RRB NTPC (UG) CBT-I Official Paper (Held On 16 Jun, 2026 Shift 3) (Previous Year Paper)

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

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MATHEMATICS

Q1. In a parallelogram, one angle is 70°. What are the measures of the other three angles?

(a) 70°, 70°, 110°
(b) 110°, 110°, 110°
(c) 70°, 110°, 110°
(d) 70°, 70°, 70°

Q2. If Rs. 5,000 is invested at 8% per annum compounded annually, what will be the compound interest earned after 2 years?

(a) Rs. 832
(b) Rs. 800
(c) Rs. 816
(d) Rs. 840

Q3. A shopkeeper sells an article to A at a profit of 20%. A sells it to B at a profit of 25%. If B pays Rs. 3,000, what is the cost price of the article for the shopkeeper?

(a) Rs. 2,080
(b) Rs. 2,100
(c) Rs. 2,000
(d) Rs. 2,200

Q4. A shopkeeper offers the following schemes on toys of the same marked price.

(A) Successive discounts of 27% and 39% on any number of toys bought.
(B) Successive discounts of 39%, 7% and 40% on any number of toys bought.
(C) 26% discount on the first 9 toys and 13% discount on each toy thereon.
(D) 7 toys free of cost on buying 9 toys.

A customer wants to buy 9 toys. Which of the above schemes is the least beneficial to her?

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

Q5. Two trains P and Q, measure 200 m and 300 m in length, respectively. The faster train, coming from behind, takes 48 seconds to overtake the slower when moving in the same direction. When they approach each other from opposite directions, they cross each other completely in 20 seconds. Determine the speed of the faster train.

(a) 61.75 km/h
(b) 62.75 km/h
(c) 63.75 km/h
(d) 60.75 km/h

Q6. The arithmetic mean of 3, 7, 11, ..., 51 is _____.

(a) 31
(b) 23
(c) 35
(d) 27

Q7. A cistern is filled by two taps, C and D, in 54 minutes and 81 minutes, respectively. There is also a drain E at the bottom. If all three are opened simultaneously, the cistern is filled in 108 minutes. In how many minutes can drain E alone empty the cistern? (up to two decimal places)

(a) 42.06
(b) 46.29
(c) 49.24
(d) 45.64

Q8. A shopkeeper marks a washing machine at Rs. 24,000. During a festival, he offers a 20% discount and sells it for an additional Rs. 800 less. What is the final selling price of the washing machine?

(a) Rs. 18,800
(b) Rs. 19,200
(c) Rs. 17,600
(d) Rs. 18,400

Q9. The sum of two positive numbers is 44 and their product is 228. The positive difference between them is:

(a) 36
(b) 32
(c) 37
(d) 33

Q10. A vertical communication tower stands on a building 30 meters high. From a point 70 meters from the building, the angles of elevation to the top and bottom of the tower are 60° and 30°, respectively. What is the height of the tower (in m)?

(a) 70 √3 - 30
(b) 70√3/2 + 30
(c) 30 √3
(d) 70 √3 + 30

Q11. What is the ratio between the third proportional of 36 and 48 to the third proportional of 49 and 64?

(a) 3:5
(b) 16:25
(c) 49:64
(d) 38:41

Q12. Three friends, Amit, Bala, and Chetan, have savings in the ratio 5:7:9. If Bala's savings exceed Amit's by Rs. 3,600, what are Chetan's total savings?

(a) Rs. 16,800
(b) Rs. 16,400
(c) Rs. 16,200
(d) Rs. 16,600

Q13. A shopkeeper buys two types of notebooks. The cost of 3 notebooks of the first type and 5 notebooks of the second type together is Rs. 420. The cost of one notebook of the second type is Rs. 20 more than the cost of one notebook of the first type. What is the cost of one notebook of the first type?

(a) Rs. 40
(b) Rs. 48
(c) Rs. 42
(d) Rs. 45

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Q14. An item is sold after giving successive discounts of 10% and 20%. What is the net percentage reduction in its price?

(a) 32%
(b) 34%
(c) 28%
(d) 30%

Q15. Two taps can fill a cistern in 4 hours and 13 hours, respectively. A third tap can empty it in 13 hours. How long (in hours) will it take to fill one-fourth of the empty cistern if all the taps are opened together?

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

Q16. If 6^x - 6^(x-1) = 30, then the value of (2x-1)/(2x+3) is:

(a) 3/11
(b) 3/9
(c) 3/4
(d) 3/7

Q17. Which of the following numbers is divisible by 11?

(a) 869756
(b) 978626
(c) 447255
(d) 112044

Q18. The HCF and LCM of two numbers are 15 and 225, respectively. Which of the following pairs can be the numbers?

(a) 45 and 75
(b) 25 and 135
(c) 15 and 75
(d) 25 and 65

Q19. The average of five numbers is 24. If four of the numbers are 18, 20, 25 and 27, what is the fifth number?

(a) 35
(b) 30
(c) 28
(d) 32

Q20. If 1.2x = 0.5y, find the value of (x+y)/(x-y).

(a) -21/4
(b) -17/7
(c) 14/3
(d) 12/3

Q21. A shopkeeper claims to sell rice at cost price, but uses a false weight and gains 25%.
For 1 kg, how much rice does he actually give?

(a) 900 gm
(b) 800 gm
(c) 850 gm
(d) 750 gm

Q22. What sum (in Rs.) will earn a simple interest of Rs. 1,320 in 3 years at 16% per year rate of interest?

(a) 5,500
(b) 633.6
(c) 1,375
(d) 2,750

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Q23. If the difference between the ages of a mother and her daughter is 24 years, and the sum of their ages is 52 years, how old (in years) is the mother?

(a) 36
(b) 28
(c) 38
(d) 40

Q24. The LCM of the numbers 7, 12.4 and 1 is:

(a) 440
(b) 441
(c) 442
(d) 434

Q25. A company's revenue increases by 20% in the first year, decreases by 10% in the second year, and increases by 15% in the third year. What is the overall percentage change in revenue over the three years?

(a) 24.2% increase
(b) 25.2% increase
(c) 23.2% increase
(d) 26.2% increase

Q26. A hollow cylinder of thickness 1 unit and length 14 units is made with 396 cubic units of metal. Its inner volume is _____ cubic units. (Take begin mathsize 12px style pi equals 22 over 7 end style)

(a) 636
(b) 730
(c) 704
(d) 676

Q27. A cylindrical tank of radius 20 cm contains water up to a height of 10 cm. If 30 solid spheres, each of radius 7 cm, are completely immersed in the water, then the rise in the water level (in cm) is (Use $\pi = 3.14$)

(a) 32.4 space cm
(b) 34.3 space cm
(c) 28.7 space cm
(d) 36.5 space cm

Q28. A person travels three-fifths of the total distance from home to office by train, one-fourth by car, and the remaining 300 metres on foot. What is the total distance (in kilometres) from home to office?

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

Q29. IF 2^(x+1) X 4^(y-2) = 32 and x = 3y, what is the value of y?

(a) 1.4
(b) 1.5
(c) 1.6
(d) 1

Q30. The present ages of A and B are in the ratio 4:5. If after 8 years from now, A will be 32 years old, what is B's present age?

(a) 34 years
(b) 30 years
(c) 32 years
(d) 28 years

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GENERAL AWARENESS

Q31. Which of the following provides evidence that the Great Indian Desert was once under the sea during the Mesozoic era?

(a) Presence of black soil
(b) Marine deposits and wood fossils
(c) Glacial deposits
(d) Volcanic ash layers

Q32. Which of the following Articles of the Indian Constitution provides for the suspension of enforcement of the rights conferred by Part III during emergencies?

(a) Article 358
(b) Article 356
(c) Article 357
(d) Article 359

Q33. In which case did the Supreme Court lay down the principle that Parliament cannot alter the 'basic structure' of the Indian Constitution?

(a) Shankari Prasad case
(b) Kesavananda Bharati case
(c) Golaknath case
(d) Minerva Mills case

Q34. The Prime Minister of which of the following countries was conferred the ‘Speaker of the Knesset Medal’ by the Israeli Parliament in February 2026?

(a) India
(b) Spain
(c) Luxembourg
(d) Belgium

Q35. In the Windows Operating System, when the dedicated Power Saver plan is activated, which of the following is the primary technical mechanism the operating system employs to significantly conserve energy, consequently leading to a noticeable reduction in system responsiveness and performance?

(a) Aggressively flushing the cache memory every few seconds to minimize the power drawn by the CPU's fastest memory components
(b) Disabling the Graphical Processing Unit (GPU) entirely and forcing all display rendering onto the CPU
(c) Increasing the hard disk spin-down time to ensure the drive remains idle and consumes zero mechanical power
(d) Reducing the maximum processor state (clock speed/frequency) to cap the peak computational capacity and thermal output

Q36. Which option is used in Windows 11 to temporarily turn off the computer to save power while keeping programs open?

(a) Wake Up
(b) Shut Down
(c) Restart
(d) Hibernate

Q37. Which continent has the highest average elevation due to its thick ice sheets?

(a) Antarctica
(b) Europe
(c) South America
(d) Africa

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Q38. Who among the following was a ruler of the Chedi (Mahameghavahana) dynasty of Kalinga?

(a) Gautamiputra Satakarni
(b) Kanishka
(c) Kharavela
(d) Pushyamitra Shunga

Q39. Which term describes sound energy received per second per unit area?

(a) Frequency
(b) Pitch
(c) Echo
(d) Intensity

Q40. Which heat transfer method enables the Sun to warm Earth, despite the vast empty space between them?

(a) Convection
(b) Radiation
(c) Insulation
(d) Conduction

Q41. The British gained control over Bengal after which major battle?

(a) Battle of Buxar
(b) Battle of Plassey
(c) Battle of Panipat
(d) Battle of Wandiwash

Q42. Who was appointed as the 26th Governor of the Reserve Bank of India in December 2024?

(a) Sanjay Malhotra
(b) Michael Patra
(c) Poonam Gupta
(d) Raghuram Rajan

Q43. The 20-Point Economic Programme was initially launched in 1975 primarily to:

(a) Liberalize trade policies
(b) Reduce government borrowing
(c) Promote foreign direct investment
(d) Accelerate socio-economic reforms

Q44. Which of the following keyboard shortcuts is used to copy selected text or objects?

(a) Ctrl + F
(b) Ctrl + C
(c) Ctrl + S
(d) Ctrl + V

Q45. Which album brought Dr. L. Subramaniam, the celebrated Indian violinist, a Grammy Award nomination in 1981?

(a) West Meets East
(b) Fantasy With Truth
(c) Music Festival of India
(d) Eternal Melodies

Q46. Which of the following scores has India secured in the SDG Index 2025?

(a) 61.5
(b) 67.0
(c) 57.0
(d) 72.3

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Q47. Which of the following provisions was brought about by the Indian Councils Act of 1909?

(a) Introduction of separate electorates for Muslims
(b) Establishment of the Supreme Court in India
(c) Universal voting rights for all Indians
(d) Elimination of Viceroy's position

Q48. The architectural style of the Jagannath Temple is primarily associated with which of the following traditions?

(a) Dravidian style
(b) Hoysala Style
(c) Vesara style
(d) Kalinga style

Q49. The Central Administrative Tribunal (CAT) was established in which year?

(a) 1985
(b) 1990
(c) 1995
(d) 1980

Q50. What was the Worker Population Ratio (WPR) for persons aged 15+ in India in October 2025 according to the Periodic Labour Force Survey (PLFS)?

(a) 48.5 %
(b) 50.1 %
(c) 42.5 %
(d) 52.5 %

Q51. Electrical energy can be calculated using which of the following formulas?

(a) Energy = Current × Resistance
(b) Energy = Voltage × Current
(c) Energy = Power × Time
(d) Energy = Power ÷ Time

Q52. As per the Constitution of India, the _____is a state's de jure head.

(a) Chief Justice of High Court
(b) Education Minister
(c) Chief Minister
(d) Governor

Q53. Which measure formed a central part of Gandhi's non-cooperation strategy adopted at the Calcutta Session of 1920?

(a) Acceptance of legislative seats to negotiate reforms within councils.
(b) Boycott of schools, courts, and councils alongside the adoption of khadi.
(c) Participation in trade negotiations to influence imperial economic policies.
(d) Establishment of armed village guards to resist colonial recruitment.

Q54. In which year was the Pune Metro Rail Project inaugurated by the Prime Minister of India?

(a) 2015
(b) 2022
(c) 2018
(d) 2020

Q55. In which of the following states is the Bateshwar fair held usually few days prior to DEEPAWALI for a period of almost three weeks?

(a) Madhya Pradesh
(b) Uttar Pradesh
(c) Chhattisgarh
(d) Bihar

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Q56. Which sector in India includes activities such as cotton textile production and iron and steel manufacturing?

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

Q57. The Gaganyaan mission was expected to boost Safran India's revenue by ~70% in 2025, aligning with which initiative?

(a) Skilling Bharat
(b) Digital India
(c) Clean energy push
(d) Make in India

Q58. The concept of Gross Enrolment Ratio belongs to the _____.

(a) health sector
(b) transport sector
(c) banking sector
(d) education sector

Q59. In October 2025, which country awarded its highest decoration, the ‘Grand Order of Mugunghwa’, to U.S. President Donald Trump?

(a) China
(b) Japan
(c) Bhutan
(d) South Korea

Q60. Which device is designed to integrate processing, memory, and input/output components into one compact unit?

(a) Motherboard
(b) Micro Board
(c) System Bus
(d) Microcontroller

Q61. Kudremukh in Karnataka is famous for which mineral?

(a) Copper
(b) Bauxite
(c) Iron Ore
(d) Manganese

Q62. In December 2025, which of the following courts has declared 26 December 2025 as a holiday and advanced the commencement of its Winter Vacation to the same date?

(a) Delhi High Court
(b) Gauhati High Court
(c) Allahabad High Court
(d) Madras High Court

Q63. The 11^(th) Schedule of the Constitution of India lists:

(a) Concurrent List subjects
(b) Fundamental Duties
(c) 29 subjects for Panchayats
(d) 18 subjects for Municipalities

Q64. Ravi Shankar is famous for his expertise in playing which classical music instrument?

(a) Flute
(b) Tabla
(c) Sitar

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(d) Sarod

Q65. The economic crisis of 1991 acted as a trigger for reforms. What was the key reason for India's 1991 economic crisis?

(a) Agricultural surplus
(b) High fiscal and current account deficits
(c) Oil price drop
(d) Increase in gold reserves

Q66. "Social, Economic and Political Justice" are borrowed from which revolution?

(a) Russian Revolution
(b) French Revolution
(c) Glorious Revolution
(d) American Revolution

Q67. Which of the following Pushyabhuti rulers strengthened his position by defeating the Hunas?

(a) Rajyavardhana
(b) Prabhakarvardhana
(c) Harshavardhana
(d) Naravardhana

Q68. If you measure the amount of electric charge flowing in a circuit, which SI unit would you use to record the result?

(a) Volt
(b) Coulomb
(c) Ampere
(d) Ohm

Q69. Which of the following is a depositional landform formed by wind action?

(a) Yardang
(b) Barchan
(c) Inselberg
(d) Moraine

Q70. Where was the annual World Economic Forum meeting held in January 2025?

(a) Davos-Klosters, Switzerland
(b) Copenhagen, Denmark
(c) Stockholm, Sweden
(d) Oslo, Norway

GENERAL INTELLIGENCE AND REASONING

Q71. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

FEL 17, KIQ 21, PMV 25, UQA 29, ?

(a) YUF 32
(b) ZUF 33
(c) ZVG 33
(d) YVG 32

Q72. DO 9 is related to FL -5 in a certain way. In the same way, EQ 3 is related to GN -11. To which of the following is KH 6 related, following the same logic?

(a) GY -11
(b) IE -7
(c) ME -8
(d) NI -14

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Q73. Amrita is the sister of Bablu. Bablu is the brother of Deepak. Deepak is the son of Malti and Malti is the wife of Lakhan. Nehal is the brother of Lakhan. How is Nehal related to Amrita?

(a) Father's brother
(b) Brother
(c) Son
(d) Mother's brother

Q74. Mr. Vasu starts from Point A and drives 25 km towards the West. He then takes a left turn, drives 15 km, turns left and drives 51 km. He then takes a left turn, drives 28 km, turns left and drives 14 km. He then takes a left turn and drives 6 km. He takes a final right turn, drives 12 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 8 km to the North
(b) 10 km to the East
(c) 9 km to the West
(d) 7 km to the South

Q75. 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) UXZ
(b) LOQ
(c) ZDE
(d) DGI

Q76. Each of the digits in the number 8254316 is arranged in ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q77. What should come in place of '?' in the given series?

56 57 ? 70 86 111

(a) 61
(b) 63
(c) 64
(d) 62

Q78. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statement: Some Power Saws are Chisels. Some Chisels are Wrenches.

Conclusion (I): Some Power Saws are Wrenches.

Conclusion (II): No Power Saws are Wrenches.

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

Q79. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) DV - PH
(b) JB - DN
(c) NF - HR

(d) TL - NX

Q80. Based on the English alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) CAY
(b) RON
(c) YVU
(d) LIH

Q81. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statement: No Race Cars are Tractors. Some Tractors are Trains.

Conclusion I: No Race Cars are Trains.

Conclusion II: Some Race Cars are Trains.

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

Q82. Seven people P1, P2, P3, P4, P5, P6 and P7 are sitting around a circular table facing towards the centre of the table. P5 sits to the immediate left of P6. There are exactly two people between P1 and P6 when checked from right of P6. P3 is sitting immediately between P2 and P1. P7 is sitting immediately between P4 and P5. How many people are sitting between P4 and P6 when checked from left of P6?

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

Q83. Each of the digits in the number 3219854 is arranged in ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q84. Six boxes, R, S, T, U, V and X, are kept one over the other, but not necessarily in the same order.

Only one box is kept below S. Only one box is kept above U. Only one box is kept between U and V. T is kept immediately below S. R is kept at some place below X.

How many boxes are kept between X and T?

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

Q85. Seven people H, I, J, K, W, Y and Z are sitting around a circular table facing the centre of the table. K sits third to the left of Z. Only two people sit between J and K when counted from the right of J. Only three people sit between J and I. H sits to the immediate left of W. Who sits third to the left of Y?

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

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Q86. In a row of 25 students facing North, Vinayak is 13th from the right end. If Utkarsh is 4th to the left of Vinayak, what is Utkarsh's position from the left end of the row?

(a) 4th
(b) 8th
(c) 6th
(d) 9th

Q87. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

MLJ HGE CBZ XWU ?

(a) SQO
(b) SRP
(c) STV
(d) SSO

Q88. Refer to the following series and answer the question. (Counting to be done from left to right only.) (All numbers are single-digit numbers only.)

(Left) 8 2 6 6 3 1 8 6 4 2 2 8 4 3 4 9 9 3 7 4 6 1 6 (Right)

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

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

Q89. Select the triad that follows the same pattern as the one followed by the two triads given below. Both triads follow the same pattern.

LG - OJ - QS

OJ - RM - TV

(a) ID - LG - NP
(b) JD - LH - NO
(c) JD - LG - NO
(d) ID - LG - NO

Q90. 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, 6, 217)

(21, 6, 253)

(a) (23, 6, 276)
(b) (23, 4, 185)
(c) (24, 6, 287)
(d) (22, 5, 220)

Q91. Refer to the following letter series and answer the question that follows.

(Left) X P S A D U G L O E J F K I M C R T Q (Right)

How many letters are there in the English alphabetical series between the letter which is fifth from the right end and third from the left end of the series?

(a) Seven
(b) Four
(c) Six
(d) Five

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Q92. Each of the digits in the number 3184657 is arranged in ascending order from left to right.

The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q93. Seven boxes, G, H, I, J, L, M and N, are kept one over the other, but not necessarily in the same order.

Box I is kept at the third position from the top. Box N is kept at the third position from the bottom. Only three boxes are kept between N and J. Only three boxes are kept between I and H. Box M is kept at a position somewhere above L.

Which box is kept at the bottom?

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

Q94. In a certain code language, ‘rest restores energy’ is coded as ‘rk fj mg’ and ‘positive energy attracts’ is coded as ‘tw es fj’.

How is ‘energy’ coded in the given language?

(a) fj
(b) es
(c) rk
(d) mg

Q95. Refer to the given number series and answer the question that follows. All numbers are single-digit numbers only. Counting to be done from left to right only.

(Left) 3 5 1 5 9 5 3 4 6 4 8 5 1 3 2 9 6 6 6 3 6 8 7 (Right)

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

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

Q96. What should come in place of the question mark (?) in the given series to make it logically complete?

Q18N O23P M28R K33T ?

(a) I38V
(b) J40U
(c) J36V
(d) I38U

Q97. MKPT is related to QOTX in a certain way based on the English alphabetical order. In the same way, ENSU is related to IRWY.

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

(a) HDRG
(b) FJIT
(c) HLKV
(d) QEIY

Q98. In a certain code language,

A = B means ‘A is the son of B’,

A $ B means ‘A is the sister of B’,

A @ B means ‘A is the wife of B’ and

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A * B means ‘A is the father of B’.

How is W related to G if ‘W = F $ K * L @ G’?

(a) Wife's father's sister's son
(b) Wife's sister's son
(c) Father's sister's son
(d) Sister's son

Q99. In a certain code language, 'PWEA' is coded as '90' and 'QAMT' is coded as '102'.

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

(a) 91
(b) 94
(c) 97
(d) 86

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

8 ? 29 50 78 113

(a) 18
(b) 14
(c) 15
(d) 16

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 70°, 110°, 110°

Shortcut Trick

In a parallelogram, opposite angles are equal and adjacent angles are supplementary (sum is 180°).

Given angle = 70°

Opposite angle = 70°

Adjacent angle = 180° − 70° = 110°

Angle opposite to the adjacent angle = 110°

The other three angles are 70°, 110°, and 110°.

Therefore The correct answer is 70°, 110°, 110°.

Alternate Method

Given:

One angle of the parallelogram = 70°

Formula used:

1. Sum of adjacent angles of a parallelogram = 180°

2. Opposite angles of a parallelogram are equal.

Let the parallelogram be ABCD where angle A = 70°.

=> angle A + angle B = 180° (Adjacent angles are supplementary)

=> 70° + angle B = 180°

=> angle B = 180° − 70°

=> angle B = 110°

Since opposite angles are equal:

=> angle C = angle A = 70°

=> angle D = angle B = 110°

Therefore The other three angles are 110°, 70°, and 110° (which can be written as 70°, 110°, 110°).

Therefore The correct answer is 70°, 110°, 110°.

Additional Information

Sum of Interior Angles

For any quadrilateral, including a parallelogram, the sum of all interior angles is always 360°.

Properties of Diagonals

The diagonals of a parallelogram bisect each other, although they are not necessarily equal in length unless it is a rectangle.

Consecutive Angles

Any pair of consecutive angles in a parallelogram will always sum to 180° because they are interior angles on the same side of a transversal cutting parallel lines.

Q2. Answer: (a) Rs. 832

Shortcut Trick

The Effective Rate of interest for 2 years at 8% compounded annually = 8 + 8 + (8 × 8)/100 = 16.64%.

Total Compound Interest = 16.64% of Rs. 5,000.

=> CI = 5000 × (16.64 / 100) = 50 × 16.64 = Rs. 832.

Therefore The correct answer is Rs. 832.

Alternate Method

Given:

Principal (P) = Rs. 5,000

Rate (R) = 8% per annum

Time (T) = 2 years

Formula Used:

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

Compound Interest (CI) = A − P

Calculations:

=> A = 5000 × $(1 + 8/100)^2$

=> A = 5000 × (108/100) × (108/100)

=> A = 5000 × 1.08 × 1.08

=> A = 5000 × 1.1664

=> A = Rs. 5,832

=> CI = 5832 − 5000

=> CI = Rs. 832

Therefore The correct answer is Rs. 832.

Additional Information

Difference between CI and SI

For a period of 2 years, the difference between Compound Interest and Simple Interest is given by D = P × $(R/100)^2$.

Effective Percentage Method

The net change for two successive percentage increases of a% and b% is calculated as [a + b + (ab/100)]%.

Compounding Periods

If interest is compounded half-yearly, the rate is halved (R/2) and the time is doubled (2n) in the standard formula.

Q3. Answer: (c) Rs. 2,000

Shortcut Trick

Net Multiplier = (1 + 20%) × (1 + 25%)

=> Multiplier = 1.20 × 1.25 = 1.5

Shopkeeper Cost Price = B pays ÷ Net Multiplier

=> CP = 3,000 ÷ 1.5 = 2,000

Therefore The correct answer is Rs. 2,000.

Alternate Method

Given:

Amount paid by B = Rs. 3,000

Profit made by A = 25%

Profit made by shopkeeper = 20%

Calculations:

Let the cost price for the shopkeeper be x.

The shopkeeper sells it to A at 20% profit:

=> Cost price for A = x × (120 ÷ 100) = 1.2x

A sells it to B at 25% profit:

=> Cost price for B = (1.2x) × (125 ÷ 100)

=> 3,000 = 1.2x × 1.25

=> 3,000 = 1.5x

=> x = 3,000 ÷ 1.5

=> x = 2,000

Therefore The correct answer is Rs. 2,000.

Additional Information

Successive Profit Percentage

When there are two successive profits of a% and b%, the effective profit percentage is given by [a + b + (a × b ÷ 100)]%.

Cost Price and Selling Price Relation

Selling Price (SP) = CP × (100 + Profit%) ÷ 100. Conversely, Cost Price (CP) = SP × 100 ÷ (100 + Profit%).

Chain Rule in Profit and Loss

In a chain of transactions, the final price = Initial CP × (1 + r1) × (1 + r2) × ... × (1 + r_n), where r is the profit/loss fraction.

Q4. Answer: (d) C

Shortcut Trick

To find the least beneficial scheme, we calculate the effective discount percentage for each case when buying 9 toys.

Scheme A: 27% + 39% − (27 × 39 / 100) ≈ 55.47%

Scheme B: (39% + 7% − 2.73%) then with 40% → effective ≈ 65.96%

Scheme C: Flat 26% for the first 9 toys → 26%

Scheme D: 7 free on 9 items → (7 / 16) × 100 ≈ 43.75%

Comparing all, Scheme C provides the lowest discount (26%).

Therefore The correct answer is Scheme C.

Alternate Method

Given: Number of toys to be bought = 9. We evaluate the discount % for each scheme.

Formula Used:

1. Successive Discounts (x, y): d_(eff) = x + y − (xy/100)

2. Buy X Get Y Free: d_(eff) = [Y / (X + Y)] × 100

Calculations:

Scheme A: Successive 27% and 39%

=> d = 27 + 39 − (27 × 39 / 100) = 66 − 10.53 = 55.47%

Scheme B: Successive 39%, 7%, and 40%

=> Remainder factor = (1 − 0.39) × (1 − 0.07) × (1 − 0.40)

=> 0.61 × 0.93 × 0.60 = 0.34038

=> Effective Discount = (1 − 0.34038) × 100 = 65.96%

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Scheme C: 26% discount on first 9 toys

=> Since customer buys exactly 9 toys, the discount is a flat 26%.

Scheme D: 7 toys free on buying 9 toys

=> Total items = 9 + 7 = 16 | Free items = 7

=> Discount % = (7 / 16) × 100 = 43.75%

The least beneficial scheme for the customer is the one with the minimum discount percentage.

=> 26% (C) < 43.75% (D) < 55.47% (A) < 65.96% (B)

Therefore The correct answer is Scheme C.

Additional Information

Successive Discount Rule

For multiple discounts, the final price is P × (1−d1/100) × (1−d2/100) ... Total discount = 100 − [100 × (Product of remainders)].

Buy X Get Y Free

Effective Discount % = [Free Items / (Purchased Items + Free Items)] × 100.

Comparison of Schemes

The scheme most beneficial to the customer is the one with the highest discount, while the scheme most beneficial to the shopkeeper is the one with the lowest discount.

Q5. Answer: (c) 63.75 km/h

Shortcut Trick

Total Distance = 200 + 300 = 500 m

Relative Speed (Opposite) = 500 ÷ 20 = 25 m/s

Relative Speed (Same) = 500 ÷ 48 = 10.417 m/s

Faster Speed = (25 + 10.417) ÷ 2 = 17.708 m/s = 17.708 × 18/5 km/h

Faster Speed = 63.75 km/h

Therefore The correct answer is 63.75 km/h.

Alternate Method

Given:

=> Length of Train P (L1) = 200 m

=> Length of Train Q (L2) = 300 m

=> Time taken in same direction (T_(same)) = 48 sec

=> Time taken in opposite direction (T_(opp)) = 20 sec

Formula Used:

=> Relative Speed (Opposite) = (L1 + L2) ÷ T_(opp) = S_f + S_s

=> Relative Speed (Same) = (L1 + L2) ÷ T_(same) = S_f − S_s

Calculations:

=> Total distance to be covered in both cases = 200 + 300 = 500 m

=> Let Faster Train Speed = S_f and Slower Train Speed = S_s

=> S_f + S_s = 500 ÷ 20 = 25 m/s −−− (1)

=> S_f − S_s = 500 ÷ 48 = 125/12 m/s −−− (2)

=> Adding (1) and (2): 2 × S_f = 25 + 125/12

=> 2 × S_f = (300 + 125) ÷ 12 = 425 ÷ 12

=> S_f = 425 ÷ 24 m/s

=> To convert to km/h: S_f = (425 ÷ 24) × (18 ÷ 5)

=> S_f = 85 × (3 ÷ 4) = 255 ÷ 4 = 63.75 km/h

Therefore The correct answer is 63.75 km/h.

Additional Information

Relative Speed Concept

When two objects move in the opposite direction, their relative speed is the sum (u + v). When they move in the same direction, it is the difference (u − v).

Unit Conversion

To convert speed from meters per second (m/s) to kilometers per hour (km/h), multiply by 18/5 or 3.6.

Crossing Distance

The total distance covered when two trains cross each other is always the sum of their lengths (L1 + L2), regardless of their direction.

Q6. Answer: (d) 27

Shortcut Trick

The given sequence 3, 7, 11, ..., 51 is an Arithmetic Progression (AP).

For any AP, the Arithmetic Mean is simply the average of the first term and the last term.

First term (a) = 3, Last term (l) = 51

Arithmetic Mean = (a + l) ÷ 2 = (3 + 51) ÷ 2 = 54 ÷ 2 = 27.

Therefore The correct answer is 27.

Alternate Method

Given: First term (a) = 3, Common difference (d) = 7 − 3 = 4, Last term (l) = 51

Formula Used: n = [(l − a) ÷ d] + 1; Sum (S_n) = (n ÷ 2) × (a + l); Mean = Sum ÷ n

=> Number of terms (n): 51 = 3 + (n − 1) × 4

=> 48 = (n − 1) × 4 => 12 = n − 1 => n = 13

=> Sum (S_n): (13 ÷ 2) × (3 + 51) = 6.5 × 54 = 351

=> Arithmetic Mean: 351 ÷ 13 = 27

Therefore The correct answer is 27.

Additional Information

Properties of Arithmetic Progression (AP)

In an AP, the arithmetic mean is always equal to the median of the series. For a symmetric distribution or linear sequence, Mean = Median = (First + Last) ÷ 2.

General Term of an AP

The n^(th) term is calculated as $a_n = a + (n − 1)d$, where 'a' is the first term and 'd' is the common difference.

Sum of n terms

The sum of the first n terms of an AP can also be expressed as $S_n = (n ÷ 2) × [2a + (n − 1)d]$.

Q7. Answer: (b) 46.29

Shortcut Trick

LCM of 54, 81, and 108 = 324 units (Total Capacity).

Efficiency of C = 6, D = 4, and Net (C+D−E) = 3.

Efficiency of Drain E = (6 + 4) − 3 = 7 units/min.

Time for E = 324 ÷ 7 = 46.2857... ≈ 46.29 min.

Therefore The correct answer is 46.29 min.

Alternate Method

Given: Filling time for Tap C = 54 min, Tap D = 81 min. Combined filling time with Drain E = 108 min.

Formula: Net Efficiency = Efficiency of Filling Taps − Efficiency of Emptying Taps

Tap/Drain	Time (min)	Total Work (LCM)	Efficiency
Tap C	54	324	6
Tap D	81	4	
C + D − E	108	3	

=> Efficiency of Drain E = Efficiency(C) + Efficiency(D) − Efficiency(C + D − E)

=> Efficiency of Drain E = 6 + 4 − 3 = 7 units/min.

=> Time required by Drain E alone = Total Work ÷ Efficiency of E

=> Time = 324 ÷ 7

=> Time ≈ 46.29 min.

Therefore The correct answer is 46.29 min.

Additional Information

Pipes and Cisterns Principle

If a pipe fills a tank in 'x' hours and another empties it in 'y' hours, the net work in 1 hour is (1/x − 1/y).

Efficiency and Time

Efficiency is inversely proportional to the time taken to complete the work (E prop. to 1/T).
Negative Work
An outlet pipe (drain) performs negative work because it removes water from the cistern.

Q8. Answer: (d) Rs. 18,400

Shortcut Trick
Net price after 20% discount = 24,000 × 80% = Rs. 19,200
Final Selling Price after additional Rs. 800 reduction = 19,200 − 800 = Rs. 18,400
Therefore The correct answer is Rs. 18,400.
Alternate Method
Given:
Marked Price (MP) of the washing machine = Rs. 24,000
Festival Discount percentage = 20%
Additional cash discount = Rs. 800
Formula Used:
Selling Price (SP) = [MP × (100 − Discount%)/100] − Additional Discount
Calculations:
=> Price after 20% discount = 24,000 − (20% of 24,000)
=> Price after 20% discount = 24,000 − (20/100 × 24,000)
=> Price after 20% discount = 24,000 − 4,800 = Rs. 19,200
=> Final Selling Price = 19,200 − 800
=> Final Selling Price = Rs. 18,400
Therefore The correct answer is Rs. 18,400.
Additional Information
Marked Price (MP)
The price printed on the label of an item before any discount is applied. It is also known as List Price or Tag Price.
Net Discount Formula
For two successive percentage discounts a% and b%, the single equivalent discount = [a + b − (a × b)/100]%.
Selling Price (SP) Calculation
SP = MP − Discount. If profit is given, SP = CP + Profit. If loss is given, SP = CP − Loss.

Q9. Answer: (b) 32

Shortcut Trick
Use the Algebraic Identity: (Difference)² = (Sum)² − 4 × (Product)
=> (Difference)² = (44)² − 4 × 228
=> (Difference)² = 1936 − 912 = 1024
=> Difference = √1024 = 32
Therefore The correct answer is 32.
Alternate Method
Given:
Sum of two positive numbers (x + y) = 44
Product of two positive numbers (xy) = 228
Formula Used:
$(x - y)^2 = (x + y)^2 - 4xy$
Calculations:
=> $(x - y)^2 = (44)^2 - 4 \times 228$
=> $(x - y)^2 = 1936 - 912$
=> $(x - y)^2 = 1024$
=> $x - y = \sqrt{1024}$
=> $x - y = 32$
Therefore The correct answer is 32.
Additional Information

Fundamental Algebraic Identities

1. $(x + y)^2 = x^2 + y^2 + 2xy$

2. $(x - y)^2 = x^2 + y^2 - 2xy$

Relationship between Sum, Difference, and Product

$(x + y)^2 - (x - y)^2 = 4xy$. This identity is extremely useful for finding the Difference when the Sum and Product are known.

Quadratic Roots Property

If x and y are roots of a quadratic equation $t^2 - (Sum)t + (Product) = 0$, then the Difference between the roots is $\sqrt{D}$, where $D = (Sum)^2 - 4(Product)$.

Q10. Answer: (a) 70 √3 - 30

Shortcut Trick

Total Height (Building + Tower) = Distance × tan(Angle to Top)

Total Height = $70 \times \tan(60°) = 70\sqrt{3}$ m

Tower Height = Total Height − Building Height

Tower Height = $70\sqrt{3} - 30$ m

Therefore The correct answer is $70\sqrt{3} - 30$ m.

Alternate Method

Given:

Height of the building (BT) = 30 m

Distance from the point (P) to the building (B) = 70 m

Angle of elevation to top of tower (C) = 60°

Angle of elevation to bottom of tower (T) = 30°

Formula Used:

In a right-angled triangle, $\tan \theta$ = Perpendicular / Base

Calculations:

Let the height of the tower be h.

In right-angled triangle ΔPBC (Base to Top of Tower):

=> $\tan 60° = BC / PB$

=> $\sqrt{3} = (BT + TC) / 70$

=> $\sqrt{3} = (30 + h) / 70$

=> $30 + h = 70 \times \sqrt{3}$

=> $h = 70\sqrt{3} - 30$

Therefore The correct answer is $70\sqrt{3} - 30$ m.

Additional Information

Angle of Elevation

The angle formed between the horizontal line and the line of sight when an observer looks at an object above the horizontal level.

Trigonometric Ratios

Standard values used in height and distance problems: $\tan 30° = 1/\sqrt{3}$, $\tan 45° = 1$, and $\tan 60° = \sqrt{3}$.

Total Height Relation

For a structure placed on a base, the total height from the ground is the sum of the base height and the structure height ($H = h_{(base)} + h_{(object)}$).

Q11. Answer: (c) 49:64

Shortcut Trick

If third proportional of a and b is c, then $c = b^2 \div a$.

TP1 (36, 48) = $(48 \times 48) \div 36 = 64$.

TP2 (49, 64) = $(64 \times 64) \div 49$.

Ratio = $64 : (64 \times 64 \div 49) = 1 : (64 \div 49) = 49 : 64$.

Therefore The correct answer is 49:64.

Alternate Method

Given:

First pair: a1 = 36, b1 = 48

Second pair: a2 = 49, b2 = 64

Formula Used:

For two numbers a and b, the third proportional x is calculated as: a : b = b : x => $x = b^2 \div a$.

Calculations:

=> Let x be the third proportional of 36 and 48.

=> $x = (48 \times 48) \div 36$

=> $x = 2304 \div 36 = 64$

=> Let y be the third proportional of 49 and 64.

=> $y = (64 \times 64) \div 49 = 4096 \div 49$

=> Required Ratio = x : y = 64 : (4096 ÷ 49)

=> Ratio = (64 × 49) : 4096

=> Ratio = 3136 : 4096

=> Simplifying by dividing both terms by 64: (3136 ÷ 64) : (4096 ÷ 64)

=> Ratio = 49 : 64

=> This result corresponds to the value given in Option (3).

Therefore The correct answer is 49:64.

Additional Information

Mean Proportional

The mean proportional between two numbers a and b is $\sqrt{(a \times b)}$. It is the value x such that a : x = x : b.

Fourth Proportional

For four numbers a, b, c, and d in proportion (a : b = c : d), d is the fourth proportional, calculated as $d = (b \times c) \div a$.

Ratio and Proportion Properties

If a/b = c/d, then by Invertendo b/a = d/c, and by Alternando a/c = b/d.

Q12. Answer: (c) Rs. 16,200

Shortcut Trick

Difference in ratio units between Bala and Amit = 7 − 5 = 2 units.

Given that 2 units = Rs. 3,600 => 1 unit = Rs. 1,800.

Chetan total savings = 9 units = 9 × 1,800 = Rs. 16,200.

Therefore The correct answer is Rs. 16,200.

Alternate Method

Given: Savings ratio of Amit, Bala, and Chetan = 5 : 7 : 9. Bala savings − Amit savings = Rs. 3,600.

=> Let the savings of Amit, Bala, and Chetan be 5x, 7x, and 9x respectively. => According to the question, Bala savings − Amit savings = 3600. => 7x − 5x = 3600. => 2x = 3600. => x = 3600 ÷ 2 = 1800. => Chetan total savings = 9x. => Chetan total savings = 9 × 1800. => Total = Rs. 16,200.

Therefore The correct answer is Rs. 16,200.

Additional Information

Ratio and Proportion

A ratio represents how many times one number contains another. For a ratio a:b:c, actual values can be expressed as ax, bx, and cx.

Unitary Method

This method involves finding the value of one unit by dividing a known quantity by its ratio parts, then multiplying by the desired ratio parts.

Compound Ratio

When two or more ratios are multiplied term by term (a:b and c:d), the resulting ratio (ac:bd) is called the compound ratio.

Q13. Answer: (a) Rs. 40

Shortcut Trick

Assume all 8 notebooks are of the first type.

The extra cost for the 5 Type 2 notebooks is 5 × Rs. 20 = Rs. 100.

Subtract this excess from the total: Rs. 420 − Rs. 100 = Rs. 320.

Cost of one Type 1 notebook = 320 ÷ 8 = Rs. 40.

Therefore The correct answer is Rs. 40.

Alternate Method

Given:

Quantity of Type 1 = 3 | Quantity of Type 2 = 5

Total Cost of 3 Type 1 and 5 Type 2 = Rs. 420

Price Difference: Type 2 = Type 1 + Rs. 20

Formula Used:

Total Price = (n1 × p1) + (n2 × p2)

Let the cost of one Type 1 notebook be x.

=> Cost of one Type 2 notebook = x + 20

=> 3 × x + 5 × (x + 20) = 420

=> 3x + 5x + 100 = 420

=> 8x = 420 − 100

=> 8x = 320

=> x = 320 ÷ 8

=> x = 40

Therefore The correct answer is Rs. 40.

Additional Information

Linear Equation in One Variable

An equation which can be written in the form ax + b = 0, where a and b are real numbers and a ≠ 0.

Substitution Method

A strategy for solving systems of equations by expressing one variable in terms of the other to reduce the number of variables.

Price-Quantity Relation

Total Expenditure is always the product of the Price per unit and the Quantity purchased (E = P × Q).

Q14. Answer: (c) 28%

Shortcut Trick

For two successive discounts of x% and y%, the net percentage reduction is given by the formula: (x + y − (x × y) / 100)%.

=> Net Discount = (10 + 20 − (10 × 20) / 100)%

=> Net Discount = (30 − 2)%

=> Net Discount = 28%

Therefore The correct answer is 28%.

Alternate Method

Given:

First successive discount = 10%

Second successive discount = 20%

Let the Marked Price (MP) of the item be 100.

=> Price after first discount (10%) = 100 − (10% of 100)

=> Price after first discount = 100 − 10 = 90

=> Price after second discount (20%) = 90 − (20% of 90)

=> Price after second discount = 90 − (0.20 × 90) = 90 − 18

=> Final Selling Price (SP) = 72

=> Net percentage reduction = ((MP − Final SP) / MP) × 100

=> Net reduction = ((100 − 72) / 100) × 100 = 28%

Therefore The correct answer is 28%.

Additional Information

Three Successive Discounts

For three successive discounts of a%, b%, and c%, first find the net discount of a and b, then use that result with c to find the total net discount.

Successive Percentage Change Formula

The effective change for successive variations x% and y% is (x + y + (xy/100))%. Use positive values for increase and negative for decrease/discount.

Multiplier Method

Final Value = Initial Value × (1 − d1/100) × (1 − d2/100). For 10% and 20% discounts, the multiplier is 0.9 × 0.8 = 0.72, implying a

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28% reduction.

Q15. Answer: (d) 1

Shortcut Trick

Tap 2 fills the cistern in 13 hr and Tap 3 empties it in 13 hr, so their efficiencies cancel out.

The net filling is effectively done by Tap 1 alone at its original rate.

Tap 1 fills the entire cistern in 4 hr.

Time required to fill one-fourth of the cistern = Total time ÷ 4 = 4 hr ÷ 4 = 1 hr.

Therefore The correct answer is 1 hr.

Alternate Method

Given:

Time taken by Tap A to fill = 4 hr

Time taken by Tap B to fill = 13 hr

Time taken by Tap C to empty = 13 hr

Formula Used:

Efficiency = Total Work ÷ Time Taken

Tap	Time (hr)	Total Work (LCM)	Efficiency
Tap A	4	52 units	13
Tap B	13	4	
Tap C (Emptying)	13	−4	

Calculations:

=> Total capacity of the cistern = LCM(4, 13, 13) = 52 units

=> Net efficiency when all taps are open = 13 + 4 − 4 = 13 units/hr

=> Target to fill one-fourth of the cistern = 52 ÷ 4 = 13 units

=> Time taken = Target Work ÷ Net Efficiency

=> Time taken = 13 ÷ 13 = 1 hr

Therefore The correct answer is 1 hr.

Additional Information

Negative Efficiency

In pipe and cistern problems, the efficiency of an outlet pipe (or emptying tap) is always treated as negative because it reduces the total work done.

Net Filling Rate

When multiple pipes work together, the net rate of filling is the algebraic sum of their individual rates: Net Rate = ∑(Inlet Rates) − ∑(Outlet Rates).

Total Capacity via LCM

Assume the total capacity of the tank/cistern as the Least Common Multiple (LCM) of the individual times taken by each pipe to simplify efficiency calculations.

Q16. Answer: (d) 3/7

Given:

The exponential equation is 6^x − 6^(x−1) = 30

Formula used:

a^(m−n) = a^m ÷ a^n

Calculations:

6^x − 6^(x−1) = 30

=> 6^x − (6^x ÷ 6^1) = 30

=> 6^x × (1 − 1/6) = 30

=> 6^x × (5/6) = 30

=> 6^x = (30 × 6) ÷ 5

=> 6^x = 6 × 6

=> 6^x = 36

=> 6^x = 6²

=> x = 2

To find the value of (2x − 1) ÷ (2x + 3), we substitute x = 2 in the expression:

=> (2 × 2 − 1) ÷ (2 × 2 + 3)

=> (4 − 1) ÷ (4 + 3)

=> 3/7

Therefore The correct answer is option (4).

Q17. Answer: (b) 978626

Shortcut Trick

To check divisibility by 11, calculate the difference between the sum of digits at odd places and the sum of digits at even places.

For 978626: Sum of digits at odd places (1^(st), 3^(rd), 5^(th)) = 9 + 8 + 2 = 19.

Sum of digits at even places (2^(nd), 4^(th), 6^(th)) = 7 + 6 + 6 = 19.

Difference = 19 − 19 = 0. If the difference is 0 or a multiple of 11, the number is divisible by 11.

Therefore The correct answer is 978626.

Alternate Method

Given: Options (1) 869756, (2) 978626, (3) 447255, (4) 112044.

Formula: A number is divisible by 11 if (Sum of digits at odd places) − (Sum of digits at even places) = 0, 11, 22, ...

Let us check each option systematically:

=> For 869756: (8 + 9 + 5) − (6 + 7 + 6) = 22 − 19 = 3 (Not divisible by 11)

=> For 978626: (9 + 8 + 2) − (7 + 6 + 6) = 19 − 19 = 0 (Divisible by 11)

=> For 447255: (4 + 7 + 5) − (4 + 2 + 5) = 16 − 11 = 5 (Not divisible by 11)

=> For 112044: (1 + 2 + 4) − (1 + 0 + 4) = 7 − 5 = 2 (Not divisible by 11)

Therefore The correct answer is 978626.

Additional Information

Divisibility Rule of 11

A number is divisible by 11 if the alternating sum of its digits (d1 − d2 + d3 − d4 ...) is a multiple of 11 (including 0).

Divisibility Rule of 9

A number is divisible by 9 if the sum of all its digits is divisible by 9.

Divisibility Rule of 3

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

Divisibility Rule of 7

Double the last digit and subtract it from the rest of the number; if the result is divisible by 7, the original number is also divisible by 7.

Q18. Answer: (a) 45 and 75

Shortcut Trick

Both numbers must be divisible by their HCF (15), which eliminates options 2 and 4.

The Product of two numbers must equal HCF × LCM = 15 × 225 = 3375.

Testing Option 1: 45 × 75 = 3375 (Matches).

Testing Option 3: 15 × 75 = 1125 (Incorrect).

Therefore The correct answer is 45 and 75.

Alternate Method

Given: HCF = 15 and LCM = 225.

Formula Used: Product of two numbers = HCF × LCM

=> Let the numbers be 15a and 15b, where a and b are co-prime.

=> 15a × 15b = 15 × 225

=> 225 × ab = 3375

=> ab = 3375 ÷ 225 = 15

=> Possible co-prime pairs for (a, b) are (1, 15) and (3, 5).

=> Case 1: (15 × 1, 15 × 15) = (15, 225)

=> Case 2: (15 × 3, 15 × 5) = (45, 75)

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=> Comparing with the given options, the pair is 45 and 75.

Therefore The correct answer is 45 and 75.

Additional Information

HCF and LCM Relation

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

Divisibility Property

The HCF of any group of numbers is always a factor of their LCM.

Co-prime Factorization

If HCF = h, the numbers can be expressed as hx and hy, where LCM = hxy and x, y are co-prime integers.

Q19. Answer: (b) 30

Shortcut Trick

Assume the base average is 24.

Calculate deviations: (18 − 24) = −6, (20 − 24) = −4, (25 − 24) = +1, (27 − 24) = +3.

Net deviation of 4 numbers = −6 − 4 + 1 + 3 = −6.

To maintain the average, the fifth number must balance this: 24 − (−6) = 30.

Therefore The correct answer is 30.

Alternate Method

Given: Average of 5 numbers = 24, Four numbers are 18, 20, 25, and 27.

Formula: Sum = Average × Count of numbers

=> Total sum of 5 numbers = 24 × 5 = 120

=> Sum of 4 given numbers = 18 + 20 + 25 + 27 = 90

=> Let the fifth number be x.

=> 90 + x = 120

=> x = 120 − 90

=> x = 30

Therefore The correct answer is 30.

Additional Information

Weighted Average

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

Arithmetic Progression Average

For numbers in an AP (equal gaps), the average is simply (First term + Last term) ÷ 2 or the middle term.

Effect of Constant Change

If each number in a set is increased, decreased, multiplied, or divided by a constant k, the new average also changes by the same constant k.

Q20. Answer: (b) -17/7

Shortcut Trick

Given: 1.2x = 0.5y => x/y = 0.5/1.2 = 5/12

Let x = 5 and y = 12

Required value = (x + y) / (x − y) = (5 + 12) / (5 − 12) = 17 / (−7)

Therefore The correct answer is −17/7.

Alternate Method

Given: 1.2x = 0.5y

Formula Used: Ratio and Proportion properties.

=> 1.2x = 0.5y

=> x / y = 0.5 / 1.2

=> x / y = 5 / 12

=> Let x = 5k and y = 12k

=> (x + y) / (x − y) = (5k + 12k) / (5k − 12k)

=> (x + y) / (x − y) = 17k / (−7k)

=> (x + y) / (x − y) = −17 / 7

Therefore The correct answer is −17/7.

Additional Information

Componendo and Dividendo

If a/b = c/d, then (a + b)/(a − b) = (c + d)/(c − d). This is useful for solving fractional equations quickly.

Ratio Substitution

In homogeneous expressions like (x+y)/(x-y), the actual values of x and y are not needed; only their ratio is sufficient to find the result.

Decimal to Fraction

Always convert decimals to simple fractions (e.g., 0.5 = 1/2, 1.2 = 6/5) to avoid calculation errors in ratios.

Q21. Answer: (b) 800 gm

Shortcut Trick

Profit 25% = 1/4 in fraction form.

For a dishonest dealer selling at cost price, the Weight Ratio is the inverse of the Price Ratio.

Price Ratio (CP : SP) = 4 : 5 => Weight Ratio (False : True) = 4 : 5.

Given True Weight (5 units) = 1000 gm.

1 unit = 200 gm => Actual Weight (4 units) = 4 × 200 = 800 gm.

Therefore The correct answer is 800 gm.

Alternate Method

Given:

Claimed sale at cost price (CP).

Profit percentage = 25%.

Standard True Weight = 1 kg = 1000 gm.

Formula Used:

Profit % = [(True Weight − False Weight) ÷ False Weight] × 100

Calculations:

Let the false weight used be x gm.

=> 25 = [(1000 − x) ÷ x] × 100

=> 25 ÷ 100 = (1000 − x) ÷ x

=> 1 ÷ 4 = (1000 − x) ÷ x

=> x = 4 × (1000 − x)

=> x = 4000 − 4x

=> 5x = 4000

=> x = 800 gm

Therefore The correct answer is 800 gm.

Additional Information

Dishonest Dealer Concept

When a shopkeeper sells at CP but uses less weight, the Profit % = (Error ÷ Actual Value Given) × 100.

Dual Profit Scenario

If the dealer marks up the price by P% and also uses a false weight, Net Profit % = [((100+P) × True Weight) ÷ False Weight] − 100.

Inverse Proportion Rule

Profit % and weight given are inversely related; to gain 25% (1/4), the weight must be reduced to 4/5 of the original.

Q22. Answer: (d) 2,750

Shortcut Trick

Total interest percentage = Rate × Time = 16% × 3 = 48%.

Since 48% of the Principal = Rs. 1,320.

Principal (100%) = (1320 ÷ 48) × 100 = 27.5 × 100 = Rs. 2,750.

Therefore The correct answer is Rs. 2,750.

Alternate Method

Given:

Simple Interest (SI) = Rs. 1,320

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Time (T) = 3 years
Rate (R) = 16% per annum
Formula used:
Principal (P) = (SI × 100) ÷ (R × T)
=> P = (1320 × 100) ÷ (16 × 3)
=> P = 132000 ÷ 48
=> P = 2750
Therefore The correct answer is Rs. 2,750.
Additional Information
Total Amount in Simple Interest
The total amount (A) is the sum of the principal and the interest earned: A = P + SI = P × (1 + RT/100).
SI vs CI for First Year
For the first year, if the interest is compounded annually, the Simple Interest and Compound Interest are always equal.
Difference between CI and SI for 2 Years
The difference between Compound Interest and Simple Interest for 2 years is given by the formula: Difference = P × $(R/100)^2$.

Q23. Answer: (c) 38

Shortcut Trick
In problems involving Sum (S) and Difference (D) of two values, the larger value (Mother's age) is calculated as:
Mother's age = (Sum + Difference) ÷ 2
=> Mother's age = (52 + 24) ÷ 2
=> Mother's age = 76 ÷ 2 = 38 years.
Therefore The correct answer is 38 years.
Alternate Method
Given:
Sum of Mother's age (M) and Daughter's age (D) = 52 years
Difference between their ages = 24 years
Let the Mother's age be M and the Daughter's age be D.
According to the question:
1) M + D = 52
2) M − D = 24
By adding equation (1) and equation (2):
=> (M + D) + (M − D) = 52 + 24
=> 2M = 76
=> M = 76 ÷ 2
=> M = 38 years.
Therefore The correct answer is 38 years.
Additional Information
Linear Equations in Two Variables
Equations of the form x + y = A and x − y = B can be solved quickly by finding x = (A + B) ÷ 2 and y = (A − B) ÷ 2.
Age Difference Property
The difference between the ages of two people remains constant regardless of how many years pass or how many years ago it was.
Finding the Smaller Value
To find the younger person's age (Daughter), subtract the difference from the sum and divide by 2: (52 − 24) ÷ 2 = 14 years.

Q24. Answer: (d) 434

Shortcut Trick
Convert all numbers into like decimals: 7.0, 12.4, and 1.0.
Remove the decimal point to treat them as whole numbers: 70, 124, and 10.
Calculate the LCM of 70, 124, and 10 using prime factorization.
LCM(70, 124, 10) = 4340.

Divide the result by 10 to place the decimal point back: 4340 ÷ 10 = 434.

Therefore The correct answer is 434.

Alternate Method

Given: The numbers are 7, 12.4, and 1.

Formula Used: LCM of Fractions = LCM(Numerators) ÷ HCF(Denominators).

=> Represent numbers as fractions: 7 = 7/1, 12.4 = 124/10 = 62/5, 1 = 1/1.

=> To find the LCM of 7/1, 62/5, and 1/1, find the LCM of numerators (7, 62, 1) and HCF of denominators (1, 5, 1).

=> LCM(7, 62, 1) = 7 × 62 = 434 (since 7 and 62 have no common factors).

=> HCF(1, 5, 1) = 1.

=> Required LCM = 434 ÷ 1 = 434.

Therefore The correct answer is 434.

Additional Information

LCM of Fractions

The Least Common Multiple of a set of fractions is given by the formula: LCM = LCM of Numerators ÷ HCF of Denominators.

HCF of Fractions

The Highest Common Factor of a set of fractions is given by the formula: HCF = HCF of Numerators ÷ LCM of Denominators.

LCM of Decimals

To find the LCM of decimals, first convert all numbers into like decimals (equal decimal places) and then find the LCM as if they were integers, finally adjusting the decimal point.

Q25. Answer: (a) 24.2% increase

Shortcut Trick

Net multiplier = (1 + 0.20) × (1 − 0.10) × (1 + 0.15)

Net multiplier = 1.20 × 0.90 × 1.15 = 1.08 × 1.15 = 1.242

Overall percentage change = (1.242 − 1) × 100 = 24.2%

Therefore The correct answer is 24.2% increase.

Alternate Method

Given: Year 1 change = 20% increase; Year 2 change = 10% decrease; Year 3 change = 15% increase.

Formula: Final Revenue = Initial Revenue × (100 + r1)/100 × (100 + r2)/100 × (100 + r3)/100

=> Let the initial Revenue be 100 units.

=> Revenue after 1st year = 100 + (20% of 100) = 120 units.

=> Revenue after 2nd year = 120 − (10% of 120) = 120 − 12 = 108 units.

=> Revenue after 3rd year = 108 + (15% of 108) = 108 + 16.2 = 124.2 units.

=> Overall percentage change = 124.2 − 100 = 24.2%.

Therefore The correct answer is 24.2% increase.

Additional Information

Successive Percentage Formula

For two successive changes of a% and b%, the net percentage change is given by the formula: [a + b + (a × b)/100] %.

Multiplying Factor Method

An x% increase corresponds to a multiplier of (1 + x/100), while an x% decrease corresponds to a multiplier of (1 − x/100). The product of these factors gives the final result.

Base Value Adjustment

In successive changes, each percentage change is applied to the updated value from the previous step, not the original starting value.

Q26. Answer: (c) 704

Shortcut Trick

Metal Volume = $\pi(R^2 - r^2)h = 396$

Given thickness (R − r) = 1 => (R − r)(R + r) = 9 => R + r = 9

Solving R − r = 1 and R + r = 9 gives inner radius (r) = 4 units.

Inner volume = $\pi r^2 h = (22/7) \times 16 \times 14 = 704$ cubic units.

Therefore The correct answer is 704 cubic units.

Alternate Method

Given: Length (h) = 14 units, Thickness (t) = 1 unit, Metal Volume = 396 cubic units.

Formula Used: Volume of metal = $\pi h(R^2 - r^2)$; Inner volume = $\pi r^2 h$

Let the inner radius be r units and outer radius be R units.

=> Thickness = R − r = 1 unit => R = r + 1

=> Volume of metal = $\pi \times (R^2 - r^2) \times h$

=> $396 = (22/7) \times ((r + 1)^2 - r^2) \times 14$

=> $396 = 22 \times (r^2 + 2r + 1 - r^2) \times 2$

=> $396 = 44 \times (2r + 1)$

=> $2r + 1 = 396 \div 44$

=> $2r + 1 = 9$

=> $2r = 8$ => $r = 4$ units

=> Inner volume = $\pi r^2 h$

=> Inner volume = $(22/7) \times 4^2 \times 14$

=> Inner volume = $22 \times 16 \times 2 = 704$ cubic units

Therefore The correct answer is 704 cubic units.

Additional Information

Volume of Hollow Cylinder

The volume of the material in a hollow cylinder is given by $V = \pi h(R^2 - r^2)$, where R is the outer radius and r is the inner radius.

Total Surface Area (TSA)

The Total Surface Area of a hollow cylinder is the sum of the inner CSA, outer CSA, and the area of the two circular rings: TSA = $2\pi h(R + r) + 2\pi(R^2 - r^2)$.

Thickness Property

The thickness (t) is the difference between the outer radius and the inner radius: t = R − r.

Q27. Answer: (b) 34.3 space cm

Shortcut Trick

Rise in water level (h) = (Total volume of 30 spheres) ÷ (Area of cylinder base)

$h = [30 \times (4/3) \times \pi \times 7^3] \div [\pi \times 20^2]$

$h = [40 \times 343] \div 400$

$h = 13720 \div 400 = 34.3$ cm

Therefore The correct answer is 34.3 cm.

Alternate Method

Given:

Radius of cylindrical tank (R) = 20 cm

Radius of each solid sphere (r) = 7 cm

Number of solid spheres (n) = 30

Formula Used:

Volume of cylinder = $\pi \times R^2 \times h$

Volume of sphere = $(4/3) \times \pi \times r^3$

Calculations:

Let the rise in water level in the cylinder be h cm.

When the spheres are completely immersed, the volume of water displaced is equal to the total volume of the 30 spheres:

=> Volume of water risen in cylinder = 30 × Volume of one sphere

=> $\pi \times R^2 \times h = 30 \times (4/3) \times \pi \times r^3$

Canceling π from both sides:

=> $R^2 \times h = 10 \times 4 \times r^3$

=> $20^2 \times h = 40 \times 7^3$

=> $400 \times h = 40 \times 343$

=> $400 \times h = 13720$

=> $h = 13720 \div 400$

=> h = 34.3 cm

Therefore The correct answer is

Q28. Answer: (a) 2

Shortcut Trick

Let the total distance be the LCM of denominators (5 and 4) = 20 units.

Distance by train = 3/5 × 20 = 12 units.

Distance by car = 1/4 × 20 = 5 units.

Remaining distance on foot = 20 − (12 + 5) = 3 units.

Given that 3 units = 300 m => 1 unit = 100 m.

Total distance = 20 units = 2000 m = 2 km.

Therefore The correct answer is 2 km.

Alternate Method

Let the total distance from home to office be d meters.

Distance traveled by train = 3/5 of d

Distance traveled by car = 1/4 of d

Distance traveled on foot = 300 m

=> Train distance + Car distance + Foot distance = Total distance

=> (3/5) × d + (1/4) × d + 300 = d

=> 300 = d − (3/5 + 1/4) × d

=> 300 = d − [(12 + 5) / 20] × d

=> 300 = d − (17/20) × d

=> 300 = (3/20) × d

=> d = (300 × 20) ÷ 3

=> d = 2000 m

Converting meters into kilometers:

=> d = 2000 ÷ 1000 = 2 km

Therefore The correct answer is 2 km.

Additional Information

Fraction of a Whole

The sum of all fractional parts of any quantity is always equal to 1. The remaining fraction is calculated as 1 − (sum of known fractions).

Unit Conversion

To convert distance from meters to kilometers, divide the value by 1000 (since 1 km = 1000 m).

Distance-Speed-Time Relation

Distance is directly proportional to speed and time: Distance = Speed × Time.

Q29. Answer: (c) 1.6

Given:

2^(x+1) × 4^(y−2) = 32

x = 3y

Formula used:

$a^m \times a^n = a^{(m+n)}$

$(a^m)^n = a^{(mn)}$

Calculation:

Expressing the equation in base 2:

$2^{(x+1)} \times (2^2)^{(y-2)} = 2^5$

=> $2^{(x+1)} \times 2^{(2(y-2))} = 2^5$

=> $2^{(x+1)} \times 2^{(2y-4)} = 2^5$

=> $2^{(x+1+2y-4)} = 2^5$

=> $2^{(x+2y-3)} = 2^5$

Comparing the exponents:

=> x + 2y − 3 = 5

=> x + 2y = 8

Substituting x = 3y from the given data:

=> 3y + 2y = 8

=> 5y = 8

=> y = 8/5

=> y = 1.6

Therefore The correct answer is option (3).

Q30. Answer: (b) 30 years

Shortcut Trick

A's age after 8 years = 32 years.

A's present age = 32 − 8 = 24 years.

Ratio of present ages A : B = 4 : 5.

4 units → 24 years => 1 unit = 6 years.

B's present age = 5 units × 6 = 30 years.

Therefore The correct answer is 30 years.

Alternate Method

Given:

Ratio of present ages of A and B = 4 : 5

Age of A after 8 years = 32 years

Calculations:

Let the present age of A be 4x and B be 5x.

According to the question, A's age after 8 years is 32.

=> 4x + 8 = 32

=> 4x = 32 − 8

=> 4x = 24

=> x = 24 ÷ 4

=> x = 6

Now, calculate B's present age:

=> B's present age = 5x

=> B's present age = 5 × 6 = 30 years.

Therefore, the value matches Option (2).

Therefore The correct answer is 30 years.

Additional Information

Constant Age Difference

The difference between the ages of two persons always remains constant, regardless of how many years pass or have passed.

Ratio Scaling

If the ratio of ages is given as a:b, and the age of one person is known, the other can be found using the unitary method (Age ÷ Ratio Part × Required Part).

Future and Past Ages

To find age 'n' years after, add 'n' to the present age. To find age 'n' years ago, subtract 'n' from the present age.

Q31. Answer: (b) Marine deposits and wood fossils

The correct answer is Marine deposits and wood fossils.

Key Points

• The Great Indian Desert, also known as the Thar Desert, has a geological history that reveals it was once submerged under the sea during the Mesozoic era, specifically during the Jurassic and Cretaceous periods.

• The presence of extensive marine deposits in the Jaisalmer and Bikaner regions serves as primary evidence of ancient marine transgressions where the Tethys Sea covered large parts of western Rajasthan.

• Evidence of this maritime past is preserved at the Akal Wood Fossil Park, located about 17 km from Jaisalmer, which contains petrified remains of gymnosperms and other trees dating back nearly 180 million years.

• The discovery of fossilized ammonites, bivalves, and other marine invertebrates within the sedimentary rock layers confirms that the region supported a diverse marine ecosystem before tectonic shifts caused the sea to retreat.

• Geologists have identified that the desert floor consists of sedimentary rocks like sandstones, limestones, and shales, which are characteristic of shallow marine environments and coastal deltas from the Mesozoic and Cenozoic eras.

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Additional Information

• Other options do not serve as evidence for this specific geological phenomenon:

• Black soil:

• Also known as Regur soil, it is typically formed from the weathering of basaltic volcanic rocks.

• It is predominantly found in the Deccan Trap region, covering states like Maharashtra and Madhya Pradesh, rather than being an indicator of marine history in the Thar.

• Glacial deposits:

• These are sediments like tillites transported and deposited by glaciers.

• While found in the Himalayas or related to the Permo-Carboniferous glaciation of Gondwanaland, they are not the defining evidence for the Mesozoic sea in the Thar.

• Volcanic ash layers:

• These originate from explosive volcanic eruptions.

• While some volcanic activity occurred during the Deccan eruptions, they do not prove the existence of an ancient sea bed compared to the direct evidence of fossilized marine life.

Q32. Answer: (d) Article 359

The correct answer is Article 359.

Key Points

• Article 359 of the Indian Constitution empowers the President to suspend the right to move any court for the enforcement of the Fundamental Rights guaranteed by Part III during a National Emergency.

• Unlike Article 358, which automatically suspends the rights under Article 19, Article 359 does not automatically suspend any right; it only authorizes the President to issue a specific order naming the rights whose enforcement is to be suspended.

• The 44th Amendment Act of 1978 introduced a crucial safeguard, stipulating that the President cannot suspend the right to move the court for the enforcement of rights guaranteed by Article 20 (Protection in respect of conviction for offences) and Article 21 (Protection of life and personal liberty).

• A Presidential Order issued under this Article may extend to the whole or any part of the territory of India and must be laid before each House of Parliament for approval as soon as possible after it is made.

• While Article 358 only operates in the case of an External Emergency (war or external aggression), Article 359 can be invoked during both External and Internal Emergencies (armed rebellion).

Additional Information

• Article 358:

• Relates specifically to the suspension of the provisions of Article 19.

• Suspension is automatic and occurs the moment a National Emergency is proclaimed on grounds of war or external aggression.

• Article 356:

• Provisions regarding the failure of constitutional machinery in states, commonly referred to as President's Rule.

• It allows the Union Government to take direct control of a state executive.

• Article 357:

• Deals with the exercise of legislative powers under a proclamation issued under Article 356.

• It permits Parliament to confer the power to make laws for the state on the President or other specified authorities.

Q33. Answer: (b) Kesavananda Bharati case

The correct answer is Kesavananda Bharati case.

Key Points

• The Kesavananda Bharati v. State of Kerala (1973) is a landmark judgment in which the Supreme Court of India introduced the Basic Structure doctrine.

• A special bench of 13 judges, which is the largest ever constituted in the history of the Indian judiciary, heard the case for 68 days and delivered the judgment on April 24, 1973.

• By a slim majority of 7:6, the court held that while Parliament has wide powers to amend the Constitution under Article 368, these powers are not absolute and cannot be used to destroy or emasculate the basic structure or essential features of the document.

• The case challenged the validity of the 24th, 25th, and 29th Constitutional Amendment Acts, which were enacted by the government to bypass previous judicial restrictions on land reforms and property rights.

• The ruling identified several features as part of the basic structure, including Democracy, Secularism, Federalism, Rule of Law, and Judicial Review, ensuring they remain beyond the reach of parliamentary modification.

Additional Information

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• Shankari Prasad case (1951)

• This was the first case to challenge the 1st Constitutional Amendment Act.

• The Supreme Court ruled that the power of Parliament to amend the Constitution under Article 368 included the power to amend Fundamental Rights.

• Golaknath case (1967)

• An 11-judge bench overturned the previous stance and ruled that Fundamental Rights are transcendental and cannot be abridged by Parliament.

• The court stated that an amendment under Article 368 is a 'law' within the meaning of Article 13(2) and thus cannot violate Fundamental Rights.

• Minerva Mills case (1980)

• The Supreme Court reaffirmed and applied the Basic Structure doctrine to strike down portions of the 42nd Amendment Act.

• It established that the limited amending power of Parliament is itself a part of the basic structure, and emphasized the balance between Fundamental Rights and Directive Principles.

Q34. Answer: (a) India

The correct answer is India.

Key Points

• The Prime Minister of India, Narendra Modi, was conferred the prestigious Speaker of the Knesset Medal during his high-profile state visit to Israel in February 2026.

• The medal was presented by the Speaker of the Knesset, the national legislature of Israel, in a special ceremony held at the parliament building in Jerusalem.

• This honor was bestowed upon the Indian Prime Minister to recognize his visionary leadership and his instrumental role in elevating India-Israel relations to a comprehensive Strategic Partnership.

• The visit in February 2026 marked a significant milestone, reinforcing cooperation in critical areas such as defense technology, semiconductor manufacturing, water management, and space exploration.

• The award reflects the deep-rooted democratic values shared by both nations and honors India as a key stabilizing force in the Indo-Pacific and the Middle East (West Asia) regions.

Additional Information

• The Knesset:

• It is the unicameral legislature of Israel, consisting of 120 members elected for four-year terms.

• The Speaker of the Knesset is the presiding officer of the house, responsible for maintaining the dignity of the parliament and representing it in international forums.

• India-Israel Strategic Partnership:

• The relationship was upgraded to a Strategic Partnership during PM Modi’s historic first visit to Israel in July 2017.

• India is one of the largest buyers of Israeli military equipment, and both nations collaborate through the I2U2 Group (India, Israel, UAE, USA).

• Other Countries Mentioned:

• Spain: While Spain maintains diplomatic ties with Israel, its Prime Minister was not the recipient of this specific legislative honor in early 2026.

• Luxembourg: A key member of the European Union that focuses on financial and digital cooperation with Israel, but did not receive the Speaker's Medal in this timeframe.

• Belgium: Known for its role in the EU and NATO, Belgium's diplomatic interactions with Israel in 2026 were centered on trade rather than high-level parliamentary medals.

Q35. Answer: (d) Reducing the maximum processor state (clock speed/frequency) to cap the peak computational capacity and the...

The correct answer is Reducing the maximum processor state (clock speed/frequency) to cap the peak computational capacity and thermal output.

Key Points

• The Power Saver plan in the Windows Operating System is a pre-configured power scheme designed to maximize battery life by prioritizing energy efficiency over hardware performance.

• The primary technical mechanism utilized is Processor Power Management (PPM), specifically the adjustment of the Maximum Processor State within the system's power settings.

• By capping the maximum processor state (often to values like 50% or 70%), the OS forces the Central Processing Unit (CPU) to operate at a lower clock frequency than its rated base or boost speed.

• This reduction in frequency is coupled with Dynamic Voltage Scaling, where the operating voltage is lowered; since power

consumption is proportional to the square of the voltage (P prop. to $V^2 \times f$), this results in significant energy savings and reduced thermal output.

• Because the CPU executes fewer cycles per second, the time required to complete computational tasks increases, leading to the reduced system responsiveness and lag observed by the user.

• This mechanism effectively disables or limits high-performance features such as Intel Turbo Boost or AMD Precision Boost, ensuring the processor stays within a low-power P-state.

Additional Information

• Understanding Incorrect Mechanisms:

• Cache Memory Flushing:

• Aggressively flushing the L1, L2, or L3 cache would actually increase power consumption and latency, as the CPU would be forced to fetch data from the much slower and power-intensive System RAM or Virtual Memory.

• Disabling the GPU:

• The OS does not entirely disable the Graphics Processing Unit (GPU) as it is required for the Desktop Window Manager (DWM) to render the UI; however, it may switch from a discrete GPU to an Integrated GPU (iGPU) to save power.

• Hard Disk Spin-down:

• While increasing the frequency of HDD spin-down saves mechanical energy, it primarily affects storage latency rather than the overall peak computational capacity of the system.

• Related Technical Concepts:

• Thermal Design Power (TDP): By limiting the processor state, the system ensures the CPU operates well below its maximum TDP, preventing the cooling fans from spinning at high speeds, which further conserves battery.

• Idle States (C-States): In addition to limiting active performance, the Power Saver plan encourages the processor to enter deeper C-states (sleep states) more rapidly when no tasks are being processed.

Q36. Answer: (d) Hibernate

The correct answer is Hibernate.

Key Points

• Hibernate is a power management mode in Windows 11 designed to save the current state of the Operating System, including all open applications and documents, to the Hard Disk Drive (HDD) or Solid State Drive (SSD).

• When this mode is activated, the system writes the contents of the Random Access Memory (RAM) into a hidden file located in the root directory of the system drive named hiberfil.sys.

• Unlike Sleep mode, which requires a small amount of power to keep data active in the volatile RAM, Hibernate uses zero power because the computer is physically powered down after the data transfer to storage is complete.

• It is particularly useful for laptop users who need to stop working for an extended period without a power source, as it ensures that the session is preserved even if the battery drains completely.

• When the user triggers a Power On, the Windows Boot Loader reads the data from the storage drive and restores it to the RAM, allowing the user to resume work exactly where they left off.

Additional Information

• Shut Down:

• This process closes all running programs, logs out the user, and clears the RAM entirely before cutting power to the hardware.

• In Windows 11, if Fast Startup is enabled, it saves a small part of the Kernel state to the disk to speed up the next boot process.

• Restart:

• This command initiates a full Shut Down followed by an immediate boot-up sequence.

• It is the standard procedure for clearing temporary software conflicts and finalizing the installation of system updates or device drivers.

• Sleep:

• Often confused with hibernation, this is a low-power state where data is kept in the RAM for near-instant wake times.

• If power is lost while in this mode, any unsaved data that was not previously backed up to the Hard Drive will be lost.

Q37. Answer: (a) Antarctica

The correct answer is Antarctica.

Key Points

• Antarctica is globally recognized as the highest continent in terms of average elevation, reaching approximately 2,300 meters (roughly 7,500 feet) above mean sea level.

• This distinction is not due to the height of its bedrock, but rather the presence of massive, permanent ice sheets that cover approximately 98% of the landmass.

• The Antarctic Ice Sheet has an average thickness of about 1.9 kilometers (1.2 miles), and in certain locations, the ice reaches depths of nearly 4.8 kilometers.

• Without this thick layer of ice, Antarctica would likely be the lowest continent, as the weight of the ice causes isostatic depression, pushing much of the continental crust below sea level.

• In contrast, other continents consist primarily of exposed rock and soil, with their average elevations calculated based on their varied terrain of mountains, plateaus, and plains.

Additional Information

• Asia:

• While home to the world's highest point, Mount Everest (8,848.86 meters), its vast plains and lowlands result in an average elevation of approximately 950 meters.

• Africa:

• Characterized by extensive plateaus and the East African Highlands, its average elevation is roughly 600 meters.

• South America:

• Despite containing the Andes Mountains, the longest continental mountain range, the continent maintains an average elevation of about 590 meters.

• Europe:

• Considered the lowest continent by average elevation, standing at only 300 meters, largely due to the massive North European Plain.

Q38. Answer: (c) Kharavela

The correct answer is Kharavela.

Key Points

• Kharavela was the third and most illustrious ruler of the Mahameghavahana dynasty, also referred to as the Chedi dynasty of Kalinga.

• He reigned during the 1st or 2nd century BCE, significantly expanding the power of Kalinga (modern-day Odisha) following the disintegration of the Mauryan Empire.

• The primary historical source for his reign is the Hathigumpha inscription, a seventeen-line record carved in the Udayagiri Hills near Bhubaneswar.

• The inscription provides a chronological account of his first thirteen years, mentioning his military victories over the Satavahanas, the Indo-Greek king Demetrius, and various Tamil kingdoms.

• A staunch follower of Jainism, Kharavela is credited with retrieving the Kalinga Jina idol from Magadha and constructing rock-cut caves for Jain monks at Udayagiri and Khandagiri.

Additional Information

• Gautamiputra Satakarni:

• The 23rd ruler and the most powerful king of the Satavahana dynasty, who ruled the Deccan and Central India.

• He is celebrated in the Nashik inscription for destroying the Saka, Yavana, and Pahlava rulers and restoring the glory of the Satavahanas.

• Kanishka:

• The greatest emperor of the Kushan dynasty, who ruled over a vast territory spanning Central Asia and North India.

• He is famous for starting the Saka Era in 78 CE and convening the Fourth Buddhist Council in Kashmir to resolve sectarian disputes.

• Pushyamitra Shunga:

• The founder of the Shunga dynasty, who ascended the throne in 185 BCE after assassinating the last Maurya emperor, Brihadratha.

• He was a champion of Brahmanical traditions and performed two Ashvamedha (horse) sacrifices to assert his imperial authority.

Q39. Answer: (d) Intensity

The correct answer is Intensity.

Key Points

• Sound intensity is scientifically defined as the amount of sound energy passing through a unit area per unit time (per second) in a direction perpendicular to that area.

• The relationship is mathematically expressed as I = P / A, where I is intensity, P is sound power (energy per second), and A is the surface area.

• Intensity is an objective physical quantity that can be accurately measured using instruments, regardless of the listener's hearing sensitivity.

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• The S.I. unit of sound intensity is Watt per square meter (W/m^2).

• The intensity of sound is directly proportional to the square of the amplitude of the vibration. This means if the amplitude of the wave is tripled, the intensity increases by a factor of nine.

• While intensity is often associated with loudness, they are not the same; loudness is the subjective physiological response of the human ear to the intensity of sound.

Additional Information

• Frequency

• It is the number of complete oscillations or cycles of a sound wave produced in one second.

• The unit of frequency is Hertz (Hz). It determines the pitch of the sound but is independent of the energy-per-area measurement.

• Pitch

• It is the subjective perception of the frequency of a sound by the human brain.

• Sounds with higher frequencies are perceived as high-pitched (shrill), while sounds with lower frequencies are perceived as low-pitched (flat).

• Echo

• An echo is the reflection of sound that reaches the listener shortly after the direct sound.

• To distinguish an echo from the original sound, the reflected sound must reach the ear at least 0.1 seconds later, requiring a minimum distance of approximately 17.2 meters in air at room temperature.

Q40. Answer: (b) Radiation

The correct answer is Radiation.

Key Points

• Radiation is the unique method of heat transfer that does not require any material medium (solid, liquid, or gas) to propagate, allowing energy to travel through the vacuum of space.

• Energy from the Sun is transmitted in the form of electromagnetic waves, primarily consisting of visible light, infrared radiation (heat), and ultraviolet rays.

• Because the vast expanse between the Sun and the Earth is nearly a perfect vacuum, other methods like conduction or convection are impossible as they rely on molecular interaction or fluid movement.

• Thermal radiation travels at the speed of light, which is approximately 3 × 10^8 meters per second, ensuring that solar energy reaches Earth in about 8 minutes and 20 seconds.

• Once these electromagnetic waves strike the Earth's atmosphere and surface, the energy is absorbed by molecules, increasing their kinetic energy and resulting in a rise in temperature.

Additional Information

• Conduction

• This is the transfer of heat through direct contact between substances.

• It occurs as faster-moving molecules collide with slower ones, passing thermal energy through a medium, typically effective in solids like metals.

• Convection

• It involves the mass movement of molecules within fluids, which includes both liquids and gases.

• Heated fluid becomes less dense and rises, while cooler, denser fluid sinks, creating convection currents that distribute heat.

• Insulation

• This is not a heat transfer method but rather the process of reducing heat flow between objects.

• Thermal insulators like fiberglass, wool, or trapped air are used to inhabit the transfer of energy via conduction or convection.

Q41. Answer: (b) Battle of Plassey

The correct answer is Battle of Plassey.

Key Points

• The Battle of Plassey was fought on June 23, 1757, on the banks of the Bhagirathi River in Bengal.

• The conflict occurred between the British East India Company, commanded by Robert Clive, and the Nawab of Bengal, Siraj-ud-Daulah.

• A primary reason for the British victory was the secret alliance between Robert Clive and Mir Jafar, the commander of the Nawab’s army, who defected during the battle.

• The victory transformed the British East India Company from a commercial entity into a dominant political and military force in India, establishing its first major foothold in the wealthy province of Bengal.

• Following the battle, the British gained immense wealth from the Bengal treasury and were granted significant land and revenue rights, facilitating their subsequent expansion.

Additional Information

• Battle of Buxar (1764):

• This battle was fought between the British and the combined forces of Mir Qasim (Nawab of Bengal), Shuja-ud-Daulah (Nawab of Awadh), and the Mughal Emperor Shah Alam II.

• It consolidated British control over northern India and led to the Treaty of Allahabad (1765), which granted the Company the Diwani rights to collect taxes from Bengal, Bihar, and Odisha.

• Battle of Wandiwash (1760):

• A decisive engagement during the Third Carnatic War between the British and the French.

• The British victory led by Sir Eyre Coote effectively ended French colonial ambitions in India.

• Battle of Panipat:

• The Third Battle of Panipat (1761) was fought between the Maratha Empire and the Afghan forces of Ahmad Shah Abdali.

• While it resulted in a Maratha defeat, it significantly weakened indigenous powers, indirectly aiding British ascendancy.

Q42. Answer: (a) Sanjay Malhotra

The correct answer is Sanjay Malhotra.

Key Points

• The Appointments Committee of the Cabinet (ACC) approved the appointment of Sanjay Malhotra as the 26th Governor of the Reserve Bank of India (RBI) on December 9, 2024.

• He officially assumed his duties on December 11, 2024, succeeding Shaktikanta Das, who served as the 25th Governor for a tenure spanning six years from 2018 to 2024.

• Sanjay Malhotra is a veteran 1990-batch Indian Administrative Service (IAS) officer belonging to the Rajasthan cadre.

• Before his elevation to the central bank's top post, he served as the Secretary in the Department of Revenue, Ministry of Finance, where he played a pivotal role in tax administration and policy.

• His appointment is for a period of three years from the date of assuming charge or until further orders.

Additional Information

• Michael Patra:

• He is a career central banker currently serving as a Deputy Governor of the Reserve Bank of India.

• He is a vital member of the Monetary Policy Committee (MPC) and is known for his expertise in macroeconomic policy and inflation targeting.

• Poonam Gupta:

• She serves as the Director General of the National Council of Applied Economic Research (NCAER) and is a member of the Economic Advisory Council to the Prime Minister (PMEAC).

• Raghuram Rajan:

• He was the 23rd Governor of the RBI, serving from 2013 to 2016, and is a world-renowned economist.

• RBI Governor Appointment:

• The Governor is appointed by the Government of India under the provisions of Section 8 of the Reserve Bank of India Act, 1934.

• The first Governor of the RBI was Sir Osborne Smith (1935), and the first Indian to hold the post was C.D. Deshmukh (1943).

Q43. Answer: (d) Accelerate socio-economic reforms

The correct answer is Accelerate socio-economic reforms.

Key Points

• The Twenty Point Programme (TPP) was first launched by Prime Minister Indira Gandhi on July 1, 1975, with the primary objective of improving the quality of life of the poor and underprivileged sections of society.

• The programme was designed to facilitate growth with social justice by addressing critical areas such as land reforms, liquidating rural indebtedness, and ensuring the abolition of bonded labor.

• It focused on increasing agricultural production, implementing a land ceiling, and providing housing sites for the landless, which were essential components of the socio-economic reform agenda of that era.

• The initiative was closely linked to the Fifth Five-Year Plan and the slogan of Garibi Hatao (Eradicate Poverty), aiming to provide basic necessities like clean drinking water, health, and education to the rural masses.

• The programme sought to redistribute resources and curb economic inequalities by socializing urban land and preventing the hoarding of essential commodities. Hence, the primary aim was to accelerate socio-economic reforms.

Additional Information

• Evolution of TPP:

• The programme has been restructured multiple times in 1982, 1986, and most recently in 2006 (known as TPP-2006) to address contemporary challenges.

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• The Ministry of Statistics and Programme Implementation (MoSPI) is the nodal agency responsible for monitoring the implementation of the programme across various states.

• Distinction from Other Economic Shifts:

• Liberalize trade policies and Promote foreign direct investment were the core features of the New Economic Policy introduced in 1991, commonly known as LPG (Liberalization, Privatization, and Globalization) reforms.

• The 1975 programme was launched during the Emergency and focused on domestic social welfare rather than market-oriented liberalization or reducing government borrowing.

Q44. Answer: (b) Ctrl + C

The correct answer is Ctrl + C.

Key Points

• The keyboard shortcut Ctrl + C is the primary command used in Graphical User Interfaces (GUI) to duplicate Selected Text, Images, or Files without removing them from their original location.

• When this shortcut is executed, the operating system places a copy of the selected data into a temporary storage area known as the Clipboard, which resides in the Random Access Memory (RAM).

• This command follows the Common User Access (CUA) standards, making it a universal shortcut across Windows, Linux, and various application softwares like Microsoft Office and Web Browsers.

• Unlike the Cut command, Ctrl + C is a non-destructive process that ensures the integrity of the source data while allowing for replication in another environment or document.

• In certain Command-Line Interfaces (CLI), such as the Linux Terminal, the same key combination is often used to send a SIGINT (Signal Interrupt) to stop a running program, though its primary role in desktop computing remains copying.

Additional Information

• Ctrl + F

• This shortcut activates the Find or Search utility, enabling users to locate specific keywords or character strings within a Document, PDF, or Webpage.

• Ctrl + S

• Known as the Save command, this shortcut writes the current state of a file from the Volatile Memory to a Permanent Storage Device like an SSD or HDD.

• Ctrl + V

• This is the Paste shortcut, which retrieves the content currently held in the System Clipboard and inserts it into the current cursor position or active window.

Q45. Answer: (b) Fantasy With Truth

The correct answer is Fantasy With Truth.

Key Points

• Dr. L. Subramaniam, a world-renowned Indian violinist, composer, and conductor, achieved a significant milestone in his career when he received a Grammy Award nomination in 1981.

• The nominated album, Fantasy With Truth, is a landmark recording in the Global Fusion genre, showcasing his ability to blend the intricate gamakas of Carnatic music with the improvisational freedom of Western Jazz.

• This nomination in the Best Jazz Fusion Performance category highlighted the violin as a versatile lead instrument capable of transcending cultural boundaries and standard orchestral roles.

• The album features collaborations with prominent international artists, reinforcing Dr. Subramaniam's reputation as a bridge between Eastern and Western musical traditions.

Additional Information

• Dr. L. Subramaniam:

• Commonly referred to as the God of Indian Violin, he has composed major symphonic works and film scores, including the soundtrack for Salaam Bombay!.

• He was awarded the Padma Shri in 1988 and the Padma Bhushan in 2001 by the Government of India for his exceptional contribution to the arts.

• He is the founder of the Lakshminarayana Global Music Festival, which promotes cross-cultural artistic exchange.

• West Meets East:

• This is a famous collaborative album series featuring sitar maestro Pandit Ravi Shankar and violinist Yehudi Menuhin, which began in 1966 and won a Grammy Award in 1967.

• Indo-Jazz Fusion:

• Dr. Subramaniam is considered a pioneer of this movement, often working with legends such as George Harrison, Stephan Grappelli, and Jean-Luc Ponty to create a new musical vocabulary.

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Q46. Answer: (b) 67.0

The correct answer is 67.0.

Key Points

• India achieved an overall score of 67.0 in the SDG Index 2025, reflecting its incremental progress toward the United Nations 2030 Agenda.

• The SDG Index is a featured component of the Sustainable Development Report, which is published annually by the Sustainable Development Solutions Network (SDSN) to track the performance of all 193 UN Member States.

• A score of 67.0 indicates that India is approximately 67 percent of the way toward achieving the optimal target across the 17 Sustainable Development Goals (SDGs), where a score of 100 represents full achievement.

• India has demonstrated significant resilience and improvement in specific areas such as SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action), while continuing to face challenges in SDG 2 (Zero Hunger) and SDG 5 (Gender Equality).

• The index provides a quantitative framework for comparing national progress, helping policymakers identify gaps in socio-economic development and environmental sustainability.

Additional Information

• Sustainable Development Solutions Network (SDSN):

• It was launched in 2012 under the auspices of the UN Secretary-General to mobilize global scientific and technological expertise.

• The organization is currently led by Professor Jeffrey Sachs and focuses on practical problem solving for sustainable development.

• Comparison with SDG India Index:

• The SDG India Index is a separate sub-national monitoring tool developed by NITI Aayog, which usually reports different scores based on localized indicators and a specialized methodology.

• While the Global SDG Index focuses on international comparability, the NITI Aayog version focuses on competitive federalism among Indian States and Union Territories.

• The 17 Goals:

• These goals were adopted in September 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

• Key goals include No Poverty (Goal 1), Quality Education (Goal 4), Affordable and Clean Energy (Goal 7), and Decent Work and Economic Growth (Goal 8).

Q47. Answer: (a) Introduction of separate electorates for Muslims

The correct answer is Introduction of separate electorates for Muslims.

Key Points

• The Indian Councils Act of 1909, popularly known as the Morley-Minto Reforms, introduced the system of separate electorates based on religion. Under this provision, Muslim members were to be elected exclusively by Muslim voters, thereby institutionalizing communal representation in the Indian political system.

• This act effectively legalized communalism in India, and Lord Minto came to be known as the Father of Communal Electorate for his role in implementing this divisive electoral policy.

• The reform significantly increased the size of the Legislative Councils at both the Central and Provincial levels, where the number of members in the Central Legislative Council was raised from 16 to 60.

• It empowered members of the Legislative Council to ask supplementary questions and move resolutions on the Budget, expanding the deliberative functions of the legislative bodies beyond mere discussion.

• The act provided for the first time for the association of Indians with the Executive Councils of the Viceroy and Governors, leading to the appointment of Satyendra Prasad Sinha as the first Indian member of the Viceroy's Executive Council.

Additional Information

• Historical Context of Other Options:

• The Supreme Court in India was first established at Calcutta through the Regulating Act of 1773, with Sir Elijah Impey as the first Chief Justice.

• Universal voting rights or Universal Adult Franchise was not granted during the British Raj; it was formally adopted only with the enforcement of the Constitution of India on January 26, 1950.

• The position of the Viceroy was created by the Government of India Act 1858 following the Revolt of 1857 and remained the supreme executive authority until the Indian Independence Act of 1947.

• The Government of India Act 1919 (Montagu-Chelmsford Reforms) later introduced Dyarchy in the provinces and expanded the principle of communal representation to Sikhs, Indian Christians, and Anglo-Indians.

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Q48. Answer: (d) Kalinga style

The correct answer is Kalinga style.

Key Points

• The Jagannath Temple in Puri, Odisha, is a monumental example of the Kalinga style of architecture, which is a specialized sub-branch of the broader Nagara (North Indian) tradition.

• This architectural style is characterized by three distinct types of temples: Rekha Deula (tall curvilinear tower), Pidha Deula (pyramidal roofed square porch), and Khakhara Deula (rectangular temple with a barrel-vaulted roof).

• The main sanctum of the Jagannath Temple is a Rekha Deula, while the assembly hall or porch, known as the Jagamohana, follows the Pidha Deula structure.

• Construction was initiated in the 12th century by King Anantavarman Chodaganga Deva of the Eastern Ganga Dynasty, showcasing the pinnacle of Odishan stone masonry.

• The temple complex is enclosed by two massive concentric walls: the outer Meghanada Pacheri and the inner Kurma Bheda, which protect the sacred deities Jagannath, Balabhadra, and Subhadra.

Additional Information

• Dravidian style

• Origin: Developed primarily in South India under dynasties like the Cholas and Pallavas.

• Features: Characterized by a pyramid-like tower called a Vimana and massive gateways known as Gopurams.

• Hoysala Style

• Origin: Flourished in Karnataka between the 11th and 14th centuries.

• Features: Distinguished by a stellate (star-shaped) ground plan and extremely intricate carvings on chloritic schist (soapstone).

• Vesara style

• Origin: Emerged in the Deccan region, particularly under the Later Chalukyas and Rashtrakutas.

• Features: A hybrid style that harmoniously combines elements of both the Nagara and Dravidian architectural traditions.

Q49. Answer: (a) 1985

The correct answer is 1985.

Key Points

• The Central Administrative Tribunal (CAT) was established under the Administrative Tribunals Act, 1985, following the 42nd Amendment Act, 1976 of the Constitution of India.

• The tribunal was officially inaugurated on November 1, 1985, during the tenure of the Rajiv Gandhi government to provide specialized adjudication for service-related disputes.

• The constitutional backing for the CAT is found in Article 323-A, which empowers the Parliament to establish administrative tribunals for the adjudication of disputes relating to recruitment and conditions of service.

• Its primary objective is to offer a speedy and inexpensive justice delivery mechanism to employees of the Central Government, thereby reducing the workload of the regular civil courts.

Additional Information

• Jurisdiction and Scope:

• The CAT exercises original jurisdiction over service matters concerning members of the All-India Services, Central Civil Services, and civilian employees of the Defense Services.

• It does not have jurisdiction over members of the Armed Forces, officers and servants of the Supreme Court, and the secretarial staff of the Parliament.

• Legal Framework and Composition:

• The tribunal is a multi-member body consisting of a Chairman and various Members (Judicial and Administrative), all of whom are appointed by the President of India.

• In its proceedings, the tribunal is not bound by the technicalities of the Code of Civil Procedure, 1908, but is governed by the Principles of Natural Justice.

• Following the L. Chandra Kumar Case (1997), the decisions of the CAT can be challenged before the Division Bench of the respective High Court through a writ petition.

Q50. Answer: (d) 52.5 %

The correct answer is 52.5 %.

Key Points

• The Worker Population Ratio (WPR) is defined as the percentage of employed persons in the total population, providing a primary indicator of the level of employment in the country.

• As per the Periodic Labour Force Survey (PLFS) Quarterly Bulletin covering the period October – December 2025, the WPR for

persons aged 15 years and above in India was recorded at 52.5%.

• The data is compiled and released by the National Statistical Office (NSO), which operates under the Ministry of Statistics and Programme Implementation (MoSPI).

• The survey utilizes the Current Weekly Status (CWS) approach for quarterly reports, which classifies a person as employed if they worked for at least one hour on any day during the seven-day reference period preceding the interview.

• An increasing WPR trend signifies an expansion in employment opportunities and higher participation of the population in economic activities.

Additional Information

• Periodic Labour Force Survey (PLFS):

• Launched in April 2017 to provide more frequent labor market data.

• Objectives include estimating employment and unemployment indicators in the short time interval of three months for urban areas and annually for both rural and urban areas.

• Key indicators tracked include Labour Force Participation Rate (LFPR), Worker Population Ratio (WPR), and Unemployment Rate (UR).

• The 15+ age group is the standard demographic used to measure the active labor force, excluding children and early adolescents from the primary employment statistics.

Q51. Answer: (c) Energy = Power × Time

The correct answer is Energy = Power times Time.

Key Points

• Electrical Energy represents the total work done by an electric current in maintaining the flow of charge through a circuit for a given duration.

• Electric Power (P) is defined as the rate at which electrical energy is consumed or dissipated in an electrical circuit. It is mathematically expressed as Power = Energy / Time.

• By rearranging the fundamental definition of power, Electrical Energy (E) can be calculated as the product of the power consumed and the time interval over which it is used: Energy = Power × Time.

• In the International System of Units (SI), energy is measured in Joules (J). One Joule is defined as the energy transferred when a power of one Watt (W) is applied for one Second (s).

• This relationship is fundamental for calculating electricity bills, where the total energy consumption is determined by the wattage of appliances and their duration of operation.

Additional Information

• Power Components:

• Electric Power itself is the product of Voltage (V) and Current (I). Therefore, energy can also be expressed as Energy = Voltage × Current × Time.

• The unit of power is the Watt, named after the Scottish inventor James Watt.

• Commercial Unit of Energy:

• The Kilowatt-hour (kWh) is the standard unit for commercial electricity consumption, often referred to as a Unit.

• One Kilowatt-hour is equal to 1000 Watts used for one hour (3600 seconds), which equates to 3.6 × 10^6 Joules.

• Ohm’s Law and Energy:

• According to Ohm’s Law, Voltage = Current × Resistance. Substituting this into the energy formula yields Energy = $I^2 \times R \times t$, known as Joule’s Law of Heating.

• This formula explains how electrical energy is converted into heat energy in resistors.

Q52. Answer: (d) Governor

The correct answer is Governor.

Key Points

• According to the Constitution of India, the Governor is the de jure head (legal or nominal head) of the state executive, similar to the President at the Union level.

• Article 153 states that there shall be a Governor for each state, although the 7th Constitutional Amendment Act (1956) facilitated the appointment of the same person for two or more states.

• Article 154 mandates that the executive power of the State shall be vested in the Governor and shall be exercised by him either directly or through officers subordinate to him.

• While the Governor is the constitutional head, the Chief Minister is the de facto (real) executive head who leads the Council of Ministers.

• All executive actions of the Government of a State are formally taken in the name of the Governor as per the provisions of Article 166.

• The Governor acts as a vital link between the Union Government and the State Government, ensuring that the state administration is carried out in accordance with the Constitution.

Additional Information

• Governor's Appointment and Tenure:

• The Governor is appointed by the President of India by warrant under his hand and seal (Article 155).

• A person must be a citizen of India and have completed at least 35 years of age to be eligible for the post.

• The Governor holds office during the pleasure of the President, with a standard term of five years.

• Chief Minister:

• The Chief Minister is the head of the elected government and is appointed by the Governor under Article 164.

• Chief Justice of High Court:

• The Chief Justice is the highest judicial authority in the state, appointed by the President under Article 217.

Q53. Answer: (b) Boycott of schools, courts, and councils alongside the adoption of khadi.

The correct answer is Boycott of schools, courts, and councils alongside the adoption of khadi.

Key Points

• The Calcutta Session of the Indian National Congress was a special session held in September 1920, presided over by Lala Lajpat Rai.

• During this session, Mahatma Gandhi introduced the resolution for the Non-Cooperation Movement (NCM) to address grievances related to the Jallianwala Bagh Massacre and the Khilafat Movement.

• The core strategy involved a phased withdrawal of support from British institutions, specifically targeting the boycott of government schools and colleges, British law courts, and the Legislative Councils established under the 1919 Reforms.

• The strategy also emphasized economic self-reliance through the boycott of foreign cloth and the proactive adoption of Khadi (hand-spun cloth) and the Charkha (spinning wheel) to revive the domestic textile industry.

• This session marked the transition of the Congress from a middle-class pressure group into a mass movement by integrating social, political, and economic boycotts.

Additional Information

• Nagpur Session (December 1920):

• The Non-Cooperation program approved at Calcutta was formally ratified here, and the Congress goal was changed from constitutional means to Swaraj (Self-Rule).

• Legislative Councils and Swarajists:

• While the 1920 strategy demanded a total boycott, leaders like C.R. Das and Motilal Nehru later formed the Swaraj Party in 1923 to contest elections and negotiate reforms from within the councils.

• Ahimsa and Non-Violence:

• Gandhi's strategy was strictly based on Non-Violence (Ahimsa), making the establishment of armed village guards or any form of violent resistance fundamentally incompatible with his philosophy of Satyagraha.

• Educational Impact:

• The boycott led to the establishment of National Institutions such as Jamia Millia Islamia, Kashi Vidyapeeth, and Gujarat Vidyapeeth to provide alternative education to students.

Q54. Answer: (b) 2022

The correct answer is 2022.

Key Points

• The Pune Metro Rail Project was officially inaugurated by Prime Minister Narendra Modi on March 6, 2022.

• During the inauguration, the Prime Minister flagged off the metro service on two priority stretches: the 7-kilometer section from Pimpri Chinchwad Municipal Corporation (PCMC) to Phugewadi and the 5-kilometer section from Vanaz to Garware College.

• The project is a significant infrastructure development for Maharashtra, designed to provide a world-class, environment-friendly Mass Rapid Transit System (MRTS) to the citizens of Pune and Pimpri Chinchwad.

• The total length of the Pune Metro project is approximately 32.2 kilometers, comprising two corridors: the Purple Line (Line 1) and the Aqua Line (Line 2).

• While the project was inaugurated in 2022, the foundation stone for the same was laid by Prime Minister Narendra Modi several years earlier, on December 24, 2016.

Additional Information

• Project Execution and Features:

• The project is executed by the Maharashtra Metro Rail Corporation Limited (MAHA-METRO), which is a joint venture between the Government of India and the Government of Maharashtra.

• The Pune Metro is notable for its sustainable features, including solar energy generation at stations and the use of lightweight aluminum-body coaches manufactured under the Make in India initiative.

• It aims to integrate with other modes of transport such as the Pune Suburban Railway, city bus services (PMPML), and the Pune Railway Station to ensure seamless multi-modal connectivity.

• The project has an estimated completion cost of over 11,400 crore rupees and is funded through a combination of equity and loans from international agencies like the European Investment Bank (EIB) and Agence Française de Développement (AFD).

Therefore, the correct option is 2.

Q55. Answer: (b) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• The Bateshwar Fair is a prominent annual event held in the town of Bateshwar, located in the Agra district of Uttar Pradesh.

• Geographically, the fair is situated on the banks of the Yamuna River, a site famous for its complex of 101 Shiva temples arranged in a crescent shape along the riverfront.

• The fair typically commences a few days before the festival of Deepawali and continues for a duration of nearly three weeks, reaching its religious peak on Kartika Purnima.

• It is recognized as one of the largest cattle fairs in North India, serving as a major hub for the trading of camels, horses, cows, and buffaloes.

• The fair carries immense spiritual significance, as thousands of devotees perform ritualistic baths in the Yamuna and offer prayers at the Bateshwar Mahadev temple.

Additional Information

• Bihar:

• This state is home to the Sonepur Cattle Fair, also known as the Harihar Kshetra Mela, which is considered the largest animal fair in Asia.

• Madhya Pradesh:

• The state hosts several major cultural and religious events, such as the Ujjain Simhastha Kumbh and the Gwalior Trade Fair, but it is not the site of the Bateshwar animal fair.

• Chhattisgarh:

• Known for the Bastar Dussehra and the Rajim Kumbh Mela, the state's festivals focus on tribal heritage and religious congregations at the confluence of the Mahanadi, Pairi, and Sondur rivers.

• Historical Context:

• The Bateshwar temples are believed to have been patronized by the Bhadauria kings, reflecting the Maratha and Chauhan architectural influences common in western Uttar Pradesh.

Q56. Answer: (b) Secondary sector

The correct answer is Secondary sector.

Key Points

• The Secondary sector encompasses activities where natural products are transformed into other forms through manufacturing processes, typically within industrial units or workshops.

• This sector is often referred to as the industrial sector because it involves the processing of raw materials to produce semi-finished or finished goods.

• Cotton textile production is a key example of secondary activity; it involves using raw cotton (a primary product) to spin yarn and subsequently weave textile fabric.

• Iron and steel manufacturing is a foundational heavy industry within this sector, utilizing iron ore to produce steel, which serves as a vital input for various other industries like infrastructure and automobiles.

• In the Indian economy, the secondary sector is essential for value addition and contributes approximately 25% to 30% to the Gross Domestic Product (GDP).

Additional Information

• Economic Classification in India:

• Primary sector: Focuses on the direct extraction and use of natural resources. Key activities include agriculture, forestry, fishing, and mining.

• Tertiary sector: Also known as the service sector, it provides support services to the primary and secondary sectors. It includes banking, transportation, trade, and communication.

• Quaternary sector: A specialized component of the tertiary sector that involves knowledge-based services. Examples include Information Technology (IT), Research and Development (R&D), and financial planning.

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Q57. Answer: (d) Make in India

The correct answer is Make in India.

Key Points

• Safran Group, a French multinational aerospace and defense corporation, has significantly integrated its supply chain within the Indian ecosystem to support major ISRO and DRDO projects.

• The Gaganyaan mission, which aims to demonstrate India's human spaceflight capability, involves high-end technological collaboration and localized production of critical components.

• The projected 70% revenue boost for Safran India by 2025 is driven by the establishment of large-scale manufacturing and MRO (Maintenance, Repair, and Overhaul) facilities in cities like Hyderabad and Bengaluru.

• This strategic growth is a direct alignment with the Make in India initiative, which encourages global firms to manufacture products domestically to foster a self-reliant aerospace and defense sector.

Additional Information

• Make in India Initiative

• Launched in September 2014 to transform India into a global design and manufacturing hub.

• Focuses on 27 sectors, with Aviation and Space being primary pillars for technological advancement.

• It facilitates Foreign Direct Investment (FDI) and protects intellectual property to build a best-in-class manufacturing infrastructure.

• Safran's Presence in India

• Safran operates the largest MRO facility for LEAP engines in India to service commercial airlines.

• The company is a key partner in the Rafale fighter jet program, providing the M88 engines and other critical avionics.

• Gaganyaan Mission Details

• The mission aims to launch a crew of three members to an orbit of 400 km for a duration of 3 days.

• It is a cornerstone for the future Indian Space Station and interplanetary explorations.

Q58. Answer: (d) education sector

The correct answer is education sector.

Key Points

• The Gross Enrolment Ratio (GER) is a critical statistical measure used within the education sector to determine the number of students enrolled in school at different grade levels, such as primary, secondary, and tertiary education.

• It is calculated by dividing the number of students enrolled in a specific level of education, regardless of age, by the population of the official age group corresponding to that level, and then multiplying the result by 100.

• The GER serves as an indicator of the educational capacity of a country and the extent of participation in the schooling system by the eligible population.

• A unique characteristic of this ratio is that it can exceed 100%; this occurs when students who are older or younger than the official age group (due to late entry or grade repetition) are enrolled in that specific level.

• In the context of Higher Education in India, the All India Survey on Higher Education (AISHE) is the primary report that tracks and publishes the GER data annually.

Additional Information

• Education Sector Targets:

• The National Education Policy (NEP) 2020 has set a target to increase the Gross Enrolment Ratio in higher education, including vocational education, from 26.3% (2018) to 50% by the year 2035.

• Health Sector:

• Utilizes metrics such as Infant Mortality Rate (IMR), Maternal Mortality Ratio (MMR), and Life Expectancy to gauge public welfare, which are conceptually distinct from enrolment ratios.

• Banking Sector:

• Focuses on financial liquidity and stability through indicators like the Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR), and Capital Adequacy Ratio (CAR).

• Transport Sector:

• Evaluates efficiency using metrics like Operating Ratio, Load Factor, and Network Density, which relate to logistics and infrastructure rather than human capital development.

Q59. Answer: (d) South Korea

The correct answer is South Korea.

Key Points

• In October 2025, the government of South Korea conferred its highest national honor, the Grand Order of Mugunghwa, upon

U.S. President Donald Trump during his diplomatic visit.

• The award ceremony took place on October 29, 2025, in the historic city of Gyeongju, which served as the capital of the ancient Silla Kingdom, on the sidelines of the APEC 2025 Leaders' Summit.

• South Korean President Lee Jae Myung personally presented the decoration to Donald Trump, making him the first U.S. President to receive this prestigious distinction.

• The honor was awarded in recognition of Trump's contributions to regional security, his role as a peacemaker on the Korean Peninsula, and his efforts in enhancing bilateral economic cooperation.

• As part of the ceremonial gesture, Trump was also gifted a symbolic replica of the Cheonmachong gold crown, an ancient Silla Dynasty artifact representing national pride and unity.

Additional Information

• Grand Order of Mugunghwa:

• Instituted on August 13, 1949, it stands as the highest of all Korean orders and is superior to the Order of National Foundation.

• It is named after the Mugunghwa (Hibiscus syriacus), South Korea's national flower, which symbolizes resilience and the nation's eternal spirit.

• The award is exceptionally granted to foreign heads of state or their spouses who have rendered distinguished service to the Republic of Korea.

• Incorrect Options Context:

• China: The highest award for foreigners is the Order of Friendship, which was not the subject of this 2025 conferment.

• Japan: Japan's highest honor is the Supreme Order of the Chrysanthemum, typically reserved for monarchs and exceptional heads of state.

• Bhutan: The kingdom's highest civilian honor is the Order of the Dragon King (Druk Gyalpo).

Q60. Answer: (d) Microcontroller

The correct answer is Microcontroller.

Key Points

• A Microcontroller (MCU) is a highly integrated Integrated Circuit (IC) designed to govern specific operations within an Embedded System.

• It is often referred to as a 'computer on a chip' because it integrates a Central Processing Unit (CPU), Volatile Memory (RAM), and Non-volatile Memory (ROM or Flash) into a single compact silicon die.

• The primary design goal of a microcontroller is to provide a self-contained unit that includes Input/Output (I/O) Peripherals, such as Timers, Serial Communication Ports, and Analog-to-Digital Converters (ADC), which are necessary for interacting with sensors and actuators.

• Unlike a Microprocessor, which requires external components like a Northbridge or separate memory modules to function, the microcontroller combines these features to reduce Power Consumption, physical size, and overall system cost.

• Microcontrollers are widely utilized in Real-time Applications where specific, repetitive tasks are performed, such as in Automobile Engine Control Systems, Medical Devices, and Remote Controls.

Additional Information

• Motherboard

• The Motherboard is the main Printed Circuit Board (PCB) in a general-purpose computer (like a PC or Laptop) that serves as a backbone for connecting various discrete components.

• It contains Sockets for the CPU, slots for RAM modules, and interfaces for Storage Devices (SATA/NVMe), but it is not a single integrated chip itself.

• System Bus

• A System Bus is a communication system that transfers data between the internal components of a computer.

• It typically consists of three main parts: the Data Bus (carries actual data), the Address Bus (specifies where data should go), and the Control Bus (carries commands from the CPU).

• Microprocessor vs. Microcontroller

• A Microprocessor consists only of a CPU and is designed for high-speed, general-purpose computing tasks found in personal computers.

• In contrast, Microcontrollers are task-specific, emphasizing Energy Efficiency and Integration rather than raw computational power.

Q61. Answer: (c) Iron Ore

The correct answer is Iron Ore.

Key Points

• Kudremukh is a mountain range located in the Chikmagalur district of Karnataka, situated within the Western Ghats, which is a

UNESCO World Heritage Site.

• The name Kudremukh literally translates to Horse-face in the Kannada language, describing the unique shape of one of the highest peaks in the region.

• The region is world-renowned for housing one of the largest deposits of Magnetite iron ore in the world, which is a high-grade mineral known for its magnetic properties.

• The Kudremukh Iron Ore Company Limited (KIOCL), a Public Sector Undertaking (PSU), was established in 1976 to exploit these massive mineral resources.

• For logistical efficiency, the ore was transported in the form of slurry through a 110 km long pipeline to the New Mangalore Port for international export.

• Due to environmental concerns regarding the biodiversity of the Kudremukh National Park, the Supreme Court of India ordered the cessation of mining operations in December 2005.

Additional Information

• Copper:

• In Karnataka, copper deposits are primarily found in Ingaldhal within the Chitradurga district.

• Significant Indian copper reserves are located in Malanjkhand (Madhya Pradesh) and Khetri (Rajasthan).

• Bauxite:

• This is the primary ore for Aluminium production.

• In Karnataka, it is extracted from the Belagavi and Chikmagalur districts, particularly around the Baba Budan hills.

• Manganese:

• Karnataka is a major producer of manganese ore in India.

• Large-scale deposits are concentrated in the Sandur belt of Ballari district, as well as in Shimoga and Tumakuru.

Q62. Answer: (a) Delhi High Court

The correct answer is Delhi High Court.

Key Points

• The Delhi High Court officially issued a notification regarding its calendar for the year 2025, wherein it declared 26 December 2025 (Friday) as a court holiday.

• By declaring this date a holiday, the court has advanced the commencement of its Winter Vacation, which will now effectively begin on 26 December 2025 and continue until 31 December 2025.

• This administrative decision was made under the powers vested in the Chief Justice and the Registry of the High Court to regulate the judicial calendar and ensure a structured recess for the judiciary and the legal fraternity.

• The notification ensures that both the High Court and the Subordinate Courts under its jurisdiction in the National Capital Territory of Delhi follow the revised schedule for the winter break.

• Typically, Christmas (December 25) is a standard holiday, and by declaring December 26 as a holiday, the court bridged the gap to create a continuous Winter Vacation period.

• The decision was communicated through a circular issued by the Registrar General, citing the administrative requirements and the approved List of Holidays for the calendar year 2025.

Additional Information

• Delhi High Court Establishment and Structure:

• The Delhi High Court was established on 31 October 1966, following the enactment of the Delhi High Court Act, 1966.

• It serves as the highest judicial authority within the National Capital Territory (NCT) of Delhi.

• The court currently has a sanctioned strength of 60 judges, comprising 45 permanent judges and 15 additional judges.

• The administrative control over the District Courts and other subordinate judiciary in Delhi is exercised by the High Court through its Full Court and Administrative Committees.

• Judicial Vacations in India:

• High Courts in India are empowered under Article 225 of the Constitution of India and their respective High Court Rules to determine their working days and vacation schedules.

• Vacations are categorized into Summer Vacation (usually in May-June) and Winter Vacation (usually in late December).

• During these periods, Vacation Benches are constituted to hear urgent matters, such as habeas corpus petitions, stay orders, and bail applications.

Q63. Answer: (c) 29 subjects for Panchayats

The correct answer is 29 subjects for Panchayats.

Key Points

• The 11th Schedule was added to the Constitution of India by the 73rd Constitutional Amendment Act of 1992, which

institutionalized the Panchayati Raj system.

• It contains a list of 29 subjects or functional items over which the Panchayats have the power to plan and implement schemes for economic development and social justice.

• This schedule is linked directly to Article 243-G of the Constitution, which defines the powers, authority, and responsibilities of Panchayats.

• The subjects mentioned in the schedule include Agriculture, Land Improvement, Minor Irrigation, Animal Husbandry, Fisheries, Social Forestry, Small-scale Industries, Rural Housing, and Drinking Water.

• The inclusion of this schedule aimed to decentralize power and ensure the participation of the rural population in the democratic process at the grassroots level.

Additional Information

• 12th Schedule:

• It was added by the 74th Constitutional Amendment Act, 1992.

• It contains 18 functional items related to the powers and responsibilities of Municipalities (Urban Local Bodies) under Article 243-W.

• Concurrent List:

• It is part of the 7th Schedule of the Constitution, which divides legislative powers between the Union and the States.

• It contains subjects like Education, Forests, and Marriage, where both the Parliament and State Legislatures can make laws.

• Fundamental Duties:

• These are contained in Part IV-A and Article 51A of the Constitution.

• They were added by the 42nd Amendment Act, 1976, based on the recommendations of the Swaran Singh Committee; currently, there are 11 duties.

Q64. Answer: (c) Sitar

The correct answer is Sitar.

Key Points

• Pandit Ravi Shankar (1920–2012) was a legendary Indian sitar virtuoso and a globally acclaimed composer who became the most well-known proponent of Hindustani classical music in the 20th century.

• He was a disciple of Acharya Allauddin Khan, the founder of the Maihar gharana, under whom he underwent rigorous training in the traditional Gurukul system.

• The Sitar is a plucked stringed instrument used mainly in Hindustani music; Shankar is credited with introducing several innovations to the instrument's design and playing style, particularly the use of the bass strings (kharaj) to enhance the Alap section.

• His international fame peaked in the 1960s through his association with George Harrison of The Beatles, which led to a global Sitar explosion and performances at iconic events like the Monterey Pop Festival (1967) and Woodstock (1969).

• For his immense contributions, he was honored with the Bharat Ratna, India's highest civilian award, in 1999, and he received five Grammy Awards, including a posthumous Lifetime Achievement Award in 2013.

Additional Information

• Flute

• In the context of Indian Classical Music, the Bansuri (bamboo flute) is the primary instrument.

• Renowned masters of this instrument include Pandit Hariprasad Chaurasia and Pannalal Ghosh.

• Tabla

• A pair of hand drums (the Dayan and Bayan) used for rhythm in Hindustani music.

• Legendary exponents include Ustad Zakir Hussain, Ustad Alla Rakha, and Pandit Kishan Maharaj.

• Sarod

• A fretless stringed instrument known for its deep, introspective sound and continuous slides (meend).

• Prominent virtuosos include Ustad Amjad Ali Khan, Ustad Ali Akbar Khan, and Amaan Ali Bangash.

Q65. Answer: (b) High fiscal and current account deficits

The correct answer is High fiscal and current account deficits.

Key Points

• The 1991 Economic Crisis in India was a severe Balance of Payments (BoP) crisis resulting from a long period of macroeconomic mismanagement during the 1980s.

• A primary driver was the high fiscal deficit, which reached 8.4% of GDP in 1990-91. This was caused by the government living far beyond its means, funded by internal and external borrowings.

• Simultaneously, the current account deficit (CAD) widened significantly, reaching about 3% of GDP. This meant India was

importing far more goods and services than it was exporting, leading to a massive drain on foreign exchange reserves.

• The Gulf War (1990-91) acted as an immediate catalyst, causing a sharp spike in global oil prices and a sudden drop in remittances from Indian workers in West Asia, further straining the BoP position.

• By mid-1991, India's foreign exchange reserves had dropped to approximately $1.2 billion, an amount barely sufficient to sustain two weeks of essential imports.

Additional Information

• Incorrect Factors:

• Agricultural Surplus: India did not have an agricultural surplus that triggered the crisis; instead, the economy suffered from high inflation, which peaked at nearly 17% in 1991.

• Oil Price Drop: Contrary to a drop, the Gulf War led to a massive oil price hike, which was a major external shock to India's economy.

• Increase in Gold Reserves: Gold reserves were not increasing; the crisis was so dire that the government had to pledge 67 tonnes of gold to the Bank of England and the Union Bank of Switzerland to avoid a sovereign default.

• Policy Transformation:

• The crisis necessitated a loan from the IMF and World Bank, which came with conditions to restructure the economy.

• This led to the New Economic Policy of 1991, introducing Liberalization, Privatization, and Globalization (LPG) to open up the Indian economy to international competition.

Q66. Answer: (a) Russian Revolution

The correct answer is Russian Revolution.

Key Points

• The Preamble of the Indian Constitution declares the resolve to secure for all its citizens Justice in three distinct forms: Social, Economic, and Political.

• These ideals of Justice were inspired by the Russian Revolution of 1917, which sought to create a society based on egalitarian principles and the end of exploitation.

• Social Justice implies that the Constitution aims to create a society without discrimination based on caste, creed, religion, sex, or place of birth, ensuring the improvement of conditions for backward classes and women.

• Economic Justice refers to the elimination of glaring inequalities in wealth, income, and property, ensuring that economic resources are distributed to serve the common good.

• Political Justice ensures that all citizens have equal opportunities to participate in the political process, including the right to vote and access to public offices without discrimination.

• The Preamble acts as an introductory statement that sets out the guiding principles and philosophy of the Constitution of India.

Additional Information

• French Revolution (1789):

• The Indian Constitution borrowed the ideals of Liberty, Equality, and Fraternity from the French Revolution.

• It emphasized the rights of man and the republican form of government.

• American Revolution (1776):

• This revolution influenced the concept of a Written Constitution and the inclusion of a Bill of Rights (transformed into Fundamental Rights in India).

• Other features borrowed from the USA include the Independence of the Judiciary and Judicial Review.

• Glorious Revolution (1688):

• Occurring in England, it established the Supremacy of Parliament over the monarchy.

• It laid the foundation for the Parliamentary form of government that India adopted from the British Constitution.

Q67. Answer: (b) Prabhakarvardhana

The correct answer is Prabhakarvardhana.

Key Points

• Prabhakarvardhana was the first significant and powerful king of the Pushyabhuti dynasty, also known as the Vardhana dynasty, ruling from Thanesar (modern-day Haryana) during the late 6th century.

• He was the first ruler of the dynasty to assume imperial titles such as Maharajadhiraja (King of Kings) and Parama-bhattaraka, marking the transition of the family from local feudatories to independent sovereigns.

• In the historical text Harshacharita, written by the court poet Banabhatta, he is famously described using the epithet Huna-harina-kesari, which translates to 'a lion to the Huna deer', indicating his decisive military victories over the invading Hunas.

• His military campaigns significantly strengthened the Pushyabhuti position in Northern India, as he is also credited with defeating or intimidating the rulers of Sindh, Gandhara, Lata, and Malwa.

• By successfully repelling the Huna tribes, who had previously caused the decline of the Gupta Empire, Prabhakarvardhana established a stable and powerful foundation for his successors, Rajyavardhana and Harshavardhana.

Additional Information

• Rajyavardhana:

• He was the eldest son of Prabhakarvardhana and ascended the throne in 605 CE.

• He defeated the Malwa king Devagupta but was treacherously murdered by Shashanka, the ruler of Gauda (Bengal).

• Harshavardhana:

• The most illustrious ruler of the dynasty, he reigned from 606 to 647 CE and shifted the capital to Kannauj.

• He was a great patron of Buddhism and authored famous Sanskrit plays including Ratnavali, Nagananda, and Priyadarsika.

• Naravardhana:

• Regarded as the earliest known ancestor and the founder of the Pushyabhuti line.

• He was a minor chieftain and a feudatory, likely under the Imperial Guptas or the Maukhari kings, lacking the sovereign power achieved by his descendants.

Q68. Answer: (b) Coulomb

The correct answer is Coulomb.

Key Points

• The Coulomb (symbol: C) is the derived SI unit of electric charge, which measures the total quantity of electricity flowing through a circuit.

• By definition, one coulomb is equivalent to the amount of charge transferred by a constant current of one ampere in one second.

• The relationship between charge, current, and time is given by the formula Q = I × t, where Q represents charge in coulombs, I represents current in amperes, and t represents time in seconds.

• Scientifically, a single coulomb is a large unit representing approximately 6.242 × 10^(18) elementary charges (electrons or protons).

• The unit is named after Charles-Augustin de Coulomb, the scientist who discovered Coulomb's Law, which quantifies the electrostatic force between two point charges.

Additional Information

• Volt

• The Volt (V) is the SI unit for electric potential, potential difference, and electromotive force (EMF).

• It measures the energy available to move a unit charge; specifically, one volt is defined as one joule per coulomb.

• Ampere

• The Ampere (A) is the SI base unit for electric current.

• It represents the rate of flow of charge, where one ampere equals one coulomb per second.

• Ohm

• The Ohm (Ω) is the SI unit for electrical resistance.

• Based on Ohm's Law, one ohm is the resistance of a conductor in which a potential difference of one volt produces a current of one ampere.

Q69. Answer: (b) Barchan

The correct answer is Barchan.

Key Points

• A Barchan is a crescent-shaped sand dune that is primarily formed by the depositional action of wind, a process known as Aeolian action.

• These landforms typically develop in arid regions where the wind direction remains relatively constant and there is a limited supply of sand.

• The convex side of a Barchan faces the prevailing wind (the windward side), while the leeward side forms a steep slip face between two projecting horns.

• The horns of the Barchan always point in the downwind direction, signifying the direction toward which the dune is slowly migrating.

• Barchans can range in height from a few meters to over 30 meters, and their width between horns can reach several hundred meters depending on sand availability and wind velocity.

Additional Information

• Yardang:

• It is an erosional landform carved by the abrasive action of wind-blown sand.

• It consists of streamlined, elongated ridges of resistant rock separated by grooves of softer material.

• Inselberg:

• An isolated hill or mountain that rises abruptly from a flat plain, often found in desert landscapes.

• It is an erosional feature created by the long-term weathering and removal of surrounding weaker rock layers.

• Moraine:

• This is a depositional landform, but it is formed by glacial action rather than wind.

• It consists of unconsolidated debris such as glacial till, boulders, and silt deposited by a moving or melting glacier.

Q70. Answer: (a) Davos-Klosters, Switzerland

The correct answer is Davos-Klosters, Switzerland.

Key Points

• The World Economic Forum (WEF) organized its 55th Annual Meeting in the alpine resort of Davos-Klosters, Switzerland, from January 20 to 24, 2025.

• The 2025 meeting focused on the overarching theme of Collaboration for the Intelligent Age, reflecting the global shift toward Artificial Intelligence (AI) and advanced computing.

• This gathering served as a platform for over 2,500 leaders from the private sector, government, and international organizations to discuss the ethical, economic, and social implications of rapid technological transformation.

• Key agenda items included navigating the global energy transition, addressing geopolitical fragmentation, and fostering sustainable economic growth in a post-globalization landscape.

• The selection of Davos continues a decades-long tradition where the secluded mountain environment encourages informal yet high-stakes diplomatic dialogue and strategic partnerships.

Additional Information

• World Economic Forum (WEF):

• Founded in 1971 by Klaus Schwab, the WEF is an independent international organization committed to improving the state of the world through public-private cooperation.

• The organization is headquartered in Cologny, Geneva, Switzerland, and is officially recognized by the Swiss Confederation as an international body.

• It is renowned for championing Stakeholder Capitalism, a concept emphasizing that corporations should serve the interests of all society, not just their shareholders.

• Davos-Klosters as a Venue:

• Located in the Graubünden region of the Swiss Alps, it is the highest town in Europe, which provides the necessary security infrastructure for world leaders.

• The Davos Manifesto, originally drafted in 1973 and updated in 2020, sets the ethical guidelines for the forum's interactions and its mission of global governance.

Q71. Answer: (b) ZUF 33

The logic followed here is:

The pattern observed for the letters is (+5, +4, +5) and for the numbers, it is +4. Combining these parts, the next term in the series is ZUF 33.

Hence, the correct answer is "Option 2"

Q72. Answer: (c) ME -8

The logic followed here is:

DO 9 is related to FL -5,

EQ 3 is related to GN -11,

KH 6 related to,

Hence, the correct answer is 'Option 3'.

Q73. Answer: (a) Father's brother

Family Chart:

The family tree diagram is,

Therefore, Lakhan is the father of Amrita, and Nehal is the brother of Lakhan. This means Nehal is the Father's brother of Amrita.

Hence, the correct answer is 'Option 1'.

Q74. Answer: (d) 7 km to the South

• Mr. Vasu starts from Point A and drives 25 km towards the West.
• He then takes a left turn, drives 15 km, turns left and drives 51 km.
• He then takes a left turn, drives 28 km, turns left and drives 14 km.
• He then takes a left turn and drives 6 km.
• He takes a final right turn, drives 12 km and stops at Point P

The Final Diagram,

Therefore, he should drive 7 km to the South to reach Point A again.

Hence, the correct answer is " Option 4"

Q75. Answer: (c) ZDE

The logic followed here is,

Logic: The difference between the numerical positions of consecutive letters in the group is +3 and +2.

UXZ,

LOQ,

DGI,

ZDE,

This letter cluster follows a different pattern (+4, +1) and does not follow the rule.

Therefore, the letter cluster that is different from the others is ZDE.

Hence, the correct answer is 'Option 3'.

Q76. Answer: (d) Two

Given number: 8254316

Arranging them in ascending order, : 1, 2, 3, 4, 5, 6, 8.

Now, let us compare the original number with the newly arranged sequence:

Original Number	**8**	**2**	**5**	**4**	**3**	**1**	**6**
Ascending Order	1	2	3	4	5	6	8

The positions of the digits 2 and 4 remain the same after rearrangement.

Hence, the correct answer is 'Option 4'.

Q77. Answer: (a) 61

The numbers are increased by consecutive perfect squares.

• $56 + 1^2 = 57$
• $57 + 2^2 = 61$
• $61 + 3^2 = 70$
• $70 + 4^2 = 86$
• $86 + 5^2 = 111$

Hence, the missing number is:

57 + 4 = 61

Hence, the correct answer is "option 1"

Q78. Answer: (d) Neither conclusion (I) nor (II) follows

The least possible Venn diagram for the given statements is:

(I) Some Power Saws are Wrenches - Doesn't Follows.(Their is no direct relation between PowerSawas and wrencehes may be it is possible but not definite. Hence, it is false)

(II) No Power Saws are Wrenches - Doesn't Follows.

(Their is no direct relation between PowerSawas and wrencehes may be it is possible but not definite. Hence, it is false)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is " Option 4"

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Q79. Answer: (a) DV - PH

The logic followed here is

DV - PH,

JB - DN,

NF - HR,

TL - NX,

Therefore, the letter-cluster pair that is different from the others is DV - PH.

Hence, the correct answer is 'Option 1'.

Q80. Answer: (a) CAY

The Logic followed here is,

For RON,

For YVU,

For LIH,

For CAY,

CAY is the odd one.

Hence, the correct answer is "option 1"

Q81. Answer: (b) Neither conclusion (I) nor (II) follows

The least possible Venn diagram for the given statements is:

(I) No Race Cars are Trains - Doesn't Follows

(There is no direct relation between race cars and trains; maybe it is possible but not definite.)

(II) Some Race Cars are Trains - Doesn't Follows

(There is no direct relation between race cars and trains; maybe it is possible but not definite.)

Neither conclusion (I) nor (II) follows

Hence, the correct answer is "Option 1".

Q82. Answer: (c) Two

Given: Seven people, P1, P2, P3, P4, P5, P6, and P7, are sitting around a circular table facing towards the center of the table.

1. P5 sits to the immediate left of P6.
2. There are exactly two people between P1 and P6 when checked from the right of P6.
3. P3 is sitting immediately between P2 and P1.
4. P7 is sitting immediately between P4 and P5.

The Final Diagram,

The people sitting between them are P5 and P7. Thus, there are exactly two people.

Hence, the correct answer is 'Option 3'.

Q83. Answer: (c) ONE

Given: 3219854

Comparing this new sequence with the original number:

Original Number	**3**	**2**	**1**	**9**	**8**	**5**	**4**
Ascending Order	1	2	3	4	5	8	9

So, the number of digits whose position remains unchanged is one = 2.

Hence, the correct answer is 'Option 3'.

Q84. Answer: (c) Four

Given:Six boxes, R, S, T, U, V and X, are kept one over the other, but not necessarily in the same order.

1. Only one box is kept below S.
2. Only one box is kept above U.
3. Only one box is kept between U and V.

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Position	Box
6	
5	U
4	
3	V
2	S
1	

1. T is kept immediately below S.
2. R is kept at some place below X.

Final Arrangement:

6	X
5	U
4	R
3	V
2	S
1	T

• Boxes kept between X and T are U, R, V, and S.
• Thus, there are four boxes kept between X and T.

Hence, the correct answer is 'Option 3'.

Q85. Answer: (d) W

Seven people H, I, J, K, W, Y and Z are sitting around a circular table facing the centre of the table.
1. K sits third to the left of Z.
2. Only two people sit between J and K when counted from the right of J.
3. Only three people sit between J and I.
4. H sits to the immediate left of W

The Final Arrangement is,

So, W sits third to the left of Y.

Hence, the correct answer is 'Option 4'.

Q86. Answer: (d) 9th

The logic followed here is:

Total number of students in the row = 25

Position of Vinayak from the right end = 13^(th)

Position of Utkarsh from the right end = Position of Vinayak from the right end + 4

= 13 + 4

= 17^(th)

Position from the left end = (Total number of students − Position from the right end) + 1

Position of Utkarsh from the left end = (25 − 17) + 1

= 8 + 1

= 9^(th)

Hence, the correct answer is "Option 4".

Q87. Answer: (b) SRP

The logic followed here is,

By following the pattern, the missing term in the series MLJ, HGE, CBZ, XWU is SRP.

Hence, the correct answer is "Option 2"

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Q88. Answer: (a) Three

Given series: (Left) 8 2 6 6 3 1 8 6 4 2 2 8 4 3 4 9 9 3 7 4 6 1 6 (Right)

Required Condition: Even Digit - Even Digit - Odd Digit

(Left) 8 2 6 6 3 1 8 6 4 2 2 8 4 3 4 9 9 3 7 4 6 1 6 (Right)

There are three such even digits in the series: 6 6 3,

8 4 3 and 4 6 1

Hence the correct answer is 'Option 1'.

Q89. Answer: (a) ID - LG - NP

The Logic followed here is:

LG - OJ - QS,

OJ - RM - TV,

Following same Logic, ID - LG - NP,

Hence, the correct answer is "Option 1".

Q90. Answer: (b) (23, 4, 185)

The logic followed here is:

Logic: Third Number = (First Number × Second Number × 2) + 1

For the first set (18, 6, 217)

=> (18 × 6 × 2) + 1

=> 108 × 2 + 1

=> 216 + 1 = 217.

For the second set (21, 6, 253)

=> (21 × 6 × 2) + 1

=> 126 × 2 + 1

=> 252 + 1 = 253.

Applying the same logic to the set (23, 4, 185)

=> (23 × 4 × 2) + 1

=> 92 × 2 + 1

=> 184 + 1 = 185.

Hence, the correct answer is "(23, 4, 185)".

Q91. Answer: (d) Five

Logic followed here is.

Logic: Identify the letter at the specified positions within the given letter series, then determine the count of letters between those two identified letters in the standard English alphabetical series.

Given Letter Series:

(Left) X P S A D U G L O E J F K I M C R T Q (Right)

1) Letter which is third from the left end →

1st	2nd	3rd
X	P	S

The letter third from the left end is S.

2) Letter which is fifth from the right end →

5th	4th	3rd	2nd	1st
M	C	R	T	Q

The letter fifth from the right end is M.

3) Count of letters between M and S in the English alphabetical series →

The identified letters are M and S. We need to find how many letters exist between them in the standard alphabet (A to Z).

Positional value of M = 13

Positional value of S = 19

The letters between M and S are: N (14), O (15), P (16), Q (17), and R (18).

Total count = 19 − 13 − 1 = 5.

The correct answer is Five

Q92. Answer: (a) One

Given Number: 3184657

Original Number	**3**	**1**	**8**	**4**	**6**	**5**	**7**
Ascending Order	1	3	4	5	6	7	8

By comparing both sequences, we can see that only the digit 6 remains in the same position.

So, the number of digits whose position remains unchanged is 1.

Hence, the correct answer is 'Option 1'.

Q93. Answer: (c) H

Given: Seven boxes, G, H, I, J, L, M and N, are kept one over the other, but not necessarily in the same order.

1. Box I is kept at the third position from the top.
2. Box N is kept at the third position from the bottom.
3. Only three boxes are kept between N and J.

Position	**Box**
7 (Top)	J
6	
5	I
4	
3	N
2	
1 (Bottom)	

1. Only three boxes are kept between I and H.
2. Box M is kept at a position somewhere above L.

Final Arrangement:

7	**J**
6	M/G
5	I
4	M/G/L
3	N
2	G/L
1	H

Thus, the box kept at the bottom position is H.

Hence, the correct answer is 'Option 3'.

Q94. Answer: (a) fj

The logic followed here is.

Hence, the correct answer is "option 1"

Q95. Answer: (c) Two

Given: 3 5 1 5 9 5 3 4 6 4 8 5 1 3 2 9 6 6 6 3 6 8 7

Required Conditions : Odd digit - odd digit - even digit

Left 3 5 1 5 9 5 3 4 6 4 8 5 1 3 2 9 6 6 6 3 6 8 7 Right

5 3 4, 1 3 2

So, the total number of such odd digits that satisfy the condition in the series is: Two

Hence, the correct answer is 'Option 3'.

Q96. Answer: (a) I38V

The logic follows here,

Combining all three parts, the missing term is I38V.

Hence, the correct answer is "option 1".

Q97. Answer: (c) HLKV

The logic followed in this pattern is a constant addition of 4 to the positional value of each letter in the English alphabet.

For 'MKPT' related to 'QOTX':

M(13)	K(11)	P(16)	T(20)
+4 ↓	+4 ↓	+4 ↓	+4 ↓
Q(17)	O(15)	T(20)	X(24)

For 'ENSU' related to 'IRWY':

E(5)	N(14)	S(19)	U(21)
+4 ↓	+4 ↓	+4 ↓	+4 ↓
I(9)	R(18)	W(23)	Y(25)

Applying the same logic to 'DHGR':

D(4)	H(8)	G(7)	R(18)
+4 ↓	+4 ↓	+4 ↓	+4 ↓
H(8)	L(12)	K(11)	V(22)

Thus, DHGR is related to HLKV.

Hence, the correct answer is 'Option 3'.

Q98. Answer: (a) Wife's father's sister's son

Family Chart:

Let us first decode the given symbols and then draw a family tree.

Symbol	=	$	@	•
Meaning	Son	Sister	Wife	Father

Given : W = F K × L @ G

Based on the tree, G is the husband of L, whose father is K. F is the sister of K, and W is the son of F. Therefore, W is the Wife's father's sister's son of G.

Hence, the correct answer is 'Option 1'.

Q99. Answer: (b) 94

The logic followed here is,

Logic: The code for a word is determined by summing the positional values of its letters in the alphabetical order and then multiplying the sum by 2.

For PWEA is coded as 90,

• Sum of positional values = 16 + 23 + 5 + 1 = 45

• Code = 45 × 2 = 90

For QAMT is coded as 102,

• Sum of positional values = 17 + 1 + 13 + 20 = 51

• Code = 51 × 2 = 102

Applying same logic for LJCV:

• Sum of positional values = 12 + 10 + 3 + 22 = 47

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• Code = 47 × 2 = 94

Hence, the correct answer is "option 2".

Q100. Answer: (c) 15

The logic followed here is:

Logic: The series follows a pattern where each subsequent number is obtained by adding consecutive multiples of 7 to the previous number.

• 8 + 7 = 15

• 15 + 14 = 29

• 29 + 21 = 50

• 50 + 28 = 78

• 78 + 35 = 113

The missing number in the series is 15.

Hence, the correct answer is "option 3"

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