RRB NTPC (UG) CBT-I Official Paper (Held On 08 May, 2026 Shift 1) (Previous Year Paper)

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

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MATHEMATICS

Q1. A shopkeeper offers two successive discounts of 18% and 15% on a frock whose marked price is Rs. 1,000. What is the final selling price (in Rs.) of the frock?

(a) 697
(b) 723
(c) 679
(d) 796

Q2. The sum of all interior angles of a regular polygon is 1800°. How many diagonals does the polygon have?

(a) 51
(b) 54
(c) 50
(d) 53

Q3. A Company produces 1,520 packets of noodles in 5 hours. How many packets will it produce in 17 hours at the same rate?

(a) 5,861
(b) 5,168
(c) 5,816
(d) 5,618

Q4. The largest four-digit number which when divided by 15, 12 and 14 leaves remainder 5 in each case is:

(a) 9665
(b) 9595
(c) 9192
(d) 9988

Q5. A, B, and C start a business by investing Rs. 60,000, Rs. 80,000, and Rs. 1,20,000, respectively. After one year, the total profit earned is Rs. 78,000. By how much does C’s share exceed B’s share?

(a) Rs. 10,600
(b) Rs. 9,800
(c) Rs. 12,000
(d) Rs. 9,400

Q6. Two buses start at the same time from two towns that are 264 km apart and travel towards each other along the same highway. The first bus travels at a speed of 22 km/h, while the second bus travels at a speed of 26 km/h. After how much time will they meet?

(a) 5 hours
(b) 6.25 hours
(c) 5.5 hours
(d) 6.5 hours

Q7. A tank can be filled by pipe P in 8 hours and by pipe Q in 4 hours. If they open alternately for one hour each with Q starting first, what is the total time taken to fill the tank?

(a) 4 hours and 40 minutes
(b) 6 hours
(c) 5 hours and 20 minutes
(d) 5 hours

Q8. A group of 3 adults and 4 children pay Rs. 380 for movie tickets. Another group of 2 adults and 3 children pay Rs. 270 for the same tickets. What is the price of one adult ticket?

(a) Rs. 70
(b) Rs. 80
(c) Rs. 60
(d) Rs. 50

Q9. A bookseller bought 7 identical sets of books at Rs. 375 each. He sold 3 sets at a profit of 16% per set and the remaining sets at a profit of 24% per set. What was his total profit (in Rs.) from selling all the sets?

(a) Rs. 504
(b) Rs. 588
(c) Rs. 540
(d) Rs. 572

Q10. If the salary of a person is first increased by 15% and thereafter decreased by 12%, what is the net change in his salary?

(a) 1.2% decrease
(b) 1.2% increase
(c) 1.32% decrease
(d) 1.4% decrease

Q11. The diagonals of a rhombus are mutually perpendicular and bisect each other. One diagonal is 10 cm longer than the other. If the area of the rhombus is 600 cm^2, the perimeter (in cm) of the rhombus is:

(a) 120 cm
(b) 96 cm
(c) 100 cm
(d) 84 cm

Q12. Simplify: $(3+\sqrt{6})/(5\sqrt{3}-2\sqrt{12}-\sqrt{32}+\sqrt{50})$

(a) $\sqrt{5}$
(b) $\sqrt{2}$
(c) $\sqrt{3}$
(d) $\sqrt{6}$

Q13. If $\sin A = 5/7$, find the value of $(5 \operatorname{cosec} A - 7 \sin A)/(2\sqrt{6} \sec A + 7 \cos^2 A)$.

(a) 3/19
(b) 11/46
(c) 14/73
(d) 9/23

Q14. Which of the following numbers is not divisible by 88?

(a) 1232
(b) 968
(c) 1144
(d) 1058

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Q15. The present ages of two sisters are in the ratio 5:7. After 4 years, their ages will be in the ratio 6:8. Find the present age of the younger sister.

(a) 20 years
(b) 18 years
(c) 24 years
(d) 22 years

Q16. The ages of a mother and daughter are 36 years and 12 years, respectively. In how many years will the mother be twice the age of the daughter?

(a) 8 years
(b) 10 years
(c) 12 years
(d) 15 years

Q17. Evaluate $21^3 + (-2)^3 + (-19)^3$

(a) 2397
(b) 2354
(c) 2394
(d) 2468

Q18. Three friends Arshdeep, Sandeep and Avtar are on a trip by a car. Arshdeep drives during the first 3 hours at an average speed of 52 km/hr. Sandeep drives during the next 4 hours at an average speed of 65 km/hr. Avtar drives for the next 3 hours at an average speed of 76 km/hr. They reached their destination after exactly 10 hours. Their average speed during the journey was:

(a) 60.2 km/hr
(b) 56.4 km/hr
(c) 64.4 km/hr
(d) 65.2 km/hr

Q19. Which of the following ratios is the greatest?

a) 7 : 11
b) 9 : 14
c) 11 : 18
d) 13 : 21

(a) 9 : 14
(b) 11 : 18
(c) 13 : 21
(d) 7 : 11

Q20. Chitra gets a discount of 40% on a water cooler whose marked price is Rs. 2,200. Since she pays by credit card, she gets an additional 20% discount. How much does she pay (in Rs.)?

(a) 1,059
(b) 1,055
(c) 1,058
(d) 1,056

Q21. Which of the following pairs of numbers is not coprime?

(a) (173, 351)
(b) (177, 827)
(c) (171, 273)
(d) (127, 257)

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Q22. The length of each edge of a cube is 10 cm. If a sphere is inscribed inside the cube, what is the ratio of the surface area of the sphere to the outer surface area of the cube?

(a) π : 6
(b) 3 : π
(c) π : 3
(d) 6 : π

Q23. The average of 5 numbers is 18.5. If one number is removed, the average of the remaining 4 numbers becomes 16. Find the number that was removed.

(a) 28.5
(b) 29
(c) 29.5
(d) 28

Q24. If the simple interest on Rs. 5,000 for T years at 6% p.a. equals the simple interest on Rs. 7,500 for 4 years at 4% per annum, then find the value of T.

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

Q25. A shopkeeper offers the following schemes on toys of the same marked price.

(A) Successive discounts of 43% and 19% on any number of toys bought.

(B) Successive discounts of 41%, 21% and 49% on any number of toys bought.

(C) 35% discount on the first 5 toys and 3% discount on each toy thereon.

(D) 4 toys free of cost on buying 5 toys.

A customer wants to buy 5 toys. Which of the above schemes is the least beneficial to her?

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

Q26. Pipe A can fill a cistern in 12 hours and another pipe B can empty it in 18 hours. Pipe A is opened first and after 4 hours, pipe B is also opened. In how much total time will the cistern be filled?

(a) 28 hours
(b) 24 hours
(c) 36 hours
(d) 32 hours

Q27. A sum of money amounts to Rs. 4,600 in 3 years at 5% simple interest per annum. What is the sum?

(a) Rs. 3,800
(b) Rs. 4,200
(c) Rs. 4,000
(d) Rs. 3,500

Q28. Find the value of m which satisfies

(14/6)^8 × (6/14)³ × (14/6)^(10) = (6/14)^(9m+9)

(a) -8/3
(b) -32/9
(c) -28/9
(d) -25/9

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Q29. A cricketer has scored an average of 55 runs in 9 matches. In the 10th match, he scores 85 runs. What is his new average?

(a) 55
(b) 57
(c) 56
(d) 58

Q30. A student initially scored equal marks in Mathematics and Physics. Later, the marks in Mathematics increase by 20% of the original Mathematics marks, while the marks in Physics decrease by 10% of the original Physics marks. Taking the initial total marks as the base, what is the overall percentage change in the total marks?

(a) No change
(b) 10% increase
(c) 5% increase
(d) 5% decrease

GENERAL AWARENESS

Q31. The Dashavatar Temple-Deogarh is important because it is an early example of which temple style?

(a) Rock-cut architecture
(b) Vesara style
(c) Dravida style
(d) Panchayatana Nagara temple

Q32. Which of the following sites is known for its paintings and sculptures, considered masterpieces of Buddhist art?

(a) Elephanta Caves
(b) Mawsmai Cave
(c) Bhimbetka Caves
(d) Ajanta Caves

Q33. According to the World Bank's Travel and Tourism Economic Impact Research (EIR) of 2025, what was the contribution of the global tourism industry to the total Global Gross Domestic Product (GDP) in 2024?

(a) 20%
(b) 12%
(c) 15%
(d) 10%

Q34. The Anti-Defection Law was introduced through which Constitutional Amendment?

(a) 61st Amendment
(b) 73rd Amendment
(c) 44th Amendment
(d) 52nd Amendment

Q35. A device driver acts as an interface between which two components?

(a) Software and User
(b) Operating system and Hardware device
(c) CPU and Memory
(d) User and Computer

Q36. Which Late Harappan and Chalcolithic site in Maharashtra has yielded excellent examples of metal-cast sculptures?

(a) Inamgaon
(b) Daimabad
(c) Tekwada
(d) Chandoli

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Q37. In the search box of File Explorer, which search pattern finds all Word documents in the current folder whose names start with “Unit”?

(a) Unit* .docx
(b) *Unit.docx
(c) Unit?.txt
(d) Unit*.docx

Q38. Which of the following Schedules of the Indian Constitution contains provisions for administration of tribal areas in northeastern India?

(a) Eleventh Schedule
(b) Sixth Schedule
(c) Third Schedule
(d) Eighth Schedule

Q39. Gangaikondacholapuram was established as a capital city by which Chola ruler?

(a) Rajadhiraja I
(b) Rajaraja I
(c) Kulottunga I
(d) Rajendra I

Q40. Which of the following tunnels was recognised as the Longest Highway Tunnel above 10,000 feet by the World Book of Records in February 2022?

(a) Atal Tunnel
(b) Zojila Tunnel
(c) Chenani-Nashri Tunnel
(d) Pir Panjal Tunnel

Q41. The laws to provide for the representation of the Chairpersons of the Panchayats are made by _____.

(a) State Legislature
(b) The Parliament of India
(c) Governor of State
(d) The President of India

Q42. In which year did the Indian Parliament enact the Fiscal Responsibility and Budget Management Act to institutionalise financial discipline and ensure long-term macroeconomic stability?

(a) 2009
(b) 2000
(c) 2006
(d) 2003

Q43. The incidence of oral cancer in India is strongly linked to the frequent consumption of which of the following harmful substances?

(a) Soft drinks
(b) Fried food
(c) High-salt diet
(d) Tobacco

Q44. Which Part of the Indian Constitution deals specifically with the Union executive structure?

(a) Part VI
(b) Part IV
(c) Part III
(d) Part V

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Q45. Which of the following is included among the water-soluble vitamins collectively grouped together in a specific vitamin class known as vitamin B complex?

(a) Thiamin
(b) Retinol
(c) Tocopherol
(d) Calciferol

Q46. Which of the following British officials was responsible for the annexation of Awadh, a major cause of resentment before 1857?

(a) Lord Dalhousie
(b) Lord Canning
(c) Charles Metcalfe
(d) Henry Lawrence

Q47. Which characteristic correctly describes the Dual System of Administration established in Bengal after 1765?

(a) Judicial authority was fully consolidated under the Company's direct rule.
(b) Revenue powers lay with the Company, while administrative responsibility lay with the Nawab.
(c) Criminal justice remained independent of Company supervision throughout.
(d) Revenue collection was handled solely by Mughal officials without Company control.

Q48. 'Agenda 21' — a comprehensive action plan for sustainable development — was adopted at which international conference?

(a) 1972 – Stockholm Conference
(b) 1992 – Earth Summit, Rio de Janeiro
(c) 1961 – Vienna Convention
(d) 2016 – Kigali Agreement

Q49. In the context of Indian classical music, the term "Khayal" literally signifies which of the following?

(a) An expression of devotional sentiment
(b) A structured rhythmic pattern
(c) Imagination or reflective thought
(d) A melodic framework

Q50. In the Balance of Payments, an increase in foreign exchange reserves appears under which category?

(a) Current Account – Credit
(b) Capital Account – Debit
(c) Capital Account – Credit
(d) Current Account – Debit

Q51. Why do noble gases exist as gases at room temperature, while halogens exist as solids, liquids, or gases down the group?

(a) Larger atomic size of noble gases
(b) Weak intermolecular forces in noble gases
(c) High reactivity of noble gases
(d) Strong chemical bonds in noble gases

Q52. Which of the following Union Territories had the lowest density of population according to Census 2011?

(a) Chandigarh
(b) Puducherry
(c) Lakshadweep
(d) Andaman and Nicobar Islands

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Q53. The Tri-Services Exercise (TSE-2025) “Trishul,” commencing in November 2025, is being led by which branch of the Indian Armed Forces?

(a) Indian Coast Guard
(b) Indian Air Force
(c) Indian Army
(d) Indian Navy

Q54. In which of the following countries did the One Health Summit take place from 5-7 April 2026?

(a) China
(b) Myanmar
(c) Germany
(d) France

Q55. In the context of computer hardware, what does the abbreviation "PCB" stand for?

(a) Primary Cache Buffer
(b) Printed Circuit Board
(c) Processor Control Base
(d) Peripheral Communication Bus

Q56. Who among the following has been appointed as the Deputy Governor of the Reserve Bank of India in April 2025?

(a) Dr. Jay Bhattacharya
(b) Nidhi Tiwari
(c) Manan Kumar Mishra
(d) Dr. Poonam Gupta

Q57. Which city hosted the Global Justice, Love and Peace Summit in April 2025?

(a) Milan
(b) New Delhi
(c) Oslo
(d) Dubai

Q58. In a sound wave traveling through air, which of the following terms refers to a region where the particles are crowded together, resulting in high pressure and high density?

(a) Wavelength
(b) Rarefaction
(c) Compression
(d) Crest

Q59. Which city’s metro rail system’s first phase was inaugurated on 6 October 2025, making it the 24^(th) Indian city with a functional metro?

(a) Patna
(b) Kolkata
(c) Lucknow
(d) Bhubaneswar

Q60. Who were the founding members of the 'Servants of India Society' along with Gopal Krishna Gokhale?

(a) Subhas Chandra Bose, Jawaharlal Nehru, Sardar Patel
(b) A.O. Hume, Dadabhai Naoroji, Lala Lajpat Rai
(c) Rajendra Prasad, C.R. Das, Mahatma Gandhi
(d) Natesh Appaji Dravid, Gopal Krishna Deodhar, Anant Vinayak Patwardhan

Q61. In November 2025, which of the following brands partnered with the Board of Control for Cricket in India (BCCI) as Team India's official colour partner for a period of three years?

(a) Kansai Nerolac
(b) Nippon Paint

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(c) Berger Paints
(d) Asian Paints

Q62. Which type of Centre-State relation is covered under Articles 245 to 255 of Part XI of the Indian Constitution?
(a) Judicial relations
(b) Administrative relations
(c) Legislative relations
(d) Financial relations

Q63. In which year was the National seeds policy launched?
(a) 2007
(b) 2005
(c) 2000
(d) 2002

Q64. Which of the following is classified as a longitudinal valley located between the Lesser Himalaya and the Shiwaliks?
(a) Kangra Valley
(b) Dehra Dun
(c) Patkai Hill Valley
(d) Kullu Valley

Q65. Which of the following coastal plains is correctly matched with its state?
(a) Malabar Plain – Gujarat
(b) Utkal Plain – Odisha
(c) Konkan Plain – Tamil Nadu
(d) Coromandel Plain – Kerala

Q66. Directive Principles collectively aim to achieve which ideals prominently declared in the Constitution's Preamble?
(a) Justice, liberty, equality, fraternity
(b) Unity, diversity and fraternity
(c) Sovereignty, security and hierarchy
(d) Property, privilege, hierarchy

Q67. An image-editing program and a video-editing program both use the same shared library for color correction. Which advantage of modular application software does this situation show?
(a) Code reusability across different applications
(b) Increased redundancy
(c) Removal of all dependencies
(d) Guaranteed offline operation

Q68. Which of the following features at Lothal provides the most convincing evidence of its role as a maritime trading centre in the Harappan Civilization?
(a) Discovery of seals indicating contacts with distant regions
(b) A brick-built basin connected to an ancient river channel
(c) Evidence of bead-making workshops within the settlement
(d) A large warehouse located near the dock structure

Q69. Which of the following editions of the Seatrade Maritime Logistics Middle East (SMLME) conference opened on May 6, 2025 at the Dubai World Trade Centre?
(a) 7th
(b) 11th
(c) 12th
(d) 9th

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Q70. V.S. Achuthanandan, who passed away in July 2025, was a prominent leader of which political party in India?

(a) Bharatiya Janata Party
(b) Communist Party of India (Marxist)
(c) All India Trinamool Congress
(d) Indian National Congress

GENERAL INTELLIGENCE AND REASONING

Q71. Refer to the following series and answer the question. (All numbers are single digit numbers only. Counting has to be done from left to right).

(Left) 2 9 3 3 8 4 7 2 4 2 8 9 9 7 4 9 9 4 6 7 7 (Right)

How many such odd digits are there each of which is immediately preceded by an odd digit and also immediately followed by a perfect square?

(NOTE: 1 is also a perfect square)

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

Q72. Seven boxes M, N, O, P, X, Y and Z are kept one over the other but not necessarily in the same order. Only N is kept above P. Only two boxes are kept between P and X. Only O is kept below Y. Z is not kept immediately above X.

Which box is kept second above M?

(a) P
(b) Z
(c) O
(d) X

Q73. In a certain code language, ‘steak tooth badge’ is coded as ‘qj hc sv’ and ‘badge poet lemon’ is coded as ‘tz qj wv’.

How is ‘badge’ coded in that language? (All codes are two-letter codes.)

(a) qj
(b) tz
(c) hc
(d) sv

Q74. Mr. Yorly starts from Point A and drives 6 km towards South. He then takes a right turn, drives 37 km, turns right and drives 42 km. He then takes a right turn and drives 47 km. He takes a final right turn, drives 36 km and stops at Point P.

How far (shortest distance) and towards which direction should he drive in order to reach Point A again?

(All turns are 90 degrees turns only unless specified.)

(a) 11 km to the North
(b) 15 km to the South
(c) 12 km to the East
(d) 10 km to the West

Q75. LM 5 is related to NL -14 in a certain way. In the same way, JK 9 is related to LJ -10.

To which of the following is UV 11 related, following the same logic?

(a) GT 3
(b) WU -8
(c) YT -7
(d) NJ 9

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Q76. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

HWR66, MBW78, RGB90, WLG102, ?

(a) BQL114
(b) BQM114
(c) BOL114
(d) EQL114

Q77. In a certain code language,

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

A ≤ B means 'A is the wife of B',

A £ B means 'A is the father of B' and

A ≠ B means 'A is the brother of B'.

How is A related to P if 'A @ D £ J ≠ L ≤ P'?

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

Q78. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster.)

(a) FE−IH
(b) LK−ON
(c) CB−FE
(d) KJ−MO

Q79. What should come in place of '?' in the given series?

7 ? 19 31 47 67

(a) 14
(b) 11
(c) 18
(d) 16

Q80. BFGJ is related to GKLO in a certain way based on the English alphabetical order. In the same way, HKMN is related to MPRS.

To which of the following is ORTU related, following the same logic?

(a) QEIY
(b) TWYZ
(c) SVXY
(d) UXZA

Q81. Refer to the following series and answer the question (all numbers are single digit numbers only).

(Left) 456233321123874646582565 43423(Right)

How many such odd digits are there each of which is immediately preceded by an even digit and also immediately followed by an odd digit?

(a) NONE
(b) TWO
(c) FIVE
(d) ONE

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Q82. Seven people A, B, D, J, O, T and Z are sitting in a row, facing north. Only one person sits to the right of A. Only three people sit between B and A. Only three people sit between T and J, neither of whom sits on the left end. D sits immediately to the right of Z. Only one person sits between T and O. Who sits immediately to the left of A?

(a) D
(b) J
(c) B
(d) T

Q83. Each of the digits in the number 84157639 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) Three
(b) One
(c) Two
(d) None

Q84. Read the given statement(s) 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 statement(s).

Statements:

All huts are villages.

No hut is a district.

Conclusions:

(I) No village is a district.

(II) Some districts are huts.

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

Q85. If 2 is added to each odd digit and 1 is subtracted from each even digit in the number 82135746, then what will be the difference between the first digit from the right end and the first digit from the left end in the new number thus formed?

(a) 8
(b) 2
(c) 6
(d) 4

Q86. 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) DAY
(b) PNK
(c) OLJ
(d) NKI

Q87. What should come in place of '?' in the given series?

8 9 17 26 90 115 ?

(a) 198
(b) 313
(c) 331
(d) 231

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Q88. Read the given statement(s) 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 statement(s).

Statements:

All jokers are frogs.

All frogs are cars.

Conclusions:

(I) Some cars are frogs.

(II) All jokers are cars.

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

Q89. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

18, 109

17, 103

(a) 22, 133
(b) 19, 116
(c) 24, 155
(d) 26, 130

Q90. Seven people, Q, M, B, L, E, F and G, are sitting in a row, facing north.

Only six people sit to the right of E. Only five people sit to the left of Q. Only three people sit between M and Q. B is the immediate neighbour of L and G. Only three people sit between F and L.

How many people sit between G and F?

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

Q91. Ayush ranked 44^(th) from the top and 25^(th) from the bottom in his class. How many students are there in his class?

(a) 66
(b) 68
(c) 69
(d) 67

Q92. X is the mother of F. F is the sister of T. U is the father of K. K is the husband of T. How is X related to U?

(a) Mother
(b) Son's wife's mother
(c) Son's wife's sister
(d) Daughter

Q93. What should come in place of '?' in the given series based on the English alphabetical order?

GJE ZCX SVQ LOJ ?

(a) LNJ
(b) PRN
(c) EHC

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(d) BFU

Q94. Which of the following options should come in place of the '?' in the given series based on the English alphabetical order?

N 32, I 25, D 18, Y 11, ?

(a) S 4
(b) T 4
(c) Z 4
(d) Y 4

Q95. KY 1 is related to MU 17 in a certain way. In the same way, FI 8 is related to HE 24. To which of the following is RF 3 related, following the same logic?

(a) YG 9
(b) KL 5
(c) TB 19
(d) KJ 7

Q96. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 51748623, then how many digits will appear more than once in the new number thus formed?

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

Q97. In a certain code language, 'COAL' is coded as '7649' and 'ALSO' is coded as '5967'. What is the code for 'S' in the given code language?

(a) 7
(b) 6
(c) 9
(d) 5

Q98. Tuv ranked 27^(th) from the top and 64^(th) from the bottom in his class. How many students are there in his class?

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

Q99. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) HL - NR
(b) DH - JN
(c) KO - QV
(d) AE - GK

Q100. Each vowel in the word REFERTILIZES is changed to the second letter immediately following it in the English alphabetical order, and each consonant is changed to the second letter immediately preceding it in the English alphabetical order. Which of the following letters will appear exactly twice in the group of letters thus formed?

(a) X
(b) G
(c) K
(d) R

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) 697

Shortcut Trick

Effective Selling Price percentage = (100 − 18)% × (100 − 15)%

Effective Multiplier = 0.82 × 0.85 = 0.697

Final Selling Price = 1000 × 0.697 = 697

Therefore The correct answer is Rs. 697.

Alternate Method

Given:

Marked Price (MP) = Rs. 1,000

Discount 1 (d1) = 18%

Discount 2 (d2) = 15%

Formula Used:

Final Selling Price = MP × (100 − d1)/100 × (100 − d2)/100

Calculations:

=> Price after 1st discount = 1000 − (18% of 1000)

=> Price after 1st discount = 1000 − 180 = Rs. 820

=> Final Selling Price = 820 − (15% of 820)

=> Final Selling Price = 820 − 123 = Rs. 697

Therefore The correct answer is Rs. 697.

Additional Information

Successive Discount Formula

The single equivalent discount for two successive discounts x% and y% is given by (x + y − xy/100)%.

Marked Price and Cost Price Relation

The relationship is given by: MP/CP = (100 + Profit%)/(100 − Discount%).

Effective Percentage Change

For successive changes of a% and b%, the net percentage change is (a + b + ab/100)%, where negative values represent decreases/discounts.

Q2. Answer: (b) 54

Shortcut Trick

Number of sides (n) in a regular polygon − 2 = (Sum of interior angles) ÷ 180°

=> n − 2 = 1800 ÷ 180 = 10

=> n = 12

Number of diagonals = [n × (n − 3)] ÷ 2

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=> [12 × (12 − 3)] ÷ 2 = 6 × 9 = 54

Therefore The correct answer is 54 diagonals.

Alternate Method

Given: Sum of all interior angles of a regular polygon = 1800°

Formula Used:

1. Sum of interior angles of an n-sided polygon = (n − 2) × 180°

2. Number of diagonals = [n × (n − 3)] ÷ 2

Calculations:

=> (n − 2) × 180 = 1800

=> n − 2 = 1800 ÷ 180

=> n − 2 = 10

=> n = 10 + 2 = 12

Now, calculate the number of diagonals for a polygon with 12 sides:

=> Number of diagonals = [12 × (12 − 3)] ÷ 2

=> Number of diagonals = [12 × 9] ÷ 2

=> Number of diagonals = 108 ÷ 2

=> Number of diagonals = 54

Therefore The correct answer is 54 diagonals.

Additional Information

Sum of Exterior Angles

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

Individual Angle Formulas

For a regular polygon, each interior angle = [(n − 2) × 180°] ÷ n, and each exterior angle = 360° ÷ n.

Relationship between Interior and Exterior Angles

At each vertex of a polygon, the sum of the interior angle and the exterior angle is always 180°.

Q3. Answer: (b) 5,168

Shortcut Trick

In 5 hr, the company produces 1520 packets.

Find the packets produced in 1 hr: 1520 ÷ 5 = 304.

Find the production for 17 hr: 304 × 17.

Calculation: 304 × 17 = 5168.

Therefore The correct answer is 5168 packets.

Alternate Method

Given:

Production in 5 hr (P1) = 1520 packets

Time period 1 (T1) = 5 hr

Time period 2 (T2) = 17 hr

Since the rate of production is constant, this is a case of Direct Proportion.

Formula Used:

(Packets1 / Time1) = (Packets2 / Time2)

Calculations:

=> Rate = P1 / T1

=> Rate = 1520 ÷ 5

=> Rate = 304 packets/hr

=> P2 = Rate × T2

=> P2 = 304 × 17

=> P2 = 5168

Therefore The correct answer is 5168 packets.

Additional Information

Direct Proportion

Two quantities are in direct proportion if an increase in one leads to a proportional increase in the other, expressed as x/y = k

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(constant).

Unitary Method

A technique where you find the value of a single unit first (e.g., 1 hour) and then multiply to find the value for the required number of units.

Rate of Work

Rate = Total Work ÷ Total Time. In this problem, the rate of production is the number of packets produced per unit time.

Q4. Answer: (a) 9665

Shortcut Trick

Find the LCM of divisors 15, 12, and 14, which is 420.

Divide the largest 4-digit number (9999) by 420 to find the remainder: 9999 ÷ 420 => Remainder = 339.

Largest 4-digit multiple of 420 = 9999 − 339 = 9660.

Required number = Multiple + Common Remainder = 9660 + 5 = 9665.

Therefore The correct answer is 9665.

Alternate Method

Given:

Divisors: 15, 12, 14

Common Remainder (R) = 5

Target: Largest 4-digit number (N ≤ 9999)

Formula Used:

Required Number = [LCM(Divisors) × k] + Remainder

Step-by-step Calculations:

=> Prime factorization: $15 = 3 \times 5$, $12 = 2^2 \times 3$, $14 = 2 \times 7$

=> LCM = $2^2 \times 3 \times 5 \times 7 = 4 \times 3 \times 35 = 420$

=> Divide 9999 by 420 to find the nearest multiple:

=> 9999 = 420 × 23 + 339

=> Largest multiple = 420 × 23 = 9660

=> Required number = 9660 + 5

=> Required number = 9665

Therefore The correct answer is 9665.

Additional Information

LCM and Common Remainder

When a number N is divided by a, b, and c and leaves the same remainder R in each case, the general form is N = LCM(a, b, c) × k + R.

LCM and Different Remainders

If the remainders are r1, r2, r3 such that (a−r1) = (b−r2) = (c−r3) = d (constant difference), then N = LCM(a, b, c) × k − d.

HCF and Remainder

To find the largest number that divides x, y, and z leaving the same remainder R, find the HCF of (x−R), (y−R), and (z−R).

Q5. Answer: (c) Rs. 12,000

Shortcut Trick

Profit ratio of A, B, and C = 60,000 : 80,000 : 1,20,000 = 3 : 4 : 6

Total units = 3 + 4 + 6 = 13 units

Given: 13 units = Rs. 78,000 => 1 unit = Rs. 6,000

Required difference (C − B) = (6 − 4) = 2 units

Value = 2 × 6,000 = Rs. 12,000

Therefore The correct answer is Rs. 12,000.

Alternate Method

Given:

Capital of A = Rs. 60,000

Capital of B = Rs. 80,000

Capital of C = Rs. 1,20,000

Total Profit = Rs. 78,000

Formula Used:

In a partnership business, Profit Ratio = Capital × Time

Calculations:

Since the time period for all partners is 1 year, the profit will be divided in the ratio of their investments.

=> Profit Ratio (A : B : C) = 60,000 : 80,000 : 1,20,000

=> Ratio = 6 : 8 : 12 = 3 : 4 : 6

=> Total sum of ratios = 3 + 4 + 6 = 13 units

=> 13 units = Rs. 78,000

=> 1 unit = 78,000 ÷ 13 = Rs. 6,000

=> B’s share = 4 × 6,000 = Rs. 24,000

=> C’s share = 6 × 6,000 = Rs. 36,000

=> Difference = C’s share − B’s share = 36,000 − 24,000 = Rs. 12,000

Therefore The correct answer is Rs. 12,000.

Additional Information

Partnership Profit Division

If partners invest C1, C2, C3 capitals for times T1, T2, T3, the profit is shared in the ratio (C1 × T1) : (C2 × T2) : (C3 × T3).

Working vs Sleeping Partner

A Working Partner receives a fixed salary or percentage for managing the business, while the remaining profit is shared according to investment ratios.

Compound Partnership

When partners invest capital for different time durations, it is termed a compound partnership, and time must be multiplied with capital for calculations.

Q6. Answer: (c) 5.5 hours

Shortcut Trick

Relative speed (opposite direction) = 22 + 26 = 48 km/h.

Meeting time = Total distance ÷ Relative speed.

Meeting time = 264 ÷ 48 = 5.5 hours.

Therefore The correct answer is 5.5 hr.

Alternate Method

Given:

Total distance between two towns = 264 km

Speed of the first bus (S1) = 22 km/h

Speed of the second bus (S2) = 26 km/h

Formula Used:

Time = Distance ÷ Relative Speed

Calculations:

=> Since the buses are traveling towards each other, they are in opposite directions.

=> Relative Speed = S1 + S2

=> Relative Speed = 22 + 26 = 48 km/h

=> Time taken to meet = 264 ÷ 48

=> Time taken = 132 ÷ 24 = 66 ÷ 12 = 11 ÷ 2

=> Time taken = 5.5 hours

Therefore The correct answer is 5.5 hr.

Additional Information

Relative Speed Rules

For two objects with speeds u and v: if moving in the opposite direction, Relative Speed = u + v; if moving in the same direction, Relative Speed = |u − v|.

Average Speed Formula

When a person travels equal distances at speeds x and y, the average speed for the whole journey is (2xy) ÷ (x + y).

Time and Distance Relation

Distance = Speed × Time. For a constant distance, speed is inversely proportional to time (S prop. to 1/T).

Q7. Answer: (d) 5 hours

Shortcut Trick

Efficiency of Pipe P = 1 unit/hr and Pipe Q = 2 units/hr (Total 8 units).

Work done in 1 cycle (2 hours: Q then P) = 2 + 1 = 3 units.

Work done in 2 cycles (4 hours) = 3 × 2 = 6 units.

Remaining work = 8 − 6 = 2 units, which Pipe Q fills in exactly 1 hour.

Total time = 4 + 1 = 5 hr.

Therefore The correct answer is 5 hr.

Alternate Method

Given: Filling time for Pipe P = 8 hr, Pipe Q = 4 hr.

Method: LCM method to find Total Work and Efficiency.

Person	Days	Total Work	Efficiency
Pipe P	8 hr	8 units	1 unit/hr
Pipe Q	4 hr	2 units/hr	

=> Total capacity of the tank = LCM(8, 4) = 8 units.

=> In the 1^(st) hour, Pipe Q is opened: Work done = 2 units.

=> In the 2^(nd) hour, Pipe P is opened: Work done = 1 unit.

=> Total work done in 2 hours = 2 + 1 = 3 units.

=> Total work done in 4 hours (2 such cycles) = 3 × 2 = 6 units.

=> Remaining work = 8 − 6 = 2 units.

=> In the 5^(th) hour, it is Pipe Q's turn again.

=> Time taken by Pipe Q to fill 2 units = 2 ÷ 2 = 1 hr.

=> Total time taken = 4 hr + 1 hr = 5 hr.

Therefore The correct answer is 5 hr.

Additional Information

Pipes and Cisterns Basics

If a pipe fills a tank in x hours, its efficiency is 1/x of the tank per hour. For emptying pipes, efficiency is taken as negative.

Alternate Work Concept

When pipes work alternately, calculate the combined work in one full cycle (sum of individual hours) and then determine how many full cycles fit into the total work.

Total Time Calculation

Total Time = (Number of full cycles × hours per cycle) + (Remaining work ÷ Efficiency of the next pipe in sequence).

Q8. Answer: (c) Rs. 60

Shortcut Trick

Find the difference: (3 Adults + 4 Children) − (2 Adults + 3 Children) = Rs. 380 − Rs. 270

=> 1 Adult + 1 Child = Rs. 110

From the second group: 2(1 Adult + 1 Child) + 1 Child = Rs. 270

=> 2 × Rs. 110 + 1 Child = Rs. 270 => Child ticket = Rs. 270 − Rs. 220 = Rs. 50

=> Adult ticket = Rs. 110 − Rs. 50 = Rs. 60

Therefore The correct answer is Rs. 60.

Alternate Method

Given:

Case 1: 3 adults and 4 children pay Rs. 380.

Case 2: 2 adults and 3 children pay Rs. 270.

Let the price of an adult ticket be Rs. x and a child ticket be Rs. y.

=> 3x + 4y = 380 --- (i)

=> 2x + 3y = 270 --- (ii)

To find x, eliminate y by multiplying (i) by 3 and (ii) by 4:

=> 3 × (3x + 4y) = 3 × 380 => 9x + 12y = 1140 --- (iii)

=> 4 × (2x + 3y) = 4 × 270 => 8x + 12y = 1080 --- (iv)

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Subtract equation (iv) from (iii):

=> (9x − 8x) + (12y − 12y) = 1140 − 1080

=> x = 60

Therefore The correct answer is Rs. 60.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by + c = 0 where a and b are coefficients and x and y are variables.

Elimination Method

A process of solving a system of equations by adding or subtracting them to remove one variable.

Substitution Method

Solving one equation for one variable and replacing that expression in the other equation.

Q9. Answer: (c) Rs. 540

Shortcut Trick

Total profit is calculated using the weighted average of the profit percentages.

Overall Profit % = [(3 × 16) + (4 × 24)] ÷ 7 = (48 + 96) ÷ 7 = 144/7 %

Total Profit = (Total CP) × (Overall Profit %)

Total Profit = (7 × 375) × (144 ÷ 7 ÷ 100) = 375 × 1.44 = Rs. 540

Therefore The correct answer is Rs. 540.

Alternate Method

Given:

Cost Price (CP) of 1 set = Rs. 375

Number of sets sold at 16% profit = 3

Remaining sets sold at 24% profit = 7 − 3 = 4

Formula Used:

Profit = CP × Profit%

Total Profit = (Profit per set1 × n1) + (Profit per set2 × n2)

Calculations:

=> Profit from 3 sets = 3 × (16 ÷ 100 × 375) = 3 × 60 = Rs. 180

=> Profit from 4 sets = 4 × (24 ÷ 100 × 375) = 4 × 90 = Rs. 360

=> Total Profit = Rs. 180 + Rs. 360 = Rs. 540

Therefore The correct answer is Rs. 540.

Additional Information

Net Profit Percentage

It is the total profit earned on all items divided by the total cost price of all items, multiplied by 100: (Total Profit ÷ Total CP) × 100.

Weighted Average Profit

When quantities are different, the overall profit % = (n1p1 + n2p2 + ...) ÷ (n1 + n2 + ...), where n is the quantity and p is the profit %.

Relation between CP and SP

Selling Price (SP) = CP + Profit. If profit is given in percentage, SP = CP × (100 + Profit%) ÷ 100.

Q10. Answer: (b) 1.2% increase

Shortcut Trick

Net percentage change formula = a + b + (a × b)/100.

Here, a = +15 (increase) and b = −12 (decrease).

Net change = 15 − 12 + (15 × −12)/100 = 3 − 1.8 = 1.2%.

Since the result is positive, it is a 1.2% increase.

Therefore The correct answer is 1.2% increase.

Alternate Method

Given:

Initial increase in salary = 15%

Subsequent decrease in salary = 12%

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Formula Used:

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

Calculations:

=> Let the initial salary of the person be Rs. 100.

=> Salary after 15% increase = 100 + (15% of 100) = 100 + 15 = Rs. 115.

=> Salary after 12% decrease = 115 − (12% of 115)

=> New Salary = 115 − (12/100 × 115) = 115 − 13.8 = Rs. 101.2.

=> Net Change in salary = 101.2 − 100 = 1.2.

=> Net percentage change = (1.2 / 100) × 100 = 1.2%.

=> Since the final value is more than the initial value, it is an increase.

Therefore The correct answer is 1.2% increase.

Additional Information

Successive Percentage Change

When a value is changed by a% and then by b%, the net change is given by [a + b + (ab/100)]%.

Multiplying Factor Method

For an increase of r%, the factor is (1 + r/100). For a decrease, it is (1 − r/100). Net change = (Factor1 × Factor2 − 1) × 100.

Applications in Revenue

This logic is widely used in questions involving Price × Consumption = Expenditure or Length × Breadth = Area.

Q11. Answer: (c) 100 cm

Shortcut Trick

Product of diagonals = 2 × Area = 2 × 600 = 1200.

Identify two numbers with product 1200 and difference 10: 40 and 30.

Semi-diagonals are 20 cm and 15 cm. Using Pythagorean triplet (15, 20, 25), the side is 25 cm.

Perimeter = 4 × 25 = 100 cm.

Therefore The correct answer is 100 cm.

Alternate Method

Given: Area of Rhombus = 600 cm^2, difference between diagonals = 10 cm.

Formula Used: Area = (1/2) × d1 × d2; Side (s) = $\sqrt{[(d1/2)^2 + (d2/2)^2]}$; Perimeter = 4s.

Let the smaller diagonal be d cm. Then the longer diagonal is (d + 10) cm.

=> Area = (1/2) × d × (d + 10) = 600

=> $d^2 + 10d = 1200$

=> $d^2 + 10d − 1200 = 0$

=> $d^2 + 40d − 30d − 1200 = 0$

=> d(d + 40) − 30(d + 40) = 0

=> (d − 30)(d + 40) = 0

=> d = 30 cm (Since length cannot be negative)

=> d1 = 30 cm and d2 = 30 + 10 = 40 cm

=> Side of rhombus (s) = $\sqrt{[(30/2)^2 + (40/2)^2]}$

=> s = $\sqrt{[15^2 + 20^2]} = \sqrt{[225 + 400]}$

=> s = $\sqrt{625}$ = 25 cm

=> Perimeter = 4 × 25 = 100 cm

Therefore The correct answer is 100 cm.

Additional Information

Properties of a Rhombus

All sides are equal, and diagonals bisect each other at 90°. Opposite angles are equal, and adjacent angles are supplementary (sum = 180°).

Relation Between Side and Diagonals

The sum of the squares of the diagonals is equal to four times the square of the side: $d1^2 + d2^2 = 4s^2$.

Area of Rhombus

Area can also be calculated using base and height: Area = Base × Height, or using trigonometry: Area = $s^2 \times \sin(\theta)$.

Q12. Answer: (c) √3

Shortcut Trick

Break down the denominator terms: 2√12 = 4√3, √32 = 4√2, and √50 = 5√2.

Combine like terms: (5√3 − 4√3) + (5√2 − 4√2) = √3 + √2.

Factorize the numerator: 3 + √6 = √3 × √3 + √3 × √2 = √3(√3 + √2).

The expression simplifies to: √3(√3 + √2) ÷ (√3 + √2) = √3.

Therefore The correct answer is √3.

Alternate Method

Given Expression: (3 + √6) ÷ (5√3 − 2√12 − √32 + √50)

Step 1: Simplify the Denominator

=> Denominator = 5√3 − 2√(4 × 3) − √(16 × 2) + √(25 × 2)

=> Denominator = 5√3 − 2(2√3) − 4√2 + 5√2

=> Denominator = 5√3 − 4√3 − 4√2 + 5√2

=> Denominator = (5 − 4)√3 + (5 − 4)√2 = √3 + √2

Step 2: Factorize the Numerator

=> Numerator = 3 + √6

=> Numerator = (√3 × √3) + (√3 × √2)

=> Numerator = √3(√3 + √2)

Step 3: Simplify the Ratio

=> Result = [√3(√3 + √2)] ÷ (√3 + √2)

=> Result = √3

Therefore The correct answer is √3.

Additional Information

Simplification of Surds

To simplify a surd, extract the largest perfect square factor from under the radical sign, such as √12 = √(4 × 3) = 2√3.

Addition and Subtraction of Surds

Only like surds (those with the same irrational part) can be added or subtracted together, e.g., 5√2 + 3√2 = 8√2.

Conjugate Surds

The conjugate of (√a + √b) is (√a − √b). Multiplying a surd by its conjugate results in a rational number: (√a + √b)(√a − √b) = a − b.

Q13. Answer: (c) 14/73

Shortcut Trick

Given sin A = 5/7, then cosec A = 7/5, $\cos^2 A = 1 - (5/7)^2 = 24/49$, and sec A = 7/√24 = 7/2√6.

Numerator = 5(7/5) − 7(5/7) = 7 − 5 = 2.

Denominator = 2√6(7/2√6) + 7(24/49) = 7 + 24/7 = 73/7.

Final value = 2 ÷ (73/7) = 14/73.

Therefore The correct answer is 14/73.

Alternate Method

Given:

sin A = 5/7

Formula Used:

sin A = Opposite/Hypotenuse | $\cos^2 A = 1 - \sin^2 A$ | sec A = 1/cos A | cosec A = 1/sin A

=> Base = $\sqrt{(\text{Hypotenuse}^2 - \text{Opposite}^2)} = \sqrt{(7^2 - 5^2)} = \sqrt{(49 - 25)} = \sqrt{24} = 2\sqrt{6}$

=> cosec A = 7/5

=> sec A = 7/2√6

=> $\cos^2 A = (2\sqrt{6}/7)^2 = 24/49$

=> Numerator = 5 × (7/5) − 7 × (5/7) = 7 − 5 = 2

=> Denominator = 2√6 × (7/2√6) + 7 × (24/49) = 7 + 24/7 = (49 + 24)/7 = 73/7

=> Required Value = 2 ÷ (73/7) = 14/73

Therefore The correct answer is 14/73.

Additional Information

Trigonometric Identities

The fundamental identity is $\sin^2 A + \cos^2 A = 1$, from which we derive $\sec^2 A - \tan^2 A = 1$ and $\operatorname{cosec}^2 A - \cot^2 A = 1$.

Reciprocal Ratios

The primary ratios and their reciprocals are: $\operatorname{cosec} A = 1/\sin A$, $\sec A = 1/\cos A$, and $\cot A = 1/\tan A$.

Double Angle Formula

$\cos 2A$ can be expressed in terms of sin and cos as: $\cos 2A = \cos^2 A - \sin^2 A = 2\cos^2 A - 1 = 1 - 2\sin^2 A$.

Q14. Answer: (d) 1058

Shortcut Trick

A number is divisible by 88 if it is divisible by both its co-prime factors 8 and 11.

Quick check for 8: The last three digits must be divisible by 8.

For 1058, the last three digits are 058, which is not divisible by 8 ($58 \div 8 = 7.25$).

Therefore, 1058 cannot be divisible by 88.

Therefore The correct answer is 1058.

Alternate Method

Given: The numbers are 1232, 968, 1144, and 1058.

Formula: Divisibility by 88 => Divisibility by 8 AND 11.

=> For 1232: Last 3 digits $232 \div 8 = 29$ (Yes); Difference of sums $(1+3) - (2+2) = 0$ (Yes). Divisible by 88.

=> For 968: Last 3 digits $968 \div 8 = 121$ (Yes); Difference of sums $(9+8) - 6 = 11$ (Yes). Divisible by 88.

=> For 1144: Last 3 digits $144 \div 8 = 18$ (Yes); Difference of sums $(1+4) - (1+4) = 0$ (Yes). Divisible by 88.

=> For 1058: Last 3 digits $058 \div 8 = 7.25$ (No). Difference of sums $(1+5) - (0+8) = -2$ (No).

=> Since 1058 fails both tests, it is not divisible by 88.

Therefore The correct answer is 1058.

Additional Information

Divisibility Rule of 8

A number is divisible by 8 if its last three digits are divisible by 8 or if the last three digits are 000.

Divisibility Rule of 11

A number is divisible by 11 if the difference between the sum of digits at odd positions and the sum of digits at even positions is either 0 or a multiple of 11.

Composite Divisibility

If a number is divisible by two co-prime numbers a and b, then it must also be divisible by their product $a \times b$.

Q15. Answer: (a) 20 years

Shortcut Trick

Compare the ratios: Present (5:7) and After 4 years (6:8).

The difference between parts is equal: $(6 - 5) = 1$ unit and $(8 - 7) = 1$ unit.

This 1 unit difference corresponds to the time gap of 4 years.

=> 1 unit = 4 years.

=> Younger sister's present age = 5 units = $5 \times 4 = 20$ years.

Therefore The correct answer is 20 years.

Alternate Method

Given:

Ratio of present ages = 5 : 7

Ratio after 4 years = 6 : 8

Calculation:

Let the present ages be 5x and 7x.

=> $(5x + 4) / (7x + 4) = 6 / 8$

=> $(5x + 4) / (7x + 4) = 3 / 4$

=> $4 \times (5x + 4) = 3 \times (7x + 4)$

=> $20x + 16 = 21x + 12$

=> $21x - 20x = 16 - 12$

=> $x = 4$

=> Present age of younger sister = $5x = 5 \times 4 = 20$ years.

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Therefore The correct answer is 20 years.

Additional Information

Ratio and Age Problems

When the difference between the ratio parts is same for both subjects, the change in value is directly proportional to the change in ratio units.

Equating Differences

If the difference between ratios is not equal, multiply the ratios by the difference of the other ratio to make the unit gap constant.

Age Gap Property

The difference between the ages of two people remains constant throughout their lives, regardless of the number of years passed.

Q16. Answer: (c) 12 years

Shortcut Trick

The age difference between the mother and daughter is 36 − 12 = 24 years.

Since the age difference remains constant, when the mother is twice the daughter's age (ratio 2:1), the difference of 1 unit must equal 24 years.

Therefore, the daughter's age at that time will be 1 unit = 24 years.

The number of years required is 24 − 12 = 12 years.

Therefore The correct answer is 12 years.

Alternate Method

Given:

Current age of Mother = 36 years

Current age of Daughter = 12 years

Let the required number of years be x.

After x years:

Mother's age = 36 + x

Daughter's age = 12 + x

According to the condition (Mother = 2 × Daughter):

=> 36 + x = 2 × (12 + x)

=> 36 + x = 24 + 2x

=> 36 − 24 = 2x − x

=> x = 12

Therefore The correct answer is 12 years.

Additional Information

Constant Age Difference

The difference between the ages of two people always remains the same, regardless of how many years pass (Difference = Age1 − Age2).

Ratio Method for Ages

If the ratio of ages changes from a:b to c:d over time, the difference between the ratio parts (scaled appropriately) must correspond to the constant age difference.

Age after 'n' years

If the current age is A, then the age after n years is A + n, and the age n years ago was A − n.

Q17. Answer: (c) 2394

Shortcut Trick

If the sum of three numbers is zero (a + b + c = 0), then $a^3 + b^3 + c^3 = 3abc$.

Here, a = 21, b = −2, and c = −19.

Checking the sum: 21 + (−2) + (−19) = 21 − 21 = 0.

Therefore, the value is 3 × 21 × (−2) × (−19) = 63 × 38 = 2394.

Therefore The correct answer is 2394.

Alternate Method

Given: Expression $21^3 + (-2)^3 + (-19)^3$

Calculation:

=> Calculate $21^3 = 21 \times 21 \times 21 = 9261$

=> Calculate $(-2)^3 = (-2) \times (-2) \times (-2) = -8$

=> Calculate $(-19)^3 = (-19) \times (-19) \times (-19) = -6859$

=> Sum = 9261 + (−8) + (−6859)

=> Sum = 9261 − 8 − 6859

=> Sum = 9261 − 6867 = 2394

Therefore The correct answer is 2394.

Additional Information

Algebraic Identity for Cubes

The fundamental identity is $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$.

The Conditional Property

When $(a + b + c) = 0$, the entire expression $(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$ becomes zero, which simplifies the equation to $a^3 + b^3 + c^3 = 3abc$.

Cubes of Negative Numbers

The cube of a negative number is always negative, i.e., $(-x)^3 = -(x^3)$.

Q18. Answer: (c) 64.4 km/hr

Shortcut Trick

Use the weighted average formula where Time acts as the weight.

Average Speed = (S1t1 + S2t2 + S3t3) ÷ (t1 + t2 + t3)

Average Speed = (52 × 3 + 65 × 4 + 76 × 3) ÷ 10

Average Speed = (156 + 260 + 228) ÷ 10 = 644 ÷ 10 = 64.4 km/hr.

Therefore The correct answer is 64.4 km/hr.

Alternate Method

Given:

Time spent by Arshdeep = 3 hr, Speed = 52 km/hr

Time spent by Sandeep = 4 hr, Speed = 65 km/hr

Time spent by Avtar = 3 hr, Speed = 76 km/hr

Formula Used:

Distance = Speed × Time

Average Speed = Total Distance ÷ Total Time

Calculations:

=> Distance covered by Arshdeep = 52 × 3 = 156 km

=> Distance covered by Sandeep = 65 × 4 = 260 km

=> Distance covered by Avtar = 76 × 3 = 228 km

=> Total Distance = 156 + 260 + 228 = 644 km

=> Total Time = 3 + 4 + 3 = 10 hr

=> Average Speed = 644 ÷ 10 = 64.4 km/hr

Therefore The correct answer is 64.4 km/hr.

Additional Information

Average Speed for Equal Distance

When a person travels two equal distances at speeds x and y, the average speed is given by 2xy ÷ (x + y).

Average Speed for Equal Time

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

Relative Speed

Speed of one object with respect to another. For opposite directions, add speeds (S1 + S2); for the same direction, subtract them (S1 − S2).

Q19. Answer: (a) 9 : 14

Shortcut Trick

Compare pairs using Cross-Multiplication: a c/d if (a × d) > (b × c).

1. 7/11 and 9/14 → 7×14 = 98, 9×11 = 99 Therefore 9:14 is larger.

2. 9/14 and 11/18 → 9×18 = 162, 11×14 = 154 Therefore 9:14 is larger.

3. 9/14 and 13/21 → 9×21 = 189, 13×14 = 182 Therefore 9:14 is larger.

Therefore The correct answer is 9 : 14.

Alternate Method

Given: Ratios are 7 : 11, 9 : 14, 11 : 18, and 13 : 21.

Formula Used: Convert each ratio into its Decimal Equivalent for direct comparison.

Calculations:

=> 7 ÷ 11 ≈ 0.6363

=> 9 ÷ 14 ≈ 0.6428

=> 11 ÷ 18 ≈ 0.6111

=> 13 ÷ 21 ≈ 0.6190

=> Comparing the values: 0.6428 > 0.6363 > 0.6190 > 0.6111

=> Therefore, 9 : 14 is the greatest ratio.

Therefore The correct answer is 9 : 14.

Additional Information

Comparison of Fractions

For any two fractions a/b and c/d, if ad > bc, then a c/d. If ad < bc, then a/b < c/d.

Duplicate and Sub-duplicate Ratio

The duplicate ratio of a : b is $a^2 : b^2$, and the sub-duplicate ratio is $\sqrt{a} : \sqrt{b}$.

Compounded Ratio

The compounded ratio of (a : b) and (c : d) is calculated as (a × c) : (b × d).

Q20. Answer: (d) 1,056

Shortcut Trick

Use the Successive Multiplying Factor method for effective discounts.

Net Multiplier = (100 − 40)% × (100 − 20)% = 0.6 × 0.8 = 0.48

Final Price = 2200 × 0.48 = 22 × 48 = 1056

Therefore The correct answer is Rs. 1056.

Alternate Method

Given: Marked Price (MP) = Rs. 2,200 | First Discount = 40% | Additional Discount (Credit Card) = 20%

Formula Used: Selling Price (SP) = MP × (1 − d1/100) × (1 − d2/100)

=> Price after 40% discount = 2200 − (40% of 2200)

=> Price = 2200 − 880 = Rs. 1320

=> Price after 20% additional discount = 1320 − (20% of 1320)

=> Price = 1320 − 264 = Rs. 1056

Therefore The correct answer is Rs. 1056.

Additional Information

Net Successive Discount Formula

For two successive discounts of a% and b%, the Equivalent Single Discount = (a + b − ab/100)%.

Marked Price (MP) and Selling Price (SP)

The price printed on the label is MP. The actual price after deducting the Discount from MP is the SP.

Successive Percentage Change

Final Value = Initial Value × (1 ± r1/100) × (1 ± r2/100). Use '+' for increase and '−' for decrease (discount).

Q21. Answer: (c) (171, 273)

Shortcut Trick

Identify the pair where both numbers share a common factor using divisibility rules.

For the pair (171, 273):

Sum of digits of 171 = 1 + 7 + 1 = 9 (Divisible by 3).

Sum of digits of 273 = 2 + 7 + 3 = 12 (Divisible by 3).

Since both numbers are divisible by 3, their HCF is at least 3, making them not coprime.

Therefore The correct answer is (171, 273).

Alternate Method

Given: Pairs of numbers to check for coprimality.

Definition: Two numbers are coprime if their Highest Common Factor (HCF) is 1.

Testing the pairs:

=> (173, 351): 173 is a prime number. 351 is not divisible by 173. HCF = 1 (Coprime).

=> (177, 827): 177 = 3 × 59. 827 is a prime number not divisible by 3 or 59. HCF = 1 (Coprime).

=> (171, 273):

=> Prime factors of 171 = $3^2 \times 19$

=> Prime factors of 273 = $3 \times 7 \times 13$

=> HCF (171, 273) = 3

=> Since HCF ≠ 1, the numbers are not coprime.

=> (127, 257): Both 127 and 257 are prime numbers. HCF = 1 (Coprime).

Therefore The correct answer is (171, 273).

Additional Information

Coprime Numbers

Two numbers a and b are called coprime or relatively prime if the only positive integer that divides both of them is 1, i.e., HCF(a, b) = 1.

Divisibility Rule of 3

A number is divisible by 3 if the sum of its digits is a multiple of 3. This is the fastest way to check for a common factor of 3 in large numbers.

Properties of Coprime Pairs

Any two consecutive integers are always coprime. Any two prime numbers are always coprime. The Least Common Multiple (LCM) of two coprime numbers is always their product (a × b).

Q22. Answer: (a) π : 6

Shortcut Trick

For a sphere inscribed inside a cube, the diameter (d) of the sphere is equal to the edge (a) of the cube (d = a).

Radius of sphere (r) = a / 2

Ratio = (Surface Area of Sphere) : (Surface Area of Cube)

Ratio = $4 \times \pi \times (a / 2)^2 : 6a^2 = 4 \times \pi \times (a^2 / 4) : 6a^2 = \pi a^2 : 6a^2$

Ratio = π : 6

Therefore The correct answer is pi : 6.

Alternate Method

Given: Edge of the cube (a) = 10 cm.

Formula Used:

1. Surface Area of Sphere = $4 \times \pi \times r^2$

2. Surface Area of Cube = $6 \times a^2$

=> Diameter of inscribed sphere = Edge of cube = 10 cm

=> Radius (r) of sphere = 10 ÷ 2 = 5 cm

=> Surface Area of Sphere = $4 \times \pi \times (5)^2 = 4 \times \pi \times 25 = 100\pi$ cm²

=> Surface Area of Cube = $6 \times (10)^2 = 6 \times 100 = 600$ cm²

=> Required Ratio = (100π) : 600

=> Ratio = π : 6

Therefore The correct answer is pi : 6.

Additional Information

Volume Ratio for Inscribed Sphere

The ratio of the volume of an inscribed sphere to the volume of the cube is π : 6.

Circumscribed Sphere

If a sphere is circumscribed around a cube, its diameter equals the body diagonal of the cube (a√3).

Cube Diagonals

Face diagonal of a cube = a√2 | Body diagonal of a cube = a√3.

Q23. Answer: (a) 28.5

Shortcut Trick

In averages, when a value is removed, the formula is:

Removed Number = Old Average + [Remaining Count × (Old Average − New Average)]

=> Removed Number = 18.5 + [4 × (18.5 − 16)]

=> Removed Number = 18.5 + [4 × 2.5] = 18.5 + 10 = 28.5

Therefore The correct answer is 28.5.

Alternate Method

Given:

Initial count of numbers (n1) = 5

Initial average (A1) = 18.5

Remaining count of numbers (n2) = 4

New average (A2) = 16

Formula Used:

Sum of values = Average × Total numbers

Calculations:

=> Total sum of 5 numbers = 5 × 18.5 = 92.5

=> Total sum of remaining 4 numbers = 4 × 16 = 64

=> Removed number = (Sum of 5 numbers) − (Sum of 4 numbers)

=> Removed number = 92.5 − 64

=> Removed number = 28.5

Therefore The correct answer is 28.5.

Additional Information

Net Deviation Rule

The sum of deviations from the average is always zero. If a value is removed, the total deviation caused by its removal must be balanced by the remaining items.

Effect of Adding/Removing

If the removed number is greater than the average, the new average decreases. If the removed number is less than the average, the new average increases.

Weighted Average Formula

Total Average = (n1A1 + n2A2) ÷ (n1 + n2). This is used when two groups are combined.

Q24. Answer: (a) 4

Shortcut Trick

Since the Simple Interest is the same for both cases, equate the product of (P × R × T).

5000 × 6 × T = 7500 × 4 × 4

=> 30000 × T = 120000

=> T = 120000 ÷ 30000

=> T = 4

Therefore The correct answer is 4 years.

Alternate Method

Given:

First case: Principal (P1) = Rs. 5,000, Rate (R1) = 6%, Time (T1) = T years.

Second case: Principal (P2) = Rs. 7,500, Rate (R2) = 4%, Time (T2) = 4 years.

Formula Used:

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

Calculations:

=> SI1 = (5000 × 6 × T) ÷ 100 = 300T

=> SI2 = (7500 × 4 × 4) ÷ 100 = 75 × 16 = 1200

=> According to the question, SI1 = SI2

=> 300T = 1200

=> T = 1200 ÷ 300

=> T = 4 years

Therefore The correct answer is 4 years.

Additional Information

Simple Interest Definition

Simple Interest is calculated only on the initial Principal amount of a loan or deposit. Formula: SI = (P × R × T) ÷ 100.

Total Amount

The Total Amount (A) accumulated at the end of the time period is given by the sum of the Principal and the Simple Interest: A = P + SI.

Rate of Interest conversion

Always ensure the Rate of Interest (R) and Time (T) are in the same units (usually per annum and years). If time is in months, divide by 12; if in days, divide by 365.

Q25. Answer: (b) C

Shortcut Trick

Scheme A: Net discount = 43 + 19 − (43 × 19)/100 = 53.83%

Scheme B: Successive discounts of 41%, 21% and 49% results in > 70% discount.

Scheme C: For exactly 5 toys, the discount is fixed at 35%.

Scheme D: Discount % = [Free / Total] × 100 = [4 / (5 + 4)] × 100 ≈ 44.44%

Comparing all: 35% (C) is the minimum discount, making it the least beneficial.

Therefore The correct answer is Scheme C.

Alternate Method

Given: A customer buys 5 toys of the same Marked Price (MP).

Formula Used:

1. Successive Discount (x%, y%) = [x + y − (xy / 100)]%

2. Buy X Get Y Free Discount % = [Y / (X + Y)] × 100

=> Scheme A: Successive discounts of 43% and 19%

=> Net Discount = 43 + 19 − (43 × 19)/100 = 62 − 8.17 = 53.83%

=> Scheme B: Successive 41%, 21% and 49%

=> First two: 41 + 21 − (41 × 21)/100 = 62 − 8.61 = 53.39%

=> With 49%: 53.39 + 49 − (53.39 × 49)/100 = 102.39 − 26.16 = 76.23%

=> Scheme C: Customer buys 5 toys. According to the scheme, the discount is 35% on the first 5 toys. Since the purchase is exactly 5 toys, the effective discount is 35%.

=> Scheme D: 4 toys free on buying 5 toys. Total toys = 5 + 4 = 9.

=> Discount % = (4 / 9) × 100 ≈ 44.44%

=> The least beneficial scheme is the one with the lowest discount percentage.

=> Minimum value among {53.83%, 76.23%, 35%, 44.44%} is 35%.

Therefore The correct answer is Scheme C.

Additional Information

Successive Discounts

For three successive discounts a%, b%, and c%, the final multiplier is (1 − a/100) × (1 − b/100) × (1 − c/100). The effective discount is (1 − Multiplier) × 100.

Buy X Get Y Free

In this offer, the customer pays for X items and receives X + Y items. The discount percentage is calculated as [Free Items / Total Items] × 100.

Profit and Loss Relationship

Discount is always calculated on the Marked Price (MP). Selling Price (SP) = MP × (100 − Discount%)/100.

Q26. Answer: (a) 28 hours

Shortcut Trick

Total Capacity = LCM(12, 18) = 36 units.

Efficiency of Pipe A = +3 and Pipe B = −2.

Work done by A alone in 4 hr = 3 × 4 = 12 units.

Remaining work = 36 − 12 = 24 units.

Combined efficiency (A + B) = 3 − 2 = 1 unit/hr.

Therefore The correct answer is 28 hr.

Alternate Method

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Given:

Time taken by Pipe A to fill = 12 hr

Time taken by Pipe B to empty = 18 hr

Initial time Pipe A runs alone = 4 hr

Pipes	Time (hr)	Total Work (LCM)	Efficiency
Pipe A (Fill)	12	36 units	+3
Pipe B (Empty)	18	−2	

Calculations:

=> Total Capacity of cistern = LCM(12, 18) = 36 units.

=> Part filled by Pipe A in the first 4 hours = 3 × 4 = 12 units.

=> Remaining part to be filled = 36 − 12 = 24 units.

=> Combined efficiency when both pipes are open = 3 − 2 = 1 unit/hr.

=> Time taken to fill the remaining part = 24 ÷ 1 = 24 hr.

=> Total time taken = Initial 4 hr + Next 24 hr = 28 hr.

Therefore The correct answer is 28 hr.

Additional Information

Filling vs Emptying Pipes

Filling pipes have positive efficiency (+), while emptying pipes (leaks) have negative efficiency (−).

Net Efficiency

When multiple pipes work together, the net efficiency is the algebraic sum of their individual efficiencies.

Pipes and Cisterns Formula

If pipe A fills in 'x' hours and pipe B empties in 'y' hours, net work in 1 hr = (1/x) − (1/y).

Q27. Answer: (c) Rs. 4,000

Shortcut Trick

Net Simple Interest percentage = Rate × Time = 5% × 3 = 15%.

Total Amount percentage = 100% (Principal) + 15% (Interest) = 115%.

According to the question, 115% = Rs. 4,600.

Therefore, 100% (Sum) = (4,600 ÷ 115) × 100 = 40 × 100 = Rs. 4,000.

Therefore The correct answer is Rs. 4,000.

Alternate Method

Given:

Amount (A) = Rs. 4,600

Time (T) = 3 years

Rate (R) = 5% per annum

Formula Used:

Amount (A) = Principal (P) + Simple Interest (SI)

A = P + (P × R × T) ÷ 100

Calculations:

=> 4,600 = P + (P × 5 × 3) ÷ 100

=> 4,600 = P + (15P ÷ 100)

=> 4,600 = (100P + 15P) ÷ 100

=> 4,600 = 115P ÷ 100

=> P = (4,600 × 100) ÷ 115

=> P = 40 × 100

=> P = 4,000

Therefore The correct answer is Rs. 4,000.

Additional Information

Simple Interest Formula

The basic formula for Simple Interest is SI = (P × R × T) ÷ 100, where P is the principal sum.

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Relationship between SI and Amount

Amount is calculated as A = P + SI, which can also be written as A = P[1 + (R × T) ÷ 100].

Calculating Rate and Time

To find Rate (R): (SI × 100) ÷ (P × T). To find Time (T): (SI × 100) ÷ (P × R).

Q28. Answer: (a) -8/3

Shortcut Trick

Convert the middle term to the same base (14/6): $(6/14)^3 = (14/6)^{(-3)}$.

Total power of LHS with respect to base (14/6) = 8 − 3 + 10 = 15.

Convert LHS to base (6/14): $(14/6)^{(15)} = (6/14)^{(-15)}$.

Equate exponents: 9m + 9 = −15 => 9m = −24 => m = −8/3.

Therefore The correct answer is −8/3.

Alternate Method

Given:

Equation: $(14/6)^8 \times (6/14)^3 \times (14/6)^{(10)} = (6/14)^{(9m+9)}$

Formula Used:

1. Multiplication Law: $a^x \times a^y = a^{(x+y)}$
2. Negative Exponent Law: $(a/b)^n = (b/a)^{(-n)}$
3. Equality of Bases: If $a^x = a^y$, then x = y

Calculations:

=> $(14/6)^8 \times (14/6)^{(-3)} \times (14/6)^{(10)} = (6/14)^{(9m+9)}$

=> $(14/6)^{((8 - 3 + 10))} = (6/14)^{(9m+9)}$

=> $(14/6)^{(15)} = (6/14)^{(9m+9)}$

=> $(6/14)^{(-15)} = (6/14)^{(9m+9)}$

=> −15 = 9m + 9

=> 9m = −15 − 9

=> 9m = −24

=> m = −24/9 = −8/3

Therefore The correct answer is −8/3.

Additional Information

Product of Powers Rule

When multiplying two powers with the same base, add their exponents: $a^m \times a^n = a^{(m+n)}$.

Negative Exponent Rule

To change the sign of an exponent, take the reciprocal of the base: $(a/b)^{(-n)} = (b/a)^n$.

Property of Equality for Exponential Equations

If the bases on both sides of an equation are equal, the exponents must also be equal, provided the base is not 0, 1, or −1.

Q29. Answer: (d) 58

Shortcut Trick

Extra runs over average = 85 − 55 = 30

Distributed increase per match = 30 ÷ 10 = 3

New average = 55 + 3 = 58

Therefore The correct answer is 58.

Alternate Method

Given: Average of 9 matches = 55, 10th match score = 85

Formula: Total = Average × Number of items

=> Total runs in 9 matches = 55 × 9 = 495

=> Total runs in 10 matches = 495 + 85 = 580

=> New average = 580 ÷ 10 = 58

Therefore The correct answer is 58.

Additional Information

Net Deviation Concept

The sum of deviations of all observations from the average is always zero. This is used to find the effect of adding or removing an item from the data set.

Weighted Average Formula

Combined Average = (n1A1 + n2A2) ÷ (n1 + n2), where n is the quantity and A is the average of each group.

Q30. Answer: (c) 5% increase

Shortcut Trick

When the initial values are equal, the overall percentage change is simply the average of the individual percentage changes.

Mathematics change = +20% | Physics change = −10%

Overall % Change = (+20% − 10%) ÷ 2

Overall % Change = 10% ÷ 2 = 5% increase.

Therefore The correct answer is 5% increase.

Alternate Method

Given: Initial marks in Mathematics = Initial marks in Physics.

=> Let initial marks in Mathematics = 100 and Physics = 100.

=> Initial Total Marks = 100 + 100 = 200.

=> New Mathematics marks = 100 + (20% of 100) = 100 + 20 = 120.

=> New Physics marks = 100 − (10% of 100) = 100 − 10 = 90.

=> New Total Marks = 120 + 90 = 210.

=> Net change in total marks = 210 − 200 = 10.

=> Percentage Change = (Change ÷ Initial Total) × 100

=> Percentage Change = (10 ÷ 200) × 100 = 5%.

Therefore The correct answer is 5% increase.

Additional Information

Percentage Change Formula

The percentage change is calculated as [(Final Value − Initial Value) ÷ Initial Value] × 100.

Weighted Average Percentage

If components have different weights w1 and w2, the net change is (w1×p1 + w2×p2) ÷ (w1 + w2).

Successive Percentage Change

When a value changes by a% and then b%, the net effective change is [a + b + (a×b)/100]%.

Q31. Answer: (d) Panchayatana Nagara temple

The correct answer is Panchayatana Nagara temple.

Key Points

• The Dashavatara Temple, located in Deogarh, Uttar Pradesh (Lalitpur district), is a landmark monument belonging to the Gupta Period, specifically dating back to the early 6th century CE.

• It is historically significant for being one of the earliest surviving structural stone temples in North India, marking a transition from earlier flat-roofed structures to the more complex Nagara style of architecture.

• The temple follows a Panchayatana layout, which is characterized by a central main shrine dedicated to Lord Vishnu, originally surrounded by four smaller subsidiary shrines at the corners of a high Jagati (raised platform).

• A defining feature of this temple is its Shikhara (curvilinear spire), which, although partially ruined today, represents one of the earliest examples of a spire in Hindu temple architecture, a core element of the Nagara style.

• The temple is constructed using dressed stone masonry and features a square plan with elaborate carvings on its doorway, including depictions of the river goddesses Ganga and Yamuna.

• The walls are adorned with three magnificent relief panels in deep niches, portraying Sheshashayi Vishnu (Vishnu reclining on the serpent Ananta), Gajendra Moksha, and the penance of Nara-Narayana.

Additional Information

• Rock-cut architecture

• This refers to structures created by carving out solid natural rock, such as the Ajanta Caves or Kailasa Temple at Ellora. The Deogarh temple is structural, meaning it was built by assembling cut blocks of stone.

• Dravida style

• Primarily found in South India, this style is characterized by pyramid-shaped towers called Vimanas, enclosed courtyards, and massive gateways known as Gopurams. The Deogarh temple lacks these features.

• Vesara style

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• This is a hybrid style combining elements of both Nagara and Dravida traditions. It flourished later under the Chalukyas of Badami and the Hoysalas, whereas the Deogarh temple is a pure early Nagara specimen.

• Nagara Architecture characteristics

• The Nagara style is the northern Indian style of temple architecture. Its primary features include a square plan with a Shikhara that curves inward toward the top, crowned by an Amalaka and Kalasha.

Q32. Answer: (d) Ajanta Caves

The correct answer is Ajanta Caves.

Key Points

• Located in the Aurangabad district of Maharashtra, the Ajanta Caves comprise 30 rock-cut Buddhist cave monuments excavated from a horseshoe-shaped cliff along the Waghur River.

• Constructed in two phases between the 2nd century BCE and 480 CE, the site represents the peak of Buddhist religious art, featuring intricate fresco-secco paintings and monumental sculptures.

• The paintings predominantly illustrate the Jataka tales, which recount the previous incarnations of the Buddha, showcasing exceptional mastery in expressive anatomy and color application using natural minerals.

• Architecturally, the caves are divided into Viharas (monasteries) and Chaityagrihas (prayer halls), documenting the evolution from the Hinayana tradition to the Mahayana tradition, where Buddha is depicted in human form.

• Recognized as a UNESCO World Heritage Site in 1983, Ajanta remains a primary source for understanding ancient Indian social life, costumes, and artistic techniques that influenced art across South Asia.

Additional Information

• Elephanta Caves:

• Located on Gharapuri Island near Mumbai, these 5th-century caves are primarily dedicated to Lord Shiva.

• The site is famous for the Trimurti sculpture, a 20-foot high masterpiece representing Shiva as the Creator, Preserver, and Destroyer.

• Bhimbetka Caves:

• Situated in the Raisen district of Madhya Pradesh, these rock shelters preserve the earliest traces of human life on the Indian subcontinent.

• The paintings date back to the Upper Paleolithic and Mesolithic periods, depicting prehistoric hunting, dancing, and animal figures.

• Mawsmai Cave:

• A significant natural limestone cave located near Cherrapunji in Meghalaya.

• It is primarily known for its unique geological formations like stalactites and stalagmites rather than religious paintings or sculptures.

Q33. Answer: (d) 10%

The correct answer is 10%.

Key Points

• The global tourism industry reached a significant milestone in 2024, with its contribution to the Global Gross Domestic Product (GDP) estimated at approximately 10%.

• According to economic research data for the 2024-2025 period, the sector's total economic output hit an all-time high of approximately $11.1 trillion, marking a full recovery from pandemic-era declines.

• This 10% share indicates that the travel and tourism sector now accounts for one in every ten dollars generated in the global economy, highlighting its role as a critical driver of international financial stability.

• The industry growth in 2024 reflected a 7.5% increase compared to the previous peak recorded in 2019, suggesting a robust expansion phase beyond pre-pandemic levels.

• Furthermore, the sector supported approximately 348 million jobs worldwide in 2024, which is an increase of over 13 million positions compared to the previous record set before the global health crisis.

Additional Information

• Travel and Tourism Economic Impact Research (EIR):

• This research is a comprehensive study that assesses the direct, indirect, and induced impacts of the tourism sector on the Global Economy.

• It tracks key metrics such as Domestic Visitor Spending, International Visitor Spending, and capital investment within the hospitality and aviation industries.

• The 2025 EIR (reporting on 2024 data) emphasizes that the sector is growing at a faster rate than the wider global economy, which is projected to grow at around 2.6%.

• Sectoral Growth Drivers:

• The surge in 2024 was largely driven by the reopening of major markets like China and increased Domestic Travel spending in countries such as the United States and India.

• The industry is also a major contributor to Services Exports, facilitating foreign exchange earnings for developing and developed nations alike.

Q34. Answer: (d) 52nd Amendment

The correct answer is 52nd Amendment.

Key Points

• The Anti-Defection Law was formally introduced in India through the 52nd Constitutional Amendment Act in 1985.

• This legislation was enacted during the government of Prime Minister Rajiv Gandhi to maintain the stability of elected governments by preventing unethical floor-crossing.

• The amendment added the Tenth Schedule to the Constitution of India, which provides for the disqualification of members of Parliament and State Legislatures on grounds of defection.

• Under this law, a legislator is deemed to have defected if they voluntarily give up the membership of their political party or vote against the party whip without obtaining prior permission.

• The power to decide on disqualification rests with the Speaker or the Chairman of the respective House, whose decision was initially final but later made subject to Judicial Review by the Supreme Court in the Kihoto Hollohan case.

Additional Information

• 61st Amendment Act

• Passed in 1988, this amendment reduced the minimum voting age from 21 years to 18 years for the Lok Sabha and State Legislative Assembly elections.

• It amended Article 326 of the Constitution to encourage greater youth participation in the democratic process.

• 73rd Amendment Act

• Enacted in 1992, it granted constitutional status and protection to the Panchayati Raj Institutions (PRIs).

• It added Part IX and the Eleventh Schedule to the Constitution, mandating a three-tier structure of local self-government.

• 44th Amendment Act

• Passed in 1978 by the Janata Government, it aimed to nullify several controversial changes introduced by the 42nd Amendment during the Emergency.

• It replaced the term internal disturbance with armed rebellion for declaring a National Emergency and removed the Right to Property from the list of Fundamental Rights.

Q35. Answer: (b) Operating system and Hardware device

The correct answer is Operating system and Hardware device.

Key Points

• A device driver is a specialized type of software program that functions as a communication bridge or translator between the Operating System (OS) and specific hardware components. It allows the OS to interact with hardware without needing to know the precise internal details of how the hardware functions.

• The primary role of a driver is Hardware Abstraction. By providing a uniform interface, it enables high-level application software to perform actions like printing or displaying graphics through the OS, which then passes the request to the driver to execute on the physical hardware device.

• When an OS issues a generic command (e.g., 'write data to disk'), the device driver translates this command into low-level machine language or signaling protocols that the hardware controller can interpret. This mechanism ensures interoperability across different brands and models of hardware.

• Most drivers run in Kernel Mode, which is a highly privileged layer of the Operating System. This allows the driver to have direct access to System Memory and CPU registers, ensuring high-speed data transfer through Direct Memory Access (DMA) or Interrupt Requests (IRQ).

• Without these drivers, a computer would be unable to recognize or utilize peripherals such as Network Interface Cards (NIC), Graphics Processing Units (GPU), Printers, or Sound Cards, as the OS lacks the built-in logic to communicate with thousands of different hardware variations.

Additional Information

• Software and User Interaction:

• This interface is typically known as the User Interface (UI) or Graphical User Interface (GUI). It involves shells like Windows Explorer or macOS Finder that allow users to launch applications and manage files.

• CPU and Memory Communication:

• Communication between the Central Processing Unit (CPU) and Random Access Memory (RAM) is facilitated by the Memory Controller and the System Bus, which includes the Address Bus and Data Bus. This is a hardware-level interaction, not managed

by software drivers in the same way peripherals are.

• User and Computer Interface:

• The Operating System acts as the master interface between the User and the Computer hardware. It manages Resource Allocation, Task Scheduling, and File Management, providing the environment in which users can perform computing tasks.

• Driver Types:

• Virtual Device Drivers (VxD): Used to manage Virtual Machines or software-simulated hardware.

• Generic Drivers: Standardized drivers provided by the OS (like USB Mass Storage drivers) that work with a wide range of devices without requiring specific manufacturer software.

Q36. Answer: (b) Daimabad

The correct answer is Daimabad.

Key Points

• Daimabad is an archaeological site situated on the left bank of the Pravara River, a tributary of the Godavari, in the Ahmednagar district of Maharashtra.

• The site is renowned for the discovery of the Daimabad Hoard in 1974, which contains four magnificent solid bronze sculptures: a chariot driven by a man and harnessed to two oxen, a rhinoceros, an elephant, and a water buffalo.

• These metal-cast sculptures are considered masterpieces of Late Harappan or Chalcolithic metallurgy, showcasing the use of the lost-wax (cire perdue) casting technique or solid casting methods.

• The chariot sculpture is approximately 45 cm long and 16 cm wide, featuring a human figure standing in the chariot, which is mounted on two solid wheels, representing advanced transportation technology of the era.

• Excavations at the site revealed a continuous sequence of five Chalcolithic cultures: Savalda, Late Harappan, Daimabad, Malwa, and Jorwe, making it one of the largest Chalcolithic settlements in the Deccan.

Additional Information

• Inamgaon:

• Located in the Pune district of Maharashtra, it is a prominent site of the Jorwe culture.

• It is famous for its well-planned mud houses, large granaries, and unique burial practices, including urn burials.

• Chandoli:

• A Chalcolithic site on the Ghod River where significant copper artifacts, such as a copper dagger with a mid-rib and copper beads, were found.

• It provides evidence of the transition from Neolithic to Copper Age tools in the Deccan Plateau.

• Tekwada:

• Situated opposite the site of Bahal on the banks of the Girna River.

• It is primarily known for burial sites associated with the Jorwe culture, including pit burials and urns containing skeletal remains and pottery.

Q37. Answer: (a) Unit* .docx

The correct answer is Unit*.docx.

Key Points

• In Windows File Explorer, wildcard characters are specialized symbols used to represent one or more characters when searching for files or folders. The asterisk (*) is the most versatile wildcard, representing a string of zero or more characters in a filename.

• The search pattern Unit* specifies that the filename must begin with the literal string Unit. The asterisk following it allows for any sequence of characters (including numbers, symbols, or nothing at all) to follow the prefix, ensuring that files like Unit1, Unit_Report, or just Unit are captured.

• The .docx component of the pattern acts as a filter for the file extension. It specifically targets Microsoft Word Open XML Format documents created in Word 2007 and later versions. By combining the prefix and the extension, Unit*.docx retrieves only Word files starting with the specified text.

• The pattern Unit*.docx is the standard syntax because it places the wildcard directly between the known prefix and the mandatory extension. This ensures maximum coverage for all naming conventions starting with Unit without requiring specific characters like spaces or underscores.

Additional Information

• Understanding Incorrect Wildcard Patterns:

• *Unit.docx: This pattern uses the asterisk at the beginning, which directs the search engine to find files that end with Unit before the .docx extension, such as ProjectUnit.docx.

• Unit?.txt: The question mark (?) wildcard represents exactly one character. This pattern would find files like Unit1.txt or UnitA.txt, but it fails the requirement because it targets plain text files (.txt) rather than Word documents.

• Unit* .docx: The inclusion of a space between the asterisk and the period is a syntax error for general searches. It would only match files that explicitly contain a space character at the end of their name (e.g., Unit Test .docx), excluding standard files like Unit1.docx.

• Search Efficiency: Using Unit* in the File Explorer search box is non-case-sensitive in Windows, meaning it will return results for both unit*.docx and UNIT*.docx, increasing the search's effectiveness in finding Word documents.

Q38. Answer: (b) Sixth Schedule

The correct answer is Sixth Schedule.

Key Points

• The Sixth Schedule of the Indian Constitution provides for the specialized administration of tribal areas in four northeastern states: Assam, Meghalaya, Tripura, and Mizoram.

• It was established under the provisions of Article 244(2) and Article 275(1) to protect the indigenous culture and traditions of tribal populations in these regions.

• The schedule mandates the creation of Autonomous District Councils (ADCs) and Regional Councils, which are vested with legislative, judicial, and executive powers.

• These ADCs consist of up to 30 members, where the Governor nominates 4 members and the remaining 26 are elected through adult franchise for a five-year term.

• The Governor of the respective state has the authority to define, reorganize, or alter the boundaries of the autonomous districts.

• Law-making powers of these councils extend to subjects like land management, forest administration, village committees, inheritance, marriage, and social customs, though acts usually require the Governor's assent.

Additional Information

• Eleventh Schedule:

• Inserted by the 73rd Constitutional Amendment Act, 1992.

• Contains 29 functional items outlining the powers, authority, and responsibilities of Panchayati Raj Institutions.

• Third Schedule:

• Contains the specific forms of Oaths or Affirmations for various constitutional posts including Union Ministers, Members of Parliament, Supreme Court Judges, and the Comptroller and Auditor General (CAG).

• Eighth Schedule:

• Recognizes the 22 official languages of India.

• Originally contained 14 languages; others were added through the 21st, 71st, and 92nd Amendment Acts.

Q39. Answer: (d) Rajendra I

The correct answer is Rajendra I.

Key Points

• Rajendra I, the son of Rajaraja I, established the city of Gangaikondacholapuram in the Ariyalur district of modern-day Tamil Nadu around 1025 CE.

• The city was founded to commemorate his victorious military expedition to North India, where his forces reached the Ganges river and defeated the Pala king, Mahipala I.

• To celebrate this milestone, he assumed the title Gangaikonda Chola, which translates to 'The Chola who conquered the Ganges'.

• He shifted the capital of the Chola Empire from Thanjavur (Tanjore) to Gangaikondacholapuram, and it remained the seat of power for nearly 250 years.

• He commissioned the construction of a magnificent Shiva temple, the Brihadisvara Temple of Gangaikondacholapuram, which is recognized as a UNESCO World Heritage Site.

• To mark the victory, he also excavated a massive irrigation tank called Cholagangam (the lake of the Cholas), where water brought from the Ganges was ritually poured.

Additional Information

• Rajaraja I:

• He was the father of Rajendra I and built the iconic Brihadisvara Temple at Thanjavur.

• He laid the foundation of the Chola navy and conquered the Maldives and northern Sri Lanka.

• Rajadhiraja I:

• The son and successor of Rajendra I, known for his military exploits against the Western Chalukyas.

• He died on the battlefield during the Battle of Koppam.

• Kulottunga I:

• He belonged to the Later Chola dynasty and was a descendant of both the Cholas and the Eastern Chalukyas.

• He is famous for Sungamtavirtta Chola (the Chola who abolished tolls) and his trade diplomatic ties with China.

Q40. Answer: (a) Atal Tunnel

The correct answer is Atal Tunnel.

Key Points

• The Atal Tunnel, built by the Border Roads Organization (BRO), was officially certified as the World's Longest Highway Tunnel above 10,000 Feet by the World Book of Records, London, on February 9, 2022.

• The tunnel spans a total length of 9.02 kilometers and is situated at an altitude of 10,017 feet (approximately 3,053 meters) above mean sea level.

• It was constructed under the Rohtang Pass on the Leh-Manali Highway in the Pir Panjal Range of the Himalayas, Himachal Pradesh.

• The project was dedicated to the nation by Prime Minister Narendra Modi on October 3, 2020, fulfilling the vision of former PM Atal Bihari Vajpayee.

• The tunnel ensures all-weather connectivity to the Lahaul and Spiti Valley, reducing the travel distance between Manali and Leh by 46 kilometers and the travel time by about 4 to 5 hours.

• It features a horseshoe-shaped cross-section and includes a dedicated emergency escape tunnel integrated into the main structure for enhanced safety.

Additional Information

• Chenani-Nashri Tunnel:

• Officially known as the Dr. Syama Prasad Mookerjee Tunnel, it is located in Jammu & Kashmir on NH-44.

• While it is one of India's longest road tunnels at 9.28 kilometers, it is situated at a lower altitude of approximately 1,200 meters.

• Zojila Tunnel:

• A significant infrastructure project currently under construction to provide year-round connectivity between Srinagar and Leh.

• Located at an altitude of over 11,500 feet, it aims to bypass the treacherous Zojila Pass.

• Pir Panjal Railway Tunnel:

• Also known as the Banihal Railway Tunnel, it is an 11.215-kilometer long rail tunnel in the Pir Panjal Range.

• It is India's longest transportation railway tunnel, but it does not carry highway traffic.

Q41. Answer: (a) State Legislature

The correct answer is State Legislature.

Key Points

• Under Article 243C of the Indian Constitution, the State Legislature is empowered to make laws regarding the composition of Panchayats.

• The 73rd Constitutional Amendment Act, 1992, explicitly states that the Legislature of a State may, by law, provide for the representation of the Chairpersons of the Panchayats at the village level in the Panchayats at the intermediate level or the district level.

• This legislative power also extends to providing representation for the Chairpersons of the Panchayats at the intermediate level in the Panchayats at the district level.

• The provision ensures a vertical linkage between the three tiers of the Panchayati Raj Institution (PRI), allowing leaders from lower tiers to participate in the planning and execution processes of higher tiers.

• The State Legislature also determines the manner in which the Chairperson of a Panchayat at the village, intermediate, or district level shall be elected, as per Article 243C(5).

Additional Information

• The Parliament of India:

• While the Parliament passed the 73rd Amendment Act to provide a constitutional framework for Local Self-Government, it does not legislate on the specific representation of Chairpersons within individual states.

• The Parliament reserves the power to extend the provisions of Part IX to Scheduled Areas and Tribal Areas under the PESA Act, 1996.

• Governor of State:

• The Governor has the authority to specify which areas constitute a village for the purposes of Part IX via public notification under Article 243(g).

• However, the Governor does not possess the legislative power to frame laws concerning the representation of Panchayat members; this remains a State Legislature function.

• The President of India:

• The President may direct that the provisions of Part IX shall apply to any Union Territory with such exceptions or modifications as

specified under Article 243L.

• The President does not intervene in the legislative domain of states regarding Panchayat chairpersons' representation.

Q42. Answer: (d) 2003

The correct answer is 2003.

Key Points

• The Fiscal Responsibility and Budget Management (FRBM) Act was enacted by the Indian Parliament in 2003 to institutionalize financial discipline and improve fiscal management.

• The primary objective of the legislation was to reduce India's fiscal deficit and revenue deficit, thereby ensuring long-term macroeconomic stability.

• It mandated the Central Government to take necessary steps to limit the fiscal deficit to a target of 3% of the Gross Domestic Product (GDP) over a specified timeframe.

• The act aimed to provide a legal framework for inter-generational equity in fiscal management and minimize the public debt burden on future generations.

Additional Information

• Implementation and Documents:

• Although enacted in 2003, the FRBM Act officially came into force on July 5, 2004.

• The act requires the government to present four fiscal policy statements along with the Union Budget: the Medium-term Fiscal Policy Statement, the Fiscal Policy Strategy Statement, the Macroeconomic Framework Statement, and the Medium-Term Expenditure Framework.

• The NK Singh Committee:

• In May 2016, the Government of India constituted a committee chaired by N.K. Singh to review the working of the FRBM Act.

• The committee recommended a Debt-to-GDP ratio of 60% for the general government (40% for the Centre and 20% for States) by the year 2023.

• Escape Clause:

• The act includes an Escape Clause under Section 4(2), which allows the government to relax the fiscal deficit target during exceptional times such as national security, war, national calamity, or structural reforms in the economy.

Q43. Answer: (d) Tobacco

The correct answer is Tobacco.

Key Points

• The high incidence of oral cancer in India is primarily driven by the frequent use of Tobacco, which contains over 70 known carcinogens, including Tobacco-specific nitrosamines (TSNAs) like NNN and NNK.

• According to clinical data, oral cavity cancer accounts for approximately 30 percent of all cancer types in the country, making it the most common cancer among Indian men.

• The World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) have categorized tobacco as a Group 1 Carcinogen, indicating a direct causal link to malignancies in the buccal mucosa, tongue, and palate.

• Frequent consumption of tobacco leads to Oral Submucous Fibrosis (OSMF), a chronic, debilitating, and premalignant condition characterized by inflammation and progressive fibrosis of the oral tissues, often resulting in Squamous Cell Carcinoma.

Additional Information

• Forms of Tobacco Use in India:

• Smokeless Tobacco (SLT): Products like Khaini, Gutkha, Zarda, and Mawa are chewed or kept in the mouth, leading to prolonged exposure of the oral lining to harmful chemicals.

• Smoking: The use of Bidis and Cigarettes releases polycyclic aromatic hydrocarbons and carbon monoxide, which further increase the risk of cancers of the floor of the mouth and pharynx.

• Betel Quid (Paan): Often mixed with tobacco, the Areca nut in paan acts as an independent carcinogen, and the addition of Slaked Lime enhances the absorption of nicotine and toxins.

• Analysis of Other Options:

• High-salt diet: Primarily linked to hypertension and gastric (stomach) cancer, but it does not have a direct localized carcinogenic effect on the oral cavity.

• Soft drinks and Fried food: While these contribute to obesity and Type 2 diabetes, which are general risk factors for metabolic health, they are not primary triggers for oral oncogenesis.

Q44. Answer: (d) Part V

The correct answer is Part V.

Key Points

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• Part V of the Constitution of India is titled The Union and encompasses Articles 52 to 151.

• The structure of the Union Executive is specifically detailed within Chapter I of this Part, covering Articles 52 to 78.

• The Union Executive consists of the President, the Vice-President, the Prime Minister, the Council of Ministers, and the Attorney General of India.

• This Part defines the powers, functions, and election procedures for these offices, establishing the President as the constitutional head and the Prime Minister as the real executive head under a parliamentary system.

• Beyond the executive, Part V also includes provisions for the Parliament, the Legislative Powers of the President, the Union Judiciary (Supreme Court), and the Comptroller and Auditor-General of India (CAG).

Additional Information

• Part III:

• Focuses on Fundamental Rights ranging from Articles 12 to 35.

• It is often referred to as the Magna Carta of the Indian Constitution, protecting individual liberties such as Right to Equality and Right to Freedom.

• Part IV:

• Contains the Directive Principles of State Policy (DPSP) from Articles 36 to 51.

• These are non-justiciable guidelines for the State to ensure social and economic justice.

• Part VI:

• Deals with The States and spans from Articles 152 to 237.

• It defines the structure of the State Executive (Governor, Chief Minister), State Legislature, and the High Courts.

Q45. Answer: (a) Thiamin

The correct answer is Thiamin.

Key Points

• Thiamin, chemically identified as Vitamin B1, is a fundamental member of the Vitamin B complex, which is a group of water-soluble vitamins essential for cellular function.

• Its primary biological role is acting as a coenzyme (thiamin pyrophosphate) in the citric acid cycle and the metabolism of carbohydrates, enabling the body to convert nutrients into adenosine triphosphate (ATP).

• Because it is water-soluble, it is not stored in large amounts in the body and must be consumed regularly through the diet; excess amounts are typically excreted through urine.

• Severe deficiency of this vitamin leads to Beriberi, characterized by peripheral neuropathy and heart failure, or Wernicke-Korsakoff syndrome, which primarily affects the central nervous system.

• Major dietary sources include fortified grains, yeast, legumes, nuts, and pork.

Additional Information

• Vitamins are broadly classified into two categories: Fat-soluble (stored in fatty tissues and the liver) and Water-soluble (carried to the body's tissues but not stored).

• Retinol:

• Commonly known as Vitamin A, it is a fat-soluble vitamin essential for phototransduction in the retina.

• It supports epithelial integrity, immune response, and bone growth.

• Tocopherol:

• Commonly known as Vitamin E, it is a fat-soluble antioxidant that protects cell membranes from reactive oxygen species (ROS).

• It is vital for immune signaling and preventing lipid peroxidation.

• Calciferol:

• Commonly known as Vitamin D, this fat-soluble vitamin acts more like a hormone in the body.

• It is critical for the absorption of calcium and phosphate in the intestines, preventing Rickets and Osteoporosis.

Q46. Answer: (a) Lord Dalhousie

The correct answer is Lord Dalhousie.

Key Points

• Lord Dalhousie, serving as the Governor-General of India from 1848 to 1856, was responsible for the final annexation of Awadh in February 1856.

• The annexation was unique because it was not based on the Doctrine of Lapse; instead, Dalhousie used the pretext of maladministration and misgovernance to depose Nawab Wajid Ali Shah.

• Dalhousie famously described the kingdom of Awadh as 'a cherry that will fall into our mouth one day' in 1851, highlighting the strategic and economic importance of the region to the British East India Company.

• The takeover led to the Summary Settlement of 1856, which stripped many Taluqdars (local landholders) of their land and authority, causing significant socio-economic distress.

• This move was a primary cause of the Revolt of 1857, as a massive portion of the Bengal Army sepoys were residents of Awadh and felt personally insulted by the humiliation of their Nawab and the loss of their lands.

Additional Information

• Lord Canning:

• He was the successor to Dalhousie and served as the Governor-General during the 1857 Revolt.

• Following the Government of India Act 1858, he became the first Viceroy of India and officially abolished the Doctrine of Lapse.

• Charles Metcalfe:

• Known as the 'Liberator of the Indian Press', he served as the acting Governor-General between 1835 and 1836.

• His major contribution was the Metcalfe Act of 1835, which removed restrictive licensing regulations on Indian newspapers.

• Henry Lawrence:

• He was a British military officer who served as the Chief Commissioner of Awadh in 1857.

• He is widely known for his defense of the British residency during the Siege of Lucknow, where he eventually succumbed to his injuries.

Q47. Answer: (b) Revenue powers lay with the Company, while administrative responsibility lay with the Nawab.

The correct answer is Revenue powers lay with the Company, while administrative responsibility lay with the Nawab..

Key Points

• The Dual System of Government (or Diarchy) was introduced in Bengal by Robert Clive in 1765 following the Treaty of Allahabad, which concluded the Battle of Buxar.

• Under this administrative setup, the East India Company acquired the Diwani rights from the Mughal Emperor Shah Alam II, giving them direct control over revenue collection and civil justice.

• The Nizamat functions, which included general administration, maintenance of law and order, and criminal justice, remained technically with the Nawab of Bengal.

• This system resulted in a unique situation of power without responsibility for the Company, as they controlled the finances, and responsibility without power for the Nawab, who lacked funds to govern effectively.

Additional Information

• Institutional Features:

• The Company appointed Deputy Diwans (Raza Khan for Bengal and Shitab Rai for Bihar) to exercise their Diwani authority, while the Nawab's administration was overseen by a Deputy Subahdar nominated by the Company.

• The system led to extreme economic exploitation and administrative neglect, which were major factors in the Great Bengal Famine of 1770, causing the deaths of nearly one-third of the population.

• Abolition: The failure of the Dual System led the British Parliament to pass the Regulating Act of 1773. Warren Hastings abolished the system in 1772, placing Bengal under the direct rule of the East India Company.

• The Dual System ensured that the Company could appropriate the surplus revenue of Bengal to finance its investments and military expansion in India without being legally accountable for the welfare of the inhabitants.

Q48. Answer: (b) 1992 – Earth Summit, Rio de Janeiro

The correct answer is 1992 - Earth Summit, Rio de Janeiro.

Key Points

• Agenda 21 is a comprehensive, non-binding voluntary action plan of the United Nations regarding sustainable development. It was a key outcome of the United Nations Conference on Environment and Development (UNCED), popularly known as the Earth Summit, held in Rio de Janeiro, Brazil, in June 1992.

• The number 21 in the title signifies the 21st Century, representing the global commitment to achieving sustainable development goals in the new millennium.

• The plan provides a framework for actions to be taken globally, nationally, and locally by organizations of the UN System, governments, and major groups in every area where human activity impacts the environment.

• It addresses critical issues including poverty, hunger, health, atmospheric protection, and biodiversity conservation. It also emphasized the Rio Declaration on Environment and Development and the Statement of Forest Principles.

• One of its significant legacies is Local Agenda 21, which encouraged local authorities to develop their own environmental strategies to address the specific needs of their communities.

Additional Information

• 1972 - Stockholm Conference

• Formally the United Nations Conference on the Human Environment, it was the first major international gathering focused on environmental protection.

• It led to the Stockholm Declaration and the creation of the United Nations Environment Programme (UNEP).

• 1961 - Vienna Convention

• This primarily refers to the Vienna Convention on Diplomatic Relations, which established the framework for diplomatic conduct and immunity between sovereign states.

• Another significant Vienna Convention is the 1985 treaty for the Protection of the Ozone Layer, which paved the way for the Montreal Protocol.

• 2016 - Kigali Agreement

• This is a legally binding amendment to the Montreal Protocol designed to phase out the production and consumption of Hydrofluorocarbons (HFCs).

• Adopted in Rwanda, it aims to prevent up to 0.5 degrees Celsius of global warming by the end of the century.

Q49. Answer: (c) Imagination or reflective thought

The correct answer is Imagination or reflective thought.

Key Points

• The word Khayal (also spelled Khyal) is an Arabic-Persian loanword that literally translates to imagination, conception, fancy, or reflective thought.

• In the context of Indian classical music, specifically the Hindustani tradition, it refers to a modern vocal genre that allows for extensive improvisation and creative freedom for the performer.

• Unlike the older, more structured Dhrupad style which focuses on precise syllable articulation and rigid rules, Khayal emphasizes the singer's imaginative treatment of the Raga (melodic framework) through complex ornamentations.

• This musical form is characterized by its focus on the aesthetic beauty of the notes and the personal interpretative thought of the artist, rather than just the rhythmic or lyrical constraints.

• The emergence of Khayal represented a shift towards more lyrical and ornate musical expressions, making it the most popular and standard genre of classical singing in North India today.

Additional Information

• Historical Development:

• While its roots are sometimes traced back to the 13th century and Amir Khusrau, the modern Khayal format was popularized in the 18th century Mughal court of Muhammad Shah 'Rangila'.

• The legendary musicians Nyamat Khan (known by the pen name Sadarang) and his nephew Firoz Khan (Adarang) are credited with composing numerous Bandishes (compositions) that elevated Khayal to its supreme status.

• Structural Components:

• A typical performance includes Bada Khayal (great Khayal), sung in a slow tempo or Vilambit Laya, and Chhota Khayal (small Khayal), sung in a fast tempo or Drut Laya.

• The lyrics, known as the Bandish, usually consist of two parts: the Sthayi (initial phrase) and the Antara (second half).

• Commonly used Talas (rhythmic cycles) for this style include Ektal, Teental, Tilwada, and Jhumra.

• Gharanas:

• The tradition of Khayal is preserved through various Gharanas (lineages/schools) such as Gwalior (the oldest), Agra, Kirana, Jaipur-Atrauli, and Patiala, each having a unique approach to reflective improvisation.

Q50. Answer: (b) Capital Account – Debit

The correct answer is Capital Account - Debit.

Key Points

• The Balance of Payments (BoP) is a comprehensive statistical statement that summarizes the economic transactions of a country with the rest of the world during a specific period. It follows a double-entry bookkeeping system where every transaction is recorded as either a Credit or a Debit.

• In BoP terminology, any transaction that leads to an inflow of foreign exchange into the country is recorded as a Credit (+), while any transaction resulting in an outflow of foreign exchange is recorded as a Debit (−).

• Foreign Exchange Reserves (including foreign currencies, Gold, and Special Drawing Rights) are managed by the Central Bank (such as the Reserve Bank of India). When there is a surplus in the overall BoP, the Central Bank buys foreign currency to prevent the domestic currency from appreciating excessively, thereby increasing the reserves.

• Since the purchase of foreign assets/currencies involves an outflow of domestic funds to acquire those assets, an increase in official reserves is recorded as a Debit entry in the Capital Account (or the Official Reserve Account, which is a sub-component of the Capital/Financial account).

• Conversely, if the country faces a BoP deficit, the Central Bank sells its reserves to meet the shortage of foreign exchange. This decrease in reserves represents an inflow of foreign exchange into the system and is recorded as a Credit entry.

Additional Information

• Current Account:

• It records the export and import of visible goods (merchandise trade) and invisible services (like shipping, banking, and insurance).

• It also includes unilateral transfers (gifts, remittances, and donations) and income receipts/payments (interest, profits, and dividends).

• A Current Account Debit occurs when a country imports more than it exports or makes transfer payments abroad.

• Capital Account:

• It records transactions that cause a change in the assets or liabilities of the residents of a country or its government.

• Key components include Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI), External Commercial Borrowings (ECB), and Banking Capital.

• A Capital Account Credit occurs during borrowings from abroad or disinvestment (sale of assets), as these bring foreign exchange into the country.

Q51. Answer: (b) Weak intermolecular forces in noble gases

The correct answer is Weak intermolecular forces in noble gases.

Key Points

• Noble gases, belonging to Group 18 of the periodic table, have a completely filled valence shell electronic configuration (ns^2np^6), except for Helium ($1s^2$).

• Due to this stable octet, noble gas atoms do not readily share or transfer electrons to form covalent or ionic bonds under standard conditions, causing them to exist as monatomic atoms.

• The only attractive forces existing between these monatomic atoms are extremely weak London Dispersion Forces (a type of Van der Waals force), which arise from temporary dipoles.

• Because these intermolecular forces are so weak, the thermal energy available at room temperature (approximately 298 K) is more than sufficient to overcome the attraction, keeping the atoms in a gaseous state.

• As a result, noble gases have very low melting and boiling points compared to other elements in the same period.

Additional Information

• Halogens (Group 17):

• Unlike noble gases, halogens exist as diatomic molecules (F2, Cl2, Br2, I2).

• Down the group, the atomic size and the number of electrons increase, which enhances the polarizability of the molecule.

• Stronger polarizability leads to stronger London Dispersion Forces. This is why Fluorine and Chlorine are gases, Bromine is a liquid, and Iodine is a solid at room temperature.

• Reactivity and Bonding:

• High reactivity: Noble gases are actually known for their chemical inertness or low reactivity due to high ionization enthalpy and stable configurations.

• Strong chemical bonds: Noble gases do not form strong bonds in their elemental form; strong interatomic forces only appear in compounds like Xenon tetrafluoride (XeF4), which are formed under specific conditions.

Q52. Answer: (d) Andaman and Nicobar Islands

The correct answer is Andaman and Nicobar Islands.

Key Points

• According to the Census 2011 data, the Andaman and Nicobar Islands recorded the lowest population density among all the Union Territories of India, with a value of 46 persons per square kilometer.

• Population density is a measurement of population per unit area, typically expressed as the number of people per square kilometer, which helps in understanding the spatial distribution of the population.

• The Andaman and Nicobar Islands comprise 572 islands, of which only 38 are permanently inhabited, and a massive portion of the land is designated as protected forests and tribal areas, contributing to the low density.

• Among all administrative units (States and UTs) in 2011, this Union Territory stood out for its sparse settlement compared to the mainland Union Territories like Delhi or Chandigarh.

• While the Andaman and Nicobar Islands have the lowest density among UTs, Arunachal Pradesh holds the record for the lowest density among all Indian States with only 17 persons per square kilometer.

Additional Information

• Density comparison of other Union Territories (Census 2011):

• Delhi (NCT): It recorded the highest population density in India at 11,320 persons per square kilometer.

• Chandigarh: This highly urbanized UT recorded a density of 9,258 persons per square kilometer.

• Puducherry: The density was recorded at 2,547 persons per square kilometer.

• Lakshadweep: Despite its small land area, it had a high density of 2,149 persons per square kilometer.

• Daman and Diu and Dadra and Nagar Haveli recorded densities of 2,191 and 700 persons per square kilometer respectively.

• National Context:

• The overall population density of India as per the 2011 Census was 382 persons per square kilometer, an increase from 324 in the 2001 Census.

• Bihar was identified as the most densely populated state with 1,106 persons per square kilometer, followed by West Bengal at 1,028.

Q53. Answer: (d) Indian Navy

The correct answer is Indian Navy.

Key Points

• The Tri-Services Exercise (TSE-2025), specifically codenamed Trishul for its November 2025 iteration, represents a pinnacle of Jointness and Integration within the Indian Armed Forces.

• The Indian Navy has been designated as the lead branch for this exercise, taking responsibility for the strategic planning and tactical execution of operations across the maritime and coastal domains.

• A primary goal of the exercise is to refine Inter-Service Synergy, ensuring that the Indian Army, Indian Air Force, and Indian Coast Guard can operate as a single cohesive unit during high-intensity conflict scenarios.

• The exercise is a critical step toward the implementation of Integrated Theatre Commands (ITC), specifically testing the operational framework of the proposed Maritime Theatre Command.

• It will involve a massive mobilization of assets, including Aircraft Carriers (such as INS Vikrant or INS Vikramaditya), Nuclear Submarines, Guided-Missile Destroyers, and specialized Amphibious Warfare units.

• The drill focuses on complex maneuvers such as Anti-Submarine Warfare (ASW), Electronic Warfare, and coordinated strikes involving carrier-based fighters and land-based long-range bombers.

Additional Information

• Indian Air Force (IAF)

• Traditionally conducts an annual training exercise also named Trishul under the Western Air Command to test air defense and offensive readiness along the northern borders.

• Recently spearheaded Exercise Tarang Shakti, which is India's largest-ever multi-national air exercise, involving several global partners.

• Indian Army

• In March 2024, the Army led the tri-service Exercise Bharat Shakti at Pokhran, Rajasthan, which demonstrated the capabilities of Indigenously Developed weapon systems.

• Regularly participates in Exercise Trishakti Prahaar, focusing on integrated battle groups and rapid mobilization in the eastern and northern sectors.

• Indian Coast Guard (ICG)

• Functions as the primary agency for Coastal Security, playing a vital role in protecting India's Exclusive Economic Zone (EEZ).

• During tri-service exercises, the ICG coordinates with the Navy for Maritime Search and Rescue (SAR) and protecting offshore vital assets like oil rigs.

• Theatrisation Concept

• This involves the reorganization of the 17 single-service commands into a fewer number of Integrated Commands to maximize combat power and minimize logistical redundancies.

• The 2025 exercise serves as a live-testing ground for the command-and-control protocols of these future unified structures.

Q54. Answer: (d) France

The correct answer is France.

Key Points

• The One Health Summit was hosted by France from 5-7 April 2026 as a high-level strategic gathering to address the interconnected nature of human, animal, and environmental health.

• The event coincided with France holding the G7 Presidency in 2026, where global health security was prioritized as a core pillar of the international agenda.

• A primary focus of the summit was the evaluation and expansion of the One Health Joint Plan of Action (OH JPA), which runs through 2026, aimed at integrating systems for zoonotic disease surveillance and early warning.

• The summit facilitated dialogue between the Quadripartite organizations, including the World Health Organization (WHO) and the United Nations Environment Programme (UNEP), to strengthen the Global Health Security architecture.

• Special emphasis was placed on the PREZODE initiative (Preventing Zoonotic Disease Emergence), a French-led global program launched to mitigate the risk of pathogen spillover from wildlife to humans.

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Additional Information

• One Health Concept:

• It is a collaborative, multisectoral approach working at local, national, and global levels to achieve optimal health outcomes.

• It addresses critical issues such as Antimicrobial Resistance (AMR), food safety, and the impact of climate change on infectious disease patterns.

• The Quadripartite:

• Consists of the FAO (Food and Agriculture Organization), UNEP, WHO, and WOAH (World Organisation for Animal Health).

• These bodies provide technical guidance to countries to implement One Health policies effectively.

• Antimicrobial Resistance (AMR):

• The summit discussed the misuse of antibiotics in agriculture and human medicine, which contributes to the rise of resistant pathogens, causing millions of deaths annually.

• Pandemic Preparedness:

• Discussions contributed to the refinement of the International Health Regulations (IHR) and the development of the Pandemic Treaty to ensure equitable access to medical countermeasures.

Q55. Answer: (b) Printed Circuit Board

The correct answer is Printed Circuit Board.

Key Points

• A Printed Circuit Board (PCB) is the foundational block of almost all modern electronic devices and computer hardware.

• Its primary function is to provide mechanical support to electronic components while electrically connecting them using conductive pathways or traces.

• These traces are typically chemically etched from copper sheets that are laminated onto a non-conductive substrate material.

• The substrate is most commonly made of FR-4, which is a flame-retardant glass-reinforced epoxy laminate, chosen for its excellent insulating properties and thermal stability.

• PCBs are vital for the operation of motherboards, graphics cards, and internal peripherals, allowing for high-speed data transmission and power distribution between the CPU, RAM, and other integrated circuits (ICs).

Additional Information

• Common PCB Classifications:

• Single-Sided PCBs: Contain only one layer of conductive material, often used in simple electronics like calculators or power supplies.

• Multi-Layer PCBs: Feature multiple layers of copper separated by insulating layers, allowing for the extremely dense wiring required in smartphones and high-end servers.

• Flexible PCBs: Made of materials like polyimide that allow the board to bend, commonly used in foldable devices and wearable technology.

• Assembly and Protection:

• Surface Mount Technology (SMT): A process where components are mounted directly onto the surface of the PCB, enabling miniaturization of hardware.

• Solder Mask: The distinctive green coating applied over the copper traces to prevent oxidation and accidental short-circuits during the soldering process.

• Through-Hole Technology (THT): A method where component leads are inserted through drilled holes, providing a stronger mechanical bond for heavy or high-power components.

Q56. Answer: (d) Dr. Poonam Gupta

The correct answer is Dr. Poonam Gupta.

Key Points

• Dr. Poonam Gupta was appointed as the Deputy Governor of the Reserve Bank of India (RBI) in April 2025, with her appointment being approved by the Appointments Committee of the Cabinet (ACC) for a tenure of three years.

• She officially succeeded Michael Debabrata Patra, who served a distinguished term in the central bank before demitting office in early 2025.

• Before her transition to the RBI, Dr. Gupta served as the Director General of the National Council of Applied Economic Research (NCAER), becoming the first woman to lead India's oldest and largest independent economic policy think tank.

• Historically, her appointment is significant as she is the fourth woman to hold the position of Deputy Governor in the RBI, following K. J. Udeshi, Shyamala Gopinath, and Usha Thorat.

• In her capacity as Deputy Governor, she is a crucial member of the Monetary Policy Committee (MPC), which is the statutory body responsible for determining the policy interest rates required to maintain price stability in India.

Additional Information

• RBI Leadership Structure:

• The Reserve Bank of India is governed by a Central Board of Directors. As of June 2026, the Governor of the RBI is Sanjay Malhotra.

• The central bank is mandated to have four Deputy Governors. Currently, the other three serving Deputy Governors are Swaminathan Janakiraman, Shirish Chandra Murmu (appointed in October 2025), and Rohit Jain (appointed in May 2026).

• Portfolios and Responsibilities:

• Dr. Poonam Gupta oversees critical verticals including the Monetary Policy Department, Financial Stability Department, and the Department of Economic and Policy Research.

• The role of a Deputy Governor involves managing functions such as banking regulation, currency management, and foreign exchange reserves.

• Academic and Professional Background:

• She holds a PhD in Economics from the University of Maryland and a Master's degree from the Delhi School of Economics.

• Her extensive professional career includes nearly 20 years of experience at international financial institutions like the World Bank and the International Monetary Fund (IMF).

Q57. Answer: (d) Dubai

The correct answer is Dubai.

Key Points

• The Global Justice, Love and Peace Summit was held in Dubai, United Arab Emirates (UAE), in April 2025, serving as a prestigious platform for international dialogue on humanitarian values and global stability.

• The summit aimed to address critical issues such as social inequality, interfaith harmony, and international conflict resolution, bringing together Nobel laureates, political leaders, and social activists.

• Dubai was selected as the host city due to its established infrastructure for mega-events and its strategic role as a neutral ground for global diplomacy and cultural exchange.

• The event emphasized the Dubai Declaration on Peace, which advocated for the use of Artificial Intelligence (AI) and digital innovation to promote ethical justice and sustainable development goals.

Additional Information

• Dubai:

• Known for hosting high-profile international gatherings, including COP28 and Expo 2020.

• The city has a dedicated Ministry of Possibilities and a Ministry of Tolerance, aligning with the summit's core themes.

• Oslo:

• The capital of Norway is globally recognized as the home of the Nobel Peace Prize ceremony, making it a common reference point for peace summits.

• Milan and New Delhi:

• Milan (Italy) is a hub for global fashion and economy, while New Delhi (India) frequently hosts G20 and BRICS related diplomatic meetings, though neither was the venue for this specific 2025 summit.

Q58. Answer: (c) Compression

The correct answer is Compression.

Key Points

• Sound waves are categorized as longitudinal mechanical waves, meaning the particles of the medium vibrate back and forth in the same direction as the wave propagation.

• A Compression is a region in a longitudinal wave where the particles of the medium are temporarily crowded together due to the external force of a vibrating object.

• Because the particles are packed into a smaller volume, this region is characterized by high density and high pressure relative to the average state of the medium.

• Scientifically, the pressure of a medium is directly proportional to its density; thus, when particles are forced together in a compression, both values peak simultaneously.

• On a graphical representation (pressure-distance graph), a compression is depicted as the crest or the highest point of the curve, representing maximum disturbance from the equilibrium position.

Additional Information

• Rarefaction:

• This is the region of a longitudinal wave where the particles are spread apart.

• It is associated with low density and low pressure, appearing as a trough on a pressure-distance graph.

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• Wavelength:

• It is defined as the physical distance between two consecutive compressions or two consecutive rarefactions.

• In the International System of Units (SI), wavelength is measured in meters (m).

• Crest:

• This term is primarily used for transverse waves (like light or ripples on water) to describe the point of maximum upward displacement.

• In sound wave analysis, while the term compression describes the physical state, 'crest' is often the mathematical label for that peak in a sine wave model.

Q59. Answer: (a) Patna

The correct answer is Patna.

Key Points

• On 6 October 2025, the first phase of the Patna Metro Rail System was inaugurated by Bihar Chief Minister Nitish Kumar, officially making Patna the 24th Indian city to have a functional metro network.

• The initial operational stretch consists of a 3.6-kilometer (or 4.3 km including depot connectivity) elevated priority corridor on the Blue Line (also known as Corridor-II).

• The first phase includes three key elevated stations: Patliputra Inter-State Bus Terminal (ISBT), Zero Mile, and Bhoothnath.

• The project is a joint venture between the Government of Bihar and the Government of India, with the Delhi Metro Rail Corporation (DMRC) acting as the executing agency for the development.

• The total estimated cost for the first phase of the Patna Metro Rail Project is approximately 13,365.77 crore, covering two corridors with a combined length of 32.5 kilometers.

• The Blue Line (North-South corridor) is designed to eventually connect Patna Junction to the New ISBT, featuring a mix of elevated and underground sections to mitigate urban traffic congestion.

Additional Information

• Kolkata:

• It was the first city in India to have a functional metro rail system, with operations beginning on 24 October 1984.

• It is unique for operating the country's first underwater metro section under the Hooghly River.

• Lucknow:

• The Lucknow Metro commenced its commercial operations on 5 September 2017, initially covering the stretch between Transport Nagar and Charbagh.

• Bhubaneswar:

• The foundation stone for the Bhubaneswar Metro Rail Project was laid in January 2024, with full phase-1 operations expected to begin by 2027-2028.

• General Metro Statistics:

• As of late 2025, India possesses the third-largest operational metro rail network in the world, following China and the USA.

• The National Urban Transport Policy (2006) provides the framework for such mass transit developments across Indian tier-1 and tier-2 cities.

Q60. Answer: (d) Natesh Appaji Dravid, Gopal Krishna Deodhar, Anant Vinayak Patwardhan

The correct answer is Natesh Appaji Dravid, Gopal Krishna Deodhar, Anant Vinayak Patwardhan.

Key Points

• The Servants of India Society was established on June 12, 1905, in Pune, Maharashtra, as a premier organization dedicated to social and humanitarian development.

• The primary founder was Gopal Krishna Gokhale, who left the Deccan Education Society to create a dedicated cadre of selfless workers for national service.

• The society was formally launched with three other founding members who took the oath of service alongside Gokhale: Natesh Appaji Dravid, Gopal Krishna Deodhar, and Anant Vinayak Patwardhan.

• The organization aimed to train national missionaries for the service of India and to promote the true interests of the Indian people by all constitutional means, regardless of caste or creed.

• Members of the society were required to lead a life of poverty and dedication, promising to serve the nation for at least twenty-five years on a very meager subsistence allowance.

Additional Information

• Gopal Krishna Gokhale:

• He is widely regarded as the political guru of Mahatma Gandhi.

• He served as the President of the Banaras Session of the Indian National Congress in 1905.

• He was a leading Moderate leader who advocated for reforms through dialogue and constitutional agitation.

• Incorrect Entities:

• A.O. Hume and Dadabhai Naoroji: These leaders were central to the formation of the Indian National Congress in 1885, nearly two decades before the society.

• Lala Lajpat Rai: While a contemporary, he belonged to the Extremist faction and later founded the Servants of the People Society in 1921 in Lahore.

• Subhas Chandra Bose and Jawaharlal Nehru: These were leaders of the younger, radical generation of the Indian National Movement who became prominent long after the society's foundation.

Q61. Answer: (d) Asian Paints

The correct answer is Asian Paints.

Key Points

• On November 25, 2025, the Board of Control for Cricket in India (BCCI) announced Asian Paints as the Official Colour Partner of Team India.

• The partnership is established for a duration of three years, extending through March 2028.

• The agreement is comprehensive, covering a total of 110 matches, including Men’s, Women’s, and Domestic series (such as Ranji Trophy and Duleep Trophy) played within India.

• The deal is reportedly valued at approximately 45 crore, placing the brand in the Official Partner tier alongside entities like SBI Life, Campa, and Atomberg Technologies.

• As part of the fan engagement strategy, Asian Paints introduced innovative digital and on-ground activations including the Colour Cam, which highlights the most vibrant fans in the stadium, and the Colour Countdown, which integrates home décor trends with live match moments.

• The collaboration aims to leverage cricket’s massive reach to strengthen the brand’s Har Ghar (Every Home) connection across the Indian subcontinent.

Additional Information

• Asian Paints:

• It is India’s leading paint and décor company, headquartered in Mumbai, Maharashtra.

• The current Managing Director & CEO is Amit Syngle.

• BCCI (Board of Control for Cricket in India):

• The governing body for cricket in India was founded in December 1928.

• The headquarters are located at the Cricket Centre, Wankhede Stadium, Mumbai.

• Devajit Saikia currently serves as the Secretary of the BCCI.

• The Official Partners segment of BCCI helps generate significant revenue, which reached approximately 180 crore collectively with the addition of Asian Paints in late 2025.

Q62. Answer: (c) Legislative relations

The correct answer is Legislative relations.

Key Points

• Part XI of the Indian Constitution is divided into two chapters, where Chapter I, comprising Articles 245 to 255, specifically governs the Legislative relations between the Union and the States.

• Article 245 defines the territorial extent of laws, stating that Parliament can make laws for the whole or any part of India, while a State Legislature can make laws for the whole or any part of that specific state.

• Article 246 deals with the subject matter of laws, utilizing the Seventh Schedule which contains the Union List, State List, and Concurrent List to distribute power.

• Article 248 grants Residuary powers of legislation exclusively to the Parliament, covering any matter not enumerated in the Concurrent or State Lists.

• Article 249 and Article 250 empower the Parliament to legislate on matters in the State List under specific circumstances, such as in the national interest (upon a Rajya Sabha resolution) or during a Proclamation of Emergency.

• Article 254 handles the doctrine of Repugnancy, ensuring that if a state law conflicts with a central law on a Concurrent List subject, the central law prevails to maintain constitutional consistency.

Additional Information

• Administrative relations:

• These are detailed in Chapter II of Part XI, spanning Articles 256 to 263, focusing on the executive powers and coordination between the Centre and States.

• Financial relations:

• These relations are primarily contained in Part XII of the Constitution, from Articles 264 to 293, covering the distribution of taxes, grants-in-aid, and the Finance Commission (Article 280).

• Judicial system:

• India possesses an integrated judicial system; therefore, unlike legislative or executive powers, there is no strict federal division of judicial relations. The Supreme Court and High Courts form a single hierarchy.

Q63. Answer: (d) 2002

The correct answer is 2002.

Key Points

• The National Seeds Policy was launched by the Ministry of Agriculture, Government of India, in 2002 to provide a stable policy environment for the seed industry.

• It was formulated to replace the New Policy on Seed Development of 1988, aiming to address the challenges of the post-WTO (World Trade Organization) regime and the TRIPS agreement.

• The primary objective of the policy is to ensure the availability of high-quality seeds and planting materials to farmers at the right time and affordable prices.

• A significant focus of the 2002 policy was the encouragement of private sector participation in seed research, development, and production to supplement the efforts of public agencies.

• The policy introduced provisions for a National Seed Grid to monitor seed availability and a National Seed Fund to support the growth of the sector.

• It also emphasized the export of seeds, quality assurance through stringent certification, and the establishment of the National Seed Board (NSB).

Additional Information

• Seed Act, 1966:

• This was the first legislation in India to regulate the quality of seeds for sale and matters connected therewith.

• It led to the creation of the Central Seed Committee and established State Seed Certification Agencies.

• PPV&FR Act, 2001:

• The Protection of Plant Varieties and Farmers Rights Act was enacted to protect the intellectual property rights of plant breeders and farmers.

• It provides a legal framework for the registration of new varieties, extant varieties, and farmers varieties.

• National Seed Corporation (NSC):

• Established in 1963, it is a Schedule 'A' Miniratna Category-I company under the Ministry of Agriculture and Farmers Welfare.

• It plays a vital role in the production of foundation and certified seeds for various crops across the country.

Q64. Answer: (b) Dehra Dun

The correct answer is Dehra Dun.

Key Points

• The longitudinal valleys located between the Lesser Himalayas (also known as Himachal) and the Shiwaliks (the Outer Himalayas) are known as Duns.

• These valleys are tectonic in origin and were originally lakes that were subsequently filled with gravel and alluvium brought down by Himalayan rivers.

• Dehra Dun is the most prominent and largest of these longitudinal valleys, situated in the state of Uttarakhand.

• Geographically, these valleys are bounded by the Main Boundary Thrust (MBT) to the north and the Himalayan Frontal Fault (HFF) to the south.

• Dehra Dun measures approximately 35 to 45 km in length and 22 to 25 km in width, making it a significant structural feature of the Kumaon and Garhwal Himalayas.

• Other well-known examples of such formations include Kotli Dun and Patli Dun, which share similar geological and topographical characteristics.

Additional Information

• Kangra Valley:

• Located in the state of Himachal Pradesh, it is a strike valley situated in the Lesser Himalayas.

• It lies at the base of the Dhauladhar Range and is known for its high agricultural productivity.

• Kullu Valley:

• Popularly known as the 'Valley of Gods', it is a broad transverse valley formed by the Beas River.

• It is situated between the Pir Panjal range and the Great Himalayan range in Himachal Pradesh.

• Patkai Hill Valley:

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• This refers to the valley systems within the Patkai Range, which forms part of the Purvanchal or Eastern Hills.

• It is located along India's North-Eastern border with Myanmar, covering states such as Arunachal Pradesh and Nagaland.

Q65. Answer: (b) Utkal Plain – Odisha

The correct answer is Utkal Plain - Odisha.

Key Points

• The Utkal Plain is a coastal region located in the state of Odisha. It stretches between the Rusikulya River and the Subarnarekha River, encompassing the deltaic regions of the Mahanadi, Brahmani, and Baitarani rivers. It is also home to Chilika Lake, the largest brackish water lagoon in India. Hence, the match Utkal Plain - Odisha is correct.

• The Malabar Plain is situated on the southwestern coast of the Indian peninsula, primarily covering the state of Kerala and parts of Karnataka. This region is renowned for its backwaters (locally known as Kayals) and heavy monsoon rainfall. Hence, the match Malabar Plain - Gujarat is incorrect.

• The Konkan Plain refers to the rugged section of the western coastline of India, extending from Daman in the north to Goa in the south, primarily covering the coastal areas of Maharashtra. It lies between the Western Ghats and the Arabian Sea. Hence, the match Konkan Plain - Tamil Nadu is incorrect.

• The Coromandel Plain represents the southeastern coastal region of India, bounded by the Utkal Plains to the north and Kanyakumari to the south. It spans the coastline of Tamil Nadu and parts of Andhra Pradesh. Hence, the match Coromandel Plain - Kerala is incorrect.

Additional Information

• Western Coastal Plains:

• These are submerged coastal plains located between the Western Ghats and the Arabian Sea.

• They are narrower than the eastern plains and are divided into the Kachchh and Kathiawar coast (Gujarat), Konkan coast (Maharashtra), Goan coast (Karnataka), and Malabar coast (Kerala).

• Eastern Coastal Plains:

• These are emergent coastal plains located between the Eastern Ghats and the Bay of Bengal.

• They are broader and characterized by large fertile deltas formed by the Mahanadi, Godavari, Krishna, and Kaveri rivers, making them ideal for rice cultivation.

Q66. Answer: (a) Justice, liberty, equality, fraternity

The correct answer is Justice, liberty, equality, fraternity.

Key Points

• The Directive Principles of State Policy (DPSP) are contained in Part IV of the Indian Constitution, spanning from Article 36 to 51.

• These principles are fundamental in the governance of the country and are intended to serve as the guiding light for the State to achieve the high ideals of Justice, Liberty, Equality, and Fraternity mentioned in the Preamble.

• Specifically, Article 38 directs the State to strive to promote the welfare of the people by securing and protecting a social order in which social, economic, and political justice shall inform all the institutions of national life.

• The DPSP aim at establishing social and economic democracy, complementing the political democracy guaranteed by the Fundamental Rights, to realize the vision of a Welfare State.

• The concept of Fraternity is promoted through principles that encourage harmony, the spirit of common brotherhood, and the protection of the weaker sections of society, such as those mentioned in Article 46.

Additional Information

• Classification of Directive Principles:

• Socialistic Principles: These aim at social and economic justice and include Article 39 (equitable distribution of resources) and Article 41 (right to work and education).

• Gandhian Principles: Based on the ideology of Mahatma Gandhi, these include Article 40 (organization of village panchayats) and Article 47 (prohibition of intoxicating drinks).

• Liberal-Intellectual Principles: These include Article 44 (Uniform Civil Code) and Article 50 (separation of judiciary from executive).

• Legal Nature:

• Unlike Fundamental Rights, DPSP are non-justiciable, meaning they are not enforceable by any court for their violation.

• However, the Supreme Court has ruled in cases like Minerva Mills (1980) that the Indian Constitution is founded on the bedrock of the balance between Part III and Part IV.

• Incorrect Options Context:

• Terms like hierarchy and privilege are antithetical to the constitutional values of Equality and Democracy and are specifically abolished through provisions like Article 17 (Abolition of Untouchability) and Article 18 (Abolition of Titles).

Q67. Answer: (a) Code reusability across different applications

The correct answer is Code reusability across different applications.

Key Points

• Modular application software is a design technique that emphasizes separating the functionality of a program into independent, interchangeable modules.

• A shared library is a file that contains code and data that can be used by multiple programs at the same time, promoting the concept of Write Once, Run Anywhere within a system.

• In this scenario, the color correction logic is encapsulated within a single library. Since both the image-editing and video-editing programs utilize this same resource, the developer avoids duplicating the complex algorithms for color grading in two separate places.

• This practice is the definition of code reusability, which significantly reduces development time, minimizes the memory footprint of the software, and ensures that improvements made to the library benefit all connected applications simultaneously.

Additional Information

• Modular Design Benefits:

• Easier Maintenance: Bug fixes or updates performed on the shared library automatically propagate to both programs without needing to recompile the individual applications.

• Interoperability: It allows different software systems to work together and share common data processing protocols.

• Efficiency: It reduces redundancy because the system does not need to store multiple copies of the same logic on the hard drive or in RAM.

• Analysis of Other Concepts:

• Redundancy: In computing, redundancy refers to the duplication of components or functions. Modular software using shared libraries actually decreases redundancy by centralizing functions.

• Dependencies: Modular software actually creates dependencies (the program depends on the library to run). Shared libraries do not remove dependencies; they manage them through dynamic linking.

• Offline Operation: Whether a program is modular or uses shared libraries has no direct correlation with its ability to function without an internet connection.

Q68. Answer: (b) A brick-built basin connected to an ancient river channel

The correct answer is A brick-built basin connected to an ancient river channel.

Key Points

• Lothal, located in the modern-day state of Gujarat, served as a vital industrial and commercial hub of the Indus Valley Civilization (Harappan Civilization) around 2400 BCE.

• The most distinctive feature of Lothal is its brick-built basin, which is widely identified by archaeologists as the world's earliest known artificial dockyard.

• This structure was designed with advanced hydraulic engineering, featuring a rectangular basin measuring approximately 218 meters in length and 37 meters in width, constructed entirely of baked bricks.

• It was strategically connected via an inlet channel to an ancient course of the Bhogavo River, a tributary of the Sabarmati, allowing ships to enter the basin during high tide.

• The presence of a sluice gate mechanism helped maintain the water level within the basin, facilitating the berthing and loading of seafaring vessels, which provides the most direct and convincing evidence of its role as a maritime trading centre.

Additional Information

• Trade and Infrastructure:

• The Warehouse: A massive wooden structure (now only the mud-brick platforms remain) situated next to the dockyard was used to store cargo, indicating organized international trade.

• Seals: The discovery of Persian Gulf seals (circular button seals) at the site confirms direct maritime links with Mesopotamia and the Dilmun civilization (modern Bahrain).

• Bead-making Industry: Lothal was a major production center for carnelian and steatite beads, which were highly valued export items found across Western Asia.

• Excavation: The site was discovered and excavated by the renowned archaeologist S.R. Rao in 1954.

Q69. Answer: (b) 11th

The correct answer is 11th.

Key Points

• The 11th edition of the Seatrade Maritime Logistics Middle East (SMLME) conference and exhibition was officially inaugurated on May 6, 2025, at the Dubai World Trade Centre (DWTC).

• The event serves as the flagship exhibition and conference of the UAE Maritime Week, showcasing the region's progress in the

maritime and logistics sectors.

• The conference was inaugurated by Eng. Hessa Al Malek, Senior Advisor to the Minister for Maritime Transport Affairs at the UAE Ministry of Energy and Infrastructure, alongside Abdulla bin Damithan, CEO and Managing Director of DP World GCC.

• This edition saw a significant turnout, attracting over 7,500 maritime professionals and industry leaders from more than 90 countries, reflecting a substantial growth in global interest in the Middle Eastern maritime market.

• A major highlight during the opening day was the announcement by the Indian Register of Shipping (IRS) regarding the opening of a new office in Dammam, Saudi Arabia, marking its 50th anniversary globally and 25 years of operations in the UAE.

Additional Information

• UAE Maritime Week:

• It is a premier biennial event held under the patronage of the UAE Ministry of Energy and Infrastructure to strengthen the country's position as a global maritime hub.

• The week focuses on fostering innovation, improving the business environment, and enhancing human capital investment within the maritime regulatory framework.

• Strategic Focus Areas:

• The 2025 conference agenda prioritized critical industry themes such as digitalisation, decarbonisation, and the integration of STEM skills to meet future logistical demands.

• DP World participated as the Strategic Partner, highlighting the GCC region's role in navigating global trade disruptions and energy transitions.

• The event included specialized segments like the Maritime Logistics Summit, which featured over 80 expert speakers discussing offshore operations and sustainable bunkering.

Q70. Answer: (b) Communist Party of India (Marxist)

The correct answer is Communist Party of India (Marxist).

Key Points

• V.S. Achuthanandan, born in 1923, was one of the most influential veterans of the Communist Party of India (Marxist) and a legendary figure in Kerala politics.

• He was one of the 32 members who walked out of the Communist Party of India (CPI) National Council in 1964 to form the CPI(M), making him a founding father of the party.

• He served as the Chief Minister of Kerala from 2006 to 2011, heading the Left Democratic Front (LDF) administration.

• During his tenure and long career, he was known for his crusade against corruption, land encroachments, and his advocacy for environmental protection and women’s rights.

• He served as a member of the CPI(M) Politburo from 1985 to 2009 and acted as the Leader of the Opposition in the Kerala Legislative Assembly multiple times.

Additional Information

• Communist Party of India (Marxist):

• Formed: 1964 following a split in the CPI.

• Ideology: Marxism-Leninism, focusing on the interests of the working class and peasantry.

• Key Strongholds: Historically dominant in Kerala, West Bengal, and Tripura.

• Indian National Congress (INC):

• Founded in 1885 by Allan Octavian Hume.

• It was the primary organization leading the Indian Independence Movement against British rule.

• Bharatiya Janata Party (BJP):

• Officially formed in 1980, succeeding the Bharatiya Jana Sangh.

• It adheres to the ideology of Integral Humanism and Hindutva.

• All India Trinamool Congress (AITC):

• Founded by Mamata Banerjee in 1998.

• It is currently the ruling party in the state of West Bengal.

Q71. Answer: (d) Two

Given series: (Left) 2 9 3 3 8 4 7 2 4 2 8 9 9 7 4 9 9 4 6 7 7 (Right)

Required Condition: Odd Digit - Odd Digit - Perfect Square.

(Left) 2 9 3 3 8 4 7 2 4 2 8 9 9 7 4 9 9 4 6 7 7 (Right)

So, there are two such odd digits in the given series:

9 7 4, 9 9 4

Hence, the correct answer is 'Option 4'.

Q72. Answer: (a) P

Given: Seven boxes (M, N, O, P, X, Y and Z are kept one over the other but not necessarily in the same order.

1. Only N is kept above P.
2. Only two boxes are kept between P and X.
3. Only O is kept below Y.
4. Z is not kept immediately above X.

Final Arrangement:

7	N
6	P
5	Z
4	M
3	X
2	Y
1	O

Thus, the box kept second above M is P.

Hence, the correct answer is 'Option 1'.

Q73. Answer: (a) qj

The logic followed here is.

Given:‘

'steak tooth badge’ is coded as ‘qj hc sv’

‘badge poet lemon’ is coded as ‘tz qj wv’.

The code for the word "badge" is qj.

Hence, the correct answer is "option 1"

Q74. Answer: (d) 10 km to the West

Given:

• Mr. Yorly starts from Point A and drives 6 km towards South.

• He then takes a right turn, drives 37 km, turns right and drives 42 km.

• He then takes a right turn and drives 47 km.

• He takes a final right turn, drives 36 km and stops at Point P.

The Final Diagram,

He should drive 10 Km in west direction in order to reach Point A again.

Hence, the correct answer is "Option (4)".

Q75. Answer: (b) WU -8

The logic follows here,

For LM 5 is related to NL -14,

For JK 9 is related to LJ -10,

Applying to the same logic, UV 11 related to,

Hence, the correct answer is 'Option 2'.

Q76. Answer: (a) BQL114

The logic followed here is:

The next term is BQL114.

Hence, the correct answer is "Option 1"

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Q77. Answer: (d) Wife’s brother

Family Chart:

Let us first decode the given symbols and then draw a family tree.

Symbol	@	≤	£	≠
Meaning	Son	Wife	Father	Brother

Given: 'A @ D £ J ≠ L ≤ P’

Family tree diagram is,

Therefore, A is the brother of L, who is the wife of P → A is the Wife's brother of P.

Hence, the correct answer is 'Option 4'.

Q78. Answer: (d) KJ−MO

The logic followed here is

Logic: The first letter of the second cluster is 3 positions ahead of the first letter of the first cluster, and the letters in each cluster are in consecutive reverse alphabetical order.

FE-IH,

LK-ON,

CB-FE,

KJ-MO,

Therefore, the letter-cluster pair that is different from the others is KJ-MO.

Hence, the correct answer is 'Option 4'.

Q79. Answer: (b) 11

The logic follows here,

• 7 + 4 = 11

• 11 + 8 = 19

• 19 + 12 = 31

• 31 +16 = 47

• 47 + 18 = 67

The missing value is 11.

Hence, the correct answer is "Option 2"

Q80. Answer: (b) TWYZ

The logic followed in this pattern is a consistent alphabetical shift of +5 for each letter.

For 'BFGJ' related to 'GKLO':

B(2)	F(6)	G(7)	J(10)
+5 ↓	+5 ↓	+5 ↓	+5 ↓
G(7)	K(11)	L(12)	O(15)

For 'HKMN' related to 'MPRS':

H(8)	K(11)	M(13)	N(14)
+5 ↓	+5 ↓	+5 ↓	+5 ↓
M(13)	P(16)	R(18)	S(19)

Applying the same logic to 'ORTU':

O(15)	R(18)	T(20)	U(21)
+5 ↓	+5 ↓	+5 ↓	+5 ↓
T(20)	W(23)	Y(25)	Z(26)

Thus, ORTU is related to TWYZ.

Hence, the correct answer is 'Option 2'.

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Q81. Answer: (b) TWO

Given series: 4 5 6 2 3 3 3 2 1 1 2 3 8 7 4 6 4 6 5 8 2 5 6 5 4 3 4 2 3
Required Condition: Even Digit - Odd Digit - Odd Digit
(Left) 4 5 6 2 3 3 3 2 1 1 2 3 8 7 4 6 4 6 5 8 2 5 6 5 4 3 4 2 3 (Right)
Thus, there are exactly two such odd digits that satisfy the given conditions: 2 3 3, 2 1 1
Hence, the correct answer is 'Option 2'.

Q82. Answer: (a) D

Given: Seven people, A, B, D, J, O, T, and Z, are sitting in a row, facing north.
• Only one person sits to the right of A.
• Only three people sit between B and A.
• Only three people sit between T and J, neither of whom sits on the left end.
• D sits immediately to the right of Z.
• Only one person sits between T and O.
The Final Arrangement is,
From the arrangement, we can see that D sits immediately to the left of A.
Hence, the correct answer is "Option 1"

Q83. Answer: (c) Two

Given number: 84157639
When the digits of the given number are arranged in ascending order from left to right, we get the following sequence:
Original number: 8 4 1 5 7 6 3 9
Ascending order: 1 3 4 5 6 7 8 9
Therefore, the positions of two digits remain unchanged.
Hence, the correct answer is 'Option 3'.

Q84. Answer: (b) Neither conclusion (I) nor (II) follows

The least possible Venn diagram for the given statements is:
Conclusions:
(I) No village is a district - Does not follow (No direct relation between village and district. Hence, it is false)
(II) Some districts are huts - Does not follow (No direct relation between huts and district. Hence, it is false)
Neither conclusion (I) nor (II) follows.
Hence, the correct answer is "Option 2".

Q85. Answer: (b) 2

According to the given information:
When 2 is added to each odd digit and 1 is subtracted from each even digit in the number 82135746
Now the new number is: Left 7 1 3 5 7 9 3 5 Right
The difference between the first digit from the right end and the first digit from the left end in the new number = 7 - 5 = 2.
Hence the correct answer is Option 2)

Q86. Answer: (b) PNK

The logic followed here is,
Logic: 1st Letter − 3 = 2nd Letter; 2nd Letter − 2 = 3rd Letter.
DAY
PNK
OLJ
NKI
Therefore, the letter cluster that is different from the others is PNK.
Hence, the correct answer is 'Option 2'.

Q87. Answer: (c) 331

The logic followed here is:
$8 + 1^2 = 8 + 1 = 9$

$9 + 2^3 = 9 + 8 = 17$

$17 + 3^2 = 17 + 9 = 26$

$26 + 4^3 = 26 + 64 = 90$

$90 + 5^2 = 90 + 25 = 115$

$115 + 63 = 115 + 216 = 331$

Hence, the correct answer is "Option 3"

Q88. Answer: (d) Both conclusions (I) and (II) follow

The least possible Venn diagram for the given statements is:

Conclusion

(I) Some cars are frogs - Follows (All frogs are car that means some frogs are car and some cars are frogs)

(II) All jokers are cars - Follows (All jokers are car that means some jokers are car and some cars are jokers)

Both conclusions (I) and (II) follow.

Hence the correct answer is "Option 4"

Q89. Answer: (a) 22, 133

The logic followed here is:

Logic: Second Number = (First Number × 6) + 1

For the first set 18, 109

=> (18 × 6) + 1

=> 108 + 1 = 109

For the second set 17, 103

=> (17 × 6) + 1

=> 102 + 1 = 103

Applying the same logic to the options

22, 133

=> (22 × 6) + 1

=> 132 + 1 = 133

Hence, the correct answer is 'Option 1'.

Q90. Answer: (a) One

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

1. Only six people sit to the right of E
2. Only five people sit to the left of Q
3. Only three people sit between M and Q
4. B is the immediate neighbour of L and G
5. Only three people sit between F and L

Final Seating Arrangement:

Therefore, one person sits between G and F.

Hence, the correct answer is "Option 1"

Q91. Answer: (b) 68

The logic followed here is:

Rank of Ayush from the top = 44^(th)

Rank of Ayush from the bottom = 25^(th)

Total number of students = (Rank from the top + Rank from the bottom) − 1

= (44 + 25) − 1

= 69 − 1

= 68

Hence, the correct answer is 'Option 2'.

Q92. Answer: (b) Son's wife's mother

The family tree diagram is,

Based on the tree, K is the son of U and T is K's wife. Since X is the mother of T, X is the mother of U's son's wife.

Hence, the correct answer is 'Option 2'.

Q93. Answer: (c) EHC

The logic followed here is:

The term is EHC.

Hence, the correct answer is "Option 3"

Q94. Answer: (b) T 4

The logic followed here is:

The missing term in the series is T 4.

Hence, the correct answer is "Option 2"

Q95. Answer: (c) TB 19

The logic follows here,

For KY 1 is related to MU 17,

For FI 8 is related to HE 24,

Applying same logic, RF 3 related to

Thus, RF 3 is related to TB 19.

Hence, the correct answer is 'Option 3'.

Q96. Answer: (d) Three

Given number: 51748623

1 is added to each odd digit and 2 is subtracted from each even digit in the number 51748623

Digits will appear more than once in the new number, thus three are formed: 2, 6, and 4.

Hence, the correct answer is 'Option 4'.

Q97. Answer: (d) 5

The logic followed here is the comparison of letters and their corresponding numerical codes in the given words.

Therefore, the code for S is 5.

Hence, the correct answer is "Option 4"

Q98. Answer: (a) 90

The logic followed here is:

Position of Tuv from the top = 27^(th)

Position of Tuv from the bottom = 64^(th)

Total number of students in the class = (Position from the top + Position from the bottom) − 1

= (27 + 64) − 1

= 91 − 1

= 90

Hence, the correct answer is 'Option 1'.

Q99. Answer: (c) KO - QV

The logic followed here is

HL − NR,

DH − JN,

KO − QV

AE − GK,

Therefore, the letter-cluster pair that is different from the others is KO − QV.

Hence, the correct answer is 'Option 3'.

Q100. Answer: (c) K

The logic followed here is:

For the word REFERTILIZES:

Original Letter	R	E	F	E	R	T	I	L	I	Z	E	S

New Letter	P	G	D	G	P	R	K	J	K	X	G	Q

The letters that appear exactly twice in the formed group are P and K.

Comparing this with the given options, K is in the options that appear exactly twice.

Hence, the correct answer is "Option 3"

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