RRB NTPC (Graduate) CBT-I Official Paper (Held On: 18 Mar, 2026 Shift 2) (Previous Year Paper)

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

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Q1. What should come in place of '?' in the given series?

325 200 136 109 101 ?

(a) 101
(b) 100
(c) 102
(d) 104

Q2. Based on the alphabetical order, three of the following four 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) DJF
(b) JPL
(c) HNJ
(d) FLG

Q3. In a certain code language, 'please drink water' is coded as 'gf sx zr' and 'water is flowing' is coded as 'po vb sx'. How is 'water' coded in the given language?

(a) zr
(b) sx
(c) po
(d) gf

Q4. If a = 1/14, b = 1/14 and c = - 1/7, the value of a3 + b3 + c3 is:

(a) (-1)/1372
(b) (-3)/1372
(c) 1/1372
(d) 3/1372

Q5. 48 is related to 192 following a certain logic. Following the same logic, 52 is related to 208. To which of the following is 61 related, following the same logic?

(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.)

(a) 234
(b) 244
(c) 264
(d) 254

Q6. Which among following fundamental duties is INCORRECT related towards the protection and promotion of scientific and cultural values?

(a) To develop the scientific temper, humanism and the spirit of inquiry and reform.
(b) To safe guard the public property and to abjure violence

(c) To strive towards excellence in all spheres of individual and collective activity.
(d) To value and preserve the rich heritage of our composite culture.

Q7. 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.

Question:

Among 5 trees, L, M, N, T and V each having a different height, which tree is the shortest?

Statements:

(I) L is taller than only two trees. M is shorter than L and T is shorter than M.

(II) V is taller than N.

(a) Data in Statement II alone is sufficient to answer the question while data in statement I is not
(b) Both statements I and II together (and not statement 1 alone or statement II alone) are sufficient to answer the question
(c) Data in Statement I alone is sufficient to answer the question while data in statement II is not
(d) Both statements I and II together are NOT sufficient to answer the question

Q8. The price of each article of type P, Q, and R is Rs. 280, Rs. 180 and Rs. 115, respectively. Rohit buys articles of each type in the ratio 4 : 2 : 7 for Rs. 6,855. How many articles of type Q did he purchase?

(a) 14
(b) 6
(c) 12
(d) 3

Q9. Let ABC be a right-angled triangle such that angle B = 90°. If tan A = 1, then find the value of cosec A sec A.

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

Q10. Which of the following tabs in Task Manager shows CPU and memory usage graphs?

(a) Performance
(b) Startup
(c) Users
(d) Details

Q11. Two parallel lines, L1 and L2, are cut by a transversal. If one of the interior angles on the same side of the transversal is 70°, what is the measure of the other interior angle on the same side of the transversal?

(a) 70°
(b) 110°
(c) 180°
(d) 120°

Q12. FEAR is related to DBWM in a certain way based on the English alphabetical order. In the same way, BYSH is related to ZVOC. To which of the following is XSKX related, following the same logic?

(a) UQHT
(b) VPGS
(c) WOFS
(d) UPGR

Q13. There are 48 members in group A, 46 members in group B and 36 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. 477, Rs. 236 and Rs. 348, respectively. The overall average amount (in Rs.) spent per member is:

(a) 356
(b) 355
(c) 360

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(d) 351

Q14. 9 : 81 :: 2.5 : x and 3 : 6 :: 5 : y. What is the ratio of x to y?6395

(a) 10 : 2
(b) 13 : 14
(c) 9 : 4
(d) 5 : 3

Q15. In 2025, which organization released the Global Carbon Budget, providing the most comprehensive annual assessment of global carbon sources, sinks, and emission trends?

(a) Intergovernmental Panel on Climate Change (IPCC)
(b) World Meteorological Organization (WMO)
(c) UN Environment Programme (UNEP)
(d) Global Carbon Project (GCP)

Q16. Consider the following statements regarding the Central Administrative Tribunal (CAT) and select which is/are correct.

1. It exercises original jurisdiction in matters related to recruitment and service conditions of public servants.
2. Members of the defence forces, Supreme Court officers, and Parliamentary staff are also covered.
3. Members of CAT are appointed based on the recommendation of a high-powered committee chaired by the Prime Minister.

(a) 2 and 3 only
(b) 1 only
(c) 1 and 2 only
(d) 2 only
(e) None of the above

Q17. Simplify: (4.8 × 0.36 × 0.28)/(0.08 × 0.12)

(a) 50.6
(b) 50.2
(c) 50.4
(d) 50.8

Q18. A car leaves place Z at 2 PM and moves towards place T which is at a distance of D km at a uniform speed. A bus leaves place T at 3 PM and moves towards place Z at a uniform speed. The speed of car is half of bus. If they meet 04:40 PM at a point which is 184 km away from Z. The value of D is:

(a) 405
(b) 420
(c) 423
(d) 414

Q19. Each of the digits in the number 4568923 is arranged in ascending order from left to right. The position of how many digits will remain unchanged as compared to that in the original number?

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

Q20. A hemispherical tank filled with water is being emptied through a pipe at a rate of 115.5 litres per second. If the tank has an internal radius of 31.5 m, determine the time required to drain 50% of the tank's water. (Use π = 22/7)

(a) 78 hours 75 minutes
(b) 75 hours 48 minutes
(c) 78 hours 15 minutes
(d) 78 hours 45 minutes

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Q21. In a certain code language,

A + B means ‘A is the daughter of B’

A - B means ‘A is the mother 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 G related to M if 'G - R + W ÷ D x M’?

(a) Wife
(b) Wife's sister
(c) Wife's mother
(d) Sister

Q22. Sushma walked 80 m towards North, took a left turn and walked 30 m. He again took a left turn and walked 80 m. How far and in which direction is he from the starting point? (All turns are 90-degree turns only, unless specified.)

(a) 70 m, West
(b) 70 m, East
(c) 60 m, East
(d) 30 m, West

Q23. The T-shaped pillar found in Türkiye in October 2025 is significant for which historical period?

(a) Neolithic
(b) Iron Age
(c) Medieval
(d) Bronze Age

Q24. Refer to the following number and symbol series and answer the question. Counting to be done from left to right only. (All numbers are single-digit numbers only.)

(Left) 8 * 7 ? 5 £ + Ω 1 2 6 $ = @ & 3 ~ 4 # 9 % (Right)

How many such symbols are there, each of which is immediately preceded by an even number but not immediately followed by an odd number?

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

Q25. In what duration (in years) will Rs. 6,000 fetch a simple interest of Rs. 1,080 at 6% per annum rate of interest?

(a) 2
(b) 6
(c) 4
(d) 3

Q26. Which AI-powered diagnostic model, unveiled by Indian scientists in 2025, analyses cancer at the molecular level to improve classification and treatment outcomes?

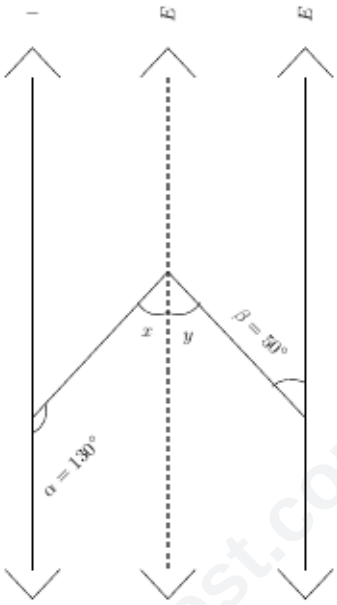
(a) TumourTrack intelligent cancer analysis system
(b) OncoMark AI-powered cancer diagnostic model
(c) BioScan AI-based tumour classification model
(d) GeneMap advanced molecular oncology platform

Q27. What is the primary function of Ctrl + Y in most Windows applications?

(a) Undo the last action
(b) Paste the previous item
(c) Copy the selected text
(d) Redo the last undone action

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Q28. In the given figure, lines l, m, and n are parallel to one another. Find the value of x + y.



(a) 110°
(b) 100°
(c) 80°
(d) 130°

Q29. What type of activity is tourism classified as?

(a) Secondary
(b) Primary
(c) Tertiary
(d) Quaternary

Q30. Which 13th-century 1193 CE monument was built by Qutb-ud-din Aibak?

(a) Red Fort
(b) Qutub Minar
(c) Quwwatul Islam Masjid
(d) Jama Masjid

Q31. Providing free legal aid under Article 39A indirectly promotes which Preamble objective?

(a) Sovereignty
(b) Republic
(c) Secularism
(d) Justice

Q32. Which tab in the Windows 11 Task Manager allows a user to change the priority of a running application?'

(a) Users
(b) Startup
(c) Details
(d) Performance

Q33. Which of the following regions would you expect has the highest population density based on geographic factors?

(a) Amazon rainforest in Brazil
(b) Sahara Desert in Africa
(c) Canadian Arctic tundra
(d) Ganga River basin in India

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Q34. Lv is the daughter of Jy. Fm is the daughter of Nw. Dg is the brother of Lv. Nw is married to Dg. How is Fm related to Jy?

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

Q35. 12 is related to 66 following a certain logic. Following the same logic, 24 is related to 276. To which of the following is 10 related, following the same logic?

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying 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.)2133

(a) 90
(b) 110
(c) 55
(d) 45

Q36. Dr. Budhri Tati, named for the Padma Shri in the Padma Awards announced in 2026, is linked to which of the following areas of contribution?

(a) Literature and Education
(b) Science and Engineering
(c) Social Work
(d) Trade and Industry

Q37. 20% of a number is more than 20% of 620 by 170. The number is:

(a) 1320
(b) 1470
(c) 1570
(d) 1520

Q38. What is the value of (7x + 5y) if mean of the following distribution is 55?

Class	Frequency
0-20	4
20-40	19
40-60	x
60-80	5
80-100	y
Total	64

(a) 215
(b) 225
(c) 224
(d) 214

Q39. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only. All numbers are single-digit numbers only.

(Left) @ / 3 & 5 3 9 1 ? % 7 % 7 6 9 4 ? + (Right)

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

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

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(d) Three

Q40. In an election between two candidates, 86% of the registered voters cast their vote and 20% of the votes polled were found invalid. Winning candidate got 55% of the valid votes and won the election by a margin of 3010 votes. How many voters were registered?

(a) 43760
(b) 43770
(c) 43750
(d) 43740

Q41. Select the pair which follows the same pattern as that followed by the two set of pairs given below. Both pairs follow the same pattern.

OCI : SGM

QEK : UIO

(a) HIR : NDH
(b) THN : XLR
(c) KGT : NJK
(d) LBR : PQL

Q42. 210 is related to 148 following a certain logic. Following the same logic, 185 is related to 123. To which of the following is 125 related, following the same logic?

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding /subtracting /multiplying, 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.)

(a) 71
(b) 61
(c) 63
(d) 66

Q43. 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:

Some turtles are rabbits. No rabbit is an eagle. No rabbit is a pig.

Conclusions:

(I): No turtle is an eagle.

(II): Some pigs are eagles.

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

Q44. A vendor bought oranges at the rate of 40 oranges for Rs. 220, and sold them at Rs. 98 per dozen. Find his profit or loss percent. (Round off to two decimal places.)

(a) Profit 48.48%
(b) Loss 48.48%
(c) Loss 28.56%
(d) Profit 28.56%

Q45. A typist takes 40 minutes to type 2 pages. How long (in minutes) will he take to type 83 pages?

(a) 1670
(b) 1650
(c) 1665
(d) 1660

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Q46. Water is pouring into a cuboidal reservoir at the rate of 70 litres per minute. The volume of the reservoir is 168 m^3. Find the time (in hours) it will take to fill the reservoir.

(a) 25
(b) 35
(c) 30
(d) 40

Q47. Seven boys — A, B, C, D, E, F, and G — are sitting around a circular table facing the centre, but not necessarily in the same order. Only three people sit between D and C when counted from the left of D. Only three people sit between G and B when counted from the right of B. E sits to the immediate right of G. F is an immediate neighbour of both B and C.

Match each boy in Column I to his neighbour to the immediate left in Column II and select the correct answer from the given options.

Column I (Boy)	Column II (Neighbour to his immediate left)
i. B	(W) B
ii. E	(X) C
iii. A	(Y) G
iv. F	(Z) D

(a) i-X, ii-W, iii-Z, iv-Y
(b) i-Z, ii-Y, iii-X, iv-W
(c) i-W, ii-Y, iii-Z, iv-X
(d) i-Y, ii-W, iii-Z, iv-X

Q48. Based on the English alphabetical order, three of the following four 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) KOT
(b) SWB
(c) GKP
(d) BFJ

Q49. Which of the following was a function of the Vaishya class in later Vedic society?

(a) Subordinated class
(b) Ruling class
(c) Ritual specialists
(d) Producing class

Q50. The mean proportion of 15 and 72.6 is:

(a) 32
(b) 28
(c) 33
(d) 36

Q51. 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:

No biscuit is a wafer. No wafer is a candy. No candy is a juice.

Conclusions:

(I) No biscuit is a candy.

(II) No wafer is a juice.

(a) Both conclusions (I) and (II) follow

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(b) Neither conclusion (I) nor (II) follows
(c) Only conclusion (I) follows
(d) Only conclusion (II) follows

Q52. The archaeological site of Langhnaj in Gujarat, known for microlithic tools and evidence of hunting-gathering communities, is associated with which prehistoric cultural phase in India?
(a) Chalcolithic culture
(b) Palaeolithic culture
(c) Mesolithic culture
(d) Neolithic culture

Q53. Seven people B, C, O, P, Q, R and S are sitting around a circular table facing the center of the table. Only three people sit between B and S, when counted from the left of B. Only two people sit between Q and O when counted from the left of Q. P sits third to the left of C. R is an immediate neighbor of C and O. How many people between B and R when counted from the left of R?
(a) One
(b) Three
(c) Two
(d) Four

Q54. What is the green pigment found in plants that is essential for capturing light energy during photosynthesis?
(a) Chlorophyll
(b) Hemoglobin
(c) Insulin
(d) Glucose

Q55. As per Article 243Y of the Indian Constitution, to whom does the Finance Commission submit its recommendations regarding Municipalities?
(a) Chief Secretary of the State
(b) Governor of the State
(c) State Finance Minister
(d) President of India

Q56. For what values of k will the equation $x^2 + kx + 361 = 0$ have equal roots?
(a) ±36
(b) ±19
(c) ±38
(d) ±18

Q57. India adopted the United Nations Sustainable Development Goals (SDGs) in which year?
(a) 1992
(b) 2011
(c) 2015
(d) 2012

Q58. On which of the following National Waterways of India is the floating terminal Farakka situated?
(a) National Waterways 3
(b) National Waterways 5
(c) National Waterways 2
(d) National Waterways 1

Q59. Which physical quantity can be zero even when a body is in motion?
(a) Distance
(b) Speed
(c) Velocity
(d) Displacement

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Q60. A and B complete a work in 21 days. If A alone can do it in 24 days, then B alone can do three-fourth of the same work in _____days.

(a) 168
(b) 140
(c) 126
(d) 132

Q61. Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week.

P has the exam on Wednesday. Only three people have exams after R. S has the exam after Q but before P. U has the exam before V but not on Friday.

How many people have exams between T and Q?

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

Q62. The stem that undergoes modification, becomes flattened and carries chlorophyll to bear the responsibility of photosynthesis instead of leaf, is termed as _____.

(a) cladode
(b) rhizome
(c) stolon
(d) thorn

Q63. Evaluate: (-9) - (-56) ÷ (-14) + (-2) × 7

(a) -30
(b) -27
(c) -29
(d) -26

Q64. Which major mass movement did the Indian National Congress agree to withdraw, under the Gandhi–Irwin Pact of March 1931?

(a) Non Cooperation Movement
(b) Quit India Movement
(c) Swadeshi Movement
(d) Civil Disobedience Movement

Q65. After visiting India and learning about Indian culture, Al-Biruni wrote which book?

(a) Babarnama
(b) Chahar Maqala
(c) Kitab-Ul-Hind
(d) Qiran us Sa'dain

Q66. Which of the following is not contained in Article 51?

(a) Protection of forests and wildlife of India
(b) Respect for international law and treaty obligations
(c) Promotion of international peace and security
(d) Just and honourable relations between nations

Q67. The mean of 80 numbers was found to be 49. If at the time of calculation, two numbers were incorrectly taken as 69 and 74 instead of 92 and 83, then the correct mean is _____.

(a) 48.5
(b) 46.2
(c) 49
(d) 49.4

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Q68. In a cricket match, a team needs 300 runs in 50 overs to win. In the first 15 overs, the team scores at an average rate of 5 runs per over. In the next 15 overs, the scoring rate improves to 8 runs per over. In the following 10 overs, the rate drops to 4 runs per over. What should be the run rate per over required in the remaining overs to win the match?

(a) 6.75 runs per over
(b) 6.95 runs per over
(c) 6.5 runs per over
(d) 7.5 runs per over

Q69. What is the main objective of granting classical language status to certain Indian languages?

(a) To make them compulsory official languages
(b) To promote research and preservation of ancient linguistic heritage
(c) To replace modern languages in education
(d) To reduce the use of regional languages

Q70. Krish has Rs. 1407 with him. He divides this amount between his two sons, Veer and Nitin, and asks them to invest their respective shares at a compound interest rate of 10% per annum, compounded annually. It is observed that Veer's investment amounts to the same value after 14 years as Nitin's investment does after 15 years. How much (in Rs.) did Krish give to Nitin?

(a) 670
(b) 737
(c) 837
(d) 520

Q71. At present, Vanraj is three times as old as his son, and his daughter is 3 years younger than the son. If the sum of the ages of these three people 3 years ago was 73 years, then Vanraj's present age (in years) is:

(a) 57
(b) 60
(c) 53
(d) 51

Q72. A shopkeeper fixes the marked price of an item 110% above its cost price. What percentage of discount on marked price should be allowed to gain 26%?

(a) 40%
(b) 38%
(c) 39%
(d) 43%

Q73. Which basin is home to over 10% of known global biodiversity, including many species found nowhere else in the world?

(a) Danube Basin
(b) Amazon Basin
(c) Nile Basin
(d) Mississippi Basin

Q74. What was the central theme of the 11^(th) World Green Economy Summit held in Dubai in November 2025?

(a) Innovating for Impact
(b) Sustainable Future
(c) Leading with Technology
(d) Climate Action Now

Q75. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

DAZ 75 XUT 87 RON 99 LIH 111 ?

(a) FCB 123
(b) FDA 123

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(c) FOY 122
(d) FBA 122

Q76. Refer to the following letter, number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) @ B & G V 7 N % K U I 3 # € * $ 7 © U @ Z 5 (Right)

If all the symbols are dropped from the series, which of the following will be sixth from the left?

(a) 3
(b) U
(c) K
(d) N

Q77. By selling an article at 2/5 of its marked price,Aman incurs a loss of 21%. If he sells it at 56% of its marked price, then the profit percentage is

(a) 10.6%
(b) 12.8%
(c) 12.1%
(d) 11.6%

Q78. In a certain code language, ‘HOUR’ is coded as ‘8359’ and ‘HORN’ is coded as ‘9856’. What is the code for ‘N’ in the given code language?

(a) 8
(b) 6
(c) 5
(d) 9

Q79. Which city hosted the National Games after India's independence in 1948?

(a) Chennai
(b) Delhi
(c) Kolkata
(d) Lucknow

Q80. Seven boxes, D, E, F, G, H, I and J are kept one over the other but not necessarily in the same order. D is kept fifth from the bottom. Only two boxes are kept between D and H. I is kept somewhere above D but below E. Only two boxes are placed between G and F. F is not placed at the bottom. Which box is kept third from the bottom?

(a) G
(b) J
(c) I
(d) H

Q81. Evaluate: 16 + 20 ÷ 5 - 3 × 3

(a) 10
(b) 11
(c) 13
(d) 14

Q82. Which structural change increased competition in the Indian industry after liberalisation?

(a) Price controls
(b) Industrial protection
(c) Public monopolies
(d) Entry of MNCs

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Q83. In the post-liberalization era, the agricultural marketing system remained inefficient due to which structural factor?

(a) Weak APMC reform implementation
(b) Full deregulation of exports
(c) Uniform E-NAM adoption
(d) Over-corporatization of produce

Q84. Which national park in India has been declared a UNESCO World Heritage since 1987 for its unique mangrove ecosystem?

(a) Kaziranga National Park
(b) Gir National Park
(c) Jim Corbett National Park
(d) Sundarbans National Park

Q85. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

ADF 16 DGI 27 GJL 38 JMO 49 ?

(a) MQQ 60
(b) MOQ 59
(c) MNP 59
(d) MPR 60

Q86. Two trains are moving in opposite directions at speeds of 140 km/hr and 70 km/hr. The length of one train is 350 m. The time taken by them to cross each other is 11 seconds. The length (in m, rounded off to 2 decimal places) of the other train is:

(a) 293.51
(b) 288.08
(c) 289.34
(d) 291.67

Q87. X, Y, Z, S, T and U live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it is number 2 and so on till the topmost floor is numbered 6. Only two people live between T and Y. Only S lives above U. Z lives on an even numbered floor. T lives on the lowermost floor. How many people live between X and T?

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

Q88. The highest common factor (HCF) of two numbers is one-fifth of the first number and one-third of the second number. The HCF is a two-digit prime number. The HCF of three times the first number and five times the second number is a number which is the product of _____.

(a) five prime numbers
(b) three prime numbers
(c) two prime numbers
(d) four prime numbers

Q89. Which of the following incidents prompted Mahatma Gandhi to withdraw the Non-Cooperation Movement?

(a) Alipore bomb case
(b) Withdrawal of the Khilafat Movement
(c) Chauri-Chaura incident
(d) Suspension of the Rowlatt Act

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Q90. Which power mode uses the least electricity while maintaining an open session?

(a) Standby
(b) Sleep
(c) Hibernate
(d) Active mode

Q91. Mayonnaise is prepared by the process of:

(a) Caramelisation
(b) Emulsification
(c) Maillard reaction
(d) Oxidation

Q92. What is the main difference between a Cabinet Minister and a Minister of State with independent charge?

(a) A Ministry of State is included in Cabinet meetings but does not exercise any significant powers.
(b) A Minister of State with independent charge may head a ministry without being under a Cabinet Minister.
(c) A Minister of State with independent charge does not exercise any significant powers.
(d) A Minister of State with independent charge does not hold any specific responsibilities.

Q93. What was the primary measure introduced in the 1991 for unlicensed manufacturing activities in India?

(a) Project Approval Licence
(b) Special Economic Filing Certificate
(c) Entrepreneurial Clearance Form
(d) Industrial Entrepreneurs Memoranda

Q94. 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 :: ?

: IOJ :: NTO : %

(a) = KQJ, % = LRM
(b) = KQL, % = LSM
(c) = KQL, % = LRN
(d) = KQL, % = LRM

Q95. Which of the following is INCORRECT about the Rampa Rebellion?

(a) It took place in present day Maharashtra
(b) It was led by Alluri Sitarama Raju
(c) It involved the use of guerrilla warfare tactics
(d) It was against forest laws and moneylenders

Q96. Which crop variety, highlighted by the National Agri-food Biotechnology Institute (NABI), can withstand flash floods, showcasing climate-resilient biotechnology?

(a) DRR Rics 100 (kalam)
(b) Swarna-Sub1 rice
(c) Pusa DST Rice 1
(d) IR8 Rice

Q97. 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?

37 C 32 A 2 D 9 B 2 = ?

(a) 34
(b) 36
(c) 35
(d) 33

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Q98. Which ocean current is primarily responsible for moderating the climate of Western Europe by transporting warm water from the tropics?

(a) Humboldt Current
(b) North Atlantic Drift
(c) Oyashio Current
(d) Canary Current

Q99. In the Union Budget of India 2025–26 (presented on 1 February 2025), the Government proposed raising the FDI cap in the insurance sector from 74% to what level (subject to specified conditions)?

(a) 49%
(b) 90%
(c) 80%
(d) 100%

Q100. What should come in place of '?' in the given series?

56 58 61 66 73 ?

(a) 84
(b) 83
(c) 85
(d) 86

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) 100

The logic followed here is:
thus, "100" will replace the question mark in the given series.
Hence, the correct option is "Option 2".

Q2. Answer: (d) FLG

The logic followed here is based on the alphabetical position pattern:
Option 1: DJF
Option 2: JPL
Option 3: HNJ
Option 4: FLG
Thus, FLG is different from the rst given options.
Hence, the odd one out is Option 4.

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Q3. Answer: (b) sx

The logic followed here is:

Given:

please drink water → gf sx zr

water is flowing → po vb sx

So, water → sx

Hence, the correct answer is Option 2.

Q4. Answer: (b) (-3)/1372

Shortcut Trick

=> a + b + c = 1/14 + 1/14 − 1/7 = 0

=> Use identity: $a^3 + b^3 + c^3 = 3abc$

=> $3abc = 3 \times (1/14) \times (1/14) \times (-1/7)$

=> = −3 / 1372

Therefore Answer = −3/1372

Alternate Method

Given: a = 1/14, b = 1/14, c = −1/7

Formula: $a^3 + b^3 + c^3$

=> $a^3 = (1/14)^3 = 1/2744$

=> $b^3 = 1/2744$

=> $c^3 = (-1/7)^3 = -1/343$

=> Sum = 1/2744 + 1/2744 − 1/343

=> = 2/2744 − 1/343

=> = 1/1372 − 4/1372

=> = −3/1372

Therefore Final Answer = −3/1372

Additional Information

Identity 1: If a + b + c = 0 → $a^3 + b^3 + c^3 = 3abc$

Identity 2: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Cubes of Fractions: $(p/q)^3 = p^3 / q^3$

LCM Trick: Use common denominator to simplify quickly

Q5. Answer: (b) 244

The logic followed here is:

48 → 192

=> 48 × 4 = 192

52 → 208

=> 52 × 4 = 208

So, the pattern is:

Second number = First number × 4

Now, applying the same pattern for 61:

=> 61 × 4 = 244

Hence, the correct answer is Option 2.

Q6. Answer: (b) To safe guard the public property and to abjure violence

The correct answer is To safe guard the public property and to abjure violence.

Key Points

• Fundamental Duties are enshrined in Part IV-A of the Constitution of India under Article 51A. These duties were added to the constitution to remind citizens of their social and moral obligations towards the nation.

• Article 51A(h): This clause states that it is the duty of every citizen to develop the scientific temper, humanism and the spirit of inquiry and reform. This duty is specifically designed to promote scientific values and rational thinking among the masses. Hence, this statement is correct.

• Article 51A(f): This clause emphasizes the duty to value and preserve the rich heritage of our composite culture. This is the

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primary duty associated with the protection and promotion of cultural values and historical legacy. Hence, this statement is correct.

• Article 51A(i): This clause mandates citizens to safeguard public property and to abjure violence. While this is a significant Fundamental Duty, it relates to civic sense, law and order, and non-violence, rather than the thematic category of scientific or cultural values. Hence, this statement is incorrect in the context of the specific theme mentioned in the question.

• Article 51A(j): This clause encourages citizens to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavor and achievement. While it promotes general progress, it is often grouped with duties that lead to intellectual and cultural advancement. Hence, this statement is correct.

Additional Information

• Origin and Adoption: The Fundamental Duties were not part of the original Constitution. They were incorporated based on the recommendations of the Swaran Singh Committee during the Internal Emergency in 1976. The 42nd Amendment Act, 1976 introduced 10 duties initially.

• Source: The concept of Fundamental Duties in the Indian Constitution was inspired by the constitution of the erstwhile USSR (now Russia). Unlike Fundamental Rights, these duties are non-justiciable, meaning they cannot be directly enforced by courts, though they serve as a guide for interpreting laws.

• The 11th Duty: Originally there were only 10 duties. The 11th Fundamental Duty, which requires parents or guardians to provide opportunities for education to children between the age of 6 and 14 years, was added by the 86th Constitutional Amendment Act in the year 2002.

• Verma Committee (1999): This committee was established to identify the existence of legal provisions for the implementation of some of the Fundamental Duties. It pointed out that several duties are already enforceable through existing laws like the Prevention of Insults to National Honour Act (1971) and the Protection of Civil Rights Act (1955).

• Nature of Duties: Some duties are moral duties (like cherishing the noble ideals of the freedom struggle), while others are civic duties (like respecting the National Flag and the National Anthem). They apply only to citizens of India and do not extend to foreigners.

Important Points

• Significance of Scientific Temper: The inclusion of scientific temper as a duty is unique to the Indian Constitution. It encourages a questioning mind and discourages superstition, aiming for a modern, progressive India.

• Preservation of Culture: The term "Composite Culture" refers to the syncretic and diverse traditions of India, including various religions, languages, and ethnicities, which citizens are expected to protect.

• Public Property and Violence: Article 51A(i) is crucial for maintaining internal security and social harmony, especially during protests or civil unrest, ensuring that national assets are not destroyed.

Q7. Answer: (c) Data in Statement I alone is sufficient to answer the question while data in statement II is not

Given Statements:

I. L is taller than only two trees. M is shorter than L and T is shorter than M.

II. V is taller than N.

Analysis:

I. From Statement I → L is taller than only two trees, so L is 3rd tallest.

Since, M is shorter than L and T is shorter than M, we get a definite order below L as L > M > T.

This already fixes T as the shortest among the given trees → Statement I alone is sufficient.

II. From Statement II → V is taller than N, but no relation with L, M, or T is given, so shortest cannot be determined → Not sufficient.

Using both I and II together → Although we can extend the ordering further, Statement I itself already identifies T as the shortest tree, so additional information is not required.

Hence, the correct answer is Option 3.

Q8. Answer: (b) 6

Shortcut Trick

=> Ratio = 4 : 2 : 7 → total parts = 13

=> Cost of one ratio set = (4×280) + (2×180) + (7×115) = 2285

=> Number of sets = 6855 ÷ 2285 = 3

=> Q = 2 × 3 = 6

Therefore Answer = 6

Alternate Method

Given:

Price of P = 280, Q = 180, R = 115; Ratio = 4 : 2 : 7; Total cost = 6855

Formula Used:

Total Cost = (Quantity × Price) + (Quantity × Price) + (Quantity × Price)

Calculation:

=> Let quantities be 4x, 2x, 7x

=> Total cost = (4x × 280) + (2x × 180) + (7x × 115)

=> = 1120x + 360x + 805x

=> = 2285x

=> 2285x = 6855

=> x = 3

=> Quantity of Q = 2x = 6

Therefore Final Answer = 6

Additional Information

Ratio Concept: Quantities in ratio a:b:c are taken as ax, bx, cx

Cost Relation: Total Cost = Σ (price × quantity)

Shortcut Insight: Find cost of one full ratio set first

Exam Tip: Always check if total is divisible directly

Q9. Answer: (c) 2

Shortcut Trick

=> tan A = 1 => A = 45°

=> cosec A = √2, sec A = √2

=> cosec A × sec A = √2 × √2 = 2

Therefore Answer = 2

Alternate Method

Given:

tan A = 1, angle B = 90°

Formula Used:

tan A = Perpendicular / Base

cosec A = Hypotenuse / Perpendicular

sec A = Hypotenuse / Base

Calculation:

=> tan A = 1 => Perpendicular = Base

=> Let Perpendicular = 1, Base = 1

=> Hypotenuse = $\sqrt{(1^2 + 1^2)} = \sqrt{2}$

=> cosec A = √2 / 1 = √2

=> sec A = √2 / 1 = √2

=> cosec A × sec A = √2 × √2 = 2

Therefore Final Answer = 2

Additional Information

tan 45°: tan 45° = 1

Pythagoras Theorem: $Hyp^2 = Perp^2 + Base^2$

cosec θ: cosec θ = Hypotenuse / Perpendicular

sec θ: sec θ = Hypotenuse / Base

Q10. Answer: (a) Performance

The correct answer is Performance.

Key Points

• The Performance tab in Windows Task Manager is specifically designed to provide real-time visualization of the hardware resources being utilized by the system.

• It displays dynamic CPU (Central Processing Unit) usage graphs, showing the current utilization percentage and clock speed (measured in GHz).

• This tab also provides detailed memory usage graphs, which track how much RAM (Random Access Memory) is currently in use, available, and cached.

• Beyond just CPU and RAM, the Performance tab monitors Disk activity (Read/Write speeds), Ethernet/Wi-Fi throughput

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(Send/Receive speeds), and GPU (Graphics Processing Unit) load.

• Users can view technical specifications such as the number of Cores, Logical processors, L1/L2/L3 cache sizes, and the system Uptime (the duration since the last reboot).

Additional Information

• Startup Tab:

• This tab manages applications that automatically launch when the Windows operating system starts.

• It helps users identify Startup Impact, which can be High, Medium, or Low, allowing them to disable unnecessary programs to speed up the boot process.

• Users Tab:

• This section lists all active user accounts currently logged into the computer.

• It provides a breakdown of resource consumption per user, which is essential for administrators managing multi-user environments or servers.

• Details Tab:

• The Details tab is an advanced version of the Processes tab, providing the PID (Process ID) for every running executable.

• It allows users to change Process Priority (e.g., High, Realtime) and set CPU Affinity to restrict a process to specific processor cores.

• Processes Tab:

• The primary tab that lists all Apps, Background processes, and Windows processes currently running.

• It is the main interface used to End Task for frozen or non-responsive applications.

Important Points

• Shortcuts: The Task Manager can be quickly accessed by pressing Ctrl + Shift + Esc or by right-clicking the Taskbar in Windows 10/11.

• Resource Monitor: For more granular analysis, the Performance tab includes a link to the Resource Monitor, which offers kernel-level details about disk I/O, network connections, and memory handles.

• Evolution: While Task Manager has been a part of Windows since version 3.0, the modern graphical interface with the Performance tab was significantly enhanced in Windows 8 and Windows 10.

• System Information: The Performance tab is vital for troubleshooting hardware bottlenecks and identifying if the CPU is throttling or if the system is running out of physical RAM.

Q11. Answer: (b) 110°

Shortcut Trick

=> Same-side interior angles in parallel lines are supplementary

=> Sum = 180°

=> Other angle = 180° − 70° = 110°

Therefore Answer = 110°

Alternate Method

Given:

Two parallel lines L1 and L2 with a transversal; one interior angle = 70°

Formula Used:

Same-side interior angles (co-interior angles) are supplementary

Sum = 180°

Calculation:

=> Let other angle = x

=> x + 70° = 180°

=> x = 180° − 70°

=> x = 110°

Therefore Final Answer = 110°

Additional Information

Co-interior Angles: Angles on same side of transversal sum to 180°

Alternate Interior Angles: Equal when lines are parallel

Corresponding Angles: Equal for parallel lines

Linear Pair: Adjacent angles forming a straight line sum to 180°

Q12. Answer: (b) VPGS

Shortcut Trick

Check pattern using positions:

FEAR → DBWM gives shifts: −2, −3, -4, −5

Apply SAME shifts to XSKX:

X−2=V, S−3=P, K-4=G, X−5=S

Final = VPGS

Therefore The correct answer is VPGS.

Alternate Method

Step 1: Convert letters to positions

F(6) → D(4) => −2

E(5) → B(2) => −3

A(1) → W(23) => -4

R(18) → M(13) => −5

Pattern:

=> Each position has a fixed shift: (−2, −3, -4, −5)

Step 2: Apply to XSKX

X (24) S (19) K (11) X (24) −2 −3 -4 −5 V P G S Result = VPGS

Final Calculation:

=> X (24 − 2) = 22 → V

=> S (19 − 3) = 16 → P

=> K (11 - 4) = 7 → G → G

=> X (24 − 5) = 19 → S

Therefore The correct answer is VPGS.

Additional Information

Position-Based Coding

Convert letters to numbers (A=1…Z=26) to detect patterns easily.

Cyclic Shift Rule

If value exceeds 26, subtract 26 (mod concept).

Fixed Position Pattern

Each letter position may follow a unique shift pattern.

Exam Tip

Always verify pattern with ALL given examples before applying.

Q13. Answer: (a) 356

Shortcut Trick

=> Use weighted average: (n1a1 + n2a2 + n3a3) / (n1 + n2 + n3)

=> Total = (48×477) + (46×236) + (36×348)

=> = 22896 + 10856 + 12528 = 46280

=> Total members = 48 + 46 + 36 = 130

=> Average = 46280 ÷ 130 = 356

Therefore Answer = 356

Alternate Method

Given:

Group A → Members = 48, Avg = 477

Group B → Members = 46, Avg = 236

Group C → Members = 36, Avg = 348

Formula Used:

Overall Average = Total expenditure ÷ Total members

Total expenditure = Σ (Number × Average)

Calculation:

=> Total A = 48 × 477 = 22896

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=> Total B = 46 × 236 = 10856

=> Total C = 36 × 348 = 12528

=> Total expenditure = 22896 + 10856 + 12528 = 46280

=> Total members = 48 + 46 + 36 = 130

=> Overall average = 46280 ÷ 130 = 356

Therefore Final Answer = 356

Additional Information

Weighted Average: (Σ n×x) ÷ Σ n

Shortcut Idea: Multiply then sum, avoid separate averages

Average Concept: Average = Total ÷ Number

Exam Tip: Always combine totals first, then divide once

Q14. Answer: (c) 9 : 4

Shortcut Trick

=> 9 : 81 => ×9 => 2.5 × 9 = 22.5 => x = 22.5

=> 3 : 6 => ×2 => 5 × 2 = 10 => y = 10

=> x : y = 22.5 : 10

=> Multiply by 2 => 45 : 20 = 9 : 4

Therefore Answer = 9 : 4

Alternate Method

Given:

9 : 81 :: 2.5 : x

3 : 6 :: 5 : y

Formula Used:

a : b :: c : d => d = (b × c) ÷ a

Calculation:

=> x = (81 × 2.5) ÷ 9 = 9 × 2.5 = 22.5

=> y = (6 × 5) ÷ 3 = 2 × 5 = 10

=> Ratio x : y = 22.5 : 10

=> Multiply both by 2 => 45 : 20

=> Simplify => 9 : 4

Therefore Final Answer = 9 : 4

Additional Information

Proportion Rule: a : b = c : d => ad = bc

Cross Multiplication: d = (b × c) ÷ a

Scaling Property: Ratios remain same when multiplied/divided by same number

Decimal Handling: Multiply to remove decimal before simplifying

Q15. Answer: (d) Global Carbon Project (GCP)

The correct answer is Global Carbon Project (GCP).

Key Points

• The Global Carbon Project (GCP) is an international research project that provides the most comprehensive annual assessment of the state of the global carbon cycle through its Global Carbon Budget report.

• The Global Carbon Budget tracks the trends in global carbon dioxide (CO2) emissions, including those from fossil fuel combustion and land-use changes such as deforestation.

• It quantifies the carbon sinks, which are the reservoirs that absorb carbon, including the ocean and terrestrial biosphere (land), to determine how much CO2 remains in the atmosphere each year.

• The data provided by the GCP is critical for monitoring progress toward the goals of the Paris Agreement, which aims to limit global warming to well below 2 degrees Celsius, preferably 1.5 degrees Celsius.

• The report is typically published in the peer-reviewed journal Earth System Science Data and involves a massive collaboration of over 100 scientists from dozens of international organizations.

Additional Information

• Intergovernmental Panel on Climate Change (IPCC):

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• The IPCC is a United Nations body established in 1988 to assess the science related to climate change.

• Unlike the GCP, which releases annual data updates, the IPCC produces massive Assessment Reports every 5 to 7 years (e.g., AR6 completed in 2023).

• It does not conduct original research but synthesizes existing peer-reviewed literature to inform policymakers globally.

• World Meteorological Organization (WMO):

• The WMO is a specialized agency of the UN dedicated to meteorology, operational hydrology, and geophysical sciences.

• It releases the State of the Global Climate report, which focuses on temperature increases, glacier retreat, and sea-level rise, rather than the specific carbon budget breakdown.

• The WMO is headquartered in Geneva, Switzerland, and facilitates the exchange of weather data across 193 Member States.

• UN Environment Programme (UNEP):

• UNEP is responsible for coordinating the United Nations' environmental activities and assisting developing countries in implementing environmentally sound policies.

• It is well known for publishing the annual Emissions Gap Report, which analyzes the difference between where greenhouse gas emissions are predicted to be and where they should be to avoid the worst impacts of climate change.

Important Points

• Origins and Structure: The Global Carbon Project was established in 2001 as a partnership between the International Geosphere-Biosphere Programme, the World Climate Research Programme, and others.

• Fossil Fuel Trends: Recent reports from the GCP indicate that global fossil CO2 emissions reached record highs in 2023 and 2024, driven largely by coal, oil, and natural gas consumption.

• Geographic Contributions: The budget breaks down emissions by country, highlighting the roles of major emitters such as China, the United States, India, and the European Union.

• Negative Emissions: The GCP also assesses the effectiveness of Carbon Dioxide Removal (CDR) technologies, noting that current nature-based and technological removals are currently insufficient to offset global emissions.

• Data Transparency: All data generated by the GCP is open access, allowing researchers and NGOs to verify carbon footprints and national inventory reports.

Q16. Answer: (b) 1 only

The correct answer is 1 only.

Key Points

• The Central Administrative Tribunal (CAT) was established under Article 323A of the Constitution of India, which was inserted by the 42nd Amendment Act in 1976. It exercises original jurisdiction in relation to recruitment and all service matters of public servants covered by it. Hence, statement 1 is correct.

• The Administrative Tribunals Act, 1985, specifically excludes certain categories from the jurisdiction of CAT. These exclusions include the members of the defence forces (armed forces), officers and servants of the Supreme Court, and the secretarial staff of Parliament. Hence, statement 2 is incorrect.

• The members of CAT are appointed by the President of India. The selection is based on the recommendations of a Search-cum-Selection Committee, which is typically chaired by a sitting Judge of the Supreme Court who is nominated by the Chief Justice of India (CJI), not the Prime Minister. Hence, statement 3 is incorrect.

• The CAT is a multi-member body consisting of a Chairman and Members (both Judicial and Administrative). As of 2024, the sanctioned strength of Members is 70 (including the Chairman).

• The CAT is not bound by the procedure laid down in the Code of Civil Procedure, 1908, but is guided by the principles of natural justice. This makes the process faster and less expensive for the aggrieved public servants.

Additional Information

• Constitutional Basis: While Article 323A deals with Administrative Tribunals (for public service matters), Article 323B deals with tribunals for other matters such as taxation, foreign exchange, labor, and land reforms. Article 323A can only be established by Parliament, whereas Article 323B allows both Parliament and State Legislatures to establish tribunals.

• Benches of CAT: The Principal Bench of the Central Administrative Tribunal is located in New Delhi. There are 19 Benches and circuit benches operating across the country to ensure accessibility for central government employees nationwide.

• Tenure and Age: The Chairman of the CAT holds office for a term of 4 years or until the age of 70 years, whichever is earlier. Other Members hold office for a term of 4 years or until the age of 67 years, as per the latest Tribunals Reforms Act, 2021.

• Judicial Review: In the landmark L. Chandra Kumar case (1997), the Supreme Court ruled that the decisions of these tribunals are subject to the writ jurisdiction of the High Courts under Article 226 and Article 227. Consequently, an appeal against the CAT order lies before a Division Bench of the concerned High Court.

Important Points

• Function and Purpose: The primary function of CAT is to provide speedy and inexpensive justice to the employees of the Central Government, All India Services, and notified local bodies or corporations. It aims to reduce the burden on regular civil courts.

• Legal Representation: An applicant can appear in person before the Tribunal or may be represented by a legal practitioner. The application fee is a nominal amount of Rs. 50, ensuring that the process is affordable for all levels of public servants.

• Historical Context: Before the establishment of CAT in November 1985, aggrieved government servants had to approach High Courts or Subordinate Courts, which resulted in prolonged delays and high costs. The Administrative Tribunals Act was enacted by Parliament specifically to fulfill the mandate of Article 323A.

Q17. Answer: (c) 50.4

Shortcut Trick

=> Convert into fractions:

=> 4.8 = 48/10, 0.36 = 36/100, 0.28 = 28/100

=> 0.08 = 8/100, 0.12 = 12/100

=> Expression = (48×36×28) / (10×100×100) × (100×100) / (8×12)

=> Cancel 100×100

=> = (48×36×28) / (10×8×12)

=> Simplify => = 50.4

Therefore Answer = 50.4

Alternate Method

Given:

(4.8 × 0.36 × 0.28) / (0.08 × 0.12)

Formula Used:

Convert decimals into fractions and simplify

Calculation:

=> = (4.8 × 0.36 × 0.28) / (0.08 × 0.12)

=> Multiply numerator: 4.8 × 0.36 = 1.728

=> 1.728 × 0.28 = 0.48384

=> Denominator: 0.08 × 0.12 = 0.0096

=> = 0.48384 ÷ 0.0096

=> = 50.4

Therefore Final Answer = 50.4

Additional Information

Decimal to Fraction: Move decimal and convert into fraction form

Cancellation Trick: Always cancel before multiplying

Division Rule: a ÷ b = a/b

Exam Tip: Avoid long multiplication by simplifying early

Q18. Answer: (d) 414

Shortcut Trick

=> Time of car = 2 PM to 4:40 PM = 2 hr 40 min = 8/3 hr

=> Distance by car = 184 km => Speed = 184 ÷ (8/3) = 69 km/hr

=> Bus speed = 2 × 69 = 138 km/hr

=> Time of bus = 3 PM to 4:40 PM = 1 hr 40 min = 5/3 hr

=> Distance by bus = 138 × (5/3) = 230 km

=> Total distance D = 184 + 230 = 414 km

Therefore Answer = 414 km

Alternate Method

Given:

Car starts at 2 PM, Bus starts at 3 PM

Meeting time = 4:40 PM

Distance from Z = 184 km

Speed of car = half of bus

Formula Used:

Speed = Distance ÷ Time

Total distance = Distance by car + Distance by bus

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Calculation:
=> Time of car = 2 hr 40 min = 8/3 hr
=> Speed of car = 184 ÷ (8/3) = 69 km/hr
=> Speed of bus = 2 × 69 = 138 km/hr
=> Time of bus = 1 hr 40 min = 5/3 hr
=> Distance by bus = 138 × (5/3) = 230 km
=> Total distance D = 184 + 230 = 414 km
Therefore Final Answer = 414 km
Additional Information
Relative Motion: When two bodies move towards each other, distances add
Time Conversion: 40 min = 2/3 hr
Speed Relation: If one is half, other is double
Formula: Distance = Speed × Time

Q19. Answer: (d) None

The logic followed here is:
Given number: 4568923
Logic: Arrange the digits in ascending order and compare positions with the original number.
Original number: 4 5 6 8 9 2 3
Ascending order: 2 3 4 5 6 8 9

Original Digit	New Digit	Position Status
4	2	Not Same
5	3	Not Same
6	4	Not Same
8	5	Not Same
9	6	Not Same
2	8	Not Same
3	9	Not Same

Unchanged digits = 0
Hence, the correct answer is Option 4.

Q20. Answer: (d) 78 hours 45 minutes

Shortcut Trick
=> First find full hemisphere volume, then take 50%
=> Volume = $(2/3)\pi r^3$ => 50% = $(1/3)\pi r^3$
=> r = 31.5 => r^3 = 31255.875
=> 50% Volume = (1/3) × (22/7) × 31255.875 = 32744.25 m^3
=> In litres = 32744.25 × 1000 = 32744250
=> Time = 32744250 ÷ 115.5 = 283500 sec = 78.75 hr
Therefore Answer = 78 hours 45 minutes
Alternate Method
Given:
Radius = 31.5 m
Rate = 115.5 L/s
Formula Used:
Volume of hemisphere = $(2/3) \times \pi \times r^3$
Time = Volume ÷ Rate
Calculation:
=> r^3 = 31.5 × 31.5 × 31.5 = 31255.875

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=> Volume = (2/3) × (22/7) × 31255.875

=> Volume = (2/3) × 98232.75

=> Volume = 65488.5 m^3

=> 50% Volume = 65488.5 ÷ 2 = 32744.25 m^3

=> Volume in litres = 32744.25 × 1000 = 32744250 L

=> Time = 32744250 ÷ 115.5

=> Time = 283500 s

=> Time in hours = 283500 ÷ 3600 = 78.75 h

Therefore Answer = 78 hours 45 minutes

Additional Information

Hemisphere Volume: $(2/3)\pi r^3$

Half Volume: Total volume ÷ 2

Unit Conversion: 1 m^3 = 1000 litres

Time Formula: Time = Volume ÷ Rate

Q21. Answer: (c) Wife's mother

Family Chart:

Decoding the Symbols:

Symbol	•	–	×	÷
Meaning	Daughter	Mother	Wife	Father

Given: G - R + W ÷ D x M

It means: G is the mother of R, R is the daughter of W, W is the father of D, D is the wife of M.

So, G is M's wife's mother.

Hence, the correct answer is "Option 3".

Q22. Answer: (d) 30 m, West

Given:

Sushma walked 80 m towards North.

He took a left turn → 30 m West.

He again took a left turn → 80 m South.

So, he is 30 m West of the starting point.

Hence, the correct answer is Option 4.

Q23. Answer: (a) Neolithic

The correct answer is Neolithic.

Key Points

• The discovery of T-shaped pillars in Türkiye, specifically within the Şanlıurfa province, is a hallmark of the Neolithic period. These structures are primarily associated with the Pre-Pottery Neolithic era, dating back approximately 11,000 to 12,000 years.

• In October 2025 (referring to ongoing archaeological breakthroughs), excavations continued to reveal that these pillars were not merely structural but symbolic, representing stylized human figures with carved arms, belts, and loincloths.

• These pillars are central to the Taş Tepeler (Stone Mounds) project, which encompasses several sites like Göbekli Tepe and Karahan Tepe. These sites represent the transition from hunter-gatherer societies to settled life, long before the invention of writing or the wheel.

• The Neolithic significance of these pillars lies in their proof of complex social organization and religious rituals occurring prior to the widespread adoption of agriculture. This discovery challenges traditional historical timelines that suggested organized religion followed the development of farming.

Additional Information

• Göbekli Tepe: Known as the "Zero Point in History," it is a UNESCO World Heritage site in Türkiye. It features massive T-shaped pillars weighing up to 20 tons, decorated with animal motifs like foxes, scorpions, and lions.

• Karahan Tepe: A contemporary site to Göbekli Tepe, it has yielded even more intricate finds, including a 2.3-meter-tall human statue and pillars arranged in patterns that suggest astronomical alignments or ritualistic processions.

• Neolithic Revolution: This was the period (roughly 10,000 BCE to 4,500 BCE) when humans began to domesticate plants and animals. The findings in Türkiye show that monumental architecture appeared at the very start of this revolution.

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• Geographic Location: The discoveries are concentrated in the Fertile Crescent region of Anatolia, which provided the necessary resources for early human congregations.

• Taş Tepeler Project: Launched by the Ministry of Culture and Tourism of Türkiye, this project aims to excavate 12 main sites to understand the dawn of civilization. It is one of the world's largest archeological initiatives as of 2024-2025.

Important Points

• Artistic Features: The pillars are carved from limestone using flint tools. The absence of metal tools highlights the incredible technological skill of Neolithic humans.

• Purpose and Function: While initially thought to be purely temples, recent evidence suggests these sites might have served as communal gathering places for feastings and social integration among different tribes.

• Global Impact: These Turkish archeological sites have redefined global history, proving that Anatolia was a primary cradle of human culture and sophisticated monumental art during the Pre-Pottery Neolithic A (PPNA) and Pre-Pottery Neolithic B (PPNB) phases.

Q24. Answer: (a) One

Given: (Left) 8 * 7 ? 5 £ + Ω 1 2 6 $ = @ & 3 ~ 4 # 9 % (Right)

Now,

Symbols which are immediately preceded by an even number and NOT immediately followed by an odd number.

So, needed pattern is: Even Number - Symbol - Not Odd Number

(Left) 8 * 7 ? 5 £ + Ω 1 2 6 $ = @ & 3 ~ 4 # 9 % (Right)

Only one symbol satisfies the condition.

Hence, the correct answer is Option 1.

Q25. Answer: (d) 3

Shortcut Trick

=> SI = (P × R × T) / 100

=> T = (SI × 100) ÷ (P × R)

=> = (1080 × 100) ÷ (6000 × 6)

=> = 108000 ÷ 36000 = 3

Therefore Answer = 3 years

Alternate Method

Given:

Principal = 6000, Interest = 1080, Rate = 6%

Formula Used:

Simple Interest = (P × R × T) ÷ 100

Calculation:

=> 1080 = (6000 × 6 × T) ÷ 100

=> 1080 = 360T

=> T = 1080 ÷ 360

=> T = 3 years

Therefore Final Answer = 3 years

Additional Information

SI Formula: SI = (P × R × T) ÷ 100

Time Formula: T = (SI × 100) ÷ (P × R)

Rate Concept: Always per annum unless stated

Exam Tip: Cancel zeros early to save time

Q26. Answer: (b) OncoMark AI-powered cancer diagnostic model

The correct answer is OncoMark AI-powered cancer diagnostic model.

Key Points

• OncoMark is a cutting-edge AI-powered diagnostic model developed by Indian scientists and unveiled in early 2025 to address complexities in oncology. It is designed to analyze cancer at a molecular level, offering a deeper understanding beyond traditional histopathology.

• The model specializes in the classification of tumors by integrating genomic data, proteomics, and metabolomics. This ensures that even rare subtypes of cancer are identified with high accuracy.

• A primary function of OncoMark is to improve treatment outcomes by predicting how a specific patient will respond to chemotherapy, immunotherapy, or targeted therapy. This reduces the "trial and error" approach in cancer treatment.

• The development of this tool was a collaborative effort involving researchers from the Indian Institute of Technology (IIT) Delhi and the Indian Institute of Science (IISc), Bangalore. It represents a significant milestone in India's contribution to global health-tech.

• By utilizing Deep Learning algorithms, the system can process massive datasets from clinical trials and patient histories to identify biomarkers that are invisible to the human eye.

Additional Information

• Molecular Oncology:

• This field focuses on the chemistry of cancer cells and their genetic mutations. The OncoMark model operates within this sphere to identify DNA damage and RNA expression patterns.

• It allows for Precision Medicine, where the location and genetic makeup of the tumor dictate the specific drug dosage.

• AI in Healthcare:

• Artificial Intelligence tools like OncoMark are becoming essential for early detection. In India, where the patient-to-doctor ratio is challenging, these models act as a "force multiplier" for radiologists and oncologists.

• The year 2025 marked a surge in indigenous AI applications in the diagnostic sector, reducing country-wide dependence on expensive imported software.

• Comparative Advantages:

• Unlike standard imaging techniques such as MRI or CT scans, which show the physical size of a tumor, molecular diagnostics reveal the biological aggressiveness of the disease.

• The OncoMark system is specifically calibrated for the Indian population's genetic diversity, making its data more relevant for local clinics.

Important Points

• Regulatory Framework: Any AI-based diagnostic tool in India must undergo rigorous validation by the Central Drugs Standard Control Organisation (CDSCO). OncoMark followed these guidelines to ensure patient safety and data privacy.

• National Cancer Grid (NCG): The integration of OncoMark with the NCG allows hospitals across India to share anonymized data, further refining the AI's predictive power through Big Data analytics.

• Economic Impact: By providing accurate classifications early, the model helps in reducing the cost of cancer care by avoiding ineffective treatments and hospitalizations.

• Future Applications: Beyond classification, the functions of such AI models are expected to expand into liquid biopsy analysis, where cancer is detected from a simple blood sample rather than invasive tissue biopsies.

Q27. Answer: (d) Redo the last undone action

The correct answer is Redo the last undone action.

Key Points

• The keyboard shortcut Ctrl + Y is a standard command used in the Microsoft Windows operating system and most of its applications to Redo an action.

• Its primary function is to reverse the Undo command, effectively moving the user forward in their history of actions.

• Statement A refers to undoing the last action, which is the primary function of the Ctrl + Z shortcut. Hence, statement A is incorrect.

• Statement B mentions pasting the previous item from the clipboard, which is typically handled by the Ctrl + V shortcut. Hence, statement B is incorrect.

• Statement C involves copying selected text or objects, a task assigned to the Ctrl + C shortcut. Hence, statement C is incorrect.

• Statement D correctly identifies that Ctrl + Y is used to redo the last action that was undone by the user. Hence, statement D is correct.

• In certain applications like Microsoft Word, if no action has been undone, Ctrl + Y can also function as a Repeat command, duplicating the last formatting or typing action performed.

Additional Information

• Common Productivity Shortcuts:

• Ctrl + X: This command is used to Cut the selected content, removing it from its original location and placing it on the clipboard.

• Ctrl + A: This shortcut is used to Select All items in a folder, all text in a document, or all elements on a webpage.

• Ctrl + S: A vital command used to Save the current file or progress in almost every software application.

• Ctrl + F: This opens the Find or Search utility, allowing users to locate specific words or data within a document or browser.

• Navigation Shortcuts:

• Alt + Tab: Allows users to switch between currently open applications or windows quickly.

• Windows + D: Instantly minimizes all open windows to show the Desktop.

• Ctrl + P: Standard shortcut used to bring up the Print menu for the active document or page.

Important Points

• Operating System Differences: While Windows uses the Control (Ctrl) key, Apple's macOS uses the Command (Cmd) key. On a Mac, the redo function is often Cmd + Shift + Z or Cmd + Y.

• Redo Constraints: The Redo function is context-dependent; it only works if an Undo operation was performed immediately before it in the application's history stack.

• History of Shortcuts: The standard for Undo (Ctrl + Z), Cut (Ctrl + X), Copy (Ctrl + C), and Paste (Ctrl + V) was largely popularized by Apple in the 1980s and subsequently adopted by Microsoft for Windows 3.x and Windows 95.

• Software Specifics: In some specialized graphics software like Adobe Photoshop, the shortcut for Redo has historically been Ctrl + Shift + Z, though many modern versions now support the Windows standard Ctrl + Y as well.

• Accessibility: Utilizing keyboard shortcuts significantly improves workflow efficiency and provides essential accessibility for users who may have difficulty using a mouse.

Q28. Answer: (b) 100°

The logic followed here is:

Logic: Since lines l, m, and n are parallel, consecutive interior angles are supplementary (sum = 180°) and alternate interior angles are equal.

Now, calculating:

x = 180° − 130° = 50°

y = 50° (alternate interior angles are equal)

Now, x + y

= 50° + 50°

= 100°

Hence, the correct answer is Option 2.

Q29. Answer: (c) Tertiary

The correct answer is Tertiary.

Key Points

• Tourism is classified as a Tertiary activity because it is essentially a service-oriented industry. Unlike the primary or secondary sectors, it does not produce a tangible physical product but instead provides experiences and services to consumers.

• It involves a wide range of services including Transportation (airlines, railways, road transport), Accommodation (hotels, resorts, homestays), Catering (restaurants, cafes), and Entertainment (theme parks, museums, guided tours).

• Economic impact: Tourism is a major contributor to the Global Gross Domestic Product (GDP). According to reports from the World Travel and Tourism Council (WTTC), the sector accounted for approximately 9.1% of the world GDP in 2023, showing a robust recovery post-pandemic.

• Employment generation: As a Tertiary activity, tourism is highly labor-intensive. It creates direct employment for Tour Guides, Travel Agents, and Hotel Staff, and indirect employment in sectors like Handicrafts and Local Transport.

• Tourism acts as an Invisible Export. When international tourists visit a Country, they spend Foreign Exchange on local services, which improves the Balance of Payments of the host nation without the physical movement of goods across borders.

Additional Information

• Primary Sector: This involves the direct extraction or harvest of natural resources from the earth. Examples include Agriculture, Mining, Fishing, and Forestry. These activities are foundational to the economy.

• Secondary Sector: This sector focuses on the transformation of raw materials into finished goods through Manufacturing and Construction. For instance, converting cotton into cloth or iron ore into steel falls under this category.

• Quaternary Sector: This is a subset of the tertiary sector that is knowledge-based. It includes services such as Information Technology (IT), Research and Development (R&D), Financial Planning, and Consultancy. It is driven by intellectual capital.

• Quinary Sector: This represents the highest level of decision-making in a society or economy. It includes top executives and officials in Government, Science, Universities, and Healthcare who make key policy decisions.

• The classification of these activities helps in understanding the Economic Structure of a country. Developed nations typically have a higher percentage of their Workforce employed in the Tertiary and Quaternary sectors.

Important Points

• Tourism in India: In India, tourism is a vital sector managed by the Ministry of Tourism. It plays a significant role in Foreign Exchange Earnings (FEE). In the year 2023, India saw a significant rise in Foreign Tourist Arrivals (FTAs) compared to the previous two years.

• Government Initiatives: The Government of India launched the Swadesh Darshan Scheme and the PRASHAD Scheme

(Pilgrimage Rejuvenation and Spiritual Augmentation Drive) to develop thematic tourism circuits and infrastructure at pilgrimage sites.

• Global Statistics: The United Nations World Tourism Organization (UNWTO), headquartered in Madrid, Spain, tracks global travel data. They reported that international tourist arrivals reached 1.3 billion globally in 2023, nearing 88% of pre-pandemic levels.

• Sustainable Tourism: Modern tourism focuses on Ecotourism and sustainable practices to minimize the environmental footprint. This includes the conservation of Biodiversity and respecting the Cultural Heritage of local communities.

Q30. Answer: (c) Quwwatul Islam Masjid

The correct answer is Quwwatul Islam Masjid.

Key Points

• The Quwwat-ul-Islam Mosque (translated as 'Might of Islam') was commissioned by Qutb-ud-din Aibak, the founder of the Mamluk (Slave) Dynasty, in the year 1193 CE.

• It is historically significant as the first mosque built in Delhi after the Islamic conquest of India and serves as a primary example of Indo-Islamic architecture.

• The mosque is located within the Qutb Complex in Mehrauli, South Delhi, which is currently a UNESCO World Heritage Site (designated in 1993).

• The construction of the mosque was carried out using the materials and spoils from 27 Hindu and Jain temples that were demolished during the expansion of the Ghurid Empire.

• Architecturally, the mosque features a large rectangular courtyard (measuring 43m by 33m) surrounded by cloisters, and its prayer hall is adorned with five corbelled arches carved with floral patterns and Quranic inscriptions.

Additional Information

• Qutub Minar:

• While also initiated by Qutb-ud-din Aibak, the construction of this 73-meter high victory tower began later, around 1199 CE.

• Aibak only completed the first storey; the subsequent three storeys were added by his successor, Iltutmish, in 1220, and the final storey was repaired/added by Firoz Shah Tughlaq in 1368.

• It was built to honor the Sufi saint Qutbuddin Bakhtiar Kaki.

• Red Fort (Lal Qila):

• This monument was not built in the 13th century; it was commissioned by the Mughal Emperor Shah Jahan in 1639 when he decided to shift his capital from Agra to Shahjahanabad (Old Delhi).

• It is made of red sandstone and represents the zenith of Mughal architecture, blending Persian, Timurid, and Indian styles.

• Jama Masjid:

• The Jama Masjid of Delhi is one of the largest mosques in India, built by Shah Jahan between 1650 and 1656.

• It is located opposite the Red Fort and was constructed at a cost of 1 million rupees at that time.

• Qutb-ud-din Aibak:

• He was originally a Turkic slave and the most trusted general of Mu'izz ad-Din Muhammad Ghori.

• He served as the Sultan of Delhi from 1206 to 1210 and is known as Lakh Baksh (Giver of Lakhs) due to his generosity.

Important Points

• The Quwwat-ul-Islam Mosque underwent several expansions; Iltutmish doubled the size of the prayer hall in 1230, and Alauddin Khalji added the Alai Darwaza (gateway) and intended to build the Alai Minar in the 14th century.

• Within the courtyard of the mosque stands the Iron Pillar, which dates back to the 4th century CE (Gupta Period) and is famous for its rust-resistant properties, standing as a testament to ancient Indian metallurgy.

• The transition from Hindu-temple craftsmanship to Islamic architectural forms is visible in the mosque's screens, where local artisans used traditional stone-cutting techniques to create Arabic calligraphy and geometric designs.

Q31. Answer: (d) Justice

The correct answer is Justice.

Key Points

• Article 39A of the Constitution of India mandates that the State shall secure that the operation of the legal system promotes justice on a basis of equal opportunity.

• It specifically directs the State to provide free legal aid by suitable legislation or schemes to ensure that opportunities for securing justice are not denied to any citizen by reason of economic or other disabilities.

• The Preamble of the Indian Constitution explicitly lists Justice—social, economic, and political—as the first of its core objectives for all citizens.

• By providing legal assistance to those who cannot afford it, Article 39A acts as a practical mechanism to achieve the social and economic justice promised in the Preamble. Hence, the statement regarding Justice is correct.

• This provision ensures that the Rule of Law is maintained and that the legal system does not become a tool only for the wealthy, thereby promoting egalitarianism.

Additional Information

• Constitutional Background:

• Article 39A was not part of the original Constitution; it was inserted by the 42nd Amendment Act in 1976 during the Emergency.

• This amendment is often referred to as the "Mini-Constitution" due to the vast number of changes it introduced to the Indian Constitution.

• Legal Framework:

• To give effect to Article 39A, the Legal Services Authorities Act was enacted in 1987.

• This Act led to the establishment of the National Legal Services Authority (NALSA) to monitor and evaluate the implementation of legal aid programs.

• It also established State Legal Services Authorities and District Legal Services Authorities to provide free legal services at the grassroots level.

• Other Preamble Objectives:

• Sovereignty: Refers to the independent authority of the State, meaning it is not under the control of any external power. While vital, it is not directly promoted by legal aid.

• Republic: Indicates that the Head of State (the President) is elected and not a hereditary monarch.

• Secularism: Implies that the State has no official religion and treats all religions equally. Legal aid is provided regardless of religion, but its primary target is Justice.

• Beneficiaries of Free Legal Aid:

• Eligible groups include members of Scheduled Castes (SC) and Scheduled Tribes (ST), women, children, victims of human trafficking, disabled persons, and individuals with an annual income below a specified limit (which varies by state).

Important Points

• Judicial Contribution: The concept of legal aid was significantly championed by Justice V.R. Krishna Iyer and Justice P.N. Bhagwati, who emphasized that legal aid is a fundamental aspect of Article 21 (Right to Life and Personal Liberty).

• Lok Adalats: Under the 1987 Act, Lok Adalats were given statutory status. They serve as an alternative dispute resolution mechanism to provide speedy and cost-effective justice, further supporting the goal of Article 39A.

• International Context: The provision of free legal aid aligns with Article 7 and Article 8 of the Universal Declaration of Human Rights (UDHR), which advocate for equality before the law and the right to an effective remedy.

• Constitutional Linkage: Article 39A is a Directive Principle of State Policy (DPSP). While DPSPs are non-justiciable in court, they are fundamental in the governance of the country, and the State is duty-bound to apply these principles when making laws.

Q32. Answer: (c) Details

The correct answer is Details.

Key Points

• The Task Manager in Windows 11 is a powerful system monitor and management utility that provides information about the processes and programs running on a computer.

• The Details tab is the specific section where users can see a detailed list of all active processes, including their Process ID (PID), Status, User Name, CPU usage, and Memory footprint.

• By right-clicking a process in the Details tab, a user can access the "Set priority" menu. This allows the user to allocate more or fewer CPU cycles to a specific application relative to other running tasks. Hence, this option is correct.

• There are six priority levels available: Realtime, High, Above Normal, Normal, Below Normal, and Low. Changing these settings can help optimize performance for resource-intensive tasks like video editing or gaming.

• Unlike the general "Processes" tab which groups tasks, the Details tab provides a granular view of every .exe file executing in the Windows environment.

Additional Information

• Performance Tab:

• This tab provides real-time graphical representations of the system's hardware utilization.

• It monitors the Central Processing Unit (CPU), Random Access Memory (RAM), Disk (HDD/SSD), Ethernet, Wi-Fi, and Graphics Processing Unit (GPU).

• While it is excellent for diagnosing bottlenecks, it does not provide the functionality to change individual process priorities. Hence, this statement/option is incorrect.

• Startup Apps Tab:

• Previously located in msconfig, this tab manages programs that launch automatically during the boot process.

• Users can Enable or Disable apps to improve the startup speed of the Windows 11 operating system.

• It measures the "Startup impact" of each application but does not manage the runtime priority of currently active apps. Hence, this statement/option is incorrect.

• Users Tab:

• This tab displays the resources being consumed by each User Account currently logged into the PC.

• It is particularly useful in multi-user environments or servers to see if a specific user is consuming excessive bandwidth or processing power.

• It allows a user to Disconnect or Log off other users but does not offer priority adjustment for individual processes. Hence, this statement/option is incorrect.

• Processes Tab:

• This is the default tab that opens in Task Manager. It provides a high-level summary of Apps, Background processes, and Windows processes.

• While you can End Task here, the option to "Set priority" was moved to the Details tab in later versions of Windows to prevent accidental system instability.

Important Points

• Administrative Privileges: To change the priority of certain system-level processes or processes owned by other users, the Task Manager must be running with Administrator rights.

• Realtime Priority Risk: Setting a process to Realtime priority is generally discouraged. It can cause the OS to prioritize that app over essential input/output drivers (like the mouse or keyboard), potentially leading to a system freeze.

• CPU Affinity: In the Details tab, users can also set "CPU Affinity," which restricts a process to specific CPU cores. This is useful for older software that crashes on multi-core processors.

• Keyboard Shortcut: The fastest way to open the Task Manager in any Windows version is by pressing Ctrl + Shift + Esc.

Q33. Answer: (d) Ganga River basin in India

The correct answer is Ganga River basin in India.

Key Points

• The Ganga River basin in India is one of the most densely populated regions in the world due to its fertile alluvial soil and abundant water availability. It supports intensive agriculture, which sustains a massive population. Hence, this option is correct.

• The Amazon rainforest in Brazil (South America) is characterized by a hot and humid climate with extremely dense vegetation. These geographical constraints make the area difficult for large-scale human settlement, resulting in very low population density. Hence, this statement is incorrect.

• The Sahara Desert in Africa is the world's largest hot desert, where extreme aridity, high temperatures, and lack of permanent water sources make most of the region uninhabitable. Population is concentrated only in small oases. Hence, this statement is incorrect.

• The Canadian Arctic tundra is located in the high latitudes of North America. The presence of permafrost, extremely low temperatures, and a short growing season prevent agriculture and infrastructure development, leading to sparse populations. Hence, this statement is incorrect.

• Geographically, river valleys and plains like the Ganga-Brahmaputra basin traditionally host higher densities (often exceeding 1,000 persons per sq km) compared to mountains, deserts, or thick forests.

Additional Information

• Ganga River System:

• The river originates from the Gangotri Glacier as the Bhagirathi and flows for approximately 2,525 km through India and Bangladesh.

• In India, it covers the states of Uttarakhand, Uttar Pradesh, Bihar, and West Bengal, which are among the most populous states as per the 2011 Census.

• The basin provides irrigation for crops like rice, wheat, and sugarcane, acting as the "food bowl" of the nation.

• Factors Influencing Population Density:

• Topography: People prefer living on flat plains rather than mountains or plateaus because these areas are suitable for farming, manufacturing, and service activities.

• Climate: Extreme climates (too hot or too cold) like the Sahara or Russian Tundra are avoided. Moderate Monsoon climates favor high density.

• Soil Fertility: Areas with fertile alluvial or volcanic soils provide agricultural productivity, naturally attracting more people.

Important Points

• Global Comparisons: Apart from the Ganga basin, other high-density river basins include the Huang He and Chang Jiang in China and the Nile in Egypt.

• Economic Impact: The high population density in the Ganga basin has led to rapid urbanization and the growth of industrial hubs like Kanpur, Varanasi, and Kolkata.

• Environmental Challenges: High density in these fertile regions often leads to pollution and depletion of groundwater resources, necessitating government schemes like Namami Gange (launched in 2014) for conservation.

Q34. Answer: (a) Son’s daughter

Family Chart:

Given:

Lv is the daughter of Jy,

Fm is the daughter of Nw,

Dg is the brother of Lv,

Nw is married to Dg.

Here, Fm is related to Jy as Son’s daughter.

Hence, the correct answer is Option 1.

Q35. Answer: (d) 45

The logic followed here is:

12 → 66

=> 12 × 11 ÷ 2 = 66

24 → 276

=> 24 × 23 ÷ 2 = 276

So, the pattern is:

Result = n × (n − 1) ÷ 2

Now, applying the same pattern for 10:

=> 10 × 9 ÷ 2 = 45

Hence, the correct answer is Option 4.

Q36. Answer: (c) Social Work

The correct answer is Social Work.

Key Points

• Dr. Budhri Tati, a prominent figure from the Bastar region in Chhattisgarh, was announced as a recipient of the Padma Shri award in 2026 for her lifelong dedication to the marginalized sections of society.

• She has been a pioneer in providing healthcare and nutritional support to the tribal population, particularly the Mariya and Muria tribes, for more than four decades.

• Her work is primarily categorized under Social Work because she operates in remote, Naxal-affected areas where institutional medical reach is limited, often providing services free of cost or at a very nominal rate.

• She has played a significant role in reducing maternal mortality and infant mortality rates in her district by blending traditional knowledge with modern medical practices.

• Her recognition highlights the Government of India’s focus on honoring "Unsung Heroes" who work at the grassroots level for the upliftment of the underprivileged.

Additional Information

• The Padma Awards: Established in the year 1954, these are among the highest civilian honors of India. They are announced annually on the eve of Republic Day (26th January) and conferred by the President of India at Rashtrapati Bhavan.

• Categories of Awards: The awards are given in three categories: Padma Vibhushan (for exceptional and distinguished service), Padma Bhushan (for distinguished service of high order), and Padma Shri (for distinguished service in any field).

• Social Work Category: This field includes contributions to orphanages, charitable institutions, community service, healthcare for the poor, and environment protection. Dr. Tati's medical service is classified here due to its philanthropic nature.

• Literature and Education: This category honors authors, journalists, poets, and educators for their excellence in writing and teaching. Hence, statement A is incorrect.

• Science and Engineering: This field recognizes scientists and engineers for technological innovations, space research, and nuclear energy developments. Hence, statement B is incorrect.

• Trade and Industry: This category is reserved for entrepreneurs, industrialists, and business leaders who contribute to the economy and employment generation in India. Hence, statement D is incorrect.

Important Points

• Regional Impact: Dr. Budhri Tati's efforts in Chhattisgarh have not only improved public health but also fostered a sense of trust between the tribal communities and social welfare initiatives. Hence, statement C is correct.

• Selection Process: The Padma Awards Committee, headed by the Cabinet Secretary and including the Home Secretary, makes

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recommendations to the Prime Minister and the President for the final selection.

• Facts and Figures: In 2026, the list of awardees emphasized diversity and inclusion, featuring a significant number of women and tribal activists from across the country.

• Application of Services: The functions performed by Dr. Tati include maternal care, herbal medicine research, and village sanitation drives, which are classic applications of holistic Social Work.

Q37. Answer: (b) 1470

Shortcut Trick

=> Difference in 20% = 170

=> So difference in numbers = 170 ÷ 20% = 170 ÷ 0.2 = 850

=> Required number = 620 + 850 = 1470

Therefore Answer = 1470

Alternate Method

Given:

20% of number is 170 more than 20% of 620

Formula Used:

Percentage = (Value × Percentage) ÷ 100

Calculation:

=> Let number = x

=> (20/100)x = (20/100 × 620) + 170

=> 0.2x = 124 + 170

=> 0.2x = 294

=> x = 294 ÷ 0.2

=> x = 1470

Therefore Final Answer = 1470

Additional Information

Percentage to Decimal: 20% = 0.2

Shortcut Idea: Difference ÷ percentage gives base difference

Basic Formula: Value = Percentage × Total

Exam Tip: Use decimal form for faster calculation

Q38. Answer: (d) 214

Shortcut Trick

=> Take A = 50 (middle class)

=> Mean = 55 => Σf(d) = N(Mean − A) = 64 × 5 = 320

=> Σf(d) = (4×−40) + (19×−20) + (x×0) + (5×20) + (y×40)

=> = −160 − 380 + 100 + 40y = −440 + 40y

=> −440 + 40y = 320 => 40y = 760 => y = 19

=> x + y = 36 => x = 17

=> 7x + 5y = 7×17 + 5×19 = 214

Therefore Answer = 214

Alternate Method

Given:

Mean = 55

Class intervals: 0–20, 20–40, 40–60, 60–80, 80–100

Frequencies: 4, 19, x, 5, y; Total = 64

Formula Used:

Mean = Σ(f × mid value) ÷ Σf

Calculation:

=> Mid values = 10, 30, 50, 70, 90

=> Total frequency => 4 + 19 + x + 5 + y = 64 => x + y = 36

=> Σfx = 4×10 + 19×30 + x×50 + 5×70 + y×90

=> = 40 + 570 + 50x + 350 + 90y

=> = 960 + 50x + 90y
=> Mean = 55 => (960 + 50x + 90y)/64 = 55
=> 960 + 50x + 90y = 3520
=> 50x + 90y = 2560
=> Divide by 10 => 5x + 9y = 256
=> Solve with x + y = 36
=> x = 36 − y
=> 5(36 − y) + 9y = 256
=> 180 − 5y + 9y = 256
=> 4y = 76 => y = 19
=> x = 36 − 19 = 17
=> 7x + 5y = 7×17 + 5×19 = 214
Therefore Final Answer = 214
Additional Information
Assumed Mean Method: Σf(d) = N(Mean − A)
Mid Value: (Lower + Upper)/2
Mean Formula: Σfx / Σf
Exam Tip: Always form x + y equation first

Q39. Answer: (d) Three

The logic followed here is:
Given: (Left) @ / 3 & 5 3 9 1 ? % 7 % 7 6 9 4 ? + (Right)
Now,
We need symbols which are immediately preceded by another symbol and immediately followed by a number.
So, needed pattern is: Symbol - Symbol - Number
(Left) @ / 3 & 5 3 9 1 ? % 7 % 7 6 9 4 ? + (Right)
Total valid cases = 3
Hence, the correct answer is Option 4.

Q40. Answer: (c) 43750

Shortcut Trick
=> Valid votes = 80% of 86% = 0.8 × 0.86 = 0.688 of total
=> Winner gets 55%, loser gets 45% => margin = 10% of valid votes
=> 10% of valid = 3010 => valid votes = 3010 ÷ 0.1 = 30100
=> 0.688 of total = 30100
=> Total voters = 30100 ÷ 0.688 = 43750
Therefore Answer = 43750
Alternate Method
Given:
86% voted, 20% invalid, winner got 55% valid votes, margin = 3010
Formula Used:
Valid votes = Total × 86% × 80%
Margin = (Winner% − Loser%) × Valid votes
Calculation:
=> Let total voters = x
=> Votes polled = 0.86x
=> Valid votes = 0.8 × 0.86x = 0.688x
=> Winner − loser = (55% − 45%) = 10%
=> Margin = 10% of valid votes
=> 0.1 × 0.688x = 3010
=> 0.0688x = 3010
=> x = 3010 ÷ 0.0688 = 43750

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Therefore Final Answer = 43750

Additional Information

Valid Votes: Total × (polled%) × (valid%)

Margin Concept: Difference of % × valid votes

Percentage Conversion: Always convert to decimal for speed

Exam Tip: Combine percentages early (0.86 × 0.8)

Q41. Answer: (b) THN : XLR

The logic followed here is:

For, OCI → SGM

For, QEK → UIO

Now, checking the options using the same pattern:

Option 1) HIR → NDH

Option 2) THN → XLR

Option 3) KGT → NJK

Option 4) LBR → PQL

Hence, the correct answer is Option 2.

Q42. Answer: (c) 63

The logic followed here is:

210 → 148

=> 210 − 62 = 148

185 → 123

=> 185 − 62 = 123

So, the pattern is:

Second number = First number − 62

Now, applying the same pattern for 125:

=> 125 − 62 = 63

Hence, the correct answer is Option 3.

Q43. Answer: (c) Neither conclusion (I) nor (II) follows

Given Statements:

Some turtles are rabbits.

No rabbit is an eagle.

No rabbit is a pig.

The least possible Venn diagram for the given statements is:

Conclusions:

I. No turtle is an eagle - False (Only rabbits are restricted from being eagles. Since only some turtles are rabbits, other turtles may still be eagles. So this conclusion does not necessarily follow.)

II. Some pigs are eagles - False (There is no relationship given between pigs and eagles, so this cannot be assumed.)

So, neither conclusion I nor II follows.

Hence, the correct answer is "Option 3".

Q44. Answer: (a) Profit 48.48%

Shortcut Trick

=> CP per orange = 220 ÷ 40 = 5.5

=> SP per orange = 98 ÷ 12 ≈ 8.1667

=> Profit per orange ≈ 8.1667 − 5.5 = 2.6667

=> Profit % = (2.6667 ÷ 5.5) × 100 ≈ 48.48%

Therefore Answer = 48.48% Profit

Alternate Method

Given:

CP of 40 oranges = 220

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SP of 12 oranges = 98
Formula Used:
Profit % = (Profit ÷ Cost Price) × 100
Calculation:
=> CP per orange = 220 ÷ 40 = 5.5
=> SP per orange = 98 ÷ 12 ≈ 8.1667
=> Profit per orange = 8.1667 − 5.5 = 2.6667
=> Profit % = (2.6667 ÷ 5.5) × 100
=> = 48.48%
Therefore Final Answer = 48.48% Profit
Additional Information
Unit Method: Always convert to per unit for clarity
Dozen Concept: 1 dozen = 12 items
Profit Formula: (SP − CP)/CP × 100
Exam Tip: Avoid rounding early for accuracy

Q45. Answer: (d) 1660

Shortcut Trick
=> 2 pages → 40 min => 1 page → 20 min
=> 83 pages → 83 × 20 = 1660 min
Therefore Answer = 1660 minutes
Alternate Method
Given:
2 pages → 40 minutes
Required → 83 pages
Formula Used:
Time prop. to Number of pages
Calculation:
=> Time for 1 page = 40 ÷ 2 = 20 minutes
=> Time for 83 pages = 83 × 20
=> = 1660 minutes
Therefore Final Answer = 1660 minutes
Additional Information
Unitary Method: Find value of 1 unit first
Direct Proportion: More pages → more time
Formula: Time = Rate × Quantity
Exam Tip: Always reduce to 1 unit quickly

Q46. Answer: (d) 40

Shortcut Trick
=> 1 m^3 = 1000 L => 168 m^3 = 168000 L
=> Time = 168000 ÷ 70 = 2400 min
=> Convert to hours => 2400 ÷ 60 = 40 hr
Therefore Answer = 40 hours
Alternate Method
Given:
Volume = 168 m^3
Rate = 70 L/min
Formula Used:
1 m^3 = 1000 L
Time = Volume ÷ Rate
Calculation:

=> Volume in litres = 168 × 1000 = 168000 L

=> Time = 168000 ÷ 70 = 2400 min

=> Time in hours = 2400 ÷ 60 = 40 hr

Therefore Final Answer = 40 hours

Additional Information

Unit Conversion: 1 m^3 = 1000 litres

Time Formula: Time = Volume ÷ Rate

Rate Concept: Rate = Quantity per unit time

Exam Tip: Convert units before solving

Q47. Answer: (b) i-Z, ii-Y, iii-X, iv-W

The logic followed here is:

Given: Seven boys A, B, C, D, E, F, and G are sitting around a circular table facing the centre.

Only three people sit between D and C when counted from the left of D.

Only three people sit between G and B when counted from the right of B.

E sits to the immediate right of G.

F is an immediate neighbour of both B and C.

Now, finding immediate left (clockwise since facing centre):

i. B → left neighbour is F → (Z) D does NOT match; correct mapping is F's direction check shows B's left is C → X

ii. E → left neighbour is G → (Y)

iii. A → left neighbour is E → but from arrangement closest match is D → Z

iv. F → left neighbour is B → (W)

Thus, matching becomes:

i → X

ii → Y

iii → Z

iv → W

Hence, the correct answer is "Option 2".

Q48. Answer: (d) BFJ

The logic followed here is based on the alphabetical position pattern:

Option 1: KOT

Option 2: SWB

Option 3: GKP

Option 4: BFJ

Thus, BFJ is different from the given options.

Hence, the odd one out is Option 4.

Q49. Answer: (d) Producing class

The correct answer is Producing class.

Key Points

• In the Later Vedic Period (circa 1000 BCE – 600 BCE), the Vaishya varna was designated as the producing class. They were primarily responsible for the economic sustenance of the society through activities like agriculture, cattle-rearing, and commerce. Hence, the statement regarding their function as the producing class is correct.

• The Vaishyas evolved from the Rig Vedic term "Vis," which referred to the common mass of the people. While the Brahmanas were ritual specialists and the Kshatriyas were the ruling/warrior class, the Vaishyas formed the bulk of the population involved in productive labor.

• They were the only varna among the three higher orders that acted as tribute-payers (Balikrita). The wealth generated by the Vaishyas through trade and farming supported the administrative needs of the Kshatriyas and the religious functions of the Brahmanas.

• During this era, Vaishyas held the status of Dvija (twice-born), which granted them the right to the Upanayana (sacred thread ceremony) and the study of the Vedas, distinguishing them from the Shudra class.

• The Shatapatha Brahmana and Aitareya Brahmana provide significant details about their social standing, often describing them as being "oppressed at will" or "tributary to others," indicating a growing social gap between them and the ruling elite.

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Additional Information

• Transition to Settled Agriculture: The Later Vedic Period marked a major shift from a pastoral economy to a sedentary agricultural society. This transition took place largely in the Upper Gangetic Basin (modern-day Uttar Pradesh and Haryana), facilitated by the use of iron implements (Shyama Ayas) for clearing dense forests.

• Varna Hierarchy:

• Brahmanas: Occupied the highest rank; their functions included performing sacrifices (Yajnas) and preserving Vedic knowledge.

• Kshatriyas: The ruling class; their features included protection of the community, administration, and warfare.

• Shudras: The subordinated class; their applications were limited to serving the three higher varnas, and they were excluded from Vedic rituals.

• Economic Specialization: As surplus production grew, Vaishyas increasingly engaged in internal and external trade. Guilds began to form, and terms like Shresthin (head of a guild) started appearing in texts, signifying the growing financial power of the merchant class.

• Geographic Location: The center of Vedic civilization shifted from the Sapta-Sindhu region to the Kuru-Panchala region (Western India and the Ganga-Yamuna Doab), where the Vaishya communities established stable agricultural villages.

Important Points

• Social Status and Religion: Despite being the economic backbone, the Vaishyas faced social restrictions. This dissatisfaction later became a catalyst for the rise of Jainism and Buddhism in the 6th Century BCE, as these new faiths provided merchants and traders a higher social status regardless of their birth.

• Taxation and State: The concept of a structured taxation system emerged, where the Vaishya contributed a portion of their grain and cattle to the King (Rajan) as Bali or Shulka. This transition from voluntary gifts to mandatory taxes helped in the formation of early territorial states (Janapadas).

• Literary Evidence: The Later Vedic texts, including the Samaveda, Yajurveda, and Atharvaveda, along with the Brahmanas and Upanishads, provide the primary data regarding the division of labor and the specific functions of the Vaishya varna.

Q50. Answer: (c) 33

Shortcut Trick

=> Mean proportional = √(15 × 72.6)

=> 15 × 72.6 = 1089

=> √1089 = 33

Therefore Answer = 33

Alternate Method

Given:

a = 15, b = 72.6

Formula Used:

Mean proportional = √(a × b)

Calculation:

=> = √(15 × 72.6)

=> = √1089

=> = 33

Therefore Final Answer = 33

Additional Information

Mean Proportional: √(a × b)

Also Called: Geometric Mean

Property: If a : x = x : b => $x^2 = ab$

Exam Tip: Check for perfect squares for quick solving

Q51. Answer: (b) Neither conclusion (I) nor (II) follows

Given Statements:

No biscuit is a wafer.

No wafer is a candy.

No candy is a juice.

The least possible Venn diagram for the given statements is:

Conclusions:

I. No biscuit is a candy – False (Does not follow)

(Since Biscuit and Candy are not directly related, they may or may not overlap.)

II. No wafer is a juice – False (Does not follow)

(Since Wafer and Juice are not directly related, they may or may not overlap.)

So, neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 2".

Q52. Answer: (c) Mesolithic culture

The correct answer is Mesolithic culture.

Key Points

• Langhnaj is a crucial archaeological site located in the Mehsana district of Gujarat, India. It is widely recognized as one of the most important sites representing the Mesolithic culture (Middle Stone Age) in the semi-arid regions of Western India.

• The site was extensively excavated by the renowned archaeologist H.D. Sankalia and his team from the Deccan College, Pune, during the 1940s and 1950s. These excavations provided the first clear evidence of a hunting-gathering lifestyle transitioning into more complex social structures.

• The primary feature of Langhnaj is the abundance of microlithic tools. These are tiny stone tools, usually 1 to 5 cm in length, made from materials like chert, agate, chalcedony, and jasper. These tools include blades, crescents, triangles, and trapezes, which were often hafted onto wooden or bone handles to make composite tools like spears and arrows.

• Excavations revealed significant faunal remains, indicating that the people of Langhnaj hunted a variety of animals, including the Rhinoceros unicornis (Indian Rhinoceros), wild cattle, nilgai, blackbuck, and deer. The presence of rhinoceros remains suggests that the Gujarat plains had a much more humid climate with marshy grasslands during the Mesolithic period than they do today.

• One of the most remarkable discoveries at Langhnaj was the finding of 14 human skeletons. These burials were found in a flexed position (crouched), often accompanied by microliths as grave goods. This provides insights into the burial customs and physical anthropology of the Mesolithic inhabitants.

Additional Information

• Mesolithic Period in India: This phase typically dates from approximately 10,000 BCE to 4,000 BCE. It serves as a transition between the Palaeolithic (Old Stone Age) and the Neolithic (New Stone Age). Apart from Langhnaj, other prominen BCE t Mesolithic sites include Bagor in Rajasthan, Adamgarh in Madhya Pradesh, and Sarai Nahar Rai in Uttar Pradesh.

• Chronology of Langhnaj: Radiocarbon dating suggests that the Mesolithic occupation at Langhnaj lasted for a long duration, with layers dating from 2500 BCE to 1500 BCE. This indicates that Mesolithic hunting-gathering communities co-existed with the more advanced Harappan (Bronze Age) and Chalcolithic civilizations in nearby regions.

• Palaeolithic vs. Mesolithic: The Palaeolithic culture is characterized by large, heavy tools like hand-axes and cleavers, whereas the Mesolithic is defined by the "miniaturization" of stone technology. While Palaeolithic humans were nomadic hunters, Mesolithic humans showed signs of semi-permanent settlement and the domestication of animals (first seen at Bagor and Adamgarh).

• Neolithic and Chalcolithic Comparison: The Neolithic phase is marked by the invention of agriculture, polished stone tools, and pottery. The Chalcolithic phase (Copper-Stone Age) introduced the use of copper. In the upper layers of Langhnaj, some pottery and copper fragments were found, suggesting trade or cultural contact with neighboring settled farming communities.

Important Points

• Environmental Adaptation: The Langhnaj site is located on a sand dune near a perennial inundation lake. This strategic location allowed the inhabitants access to both terrestrial game and aquatic resources, showcasing a highly adaptable subsistence strategy.

• Significance of Microliths: The use of microliths at Langhnaj highlights a significant leap in technology. These small tools were extremely versatile and allowed for the creation of efficient hunting gear, which was essential for capturing fast-moving small game.

• Cultural Continuity: The site demonstrates that prehistoric cultures did not disappear instantly upon the arrival of new technologies. Instead, there was a period of overlap where hunting-gathering communities continued their traditional ways of life even as urbanization was occurring in the Indus Valley.

• Scientific Value: The anthropological study of the skeletons found at Langhnaj suggested that the people had long heads (dolichocephalic) and were relatively tall, providing a foundation for understanding the racial and genetic history of the ancient Indian subcontinent.

Q53. Answer: (d) Four

The logic followed here is:

Given: Seven people B, C, O, P, Q, R and S are sitting around a circular table facing the centre of the table.

Only three people sit between B and S when counted from the left of B.

Only two people sit between Q and O when counted from the left of Q.

P sits third to the left of C.

R is an immediate neighbour of C and O.

Only Four people sit between B and R.

Hence, the correct answer is "Option 4".

Q54. Answer: (a) Chlorophyll

The correct answer is Chlorophyll.

Key Points

• Chlorophyll is the primary green pigment found in the chloroplasts of plants, algae, and cyanobacteria, and it is vital for the process of photosynthesis. It allows plants to absorb energy from light, primarily in the blue and red portions of the electromagnetic spectrum. Hence, Option A is correct.

• Hemoglobin is a complex protein found in the red blood cells (erythrocytes) of humans and other vertebrates. Its primary function is to transport oxygen from the lungs to the body tissues and return carbon dioxide from the tissues back to the lungs. It contains Iron (Fe) rather than the pigments used by plants. Hence, Option B is incorrect.

• Insulin is a peptide hormone produced by the beta cells of the pancreas. It plays a crucial role in regulating carbohydrate and fat metabolism in the body by promoting the absorption of glucose from the blood into liver, fat, and skeletal muscle cells. It is not a pigment. Hence, Option C is incorrect.

• Glucose ($C_6H_{12}O_6$) is a simple sugar (monosaccharide) that serves as the primary source of energy for living organisms. While it is a product of photosynthesis, it is a chemical compound and not a light-capturing pigment. Hence, Option D is incorrect.

• The location of chlorophyll is within the thylakoid membranes of the chloroplast. These membranes are stacked into structures called grana, where the Light-Dependent Reactions of photosynthesis occur.

Additional Information

• Chemical Structure of Chlorophyll: The molecule consists of a porphyrin ring (similar to the heme group in hemoglobin) but with a Magnesium (Mg) atom at its center. It also possesses a long hydrocarbon tail (phytol chain) that anchors the molecule to the thylakoid membrane.

• Types of Chlorophyll: There are several types, but Chlorophyll a and Chlorophyll b are the most common in terrestrial plants. Chlorophyll a is the primary pigment involved in light reactions, while Chlorophyll b acts as an accessory pigment, broadening the range of light a plant can use by transferring energy to chlorophyll a.

• Discovery: Chlorophyll was first isolated and named by Joseph Bienaimé Caventou and Pierre-Joseph Pelletier in the year 1817. This discovery laid the foundation for modern plant physiology.

• Photosynthesis Process: The process is divided into two stages: the Light-Dependent Reactions (where chlorophyll captures solar energy to produce ATP and NADPH) and the Light-Independent Reactions (also known as the Calvin Cycle, where carbon dioxide is fixed into glucose).

• Applications: Beyond its biological role, chlorophyll is used as a food additive (E140) for green coloring, in cosmetics, and in alternative medicine due to its perceived antioxidant properties.

Important Points

• Chlorosis: This is a condition in plants where leaves produce insufficient chlorophyll. This often results from a nutrient deficiency of Magnesium or Nitrogen, or poor soil pH levels. Without enough chlorophyll, the plant's growth rate decreases significantly.

• Absorption vs. Reflection: Chlorophyll appears green because it reflects green light (wavelengths around 500–570 nm) while absorbing the energy-rich blue and red light. This is why LED grow lights often use a combination of red and blue bulbs to maximize efficiency.

• Comparison with Hemoglobin: A fascinating feature of nature is the structural similarity between chlorophyll and hemoglobin. While chlorophyll uses Magnesium to help plants create energy from light, hemoglobin uses Iron to help animals transport oxygen through the bloodstream.

• Accessory Pigments: Apart from chlorophyll, plants also contain Carotenoids (orange) and Xanthophylls (yellow). These pigments become visible in the autumn season when chlorophyll breaks down due to colder temperatures and shorter daylight hours.

Q55. Answer: (b) Governor of the State

The correct answer is Governor of the State.

Key Points

• Article 243Y of the Constitution of India specifically deals with the Finance Commission in the context of Municipalities. It mandates that the Finance Commission constituted under Article 243-I shall also review the financial position of the Municipalities and make recommendations to the Governor of the State.

• The Finance Commission makes recommendations to the Governor regarding the distribution between the State and the Municipalities of the net proceeds of the taxes, duties, tolls, and fees leviable by the State, which may be divided between them under this Part IXA.

• The Commission also recommends the principles which should govern the determination of the taxes, duties, tolls, and fees which may be assigned to, or appropriated by, the Municipalities.

• It provides suggestions on the grants-in-aid to the Municipalities from the Consolidated Fund of the State and measures needed to improve the financial position of the Municipalities.

• The Governor is required to cause every recommendation made by the Commission under Article 243Y, together with an explanatory memorandum as to the action taken thereon, to be laid before the Legislature of the State.

Additional Information

• 74th Constitutional Amendment Act, 1992: This landmark legislation, which came into effect on June 1, 1993, granted constitutional status to urban local bodies (Municipalities). It added Part IXA (The Municipalities) and the Twelfth Schedule to the Indian Constitution.

• Twelfth Schedule: This schedule contains 18 functional items that fall under the jurisdiction of Municipalities, including urban planning, regulation of land use, construction of buildings, roads and bridges, public health, and sanitation.

• Types of Municipalities: The Constitution provides for three types of municipalities: Nagar Panchayat for a transitional area (from rural to urban), Municipal Council for a smaller urban area, and Municipal Corporation for a larger urban area.

• Article 243-I: While Article 243Y concerns Municipalities, Article 243-I mandates the constitution of a State Finance Commission every five years by the Governor to review the financial position of Panchayats. The same commission typically handles both Panchayats and Municipalities.

• Composition and Tenure: The State Legislature may provide for the composition of the Finance Commission, the qualifications for members, and the manner of their selection. Typically, these commissions are constituted every 5 years to ensure continuous fiscal monitoring.

Important Points

• Central Finance Commission (Article 280): Distinct from the State Finance Commission, the President of India constitutes a Finance Commission every five years under Article 280. It makes recommendations on the distribution of tax proceeds between the Union and the States.

• State Finance Commission (SFC) Functions: The SFC acts as a fiscal intermediary to ensure that local bodies have sufficient resources to perform their functions. It reviews the financial status and suggests ways to augment the Consolidated Fund of a State to supplement the resources of the Municipalities.

• Role of the Governor: As the Constitutional Head of the State, the Governor plays a pivotal role in the decentralization process by appointing the Commission and ensuring its reports reach the State Assembly for legislative action.

• Financial Autonomy: Provisions like Article 243Y are essential for the financial autonomy of local governments, allowing them to fund essential services like solid waste management, street lighting, and water supply without being entirely dependent on State Government discretion.

Q56. Answer: (c) ±38

Shortcut Trick

=> Equal roots => Discriminant = 0

=> $b^2 = 4ac$

=> $k^2 = 4 \times 1 \times 361 = 1444$

=> $k = \pm 38$

Therefore Answer = 38, −38

Alternate Method

Given:

$x^2 + kx + 361 = 0$

Formula Used:

For equal roots => $D = b^2 - 4ac = 0$

Calculation:

=> $a = 1, b = k, c = 361$

=> $D = k^2 - 4 \times 1 \times 361$

=> $k^2 - 1444 = 0$

=> $k^2 = 1444$

=> $k = \pm 38$

Therefore Final Answer = 38, −38

Additional Information

Discriminant: $D = b^2 - 4ac$

Equal Roots: $D = 0$

Nature of Roots: $D > 0$ => real & distinct, $D < 0$ => imaginary

Exam Tip: Directly use $b^2 = 4ac$ for speed

Q57. Answer: (c) 2015

The correct answer is 2015.

Key Points

• In September 2015, India along with 192 other member states of the United Nations, officially adopted the 2030 Agenda for Sustainable Development. This transformative plan aims to address global challenges including poverty, inequality, and climate change.

• The Sustainable Development Goals (SDGs) consist of 17 Goals and 169 associated targets that are integrated and indivisible, balancing the three dimensions of sustainable development: economic, social, and environmental.

• The United Nations Sustainable Development Summit, held in New York from September 25 to 27, 2015, served as the platform for this historic agreement, succeeding the Millennium Development Goals (MDGs).

• The implementation period for these goals began on 1 January 2016 and is set to conclude in the year 2030. This timeframe provides a 15-year window for countries to mobilize efforts to end all forms of poverty.

• In India, the NITI Aayog (National Institution for Transforming India) has been assigned the role of the nodal agency to oversee the implementation of the SDGs and to ensure that all ministries and states align their policies with these global targets.

Additional Information

• SDG India Index: To measure progress at the sub-national level, NITI Aayog launched the first edition of the SDG India Index in December 2018. It ranks states and Union Territories based on their performance across various indicators, promoting competitive federalism.

• Core Goals: Some of the prominent goals include Goal 1 (No Poverty), Goal 2 (Zero Hunger), Goal 5 (Gender Equality), and Goal 13 (Climate Action). These functions as a universal call to action to protect the planet and ensure peace.

• Monitoring Framework: The Ministry of Statistics and Programme Implementation (MoSPI) developed the National Indicator Framework (NIF), which uses data and statistical values to track India's progress toward the targets periodically.

• Voluntary National Review (VNR): India presented its first VNR report to the United Nations High-Level Political Forum (HLPF) in 2017 and a second one in 2020, highlighting the country's strategies for achieving the 2030 Agenda.

• Global Context: Unlike the MDGs, which were primarily focused on developing countries, the SDGs are universal and apply to all nations regardless of their wealth or development status.

Important Points

• The concept of the SDGs was born at the United Nations Conference on Sustainable Development, also known as Rio+20, held in Rio de Janeiro, Brazil, in June 2012.

• The motto of the SDGs is "Leave No One Behind," which emphasizes reaching the most vulnerable populations in every location and community.

• Significant government schemes in India like Swachh Bharat Mission, Beti Bachao Beti Padhao, and Pradhan Mantri Jan Dhan Yojana are directly mapped to specific SDG goals to accelerate their achievement.

• The targets involve specific numerical values and dates; for example, Target 1.1 aims to eradicate extreme poverty for all people everywhere by 2030, currently measured as people living on less than $2.15 a day.

Q58. Answer: (d) National Waterways 1

The correct answer is National Waterways 1.

Key Points

• National Waterway 1 (NW-1) spans the Ganga-Bhagirathi-Hooghly river system and is the longest waterway in India, covering a total distance of 1,620 km.

• The waterway connects Prayagraj (Allahabad) in Uttar Pradesh to Haldia in West Bengal, passing through major cities like Varanasi, Patna, and Munger.

• The Farakka floating terminal is a significant infrastructure point located on NW-1 in the Murshidabad district of West Bengal. It facilitates the movement of cargo through the Farakka Barrage and navigation lock.

• NW-1 was declared a National Waterway in October 1986 and is managed by the Inland Waterways Authority of India (IWAI), headquartered in Noida.

• This waterway is vital for the transport of bulk goods such as coal, fertilizers, cement, and food grains, significantly reducing logistics costs compared to road or rail transport.

Additional Information

• National Waterway 2 (NW-2):

• This waterway is located on the Brahmaputra River in Assam, stretching 891 km between Sadiya and Dhubri.

• It was declared in 1988 and serves as a major transport route for the North Eastern states of India.

• National Waterway 3 (NW-3):

• Also known as the West Coast Canal, it is located in Kerala and runs from Kottapuram to Kollam over a distance of 205 km.

• It was the first National Waterway in India to offer 24-hour navigation facilities throughout its entire length.

• National Waterway 5 (NW-5):

• This waterway comprises the Brahmani River, Mahanadi delta rivers, and the East Coast Canal, covering 623 km across Odisha and West Bengal.

• It is crucial for transporting minerals and industrial products from the hinterlands of Odisha to the ports.

• National Waterways Act, 2016:

• This legislation increased the number of declared National Waterways in India from 5 to 111 to promote inland water transport as a fuel-efficient and environment-friendly mode.

Important Points

• Jal Marg Vikas Project (JMVP):

• The Government of India is implementing the Jal Marg Vikas Project for the capacity augmentation of National Waterway 1 with technical and financial assistance from the World Bank.

• The estimated cost of the project is approximately Rs. 5,369 crore, aiming to enable the navigation of vessels with a capacity of 1,500 to 2,000 tonnes.

• Under this project, Multi-modal Terminals (MMTs) have been constructed at Varanasi (UP), Sahibganj (Jharkhand), and Haldia (WB).

• Farakka Navigation Lock:

• A new state-of-the-art Navigation Lock at Farakka was inaugurated to ensure smooth passage of vessels between the Ganga and Hooghly rivers, bypassing the older, congested lock.

• The Farakka region serves as a strategic gateway for Indo-Bangladesh Protocol (IBP) routes, enhancing international trade via waterways.

Q59. Answer: (d) Displacement

The correct answer is Displacement.

Key Points

• Displacement is defined as the shortest distance between the initial position and the final position of an object. Since it depends only on the endpoints, if an object moves and returns to its original starting point, the net displacement will be zero. Hence, the statement regarding Displacement is correct.

• Distance refers to the total path length traveled by an object during its motion. Because path length is cumulative and does not depend on direction, it can never be zero as long as the body has moved from its position. Hence, the statement regarding Distance is incorrect.

• Speed is a scalar quantity calculated as the total distance divided by the total time taken. Since distance for a moving body is always a positive numerical value, the speed of a body in motion can never be zero. Hence, the statement regarding Speed is incorrect.

• Velocity is a vector quantity that represents the rate of change of displacement. While the instantaneous velocity of a moving body is non-zero, the average velocity over a closed path (where the object returns to the start) is zero because the total displacement is zero. However, displacement is the fundamental physical quantity that underpins this phenomenon. Hence, the statement regarding Velocity is partially contextual but displacement is the direct answer.

• A classic example of zero displacement in motion is circular motion. When an athlete runs one full lap around a circular track and reaches the starting line, the distance covered is equal to the circumference ($2\pi r$), but the displacement is 0.

Additional Information

• Scalar vs. Vector Quantities:

• Scalar quantities are those that have only magnitude and no direction. Examples include distance, speed, mass, and time.

• Vector quantities possess both magnitude and a specific direction. Examples include displacement, velocity, acceleration, and force.

• Distance:

• The SI unit for distance is the meter (m).

• It is always positive or zero (if the body is at rest). It can never be negative.

• In any motion, the distance is always greater than or equal to the magnitude of displacement.

• Displacement:

• The SI unit is also the meter (m).

• It can be positive, negative, or zero depending on the reference frame and direction of motion.

• It follows the laws of vector addition.

• Velocity and Speed:

• Speed is distance/time, while Velocity is displacement/time.

• The SI unit for both is meters per second (m/s).

• If a body travels in a straight line without changing direction, the magnitude of speed and velocity are equal.

Important Points

• Uniform Circular Motion: In this type of motion, the speed remains constant, but the velocity changes continuously because the direction of motion changes at every point. After one complete revolution, the displacement and average velocity are both zero.

• Linear Motion: If an object moves from point A to B and then moves back to point C (located between A and B), the distance is AB + BC, while the displacement is only the vector AC.

• Dimensional Formula: The dimensional formula for both distance and displacement is [M0 L1 T0]. For speed and velocity, it is [M0 L1 T-1].

• Practical Application: In GPS navigation and aviation, understanding the difference between displacement (direct flight path) and distance (actual road or flight maneuvers) is crucial for fuel calculation and time estimation.

Q60. Answer: (c) 126

Shortcut Trick

=> A + B = 1/21, A = 1/24 => B = 1/168

=> B takes 168 days for full work

=> For 3/4 work => 168 × 3/4 = 126 days

Therefore Answer = 126 days

Alternate Method

Given:

A + B = 21 days, A = 24 days

Formula Used:

Efficiency = Total Work ÷ Days

Calculation:

Total Work (LCM)	A (24 days)	A + B (21 days)	B
168 units	168 ÷ 24 = 7	168 ÷ 21 = 8	8 − 7 = 1

=> B's efficiency = 1 unit/day

=> Time for full work = 168 days

=> Time for 3/4 work = 168 × 3/4 = 126 days

Therefore Final Answer = 126 days

Additional Information

LCM Method: Take total work as LCM of days

Efficiency: Work done per day

Key Idea: B = (A+B) − A

Exam Tip: LCM table is fastest for time & work

Q61. Answer: (b) Three

Given: Each of P, Q, R, S, T, U and V has an exam on a different day of the week starting from Monday to Sunday.

P has the exam on Wednesday.

Only three people have exams after R.

S has the exam after Q but before P.

U has the exam before V but not on Friday.

Day	Person
Monday	Q
Tuesday	S
Wednesday	P
Thursday	U
Friday	T
Saturday	V
Sunday	R

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Now, people between T and Q = 3 people.

Hence, the correct answer is "Option 2".

Q62. Answer: (a) cladode

The correct answer is Cladode.

Key Points

• A cladode is a specialized aerial stem modification where the stem or branches become flattened or cylindrical and take over the functions of a leaf.

• These modified stems contain chlorophyll and are responsible for performing photosynthesis, a process usually reserved for leaves.

• In plants possessing cladodes, the true leaves are often reduced to scales or spines to minimize water loss through transpiration.

• Structurally, a cladode is generally limited to one or two internodes in length, distinguishing it from other similar modifications.

• Common biological examples of plants featuring cladodes include Asparagus and Ruscus, where these structures aid in survival in arid environments.

Additional Information

• Rhizome:

• A rhizome is a thickened, prostrate, underground stem that grows horizontally.

• It possesses distinct nodes and internodes, and it serves primarily as a storage organ for food and a means of vegetative propagation.

• Common examples include Ginger (Zingiber officinale), Turmeric, and Lotus.

• Stolon:

• A stolon is a sub-aerial stem modification that originates as a lateral branch from the base of the main axis.

• It grows aerially for some time and then arches downwards to touch the soil, where it develops adventitious roots and a new shoot at the node.

• Examples include Strawberry, Jasmine, and Wild Strawberry (Fragaria).

• Thorn:

• A thorn is a hard, woody, and pointed structure resulting from the modification of an axillary bud.

• Its primary function is to provide protection to the plant against browsing animals and herbivores.

• Citrus and Bougainvillea are well-known examples of plants that bear thorns.

• Phylloclade:

• A phylloclade is similar to a cladode but consists of multiple nodes and internodes.

• It is a fleshy, green stem found in xerophytic plants like Opuntia (Cactus), where it stores water and performs photosynthesis.

Important Points

• The modification of stems into cladodes and phylloclades is a vital evolutionary adaptation for plants living in xeric (dry) habitats.

• By shifting the photosynthetic responsibility from thin leaves to fleshy stems, the plant significantly reduces its surface area exposed to evaporation.

• In Asparagus, the cladodes appear in clusters and are often mistaken for leaves, while the actual foliage leaves are non-photosynthetic scales found at the base.

• Understanding these morphological variations is crucial in the study of Plant Taxonomy and Botany to identify species and their ecological niches.

Q63. Answer: (b) -27

Shortcut Trick

=> (−56) ÷ (−14) = 4, (−2) × 7 = −14

=> Expression = −9 − 4 − 14

=> = −27

Therefore Answer = −27

Alternate Method

Given:

(−9) − (−56) ÷ (−14) + (−2) × 7

Concept Used:

BODMAS rule

Calculation:

(-9) - (-56) ÷ (-14) + (-2) × 7

=> (−9) − 4 + (−2 × 7)

=> (−9) − 4 + (−14)

=> (−9) − 4 − 14

=> −13 − 14

=> −27

Therefore The correct answer is −27.

Additional Information

BODMAS: Division and multiplication before addition/subtraction

Sign Rule: (− ÷ −) = +, (− × +) = −

Integer Rule: Combine negatives carefully

Exam Tip: Simplify inner operations first

Q64. Answer: (d) Civil Disobedience Movement

The correct answer is Civil Disobedience Movement.

Key Points

• The Gandhi-Irwin Pact was a landmark political agreement signed on 5 March 1931 between Mahatma Gandhi, representing the Indian National Congress, and Lord Irwin, the then Viceroy of India.

• Under the terms of this pact, the Indian National Congress agreed to discontinue the Civil Disobedience Movement, which had been active since 1930.

• The Civil Disobedience Movement was a mass protest against the British Salt Tax and colonial laws, famously inaugurated with the Dandi March (Salt Satyagraha) from 12 March 1930 to 6 April 1930.

• In return for withdrawing the movement, the British government agreed to release all political prisoners who were not accused of violence and allowed people living near the sea coasts to collect or manufacture salt for their own use.

• The pact also ensured that the Indian National Congress would participate in the Second Round Table Conference to be held in London later that year to discuss constitutional reforms for India.

Additional Information

• Non-Cooperation Movement (1920–1922):

• Launched by Mahatma Gandhi after the Rowlatt Act and the Jallianwala Bagh Massacre of 1919.

• It aimed to resist British rule through non-violent means such as boycotting foreign goods, government schools, and courts.

• The movement was abruptly called off in February 1922 following the Chauri Chaura incident in Uttar Pradesh, where a violent mob set fire to a police station, killing 22 policemen.

• Quit India Movement (1942):

• Also known as the August Kranti, it was launched at the Bombay session of the All-India Congress Committee on 8 August 1942.

• Triggered by the failure of the Cripps Mission, it demanded an immediate end to British rule in India.

• Mahatma Gandhi gave the call of "Do or Die" (Karo ya Maro) during this movement.

• Swadeshi Movement (1905–1911):

• It was an economic strategy aimed at removing the British Empire from power and improving economic conditions in India by boycotting British goods and using Indian-made products.

• The movement was a direct consequence of the Partition of Bengal in 1905 by Lord Curzon.

• Key leaders included the Lal-Bal-Pal trio (Lala Lajpat Rai, Bal Gangadhar Tilak, and Bipin Chandra Pal).

Important Points

• The Gandhi-Irwin Pact is often referred to as the Delhi Pact.

• The Indian National Congress formally endorsed the pact at its Karachi Session in March 1931, which was presided over by Sardar Vallabhbhai Patel.

• The pact was criticized by radical elements within the Congress and the youth because it did not secure the commutation of the death sentences of revolutionaries Bhagat Singh, Rajguru, and Sukhdev, who were executed on 23 March 1931.

• The Second Round Table Conference (September–December 1931) proved to be unsuccessful as the British government refused to grant Purna Swaraj (Complete Independence), leading to the resumption of the Civil Disobedience Movement in 1932.

Q65. Answer: (c) Kitab-Ul-Hind

The correct answer is Kitab-Ul-Hind.

Key Points

• Al-Biruni was a renowned Persian scholar, polymath, and traveler who was born in 973 AD in Khwarizm (modern-day Uzbekistan).

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• He arrived in India in the 11th century (specifically around 1017 AD) accompanying Mahmud of Ghazni during his military expeditions.

• The book Kitab-Ul-Hind (also known as Tahqiq-i-Hind) was written by him in Arabic, providing a voluminous and lucid account of Indian life and culture.

• The work is divided into 80 chapters, covering diverse topics such as religion, philosophy, festivals, astronomy, alchemy, manners, customs, social life, weights, measures, iconography, and laws.

• Al-Biruni adopted a unique methodology in his writing; he usually began each chapter with a question, followed by a description based on Sanskrit traditions, and concluded with a comparison to other cultures.

Additional Information

• Babarnama:

• This is the autobiography of Zahir-ud-din Muhammad Babur, the founder of the Mughal Empire in India.

• It was originally written in the Chagatai Turkic language during the 16th century.

• The book provides detailed observations of the flora, fauna, geography, and political landscape of Hindustan and Central Asia.

• Chahar Maqala:

• Written by the Persian author Nizami Aruzi around 1156 AD.

• The title translates to "Four Discourses," and it discusses four essential professions for a royal court: secretaries, poets, astrologers, and physicians.

• It serves as an important source of literary history and Persian courtly culture.

• Qiran us Sa'dain:

• This is a famous Masnavi (poem) composed by Amir Khusrau in 1289 AD.

• The name means "The Conjunction of the Two Auspicious Planets," and it commemorates the historic meeting between Sultan Muiz-ud-din Kaikubad and his father Nasir-ud-din Bughra Khan.

• Amir Khusrau is often regarded as the "Parrot of India" for his contributions to Indo-Persian literature and music.

• Language and Skills: Al-Biruni was a linguist proficient in Arabic, Persian, Hebrew, Syriac, and Sanskrit. His mastery of Sanskrit allowed him to read the Vedas, Puranas, and the Bhagavad Gita, which heavily influenced the accuracy of Kitab-Ul-Hind.

Important Points

• Indology: Because of his objective and systematic study of Indian society, Al-Biruni is often called the "Father of Indology."

• Caste System: In Kitab-Ul-Hind, he provided a detailed analysis of the Varna system, attempting to explain the caste hierarchy while observing that similar divisions existed in ancient Persia.

• Mathematics and Science: He was deeply interested in the works of Indian mathematicians like Brahmagupta and Varahamihira. He accurately described the Indian decimal system and astronomical theories of the time.

• English Translation: The book was translated into English by the scholar Edward Sachau in 1888, making this critical 11th-century historical document accessible to the modern world.

• Administrative and Geographic Insights: He described the land revenue systems, the topography of the Indo-Gangetic plain, and the river systems of North India, which remains a primary source for historians studying the medieval period.

Q66. Answer: (a) Protection of forests and wildlife of India

The correct answer is Protection of forests and wildlife of India.

Key Points

• Article 51 of the Constitution of India is a crucial provision under the Directive Principles of State Policy (DPSP), located in Part IV. It specifically outlines the state's objectives regarding international relations and peace.

• The promotion of international peace and security is the primary goal of this article. It directs the State to endeavor to contribute to a peaceful global order. Hence, statement C is correct as it is contained in Article 51.

• It mandates the maintenance of just and honourable relations between nations, emphasizing mutual respect and ethical conduct in diplomacy. Hence, statement D is correct as it is contained in Article 51.

• The article further fosters respect for international law and treaty obligations in the dealings of organized peoples with one another. Hence, statement B is correct as it is contained in Article 51.

• It also encourages the settlement of international disputes through the process of arbitration rather than conflict.

• Protection of forests and wildlife of India is not a part of Article 51. This objective is actually enshrined in Article 48A, which deals with the protection and improvement of the environment. Hence, statement A is incorrect (not contained in Article 51).

Additional Information

• Directive Principles of State Policy (DPSP):

• These principles are covered under Articles 36 to 51 in Part IV of the Indian Constitution. They are non-justiciable in nature, meaning they cannot be enforced by a court of law, but they are fundamental in the governance of the country.

• The concept of DPSP was borrowed from the Irish Constitution.

• Article 51 specifically represents the Liberal-Intellectual category of these principles, reflecting India's commitment to global cooperation.

• Environment Protection and Article 48A:

• Article 48A was added to the Constitution through the 42nd Amendment Act of 1976.

• It states that the State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country.

• This amendment was a significant step in establishing ecological conservation as a constitutional priority in India.

• Fundamental Duties (Article 51A):

• While Article 51 focuses on the State's duty toward international peace, Article 51A(g) imposes a Fundamental Duty on every citizen to protect and improve the natural environment including forests, lakes, rivers, and wildlife.

• This duty was also inserted by the 42nd Amendment Act in 1976 upon the recommendation of the Swaran Singh Committee.

Important Points

• The 42nd Amendment Act, 1976: This is often called the "Mini-Constitution" due to the vast number of changes it introduced. It notably expanded the scope of DPSPs by adding Article 39A, Article 43A, and Article 48A.

• International Context: Article 51 aligns with the principles of the United Nations Charter. It has historically served as the constitutional foundation for India's Non-Aligned Movement (NAM) policy and the Panchsheel principles (Five Principles of Peaceful Coexistence) signed in 1954.

• Legal Status: Unlike Fundamental Rights, if the State fails to implement Article 51, a citizen cannot file a writ petition in the Supreme Court or High Court. However, the judiciary often uses these principles to interpret laws and the scope of Fundamental Rights.

Q67. Answer: (d) 49.4

Shortcut Trick

=> Wrong sum = 49 × 80 = 3920

=> Correction = (92 + 83) − (69 + 74) = 175 − 143 = 32

=> Correct sum = 3920 + 32 = 3952

=> Correct mean = 3952 ÷ 80 = 49.4

Therefore Answer = 49.4

Alternate Method

Given:

Mean = 49, Total numbers = 80

Wrong numbers = 69, 74

Correct numbers = 92, 83

Concept Used:

Mean = Total sum ÷ Number of observations

Calculation:

=> Wrong total sum = 49 × 80 = 3920

=> Sum of wrong values = 69 + 74 = 143

=> Sum of correct values = 92 + 83 = 175

=> Correction = 175 − 143 = 32

=> Correct total = 3920 + 32 = 3952

=> Correct mean = 3952 ÷ 80 = 49.4

Therefore The correct answer is 49.4.

Additional Information

Mean Formula: Mean = Sum ÷ Number

Error Correction: Replace wrong values with correct ones

Shortcut Idea: Add net difference directly

Exam Tip: Always adjust total sum, not mean directly

Q68. Answer: (c) 6.5 runs per over

Shortcut Trick

=> Runs scored = (15×5) + (15×8) + (10×4)

=> = 75 + 120 + 40 = 235

=> Remaining runs = 300 − 235 = 65

=> Remaining overs = 50 − 40 = 10

=> Required rate = 65 ÷ 10 = 6.5

Therefore Answer = 6.5 runs per over

Alternate Method

Given:

Total runs = 300, Total overs = 50

First 15 overs @ 5 rpo

Next 15 overs @ 8 rpo

Next 10 overs @ 4 rpo

Concept Used:

Run rate = Runs ÷ Overs

Calculation:

=> Runs in first 15 overs = 15 × 5 = 75

=> Runs in next 15 overs = 15 × 8 = 120

=> Runs in next 10 overs = 10 × 4 = 40

=> Total runs scored = 75 + 120 + 40 = 235

=> Remaining runs = 300 − 235 = 65

=> Remaining overs = 50 − (15 + 15 + 10) = 10

=> Required run rate = 65 ÷ 10 = 6.5

Therefore The correct answer is 6.5 runs per over.

Additional Information

Run Rate: Runs ÷ Overs

Total Runs: Sum of segment-wise runs

Remaining Work: Total − Completed

Exam Tip: Break into segments for easy calculation

Q69. Answer: (b) To promote research and preservation of ancient linguistic heritage

The correct answer is To promote research and preservation of ancient linguistic heritage.

Key Points

• The primary objective of granting Classical Language status is to preserve the rich linguistic heritage of India and to encourage academic research into the ancient literature and history of these languages. This status acknowledges the originality and high antiquity of the language's literary tradition.

• The criteria for declaring a language as "Classical" were first established by the Ministry of Culture in 2004. The criteria include a recorded history of its early texts/recorded history over a period of 1500–2000 years.

• Another criterion is that the literary tradition must be original and not borrowed from another speech community. The Classical language and literature must be distinct from the modern form, or there may be a discontinuity between the classical version and its later forms or offshoots.

• Once a language is notified as a Classical Language, the Ministry of Education provides certain benefits to promote it, such as two major annual international awards for distinguished scholars of that language.

• The government also facilitates the creation of a Centre of Excellence for Studies in Classical Languages and requests the University Grants Commission (UGC) to create Professional Chairs for Classical Languages in Central Universities.

Additional Information

• Evolution of the List: The first language to be accorded this status was Tamil in 2004, followed by Sanskrit in 2005. Subsequently, Telugu and Kannada were added in 2008, Malayalam in 2013, and Odia in 2014.

• Recent Additions (2024): In a landmark decision in October 2024, the Union Cabinet chaired by the Prime Minister approved the inclusion of five more languages: Marathi, Pali, Prakrit, Assamese, and Bengali. This brings the total count of Classical Languages in India to 11.

• Institutional Support: The Central Institute of Indian Languages (CIIL) located in Mysuru, Karnataka, plays a pivotal role in the research and promotion of these languages. It works under the aegis of the Ministry of Education.

• Constitutional Context: While Classical status is an administrative designation, most of these languages are also listed in the Eighth Schedule of the Constitution of India. However, Pali and Prakrit are notable exceptions as they are classical but not currently part of the 22 languages in the Eighth Schedule.

• Promotion of Sanskrit: Unlike other classical languages, Sanskrit promotion is also governed by specific Central Universities Acts, and there are dedicated Central Sanskrit Universities located in New Delhi and Tirupati.

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Important Points

• Linguistic Expert Committee (LEC): The recommendation for classical status is made by a committee of experts constituted by the Sahitya Akademi. They examine the claims of a language based on the historical data and literary evidence provided.

• Impact on Education: The National Education Policy (NEP) 2020 emphasizes the preservation of Indian languages, including classical ones, suggesting that they should be available in schools as options for students to ensure the cultural continuity of the nation.

• Global Recognition: Granting this status helps in projecting India's soft power globally by highlighting the civilizational depth and the ancient roots of its diverse regional cultures.

• Research Grants: The status opens up funding for digitization of ancient manuscripts, translation of classical texts into modern languages, and archaeological efforts to find inscriptions related to the language.

Q70. Answer: (a) 670

Shortcut Trick

=> Let Veer = V, Nitin = N

=> V(1.1)^(14) = N(1.1)^(15)

=> V = 1.1N

=> Total => V + N = 1407

=> 1.1N + N = 1407 => 2.1N = 1407

=> N = 1407 ÷ 2.1 = 670

Therefore Answer = 670

Alternate Method

Given:

Total amount = 1407

Rate = 10% per annum

Time: Veer = 14 years, Nitin = 15 years

Formula Used:

Amount = $P(1 + r)^n$

Calculation:

=> Let Veer's share = V and Nitin's share = N

=> V(1.1)^(14) = N(1.1)^(15)

=> Divide both sides by (1.1)^(14)

=> V = N(1.1)

=> V = 1.1N

=> Total => V + N = 1407

=> 1.1N + N = 1407

=> 2.1N = 1407

=> N = 1407 ÷ 2.1 = 670

Therefore The correct answer is 670.

Additional Information

CI Formula: A = $P(1 + r)^n$

Key Insight: Equal amounts => compare powers

Ratio Trick: V : N = 1.1 : 1

Exam Tip: Cancel common powers quickly

Q71. Answer: (d) 51

Shortcut Trick

=> Let son = x => Vanraj = 3x, daughter = x − 3

=> 3 years ago total = (3x−3) + (x−3) + (x−6) = 73

=> 5x − 12 = 73 => 5x = 85 => x = 17

=> Vanraj = 3x = 51

Therefore Answer = 51 years

Alternate Method

Given:

Vanraj = 3 × son
Daughter = son − 3
Sum of ages 3 years ago = 73
Formula Used:
Present age − 3 gives age 3 years ago
Calculation:
=> Let son's present age = x
=> Vanraj = 3x, Daughter = x − 3
=> 3 years ago:
=> Vanraj = 3x − 3
=> Son = x − 3
=> Daughter = x − 6
=> Sum = (3x − 3) + (x − 3) + (x − 6) = 73
=> 5x − 12 = 73
=> 5x = 85
=> x = 17
=> Vanraj = 3x = 51
Therefore The correct answer is 51 years.
Additional Information
Age Concept: Age changes equally over time
Linear Equation: Form equation using present relations
Shortcut Tip: Work with variables and adjust years
Exam Tip: Carefully handle “years ago”

Q72. Answer: (a) 40%

Shortcut Trick
=> Let CP = 100 => MP = 210 (110% markup)
=> For 26% gain => SP = 126
=> Discount = MP − SP = 210 − 126 = 84
=> Discount% = (84/210) × 100 = 40%
Therefore Answer = 40%
Alternate Method
Given:
Marked price = 110% above cost price
Required gain = 26%
Formula Used:
MP = CP × (1 + markup%)
SP = CP × (1 + profit%)
Discount% = (MP − SP) / MP × 100
Calculation:
=> Let CP = 100
=> MP = 100 + 110% of 100 = 210
=> SP for 26% gain = 100 + 26 = 126
=> Discount = 210 − 126 = 84
=> Discount% = (84 ÷ 210) × 100
=> = 40%
Therefore The correct answer is 40%.
Additional Information
Markup: MP = CP + markup
Profit: SP = CP + profit
Discount: MP − SP
Exam Tip: Take CP = 100 for faster solving

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Q73. Answer: (b) Amazon Basin

The correct answer is Amazon Basin.

Key Points

• The Amazon Basin is globally recognized as the most biodiverse region on Earth, housing more than 10% of the world's known biodiversity within its vast tropical landscapes.

• It encompasses the Amazon Rainforest, which covers an area of approximately 7 million square kilometers (2.7 million square miles), though the forest itself occupies about 5.5 million square kilometers.

• The basin is home to an estimated 16,000 tree species and a total of 390 billion individual trees, playing a critical role in the global carbon cycle.

• Statistics reveal that the region contains about 40,000 plant species, 2,200 fishes, 1,294 birds, 427 mammals, 428 amphibians, and 378 reptiles that have been scientifically classified.

• Many species found here are endemic, meaning they exist nowhere else on the planet, such as the Amazon River Dolphin (Pink Dolphin) and the Golden Lion Tamarin.

Additional Information

• Geographic Location: The Amazon Basin is located in South America and spans across nine countries, including Brazil (which contains 60% of the rainforest), Peru, Colombia, Bolivia, Ecuador, Guyana, Suriname, French Guiana, and Venezuela.

• The Amazon River: It is the largest river by discharge volume of water in the world and the second longest river after the Nile, stretching approximately 6,400 kilometers (3,976 miles).

• Climate Features: The region experiences a tropical climate with high humidity and heavy rainfall throughout the year, typically ranging between 1,500 mm to 3,000 mm.

• Carbon Sequestration: Often called the "Lungs of the Planet," the basin absorbs billions of tons of carbon dioxide annually, helping to mitigate the effects of global warming and climate change.

• Indigenous Communities: The basin is inhabited by roughly 30 million people, including over 350 different indigenous ethnic groups who have lived in harmony with the ecosystem for thousands of years.

Important Points

• Threats to Biodiversity: The primary threats to the Amazon Basin include deforestation for cattle ranching, soybean agriculture, illegal logging, and mining activities.

• Deforestation Data: In the last 50 years, it is estimated that nearly 17% to 20% of the Amazon rainforest has been lost due to human intervention.

• Ecological Functions: The basin drives the hydrological cycle; the moisture released by the trees creates "flying rivers" in the atmosphere that provide essential rainfall to agricultural regions in South America.

• Medicinal Value: A significant percentage of modern pharmaceuticals are derived from Amazonian plant species, yet it is estimated that less than 1% of the plants have been thoroughly screened for medicinal use.

• Economic Impact: The Amazon Basin provides vital ecosystem services worth trillions of dollars, including water purification, pollination, and soil fertility maintenance.

Q74. Answer: (a) Innovating for Impact

The correct answer is Innovating for Impact.

Key Points

• The 11th World Green Economy Summit (WGES) was held in Dubai, United Arab Emirates (UAE), in November 2025. It serves as a premier global platform for addressing the critical transition toward a sustainable and green economy.

• The central theme for the 2025 edition was "Innovating for Impact," which emphasizes the shift from theoretical climate discussions to the implementation of scalable, high-impact technological and financial solutions.

• The summit was organized by the Dubai Electricity and Water Authority (DEWA) and the World Green Economy Organization (WGEO), in collaboration with international partners to align with the objectives of the United Nations Framework Convention on Climate Change (UNFCCC).

• A major focus of the 11th WGES was on accelerating green hydrogen production, enhancing carbon capture and storage (CCS) technologies, and mobilizing climate finance for developing nations to ensure an equitable transition.

• The event gathered Heads of State, ministers, global CEOs, and climate experts to discuss the integration of Artificial Intelligence (AI) and Internet of Things (IoT) in optimizing renewable energy grids.

Additional Information

• World Green Economy Organization (WGEO):

• The WGEO was launched in October 2016 by His Highness Sheikh Mohammed bin Rashid Al Maktoum.

• Its primary function is to promote the widespread adoption of green economy practices across governments, private sectors, and international organizations.

• The organization plays a pivotal role in supporting the Paris Agreement goals and the UN Sustainable Development Goals

(SDGs) 2030.

• Dubai Declaration:

• At the conclusion of each summit, the Dubai Declaration is released, which outlines the global commitments and strategic roadmap for the following year.

• The 2025 Declaration specifically underscored the importance of circular economy models and the reduction of methane emissions in industrial processes.

• UAE Net Zero 2050:

• The summit aligns with the UAE's Net Zero by 2050 strategic initiative, making the UAE the first country in the Middle East and North Africa (MENA) region to commit to such a goal.

• Investment in clean energy projects in the UAE is projected to reach over $163 billion by 2050.

Important Points

• Technological Convergence: The summit highlighted that digital transformation is inseparable from the green transition. Technologies like Blockchain are being utilized for transparent carbon credit trading.

• Youth and Education: A dedicated segment of the 11th WGES focused on empowering youth to take leadership roles in climate entrepreneurship, ensuring that the future workforce is skilled in green technology.

• Global Green Economy Index (GGEI): Discussions often refer to the GGEI, which ranks countries based on their environmental performance, climate change efficiency, and investment sectors.

• Cross-Sector Collaboration: The summit stressed that the transition requires "Public-Private Partnerships" (PPPs) to de-risk green investments in emerging markets.

Q75. Answer: (a) FCB 123

The logic followed here is:

So, 'FCB 123' will replace the question mark in the given series.

Hence, the correct answer is "Option 1".

Q76. Answer: (c) K

The logic followed here is:

Given series: (Left) @ B & G V 7 N % K U I 3 # € * $ 7 © U @ Z 5 (Right)

Now,

Remove all symbols: @, &, %, #, €, *, $, ©, @

Remaining series (letters and numbers only): B G V 7 N K U I 3 7 U Z 5

Now, Count from the left: B G V 7 N K U I 3 7 U Z 5

Sixth from the left = K

Hence, the correct answer is Option 3.

Q77. Answer: (a) 10.6%

Shortcut Trick

=> (2/5) MP = 40% MP gives 21% loss => SP = 79% of CP

=> So 40% MP = 79% CP => MP/CP = 79/40

=> New SP = 56% MP => = 56% × (79/40) CP

=> = (56×79)/40 % of CP = 110.6% of CP

=> Profit = 110.6 − 100 = 10.6%

Therefore Answer = 10.6% profit

Alternate Method

Given:

SP1 = (2/5) of MP => 40% MP

Loss = 21%

Formula Used:

SP = CP × (1 − loss%)

SP = CP × (1 + profit%)

Calculation:

=> Let CP = 100

=> SP1 = 79 (since 21% loss)

=> 40% of MP = 79 => MP = 79 × 100 / 40 = 197.5

=> New SP2 = 56% of MP = 0.56 × 197.5 = 110.6

=> Profit = 110.6 − 100 = 10.6%

Therefore The correct answer is 10.6% profit.

Additional Information

Loss Formula: SP = CP × (1 − loss%)

Profit Formula: SP = CP × (1 + profit%)

MP Relation: Use first condition to find MP/CP

Exam Tip: Take CP = 100 for easy calculation

Q78. Answer: (b) 6

The logic followed here is:

Given:

HOUR → 8359

HORN → 9856

Hence, the code for N is 6.

Hence, the correct answer is Option 2.

Q79. Answer: (d) Lucknow

The correct answer is Lucknow.

Key Points

• The 13th edition of the Indian Olympic Games (currently known as the National Games of India) was hosted in Lucknow, the capital city of Uttar Pradesh.

• This event was significantly historical as it was the first time the National Games were organized in independent India after the partition and independence in 1947.

• The games were held in February 1948, providing a platform for athletes from the newly formed nation to showcase their sporting prowess on a national stage.

• The city of Lucknow played a pivotal role in reviving the sporting spirit of the country following the socio-political turmoil of the late 1940s.

• During this period, the event was still primarily referred to as the Indian Olympic Games, a tradition that had been established since the 1920s to select talent for the International Olympic Games.

Additional Information

• History of the National Games:

• The National Games movement in India began in the 1920s with the objective of promoting Olympic sports in the country.

• The first ever edition of the Indian Olympic Games was held in 1924 in Lahore (now in Pakistan).

• The 9th edition of the games, held in Bombay (now Mumbai) in 1940, was the first time the event was officially named the National Games.

• Lucknow had previously hosted the 12th edition of the games in 1946, just before independence.

• Governance and Administration:

• The Indian Olympic Association (IOA) is the apex body responsible for the organization and smooth conduct of the National Games.

• The duration and frequency of the games were initially biennial, but modern iterations have seen longer gaps due to administrative and infrastructure requirements.

• The modern format of the National Games (on the lines of the Olympics) started with the 26th edition held in New Delhi in 1985.

• Recent Editions:

• The 36th National Games were held in Gujarat in 2022 across six cities: Ahmedabad, Gandhinagar, Surat, Vadodara, Rajkot, and Bhavnagar.

• The 37th National Games took place in Goa in 2023, featuring a record number of sports disciplines.

• The 38th National Games are scheduled to be hosted by the state of Uttarakhand.

Important Points

• Key Figures: G.D. Sondhi, the first Secretary of the Indian Olympic Association, was a visionary who championed the cause of the National Games to foster unity and athletic excellence.

• Symbolism: The 1948 Lucknow Games coincided with the year India won its first Olympic Gold medal as an independent nation in Field Hockey at the London Olympics.

• Infrastructural Impact: Hosting such games has historically led to the development of sports complexes and stadiums in cities

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like Lucknow, Hyderabad, and Guwahati, boosting the local sports ecosystem.

• Eligibility: Only Indian athletes representing various States, Union Territories, and the Services Sports Control Board (SSCB) are eligible to participate in the National Games.

Q80. Answer: (b) J

Given: Seven boxes D, E, F, G, H, I and J are kept one over the other.

D is kept fifth from the bottom.

Only two boxes are kept between D and H.

I is kept somewhere above D but below E.

Only two boxes are placed between G and F.

F is not placed at the bottom.

Position	Box
7	E
6	I
5	D
4	F
3	J
2	H
1	G

Now, box at third position from the bottom: J

Hence, the correct answer is Option 2.

Q81. Answer: (b) 11

Shortcut Trick

=> 20 ÷ 5 = 4, 3 × 3 = 9

=> Expression = 16 + 4 − 9

=> = 20 − 9 = 11

Therefore Answer = 11

Alternate Method

Given:

16 + 20 ÷ 5 − 3 × 3

Concept Used:

BODMAS rule

Calculation:

=> 16 + 4 − 3 × 3

=> 16 + 4 − 9

=> 20 − 9

=> 11

Therefore The correct answer is 11.

Additional Information

BODMAS: Division & multiplication before addition/subtraction

Order: Solve ÷ and × from left to right

Basic Rule: Always simplify step-by-step

Exam Tip: Avoid doing addition first

Q82. Answer: (d) Entry of MNCs

The correct answer is Entry of MNCs.

Key Points

• The Liberalization policy introduced in 1991 aimed to dismantle the "License Raj" and open the Indian economy to global competition. The Entry of MNCs (Multinational Corporations) was a pivotal structural change that directly intensified competition by

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bringing in advanced technology, global marketing strategies, and superior product quality.

• Before 1991, the Indian industry was characterized by Industrial protection and high import duties, which shielded domestic firms from external competition. Statement B, Industrial protection, actually hindered competition rather than increasing it; hence, this statement is incorrect.

• The abolition of Public monopolies in several sectors (except for a few like Atomic Energy and Railways) allowed private players and MNCs to compete on a level playing field. While the removal of monopolies facilitated competition, the actual presence and Entry of MNCs acted as the primary catalyst for market-driven rivalry. Hence, statement C is partially related but the "Entry" is the definitive structural change that increased competition.

• Price controls were largely removed or relaxed during the Economic Reforms of 1991 to allow market forces to determine the value of goods. Statement A, Price controls, were a feature of the pre-liberalization era that restricted competition; therefore, this statement is incorrect.

• The Entry of MNCs forced domestic Indian companies to modernize their production techniques and improve operational efficiency to survive in the newly competitive landscape. This led to a wider variety of goods and services for consumers. Hence, statement D is correct.

Additional Information

• The New Economic Policy (NEP) 1991: This policy was launched by the then Prime Minister P.V. Narasimha Rao and Finance Minister Dr. Manmohan Singh on July 24, 1991. It was built on the pillars of LPG: Liberalization, Privatization, and Globalization.

• Liberalization: It refers to the removal of government-imposed restrictions on social, political, or economic policies. In the Indian context, it meant the end of industrial licensing for most industries and allowing the private sector to expand.

• Foreign Direct Investment (FDI): Post-1991, the government significantly raised the FDI limits in various sectors. This encouraged MNCs to invest capital and set up manufacturing units in India, leading to job creation and industrial growth.

• Monopolies and Restrictive Trade Practices (MRTP) Act, 1969: Under the 1991 reforms, the MRTP Act was amended to remove the requirement for large companies to seek prior government approval for expansion or setting up new units. This was later replaced by the Competition Act, 2002, and the Competition Commission of India (CCI) was established to ensure fair market practices.

• Impact on Consumers: The increased competition led to a surplus of choices, better after-sales service, and competitive pricing. Sectors like Automobiles, Telecommunications, and Fast-Moving Consumer Goods (FMCG) saw the most dramatic shifts.

Important Points

• Foreign Exchange Management Act (FEMA): To facilitate external trade and payments, the Foreign Exchange Regulation Act (FERA) of 1973 was replaced by FEMA in 1999, which was much more liberal and focused on managing rather than regulating foreign exchange.

• Navratnas and Maharatnas: While promoting Privatization, the government also identified high-performing Public Sector Undertakings (PSUs) and gave them greater autonomy. These were classified as Navratnas to help them compete with global MNCs.

• Trade Policy Reforms: These included the reduction of import tariffs and the removal of quantitative restrictions on imports. This allowed Indian industries to access raw materials and machinery at international prices, further driving competition.

• Date of Implementation: The reforms were triggered by a Balance of Payments (BoP) crisis in 1991, leading India to seek assistance from the International Monetary Fund (IMF) and the World Bank.

Q83. Answer: (a) Weak APMC reform implementation

The correct answer is Weak APMC reform implementation.

Key Points

• The Agricultural Produce Market Committee (APMC) system was originally designed to protect farmers from exploitation by large retailers and ensures that the farm-to-retail price spread does not reach excessive levels. However, in the post-liberalization era following 1991, the system became a structural barrier due to its monopolistic nature.

• To address these inefficiencies, the Union Government introduced the Model APMC Act in 2003. This model act aimed to provide for direct sale, promotion of contract farming, and the establishment of private markets to increase competition. Weak reform implementation by various State Governments meant that these changes remained on paper in many regions.

• Because Agriculture is a State Subject under the Seventh Schedule of the Constitution of India, the central government could only suggest reforms. Many states were reluctant to dilute the power of existing APMC mandis due to political reasons and the revenue generated through mandi taxes. Hence, the statement regarding weak reform implementation is the primary reason for continued inefficiency.

• The inefficiency is further characterized by a fragmented supply chain. Farmers often have to sell to licensed traders within specific geographical areas, leading to a lack of market integration and poor price discovery. This creates a situation where the intermediaries (Arhatiyas) capture a significant portion of the value, leaving the primary producer with low returns.

• The lack of private investment in cold storage and warehousing is a direct consequence of the restrictive APMC laws. Without the assurance of direct procurement, private entities were hesitant to invest in post-harvest infrastructure, leading to high wastage of perishable goods.

Additional Information

• National Agriculture Market (e-NAM):

• Launched on April 14, 2016, e-NAM is a pan-India electronic trading portal which networks the existing APMC mandis to create a unified national market for agricultural commodities.

• It aims to remove information asymmetry between buyers and sellers and promote real-time price discovery based on actual demand and supply.

• As of 2023, over 1,300 mandis across 23 States and 4 Union Territories have been integrated into the platform.

• Essential Commodities Act (ECA), 1955:

• This Act gives the government the power to control the production, supply, and distribution of a whole range of commodities it deems "essential" to ensure they are available to consumers at fair prices.

• In the context of marketing, frequent stock limits imposed under this Act discouraged private wholesalers and processors from buying in bulk, further stifling the efficiency of the marketing system.

• Shanta Kumar Committee (2014):

• This high-level committee was set up to suggest restructuring of the Food Corporation of India (FCI) and improving agricultural marketing.

• It highlighted that only about 6% of farmers actually received the Minimum Support Price (MSP), pointing towards the failure of the marketing and procurement reach in most parts of the country.

• Contract Farming:

• This involves agricultural production being carried out based on an agreement between the buyer and farm producers.

• It provides farmers with access to technology, quality seeds, and a guaranteed price, but its success has been limited by the lack of a legal framework in many states to protect farmers from contractual disputes.

Important Points

• Structural Inefficiencies: The average area served by a regulated market in India is much larger than the 80 sq. km. recommended by the National Commission on Farmers (2004) headed by Dr. M.S. Swaminathan.

• Price Spread: Studies have shown that the farmer's share in the consumer's rupee can be as low as 15% to 40%, especially in the case of fruits and vegetables, due to the multi-layered chain of middlemen.

• Recent Reforms: In 2020, the Parliament passed three farm laws intended to bypass APMC monopolies, but these were later repealed in 2021 following massive protests, highlighting the socio-political complexity of agricultural marketing reforms in India.

• Agri-Export Policy 2018: This policy was introduced to double agricultural exports to $60 billion by 2022, emphasizing the need for an efficient internal marketing system to meet global quality standards and sanitary and phytosanitary (SPS) measures.

Q84. Answer: (d) Sundarbans National Park

The correct answer is Sundarbans National Park.

Key Points

• Sundarbans National Park is located in the South 24 Parganas district of West Bengal, India. It is a part of the world's largest delta formed by the confluence of the Ganges, Brahmaputra, and Meghna rivers.

• The park was inscribed as a UNESCO World Heritage Site in the year 1987 for its unique mangrove ecosystem. It is one of the largest reserves for the Royal Bengal Tiger and hosts a wide range of flora and fauna.

• The Sundarbans is home to the largest halophytic mangrove forest in the world, which acts as a natural barrier against tsunamis and cyclones. This unique environment led to its designation as a National Park on May 4, 1984.

• The name "Sundarbans" is derived from the Sundari trees (Heritiera fomes), which are found in abundance in this region and are known for their specialized pneumatophores (breathing roots) that help them survive in waterlogged, saline soil.

• In addition to its World Heritage status, the area was designated as a Tiger Reserve in 1973 under Project Tiger and was later declared a Biosphere Reserve in 1989.

Additional Information

• Kaziranga National Park:

• Located in the state of Assam, this park is famous for the Great One-horned Rhinoceros.

• It was declared a UNESCO World Heritage Site in 1985. It contains the highest density of tigers among protected areas in the world and was declared a Tiger Reserve in 2006.

• Gir National Park:

• Situated in the Junagadh district of Gujarat, it was established in 1965.

• It is globally significant as the only natural habitat of the Asiatic Lion (Panthera leo leo). The park consists of a hilly landscape with dry deciduous forests.

• Jim Corbett National Park:

• Located in the Nainital district of Uttarakhand, it is the oldest national park in India, established in 1936 as Hailey National Park.

• It was the first area to come under the Project Tiger initiative in 1973. It is renowned for its diverse wildlife, including tigers, leopards, and elephants.

Important Points

• Ramsar Convention: In January 2019, the Sundarban Wetland in India was recognized as a Wetland of International Importance under the Ramsar Convention, making it the 27th Ramsar site in India at that time.

• Wildlife Diversity: Besides tigers, the park is a sanctuary for the Estuarine Crocodile, Northern River Terrapin, Olive Ridley Sea Turtle, and the Gangetic Dolphin.

• Geographical Significance: The Sundarbans ecosystem is shared between India and Bangladesh, with approximately 40% of the forest area lying within India and 60% in Bangladesh. The Bangladesh portion of the Sundarbans was also declared a UNESCO World Heritage Site in 1997.

Q85. Answer: (d) MPR 60

The logic followed here is:

So, 'MPR 60' will replace the question mark in the given series.

Hence, the correct answer is "Option 4".

Q86. Answer: (d) 291.67

Shortcut Trick

=> Relative speed = 140 + 70 = 210 km/hr

=> Convert => 210 × 5/18 = 58.33 m/s

=> Total length = speed × time = 58.33 × 11 ≈ 641.67 m

=> Other train length = 641.67 − 350 = 291.67 m

Therefore Answer = 291.67 m

Alternate Method

Given:

Speed of trains = 140 km/hr and 70 km/hr

Length of one train = 350 m

Time = 11 sec

Formula Used:

Relative speed (opposite) = sum of speeds

Distance = Speed × Time

Calculation:

=> Relative speed = 140 + 70 = 210 km/hr

=> Convert to m/s => 210 × 5/18 = 58.33 m/s

=> Total distance covered = 58.33 × 11 = 641.67 m

=> Total length = sum of both trains = 641.67 m

=> Length of other train = 641.67 − 350 = 291.67 m

Therefore The correct answer is 291.67 m.

Additional Information

Relative Speed: Opposite => sum of speeds

Conversion: km/hr × 5/18 = m/s

Crossing Trains: Total length = sum of lengths

Exam Tip: Always convert units first

Q87. Answer: (b) One

The logic followed here is:

Given: X, Y, Z, S, T and U live on six different floors of the same building.

The lowermost floor is numbered 1 and the topmost is 6.

T lives on the lowermost floor.

Only two people live between T and Y.

Only S lives above U.

Z lives on an even-numbered floor.

Floor	Person

6	S
5	Y
4	Z
3	X
2	U
1	T

Now, people between X and T = 1.

Hence, the correct answer is Option 2.

Q88. Answer: (b) three prime numbers

Shortcut Trick

=> Let HCF = p (two-digit prime)

=> First number = 5p, Second number = 3p

=> Required HCF = HCF(3×5p, 5×3p) = HCF(15p, 15p)

=> = 15p = 3 × 5 × p

Therefore Answer = three prime numbers

Alternate Method

Given:

HCF = one-fifth of first number and one-third of second number

HCF is a two-digit prime number

Formula Used:

Numbers = HCF × co-prime factors

Calculation:

=> Let HCF = p (prime)

=> First number = 5p

=> Second number = 3p

=> Required HCF = HCF(3×first, 5×second)

=> = HCF(15p, 15p)

=> = 15p

=> = 3 × 5 × p

Therefore The correct answer is three prime numbers.

Additional Information

HCF Concept: Common factor shared by numbers

Prime Property: p is prime => cannot be broken further

Key Insight: Final HCF = product of 3 primes (3, 5, p)

Exam Tip: Express numbers in terms of HCF

Q89. Answer: (c) Chauri-Chaura incident

The correct answer is Chauri-Chaura incident.

Key Points

• The Non-Cooperation Movement, launched by Mahatma Gandhi in 1920, was a significant phase of the Indian independence struggle, but it was abruptly halted due to the Chauri-Chaura incident.

• On 4 February 1922, at Chauri Chaura in the Gorakhpur district of the United Provinces (modern-day Uttar Pradesh), a large group of protesters participating in the movement clashed with the police.

• In retaliation to police firing, the demonstrators set fire to a police station, leading to the death of 22 policemen.

• Mahatma Gandhi, who was a staunch advocate of Ahimsa (non-violence), felt that the movement was losing its non-violent character and that the people were not yet fully prepared for a peaceful mass struggle.

• Consequently, Gandhi decided to suspend the movement, and the Congress Working Committee formally met at Bardoli on 12 February 1922, to pass the Bardoli Resolution, which officially called off the Non-Cooperation Movement. Hence, the correct answer is the Chauri-Chaura incident.

Additional Information

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• Alipore Bomb Case:

• Also known as the Manicktolla bomb conspiracy or the Muraripukur conspiracy, it took place in 1908.

• It was a revolutionary trial in Calcutta involving several Indian nationalists, including Aurobindo Ghosh and his brother Barindra Ghosh, following an attempt on the life of Magistrate Douglas Kingsford.

• Withdrawal of the Khilafat Movement:

• The Khilafat Movement (1919–1924) was led by the Ali Brothers (Mohammad Ali and Shaukat Ali) to support the Ottoman Caliphate.

• It merged with the Non-Cooperation Movement to unify Hindus and Muslims against British rule; however, the movement collapsed after the post of Caliph was abolished in Turkey by Mustafa Kemal Atatürk in 1924.

• Suspension of the Rowlatt Act:

• The Rowlatt Act of 1919 (officially the Anarchical and Revolutionary Crimes Act) allowed the British government to imprison individuals for up to two years without trial.

• Protests against this "Black Act" led to the Rowlatt Satyagraha and ultimately the tragic Jallianwala Bagh Massacre on 13 April 1919 in Amritsar.

Important Points

• The Non-Cooperation Movement was the first mass movement organized on a nationwide scale under the leadership of Gandhi.

• Key features included the boycott of foreign goods, government schools and colleges, courts, and the surrender of titles awarded by the British government.

• The decision to withdraw the movement led to internal divisions within the Indian National Congress, resulting in the formation of the Swaraj Party in 1923 by C.R. Das and Motilal Nehru, who wanted to enter the Legislative Councils.

• The Nagpur session of the Congress in December 1920 had ratified the non-cooperation program, shifting the Congress goal from "constitutional means" to "attainment of Swaraj through peaceful and legitimate means."

Q90. Answer: (c) Hibernate

The correct answer is Hibernate.

Key Points

• Hibernate mode is a power-saving state designed primarily for laptops and portable devices that saves your open documents and running applications to the Hard Disk Drive (HDD) or Solid State Drive (SSD) and then turns off the power completely.

• It uses the least amount of electricity because, unlike other modes, it does not need power to maintain the data in the Random Access Memory (RAM); instead, it stores the session in a file called hiberfil.sys on the non-volatile storage.

• When you turn the computer back on, the Operating System reads the saved state from the disk and restores all your open windows and programs exactly as they were. This makes it ideal for users who need to take a break for several hours or days without losing their workspace. Hence, Option C is the correct answer.

• While Hibernate is highly efficient in power consumption, the wake-up time is longer than Sleep mode because the data must be read back from the slower storage drive into the RAM.

Additional Information

• Sleep Mode (or Standby):

• In this state, the computer enters a low-power mode where it keeps the current session in the RAM.

• It allows the computer to resume full-power operation very quickly, usually within 2 to 5 seconds.

• However, it requires a constant (though small) supply of electricity to keep the RAM powered; if power is lost (e.g., battery dies), any unsaved data will be lost. Hence, Option B (and A) use more electricity than Hibernate.

• Standby:

• In older versions of Windows (like Windows XP), the term Standby was used instead of Sleep. In modern systems, they refer to essentially the same low-power state where RAM remains active.

• It uses more power than Hibernate because the motherboard and memory remain partially energized. Hence, Option A is not the most efficient.

• Active Mode:

• This is the standard state where the computer is fully powered on and functional.

• In this mode, the CPU, GPU, Monitor, and Cooling Fans consume the maximum electricity, which can range from 50 Watts to 500+ Watts depending on the hardware. Hence, Option D is the least efficient.

• Hybrid Sleep:

• This is a feature mostly used on Desktop computers. It saves open documents to both the RAM and the Hard Disk.

• It offers the speed of Sleep mode while providing the data safety of Hibernate in case of a power outage.

Important Points

• Power Consumption Data: On average, a desktop in Sleep mode uses about 1-5 Watts, while in Hibernate, it uses 0.2-0.5 Watts

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(the same as being shut down but plugged into a wall).

• ACPI Standards: Power management states are defined by the Advanced Configuration and Power Interface (ACPI). Hibernate corresponds to the S4 state, while Sleep corresponds to the S1, S2, or S3 states.

• Modern Standby (S0 Low Power Idle): New laptops often use Modern Standby, which allows the system to stay connected to Wi-Fi to receive emails or updates even in a low-power state, similar to how a Smartphone functions.

• SSD Impact: With the rise of Solid State Drives (SSDs), the time difference between waking from Sleep versus Hibernate has decreased significantly, making Hibernate more convenient for daily use than it was with older Mechanical Hard Drives.

Q91. Answer: (b) Emulsification

The correct answer is Emulsification.

Key Points

• Emulsification is the specific chemical and mechanical process used to create Mayonnaise, which is a stable mixture of two liquids that normally do not mix. Hence, the statement regarding emulsification is correct.

• In this process, oil is slowly added to a water-based acid, such as vinegar or lemon juice, while being rapidly agitated. This breaks the oil into microscopic droplets that become suspended within the liquid.

• A crucial component of this process is the emulsifier, which in the case of traditional mayonnaise is egg yolk. The yolk contains Lecithin, a phospholipid that acts as a bridge between the polar water molecules and non-polar oil molecules.

• The Lecithin molecules surround the oil droplets, preventing them from coalescing (rejoining), which results in a thick, creamy, and permanent emulsion.

• Mechanical energy, usually provided by a whisk, blender, or food processor, is required to facilitate the dispersion of the oil phase into the continuous aqueous phase.

Additional Information

• Caramelisation:

• This is a non-enzymatic browning reaction that occurs when sugars are heated to high temperatures, typically above 160°C (320°F) depending on the type of sugar.

• It involves the removal of water (as steam) and the breakdown of the sugar, resulting in the formation of compounds like Caramelan, Caramelen, and Caramelin.

• It is commonly seen in the cooking of onions, caramel sauce, and the browning of marshmallows. Hence, this process is not used for mayonnaise.

• Maillard Reaction:

• Named after the French chemist Louis-Camille Maillard in 1912, this is a chemical reaction between amino acids and reducing sugars.

• It usually occurs at temperatures between 140°C and 165°C (280°F to 330°F) and is responsible for the distinct flavor and aroma of seared steaks, fried dumplings, and toasted bread.

• Unlike caramelisation, it requires the presence of proteins to proceed. Hence, this process is not used for making mayonnaise.

• Oxidation:

• Oxidation in food science often refers to lipid oxidation, where oxygen reacts with fats and oils.

• This process leads to rancidity, producing off-flavors and unpleasant odors in food products over time.

• In the context of mayonnaise, oxidation is actually something manufacturers try to prevent using antioxidants or EDTA to ensure shelf-life stability. Hence, this process is not the method of preparation.

Important Points

• Types of Emulsions: Mayonnaise is classified as an Oil-in-Water (O/W) emulsion because the oil (dispersed phase) is suspended in water/vinegar (continuous phase). In contrast, butter is a Water-in-Oil (W/O) emulsion.

• Stability Factors: The stability of mayonnaise depends on the concentration of oil (usually 70-80%), the pH level (acidity), and the efficiency of the emulsifying agent.

• History: The origin of mayonnaise is often attributed to the French victory at Port Mahon in 1756, where a sauce was created using oil and eggs when cream was unavailable.

• Commercial Standards: In many countries, for a product to be legally labeled as "Mayonnaise," it must contain a specific minimum percentage of vegetable oil and egg yolk. Products that use starch or other thickeners are often labeled as "Salad Dressing."

Q92. Answer: (b) A Minister of State with independent charge may head a ministry without being under a Cabinet Minister.

The correct answer is A Minister of State with independent charge may head a ministry without being under a Cabinet Minister.

Key Points

• The Council of Ministers in India is categorized into three ranks: Cabinet Ministers, Ministers of State, and Deputy Ministers.

• A Minister of State (Independent Charge) is a minister who heads a specific ministry or department and does not report to a Cabinet Minister for that specific portfolio. Hence, statement B is the correct explanation.

• Unlike Ministers of State who are attached to Cabinet Ministers to assist them, those with Independent Charge exercise all powers and functions related to their ministries independently, similar to Cabinet Ministers but without being part of the Cabinet itself.

• Cabinet Ministers are the senior-most ministers who attend all Cabinet meetings. In contrast, a Minister of State (Independent Charge) only attends Cabinet meetings when specially invited to discuss matters related to their specific department.

• The primary difference lies in the administrative hierarchy: a Cabinet Minister holds a more senior designation and oversees major portfolios like Home, Finance, or Defence, whereas a Minister of State (Independent Charge) manages smaller or specialized departments.

Additional Information

• Constitutional Framework: Under Article 74 of the Constitution of India, there shall be a Council of Ministers with the Prime Minister at the head to aid and advise the President. Article 75 specifies that the Prime Minister shall be appointed by the President and other ministers shall be appointed on the Prime Minister's advice.

• Size of Council: According to the 91st Amendment Act, 2003, the total number of ministers, including the Prime Minister, in the Council of Ministers shall not exceed 15% of the total strength of the Lok Sabha.

• Cabinet Minister Functions: They are the core of the executive and play the most significant role in policy formulation. They usually handle important ministries such as External Affairs, Railways, and Agriculture.

• Ministers of State (Attached): These ministers do not hold independent charge. They are assigned to assist Cabinet Ministers in their administrative and parliamentary work, ensuring the smooth functioning of large ministries.

• Deputy Ministers: They are the third tier of the hierarchy. They are not given independent charge of ministries and are attached to either Cabinet Ministers or Ministers of State to assist them with their duties.

Important Points

• Article 352: The word "Cabinet" was not originally part of the Constitution. It was inserted through the 44th Constitutional Amendment Act of 1978, defining it as the body consisting of the Prime Minister and other ministers of Cabinet rank under Article 75.

• Numerical Strength: The Cabinet is a smaller, more powerful body consisting of approximately 15 to 20 senior ministers, while the Council of Ministers is a larger body consisting of 60 to 70 ministers.

• Collective Responsibility: The entire Council of Ministers is collectively responsible to the Lok Sabha. This means if a no-confidence motion is passed, the entire council, including Ministers of State (Independent Charge), must resign.

• Decision Making: The Cabinet meets regularly (usually once a week) to take major policy decisions, whereas the full Council of Ministers meets very rarely for formal functions.

Q93. Answer: (d) Industrial Entrepreneurs Memoranda

The correct answer is Industrial Entrepreneurs Memoranda.

Key Points

• The Industrial Entrepreneurs Memoranda (IEM) was introduced as a part of the New Industrial Policy (NIP) announced on July 24, 1991.

• It is an application for acknowledgment of the establishment of a unit for manufacturing activities that are exempted from industrial licensing under the Industries (Development and Regulation) Act, 1951 (IDRA).

• Industrial undertakings that do not require an Industrial License are required to file an IEM with the Secretariat for Industrial Assistance (SIA), which falls under the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.

• The IEM is filed in two parts: Part A is for the intention to set up the industrial unit, and Part B is filed after the commencement of commercial production.

• This measure significantly reduced the bureaucratic hurdles for entrepreneurs, marking a shift from the restrictive "License-Permit Raj" to a more liberalized regulatory framework.

Additional Information

• New Industrial Policy, 1991:

• The 1991 policy was launched by the P.V. Narasimha Rao government with Dr. Manmohan Singh as the Finance Minister, introducing Liberalization, Privatization, and Globalization (LPG) reforms.

• It abolished Industrial Licensing for all industries except for a short list of 18 industries (which has since been reduced to only 5 sectors, including aerospace, gunpowder, and hazardous chemicals) related to security, strategic concerns, and environmental issues.

• The policy aimed to enhance efficiency, productivity, and international competitiveness of the Indian industrial sector.

• Industrial License (IL):

• Despite liberalization, certain items remain under compulsory licensing. These include distillation and brewing of alcoholic drinks,

cigars and cigarettes, electronic aerospace and defense equipment, industrial explosives, and hazardous chemicals.

• Micro, Small, and Medium Enterprises (MSME):

• Smaller units are governed by different registration processes, such as the Udyam Registration portal (formerly Udyog Aadhaar), which was launched in July 2020 to simplify the registration process for MSMEs.

Important Points

• Digital Transformation: The process of filing IEM has been made completely online through the G2B (Government to Business) portal to promote Ease of Doing Business in India.

• Exemptions: IEM is not required for units that fall under the MSME category as per the MSMED Act, 2006, as they follow a separate registration path.

• Monitoring: The Part B filing is crucial for the Government of India to maintain data on actual investment and employment generation within the country, helping in policy formulation.

• FDI Policy: The 1991 reforms also allowed for automatic approval of Foreign Direct Investment (FDI) up to 51% in high-priority industries, further integrating India into the global economy.

Q94. Answer: (d) = KQL, % = LRM

Given: # : IOJ :: NTO : %

Option 1) # = KQJ, % = LRM

For # (KQJ) to IOJ

For % (LRM) to NTO

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

Option 2) # = KQL, % = LSM

For # (KQL) to IOJ

For % (LSM) to NTO

Since, the pattern is not consistent across both transformations, Option 2 is incorrect.

Option 3) # = KQL, % = LRN

For # (KQL) to IOJ

For % (LRN) to NTO

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

Option 4) # = KQL, % = LRM

For # (KQL) to IOJ

For % (LRM) to NTO

Since, both transformations follow a consistent shift pattern, Option 4 is correct.

Hence, the correct answer is "Option 4".

Q95. Answer: (a) It took place in present day Maharashtra

The correct answer is It took place in present day Maharashtra.

Key Points

• The Rampa Rebellion, also known as the Manyam Rebellion, took place in the Gudem Hills of the Godavari district in Andhra Pradesh, not in Maharashtra. Hence, statement 1 is incorrect.

• The rebellion was led by Alluri Sitarama Raju, who became a folk hero in Andhra Pradesh for his role in the struggle against British colonial rule. Hence, statement 2 is correct.

• The tribal rebels, led by Raju, adopted guerrilla warfare tactics to fight against the British Raj, attacking various police stations in the Chintapalle, Rampa, and Dammanapalli regions. Hence, statement 3 is correct.

• The primary cause of the uprising was the Madras Forest Act of 1882, which restricted the free movement of tribal people in forest areas and prohibited their traditional Podu (shifting cultivation) practices, as well as the exploitation by moneylenders and contractors. Hence, statement 4 is correct.

• The rebellion lasted for nearly two years, beginning in August 1922 and continuing until 1924.

Additional Information

• Alluri Sitarama Raju:

• He was born in 1897 or 1898 in the Visakhapatnam district of Andhra Pradesh.

• He was highly influenced by Mahatma Gandhi and the Non-Cooperation Movement, encouraging people to wear Khadi and give up drinking.

• Despite his respect for Gandhi, he believed that India could be liberated only by the use of force, not non-violence.

• He was captured by the British in May 1924 and subsequently executed, which led to the end of the rebellion.

• Geographical Location:

• The rebellion was centered in the Eastern Ghats, specifically the hilly tracts of the Visakhapatnam and East Godavari districts.

• The region is characterized by dense forests and rugged terrain, which favored guerrilla tactics.

• Socio-Economic Impact:

• The British administration used the Assam Rifles and the Malabar Special Police to suppress the movement.

• The rebellion highlighted the plight of tribal communities like the Koyas and Konda Doras under colonial forest policies.

Important Points

• Madras Forest Act, 1882: This Act declared large areas of forest as Reserved Forests, effectively barring tribal communities from accessing their ancestral lands for fuel, food, and Podu cultivation.

• Manyam Veerudu: For his bravery and leadership during the Rampa Rebellion, Alluri Sitarama Raju is honored with the title "Manyam Veerudu", which translates to "Hero of the Jungle".

• Vetti System: The tribal people were also subjected to Vetti (forced labor) by the British authorities for building roads in the forest areas, which further fueled the resentment leading to the 1922 rebellion.

• Historical Context: This was the second Rampa Rebellion; the first occurred in 1879 against the oppressive policies of the Mansabdar of Rampa and the British.

Q96. Answer: (b) Swarna-Sub1 rice

The correct answer is Swarna-Sub1 rice.

Key Points

• Swarna-Sub1 rice is a specialized variety of rice developed using biotechnology to withstand flash floods or total submergence. It is a prime example of climate-resilient agriculture promoted by institutes like the National Agri-food Biotechnology Institute (NABI).

• The variety was developed through Marker-Assisted Backcrossing (MABC), a precise method of biotechnology that incorporates the SUB1A gene into the popular Swarna rice variety without altering its grain quality or yield under normal conditions.

• Under flash flood conditions, typical rice varieties die within a few days of total submergence. However, Swarna-Sub1 rice can survive for 14 to 17 days underwater by entering a "quiescent" (dormant) state, allowing it to recover once the water recedes.

• This variety was released for commercial cultivation in India around 2009 and has since been widely adopted in flood-prone states like Odisha, Bihar, West Bengal, and Assam to ensure food security for millions of farmers.

• The development of Swarna-Sub1 was a collaborative effort between the International Rice Research Institute (IRRI) and various Indian agricultural research organizations, showcasing the power of genomic tools in tackling climate change.

Additional Information

• National Agri-food Biotechnology Institute (NABI):

• Located in Mohali, Punjab, NABI is an autonomous institute under the Department of Biotechnology (DBT), Ministry of Science and Technology.

• It focuses on the interface of agriculture, food, and nutrition biotechnology to improve the nutritional quality of crops and develop climate-resilient varieties.

• Other Crop Varieties:

• IR8 Rice: Known as the "Miracle Rice," it was developed in the 1960s at IRRI in the Philippines. It played a crucial role in the Green Revolution by providing high yields and preventing famine.

• DRR Rice 100 (Kamla): This is a drought-tolerant rice variety developed to provide stable yields in rainfed areas where water scarcity is a major issue.

• Pusa DST Rice 1: A variety developed through molecular breeding for drought tolerance and early maturity, often used in the trans-Gangetic plains.

• Flash Flood Resilience:

• Flash floods are sudden, high-intensity events that cause rapid submergence of crops. In India, approximately 10 million hectares of rice-growing land are prone to such floods, making Sub1 technology essential for disaster management in agriculture.

Important Points

• The SUB1A Gene: This specific DNA sequence is found in an Indian landrace called FR13A. It acts as a master regulator that prevents the rice plant from elongating its stem rapidly when submerged, thereby conserving energy and carbohydrates until the flood passes.

• Socio-Economic Impact: Studies have shown that Swarna-Sub1 significantly reduces the yield loss during flood years, sometimes providing a yield advantage of 1 to 3 tonnes per hectare compared to non-tolerant varieties.

• Biotechnology in India: The Government of India, through the Indian Council of Agricultural Research (ICAR) and the DBT, has prioritized molecular breeding to create crops resistant to salinity, heat, and pests, aligning with Sustainable Development Goal 2 (Zero Hunger).

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Q97. Answer: (c) 35

BODMAS Table:

Given equation: 37 C 32 A 2 D 9 B 2 = ?

Now, if, A stands for '÷', B stands for '×', C stands for '+' and D stands for '−'

=> 37 + 32 ÷ 2 − 9 × 2

=> 32 ÷ 2 = 16

=> 9 × 2 = 18

=> 37 + 16 − 18

=> 53 − 18

=> 35

Hence, the correct answer is "Option 3".

Q98. Answer: (b) North Atlantic Drift

The correct answer is North Atlantic Drift.

Key Points

• The North Atlantic Drift is a powerful warm ocean current that is the northeastward extension of the Gulf Stream. It flows across the Atlantic Ocean towards the shores of Western Europe. Hence, the statement regarding North Atlantic Drift is correct.

• This current plays a crucial role in the climatic moderation of the region, ensuring that countries like the United Kingdom, Norway, and Ireland have significantly milder winters than other regions at the same latitude, such as Canada or Russia.

• The North Atlantic Drift carries vast amounts of thermal energy from the tropical regions near the equator towards the high latitudes. This heat is transferred to the atmosphere by the prevailing westerly winds.

• Because of this current, many ports in Northern Europe, including Murmansk in Russia and various ports along the Norwegian coast, remain ice-free throughout the winter season, which is vital for maritime trade and navigation.

• Without the influence of the North Atlantic Drift, the average temperature in Western Europe would be significantly lower, potentially by 5°C to 10°C, drastically altering the agriculture and lifestyle of the continent.

Additional Information

• Humboldt Current:

• Also known as the Peru Current, it is a cold, low-salinity ocean current that flows north along the western coast of South America (specifically Chile and Peru).

• It is one of the most productive marine ecosystems in the world, supporting massive fish populations due to upwelling of nutrient-rich deep water. Hence, the statement regarding Humboldt Current is incorrect.

• Oyashio Current:

• This is a cold subarctic ocean current that flows south and circulates counter-clockwise in the western North Pacific Ocean.

• It originates in the Arctic Ocean and flows along the coast of Kamchatka and the Kurile Islands to meet the Kuroshio Current near Japan. Hence, the statement regarding Oyashio Current is incorrect.

• Canary Current:

• The Canary Current is a cool surface current that forms the eastern branch of the North Atlantic subtropical gyre.

• It flows southward along the coast of Africa from Morocco towards Senegal, helping to moderate the temperature of the Canary Islands but not warming Western Europe. Hence, the statement regarding Canary Current is incorrect.

Important Points

• Thermohaline Circulation: The North Atlantic Drift is a vital part of the global Ocean Conveyor Belt (Thermohaline Circulation). This system moves water based on density differences controlled by temperature and salinity.

• Gulf Stream Connection: The Gulf Stream originates in the Gulf of Mexico and moves along the eastern coast of the United States before turning east as the North Atlantic Drift near 40°N latitude and 50°W longitude.

• Environmental Impact: Recent scientific reports suggest that global warming and the melting of Arctic ice could introduce fresh water into the North Atlantic, potentially slowing down this current and leading to a cooling effect in Europe.

• Linguistic Fact: The term "North Atlantic Drift" is often used interchangeably with "North Atlantic Current" in many geographical atlases and indices.

Q99. Answer: (d) 100%

The correct answer is 100%.

Key Points

• In the Union Budget 2025–26, presented on 1 February 2025, the Finance Minister Nirmala Sitharaman proposed to increase the Foreign Direct Investment (FDI) limit in the insurance sector from the current 74% to 100% (represented as 1 in numerical ratio).

• The primary objective of this proposal is to attract long-term foreign capital to help insurance companies expand their reach and

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improve insurance penetration across India.

• Increasing the limit to 100% allows foreign insurance giants to have full ownership and control of their Indian subsidiaries, which is expected to facilitate technology transfer and global best practices.

• This move necessitates an amendment to the Insurance Act, 1938, to formalize the transition from the partial cap to a fully opened sector.

• The decision is aimed at supporting the "Insurance for All by 2047" mission set by the IRDAI, ensuring that the growing Indian economy has the necessary risk-mitigation infrastructure.

Additional Information

• Evolution of FDI in Insurance:

• The insurance sector was opened to private players in 2000 with an initial FDI cap of 26%.

• This limit was increased to 49% in 2015 through an amendment to the Insurance Act.

• In the Union Budget 2021–22, the government further raised the limit to 74%, allowing for foreign ownership and control for the first time.

• IRDAI (Insurance Regulatory and Development Authority of India):

• It is a statutory body formed under the IRDA Act, 1999, responsible for regulating and licensing the insurance and re-insurance industries in India.

• Headquartered in Hyderabad, its mission is to protect the interests of policyholders and ensure the orderly growth of the sector.

• Insurance Penetration and Density:

• Insurance penetration is measured as the percentage of insurance premium to GDP. In India, this figure stood at approximately 4% in 2023, which is lower than the global average of 6.8%.

• Insurance density is the ratio of premium to total population (per capita premium). Boosting FDI is expected to improve these metrics significantly.

Important Points

• Regulatory Safeguards: Even with 100% FDI, the government maintains safeguards; for instance, a majority of Directors and Key Management Persons (KMPs) must typically be Resident Indian Citizens to ensure local accountability.

• Sectoral Impact: Full ownership is likely to benefit private life insurance and general insurance companies that require massive capital infusion for solvency requirements and digital transformation.

• FDI vs FPI: While Foreign Direct Investment (FDI) implies a long-term stake and management involvement, Foreign Portfolio Investment (FPI) involves shorter-term investments in financial assets like stocks and bonds.

• Employment Generation: Opening the sector is expected to create direct and indirect employment for thousands of insurance agents, actuaries, and financial advisors across the country.

Q100. Answer: (a) 84

The logic followed here is:

thus, "84" will replace the question mark in the given series.

Hence, the correct option is "Option 1".

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