact, Mahatma Gandhi attended the Second Round Table Conference in London as the sole representative of the Congress.

• Tragically, this was also the year when Bhagat Singh, Rajguru, and Sukhdev were executed on March 23.

Important Points

• The breaking of the Salt Act marked the beginning of the nationwide Civil Disobedience Movement.

• Mahatma Gandhi started the march with 78 trusted volunteers, but as they progressed, thousands of people joined the procession.

• Lord Irwin was the Viceroy of India during the launch of the Dandi March and the subsequent Civil Disobedience Movement.

• The salt tax protest was chosen because salt was a commodity used by every Indian, regardless of caste, religion, or economic status, making it a powerful symbol of British exploitation.

Q66. Answer: (b) 100%

Shortcut Trick

CP of 1 item = 474 ÷ 12 = 39.5

SP of 1 item = 79

Ratio CP : SP = 39.5 : 79 = 1 : 2

Profit % = [(2 − 1) ÷ 1] × 100 = 100%

Therefore Answer = 1

Alternate Method

Given:

Purchase Price = Rs. 474 per dozen, Selling Price = Rs. 79 per article.

Formula used:

Profit % = [(SP − CP) ÷ CP] × 100

CP = Rs. 39.5 Profit = Rs. 39.5 Total Selling Price (SP) = Rs. 79 Profit % = (39.5 / 39.5) × 100 = 100%

Calculations:

CP of 1 article = Cost per dozen ÷ 12

=> CP = 474 ÷ 12 = 39.5

=> SP of 1 article = 79

=> Profit = SP − CP = 79 − 39.5 = 39.5

=> Profit % = (39.5 ÷ 39.5) × 100 = 100%

Therefore The correct answer is 1.

Additional Information

Basic Profit Formula

Profit occurs when SP > CP. Profit = SP − CP. Profit Percentage = (Profit ÷ CP) × 100.

Calculating SP from Profit %

If there is a gain of G%, then Selling Price (SP) = CP × (100 + G) ÷ 100.

Calculating CP from Profit %

If there is a gain of G%, then Cost Price (CP) = SP × 100 ÷ (100 + G).

Successive Discounts

Total discount for two successive discounts of x% and y% = [x + y − (x × y ÷ 100)]%.

Q67. Answer: (b) Only conclusion (I) follows

Given Statements:

All cats are dogs.

Some cats are tigers.

No tiger is a lion.

The least possible Venn diagram for the given statement is:

Conclusions:

I. Some dogs are tigers - True (Because some cats are tigers and all cats are dogs, so those cats which are tigers are also dogs).

II. No cat is a lion - False (Because we do not know anything about the cats that are not tigers. Those cats can be lions without violating any of the statements. In syllogism, if a conclusion is not "definitely true" in every possible scenario, it is considered invalid).

So, Only conclusion (I) follows.

Hence, the correct answer is "Option 2".

Q68. Answer: (c) Potential and kinetic energy

The correct answer is 'Potential and kinetic energy'

Key Points

• Mechanical Energy:

• Mechanical energy is the sum of the power of an object to do work based on its motion and its position.

• It is a macroscopic form of energy that represents the total energy associated with the motion and position of physical objects.

• The total mechanical energy (E) of a system remains constant in the absence of dissipative forces (like friction), according to the principle of conservation of mechanical energy.

• It is mathematically expressed as: Mechanical Energy = Kinetic Energy + Potential Energy.

• Kinetic Energy:

• Kinetic energy is the energy possessed by an object due to its motion.

• Any object that has mass and is moving has kinetic energy. The amount of kinetic energy depends on the mass of the object and the square of its velocity ($KE = 1/2mv^2$).

• Potential Energy:

• Potential energy is the stored energy an object possesses because of its position, state, or configuration.

• The most common form is gravitational potential energy, which depends on an object's height and mass ($PE = mgh$). Another form is elastic potential energy, stored in stretched or compressed objects like springs.

Additional Information

• Electrical and Chemical Energy:

• Electrical energy results from the flow of electric charge, while chemical energy is stored in the bonds of chemical compounds.

• While these are vital forms of energy, they are typically classified as non-mechanical forms of energy related to atomic and molecular levels.

• Light and Heat Energy:

• Light (radiant) energy is a form of electromagnetic radiation that can be seen by the human eye.

• Heat (thermal) energy is the internal energy of a system due to the kinetic energy of its atoms and/or molecules. These are distinct from the mechanical energy of a whole object moving through space.

• Heat and Sound Energy:

• Sound energy is the energy produced by vibrating objects and transmitted through a medium as waves.

• Both heat and sound are often considered "lost" energy in mechanical systems because mechanical energy is frequently converted into these forms due to friction or air resistance.

Important Points

• The SI unit for all forms of energy, including mechanical energy, is the Joule (J).

• In a closed system where only conservative forces (like gravity) act, the Law of Conservation of Mechanical Energy states that the total mechanical energy remains constant.

• When an object falls from a height, its potential energy decreases as it loses altitude, but its kinetic energy increases as it gains speed, keeping the total mechanical energy constant (ignoring air resistance).

• Mechanical energy is fundamental in the study of classical mechanics and the operation of simple machines like pulleys, levers,

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and pendulums.

Q69. Answer: (b) X

Given: Each of X, Y, Z, A, B, C and D has an interview on a different day of the week starting on Monday and ending on Sunday of the same week.

C has an interview on the last day of the week.

Y has an interview on the first day of the week.

Only three people have an interview between Y and D.

Only one person has an interview between D and Z.

X has an interview on one of the days after B but on one of the days before A.

Day	Person
Monday	Y
Tuesday	B
Wednesday	Z
Thursday	X
Friday	D
Saturday	A
Sunday	C

So, X has an interview on Thursday.

Hence, the correct answer is Option 2.

Q70. Answer: (a) Allocating memory to programs

The correct answer is 'Allocating memory to programs'

Key Points

• Allocating memory to programs:

• Memory allocation is a fundamental task performed by the Operating System (OS), which is the primary type of system software.

• It involves managing the computer's primary memory (RAM) to ensure that each running program has enough space to execute its instructions and store data.

• System software acts as an intermediary between the computer hardware and the application software; without memory allocation, application software would not be able to load or run.

• This process includes tracking which parts of memory are currently in use and which are free, preventing different programs from interfering with each other's data.

Additional Information

• Modifying a digital photo file:

• This is a task-specific operation performed by application software such as Adobe Photoshop, GIMP, or basic photo editors.

• Application software is designed for end-users to accomplish specific creative or productive tasks, rather than managing the computer's internal resources.

• Designing a presentation file:

• Creating or designing slides is the function of productivity application software like Microsoft PowerPoint, Google Slides, or LibreOffice Impress.

• While it relies on the system software to save the file to the disk or display it on the monitor, the "designing" aspect is strictly an application-level activity.

• Playing an audio or video file on System:

• While the operating system provides the drivers (system software) to communicate with the sound and graphics cards, the interface and logic used to play the file belong to a media player application (e.g., VLC, Windows Media Player).

• The user interacts with the application software to select, play, pause, and manage media content.

Important Points

• System Software: Includes the Operating System, device drivers, and utilities. Its main goal is to control the hardware and provide a platform for application software to run.

• Application Software: Includes programs like web browsers, word processors, and games. These are installed by users to perform specific functions or solve specific problems.

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• Resource Management: One of the most critical roles of system software is resource management, which includes CPU scheduling, memory management, and input/output (I/O) device management.

• Dependency: Application software is entirely dependent on system software to function, as system software handles the "behind-the-scenes" complexities of the hardware.

Q71. Answer: (c) H

Given: Seven people F, G, H, I, V, W, and X are sitting around a circular table facing the centre.

I sits third to the right of G.

Only two people sit between I and F.

Only three people sit between G and V.

H sits to the immediate left of W.

Thus, H sits fourth to the left of X.

Hence, the correct answer is Option (3).

Q72. Answer: (b) Central Marine Fisheries Research Institute

The correct answer is 'Central Marine Fisheries Research Institute'

Key Points

• Central Marine Fisheries Research Institute (CMFRI):

• The ICAR-Central Marine Fisheries Research Institute (CMFRI), headquartered in Kochi, hosted the national stakeholder consultation on the High Seas Treaty (BBNJ) in December 2025.

• The consultation was aimed at discussing the implications of the treaty on India’s marine fisheries, conservation efforts, and the utilization of marine genetic resources.

• CMFRI plays a pivotal role in providing scientific inputs to the government regarding marine policy, sustainable fishing practices, and the protection of marine biodiversity within and beyond national jurisdictions.

• The event brought together scientists, policy experts, legal professionals, and representatives from the fishing industry to align India's national interests with international maritime laws.

Additional Information

• Food and Agriculture Organization (FAO):

• The FAO is a specialized agency of the United Nations that leads international efforts to defeat hunger and improve nutrition and food security.

• While it provides global guidelines on fisheries management (such as the Code of Conduct for Responsible Fisheries), it acts as an international body rather than the specific local host for India's national consultations.

• Ministry of Environment, Forest and Climate Change (MoEFCC):

• MoEFCC is the nodal ministry in the Government of India for planning, promoting, and coordinating environmental and forestry programs.

• While the ministry is heavily involved in the ratification and policy-making process of the BBNJ treaty at the federal level, the specific technical consultation in Kochi was organized by the specialized research institute, CMFRI.

• Indian Council of Agricultural Research (ICAR):

• ICAR is an autonomous body responsible for coordinating agricultural education and research in India.

• CMFRI operates under the aegis of ICAR. While ICAR provides the broader institutional framework, the specific hosting and execution of the marine-centric consultation fell under its specialized marine wing (CMFRI).

Important Points

• The High Seas Treaty, also known as the BBNJ (Biodiversity Beyond National Jurisdiction) treaty, is an international agreement under the United Nations Convention on the Law of the Sea (UNCLOS).

• The treaty aims to address the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction, which cover nearly two-thirds of the world’s oceans.

• The four main pillars of the BBNJ treaty include: Marine Genetic Resources (MGRs), Area-Based Management Tools (ABMTs) including Marine Protected Areas, Environmental Impact Assessments (EIAs), and Capacity Building and Transfer of Marine Technology (CB&TT).

• India has been a proactive participant in BBNJ negotiations to ensure "equitable access" to marine resources and to protect the livelihoods of its coastal communities.

Q73. Answer: (c) 670

Shortcut Trick

Ratio of shares (Lower time : Higher time) = (1 + r/100)^(time diff) : 1

Time difference = 13 − 12 = 1 year; Rate = 10% = 1/10

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Ratio of Mahesh : Vijay = $(1 + 1/10)^1 : 1 = 11 : 10$

Total ratio units = 11 + 10 = 21 units

21 units = Rs. 1407 → 1 unit = 1407 ÷ 21 = Rs. 67

Vijay's share = 10 units = 10 × 67 = Rs. 670

Therefore Answer = 670

Alternate Method

Given:

Total amount = Rs. 1407, Rate (r) = 10% p.a., Time for Mahesh (t_M) = 12 years, Time for Vijay (t_V) = 13 years.

Formula used:

Amount (A) = P(1 + r/100)^t

Calculations:

Let Mahesh's share be M and Vijay's share be V.

=> $M(1 + 10/100)^{12} = V(1 + 10/100)^{13}$

=> M = V(1 + 1/10)^(13 − 12)

=> $M = V(11/10)^1$

=> M/V = 11/10

=> Ratio M : V = 11 : 10

=> Vijay's share = (10 ÷ (11 + 10)) × 1407

=> Vijay's share = (10 ÷ 21) × 1407

=> Vijay's share = 10 × 67 = 670

Therefore The correct answer is 670 (Option 3).

Additional Information

Compound Interest Formula

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

Difference between CI and SI

For a period of 2 years, the difference between Compound Interest and Simple Interest is given by $D = P(r/100)^2$.

Effective Interest Rate

If interest is compounded half-yearly, the effective rate for the year becomes $[(1 + (r/2)/100)^2 − 1] × 100\%$.

Equal Amount Logic

When shares grow to equal amounts over different times t1 and t2, the share ratio is inversely proportional to (1 + r/100)^t.

Q74. Answer: (d) To improve efficiency and cost-effectiveness within the UN

The correct answer is 'To improve efficiency and cost-effectiveness within the UN'

Key Points

• UN80 Initiative:

• The UN80 Initiative is a strategic framework spearheaded by the UN Secretary-General to mark the 80th anniversary of the United Nations in 2025.

• Its primary objective is to modernize the UN's internal operations, ensuring that the organization remains fit for purpose in an increasingly complex and digitalized world.

• The initiative focuses on institutional reforms that aim to reduce bureaucratic redundancies, streamline administrative processes, and ensure that every dollar spent contributes directly to the UN's core mandates of peace, development, and human rights.

• By improving cost-effectiveness, the UN aims to redirect more resources toward field operations and humanitarian aid, maximizing the impact of member states' contributions.

Additional Information

• Expanding military presence in conflict zones:

• While the UN manages peacekeeping operations (Blue Helmets), the UN80 Initiative is an administrative and structural reform program rather than a military expansion strategy.

• Decisions regarding military presence are typically handled by the UN Security Council on a case-by-case basis and are governed by specific peacekeeping mandates, not by a general efficiency initiative.

• Creating a new global currency:

• The creation of a global currency is not within the mandate of the United Nations Secretary-General. Such matters fall under the purview of international financial institutions like the International Monetary Fund (IMF) or the World Bank.

• The UN focuses on economic development and policy coordination, but it does not have the legal or financial authority to issue

or manage a global currency.

• Promoting global tourism:

• Global tourism is the specific domain of "UN Tourism" (formerly known as the World Tourism Organization or UNWTO).

• While tourism is recognized as a driver of economic growth and the Sustainable Development Goals (SDGs), it is a sectoral focus and not the primary objective of the overarching UN80 institutional reform initiative.

Important Points

• The UN80 Initiative is closely linked to the "UN 2.0" vision, which promotes a "Quintet of Change" involving data, innovation, digital transformation, foresight, and behavioral science.

• The year 2025 is significant as it marks eight decades since the signing of the UN Charter in San Francisco in 1945.

• This initiative aligns with the outcomes of the Summit of the Future (2024), where member states committed to revitalizing multilateralism and making global governance more effective.

• The focus on cost-effectiveness is partly a response to the ongoing financial liquidity crisis faced by the UN, caused by delays in the payment of assessed contributions by member states.

Q75. Answer: (c) 22

The correct answer is '22'

Key Points

• 8th Schedule of the Indian Constitution:

• The Eighth Schedule to the Constitution of India lists the official languages of the Republic of India.

• As of June 30, 2024, there are 22 languages included in this schedule.

• The constitutional provisions relating to the 8th Schedule are enshrined in Articles 344(1) and 351 of the Indian Constitution.

• The primary purpose of this list is to ensure the representation of these languages in the Official Languages Commission and to enrich the Hindi language by drawing forms, style, and expressions from these specified languages.

• The 22 languages are: Assamese, Bengali, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Manipuri, Marathi, Nepali, Odia, Punjabi, Sanskrit, Sindhi, Tamil, Telugu, Urdu, Bodo, Santhali, Maithili, and Dogri.

Additional Information

• Historical Evolution:

• Originally, the Constitution of India contained only 14 languages in the Eighth Schedule.

• 21st Amendment Act, 1967: Added Sindhi as the 15th language.

• 71st Amendment Act, 1992: Added Konkani, Manipuri, and Nepali, bringing the total to 18.

• 92nd Amendment Act, 2003: Added Bodo, Dogri, Maithili, and Santhali, which resulted in the current count of 22 languages.

• Incorrect Figures (26, 20, 16):

• 26: This number is incorrect as there has been no constitutional amendment to increase the list to 26 languages. While there are demands for including more languages (like Tulu or Rajasthani), they haven't been officially added.

• 20: This figure does not correspond to any significant historical milestone in the evolution of the 8th Schedule.

• 16: This number is also incorrect. The count jumped from 15 to 18 after the 1992 amendment, skipping 16 and 17 in terms of major amendment milestones.

Important Points

• There is no fixed criteria for any language to be considered for inclusion in the Eighth Schedule. However, the Government of India usually follows recommendations from committees like the Pahwa (1996) and Sitakant Mohapatra (2003) committees.

• Classical Languages: Currently, six languages in India have been granted the status of 'Classical Language': Tamil (2004), Sanskrit (2005), Kannada (2008), Telugu (2008), Malayalam (2013), and Odia (2014). Note that all classical languages are also part of the 8th Schedule.

• English is not one of the 22 languages listed in the 8th Schedule, although it is an official working language of the Union.

Q76. Answer: (a) 7

Shortcut Trick

Apply BODMAS hierarchy: Divide → Multiply → Add → Subtract.

Mental Breakdown: (18 ÷ 6) = 3 and (3 × 4) = 12.

Evaluation: 16 + 3 − 12 = 7.

Therefore Answer = 7

Alternate Method

Given:

Expression: 16 + 18 ÷ 6 − 3 × 4

Formula used:

BODMAS Rule: B (Brackets), O (Of), D (Division), M (Multiplication), A (Addition), S (Subtraction).

16 + (18 ÷ 6) − (3 × 4) 3 12 Step-wise Priority Breakdown: Final: 16 + 3 − 12 = 7

Calculations:

Evaluate 16 + 18 ÷ 6 − 3 × 4

=> Step 1 (Division): 16 + 3 − 3 × 4

=> Step 2 (Multiplication): 16 + 3 − 12

=> Step 3 (Addition): 19 − 12

=> Step 4 (Subtraction): 7

Therefore The correct answer is 7 (Option 1).

Additional Information

BODMAS Rule

Standard order for mathematical operations: Brackets → Of (orders) → Division → Multiplication → Addition → Subtraction.

Vinculum (V-BODMAS)

If a bar (vinculum) is present over a set of numbers, that operation must be performed before brackets.

Same Priority Logic

Division and Multiplication share the same level of priority, as do Addition and Subtraction; solve them from left to right as they appear.

Q77. Answer: (b) 5

BODMAS Table:

Given equation: 10 C 20 A 2 D 3 B 5 = ?

Now, replacing the symbols with their meanings ‘C = +’, ‘A = ÷’, ‘D = −’, ‘B = ×’, then:

=> 10 + 20 ÷ 2 − 3 × 5

=> 10 + (20 ÷ 2) − (3 × 5)

=> 10 + 10 − 15

=> 20 − 15

=> 5

Hence, the correct answer is "Option 2".

Q78. Answer: (b) 52%

Shortcut Trick

Assume Cost Price (CP) = 100.

Marked Price (MP) = 100 + 150 = 250.

Desired Selling Price (SP) for 20% gain = 120.

Discount Amount = 250 − 120 = 130.

Discount Percentage = (130 ÷ 250) × 100 = 52%.

Therefore Answer = 52%.

Alternate Method

Given:

Markup percentage = 150% above CP

Desired Profit percentage = 20%

Formula used:

MP = CP × (100 + Markup %)/100

SP = CP × (100 + Profit %)/100

Discount % = [(MP − SP) ÷ MP] × 100

CP: 100 SP: 120 MP: 250 Markup (+150%) Discount (52%) Gain (+20%)

Calculations:

Let the Cost Price (CP) be 100 units.

=> Marked Price (MP) = 100 + 150% of 100 = 100 + 150 = 250 units.

=> Required Selling Price (SP) for 20% gain = 100 + 20% of 100 = 120 units.

=> Discount amount required = MP − SP = 250 − 120 = 130 units.

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=> Discount % = (130 ÷ 250) × 100 = 52%.

Therefore The correct answer is 52%. (Option 2).

Additional Information

Relationship between CP, MP, Profit, and Discount

The direct ratio is given by MP ÷ CP = (100 + Profit %) ÷ (100 − Discount %).

Markup Percentage

Markup % = [(MP − CP) ÷ CP] × 100. It represents how much the price is increased over the cost price before offering discounts.

Successive Discounts

Two successive discounts of a% and b% are equivalent to a single discount of [a + b − (a × b) ÷ 100]%.

Profit Percentage

Profit % = [(SP − CP) ÷ CP] × 100. Note that profit is always calculated on the Cost Price unless specified otherwise.

Q79. Answer: (a) Our Common Future

The correct answer is 'Our Common Future'

Key Points

• Our Common Future:

• The report, popularly known as the Brundtland Report, was published in October 1987 by the World Commission on Environment and Development (WCED).

• It officially defined Sustainable Development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

• The report was a response to the conflict between the promotion of globalized economic growth and the accelerating ecological degradation on a global scale.

• It highlighted three fundamental pillars of sustainable development: environmental protection, economic growth, and social equity.

• The report called for international cooperation to address the problems of population growth, food security, and energy use through sustainable practices.

Additional Information

• Agenda 21:

• Agenda 21 is a non-binding action plan of the United Nations with regard to sustainable development.

• It was a product of the Earth Summit (UN Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992.

• The "21" in Agenda 21 refers to the agenda for the 21st century, focusing on global, national, and local actions to mitigate human impact on the environment.

• Limits to Growth:

• This was a 1972 report commissioned by the Club of Rome.

• It used computer modeling to simulate the consequences of interactions between the Earth and human systems, predicting that economic growth could not continue indefinitely due to resource depletion.

• It warned that without substantial changes in resource consumption, the world system would face a collapse within the 21st century.

• Silent Spring:

• Silent Spring is an environmental science book written by Rachel Carson and published in 1962.

• The book documented the adverse environmental effects caused by the indiscriminate use of pesticides, particularly DDT.

• It is widely credited with helping launch the contemporary American environmental movement and led to a nationwide ban on DDT for agricultural uses.

Important Points

• The Brundtland Commission was chaired by Gro Harlem Brundtland, the former Prime Minister of Norway.

• The commission was established by the United Nations in 1983 to address growing concern about the "accelerating deterioration of the human environment and natural resources."

• The Brundtland Report paved the way for the 1992 Rio Summit and the eventual formulation of the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs).

• A key concept introduced in the report was intergenerational equity, emphasizing that the current generation holds the Earth in trust for future generations.

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Q80. Answer: (c) 1975–1977

The correct answer is '1975–1977'

The book titled 'The Emergency Diaries – Years That Forged a Leader', authored by Prime Minister Narendra Modi, is a significant literary work that reflects on one of the most controversial periods in post-independence Indian history: the National Emergency. The book is set to be released around the 50th anniversary of the imposition of the Emergency, providing a personal and political account of the events that transpired during that era.

Key Points

• 1975–1977 (The Emergency Period):

• The National Emergency was declared by President Fakhruddin Ali Ahmed on the recommendation of Prime Minister Indira Gandhi on June 25, 1975, and lasted until March 21, 1977.

• This period was characterized by the suspension of fundamental rights, censorship of the press, and the imprisonment of several political leaders and activists.

• Narendra Modi, who was a young RSS (Rashtriya Swayamsevak Sangh) pracharak at the time, played an active role in the underground movement against the Emergency.

• The book 'The Emergency Diaries' chronicles his experiences, observations, and the lessons learned during these 21 months, which he describes as formative years for his political leadership.

• The narrative focuses on the resistance movement, the fight for the restoration of democracy, and the socio-political climate of India during the mid-1970s.

Additional Information

• 1962–1965:

• This period in Indian history was marked by major external conflicts, including the Indo-China War of 1962 and the Indo-Pakistani War of 1965.

• It saw the end of the Jawaharlal Nehru era (1964) and the leadership of Lal Bahadur Shastri, who gave the famous slogan "Jai Jawan Jai Kisan." This period is not associated with the internal political crackdown described in the book.

• 1989–1991:

• This was a period of extreme political instability and economic transition in India, often called the "Era of Coalition Politics."

• Key events included the implementation of the Mandal Commission report, the assassination of Rajiv Gandhi, and the beginning of Economic Liberalization under P.V. Narasimha Rao in 1991. While transformative, it is distinct from the Emergency era.

• 1969–1971:

• This timeframe was defined by the split of the Indian National Congress in 1969 and the subsequent rise of Indira Gandhi's dominance.

• The year 1971 was particularly significant due to the Indo-Pakistani War which led to the creation of Bangladesh and Indira Gandhi's landslide victory in the general elections under the "Garibi Hatao" slogan.

Important Points

• The National Emergency was invoked under Article 352 of the Indian Constitution on the grounds of "internal disturbance."

• During this time, Narendra Modi worked incognito, often using disguises (such as a Sikh man) to avoid arrest while coordinating protest activities and distributing anti-government literature.

• The release of this book in 2025 serves as a historical record from a contemporary leader's perspective, emphasizing the importance of democratic values and institutional integrity.

• The Emergency ended in 1977 when Indira Gandhi called for fresh elections, resulting in a historic defeat for the Congress party and the formation of the first non-Congress government at the center by the Janata Party.

Q81. Answer: (b) Brother's wife's sister

Family Chart:

Decoding the Symbols:

Symbol	**•**	**–**	**x**	**÷**
Meaning	Daughter	Brother	Wife	Father

Given: D + F ÷ G x H – J

It means: D is daughter of F, F is father of G, G is wife of H, H is brother of J.

Thus, D is brother’s wife’s sister of J.

Hence, the correct answer is Option 2.

Q82. Answer: (b) Supernova stent

The correct answer is 'Supernova stent'

In December 2025, AIIMS Delhi successfully conducted trials of the Supernova stent under the GRASSROOT trial. This trial focuses on advancing the treatment for Intracranial Atherosclerotic Disease (ICAD), a major cause of ischemic strokes. The introduction of such advanced brain stents represents a significant leap in neuro-interventional procedures, aiming to reduce the recurrence of strokes in high-risk patients.

Key Points

• Supernova Stent:

• The Supernova stent is an advanced, self-expanding nitinol stent specifically designed for the treatment of intracranial arterial narrowing (stenosis).

• It is used in patients suffering from Intracranial Atherosclerotic Disease (ICAD), where plaque buildup narrows the arteries inside the brain, leading to restricted blood flow.

• The stent is engineered to be highly flexible and deliverable, allowing doctors to navigate the complex and fragile blood vessels of the brain.

• Under the GRASSROOT trial, this stent is evaluated for its efficacy in preventing secondary strokes compared to traditional medical management alone.

Additional Information

• da Vinci:

• The da Vinci system is a well-known robotic surgical platform used for minimally invasive surgeries.

• It is primarily utilized in urology, gynecology, and general surgery to provide surgeons with better precision and 3D visualization, rather than being a brain stent.

• Vikram-I:

• Vikram-I refers to a series of small-lift launch vehicles developed by Skyroot Aerospace, an Indian private space company.

• It is part of India's growing private space sector and has no relation to medical devices or neurology.

• OncoMark:

• OncoMark is typically associated with biotechnology and cancer diagnostics, specifically focusing on biomarkers and prognostic tests for cancer.

• It helps in determining the risk of recurrence in cancer patients, which is entirely different from the mechanical treatment of brain artery blockage.

Important Points

• The GRASSROOT trial (Generic vs. Radial vs. Antithrombotic Strategy for Stroke Treatment) is a crucial clinical study led by AIIMS Delhi to standardize and improve stroke intervention protocols.

• AIIMS Delhi (All India Institute of Medical Sciences) is a premier medical research university and public hospital, often at the forefront of introducing cutting-edge medical technology in India.

• Intracranial Atherosclerotic Disease is one of the most common causes of ischemic stroke worldwide, particularly in Asian populations, making this trial highly relevant for the Indian demographic.

• The success of the Supernova stent trial signifies a move toward more "precision medicine" in neurology, where mechanical intervention is used to save brain tissue that would otherwise be permanently damaged.

Q83. Answer: (c) 180

Shortcut Trick

Relative speed (same direction) = 60 − 24 = 36 km/hr

Relative speed in m/s = 36 × (5/18) = 10 m/s

Total distance (Sum of lengths) = Relative speed × Time = 10 × 30 = 300 m

Length of another train = Total distance − Length of first train = 300 − 120 = 180 m

Therefore Answer = 180

Alternate Method

Given:

Length of first train (L1) = 120 m

Speed of first train (S1) = 60 km/hr

Speed of second train (S2) = 24 km/hr

Time taken to cross (T) = 30 seconds

Formula used:

Total Distance = Relative Speed × Time

Relative Speed (Same direction) = S1 − S2

Train 1 (120 m) 60 km/hr Train 2 (L2 = ?) 24 km/hr Total Relative Distance = 300 m

Calculations:

Relative Speed = 60 − 24 = 36 km/hr

=> Relative Speed in m/s = 36 × (5/18) = 10 m/s

=> Total Distance = L1 + L2 = Relative Speed × Time

=> 120 + L2 = 10 × 30

=> 120 + L2 = 300

=> L2 = 300 − 120

=> L2 = 180 m

Therefore The correct answer is 180 (Option 3).

Additional Information

Relative Speed in Opposite Direction

When two objects move towards each other, relative speed is the sum of their individual speeds: S_R = S1 + S2.

Unit Conversion

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

Train Crossing a Stationary Object

If a train crosses a pole or man, distance covered = length of train. If it crosses a platform or bridge, distance = length of train + length of platform.

Q84. Answer: (d) Municipality

The correct answer is 'Municipality'

Key Points

• Article 243V:

• Article 243V of the Indian Constitution specifically details the provisions regarding the disqualification for membership of a Municipality.

• It states that a person shall be disqualified for being chosen as, and for being, a member of a Municipality if they are disqualified by any law for the time being in force for the purposes of elections to the Legislature of the State concerned.

• An important clause under this article is that no person shall be disqualified on the ground that he is less than twenty-five years of age, if he has attained the age of twenty-one years.

• If any question arises as to whether a member of a Municipality has become subject to any of the disqualifications, the question shall be referred for the decision of such authority and in such manner as the Legislature of a State may, by law, provide.

Additional Information

• Panchayats:

• Disqualifications for membership in Panchayats are governed by Article 243F of the Indian Constitution.

• Similar to Article 243V, it stipulates that the minimum age for eligibility is 21 years and refers other disqualification criteria to state laws.

• Panchayats fall under Part IX of the Constitution, which was added by the 73rd Amendment Act.

• State Legislature:

• Disqualifications for members of the State Legislative Assembly or Council are dealt with under Article 191.

• Common grounds include holding an office of profit, being of unsound mind, being an undischarged insolvent, or not being a citizen of India.

• District Council:

• District Councils generally refer to bodies in autonomous districts under the Sixth Schedule of the Constitution or the Zila Parishads in the Panchayati Raj system.

• The disqualification rules for Sixth Schedule District Councils are defined by the rules made by the Governor or the Council itself under the provisions of the Sixth Schedule, rather than Article 243V.

Important Points

• Article 243V is part of Part IX-A of the Constitution, which deals with "The Municipalities."

• This part was inserted into the Constitution by the 74th Constitutional Amendment Act, 1992.

• The 74th Amendment Act came into force on June 1, 1993, aimed at strengthening Urban Local Bodies (ULBs) and giving them constitutional status.

• Under this framework, three types of Municipalities are provided: Nagar Panchayats for transitional areas, Municipal Councils for smaller urban areas, and Municipal Corporations for larger urban areas.

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Q85. Answer: (d) (13, 10, 145)

The logic followed here is:

Logic: (1st number × 2nd number) + 15 = 3rd number

Given,

(16, 6, 111)

=> (16 × 6) + 15

=> 96 + 15 = 111

And,

(9, 14, 141)

=> (9 × 14) + 15

=> 126 + 15 = 141

Now, checking the options:

Option 1) (15, 12, 200)

=> (15 × 12) + 15

=> 180 + 15 = 195 ≠ 200

Option 2) (17, 8, 146)

=> (17 × 8) + 15

=> 136 + 15 = 151 ≠ 146

Option 3) (12, 8, 96)

=> (12 × 8) + 15

=> 96 + 15 = 111 ≠ 96

Option 4) (13, 10, 145)

=> (13 × 10) + 15

=> 130 + 15 = 145

Hence, the correct answer is "Option 4".

Q86. Answer: (d) Both 1 and 2

The correct answer is 'Both 1 and 2'

Key Points

• Article 13 and Judicial Review:

• Article 13 of the Indian Constitution serves as a protector of Fundamental Rights by conferring the power of judicial review upon the judiciary.

• Statement 1 is correct: Article 13 expressly provides for the judicial review of both pre-constitutional and post-constitutional laws.

• Article 13(1) deals with pre-constitutional laws (laws in force before January 26, 1950), stating they are void to the extent of their inconsistency with Fundamental Rights.

• Article 13(2) deals with post-constitutional laws, prohibiting the State from making any law that takes away or abridges Fundamental Rights.

• Statement 2 is correct: It explicitly declares that all laws that are inconsistent with or in derogation of any of the Fundamental Rights shall be null and void.

• This article ensures that the Fundamental Rights are paramount and that any legislative or executive action must conform to the constitutional provisions regarding these rights.

Additional Information

• Scope of 'Law' under Article 13:

• Article 13(3) provides a wide definition of "law," which includes permanent laws enacted by Parliament or State Legislatures, temporary laws like ordinances, statutory instruments like bye-laws, rules, regulations, and even non-legislative sources of law like custom or usage.

• This comprehensive definition ensures that no form of state action can bypass the scrutiny of Fundamental Rights.

• Constitutional Amendments:

• Initially, there was a conflict regarding whether a Constitutional Amendment counts as "law" under Article 13.

• The 24th Amendment Act (1971) inserted Article 13(4), stating that nothing in Article 13 shall apply to amendments made under Article 368.

• However, in the Kesavananda Bharati case (1973), the Supreme Court ruled that while an amendment is not "law" under Article 13, it can still be challenged if it violates the "Basic Structure" of the Constitution.

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• Judicial Organs:

• The power of judicial review under Article 13 is exercised by the Supreme Court under Article 32 and the High Courts under Article 226.

Important Doctrines

• Doctrine of Severability: If only a part of a law is inconsistent with Fundamental Rights, only that specific part is declared void, provided it can be separated from the rest of the law.

• Doctrine of Eclipse: Pre-constitutional laws that violate Fundamental Rights are not completely dead but become "overshadowed" or dormant. If the relevant Fundamental Right is amended later, the law can become active again.

Q87. Answer: (a) 4.2

Given: 2.8 : 3.8 :: x : 5.7

Logic: Fixed proportion

So,

2.8 / 3.8 = x / 5.7

=> x = (2.8 / 3.8) × 5.7

=> x = (2.8 / 2) × 3

=> x = 1.4 × 3

=> x = 4.2

Hence, the correct answer is Option 1.

Q88. Answer: (a) -33/6

Shortcut Trick

Convert all terms to base (9/12) using $(a/b)^n = (b/a)^{(-n)}$.

LHS: $(9/12)^{(-19)} \times (9/12)^5 \times (9/12)^{(-8)} = (9/12)^{(-19 + 5 - 8)} = (9/12)^{(-22)}$

Equate exponents: 6m + 11 = −22

6m = −22 − 11 => 6m = −33

m = −33/6

Therefore Answer = −33/6

Alternate Method

Given:

$(12/9)^{(19)} \times (9/12)^5 \times (12/9)^8 = (9/12)^{(6m + 11)}$

Formula used:

$a^x \times a^y = a^{(x+y)}$ and $(a/b)^n = (b/a)^{(-n)}$

Calculations:

Standardizing all bases to (9/12):

=> $(9/12)^{(-19)} \times (9/12)^5 \times (9/12)^{(-8)} = (9/12)^{(6m + 11)}$

=> $(9/12)^{((-19 + 5 - 8))} = (9/12)^{(6m + 11)}$

=> $(9/12)^{(-22)} = (9/12)^{(6m + 11)}$

Since bases are equal, equating the exponents:

=> −22 = 6m + 11

=> 6m = −22 − 11

=> 6m = −33

=> m = −33/6

Therefore The correct answer is option (1).

Additional Information

Product and Quotient Laws

For any non-zero base a, $a^m \times a^n = a^{(m+n)}$ and $a^m \div a^n = a^{(m-n)}$.

Negative Exponent Rule

The reciprocal of a base raised to a power is equal to the base raised to the negative of that power: $(a/b)^n = (b/a)^{(-n)}$.

Power of a Power

When a power is raised to another power, multiply the exponents: $(a^m)^n = a^{(m \times n)}$.

Equating Exponents

If $a^x = a^y$ (where a > 0 and a ≠ 1), then x = y must be true.

Q89. Answer: (c) Article 137

The correct answer is 'Article 137'

Key Points

• Article 137:

• Article 137 of the Indian Constitution grants the Supreme Court the power to review any judgment pronounced or order made by it.

• This power is subject to the provisions of any law made by Parliament or any rules made under Article 145.

• The primary objective of this power is to allow the Court to correct any "error apparent on the face of the record" or to prevent a miscarriage of justice.

• The Supreme Court is not strictly bound by its own previous decisions and can depart from them if it finds that a previous decision was erroneous or requires reconsideration due to changing circumstances.

• Under the Supreme Court Rules, a review petition must generally be filed within 30 days from the date of the judgment or order.

Additional Information

• Article 141:

• This Article stipulates that the law declared by the Supreme Court shall be binding on all courts within the territory of India.

• It establishes the principle of "Stare Decisis," ensuring consistency and predictability in the Indian legal system by making Supreme Court precedents mandatory for lower courts to follow.

• Article 145:

• Article 145 empowers the Supreme Court to make rules for regulating the practice and procedure of the Court, subject to the approval of the President and any law made by Parliament.

• This includes rules regarding the stay of proceedings, the enforcement of fundamental rights, and the conditions under which a review under Article 137 may be entertained.

• Article 136:

• Article 136 deals with "Special Leave to Appeal" (SLP). It grants the Supreme Court wide discretionary power to grant special leave to appeal against any judgment, decree, or order passed by any court or tribunal in India.

• It is considered an extraordinary power to be used in instances where a significant question of law is involved or a gross injustice has occurred, though it does not apply to judgments from military tribunals.

Important Points

• The power of review is distinct from the power of appeal. While an appeal is a rehearing by a higher court, a review is a reconsideration of the same matter by the same court.

• The concept of a Curative Petition was evolved by the Supreme Court in the case of Rupa Ashok Hurra vs. Ashok Hurra (2002) to prevent abuse of its process and to cure a gross miscarriage of justice even after a review petition has been dismissed.

• The Supreme Court is considered the 'Guardian of the Constitution' and the final interpreter of the law in India.

• Unlike the American Constitution, where the Supreme Court has the power of "Due Process of Law," the Indian Constitution originally provided for "Procedure Established by Law," though judicial interpretations have since expanded the scope of judicial review significantly.

Q90. Answer: (b) C:\config.ini

The correct answer is 'C:\config.ini'

Key Points

• Absolute Path:

• An absolute path (also known as a full path) is a hierarchical path that locates a file or folder in a computer system starting from the root directory and ending with the specific file or folder.

• In the Windows Operating System, an absolute path must include the drive letter followed by a colon (:) and a backslash ().

• The "root directory" refers to the top-most level of the file system hierarchy. In Windows, for the main drive, this is represented by C:.

• Therefore, a file named config.ini located directly in the root of the C: drive is addressed as C:\config.ini.

Additional Information

• config.ini:

• This is merely the filename or a relative path. It does not provide the complete information required to locate the file from anywhere in the system; it only works if the system is already looking within the specific directory where the file resides.

• C:\Users\config.ini:

• This represents an absolute path to a file located inside the "Users" folder on the C: drive. Since the question specifies the file is in the "root directory," adding "Users" to the path makes it incorrect.

• \config.ini:

• This is a path relative to the root of the current drive. While it points to the root, it lacks the explicit drive letter (C:), which is required for a complete absolute path reference in Windows to specify exactly which drive is being accessed.

Important Points

• In Windows, backslashes () are traditionally used as the directory separator, whereas Unix-based systems (like Linux or macOS) use forward slashes (/).

• The main partition where the operating system is installed is usually assigned the drive letter C by default.

• Absolute paths are essential in programming and system administration to ensure that scripts and applications can find necessary files regardless of the current working directory.

• Files with the .ini extension are typically initialization files used by Windows and various applications to store configuration settings.

Q91. Answer: (c) 247

Shortcut Trick

Assume a base average of 250 for the entire group.

Group A deviation = 42 × (335 − 250) = 42 × 85 = +3570

Group B deviation = 31 × (103 − 250) = 31 × (−147) = −4557

Group C deviation = 32 × (271 − 250) = 32 × 21 = +672

Net deviation = (3570 − 4557 + 672) ÷ 105 members = −315 ÷ 105 = −3

Actual Average = 250 − 3 = 247

Therefore Answer = 247

Alternate Method

Given:

Group A: n1 = 42, Avg1 = 335

Group B: n2 = 31, Avg2 = 103

Group C: n3 = 32, Avg3 = 271

Formula used:

Combined Average = (n1 × Avg1 + n2 × Avg2 + n3 × Avg3) ÷ (n1 + n2 + n3)

A (42) 335 B (31) 103 C (32) 271 Avg = 247 Total Members = 105

Calculations:

Total Expenditure = (42 × 335) + (31 × 103) + (32 × 271)

=> Total Expenditure = 14070 + 3193 + 8672

=> Total Expenditure = 25935

=> Total Members = 42 + 31 + 32 = 105

=> Overall Average = 25935 ÷ 105

=> Overall Average = 247

Therefore The correct answer is 247 (Option 3).

Additional Information

Weighted Average

When different groups have different sizes, the combined average is the sum of products of size and average, divided by the total size.

Deviation Method

For faster calculations, assume a mean (A) and find the average deviation: Result = A + (Σ Deviations ÷ Total Count).

Effect of Change

If every value in a set is increased or decreased by k, the average also increases or decreases by k.

Q92. Answer: (b) 90 cm

Shortcut Trick

Volume flow rate = Cross-section Area × Velocity

Rise in height (h) = (Area of pipe × Velocity × Time) ÷ Area of tank

$h = (\pi \times 1^2 \times 400 \times 24 \times 60) \div (\pi \times 80^2)$

h = (400 × 1440) ÷ 6400

h = 1440 ÷ 16 = 90 cm

Therefore Answer = 90 cm

Alternate Method

Given:

Pipe diameter = 2 cm => Pipe radius (r) = 1 cm

Flow speed = 4 m/s = 400 cm/s

Tank radius (R) = 80 cm

Time (t) = 24 minutes = 24 × 60 seconds = 1440 s

Formula used:

Volume of cylinder = $\pi r^2 h$

Volume of water flowed = Area of cross-section of pipe × speed × time

Pipe (r = 1 cm) Speed = 400 cm/s Tank (R = 80 cm) Rise (h) = ?

Calculations:

Let the rise in water level be h cm.

Volume of water from pipe in 24 mins = Volume of water collected in tank

=> $\pi \times r^2 \times \text{speed} \times \text{time} = \pi \times R^2 \times h$

=> $\pi \times (1)^2 \times 400 \times (24 \times 60) = \pi \times (80)^2 \times h$

=> $400 \times 1440 = 6400 \times h$

=> $h = (400 \times 1440) \div 6400$

=> $h = 1440 \div 16$

=> $h = 90$ cm

Therefore The correct answer is 90 cm.

Additional Information

Volume Flow Rate

The volume of liquid flowing through a pipe per unit time is given by $Q = A \times v$, where A is the cross-sectional area and v is the velocity.

Cylinder Surface Area

The curved surface area (CSA) of a cylinder is $2\pi rh$ and the total surface area (TSA) is $2\pi r(r + h)$.

Unit Conversion Rule

Always ensure all dimensions (radius, height, speed) are in the same unit system (e.g., cm and seconds) before calculation.

Pipe Flow into Tank

Time taken to fill a tank = (Volume of tank) ÷ (Area of pipe × Velocity of flow).

Q93. Answer: (c) 5

The logic followed here is:

Logic: Each letter in the word is represented by a unique digit, and the same letter always has the same code across words.

Given:

RUST → 3519

TEAM → 8645

Therefore, the code for 'T' is 5.

Hence, the correct answer is Option 3.

Q94. Answer: (b) 138

Shortcut Trick

Observe the difference between consecutive numbers:

40 − 33 = 7

54 − 40 = 14

75 − 54 = 21

103 − 75 = 28

Pattern: Addition of consecutive multiples of 7. Next diff = 28 + 7 = 35.

Therefore Answer = 138

Alternate Method

Given:

Series: 33, 40, 54, 75, 103, ?

Formula used:

Term_n = Term_(n−1) + (7 × (n − 1))

33 40 54 75 103 ? +7 +14 +21 +28 +35 Logic: Multiples of 7

Calculations:

Difference between 1^(st) and 2^(nd) term = 40 − 33 = 7 (7 × 1)

=> Difference between 2^(nd) and 3^(rd) term = 54 − 40 = 14 (7 × 2)

=> Difference between 3^(rd) and 4^(th) term = 75 − 54 = 21 (7 × 3)

=> Difference between 4^(th) and 5^(th) term = 103 − 75 = 28 (7 × 4)

=> Following the pattern, next difference = 7 × 5 = 35

=> Missing term = 103 + 35 = 138

Therefore The correct answer is 138.

Additional Information

Arithmetic Progression (AP)

A series where the difference between any two consecutive terms is constant, represented by T_n = a + (n − 1)d.

Double Difference Series

When the first differences do not form a pattern, finding the difference of those differences often reveals a constant or simple progression.

Geometric Progression (GP)

A series where each term is multiplied by a constant factor to get the next term, T_n = a × r^((n−1)).

Square and Cube Series

Series where the differences are perfect squares (1, 4, 9...) or cubes (1, 8, 27...), or the terms themselves follow n^2 or n^3 patterns.

Q95. Answer: (d) 3.45

Shortcut Trick

Radius (r) = CSA ÷ (2 × π × h)

Given CSA = 1300, h = 60, π = 22/7

r = 1300 ÷ (2 × 22/7 × 60)

r = (1300 × 7) ÷ (2 × 22 × 60)

r = 455 ÷ 132 ≈ 3.45 cm

Therefore Answer = 3.45

Alternate Method

Given:

Curved Surface Area (CSA) = 1300 cm^2

Length of the rod (h) = 60 cm

π = 22/7

Formula used:

Curved Surface Area (CSA) = 2 × π × r × h

r = ? h = 60 cm CSA = 1300 Radius ≈ 3.45 cm

Calculations:

CSA = 2 × π × r × h

=> 1300 = 2 × (22/7) × r × 60

=> 1300 = (2640 ÷ 7) × r

=> r = (1300 × 7) ÷ 2640

=> r = 9100 ÷ 2640

=> r = 455 ÷ 132

=> r ≈ 3.4469...

Therefore The correct answer is 3.45 (Option 4).

Additional Information

Total Surface Area of Cylinder

The total surface area includes the curved surface and the two circular bases: TSA = 2πr(h + r).

Volume of Cylinder

The amount of space occupied by a cylindrical rod is given by: Volume = $\pi r^2 h$.

Hollow Cylinder CSA

For a hollow cylinder with outer radius R and inner radius r, the total curved surface area is $2\pi h(R + r)$.

Slant Height of Cone

The slant height (l) of a cone is related to its radius (r) and height (h) as: $l = \sqrt{(r^2 + h^2)}$.

Q96. Answer: (a) (93, 185, 56)

The logic followed here is:

Logic: (1st number − 3rd number) × 5 = 2nd number

Given set:

(79, 235, 32)

=> (79 − 32) × 5

=> 47 × 5 = 235

And,

(87, 225, 42)

=> (87 − 42) × 5

=> 45 × 5 = 225

Now, checking the options:

Option 1) (93, 185, 56)

=> (93 − 56) × 5

=> 37 × 5 = 185

Option 2) (83, 290, 45)

=> (83 − 45) × 5

=> 38 × 5 = 190 ≠ 290

Option 3) (88, 280, 34)

=> (88 − 34) × 5

=> 54 × 5 = 270 ≠ 280

Option 4) (77, 235, 32)

=> (77 − 32) × 5

=> 45 × 5 = 225 ≠ 235

Hence, the correct answer is "Option 1".

Q97. Answer: (d) Centre = 1/3, States = 2/3

The correct answer is 'Centre = 1/3, States = 2/3'

Key Points

• GST Council Voting Structure:

• The Goods and Services Tax (GST) Council is a constitutional body established under Article 279A of the Indian Constitution to make recommendations to the Union and State Governments on issues related to GST.

• The voting power in the Council is distributed in a way that reflects cooperative federalism. The Central Government has a weightage of one-third (1/3rd) of the total votes cast.

• The State Governments (all states combined) hold a weightage of two-thirds (2/3rds) of the total votes cast in the meeting.

• Every decision of the Council must be taken at a meeting by a majority of not less than three-fourths (75%) of the weighted votes of the members present and voting.

• This mathematical arrangement ensures that neither the Centre nor the States (acting together) can pass a resolution without the support of the other, effectively giving the Centre a "veto" and requiring a large consensus among states.

Additional Information

• Centre = 1/2, States = 1/2:

• An equal 50-50 split is incorrect. If the power were divided equally, it would not account for the diverse fiscal interests of multiple states compared to the single Union entity, nor would it align with the 75% majority requirement.

• Centre = 2/3, States = 1/3:

• This distribution is incorrect as it would give the Central Government unilateral power to pass any decision (since it would only need a tiny fraction of states to reach 75%). The actual law empowers States more collectively to protect their fiscal autonomy.

• States alone = 1, Centre = 0:

• This is incorrect because the GST Council is a joint forum. Since the Union Government surrendered its power to levy various

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indirect taxes (like Excise Duty and Service Tax) to the GST regime, it must have a significant say in the Council's decision-making process.

Important Points

• The Union Finance Minister serves as the Chairperson of the GST Council.

• The Union Minister of State in charge of Revenue or Finance is a member.

• Each State Government nominates a Minister in charge of Finance or Taxation or any other Minister as a member.

• A quorum for the meeting of the Council is one-half (50%) of the total number of members.

• The GST Council is considered a success story of cooperative federalism in India, as it brings the Centre and all States to one table to decide uniform tax rates and laws.

Q98. Answer: (a) AXA 120

The logic followed here is:

So, 'AXA 120' will replace the question mark in the given series.

Hence, the correct answer is "Option 1".

Q99. Answer: (b) Brahmaputra valley

The correct answer is 'Brahmaputra valley'

Key Points

• Brahmaputra Valley:

• The Brahmaputra Valley is considered a minor industrial region in India, primarily located in the state of Assam.

• This region's industrial growth is largely driven by its rich natural resources, particularly tea, petroleum, and forest products.

• Key industrial centers in this region include Digboi, Naharkatiya, Noonmati, and Bongaigaon, which are famous for oil refineries and petrochemical complexes.

• Unlike major industrial regions that have a high density of diverse industries, the Brahmaputra valley has a more specialized and localized industrial setup, mainly focusing on resource extraction and primary processing.

Additional Information

• Hugli Region:

• This is one of the major industrial regions of India, extending along the Hugli River in West Bengal.

• It is the oldest industrial hub in the country, historically famous for its jute industry, but also hosts chemical, pharmaceutical, and engineering industries.

• Gujarat Region:

• The Gujarat region (specifically the Ahmedabad-Vadodara belt) is a major industrial region known for its rapid growth.

• It is a powerhouse for the textile industry, petroleum refining, chemical manufacturing, and pharmaceutical production.

• Chota Nagpur Region:

• Often referred to as the "Ruhr of India," this is a major industrial region covering parts of Jharkhand, West Bengal, and Odisha.

• It is the heartland of India's heavy industry, dominated by iron and steel plants, coal mining, and heavy engineering sectors due to the abundance of mineral resources.

Important Points

• In India, industrial regions are classified into Major Industrial Regions (8), Minor Industrial Regions (13), and Industrial Districts/Clusters (15) based on the concentration of units and labor force.

• The eight major industrial regions are:

1. Mumbai-Pune Region
2. Hugli Region
3. Bangalore-Tamil Nadu Region
4. Gujarat Region
5. Chota Nagpur Region
6. Vishakhapatnam-Guntur Region
7. Gurgaon-Delhi-Meerut Region
8. Kollam-Thiruvananthapuram Region

• Minor industrial regions include areas like Ambala-Amritsar, Saharanpur-Muzaffarnagar, Indore-Dewas-Ujjain, Jaipur-Ajmer, and the Brahmaputra Valley.

• The identification of these regions is typically based on indices like the number of industrial workers, the quantity of power used for industrial purposes, and the total value of industrial output.

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Q100. Answer: (c) 10

Given number: 54672139

Logic: Arrange digits in ascending order from left to right

Original number: 5 4 6 7 2 1 3 9

Now arranging in ascending order: 1 2 3 4 5 6 7 9

Digit position from left	Digit
1st	1
2nd	2
3rd	3
4th	4
5th	5
6th	6
7th	7
8th	9

Now, Third from left = 3

Second from right = 7

Sum = 3 + 7 = 10

Hence, the correct answer is Option 3.

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