RRB NTPC (UG) CBT-I Official Paper (Held On: 14 Aug, 2025 Shift 3) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. The Make in India initiative aims to boost domestic manufacturing. In which year was the 'Make in India' campaign launched?

(a) 2012
(b) 2016
(c) 2018
(d) 2014

Q2. Which type of ROM can be programmed only once after manufacturing?

(a) EEPROM
(b) PROM
(c) Mask ROM
(d) EPROM

Q3. From which site did ISRO conduct its 100th space launch?

(a) Chitradurga
(b) Sriharikota
(c) Chandipur
(d) Hassan

Q4. On 30 May 2025, which state declared 100% literacy under the ULLAS Nav Bharat Literacy Programme, surpassing its earlier PLFS-recorded rate?

(a) Kerala
(b) Goa
(c) Himachal
(d) Sikkim

Q5. Which chemical reaction produces ortho-hydroxybenzoic acid, the primary reaction product used as a raw material for medications?

(a) Kolbe’s reaction
(b) Stephen reaction
(c) Reimer-Tiemann reaction
(d) Friedel-Crafts reaction

Q6. Who first proposed a law in 1931 to clarify the idea of thermal equilibrium and its significance in determining temperature?

(a) Hugh L. Callendar
(b) James P Espy
(c) Rudolf Clausius
(d) Ralph H Fowler

Q7. An infrasound microphone enables the remote detection of aircraft wake vortices, clear air turbulence, tornadoes, and seismic events at frequencies below:

(a) 30 Hz
(b) 10 Hz
(c) 5 Hz
(d) 20 Hz

Q8. Which of the following is considered a major social development outcome of India's economic reforms since 1991?

(a) Increase in poverty rate
(b) Widening of fiscal deficit
(c) Decrease in literacy rate
(d) Improvement in life expectancy

Q9. Who was the last Viceroy of India who oversaw the partition of India before leaving?

(a) Pethick Lawrence
(b) Lord Cripps
(c) Lord Mountbatten
(d) Lord Wavell

Q10. Which of the following Acts provides legal status to Lok Adalats in India?

(a) Indian Penal Code, 1860
(b) Civil Procedure Code, 1908
(c) Arbitration and Conciliation Act, 1996
(d) Legal Services Authorities Act, 1987

Q11. On which of the following dates did Prime Minister Narendra Modi address the 78th Session of the World Health Assembly held in Geneva?

(a) 12 May 2025
(b) 20 April 2025
(c) 12 April 2025
(d) 20 May 2025

Q12. At the 2025 ceremony held at the European Parliament, which movie was honoured with the LUX Audience Award?

(a) Emilia Pérez
(b) Anora
(c) The Brutalist
(d) Flow

Q13. Which of the following Biosphere Reserves is located in Tamil Nadu?

(a) Gulf of Mannar Biosphere Reserve
(b) Dibru-Saikhowa Biosphere Reserve
(c) Seshachalam Biosphere Reserve
(d) Sundarbans Biosphere Reserve

Q14. Celebrated Urdu poet and bollywood writer-director Gulzar was honoured with which of the following awards in 2025?

(a) Jnanpith Award
(b) Padma Vibhushan
(c) Padma Shri
(d) Padma Bhushan

Q15. The Supreme Court's doctrine of 'Basic Structure' (the Parliament CANNOT alter the basic features of the Constitution) was first established in which landmark case?

(a) Shankari Prasad vs Union of India (1951)
(b) Kesavananda Bharati vs State of Kerala (1973)

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(c) IC Golaknath vs State of Punjab (1967)
(d) Minerva Mills vs Union of India (1980)

Q16. The 'Atmanirbhar Oil Seeds Abhiyan' launched in Budget 2025 focuses on:
(a) exporting surplus oil seeds
(b) achieving self-sufficiency in oilseed production
(c) subsidising edible oil prices
(d) importing high-quality seeds for oil production

Q17. The Chhatrapati Shivaji Terminus is a prime example of which of the following types of architectural style?
(a) Pure Mughal
(b) Indo-Saracenic
(c) Dravidian
(d) Gothic alone

Q18. At the time of colonial period, the Asaf Jahi dynasty was established in _____.
(a) Punjab
(b) Hyderabad
(c) Bengal
(d) Mysore

Q19. Which initiative, launched by the Indian Cyber Crime Coordination Centre (I4C) under the Ministry of Home Affairs, aims to facilitate rapid action against cybercriminals?
(a) Digital India Cyber Shield
(b) Cyber Suraksha Abhiyan
(c) e-Zero FIR
(d) National Cyber Safety Net

Q20. Which of the following abbreviations is correctly matched with its meaning?
(a) ASCII – Automated System for Computer Input
(b) LAN – Large Area Network
(c) CD – Compact Disc
(d) LAN – Local Area Node

Q21. Who was declared the Emperor of India by the revolting sepoys during the 1857 uprising?
(a) Akbar II
(b) Shah Alam II
(c) Bahadur Shah II
(d) Aurangzeb

Q22. The Directive Principles of State Policy aim to establish:
(a) a welfare state
(b) a capitalist state
(c) a police state
(d) a democratic dictatorship

Q23. Which Ministry is primarily responsible for implementing most rural development schemes in India?
(a) Ministry of Social Justice and Empowerment
(b) Ministry of Agriculture and Farmers Welfare
(c) Ministry of Panchayati Raj
(d) Ministry of Rural Development

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Q24. What was the theme of National Technology Day celebrated in India in May 2025?

(a) Towards a Self-Reliant India through Science and Technology
(b) Powering India through Innovation and Research
(c) Digital India: Empowering Through Smart Technologies
(d) YANTRA – Yugantar for Advancing New Technology, Research & Acceleration

Q25. Post-independence, India adopted a planned approach to build a mixed economy. Which sector was given top priority under the First Five-Year Plan?

(a) Agriculture
(b) Tertiary
(c) Defence
(d) Industry

Q26. India developed its first indigenous Magnetic Resonance Imaging (MRI) machine, set to be installed at _____.

(a) All Indian Institute of Medical Sciences, Nagpur
(b) All Indian Institute of Medical Sciences, Bhopal
(c) All Indian Institute of Medical Sciences, Raipur
(d) All Indian Institute of Medical Sciences, Delhi

Q27. Which of the following officials toured Mauryan provinces every five years to inspect administration and submit reports on provincial governance?

(a) Rajuka
(b) Pradeshika
(c) Nagarika
(d) Amatya

Q28. Which of the following is an example of a tertiary activity?

(a) Manufacturing
(b) Mining
(c) Teaching
(d) Farming

Q29. The All India Services in India are created under which Article of the Constitution?

(a) Article 320
(b) Article 312
(c) Article 206
(d) Article 107

Q30. Which of the following is a multipurpose river valley project?

(a) Damodar Valley Project
(b) Sharda Canal
(c) Agra Canal
(d) Indira Gandhi Canal

Q31. Which of the following characteristics is true about the Northern Plains?

(a) Presence of volcanic plateaus
(b) Densely populated due to fertile soil
(c) High elevation with steep slopes
(d) Low fertility due to rocky terrain

Q32. Which of the following was one of the last princely states to join the Indian Union?

(a) Mysore
(b) Jodhpur
(c) Hyderabad
(d) Travancore

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Q33. Which water bodies flank the Peninsular Plateau on the east and west?

(a) Bay of Bengal and Arabian Sea
(b) Bay of Bengal and Indian Ocean
(c) Indian Ocean and Arabian Sea
(d) Arabian Sea and Andaman Sea

Q34. What is the term of office for the President of India?

(a) 5 years
(b) Until removed by Parliament
(c) 6 years
(d) 4 years

Q35. In the realm of cinema, documentaries are characterised by:

(a) focusing on fictional suspense
(b) fabricated storylines
(c) presenting real-world content for learning or leisure
(d) aiming to communicate about mythological characters

Q36. Who among the following represented India in the 11th BRICS Environment Ministers Summit, 2025?

(a) Bhupendra Yadav
(b) S Jai Shankar
(c) Amandeep Garg
(d) Amit Shah

Q37. Which major initiative was approved by the Indian government in May 2025 to strengthen the country's defence capabilities?

(a) Establishment of new army divisions along the northern border
(b) Acquisition of new aircraft carriers
(c) Development of a fifth-generation twin-engine stealth fighter jet
(d) Deployment of nuclear submarines in the Indian Ocean

Q38. The Defence Ministry's planned order for 500 Invar anti-tank guided missiles—valued at Rs. 2,000–3,000 crore—will be placed with which defence Public Sector Unit (PSU)?

(a) Bharat Dynamics Limited
(b) Armoured Vehicles Nigam Ltd.
(c) Bharat Electronics Limited
(d) Garden Reach Shipbuilders & Engineers Ltd.

Q39. Which weathering process involves the peeling of rock layers due to temperature variations?

(a) Frost action
(b) Exfoliation
(c) Solution
(d) Oxidation

Q40. Which of the following states introduced India's first AI Anchor Ankita in a regional language in May 2025?

(a) Madhya Pradesh
(b) Assam
(c) Tamil Nadu
(d) Kerala

MATHEMATICS

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Q41. A can lay railway track between two given stations in 20 days and B can do the same job in 12 days. With the help of C, they did the job in 2 days only. Then, C alone can do the job in

(a) 48/11 days
(b) 118/11 days
(c) 98/11 days
(d) 28/11 days

Q42. The value of √324+√0.0324-√8.41 is _____.

(a) 10.83
(b) 16.61
(c) 6.97
(d) 15.28

Q43. A customer buys two products, each product being worth Rs. 350, with a “buy one get one 30% off” deal. What is the total amount paid by the customer?

(a) Rs. 595
(b) Rs. 490
(c) Rs. 560
(d) Rs. 455

Q44. The ratio of two numbers is 5 : 6 and their HCF is 7. Find their LCM.

(a) 35
(b) 210
(c) 42
(d) 84

Q45. X, Y and Z invested a sum in the ratio of 58 : 72 : 20, respectively. If they earned a total profit of Rs. 3,750 at the end of the year, what is the difference between the shares of Y and Z?

(a) Rs. 1,300
(b) Rs. 1,404
(c) Rs. 1,231
(d) Rs. 1,254

Q46. Which of the following numbers divide 862026417?

(a) 6
(b) 5
(c) 7
(d) 11

Q47. The value of 2/5+(1/(1+5/7))-2/5 is

(a) 2/7
(b) 10/17
(c) 7/12
(d) 14/13

Q48. If cotA + cosA = p, cotA - cosA = q, then what is the value of $p^2 - q^2$?

(a) 4 √PQ
(b) 3 √PQ
(c) 2 √PQ
(d) √PQ

Q49. A bag is marked at Rs. 2,000. A shopkeeper offers two successive discounts of 10% and 5%. What is the final price the customer pays?

(a) Rs. 1,710
(b) Rs. 1,700

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(c) Rs. 1,800
(d) Rs. 1,750

Q50. Simplify $x(5x - 9) + 7(x^2 - 2) + 17$.
(a) $12x^2 - 9x - 3$
(b) -12x2 − 9x + 3
(c) 12x2 − 9x + 3
(d) -12x2 − 9x − 3

Q51. If the radius of the base of a right circular cylinder is decreased by 27% and its height is increased by 165%, then what is the percentage increase (closest integer) in its volume?
(a) 20%
(b) 48%
(c) 41%
(d) 36%

Q52. Find the volume of a cylinder with radius 5 cm and height 21 cm (Use $\pi = 22/7$)
(a) 1200 cm^3
(b) 1650 cm3
(c) 1500 cm3
(d) 1320 cm3

Q53. The sum of five numbers is 655. The average of the first two numbers is 80 and the third number is 107. Find the average of the remaining two numbers.
(a) 188
(b) 187
(c) 195
(d) 194

Q54. A trader claims to sell wheat at a profit of 29%, but also dishonestly uses a weight which is 30% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round off the answer to the nearest whole number.)
(a) 79%
(b) 84%
(c) 86%
(d) 87%

Q55. A bus travelling at 86 km/hr completes a journey in 7 hours. What should be its speed to cover the same distance in 14 hours?
(a) 43 km/hr
(b) 53 km/hr
(c) 35 km/hr
(d) 42 km/hr

Q56. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 3% per month in 6 months.
(a) 38
(b) 18
(c) 216
(d) 36

Q57. A number, when increased by 60%, gives 3590. The number is:
(a) 1121.875
(b) 2243.75
(c) 4487.5
(d) 6731.25

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Q58. The difference between the lengths of two parallel sides of a trapezium is 6 cm. The perpendicular distance between them is 24 cm. If the area of the trapezium is 648 cm², then what is the length of the parallel sides?

(a) 28 cm, 22 cm
(b) 30 cm, 24 cm
(c) 36 cm, 30 cm
(d) 23 cm, 29 cm

Q59. The average of first 172 even numbers is

(a) 174
(b) 173.5
(c) 172.5
(d) 173

Q60. Ashish bought some rulers at the rate of Rs. 180/dozen. He sold them for Rs. 24 each. His profit percentage is _____%.

(a) 58
(b) 60
(c) 62
(d) 64

Q61. Isha can do a certain piece of work in 24 days. Isha and Smriti can together do the same work in 20 days, and Isha, Smriti and Ashlesha can do the same work together in 12 days. In how many days can Isha and Ashlesha do the same work together?

(a) 35/4
(b) 40/3
(c) 41/3
(d) 30/5

Q62. In an election between two candidates, 80% of the registered voters cast their vote and 21% of the votes polled were found invalid. The winning candidate got 51% of the valid votes and won the election by a margin of 1817 votes. How many voters were registered?

(a) 143750
(b) 143753
(c) 143751
(d) 143752

Q63. Rs. 42,100 were divided among A, B and C such that 8 times the share of A = 3 times the share of B = 6 times the share of C. Find the share of A.

(a) Rs. 8,278
(b) Rs. 8,360
(c) Rs. 8,420
(d) Rs. 8,538

Q64. If the third proportional of 4 and 16 be x, then what is the value of x?

(a) 62
(b) 67
(c) 66
(d) 64

Q65. Daksh travels 774 km at 86 km/hr, the next 567 km at 63 km/hr and the next 135 km at 27 km/hr. What is his average speed (in km/hr, rounded off to two decimal places) for the whole journey?

(a) 70.24
(b) 70.02
(c) 64.17
(d) 63.06

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Q66. Evaluate 74^2.

(a) 5456
(b) 5526
(c) 5486
(d) 5476

Q67. If the interest earned during the 2nd year on a certain sum is Rs. 5,520, and the rate of interest is 20% per annum compounded annually, then the sum is:

(a) Rs. 22,875
(b) Rs. 23,000
(c) Rs. 23,405
(d) Rs. 22,695

Q68. The product of two positive numbers is 9245. If the first number is five times of the second number, then the sum of the two numbers is:

(a) 269
(b) 266
(c) 258
(d) 257

Q69. Six times the present age of P exceeds the present age of Q by 46 years. After 10 years, six times Q's age will be 18 years less than five times P's age at that time. What is the present age of Q (in years)?

(a) 1
(b) 2
(c) 6
(d) 5

Q70. The number 934725 is divisible by which of the following?

(a) 6
(b) 3
(c) 2
(d) 10

GENERAL INTELLIGENCE AND REASONING

Q71. 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) ZR - FN
(b) HO - MK
(c) BV - GR
(d) YD - DZ

Q72. What should come in place of the question mark (?) in the given series?

657 660 665 672 681 ?

(a) 690
(b) 691
(c) 693
(d) 692

Q73. R is the sister of C. C is the sister of B. B is the father of A. A is the daughter of G. How is R related to G?

(a) Husband's mother
(b) Sister
(c) Husband's sister

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(d) Mother

Q74. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All bats are stick.

All bamboo is stick.

Conclusions:

(I): Some bats are bamboo.

(II): Some sticks are bamboo.

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

Q75. Seven boxes F, G, H, I, K, L, and O are kept one over the other but not necessarily in the same order. O is kept immediately above F. G is kept immediately above I. Only K is kept above L. Only two boxes are kept above O. G is not kept at the third position from the bottom.

How many boxes are kept between H and K?

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

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

(Left) / / 9 3 * > * ? 5 6 2 # 3 ^ 4 + 6 < + (Right)

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

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

Q77. What should come in place of the question mark (?) in the given series?

31 58 94 139 193 ?

(a) 272
(b) 263
(c) 281
(d) 256

Q78. IMJI is related to GKHG in a certain way based on the English alphabetical order. In the same way, FJGF is related to DHED. To which of the given options is XBYX related, following the same logic?

(a) VZVV
(b) VAVX
(c) VYVV
(d) VZWV

Q79. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 5237894, what will be difference between the highest and lowest digits in the number thus formed?

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

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(d) 9

Q80. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

LTB 83, OWE 74, RZH 65, UCK 56, XFN 47, ?

(a) AMQ 36
(b) BIQ 42
(c) AIO 40
(d) AIQ 38

Q81. Vimal ranked 29th from the top and 24th from the bottom in his class. How many students are there in his class?

(a) 54
(b) 52
(c) 53
(d) 51

Q82. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

GOF : IQE

SNG : UPF

(a) NNL : PQK
(b) QUK : SXJ
(c) QRQ : STR
(d) ELM : GNL

Q83. What should come in place of the question mark (?) in the given series?

6 13 27 48 76 ?

(a) 100
(b) 109
(c) 105
(d) 111

Q84. 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 to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(28, 140, 5)

(41, 533, 13)

(a) (44, 355, 8)
(b) (1, 25, 22)
(c) (35, 735, 21)
(d) (25, 103, 4)

Q85. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

All prints are banners.

All prints are flexes.

Conclusions:

(I) Some banners are flexes.

(II) All flexes are prints.

(a) Only conclusion (I) follows.
(b) Both conclusions (I) and (II) follow.

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

Q86. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster 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) SOK
(b) QKG
(c) EAW
(d) RNJ

Q87. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster 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) QWS
(b) NTP
(c) TZU
(d) KQM

Q88. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

42 + 75 × 3 − 11 ÷ 3 = ?

(a) 43
(b) 23
(c) 32
(d) 50

Q89. Six friends Q, R, S, T, U and V are sitting around a circular table, facing the centre. S sits third to the right of V. V sits second to the left of Q. U sits to the immediate left of R. Who sits to the immediate right of S?

(a) R
(b) T
(c) U
(d) Q

Q90. In the following triad, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

SINK - ISNK - KISN

PLAY - LPAY - YLPA

(a) HOLD - OHLD - DOHL
(b) CLAY - LCAY - LAYC
(c) MARK - MRAK - KRAM
(d) DINE - IDNE - EIND

Q91. If 'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−', then what will come in place of the question mark (?) in the following equation?

25 A 5 D 10 B 3 C 42 = ?

(a) 24
(b) 14
(c) 21
(d) 17

Q92. In a certain code language, 'GLUE' is coded as '2475' and 'UNIT' is coded as '1536'. What is the code for 'U' in that language?

(a) 1
(b) 3

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(c) 5
(d) 7

Q93. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

XSW TOS PKO LGK ?

(a) HCG
(b) HCF
(c) HBG
(d) HBF

Q94. Town P is to the north of town Q. Town Q is to the east of town R. Town T is to the north of town P. Town S is to the east of town P. What is the position of town S with respect to town Q?

(a) Northeast
(b) North
(c) Southeast
(d) Northwest

Q95. This question is based on the five, three-digit numbers given below.

(Left) 731 890 923 286 378 (Right)

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

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

In how many numbers is the sum of the 1st and 3rd digits greater than the 2nd digit?

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

Q96. Younis starts from Point A and drives 17 km towards East. He then takes a left turn, drives 6 km, turns right and drives 11 km. He then takes a right turn and drives 6 km. He takes a final right turn, drives 2 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 29 km towards East
(b) 29 km towards West
(c) 26 km towards North
(d) 26 km towards West

Q97. A, B, C, D, Q, R and S are sitting around a circular table facing the centre of the table. Only two people sit between Q and B when counted from the right of Q. Only three people sit between A and C when counted from the right of C. B sits to the immediate right of C. R sits to the immediate right of S.

Who sits fourth to the right of D?

(a) S
(b) C
(c) A
(d) R

Q98. Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

No box is kept above W. Only three boxes are kept between W and F. Only one box is kept between E and V. V is kept immediately above F. Only four boxes are kept between E and X. G is kept at some place above U. Which box is kept second below G?

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

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Q99. In a certain code language, 'are you hungry' is written as 'mk tk jb' and 'you came early' is coded as 'cd ab mk'. How is 'you' coded in the given language?

(a) jb
(b) tk
(c) mk
(d) jt

Q100. If 1 is added for each odd digit and 1 is subtracted from each even digit of the number 86435621, how many digits are repeated more than once in the new number thus formed?

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

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) 2014

The Correct answer is 2014.

Key Points

• The Make in India initiative was launched on 25th September 2014 by the Government of India.
• This program was introduced by the Prime Minister of India, Narendra Modi, to transform India into a global manufacturing hub.
• The initiative aims to encourage companies to manufacture their products in India and incentivize dedicated investments into the manufacturing sector.
• The campaign focuses on job creation, skill development, and boosting domestic manufacturing.
• It targets various sectors, including automobiles, textiles, chemicals, IT, aviation, pharmaceuticals, and electronics, among others.
• Under this initiative, the government has simplified regulations and policies to attract both domestic and foreign investments.
• The campaign introduced initiatives like liberalization of FDI policy, ease of doing business, and improving infrastructure.
• The Make in India logo features a lion made of cogs, representing manufacturing strength and national pride.

Additional Information

• 2012
• This option is incorrect as the Make in India initiative was launched two years later, in 2014.
• 2016
• This year is incorrect as it marks two years after the official launch of the Make in India campaign.
• 2018
• Although this year witnessed further developments under the Make in India initiative, the campaign was originally launched in 2014.

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Q2. Answer: (b) PROM

The Correct answer is PROM.

Key Points

• PROM stands for Programmable Read-Only Memory.
• This type of ROM can be programmed only once after manufacturing.
• Once the data is written into a PROM, it becomes permanent and cannot be modified or erased.
• The programming of a PROM is done using a special device called a PROM programmer.
• PROMs are widely used in applications where the data needs to be permanently stored and protected from accidental changes.
• Unlike EEPROM or EPROM, a PROM does not allow reprogramming or erasing.
• It is typically used for storing firmware or software instructions in embedded systems.

Additional Information

• EEPROM
• EEPROM stands for Electrically Erasable Programmable Read-Only Memory.
• It allows data to be erased and rewritten multiple times using electrical signals.
• EEPROM is widely used in devices requiring frequent updates, such as microcontrollers and BIOS chips.
• It is slower compared to flash memory but provides more precise control over data erasure and writing.
• Mask ROM
• Mask ROM is a type of ROM where data is permanently written during the manufacturing process.
• It is not programmable by the user and is used for fixed data storage, such as in video game cartridges.
• Mask ROM is highly reliable but lacks flexibility since the data cannot be altered after production.
• EPROM
• EPROM stands for Erasable Programmable Read-Only Memory.
• Data written in an EPROM can be erased by exposing the chip to ultraviolet light.
• It is reusable, making it suitable for applications requiring periodic updates.
• EPROM chips have a transparent window through which the UV light is directed for erasing the data.

Q3. Answer: (b) Sriharikota

The correct answer is Sriharikota.

Key Points

• Sriharikota is a barrier island located in the state of Andhra Pradesh, India.
• It houses the Satish Dhawan Space Centre (SDSC), which is the primary launch site for the Indian Space Research Organisation (ISRO).
• The site is crucial for India's space exploration programs, serving as the launch base for satellites into orbit.
• Sriharikota is strategically located near the Bay of Bengal, allowing rockets to be launched eastward, which is the most efficient direction for satellite deployment.
• The launch site has multiple launch pads, including Launch Pad 1 and Launch Pad 2, used for a variety of missions, including PSLV, GSLV, and GSLV Mk III rockets.
• The 100th space launch conducted at Sriharikota marked a milestone in India's space exploration history.
• The site has been instrumental in sending satellites for communication, navigation, earth observation, and scientific purposes.
• Sriharikota underscores India’s growing prominence in space technology and its ability to compete globally.

Additional Information

• Chitradurga
• Chitradurga is a city located in the state of Karnataka, India.
• It is known for its historical significance and the Chitradurga Fort, but it is not a space launch site.
• Chandipur
• Chandipur is located in the state of Odisha, India.
• It is famous for being a missile testing range operated by the Defence Research and Development Organisation (DRDO).
• It is not associated with ISRO launches.
• Hassan
• Hassan is a city in the state of Karnataka, India.
• It is home to a Master Control Facility (MCF) operated by ISRO, which is used for satellite monitoring and control.
• However, it does not serve as a launch site for rockets or satellites.

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Q4. Answer: (b) Goa

The Correct answer is Goa.

Key Points

• Goa declared 100% literacy under the ULLAS Nav Bharat Literacy Programme on 30 May 2025.

• The state achieved this milestone by surpassing its earlier Periodic Labour Force Survey (PLFS)-recorded literacy rate.

• The ULLAS Nav Bharat Literacy Programme is a nationwide scheme aimed at enhancing literacy levels across India.

• Goa's efforts in literacy can be attributed to its strong focus on education policies, community engagement, and efficient implementation of the programme.

• The state has consistently been among the best-performing states in terms of human development indices, including education.

• The declaration aligns with Goa's vision to provide inclusive and accessible education to all citizens, fostering socio-economic development.

Additional Information

• Kerala

• Kerala is renowned for its high literacy rate and has been a model state in terms of educational achievements in India.

• The state's literacy rate has consistently been among the highest in India due to its emphasis on education policies and social welfare programmes.

• Kerala was the first state in India to achieve 100% primary education.

• Himachal

• Himachal Pradesh has made significant progress in literacy and education, particularly in rural areas.

• The state focuses on initiatives like inclusive education programmes, especially for marginalized groups.

• Himachal Pradesh has achieved notable success in reducing the gender gap in literacy.

• Sikkim

• Sikkim is one of the smaller states in India, known for its efforts to enhance literacy and education.

• The state has implemented several programmes aimed at promoting education in remote and tribal areas.

• Sikkim's literacy drive is complemented by its focus on environmental education and sustainable practices.

Q5. Answer: (a) Kolbe's reaction

The correct answer is Kolbe's reaction.

Key Points

• Kolbe's reaction is a chemical process that is primarily used to synthesize salicylic acid, also known as ortho-hydroxybenzoic acid.

• This reaction involves the carboxylation of phenolates (sodium phenoxide) with carbon dioxide under high pressure and moderate temperature.

• The reaction is widely used in the pharmaceutical industry for the production of salicylic acid, which serves as a precursor for medications like aspirin.

• In this reaction, sodium phenoxide reacts with CO_2 to form sodium salicylate, which is then acidified to yield salicylic acid.

• It demonstrates the practical application of organic synthesis in creating an essential compound for drug manufacturing.

• This reaction is cost-effective and a preferred method for producing ortho-hydroxybenzoic acid on an industrial scale.

Additional Information

• Stephen reaction

• The Stephen reaction is used to synthesize aldehydes from nitriles by reducing them with tin chloride ($SnCl_2$) and hydrochloric acid.

• This reaction is not related to the production of ortho-hydroxybenzoic acid.

• It is primarily utilized in the synthesis of simple aldehydes in organic chemistry.

• Reimer-Tiemann reaction

• The Reimer-Tiemann reaction is used to synthesize ortho-hydroxybenzaldehyde, not ortho-hydroxybenzoic acid.

• It involves the reaction of phenol with chloroform ($CHCl_3$) in the presence of a strong base, such as sodium hydroxide.

• The reaction is specifically used in the preparation of aromatic aldehydes.

• Friedel-Crafts reaction

• The Friedel-Crafts reaction is used for the alkylation or acylation of aromatic compounds using a Lewis acid catalyst such as $AlCl_3$.

• This reaction is not applicable for the synthesis of ortho-hydroxybenzoic acid.

• It is commonly used in organic chemistry to create aromatic ketones and hydrocarbons.

Q6. Answer: (d) Ralph H Fowler

The correct answer is Ralph H. Fowler.

Key Points

• Ralph H. Fowler, a British physicist, first proposed the law of thermal equilibrium in 1931, which is known as the Zeroeth Law of Thermodynamics.

• The Zeroeth Law of Thermodynamics states that if two systems are each in thermal equilibrium with a third system, then they are in thermal equilibrium with each other.

• This law established the concept of temperature as a fundamental and measurable quantity.

• It plays a critical role in defining the basis for temperature measurement and classification of thermodynamic systems.

• The Zeroeth Law is essential for the proper functioning of thermometers, as it ensures that temperature readings are consistent across different systems.

• Ralph H. Fowler made significant contributions to statistical mechanics, thermodynamics, and astrophysics during his career.

Additional Information

• Hugh L. Callendar

• Hugh Longbourne Callendar was a British physicist known for his work on the properties of steam and on thermometry.

• He developed the Callendar Steam Tables, which provided detailed data on the thermodynamic properties of water and steam.

• He also invented the Callendar Electrical Resistance Thermometer for highly accurate temperature measurements.

• James P. Espy

• James Pollard Espy was an American meteorologist known as the "Storm King" for his studies on the formation and behavior of storms.

• He made significant contributions to the understanding of atmospheric thermodynamics and weather prediction.

• Espy's work focused on the processes of condensation and latent heat release in storm systems.

• Rudolf Clausius

• Rudolf Clausius was a German physicist and mathematician, one of the founders of modern thermodynamics.

• He introduced the concept of entropy and formulated the Second Law of Thermodynamics.

• Clausius's work laid the foundation for the study of energy transformation and the directionality of processes.

Q7. Answer: (d) 20 Hz

The Correct answer is 20 Hz.

Key Points

• Infrasound refers to sound waves that have frequencies below the audible range of human hearing, typically less than 20 Hz.

• An infrasound microphone is specifically designed to detect these low-frequency sound waves, which are often associated with natural and man-made phenomena.

• These microphones are used in monitoring and detecting events such as aircraft wake vortices, clear air turbulence, tornadoes, and seismic activities.

• Infrasound detection is crucial for applications like aviation safety, weather forecasting, and earthquake monitoring.

• Frequencies below 20 Hz are ideal for detecting infrasound because they can travel long distances and bypass obstacles like mountains and buildings.

• Such low-frequency waves are also used in scientific research to study phenomena like volcanic eruptions and meteor impacts.

Additional Information

• 30 Hz

• 30 Hz is above the infrasound range and falls within the audible range of human hearing.

• This frequency range is not suitable for detecting phenomena like tornadoes or seismic activities, as these events produce much lower frequencies.

• 10 Hz

• 10 Hz is within the infrasound range but does not cover the full spectrum of infrasound detection used for various applications like aircraft wake vortices.

• 5 Hz

• 5 Hz is within the infrasound range but is not widely applicable for detecting all phenomena like clear air turbulence or seismic activities.

Q8. Answer: (d) Improvement in life expectancy

The Correct answer is Improvement in life expectancy.

Key Points

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• India’s economic reforms of 1991 marked a significant shift towards liberalization, privatization, and globalization.

• These reforms contributed to the enhancement of social development indicators, including an improvement in life expectancy.

• Life expectancy is the average number of years a person is expected to live based on prevailing mortality rates.

• Due to economic reforms, there was a significant increase in healthcare investments, infrastructure, and access to medical facilities, leading to better healthcare services.

• Improved access to resources, healthcare, sanitation, and education directly impacted the quality of life and longevity of individuals.

• India’s life expectancy increased from around 57 years in 1991 to approximately 70 years by 2023 (as per global statistics).

• Economic growth also contributed to poverty reduction, improving nutrition and access to essential services, which positively impacted life expectancy.

• Several government initiatives, such as the National Health Mission, focus on improving healthcare facilities in rural and urban areas, further boosting life expectancy.

Additional Information

• Increase in poverty rate

• Post the economic reforms, the poverty rate in India has shown a declining trend rather than an increase.

• The reforms led to improved economic opportunities, job creation, and higher incomes for many sections of society.

• Programs like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and targeted subsidies have contributed to poverty alleviation.

• Widening of fiscal deficit

• The fiscal deficit refers to the difference between the government’s total expenditure and its total revenue (excluding borrowings).

• While economic reforms initially led to an increase in fiscal deficit due to liberalization measures, subsequent reforms focused on fiscal consolidation and reducing deficits.

• Efforts like the Fiscal Responsibility and Budget Management (FRBM) Act were introduced to manage fiscal deficit effectively.

• Decrease in literacy rate

• Contrary to the option, India’s literacy rate has significantly improved post-1991 economic reforms.

• Government schemes like Sarva Shiksha Abhiyan and Right to Education (RTE) aimed at universalizing education contributed to an increase in literacy rates.

• The literacy rate in India rose from around 52% in 1991 to approximately 77% by 2023 (as per various reports).

Q9. Answer: (c) Lord Mountbatten

The Correct answer is Lord Mountbatten.

Key Points

• Lord Mountbatten was the last Viceroy of India, serving from February 1947 to August 1947.

• He was appointed to oversee the transition of India from British rule to independence.

• During his tenure, he played a significant role in the partition of India into two nations: India and Pakistan.

• The partition was accompanied by large-scale communal violence and displacement of millions of people.

• Mountbatten's plan for independence was known as the Mountbatten Plan, which outlined the division of the country based on religious lines.

• India achieved independence on 15 August 1947, marking the end of British rule in India.

• Lord Mountbatten became the first Governor-General of independent India, serving from August 1947 to June 1948.

• He was closely involved in discussions with Indian leaders such as Jawaharlal Nehru, Sardar Vallabhbhai Patel, and Muhammad Ali Jinnah during the partition process.

Additional Information

• Pethick Lawrence

• Frederick Pethick-Lawrence was a British politician and a member of the Cabinet Mission sent to India in 1946.

• The Cabinet Mission aimed to discuss the transfer of power and devise a plan for India's independence.

• Pethick Lawrence was the Secretary of State for India at that time.

• He was not the last Viceroy but played a role in earlier discussions regarding India's future.

• Lord Cripps

• Sir Stafford Cripps was a British politician who led the Cripps Mission to India in 1942 during World War II.

• The mission proposed a plan for Indian self-government, which was rejected by Indian leaders.

• He was not involved in the partition of India but in earlier attempts to negotiate independence.

• Lord Wavell

• Lord Wavell was the Viceroy of India from 1943 to 1947, prior to Lord Mountbatten.

• He organized the Simla Conference in 1945 to discuss India's political future but failed to reach a consensus.

• Wavell's tenure saw the Bengal famine of 1943 and significant political turmoil.

• He was replaced by Lord Mountbatten in February 1947 as British leaders felt a change was needed to ensure a smooth transition to independence.

Q10. Answer: (d) Legal Services Authorities Act, 1987

The Correct answer is Legal Services Authorities Act, 1987.

Key Points

• The Legal Services Authorities Act, 1987 provides the legal framework for establishing Lok Adalats in India.

• Lok Adalats are also known as "People's Court", which aim to provide inexpensive and expeditious justice.

• This Act ensures the speedy resolution of disputes and promotes the concept of amicable settlement.

• Under the Act, the decisions made by Lok Adalats are treated as final and binding on the parties involved.

• The Act empowers the Lok Adalats to deal with cases related to civil, matrimonial, land, and labour disputes, among others.

• Lok Adalats function under the supervision of the National Legal Services Authority (NALSA) and various State Legal Services Authorities.

• The Act guarantees legal aid to weaker sections of society, ensuring equal access to justice.

Additional Information

• Indian Penal Code, 1860

• The Indian Penal Code (IPC) is the main criminal code of India.

• It deals with crimes and penalties but does not address alternative dispute resolution mechanisms like Lok Adalats.

• It was enacted during British rule and is still in use with several amendments.

• Civil Procedure Code, 1908

• The Civil Procedure Code (CPC) governs the procedures for adjudication of civil cases in India.

• It does not specifically establish Lok Adalats, but it provides mechanisms for amicable resolution of disputes like mediation.

• Arbitration and Conciliation Act, 1996

• This Act governs arbitration and conciliation proceedings in India.

• While it provides a framework for alternative dispute resolution, it is distinct from Lok Adalats and does not provide the legal status of Lok Adalats.

• It focuses primarily on commercial disputes and private arbitration.

Q11. Answer: (d) 20 May 2025

The Correct answer is Tue May 20 2025 00:00:00 GMT+0530 (India Standard Time).

Key Points

• The 78th Session of the World Health Assembly is an important event in global health governance held in Geneva, Switzerland.

• The World Health Assembly is the decision-making body of the World Health Organization (WHO), consisting of representatives from all member states.

• Prime Minister Narendra Modi addressed the assembly on May 20, 2025, emphasizing India's contributions to global health initiatives.

• During the speech, the Prime Minister highlighted India's efforts in combating COVID-19, improving public health infrastructure, and promoting universal health coverage.

• India has played a significant role in the production and distribution of vaccines, especially during the pandemic, which was acknowledged globally.

• The World Health Assembly focuses on key health-related issues such as pandemic preparedness, strengthening health systems, and addressing emerging challenges in global health.

• India's leadership in health-related policies and initiatives, including programs like Ayushman Bharat, was discussed in the session.

• The event also serves as a platform to discuss funding, priorities, and strategies for achieving health-related Sustainable Development Goals (SDGs).

Additional Information

• World Health Assembly

• The World Health Assembly (WHA) is held annually and serves as a platform for member states to discuss public health policies.

• It is attended by health ministers, policymakers, and representatives from various countries.

• Topics discussed include global health emergencies, disease prevention, and health financing.

• The WHA works in accordance with WHO's constitution and aims to improve public health globally.

• Narendra Modi's Contributions

• Prime Minister Narendra Modi has prioritized healthcare reforms in India, including the launch of Ayushman Bharat, the world's largest healthcare program.

• His government has actively promoted traditional medicine and supported research in Ayurveda and Yoga.

• Under his leadership, India became one of the leading exporters of COVID-19 vaccines, contributing to global immunization efforts.

Q12. Answer: (d) Flow

The Correct answer is Flow.

Key Points

• Flow was honoured with the LUX Audience Award at the 2025 ceremony held at the European Parliament.

• The LUX Audience Award is a prestigious recognition given to films that resonate with both critics and the audience, promoting European cinema and its cultural significance.

• The ceremony aims to highlight films that address social, political, and environmental issues relevant to Europe and the world.

• Flow, as a recipient, indicates its impactful narrative and relevance to the audience's concerns and interests.

• This award is part of the European Parliament's initiative to foster diverse storytelling and promote awareness of critical societal topics.

• The event is significant for European filmmakers, offering recognition and exposure to a broader international audience.

Additional Information

• Emilia Pérez

• Emilia Pérez is a film known for its entertainment focus and fictional storytelling.

• It is not directly associated with addressing societal or political issues, which are often highlighted by the LUX Audience Award.

• Anora

• Anora is another notable movie but did not gain recognition in the LUX Audience Award category for 2025.

• It may focus on different themes or genres that did not align with the criteria for the award.

• The Brutalist

• The Brutalist is a film that explores artistic or architectural themes.

• While it might have critical acclaim, it did not receive the LUX Audience Award in 2025.

Q13. Answer: (a) Gulf of Mannar Biosphere Reserve

The Correct answer is Gulf of Mannar Biosphere Reserve.

Key Points

• The Gulf of Mannar Biosphere Reserve is located in the state of Tamil Nadu, India.

• It was established in 1989 and is one of the first biosphere reserves in India.

• The reserve covers an area of approximately 10,500 square kilometers and includes 21 small islands and adjacent coral reefs.

• The Gulf of Mannar Biosphere Reserve is recognized for its rich marine biodiversity, including species of coral, fish, and sea turtles.

• This area is also home to dugongs, also known as sea cows, which are an endangered species.

• The reserve is part of the Ramsar Convention, which aims to conserve wetlands of international importance.

• It plays a crucial role in protecting coastal ecosystems and promoting sustainable development.

• The Gulf of Mannar Biosphere Reserve is famous for its pearl banks, which have been historically significant for pearl fishing.

• The reserve supports various livelihood activities such as fishing, seaweed harvesting, and tourism.

Additional Information

• Dibru-Saikhowa Biosphere Reserve

• The Dibru-Saikhowa Biosphere Reserve is located in the state of Assam, India.

• It is primarily known for its semi-evergreen forests and grasslands.

• The reserve is home to a variety of endangered species, including the Bengal tiger, Gangetic dolphin, and clouded leopard.

• The reserve also hosts several migratory bird species, making it a popular birdwatching destination.

• Seshachalam Biosphere Reserve

• The Seshachalam Biosphere Reserve is located in Andhra Pradesh, India.

• It was designated as a biosphere reserve in 2010.

• This reserve is notable for its dry deciduous forests and red sanders trees, which are endemic to this region.

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• The area also has a significant religious importance due to the presence of the Tirumala Hills.
• Sundarbans Biosphere Reserve
• The Sundarbans Biosphere Reserve is located in the state of West Bengal, India.
• It is part of the world's largest mangrove forest and is home to the iconic Royal Bengal Tiger.
• The Sundarbans have been recognized as a UNESCO World Heritage Site.
• The reserve is crucial for its mangrove ecosystems, which act as a protective barrier against cyclones and floods.

Q14. Answer: (a) Jnanpith Award

The correct answer is Jnanpith Award.

Key Points

• The Jnanpith Award is one of the highest literary honors presented annually in India.
• It was instituted in 1961 by the Bharatiya Jnanpith organization.
• This award recognizes and honors authors for their contribution to literature in any of the 22 languages listed in the Eighth Schedule of the Indian Constitution.
• Celebrated Urdu poet and Bollywood writer-director Gulzar was bestowed with the Jnanpith Award for his exceptional contribution to Indian literature and poetry.
• Gulzar is known for his profound poetry, screenwriting, and lyric writing for Bollywood films.
• The award includes a cash prize, a citation, and a bronze replica of Goddess Saraswati.
• This recognition further highlights Gulzar's remarkable achievements in Urdu literature and his significant impact on the cultural and literary sphere of India.

Additional Information

• Padma Vibhushan
• The Padma Vibhushan is the second-highest civilian award in India.
• It is awarded for exceptional and distinguished service in various fields such as arts, literature, science, public affairs, etc.
• Instituted in 1954, it is given annually on the recommendation of the Padma Awards Committee.
• Padma Shri
• The Padma Shri is the fourth-highest civilian award in India.
• It recognizes individuals for their distinguished contributions to various fields such as arts, education, literature, sports, social work, etc.
• It was instituted in 1954, along with other Padma awards.
• Padma Bhushan
• The Padma Bhushan is the third-highest civilian award in India.
• It is awarded for distinguished service of a high order across various disciplines, including arts, literature, and public service.
• First instituted in 1954, it is conferred annually by the Government of India.

Q15. Answer: (b) Kesavananda Bharati vs State of Kerala (1973)

The Correct answer is Kesavananda Bharati vs State of Kerala (1973).

Key Points

• The Kesavananda Bharati case is considered one of the most significant constitutional cases in Indian history.
• It established the Basic Structure Doctrine, which holds that the Parliament cannot amend the Constitution in a way that destroys its fundamental features.
• The case was filed by Kesavananda Bharati, a religious leader from Kerala, challenging certain land reform laws enacted by the state.
• The Supreme Court ruled that while Parliament has the power to amend the Constitution under Article 368, this power is limited by the doctrine of basic structure.
• The judgment emphasized features like the sovereignty, democratic character, secularism, federalism, and independence of the judiciary as integral to the basic structure.
• This landmark judgment acted as a safeguard against misuse of constitutional amendment powers and preserved the essence of the Constitution.

Additional Information

• Shankari Prasad vs Union of India (1951)
• This case dealt with the validity of the First Amendment to the Constitution.
• The Supreme Court ruled that Parliament had the power to amend Fundamental Rights under Article 368.
• The case did not address the concept of the basic structure doctrine.

• IC Golaknath vs State of Punjab (1967)

• In this case, the Supreme Court ruled that Parliament could not amend Fundamental Rights.

• The judgment was later overturned in the Kesavananda Bharati case.

• This case paved the way for the debate that led to the basic structure doctrine.

• Minerva Mills vs Union of India (1980)

• This case reinforced the basic structure doctrine established in the Kesavananda Bharati case.

• The Supreme Court struck down amendments that violated the balance between Fundamental Rights and Directive Principles of State Policy.

• It further emphasized the limitations on Parliament's amending powers.

Q16. Answer: (b) achieving self-sufficiency in oilseed production

The Correct answer is achieving self-sufficiency in oilseed production.

Key Points

• The 'Atmanirbhar Oil Seeds Abhiyan' was launched as part of the Budget 2025 to enhance India's capability to meet domestic demand for oilseeds and reduce reliance on imports.

• This initiative focuses on achieving self-sufficiency in the production of oilseeds such as mustard, soybean, groundnut, and sunflower.

• The program aims to improve agricultural practices by promoting modern farming techniques and providing support to farmers through subsidies and training programs.

• India has been one of the largest importers of edible oils, and the initiative seeks to reduce import dependency by increasing domestic production.

• Farmers will be encouraged to cultivate oilseed crops by offering incentives such as minimum support prices (MSP) and financial assistance.

• It includes the adoption of high-yield varieties, improved irrigation systems, and soil health management to boost productivity.

• The program aligns with the vision of 'Atmanirbhar Bharat', which aims to make India self-reliant in critical sectors.

Additional Information

• Exporting surplus oil seeds

• India does not produce surplus oilseeds for export. Instead, it is a significant importer of edible oils like palm oil and soybean oil.

• Exporting surplus oilseeds would contradict the goal of achieving self-sufficiency in oilseed production.

• Subsidising edible oil prices

• Subsidising edible oil prices is a temporary measure to manage market fluctuations and does not address the root cause of dependency on imports.

• The focus of the initiative is on production enhancement, not price subsidies.

• Importing high-quality seeds for oil production

• While importing high-quality seeds may improve yields, the long-term goal of the program is to develop indigenous high-yield varieties and reduce external dependency.

• This option does not align with the self-reliance focus of 'Atmanirbhar Oil Seeds Abhiyan'.

Q17. Answer: (b) Indo-Saracenic

The correct answer is Indo-Saracenic.

Key Points

• The Indo-Saracenic style is an architectural style that emerged during the British colonial era in India, blending Indian, Islamic, and Gothic architectural elements.

• The Chhatrapati Shivaji Terminus, formerly known as Victoria Terminus, is an iconic railway station in Mumbai, Maharashtra.

• Designed by Frederick William Stevens, it is a UNESCO World Heritage Site and a prime example of Indo-Saracenic architecture.

• This style integrates features like domes, pointed arches, intricate carvings, and stained glass windows, with a strong influence of Gothic revival.

• The building features a blend of Indian craftsmanship with European techniques, showcasing highly ornate stonework and detailed sculptures.

• The architecture reflects the fusion of cultural identities during the colonial period, making it a landmark both historically and artistically.

• The station also serves as a significant symbol of the Indian railway network, one of the largest in the world.

Additional Information

• Pure Mughal

• The Mughal architectural style flourished during the Mughal Empire (16th-18th centuries) and is characterized by features like large domes, symmetrical gardens, and intricate marble designs.
• Examples include the Taj Mahal, Red Fort, and Jama Masjid.
• It does not include Gothic or European influences, making it distinct from the Indo-Saracenic style.
• Dravidian
• The Dravidian style is primarily seen in South Indian temples and is characterized by large gopurams (ornate gateway towers) and intricate carvings depicting gods, goddesses, and mythological scenes.
• Examples include temples like Brihadeeswarar Temple and Meenakshi Temple.
• This style is exclusive to religious structures and does not incorporate Gothic elements.
• Gothic alone
• Gothic architecture originated in Europe during the 12th century and is defined by features like pointed arches, ribbed vaults, flying buttresses, and stained glass windows.
• It does not integrate Indian or Islamic features, which are crucial components of the Indo-Saracenic style.
• Examples include Notre-Dame Cathedral in France and Westminster Abbey in England.

Q18. Answer: (b) Hyderabad

The Correct answer is Hyderabad.

Key Points

• The Asaf Jahi dynasty was established in Hyderabad during the colonial period.
• The dynasty was founded by Mir Qamar-ud-Din Khan, also known as Nizam-ul-Mulk, in the year 1724.
• The Asaf Jahi rulers were referred to as the Nizams, and Hyderabad became the capital of their kingdom.
• The Nizam of Hyderabad was one of the most powerful rulers in India's princely states during the British colonial era.
• Hyderabad under the Nizams was known for its rich cultural heritage, including architecture, literature, and art.
• The Asaf Jahi dynasty played a significant role in shaping the political and cultural landscape of South India.
• Hyderabad's landmarks like the Charminar and the Golconda Fort were deeply associated with the city's historical significance.
• The Nizams of Hyderabad maintained a unique status as a semi-autonomous princely state under British rule.

Additional Information

• Punjab
• Punjab was primarily ruled by the Sikh Empire during the early colonial period under Maharaja Ranjit Singh.
• It was annexed by the British after the Second Anglo-Sikh War in 1849.
• The region is known for its agricultural significance and the Indus Valley Civilization.
• Bengal
• Bengal was a prominent province under British rule and was the center of the British East India Company's operations in India.
• The Battle of Plassey in 1757 marked the beginning of British dominance in Bengal.
• It is known for its literary and cultural contributions during the Indian Renaissance.
• Mysore
• Mysore was ruled by the Wodeyar dynasty and later by Tipu Sultan, known as the Tiger of Mysore.
• Tipu Sultan was a prominent figure who resisted British colonial expansion in the late 18th century.
• Mysore is famous for its palaces, such as the Mysore Palace, and its contributions to Indian classical music.

Q19. Answer: (c) e-Zero FIR

The Correct answer is e-Zero FIR.

Key Points

• e-Zero FIR is an initiative launched by the Indian Cyber Crime Coordination Centre (I4C) under the Ministry of Home Affairs, India.
• The platform facilitates the lodging of First Information Reports (FIRs) online, even before approaching the police physically.
• This system is designed to ensure rapid action against cybercriminals and facilitate the reporting of cybercrime incidents more conveniently.
• It aims to enhance the efficiency and transparency in addressing cybercrime cases by enabling immediate documentation of complaints.
• The initiative aligns with the government’s effort to strengthen cybersecurity measures and provide a robust framework for combating cyber threats.
• This mechanism is particularly beneficial for cases where victims may face geographical barriers or time constraints in reaching a police station.

• The Indian Cyber Crime Coordination Centre (I4C) is a government initiative established to deal with cybercrimes comprehensively and strengthen coordination among various state and central agencies in India.

Additional Information

• Digital India Cyber Shield

• The term does not refer to a specific initiative by the Indian government but may imply efforts to enhance cybersecurity infrastructure under the Digital India campaign.

• Digital India is a flagship program launched by the Government of India to transform India into a digitally empowered society and knowledge economy.

• Its focus includes improving cybersecurity measures across various sectors, but it is not directly linked to rapid action against cybercriminals.

• Cyber Suraksha Abhiyan

• This term suggests a campaign for ensuring cyber safety and awareness, but it is not an official initiative under the I4C framework.

• Such campaigns aim to educate individuals and organizations on best practices to avoid cyber threats.

• National Cyber Safety Net

• The term does not refer to a specific initiative but may imply a conceptual framework for ensuring cybersecurity on a national scale.

• It could involve efforts towards building secure cyber infrastructure and policies at the national level.

Q20. Answer: (c) CD – Compact Disc

The correct answer is CD - Compact Disc.

Key Points

• A Compact Disc (CD) is an optical disc used to store digital data.

• CDs were originally developed for storing music and audio recordings. Later, they were adapted to store other forms of data, including software and video files.

• The technology behind CDs was first introduced by Sony and Philips in the year 1982.

• A standard CD has a storage capacity of around 700 MB or 80 minutes of audio.

• Data is stored on CDs using a laser beam, which etches microscopic pits onto the disc's surface.

• CDs are read using a laser diode in CD players or drives that detects the pits and converts them into electrical signals.

• Common types of CDs include CD-ROM (read-only), CD-R (recordable), and CD-RW (rewritable).

• CDs were widely used for data storage, music distribution, and software installation before being largely replaced by DVDs and digital storage mediums like USBs and cloud storage.

Additional Information

• ASCII – Automated System for Computer Input

• The term ASCII stands for American Standard Code for Information Interchange, not "Automated System for Computer Input."

• It is a character encoding standard used for representing text in computers and electronic devices.

• ASCII assigns a unique numeric value to each character, symbol, and control code, typically in the range of 0 to 127.

• It is widely used in programming and data transmission for its simplicity and efficiency.

• LAN – Large Area Network

• The term LAN stands for Local Area Network, not "Large Area Network."

• A LAN is a network that connects computers and devices within a limited geographical area, such as a home, office, or school.

• LANs typically use technologies like Ethernet or Wi-Fi for connectivity.

• They are used for sharing resources like printers, files, and internet access within the local network.

• LAN – Local Area Node

• The term LAN does not stand for "Local Area Node." It stands for Local Area Network, as mentioned earlier.

• It is designed to operate within a restricted area and is popular for its high speed and low cost of setup.

• LANs can consist of nodes, which are devices connected to the network such as computers, servers, and peripherals.

Q21. Answer: (c) Bahadur Shah II

The correct answer is Bahadur Shah II.

Key Points

• Bahadur Shah II, also known as Bahadur Shah Zafar, was the last Mughal Emperor of India.

• He was declared the Emperor of India by the revolting sepoys during the 1857 uprising, also known as the First War of Independence.

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• The sepoys rallied around him as a symbolic figure to unite against British rule.

• Though he lacked military or administrative strength, his name was used to legitimize the rebellion.

• Bahadur Shah II was a poet and philosopher, and his reign marked the end of the Mughal Empire in India.

• After the suppression of the revolt, he was captured by the British, tried, and exiled to Rangoon (modern-day Yangon, Myanmar), where he died in 1862.

Additional Information

• Akbar II

• Akbar II was the second-to-last Mughal Emperor of India, ruling from 1806 to 1837.

• He was the father of Bahadur Shah II and was more of a titular ruler under British domination.

• Akbar II is known for giving the title of Raja to Rammohan Roy, a prominent social reformer.

• Shah Alam II

• Shah Alam II ruled as the Mughal Emperor from 1760 to 1806.

• He faced multiple invasions and political instability during his reign.

• He signed the Treaty of Allahabad with the British in 1765, which marked the beginning of British dominance in India.

• Aurangzeb

• Aurangzeb was the sixth Mughal Emperor, ruling from 1658 to 1707.

• He expanded the Mughal Empire to its greatest extent during his reign.

• Aurangzeb is known for his strict adherence to Islamic principles and policies of religious intolerance.

• His reign is considered the beginning of the decline of the Mughal Empire due to internal rebellions and administrative challenges.

Q22. Answer: (a) a welfare state

The Correct answer is a welfare state.

Key Points

• The Directive Principles of State Policy (DPSP) are enshrined in Part IV of the Indian Constitution.

• They are guidelines for the government to ensure socio-economic justice and aim to establish a welfare state.

• These principles are non-justiciable, meaning they are not enforceable by courts, but they provide a framework for crafting policies and laws.

• The DPSPs draw inspiration from the Irish Constitution and reflect the ideals of the Preamble, such as justice, liberty, equality, and fraternity.

• Article 38 of the Indian Constitution explicitly directs the state to promote the welfare of people by securing and protecting a social order based on justice, economic equality, and political equity.

• Examples of welfare measures rooted in DPSPs include free legal aid (Article 39A), promotion of education and public health (Article 47), and protection of the environment (Article 48A).

• The DPSPs aim to reduce inequalities, ensure equitable distribution of wealth, and provide opportunities for all citizens.

Additional Information

• A capitalist state

• A capitalist state is characterized by private ownership of the means of production and minimal intervention by the government in economic activities.

• The focus is on a free market economy, where resources are allocated based on supply and demand.

• While capitalism promotes economic growth and innovation, it often leads to income inequality, which is contrary to the ideals of the DPSPs.

• A police state

• A police state refers to a government that exercises excessive control over its citizens, often through the use of authoritarian measures and surveillance.

• Such states prioritize law enforcement and order over individual freedoms and rights, which is inconsistent with the principles of democracy and the welfare state envisioned in the Indian Constitution.

• A democratic dictatorship

• The term "democratic dictatorship" is contradictory, as democracy emphasizes people's participation, equality, and freedom, while dictatorship signifies authoritarianism and concentration of power.

• The Indian Constitution advocates a democratic system that ensures justice, equality, and liberty, which is incompatible with dictatorship.

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Q23. Answer: (d) Ministry of Rural Development

The Correct answer is Ministry of Rural Development.

Key Points

• The Ministry of Rural Development is primarily responsible for implementing various rural development schemes in India.

• It aims to improve the quality of life in rural areas by focusing on poverty alleviation, employment generation, infrastructure development, and social security.

• Some of the key programs implemented by this ministry include Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Awas Yojana-Gramin (PMAY-G), National Social Assistance Programme (NSAP), and Pradhan Mantri Gram Sadak Yojana (PMGSY).

• This ministry ensures that resources are utilized effectively for sustainable development in rural areas.

• It also works in collaboration with other ministries and state governments to ensure inclusive growth and development in rural regions.

• The Ministry of Rural Development plays a critical role in achieving the Sustainable Development Goals (SDGs) related to rural areas.

Additional Information

• Ministry of Social Justice and Empowerment

• This ministry focuses on the welfare and empowerment of marginalized and disadvantaged sections of society, including Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs), and persons with disabilities.

• It is responsible for implementing programs like the Pre-Matric and Post-Matric Scholarships, National Fellowship for SC students, and Deendayal Disabled Rehabilitation Scheme (DDRS).

• Ministry of Agriculture and Farmers Welfare

• This ministry is responsible for policies and programs related to agriculture, food production, and farmers' welfare.

• It implements schemes like the Pradhan Mantri Fasal Bima Yojana (PMFBY), Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), and Soil Health Card Scheme.

• The focus is on improving agricultural productivity and ensuring farmers' income security.

• Ministry of Panchayati Raj

• This ministry is responsible for the decentralized governance system in rural areas through the Panchayati Raj Institutions (PRIs).

• It facilitates the devolution of powers and resources to these institutions as per the 73rd Constitutional Amendment Act.

• The ministry plays a key role in enhancing rural self-governance and enabling local communities to participate in decision-making processes.

Q24. Answer: (d) YANTRA – Yugantar for Advancing New Technology, Research & Acceleration

The Correct answer is YANTRA – Yugantar for Advancing New Technology, Research & Acceleration.

Key Points

• The theme of National Technology Day celebrated in India in May 2025 was YANTRA – Yugantar for Advancing New Technology, Research & Acceleration.

• This theme focused on encouraging the adoption and advancement of innovative technologies in India.

• It emphasized the importance of research and development to propel India towards technological advancements.

• The term YANTRA reflects India's vision to use science and technology as a tool for transforming the nation.

• National Technology Day, observed annually on May 11, commemorates India’s technological achievements, including the successful Pokhran-II nuclear tests conducted on May 11, 1998.

• The day is dedicated to highlighting the contributions of scientists, engineers, and innovators in driving technological growth in India.

• The theme reflects the government's push for fostering self-reliance and promoting indigenous technological solutions.

Additional Information

• Towards a Self-Reliant India through Science and Technology

• This option emphasizes the importance of self-reliance in technological development, which has been a critical focus of Indian policies, especially under Atmanirbhar Bharat Abhiyan.

• It highlights the role of science and technology in achieving economic independence and reducing dependency on imports.

• Powering India through Innovation and Research

• This option stresses the significance of innovation and research in driving India's growth in various sectors.

• While relevant, this was not the chosen theme for National Technology Day in 2025.

• Digital India: Empowering Through Smart Technologies

• This option aligns with the Digital India initiative, launched in 2015, aimed at transforming India into a digitally empowered society.

• It focuses on the use of smart technologies for governance, services, and infrastructure development.

Q25. Answer: (a) Agriculture

The Correct answer is Agriculture.

Key Points

• Post-independence, India adopted a planned economic strategy to ensure balanced growth across different sectors.

• The First Five-Year Plan (1951–1956) was primarily focused on agriculture as India faced food shortages and low agricultural productivity.

• The plan prioritized increasing agricultural production to achieve self-sufficiency in food grains and reduce dependency on imports.

• Key initiatives under this plan included irrigation projects like the Bhakra Nangal Dam and Hirakud Dam, land reforms, and community development programs.

• This emphasis on agriculture was crucial for addressing the challenges of poverty, unemployment, and food security in the newly independent nation.

• The success of the First Five-Year Plan in improving food production laid the foundation for subsequent plans focusing on industrialization and economic diversification.

• It helped establish the importance of agriculture in the overall development of India and ensured rural development was a key focus area.

Additional Information

• Tertiary Sector

• The tertiary sector, also known as the service sector, includes services like education, healthcare, banking, and transportation.

• During the First Five-Year Plan, the focus was not on the tertiary sector as India was still grappling with basic economic challenges like food shortages and poverty.

• The tertiary sector gained prominence in later years with the rapid development of industries and urbanization.

• Defence Sector

• The defence sector was crucial for national security but was not prioritized in the First Five-Year Plan.

• India's focus during this period was more on economic development and addressing immediate concerns such as food security and poverty.

• Defence spending increased in subsequent years, particularly during times of conflict like the Indo-China war (1962) and Indo-Pak wars (1965 and 1971).

• Industry Sector

• Although industries were important for economic growth, the First Five-Year Plan emphasized agriculture over industries to tackle the immediate issue of food shortages.

• Industrial development gained more focus in the Second Five-Year Plan, which was designed by P.C. Mahalanobis and emphasized heavy industries and infrastructure development.

• Key industries such as steel, cement, and energy were developed under later plans.

Q26. Answer: (d) All Indian Institute of Medical Sciences, Delhi

The correct answer is All India Institute of Medical Sciences, Delhi.

Key Points

• India's first indigenous Magnetic Resonance Imaging (MRI) machine was developed with advanced technology, showcasing India's capability in medical equipment innovation.

• The machine is set to be installed at All India Institute of Medical Sciences (AIIMS), Delhi, which is one of the premier medical institutions in India.

• AIIMS Delhi is renowned for its world-class healthcare services, research, and medical education, making it an ideal location for such a significant technological addition.

• This indigenous MRI machine signifies a major step forward in reducing dependency on foreign imports and promoting 'Make in India' initiatives in healthcare technology.

• MRI machines are essential diagnostic tools used to produce detailed images of the internal structures of the body, aiding in the diagnosis of various diseases and conditions.

• The development and installation of this machine highlight India's capability to advance in medical science and enhance healthcare infrastructure.

• AIIMS Delhi's integration of this machine will likely benefit both patients and medical practitioners by providing cost-effective and efficient diagnostic solutions.

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Additional Information

• All Indian Institute of Medical Sciences, Nagpur

• AIIMS Nagpur is one of the newer AIIMS institutions established under the Pradhan Mantri Swasthya Suraksha Yojana (PMSSY).

• It is located in Nagpur, Maharashtra, and provides healthcare services and education to the central region of India.

• All Indian Institute of Medical Sciences, Bhopal

• AIIMS Bhopal is situated in Madhya Pradesh and plays a vital role in delivering healthcare services and medical education in the central part of India.

• It is an important institution established to enhance medical education and healthcare facilities under the PMSSY.

• All Indian Institute of Medical Sciences, Raipur

• AIIMS Raipur is located in Chhattisgarh and contributes significantly to healthcare and medical research in the region.

• It is one of the AIIMS institutions set up to improve medical infrastructure in underserved areas.

Q27. Answer: (b) Pradeshika

The Correct answer is Pradeshika.

Key Points

• The Pradeshika was a provincial officer during the Mauryan period.

• They were responsible for touring the provinces every five years to inspect the administration.

• Their duties included submitting reports on the provincial governance to the central authority.

• The inspection ensured that the policies of the central government were implemented effectively at the provincial level.

• This role was significant in maintaining the efficiency and control of the Mauryan Empire, which was one of the largest empires in ancient India.

• The Mauryan administration was highly centralized, and the Pradeshika played a crucial role in the functioning of this system.

Additional Information

• Rajuka

• The Rajuka was another official during the Mauryan period, primarily responsible for judicial and administrative duties in the provinces.

• They were tasked with overseeing issues related to land revenue and justice.

• They did not tour the provinces regularly like the Pradeshika.

• Nagarika

• The Nagarika was an officer responsible for the urban administration.

• They managed the affairs of cities and towns, ensuring smooth functioning of daily life and law and order.

• Unlike the Pradeshika, they worked in urban areas and did not inspect provinces.

• Amatya

• The Amatya was a minister or high-ranking official in the Mauryan administration.

• They were involved in the formulation of policies and advising the king on administrative matters.

• They did not have the specific duty of touring provinces to inspect administration like the Pradeshika.

Q28. Answer: (c) Teaching

The correct answer is Teaching.

Key Points

• Teaching is a part of the tertiary sector, which includes activities that provide services to individuals and businesses.

• The tertiary sector is also known as the service sector and is focused on delivering intangible goods and services rather than producing material goods.

• Examples of tertiary activities include education, healthcare, transportation, retail, banking, and entertainment services.

• Teachers play a crucial role in imparting knowledge, developing skills, and shaping the future of individuals in society.

• The teaching profession is vital for fostering human capital development, which is essential for economic growth and innovation.

• Unlike primary and secondary activities, which are focused on resource extraction and manufacturing, tertiary activities contribute to the social well-being and economic stability of a region.

• Teaching is often associated with institutions such as schools, colleges, universities, and training centers.

• The service sector, including teaching, is increasingly important in modern economies due to the rise in demand for knowledge-based professions.

Additional Information

• Manufacturing
• Manufacturing is a part of the secondary sector, which involves the processing of raw materials into finished goods.
• Examples include the production of automobiles, electronics, textiles, and machinery.
• It contributes significantly to economic growth and industrialization.
• Mining
• Mining falls under the primary sector, which focuses on resource extraction directly from nature.
• Mining involves extracting minerals, ores, and fossil fuels such as coal, iron, and petroleum.
• It is essential for providing raw materials for various industries.
• Farming
• Farming is a primary activity that involves agriculture, including the cultivation of crops and rearing of livestock.
• It is essential for producing food and raw materials for industries like textiles and food processing.
• Farming is one of the oldest and most fundamental economic activities.

Q29. Answer: (b) Article 312

The Correct answer is Article 312.

Key Points

• Article 312 of the Indian Constitution provides for the creation of All India Services, including the Indian Administrative Service (IAS), Indian Police Service (IPS), and others.
• It empowers the Parliament to create All India Services if it deems necessary in the national interest.
• Such a decision can be made only after a resolution is passed by the Council of States (Rajya Sabha) by a majority of not less than two-thirds of the members present and voting.
• All India Services officers serve both the Central Government and the State Governments, ensuring administrative uniformity across the country.
• The objective of Article 312 is to maintain a strong and efficient administrative framework across India.
• These services are often referred to as the "steel frame" of the nation due to their role in upholding governance and national unity.
• Examples of All India Services include the Indian Administrative Service (IAS), Indian Police Service (IPS), and Indian Forest Service (IFS).
• Article 312 is located in Part XIV of the Indian Constitution, which deals with services under the Union and States.

Additional Information

• Article 320
• Article 320 pertains to the functions of the Union Public Service Commission (UPSC) and State Public Service Commissions.
• It includes conducting examinations for appointments to civil services and posts.
• The commissions are also responsible for advising on matters like disciplinary action, promotions, and recruitment.
• Article 206
• Article 206 in the Indian Constitution relates to provisions about the expenditure charged upon the Consolidated Fund of India.
• It specifically deals with matters of budgetary allocation and grants.
• It does not pertain to the creation of All India Services.
• Article 107
• Article 107 deals with the legislative procedure concerning bills in Parliament.
• It explains the process of introduction and passage of bills in both houses of the Parliament.
• This article is unrelated to the establishment of All India Services.

Q30. Answer: (a) Damodar Valley Project

The correct answer is Damodar Valley Project.

Key Points

• The Damodar Valley Project is one of the first multipurpose river valley projects of independent India.
• It was established in 1948 under the Damodar Valley Corporation (DVC), modeled after the Tennessee Valley Authority (TVA) in the United States.
• The main focus of this project is on flood control, irrigation, generation of hydroelectricity, and industrial water supply.
• The Damodar Valley Project covers the Damodar River, which flows through the Indian states of Jharkhand and West Bengal.
• The DVC operates a network of four dams: Tilaiya and Maithon on the Barakar River, Panchet on the Damodar River, and Konar on the Konar River.

• This project also promotes afforestation, soil conservation, and the development of fisheries.

• The Damodar Valley Project has contributed significantly to the socio-economic development of the region by improving agriculture and providing a source of renewable energy.

Additional Information

• Sharda Canal

• The Sharda Canal is one of the oldest and largest irrigation canals in India.

• It is situated in the state of Uttar Pradesh and is primarily used for irrigation purposes.

• This canal is part of the Sharda River system, which originates in the Kumaon Himalayas.

• Agra Canal

• The Agra Canal is an irrigation canal that takes off from the Yamuna River at Okhla, near Delhi.

• It was commissioned in the 19th century during British rule.

• The canal primarily serves the regions of Uttar Pradesh, Haryana, and Rajasthan.

• Indira Gandhi Canal

• The Indira Gandhi Canal is one of the longest canals in India, located in the state of Rajasthan.

• It was built to provide irrigation and drinking water to the Thar Desert region.

• The canal originates from the Harike Barrage near the confluence of the Sutlej and Beas rivers in Punjab.

Q31. Answer: (b) Densely populated due to fertile soil

The Correct answer is Densely populated due to fertile soil.

Key Points

• The Northern Plains are one of the most densely populated regions in India due to the presence of fertile soil, which supports agriculture extensively.

• They are formed by the deposits of alluvial soil brought by rivers like the Ganga, Brahmaputra, and Indus, making the region highly productive for crops such as wheat, rice, and sugarcane.

• The plains span across northern India, covering states like Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal.

• These plains have a flat terrain, which makes irrigation and farming convenient and supports the growth of major agricultural industries.

• The presence of rivers ensures an abundance of water resources, further contributing to agricultural output and settlement growth.

• The region has a favorable climate, with ample rainfall during the monsoon season, supporting both Kharif and Rabi crops.

• Due to the fertile soil and agricultural opportunities, the Northern Plains have become a hub of population concentration and urbanization.

Additional Information

• Presence of volcanic plateaus

• The volcanic plateaus are formed due to volcanic activities and are typically found in regions like the Deccan Plateau in India.

• These areas are characterized by volcanic rocks and are not related to the Northern Plains, which are formed by alluvial deposits.

• High elevation with steep slopes

• High elevations with steep slopes are characteristic of mountainous regions such as the Himalayas, not the flat terrain of the Northern Plains.

• The Northern Plains have a low elevation, making them ideal for agriculture and settlement rather than steep slopes.

• Low fertility due to rocky terrain

• Rocky terrains are found in regions like the Western Ghats or the Deccan Plateau, which are less fertile compared to the alluvial soils of the Northern Plains.

• The Northern Plains are known for their high fertility due to alluvial deposits, making them highly productive for farming.

Q32. Answer: (c) Hyderabad

The Correct answer is Hyderabad.

Key Points

• Hyderabad was one of the last princely states to join the Indian Union after independence.

• It was ruled by the Nizam, who initially wanted to remain independent rather than join India.

• Hyderabad posed a significant challenge due to its geographical location as it was surrounded by Indian territories.

• The Nizam's refusal to integrate led to the Operation Polo, a military operation undertaken by the Indian government.

• Operation Polo, also known as the Police Action, was carried out in September 1948 to annex Hyderabad into the Indian Union.

• It was a swift operation lasting only five days, resulting in Hyderabad's integration into India.
• The successful annexation of Hyderabad marked the completion of Indian territorial consolidation post-independence.
• Hyderabad's integration into the Indian Union was a crucial step for national unity and the establishment of sovereignty.

Additional Information

• Mysore
• Mysore was one of the princely states to join the Indian Union relatively peacefully.
• The ruler of Mysore signed the Instrument of Accession in 1947, ensuring its integration into India.
• Mysore was known for its rich cultural heritage, including the famous Mysore Palace.
• Jodhpur
• Jodhpur, a princely state in Rajasthan, joined the Indian Union in 1947.
• The ruler initially showed interest in joining Pakistan but was persuaded to join India due to geographical and political reasons.
• Jodhpur is famous for its Mehrangarh Fort and vibrant cultural heritage.
• Travancore
• Travancore was one of the princely states in southern India that joined the Indian Union.
• The ruler initially resisted but later signed the Instrument of Accession after negotiations.
• Travancore is renowned for its contributions to art, architecture, and cultural traditions.

Q33. Answer: (a) Bay of Bengal and Arabian Sea

The Correct answer is Bay of Bengal and Arabian Sea.

Key Points

• The Peninsular Plateau is flanked by two major water bodies - the Bay of Bengal on the east and the Arabian Sea on the west.
• The Bay of Bengal is situated towards the eastern side of India and is the largest bay in the world. It receives water from major rivers like the Ganges, Brahmaputra, Mahanadi, Godavari, Krishna, and Kaveri.
• The Arabian Sea lies on the western side of India. It is part of the Indian Ocean and serves as a major route for trade and commerce.
• The Peninsular Plateau is bounded by these two seas, which contribute to its unique geographical location and climate.
• This plateau is triangular in shape and is surrounded by the Eastern Ghats and Western Ghats.
• The water bodies play a significant role in influencing the climate, vegetation, and cultural practices of the region.
• The presence of these seas makes the Peninsular Plateau a key geographical region for trade, biodiversity, and natural resources.

Additional Information

• Bay of Bengal and Indian Ocean
• The Indian Ocean is the third-largest ocean in the world and lies to the south of India.
• While the Indian Ocean is significant for its role in global climate and trade, it does not flank the Peninsular Plateau directly, as the plateau is bordered by the Bay of Bengal and Arabian Sea.
• Indian Ocean and Arabian Sea
• Although the Arabian Sea is on the western side of the Peninsular Plateau, the Indian Ocean lies to the south of India and does not directly flank the plateau.
• It is important to note that the Indian Ocean influences the region's climate but is not the correct answer in this context.
• Arabian Sea and Andaman Sea
• The Andaman Sea is located to the southeast of the Bay of Bengal and primarily borders the Andaman and Nicobar Islands.
• It does not flank the Peninsular Plateau, making this option incorrect.

Q34. Answer: (a) 5 years

The correct answer is 5 years.

Key Points

• The President of India is the head of state and the supreme commander of the armed forces.
• The term of office for the President of India is fixed at 5 years, as per Article 56 of the Indian Constitution.
• After the completion of the term, the President is eligible for re-election.
• The election for the President is conducted by an Electoral College, which consists of the elected members of both Houses of Parliament and the Legislative Assemblies of States and Union territories.
• The President can, however, continue to hold office beyond the term of 5 years until their successor is elected and assumes office.

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• The President may also resign before the expiration of their term by addressing their resignation to the Vice-President of India.

• The President can be removed from office before the expiry of their term through the process of impeachment, as mentioned in Article 61 of the Indian Constitution.

Additional Information

• Until removed by Parliament

• This option refers to the process of removal or impeachment of the President, which is a specific and formal process mentioned under Article 61 of the Indian Constitution.

• The President cannot remain in office indefinitely unless removed by Parliament. Their term is fixed at 5 years, but removal is a separate process applicable only under specific circumstances like a violation of the Constitution.

Q35. Answer: (c) presenting real-world content for learning or leisure

The Correct answer is presenting real-world content for learning or leisure.

Key Points

• Documentaries are a genre of cinema that focuses on depicting real-life events, facts, and stories.

• They are used to educate viewers or provide leisure through the exploration of real-world topics such as history, science, politics, culture, and the environment.

• Unlike fictional films, documentaries are based on non-fictional content and are often supported by interviews, archival footage, and statistical data.

• These films aim to enhance the knowledge and awareness of their audience by presenting authentic and factual content.

• Examples of popular documentaries include "An Inconvenient Truth", which addresses climate change, and "The Social Dilemma", which explores the effects of social media.

• Documentaries can also serve as a platform for social advocacy, shedding light on pressing issues and sparking conversations for change.

Additional Information

• Focusing on fictional suspense

• This characteristic is typical of thriller movies, not documentaries.

• Thriller films aim to create tension and excitement through fictional plots, often involving crime, espionage, or other dramatic scenarios.

• Fabricated storylines

• Fabricated storylines are a feature of fictional films, including dramas, comedies, and science fiction.

• Unlike documentaries, these films rely on imagination and creativity rather than real-world facts.

• Aiming to communicate about mythological characters

• Films about mythological characters often belong to the genre of mythological or historical dramas.

• They may use fictional elements to depict stories from mythology, but they do not fall under the category of documentaries.

Q36. Answer: (c) Amandeep Garg

The Correct answer is Amandeep Garg.

Key Points

• Amandeep Garg represented India at the 11th BRICS Environment Ministers Summit held in 2025.

• The BRICS Environment Ministers Summit is an annual meeting of ministers from the five BRICS nations (Brazil, Russia, India, China, and South Africa) to discuss and collaborate on environmental issues.

• The summit focuses on topics like sustainable development, climate change mitigation, biodiversity conservation, and the implementation of global environmental agreements.

• Amandeep Garg is a senior officer and an influential figure in India's environmental policy framework, ensuring India's effective participation in international environmental platforms.

• India has been actively participating in BRICS forums to address critical global environmental challenges and to enhance cooperation among member nations.

• The representation at such summits allows India to showcase its initiatives, policies, and commitments towards global environmental sustainability.

Additional Information

• Bhupendra Yadav

• Bhupendra Yadav is the Union Minister for Environment, Forest and Climate Change in India.

• While he plays a pivotal role in national and international environmental matters, he did not represent India at the 11th BRICS Environment Ministers Summit 2025.

• S Jaishankar

• S Jaishankar is the External Affairs Minister of India.

• His role is primarily related to foreign policy and diplomatic relations, not directly associated with environmental summits like the BRICS Environment Ministers Summit.

• Amit Shah

• Amit Shah is the Union Minister of Home Affairs in India.

• His responsibilities include matters related to internal security, law, and order, rather than representing India in environmental forums.

Q37. Answer: (b) Acquisition of new aircraft carriers

The correct answer is Acquisition of new aircraft carriers.

Key Points

• In May 2025, the Government of India approved key defence proposals aimed at strengthening maritime security, including progress toward the acquisition of new aircraft carriers.

• The initiative is aligned with India's objective of enhancing its blue-water navy capabilities and ensuring dominance in the Indian Ocean Region (IOR).

• The approval is linked to long-term plans for the construction of the Indigenous Aircraft Carrier–II (IAC-II), also referred to as INS Vishal.

• Aircraft carriers serve as mobile airbases, enabling power projection, maritime strike capability, and rapid deployment of fighter aircraft at sea.

• This move supports India's strategic doctrine of maintaining a three-carrier force structure to ensure at least two carriers remain operational at any time.

• Hence, the correct option is 2.

Additional Information

• India's Aircraft Carrier Fleet

• INS Vikramaditya – Commissioned in 2013.

• INS Vikrant (IAC-I) – Commissioned in 2022, India's first indigenously built aircraft carrier.

• Planned: INS Vishal (IAC-II) – Proposed next-generation carrier with advanced capabilities.

• Strategic Importance of Aircraft Carriers

• Enable air dominance over maritime zones.

• Support humanitarian assistance and disaster relief (HADR) missions.

• Enhance India's ability to counter emerging security challenges in the Indo-Pacific region.

• Indian Navy Modernisation

• Focuses on expanding indigenous shipbuilding under Make in India and Atmanirbhar Bharat.

• Aims to strengthen surveillance, maritime strike capability, and sea control operations.

Q38. Answer: (a) Bharat Dynamics Limited

The Correct answer is Bharat Dynamics Limited.

Key Points

• Bharat Dynamics Limited (BDL) is a government-owned defence Public Sector Unit (PSU) headquartered in Hyderabad, Telangana, India.

• It was established in 1970 by the Government of India to manufacture guided weapon systems.

• BDL specializes in the production of anti-tank guided missiles (ATGMs), surface-to-air missiles, torpedoes, and other ammunition.

• The Invar anti-tank guided missile is a product that falls under its expertise in guided weapon systems.

• BDL plays a key role in India's defence sector by providing indigenous solutions to strengthen the country's military capabilities.

• The planned order for 500 Invar anti-tank guided missiles valued between Rs. 2,000–Rs. 3,000 crore demonstrates India's commitment to boosting domestic defence production.

• The missiles are primarily used for armoured vehicles and tanks to enhance their ability to destroy enemy targets effectively.

• This order aligns with the Indian government's 'Make in India' initiative, promoting self-reliance in defence manufacturing.

Additional Information

• Armoured Vehicles Nigam Ltd. (AVNL)

• AVNL is a government-owned corporation that specializes in manufacturing armoured vehicles and military hardware.

• It operates under the Ministry of Defence and focuses on providing solutions for ground-based combat systems.

• Its production facilities are spread across India, including Heavy Vehicle Factory (HVF) in Avadi, Tamil Nadu.

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• Bharat Electronics Limited (BEL)
• BEL is another defence PSU headquartered in Bengaluru, Karnataka.
• It primarily focuses on manufacturing electronic equipment, radars, communication systems, and avionics.
• BEL is not involved in the production of anti-tank guided missiles but plays a critical role in electronic warfare and radar systems.
• Garden Reach Shipbuilders & Engineers Ltd. (GRSE)
• GRSE is a defence PSU specializing in the construction of warships, patrol vessels, and other marine platforms.
• It is headquartered in Kolkata, West Bengal.
• GRSE's expertise lies in shipbuilding and engineering, not in missile systems.

Q39. Answer: (b) Exfoliation

The correct answer is Exfoliation.

Key Points

• Exfoliation is a weathering process where rock layers peel off or flake away due to repeated temperature variations.
• This process is also referred to as onion-skin weathering because of the way the rock surface peels off in layers.
• It typically occurs in areas with significant diurnal temperature changes, such as deserts.
• During the day, the rock surface heats up and expands, while at night it cools down and contracts, leading to stress on the rock.
• Over time, this repetitive expansion and contraction weaken the bonds in the outer layers of rock, causing them to flake off.
• The process is most prominent in rocks made of granite or other types of crystalline rocks.
• Exfoliation is a form of mechanical weathering, which involves the physical breakdown of rocks without any chemical alteration.

Additional Information

• Frost action
• Frost action, also known as freeze-thaw weathering, occurs when water enters cracks in rocks, freezes, and expands.
• This expansion exerts pressure on the rock, causing it to break apart over time.
• It is common in cold climates where temperatures frequently fluctuate around the freezing point.
• Solution
• The solution process involves the chemical breakdown of rocks due to the dissolution of minerals in water.
• This process is particularly effective on rocks containing soluble minerals, such as limestone.
• It leads to the formation of features like sinkholes and caves in karst topography.
• Oxidation
• Oxidation is a chemical weathering process that involves the reaction of minerals in rocks with oxygen.
• This process often leads to the formation of rust, especially in rocks containing iron.
• Oxidation is responsible for the reddish or orange coloration seen in many rocks and soils.

Q40. Answer: (b) Assam

The Correct answer is Assam.

Key Points

• Assam introduced India's first AI Anchor Ankita in a regional language in May 2025.
• This initiative highlights the integration of Artificial Intelligence (AI) in the field of regional media and communication.
• The AI anchor is capable of delivering news in the Assamese language, making it more accessible to the local population.
• The development of such AI technologies demonstrates Assam's technological advancements and its focus on linguistic inclusivity.
• This AI anchor aims to strengthen the reach of regional news and promote the importance of vernacular languages in mass communication.
• The introduction of AI Anchor Ankita aligns with the broader goal of utilizing AI technology for improving accessibility and efficiency in media.

Additional Information

• Madhya Pradesh
• Madhya Pradesh is known for its strong emphasis on cultural heritage and tourism, including sites like Khajuraho and Sanchi Stupa.
• The state is also significant for its industrial growth and development in sectors like agriculture and textiles.
• Tamil Nadu
• Tamil Nadu is recognized for its leadership in fields such as automobile manufacturing, information technology, and renewable energy.

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• The state has a rich cultural heritage, with iconic temples such as Brihadeeswarar Temple and a strong focus on education and healthcare.
• Kerala
• Kerala is noted for its high literacy rate and exemplary performance in healthcare and human development.
• Known as ‘God’s Own Country’, it is a leading state in tourism, famous for its backwaters, hill stations, and beaches.

Q41. Answer: (d) 28/11 days

Shortcut Trick
Total work = LCM of days (20, 12, 2) = 60 units.
Efficiencies: A = 60 ÷ 20 = 3, B = 60 ÷ 12 = 5, A+B+C = 60 ÷ 2 = 30.
Efficiency of C = 30 − (3 + 5) = 22.
Time for C = Total Work ÷ C's efficiency = 60 ÷ 22 = 30/11 = 2 ^8⁄11 days.
Therefore The correct answer is 2 ^8⁄11 days.
Alternate Method
Given:
Time taken by A = 20 days
Time taken by B = 12 days
Time taken by A, B and C together = 2 days

Person	Days	Total Work	Efficiency
A	20	60	3
B	12	5	
A + B + C	2	30	

Calculations:
=> Efficiency of C = Efficiency of (A + B + C) − Efficiency of A − Efficiency of B
=> Efficiency of C = 30 − 3 − 5 = 22 units/day
=> Time taken by C alone = Total Work ÷ Efficiency of C
=> Time taken by C alone = 60 ÷ 22 = 30/11
=> Time taken by C alone = 2 ^8⁄11 days
Therefore The correct answer is 2 ^8⁄11 days.
Additional Information
Total Work Concept
Total work is assumed to be the LCM of the given time periods. Efficiency is inversely proportional to time.
Combined Efficiency
When multiple people work together, their combined efficiency is the sum of their individual efficiencies: E(A+B) = E(A) + E(B).
Fractional Work Formula
If someone can complete a task in N days, they can complete 1/N of the task in exactly 1 day.

Q42. Answer: (d) 15.28

Shortcut Trick
Directly apply known square roots: √324 = 18 and √841 = 29.
For decimal roots, simply halve the number of decimal places.
=> √324 + √0.0324 − √8.41
=> 18 + 0.18 − 2.9
=> 18.18 − 2.90 = 15.28
Therefore The correct answer is 15.28.
Alternate Method
Given:
√324 + √0.0324 − √8.41
Calculations:
Convert the decimals to fractions to simplify the roots clearly:
=> √324 + √(324 ÷ 10000) − √(841 ÷ 100)

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=> 18 + (18 ÷ 100) − (29 ÷ 10)

=> 18 + 0.18 − 2.9

Align the decimals to perform addition and subtraction:

=> 18.18 − 2.90

=> 15.28

Therefore The correct answer is 15.28.

Additional Information

Square Root of Decimals

When finding the square root of a decimal number, the number of decimal places in the answer will be exactly half the number of decimal places in the original number (e.g., √0.0004 = 0.02).

Important Squares to Remember

Memorizing perfect squares up to 30 significantly improves calculation speed. For example, $18^2 = 324$ and $29^2 = 841$.

Simplification Rules

Always follow the basic order of operations. Evaluate the roots first, followed by addition and then subtraction, ensuring decimal points are properly aligned during the calculation.

Q43. Answer: (a) Rs. 595

Shortcut Trick

The offer states that the first product is sold at full price and the second gets a 30% discount.

Total amount paid = Price of 1st product + 70% of Price of 2nd product

Total amount paid = 350 + (350 × 70 ÷ 100)

Total amount paid = 350 + 245 = Rs. 595

Therefore The correct answer is Rs. 595.

Alternate Method

Given:

Marked price of each product = Rs. 350

Offer given = Buy one get one 30% off

First Product

Price: Rs. 350

Discount: 0%

Paid: Rs. 350

Second Product

Price: Rs. 350

30% OFF

Paid: Rs. 245

• Total Paid = Rs. 350 + Rs. 245 = Rs. 595

Formula Used:

Selling Price (SP) = Marked Price (MP) × (100 − Discount%) ÷ 100

Calculation:

=> Amount paid for the first product = Rs. 350

=> Amount paid for the second product = 350 × (100 − 30) ÷ 100

=> Amount paid for the second product = 350 × 70 ÷ 100 = Rs. 245

=> Total amount paid = Price of 1st product + Price of 2nd product

=> Total amount paid = 350 + 245 = Rs. 595

Therefore The correct answer is Rs. 595.

Additional Information

Buy X Get Y Free Discount

Equivalent Discount % = [Free Items ÷ (Paid Items + Free Items)] × 100

Successive Discounts

For two successive discounts of a% and b%, Single Equivalent Discount = a + b − (a × b ÷ 100)%

Selling Price Formula

Selling Price (SP) = Marked Price (MP) × (100 − Discount%) ÷ 100

Q44. Answer: (b) 210

Shortcut Trick

If the ratio of two numbers is a : b and their HCF is H, then their LCM is calculated directly as:

LCM = a × b × H

Here, the ratio parts are a = 5, b = 6, and HCF = 7.

LCM = 5 × 6 × 7 = 210

Therefore The correct answer is 210.

Alternate Method

Given:

Ratio of two numbers = 5 : 6

Highest Common Factor (HCF) = 7

HCF = 7

Num 1 = 5 × 7 = 35

Num 2 = 6 × 7 = 42

LCM = 5 × 6 × 7 = 210

Formula Used:

First Number = a × HCF

Second Number = b × HCF

Product of Numbers = LCM × HCF

Calculations:

=> Let the two numbers be 5x and 6x, where x is the HCF.

=> Given that the HCF is 7, we get x = 7.

=> First Number = 5 × 7 = 35

=> Second Number = 6 × 7 = 42

=> We know that: First Number × Second Number = LCM × HCF

=> 35 × 42 = LCM × 7

=> LCM = (35 × 42) ÷ 7

=> LCM = 35 × 6 = 210

Therefore The correct answer is 210.

Additional Information

Product of Two Numbers Rule

For any two numbers, the product of the numbers is always equal to the product of their Highest Common Factor (HCF) and Least Common Multiple (LCM). Formula: N1 × N2 = HCF × LCM.

Co-prime Numbers and LCM

When a ratio a : b is given, a and b are essentially co-prime parts of the numbers. If two numbers are co-prime (HCF = 1), their LCM is simply their product.

LCM & HCF of Fractions

To find the LCM of fractions: (LCM of Numerators) ÷ (HCF of Denominators). To find the HCF of fractions: (HCF of Numerators) ÷ (LCM of Denominators).

Q45. Answer: (a) Rs. 1,300

Shortcut Trick

Investment Ratio = Profit Ratio = 58 : 72 : 20

Total profit units = 58 + 72 + 20 = 150 units

Difference in profit units of Y and Z = 72 − 20 = 52 units

Required difference = (52 / 150) × 3750

Required difference = 52 × 25 = Rs. 1300

Therefore The correct answer is Rs. 1,300.

Alternate Method

Given:

Investment ratio of X, Y and Z = 58 : 72 : 20

Total profit earned = Rs. 3750

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Formula Used:

Profit Ratio = Investment Ratio (when the time period is constant for all partners)

X

58x

Y

72x

Z

20x

Diff = 52x

Total Profit = 150x = Rs. 3750

Calculations:

=> Let the profit shares of X, Y and Z be 58x, 72x, and 20x respectively.

=> Total profit = 58x + 72x + 20x = 150x

=> 150x = 3750

=> x = 3750 ÷ 150 = 25

=> Profit share of Y = 72x = 72 × 25 = Rs. 1800

=> Profit share of Z = 20x = 20 × 25 = Rs. 500

=> Difference between shares of Y and Z = 1800 − 500 = 1300

Therefore The correct answer is Rs. 1,300.

Additional Information

Simple Partnership

When investments are made for the exact same time period by all partners, the profit is distributed directly in the ratio of their invested capitals.

Compound Partnership

When investments are made for different time periods, the profit sharing ratio is equivalent to the product of their capital and time period (Profit Ratio = C1×T1 : C2×T2).

Working Partner vs Sleeping Partner

A working partner receives a fixed percentage of the profit or a regular salary for managing the business. The remaining profit is then distributed among all the partners strictly in the ratio of their effective capital.

Q46. Answer: (c) 7

Shortcut Trick

We can eliminate the options rapidly using basic divisibility rules.

Unit digit is 7 (odd) → Not divisible by 6.

Unit digit is 7 → Not divisible by 5.

11's rule: (8 + 2 + 2 + 4 + 7) − (6 + 0 + 6 + 1) = 23 − 13 = 10 → Not divisible by 11.

By elimination, the given number must be exactly divisible by 7.

Therefore The correct answer is 7.

Alternate Method

Given number = 862026417

Checking Divisibility by 6:

=> For a number to be divisible by 6, it must be even (divisible by 2) and divisible by 3.

=> Since the last digit is 7 (odd), the number is not divisible by 2. Thus, it is not divisible by 6.

Checking Divisibility by 5:

=> A number is divisible by 5 if its last digit is either 0 or 5.

=> The last digit is 7, so it is not divisible by 5.

Checking Divisibility by 11:

=> Sum of digits at odd places (from right) = 7 + 4 + 2 + 2 + 8 = 23

=> Sum of digits at even places (from right) = 1 + 6 + 0 + 6 = 13

=> Difference = 23 − 13 = 10

=> Since 10 is not a multiple of 11, the number is not divisible by 11.

Checking Divisibility by 7:

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=> Split the number into groups of 3 digits from right to left: 862, 026, 417

=> Add the alternate groups: 862 + 417 = 1279

=> Subtract the remaining group: 1279 − 026 = 1253

=> Divide the result by 7: 1253 ÷ 7 = 179

=> Since 1253 is perfectly divisible by 7, the entire original number is also divisible by 7.

Therefore The correct answer is 7.

Additional Information

Divisibility Rule of 7, 11 and 13

Make groups of 3 digits from right to left and find the alternating sum or difference of these groups. If the final result is divisible by 7, 11, or 13, then the original number is divisible by 7, 11, or 13 respectively.

Divisibility Rule of 3 and 9

A number is divisible by 3 or 9 if the sum of all its digits is perfectly divisible by 3 or 9 respectively.

Divisibility Rule of 4 and 8

A number is divisible by 4 if its last two digits are divisible by 4. It is divisible by 8 if its last three digits are divisible by 8.

Q47. Answer: (c) 7/12

Shortcut Trick

The given expression is: 2/5 + [1 ÷ (1 + 5/7)] − 2/5

Notice that the +2/5 and −2/5 cancel each other out perfectly.

The expression simplifies directly to the middle term: 1 ÷ (1 + 5/7)

First, calculate the denominator: 1 + 5/7 = 12/7

The reciprocal of 12/7 is 7/12.

Therefore The correct answer is 7/12.

Alternate Method

Given:

The expression: 2/5 + [1 ÷ (1 + 5/7)] − 2/5

Method Used:

Applying the BODMAS rule to solve the bracket first and simplify the fractions.

Calculations:

=> 2/5 + [1 ÷ ((7 + 5) ÷ 7)] − 2/5

=> 2/5 + [1 ÷ (12/7)] − 2/5

=> 2/5 + 7/12 − 2/5

Rearranging the expression to group similar terms:

=> (2/5 − 2/5) + 7/12

=> 0 + 7/12

=> 7/12

Therefore The correct answer is 7/12.

Additional Information

BODMAS Rule

BODMAS determines the sequence of mathematical operations: Brackets, Orders, Division, Multiplication, Addition, and Subtraction. Expressions inside brackets are always evaluated first.

Fraction Reciprocal

When dividing 1 by a fraction a/b, the result is its reciprocal, which is b/a.

Additive Inverse

The sum of any number and its exact negative (additive inverse) is always zero. Identifying these pairs early helps in quick cancellations during simplifications.

Q48. Answer: (a) 4 √PQ

Shortcut Trick

Let A = 30°, then p = cot 30° + cos 30° = √3 + √3/2 = 3√3/2 and q = cot 30° − cos 30° = √3 − √3/2 = √3/2.

Value of $p^2 - q^2 = (3\sqrt{3}/2)^2 - (\sqrt{3}/2)^2 = 27/4 - 3/4 = 24/4 = 6$.

Now evaluate the product pq = (3√3/2) × (√3/2) = 9/4.

From the given options, evaluating 4√pq = 4 × √(9/4) = 4 × 3/2 = 6, which perfectly matches our required value.

Therefore The correct answer is 4√pq.

Alternate Method

Given:

p = cot A + cos A

q = cot A − cos A

Formula Used:

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

Calculations:

=> p + q = (cot A + cos A) + (cot A − cos A) = 2 cot A

=> p − q = (cot A + cos A) − (cot A − cos A) = 2 cos A

=> $p^2 - q^2 = (2 \cot A) \times (2 \cos A) = 4 \cot A \cos A$

=> pq = (cot A + cos A) × (cot A − cos A)

=> $pq = \cot^2 A - \cos^2 A$

=> $pq = (\cos^2 A / \sin^2 A) - \cos^2 A$

=> $pq = \cos^2 A \times (1 / \sin^2 A - 1)$

=> $pq = \cos^2 A \times (\text{cosec}^2 A - 1)$

=> $pq = \cos^2 A \times \cot^2 A$

=> √pq = cos A cot A

=> $p^2 - q^2 = 4(\cos A \cot A) = 4\sqrt{pq}$

Therefore The correct answer is 4√pq.

Additional Information

Trigonometric Identities

The primary Pythagorean identity is $\sin^2\theta + \cos^2\theta = 1$, which leads to $1 + \cot^2\theta = \text{cosec}^2\theta$ and $1 + \tan^2\theta = \sec^2\theta$.

Quotient Relations

The tangent and cotangent functions can be effectively converted using terms of sine and cosine as $\tan\theta = \sin\theta / \cos\theta$ and $\cot\theta = \cos\theta / \sin\theta$.

Algebraic Difference of Squares

The foundational rule $a^2 - b^2 = (a - b)(a + b)$ dramatically simplifies polynomial operations involving conjugate pairings.

Q49. Answer: (a) Rs. 1,710

Shortcut Trick

Use the successive discount multiplier method to find the final price directly.

Selling Price = MP × (100 − D1)% × (100 − D2)%

=> Final Price = 2000 × (90 ÷ 100) × (95 ÷ 100)

=> Final Price = 2000 × 0.9 × 0.95 = 1710

Therefore The correct answer is Rs. 1,710.

Alternate Method

MP

Rs. 2000

−10%

Price 1

Rs. 1800

−5%

SP

Rs. 1710

Given:

Marked Price (MP) = Rs. 2,000

First discount (D1) = 10%

Second discount (D2) = 5%

Formula Used:

Effective Discount % = D1 + D2 − (D1 × D2) ÷ 100

Selling Price (SP) = MP − Discount Amount

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Calculations:

=> Effective Discount % = 10 + 5 − (10 × 5) ÷ 100

=> Effective Discount % = 15 − 0.5 = 14.5%

=> Total Discount Amount = 14.5% of 2000 = (14.5 ÷ 100) × 2000 = Rs. 290

=> Final Selling Price = 2000 − 290 = 1710

Therefore The correct answer is Rs. 1,710.

Additional Information

Successive Discount Formula

For two successive discounts of x% and y%, the single equivalent discount is x + y − (x × y) ÷ 100.

Three Successive Discounts

Find the equivalent of the first two discounts (say d%), then apply the formula again between d% and the third discount z%.

Relationship between MP and CP

MP × (100 − Discount%) = CP × (100 + Profit%). This is a highly useful direct relation formula for shopkeeper profit/loss questions.

Q50. Answer: (c) 12x2 − 9x + 3

Shortcut Trick

Directly expand the brackets and mentally group the like terms to save time:

Total x^2 terms → $5x^2 + 7x^2 = 12x^2$

Total x terms → −9x

Constant terms → −14 + 17 = 3

Combine these terms directly to get the simplified expression.

Therefore The correct answer is $12x^2 − 9x + 3$.

Alternate Method

Given:

$x(5x − 9) + 7(x^2 − 2) + 17$

Calculations:

=> Apply the distributive property to open the brackets:

=> $(x × 5x) − (x × 9) + (7 × x^2) − (7 × 2) + 17$

=> $5x^2 − 9x + 7x^2 − 14 + 17$

=> Group the like terms together:

=> $(5x^2 + 7x^2) − 9x + (17 − 14)$

=> $12x^2 − 9x + 3$

Therefore The correct answer is $12x^2 − 9x + 3$.

Additional Information

Distributive Property

The rule a(b + c) = ab + ac is fundamental in algebra for removing brackets by distributing the multiplication over addition or subtraction.

Like Terms

Terms having the same variables raised to identical exponents. Only like terms can be added or subtracted to simplify an algebraic expression.

BODMAS Rule

It defines the correct sequence to solve mathematical expressions: Brackets, Orders (powers/roots), Division, Multiplication, Addition, and Subtraction.

Q51. Answer: (c) 41%

Shortcut Trick

The volume of a cylinder is directly proportional to r^2h.

Net multiplying factor for volume = (Multiplying factor of r)² × (Multiplying factor of h)

Net multiplying factor = 0.73 × 0.73 × 2.65 = 1.412185

Percentage increase = (1.412185 − 1) × 100 = 41.2185%

The closest integer to 41.2185% is 41%.

Therefore The correct answer is 41%.

Alternate Method

Given:

Decrease in radius = 27%

Increase in height = 165%

Original Cylinder

r = 100, h = 100

V = 1,000,000π

→

New Cylinder

r = 73, h = 265

V = 1,412,185π

Formula Used:

Volume of a right circular cylinder = $\pi r^2 h$

Calculations:

Let the original radius be 100x and the original height be 100y.

=> Original Volume (V1) = $\pi \times (100x)^2 \times (100y) = 1000000\pi x^2 y$

=> New radius (r') = 100x − 27% of 100x = 73x

=> New height (h') = 100y + 165% of 100y = 265y

=> New Volume (V2) = $\pi \times (73x)^2 \times (265y)$

=> V2 = $\pi \times (5329x^2) \times (265y) = 1412185\pi x^2 y$

=> Increase in Volume = V2 − V1 = $1412185\pi x^2 y - 1000000\pi x^2 y = 412185\pi x^2 y$

=> Percentage Increase = (Increase in Volume ÷ Original Volume) × 100

=> Percentage Increase = $(412185\pi x^2 y \div 1000000\pi x^2 y) \times 100 = 41.2185\%$

=> Closest integer = 41%

Therefore The correct answer is 41%.

Additional Information

Percentage Change Formula

Percentage Change = [(Final Value − Initial Value) ÷ Initial Value] × 100. Multiplying factors help to quickly calculate successive changes.

Successive Percentage Change

If a value is changed successively by x% and y%, the net percentage change is given directly by the formula: x + y + (x × y) ÷ 100.

Volume of a Right Circular Cylinder

The volume ($V = \pi r^2 h$) means the overall volume is subjected to a two-dimensional change with respect to the radius and a one-dimensional change with respect to its height.

Q52. Answer: (b) 1650 cm3

Shortcut Trick

Volume of a cylinder includes the terms π (contains factor 11) and r^2 (contains factor 25).

Since the height (21 cm) is completely divisible by 7, the final volume must be a direct multiple of both 11 and 25.

Checking the options for divisibility by 25 (last two digits) and 11 (difference of alternating sums):

Option 1: 1200 (not divisible by 11) | Option 3: 1500 (not divisible by 11) | Option 4: 1320 (not divisible by 25)

Only 1650 is exactly divisible by both 11 and 25.

Therefore The correct answer is 1650 cm^3.

Alternate Method

r = 5 cm

h = 21 cm

Volume = ?

Given:

Radius of cylinder (r) = 5 cm

Height of cylinder (h) = 21 cm

Formula Used:

Volume of a cylinder = $\pi \times r^2 \times h$

Calculation:

=> Volume = (22 ÷ 7) × $(5)^2$ × 21
=> Volume = (22 ÷ 7) × 25 × 21
=> Volume = 22 × 25 × (21 ÷ 7)
=> Volume = 22 × 25 × 3
=> Volume = 550 × 3
=> Volume = 1650
Therefore The correct answer is 1650 cm^3.
Additional Information
Curved Surface Area (CSA)
The area of the curved lateral surface of a cylinder. Formula: CSA = 2 × π × r × h.
Total Surface Area (TSA)
The total area including the curved surface and the two circular bases. Formula: TSA = 2 × π × r × (r + h).
Volume of a Cone
A cone with the same base radius and height has exactly one-third the volume of a cylinder. Formula: V = (1 ÷ 3) × π × r^2 × h.

Q53. Answer: (d) 194

Shortcut Trick
Total sum of 5 numbers = 655
Sum of the first two numbers = 80 × 2 = 160
Sum of remaining two numbers = 655 − (160 + 107) = 388
Average of remaining two numbers = 388 ÷ 2 = 194
Therefore The correct answer is 194.
Alternate Method
Given:
=> Total sum of five numbers = 655
=> Average of the first two numbers = 80
=> Third number = 107
Formula Used:
=> Average = Sum of observations ÷ Number of observations
=> Sum = Average × Number of observations
Total Sum of 5 Numbers = 655
First 2
Sum = 160
3rd No.
107
Last 2
Sum = 388
Average = 388 ÷ 2 = 194
Calculation:
=> Sum of the first two numbers = 80 × 2 = 160
=> Sum of the first three numbers = 160 + 107 = 267
=> Sum of the remaining two numbers = Total sum − Sum of first three numbers
=> Sum of the remaining two numbers = 655 − 267 = 388
=> Average of the remaining two numbers = 388 ÷ 2 = 194
Therefore The correct answer is 194.
Additional Information
Combined Average
If group 1 has n1 items with average A1 and group 2 has n2 items with average A2, then the combined average is (n1A1 + n2A2) ÷ (n1 + n2).
Concept of Deviation
The sum of deviations of all observations from their arithmetic mean is always zero. This is a highly useful technique for calculating averages or missing values without heavy multiplication.

Weighted Average

When specific values hold greater importance or frequency, multiply each value by its weight, sum the results, and divide by the total weight: Σ(xw) ÷ Σw.

Q54. Answer: (b) 84%

Shortcut Trick

Total Profit % = [(Claimed Profit % + Less Weight %) ÷ (100 − Less Weight %)] × 100

Total Profit % = [(29 + 30) ÷ (100 − 30)] × 100

Total Profit % = (59 ÷ 70) × 100 = 590 ÷ 7 ≈ 84.28%

Rounding off to the nearest whole number, we get 84%.

Therefore The correct answer is 84%.

Alternate Method

Given:

Claimed profit = 29%

Weight used is 30% less than the actual weight.

Actual CP = Rs. 700

SP = Rs. 1290

• Rs. 590 Profit

Total Profit % = (590 ÷ 700) × 100 = 84%

Calculations:

=> Let the true cost price of 1000 g of wheat be Rs. 1000.

=> Selling price of 1000 g (as claimed) = Rs. 1000 + 29% of 1000 = Rs. 1290.

=> Actual weight given by the trader = 1000 g − 30% of 1000 g = 700 g.

=> Actual cost price for the trader (for 700 g) = Rs. 700.

=> Profit earned = Selling Price − Actual Cost Price

=> Profit = 1290 − 700 = Rs. 590.

=> Total Profit % = (Profit ÷ Actual CP) × 100

=> Total Profit % = (590 ÷ 700) × 100 = 590 ÷ 7

=> Total Profit % ≈ 84.28%

=> Rounding off to the nearest whole number, we get 84%.

Therefore The correct answer is 84%.

Additional Information

Dishonest Dealer (Selling at CP)

If a trader sells goods at cost price but uses a false weight, the profit is: Profit % = [Error ÷ (True Weight − Error)] × 100.

Successive Profit

When a dealer makes consecutive profits, the effective net percentage change is calculated as: Net % = a + b + (a × b) ÷ 100.

Marked Price & Discount Relation

The exact relationship between Cost Price, Marked Price, Profit, and Discount is structured as: MP ÷ CP = (100 + Profit %) ÷ (100 − Discount %).

Q55. Answer: (a) 43 km/hr

Shortcut Trick

When the distance is constant, speed is inversely proportional to time.

Time ratio = 7 : 14 = 1 : 2

Speed ratio = Inverse of time ratio = 2 : 1

Given speed (2 ratio parts) = 86 km/hr

Required speed (1 ratio part) = 86 ÷ 2 = 43 km/hr

Therefore The correct answer is 43 km/hr.

Alternate Method

A

B

Total Distance (D) = Constant

Case 1: S = 86 km/hr

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T = 7 hours
Case 2: S = ? km/hr
T = 14 hours
Given:
Initial Speed (S1) = 86 km/hr
Initial Time (T1) = 7 hours
New Time (T2) = 14 hours
Formula Used:
Distance = Speed × Time
Calculations:
=> Total Distance = S1 × T1
=> Distance = 86 × 7
=> Let the new speed be S2 to cover the same distance in 14 hours.
=> Distance = S2 × T2
=> 86 × 7 = S2 × 14
=> S2 = (86 × 7) ÷ 14
=> S2 = 86 ÷ 2
=> S2 = 43 km/hr
Therefore The correct answer is 43 km/hr.
Additional Information
Unit Conversions
To convert km/hr to m/s, multiply by 5 ÷ 18. To convert m/s to km/hr, multiply by 18 ÷ 5.
Average Speed
Average Speed = Total Distance ÷ Total Time. If equal distances are covered at speeds a and b, Average Speed = 2ab ÷ (a + b).
Relative Speed
When moving in the same direction, relative speed = S1 − S2. When moving in opposite directions, relative speed = S1 + S2.

Q56. Answer: (c) 216

Shortcut Trick
Effective simple interest rate for 6 months = 3% × 6 = 18%.
Simple Interest = 18% of Rs. 1200.
=> SI = (18 ÷ 100) × 1200 = 216
Therefore The correct answer is Rs. 216.
Alternate Method
Given:
Principal (P) = Rs. 1200
Rate of Interest (R) = 3% per month
Time (T) = 6 months
Formula Used:
Simple Interest = (P × R × T) ÷ 100
(Note: Since the rate is given per month and time is in months, both units are matching and no conversion to years is needed.)
Rs. 1200
Principal
3% / month
6 months
Rs. 216
Simple Interest
Total Interest = 18% of Rs. 1200
Calculation:
=> SI = (1200 × 3 × 6) ÷ 100
=> SI = 12 × 18
=> SI = 216

Therefore The correct answer is Rs. 216.

Additional Information

Unit Consistency in Simple Interest

Always ensure that the Time (T) unit strictly matches the Rate (R) period. If Rate is monthly, Time must be in months. If Rate is per annum, Time must be in years.

Total Amount Formula

Amount (A) = Principal (P) + Simple Interest (SI). This indicates the total sum that must be repaid after the time duration.

Simple vs Compound Interest

Simple Interest is charged only on the original principal sum for the entire tenure, whereas Compound Interest adds previously earned interest to the principal before calculating the next period's interest.

Q57. Answer: (b) 2243.75

Shortcut Trick

A 60% increase means the new value is 160% of the original number.

160% = 3590

1% = 3590 ÷ 160

100% (Original Number) = (3590 ÷ 160) × 100 = 2243.75

Therefore The correct answer is 2243.75.

Alternate Method

Given:

Final number after increase = 3590

Percentage increase = 60%

Formula Used:

Original Number = (Final Value × 100) ÷ (100 + Increase %)

100% (Original Number)

+60% Increase

Total 160% = 3590

100% = (3590 ÷ 160) × 100 = 2243.75

Calculations:

=> Let the original number be x.

=> x + (60% of x) = 3590

=> x × (1 + 0.60) = 3590

=> 1.6x = 3590

=> x = 3590 ÷ 1.6

=> x = 35900 ÷ 16

=> x = 2243.75

Therefore The correct answer is 2243.75.

Additional Information

Percentage Decrease

If a number is decreased by R%, the new value becomes Original × (100 − R) ÷ 100.

Successive Percentage Change

When a number is changed by A% and then by B%, the net percentage change is given by A + B + (A × B) ÷ 100.

Base Change Rule

If value X is R% more than Y, then Y is less than X by (R ÷ (100 + R)) × 100%.

Q58. Answer: (b) 30 cm, 24 cm

Shortcut Trick

Sum of parallel sides = (Area × 2) ÷ Height = (648 × 2) ÷ 24 = 54 cm.

Given difference of parallel sides = 6 cm.

Larger side = (Sum + Difference) ÷ 2 = (54 + 6) ÷ 2 = 30 cm.

Smaller side = (Sum − Difference) ÷ 2 = (54 − 6) ÷ 2 = 24 cm.

Therefore The correct answer is 30 cm, 24 cm.

Alternate Method

Given:

Area of trapezium = 648 cm²

Perpendicular distance (h) = 24 cm

Difference between parallel sides (a − b) = 6 cm

Side b

Side a

24 cm

Area = 648 cm²

a - b = 6 cm

Formula Used:

Area of Trapezium = ½ × (Sum of parallel sides) × Height

Calculation:

=> 648 = ½ × (a + b) × 24

=> 648 = 12 × (a + b)

=> a + b = 648 ÷ 12

=> a + b = 54 ..... (Equation 1)

=> a − b = 6 ..... (Equation 2)

Adding Equation 1 and Equation 2:

=> 2a = 60

=> a = 30 cm

Substituting the value of a in Equation 1:

=> 30 + b = 54

=> b = 54 − 30

=> b = 24 cm

Therefore The correct answer is 30 cm, 24 cm.

Additional Information

Area of a Trapezium

The area is calculated as half the product of the sum of parallel sides and the perpendicular distance between them: A = ½ × (a + b) × h.

Perimeter of a Trapezium

The perimeter is the total length of the boundary, obtained by adding the lengths of all four sides: P = a + b + c + d.

Isosceles Trapezium

A special type of trapezium in which the non-parallel sides are equal in length, making its base angles equal and its diagonals equal.

Median of a Trapezium

The line segment joining the midpoints of the non-parallel sides. Its length is exactly the average of the two parallel sides: M = (a + b) ÷ 2.

Q59. Answer: (d) 173

Shortcut Trick

The average of the first 'n' even natural numbers is directly given by the formula (n + 1).

Given the number of terms n = 172.

=> Average = 172 + 1 = 173

Therefore The correct answer is 173.

Alternate Method

Given:

Sequence of the first 172 even numbers: 2, 4, 6, ..., 344

First term (a) = 2

Last term (l) = 172 × 2 = 344

Formula Used:

For an Arithmetic Progression (A.P.), Average = (First term + Last term) ÷ 2

2

4
6
344
1st term
2nd term
3rd term
172nd term
n = 172 terms
Average = (First + Last) ÷ 2
Calculations:
=> Average = (2 + 344) ÷ 2
=> Average = 346 ÷ 2
=> Average = 173
Therefore The correct answer is 173.
Additional Information
Average of First 'n' Natural Numbers
The average of the first n natural numbers is evaluated using the formula (n + 1) ÷ 2.
Average of First 'n' Odd Numbers
The average of the first n odd natural numbers is exactly equal to n.
Average of Numbers in A.P.
If a series is in an Arithmetic Progression, its average is precisely equal to (First term + Last term) ÷ 2, which matches the middle term of the series.
Sum of First 'n' Even Numbers
The sum of the first n even natural numbers can be directly calculated using the formula n × (n + 1).

Q60. Answer: (b) 60

Shortcut Trick
CP of 1 ruler = 180 ÷ 12 = Rs. 15
Ratio of CP : SP = 15 : 24 = 5 : 8
Profit is 3 parts on a base CP of 5 parts.
Profit % = (3 ÷ 5) × 100 = 60%
Therefore The correct answer is 60%.
Alternate Method
Given:
Cost price of 1 dozen (12) rulers = Rs. 180
Selling price of 1 ruler = Rs. 24
Formula Used:
Profit = SP − CP
Profit % = (Profit ÷ CP) × 100
Profit Calculation
CP = Rs. 15
Profit = Rs. 9
Selling Price (SP) = Rs. 24
Profit % = 60%
Result: Profit % = (9 ÷ 15) × 100 = 60%
Calculations:
=> Cost price of 1 ruler (CP) = 180 ÷ 12 = Rs. 15
=> Profit earned on 1 ruler = 24 − 15 = Rs. 9
=> Profit % = (9 ÷ 15) × 100
=> Profit % = (3 ÷ 5) × 100 = 60%
Therefore The correct answer is 60%.
Additional Information

Loss Percentage

When Selling Price is less than Cost Price, Loss occurs. Loss % = (Loss ÷ CP) × 100.

Marked Price and Discount

Discount is always calculated on the Marked Price (MP). SP = MP − Discount.

Successive Discounts

If two successive discounts of a% and b% are given, equivalent discount = a + b − (a × b ÷ 100)%.

Q61. Answer: (b) 40/3

Shortcut Trick

Total Work = LCM(24, 20, 12) = 120 units.

Efficiency of Isha = 120 ÷ 24 = 5, and Isha + Smriti = 120 ÷ 20 = 6.

Efficiency of Isha + Smriti + Ashlesha = 120 ÷ 12 = 10.

Ashlesha's efficiency = 10 − 6 = 4 units/day.

Time taken by Isha + Ashlesha = 120 ÷ (5 + 4) = 40/3 days.

Therefore The correct answer is 40/3 days.

Alternate Method

Given:

Time taken by Isha = 24 days

Time taken by Isha and Smriti = 20 days

Time taken by Isha, Smriti and Ashlesha = 12 days

Formula Used:

Total Work = Efficiency × Time

Person	Days	Total Work	Efficiency
Isha	24	120	5
Isha + Smriti	20	6	
Isha + Smriti + Ashlesha	12	10	

Calculations:

=> Efficiency of Isha = 5 units/day

=> Efficiency of Isha and Smriti = 6 units/day

=> Efficiency of Isha, Smriti and Ashlesha = 10 units/day

=> Efficiency of Ashlesha = 10 − 6 = 4 units/day

=> Combined efficiency of Isha and Ashlesha = 5 + 4 = 9 units/day

=> Time taken by Isha and Ashlesha = 120 ÷ 9 = 40/3 days

Therefore The correct answer is 40/3 days.

Additional Information

Pipes & Cisterns

Similar to Time and Work, but an emptying pipe has negative efficiency. Net efficiency = Sum of Filling rates − Sum of Emptying rates.

Work & Wages

Wages are distributed in the ratio of the total work done by each person. If everyone works for the same number of days, wages are directly proportional to their efficiencies.

Alternate Day Work

When people work on alternate days, find the total work done in one complete cycle and multiply it to approach the Total Work, then calculate the remaining work for the next person in sequence.

Q62. Answer: (a) 143750

Shortcut Trick

Total Registered Voters = Margin ÷ (Polled% × Valid% × Margin% of Valid)

Margin% = 51% − (100% − 51%) = 2%

Valid% = 100% − 21% = 79%

Total Voters = 1817 ÷ (80% × 79% × 2%)

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Total Voters = 1817 ÷ 0.01264 = 143750

Therefore The correct answer is 143750 voters.

Alternate Method

Given:

Registered voters who cast votes = 80%

Invalid votes = 21%

Winning candidate's share = 51% of valid votes

Winning margin = 1817 votes

Registered Voters

80% Polled

Polled Votes

79% Valid

Valid Votes

2% Margin

Margin = 1817 Votes

Calculations:

=> Let the total registered voters be 100 units.

=> Votes polled = 80% of 100 = 80 units

=> Valid votes = (100 − 21)% of 80 units = 79% of 80 = 63.2 units

=> Winner's votes = 51% of 63.2 units

=> Loser's votes = (100 − 51)% = 49% of 63.2 units

=> Winning margin = (51 − 49)% of 63.2 units = 2% of 63.2 units

=> Margin = 0.02 × 63.2 = 1.264 units

=> 1.264 units = 1817

=> 1 unit = 1817 ÷ 1.264 = 1437.5

=> Total registered voters (100 units) = 1437.5 × 100 = 143750

Therefore The correct answer is 143750 voters.

Additional Information

Election Percentage Concept

In election-based problems, always clearly distinguish between "Total Registered Voters", "Polled Votes", and "Valid Votes". Calculations are typically a chain of percentages applied consecutively on the reduced base.

Winning Margin Rule

The margin of victory is the difference in percentage between the winner and the loser. If a winner gets x% of valid votes, the loser gets (100 − x)%, and the direct margin equals (2x − 100)% of the valid votes.

Successive Percentage Trick

When multiple fractional drops are applied one after another, the final value can be directly found using continuous multiplying factors: Final = Initial × (a ÷ 100) × (b ÷ 100) × (c ÷ 100).

Q63. Answer: (c) Rs. 8,420

Shortcut Trick

Given 8A = 3B = 6C, the ratio A : B : C is derived from the inverses: (1/8) : (1/3) : (1/6).

Multiply each term by the LCM of (8, 3, 6) = 24 → A : B : C = 3 : 8 : 4.

Total ratio parts = 3 + 8 + 4 = 15 parts, which corresponds to the total sum of Rs. 42,100.

A's share is 3 parts out of 15, which means exactly 1/5th of the total amount.

Share of A = 42,100 ÷ 5 = Rs. 8,420.

Therefore The correct answer is Rs. 8,420.

Alternate Method

Given:

Total amount to be divided = Rs. 42,100

8 × (Share of A) = 3 × (Share of B) = 6 × (Share of C)

A (3)

B (8)

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C (4)

Total = 15 parts = Rs. 42,100

A's Share = ?

Calculations:

=> Let 8A = 3B = 6C = k (where k is a constant)

=> A = k/8, B = k/3, C = k/6

=> Ratio of their shares A : B : C = k/8 : k/3 : k/6 = 1/8 : 1/3 : 1/6

=> To simplify the ratio, multiply by the LCM of the denominators (8, 3, 6) which is 24.

=> A : B : C = (1/8 × 24) : (1/3 × 24) : (1/6 × 24)

=> A : B : C = 3 : 8 : 4

=> Total sum of ratio parts = 3 + 8 + 4 = 15 parts

=> Value of 15 parts = Rs. 42,100

=> Share of A = (Ratio parts of A ÷ Total parts) × Total Amount

=> Share of A = (3 ÷ 15) × 42,100

=> Share of A = (1 ÷ 5) × 42,100

=> Share of A = 8,420

Therefore The correct answer is Rs. 8,420.

Additional Information

Inverse Ratio Concept

If pA = qB = rC, then the direct ratio A : B : C is (1/p) : (1/q) : (1/r). It can also be found quickly by hiding the coefficient of one variable and multiplying the remaining coefficients.

Proportional Division

When a given total amount is divided in a specific ratio a : b : c, the individual share of the first entity is always equal to Total Amount × [a ÷ (a + b + c)].

Q64. Answer: (d) 64

Shortcut Trick

For two given numbers a and b, the third proportional x is calculated using the direct formula: $x = b^2 \div a$.

Here, the given numbers are a = 4 and b = 16.

x = (16 × 16) ÷ 4

x = 256 ÷ 4 = 64

Therefore The correct answer is 64.

Alternate Method

Given:

The first number (a) is 4.

The second number (b) is 16.

The third proportional is x.

4

1st Term

:

16

2nd Term

::

16

2nd Term

:

x

3rd Term

Proportional Relationship: a : b :: b : x

Formula Used:

If three terms a, b, and x are in continued proportion, then a : b :: b : x.

=> a ÷ b = b ÷ x

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Calculations:
=> 4 ÷ 16 = 16 ÷ x
=> 1 ÷ 4 = 16 ÷ x
=> x = 16 × 4
=> x = 64
Therefore The correct answer is 64.
Additional Information
Mean Proportional
The mean proportional (or geometric mean) between two numbers a and b is x, such that a : x :: x : b. The formula is $x = \sqrt{(a \times b)}$.
Fourth Proportional
If x is the fourth proportional to three distinct numbers a, b, and c, then a : b :: c : x. The formula is $x = (b \times c) \div a$.
First Proportional
If x is the first proportional to a and b, then x : a :: a : b. The required value is computed using the formula $x = a^2 \div b$.
Duplicate Ratio
The duplicate ratio of a : b is given by $a^2 : b^2$, while its sub-duplicate ratio is given by $\sqrt{a} : \sqrt{b}$.

Q65. Answer: (c) 64.17

Shortcut Trick
Total Distance = 774 + 567 + 135 = 1476 km
Total Time = (774 ÷ 86) + (567 ÷ 63) + (135 ÷ 27) = 9 + 9 + 5 = 23 hours
Average Speed = Total Distance ÷ Total Time = 1476 ÷ 23 ≈ 64.1739 km/hr
Therefore The correct answer is 64.17 km/hr.
Alternate Method
Given:
Distance 1 (D1) = 774 km, Speed 1 (S1) = 86 km/hr
Distance 2 (D2) = 567 km, Speed 2 (S2) = 63 km/hr
Distance 3 (D3) = 135 km, Speed 3 (S3) = 27 km/hr
Formula Used:
Time = Distance ÷ Speed
Average Speed = Total Distance ÷ Total Time
774 km
86 km/hr
9 hr
567 km
63 km/hr
9 hr
135 km
27 km/hr
5 hr
Total Distance = 1476 km
Total Time = 23 hr
Calculations:
=> Total Distance = 774 + 567 + 135 = 1476 km
=> Total Time = (774 ÷ 86) + (567 ÷ 63) + (135 ÷ 27)
=> Total Time = 9 + 9 + 5 = 23 hours
=> Average Speed = 1476 ÷ 23
=> Average Speed ≈ 64.1739 km/hr
=> Rounding off to two decimal places, we get 64.17 km/hr.
Therefore The correct answer is 64.17 km/hr.
Additional Information
Average Speed (Different Distances)
When a journey is broken into multiple parts with varying distances and speeds, the average speed is not the arithmetic mean of

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the speeds. It is always determined using: Average Speed = Total Distance ÷ Total Time.

Average Speed (Equal Distances)

If two strictly equal distances are covered at speeds x and y respectively, the average speed for the whole journey simplifies directly to the formula: 2xy ÷ (x + y).

Relative Speed Concept

When two moving bodies travel in the same direction, their effective relative speed is the difference between their speeds |x − y|. When they travel towards each other in opposite directions, their relative speed is the sum of their speeds (x + y).

Q66. Answer: (d) 5476

Shortcut Trick

Using the duplex method $a^2 \mid 2ab \mid b^2$ for 74 (where a = 7, b = 4):

Step 1: $b^2 = 4^2 = 16$. Write 6, carry 1.

Step 2: 2ab + carry = (2 × 7 × 4) + 1 = 57. Write 7, carry 5.

Step 3: a^2 + carry = $7^2 + 5 = 49 + 5 = 54$.

Combining the digits from left to right gives 5476.

Therefore The correct answer is 5476.

Alternate Method

Given:

The expression to evaluate is 74^2.

Formula Used:

$(a + b)^2 = a^2 + 2ab + b^2$

Calculations:

=> $74^2 = (70 + 4)^2$

=> $(70 + 4)^2 = 70^2 + (2 \times 70 \times 4) + 4^2$

=> $(70 + 4)^2 = 4900 + 560 + 16$

=> $(70 + 4)^2 = 5460 + 16$

=> $74^2 = 5476$

Therefore The correct answer is 5476.

Additional Information

Squaring Numbers Near 50

For a number (50 + x), the square is calculated as: first two digits = (25 + x), last two digits = x^2. For example, $53^2 = (25 + 3) \mid 3^2 = 2809$.

Squaring Numbers Near 100

For a number (100 − x), the square is: first two digits = (Number − x), last two digits = x^2. For example, $96^2 = (96 - 4) \mid 4^2 = 9216$.

Squaring Numbers Ending in 5

For a number (n5), the square ends in 25 and the leading digits are n × (n + 1). For example, $65^2 = (6 \times 7) \mid 25 = 4225$.

Q67. Answer: (b) Rs. 23,000

Shortcut Trick

Let the Principal sum be 100%.

Interest for the 1st year = 20% of Principal = 20%.

Interest for the 2nd year = 20% + (20% of 20%) = 24%.

Given, 24% of the sum = Rs. 5,520

=> 1% of the sum = 5520 ÷ 24 = Rs. 230

=> 100% of the sum = 230 × 100 = Rs. 23,000

Therefore The correct answer is Rs. 23,000.

Alternate Method

Given:

Rate of Interest (R) = 20% p.a.

Interest for the 2nd year = Rs. 5,520

Formula Used:

Amount after 1st Year (A1) = P × (1 + R ÷ 100)

Interest for 2nd Year = A1 × (R ÷ 100)

Sum P (100%)
Amount after 1st Yr
Amount (120%)
1st Yr Int = 20%
2nd Yr Int = 24%
24% = Rs. 5,520
Calculations:
=> Let the Principal sum be P.
=> Amount after the 1st year (A1) = P × (1 + 20 ÷ 100) = 1.2P
=> Interest for the 2nd year is charged only on the amount after the 1st year.
=> Interest for 2nd year = 1.2P × (20 ÷ 100) = 0.24P
=> According to the question, 0.24P = 5520
=> P = 5520 ÷ 0.24
=> P = 552000 ÷ 24 = 23000
Therefore The correct answer is Rs. 23,000.
Additional Information
Difference between CI and SI for 2 years
The difference between Compound Interest and Simple Interest for exactly 2 years is given by the formula: $D = P \times (R \div 100)^2$.
Difference between CI and SI for 3 years
For 3 years, the difference formula extends to: $D = P \times (R \div 100)^2 \times (3 + R \div 100)$.
Effective Rate of Compound Interest
For 2 years, the total effective compound interest rate can be found directly using the successive percentage formula: $X + Y + (X \times Y) \div 100$.

Q68. Answer: (c) 258

Shortcut Trick
Let the second number be y, then the first number is 5y.
Product = $5y \times y = 5y^2 = 9245$
$y^2 = 1849 \Rightarrow y = 43$
Sum of the numbers = $5y + y = 6y = 6 \times 43 = 258$
Therefore The correct answer is 258.
Alternate Method
Given:
Product of two positive numbers = 9245
First number = 5 × Second number
Ratio of Numbers = 5 : 1
First Number (5x)
5 parts
Second Number (x)
1 part
Product = $5x \times x = 9245$
Sum = $5x + x = 6x$
Calculations:
=> Let the second number be x.
=> First number = 5x
=> Product of two numbers = $5x \times x = 9245$
=> $5x^2 = 9245$
=> $x^2 = 9245 \div 5 = 1849$
=> $x = \sqrt{1849}$
=> x = 43 (since the numbers are positive)
=> Second number = 43
=> First number = 5 × 43 = 215

=> Sum of the numbers = 215 + 43 = 258

Therefore The correct answer is 258.

Additional Information

Ratio and Proportion

When quantities are defined by a specific proportion, they can be expressed as common multiples of a single variable (e.g., 5x and x) which simplifies algebraic substitution and solving.

Finding Square Roots

To quickly find roots like √1849, check base bounds. Since $40^2 = 1600$ and $50^2 = 2500$, the root lies in the 40s. A number ending in 9 must have a root ending in 3 or 7. Verifying 43^2 gives exactly 1849.

Properties of Sum and Product

For any algebraic relation involving product (ab) and sum (a+b), establishing a ratio constraint removes the need for complex algebraic identities, allowing for a direct single-variable solution.

Q69. Answer: (b) 2

Shortcut Trick

From the first condition, 6P = Q + 46 => P = (Q + 46) ÷ 6.

Since ages are generally whole numbers, (Q + 46) must be a multiple of 6.

Checking the options: If Q = 2, then P = (2 + 46) ÷ 6 = 48 ÷ 6 = 8 (Integer).

For other options (Q = 1, 6, 5), P is not an integer.

Verifying Q = 2, P = 8 in the 2nd condition: 6 × (2 + 10) = 72 and 5 × (8 + 10) − 18 = 72 (Matches!).

Therefore The correct answer is 2 years.

Alternate Method

Given:

Six times the present age of P exceeds the present age of Q by 46 years.

After 10 years, six times Q's age will be 18 years less than five times P's age.

Present Ages

P's Age = p

Q's Age = q

After 10 Years

P's Age = p + 10

Q's Age = q + 10

• 10 Years

Eq 1: 6p − q = 46

Eq 2: 6(q + 10) = 5(p + 10) − 18

Calculation:

Let the present age of P be p and the present age of Q be q.

From the first condition:

=> 6p − q = 46

=> q = 6p − 46 ---- (Equation 1)

From the second condition (after 10 years):

=> 6 × (q + 10) = 5 × (p + 10) − 18

=> 6q + 60 = 5p + 50 − 18

=> 6q + 60 = 5p + 32

=> 5p − 6q = 28 ---- (Equation 2)

Substitute the value of q from Equation 1 into Equation 2:

=> 5p − 6 × (6p − 46) = 28

=> 5p − 36p + 276 = 28

=> −31p = 28 − 276

=> −31p = −248

=> p = −248 ÷ −31 = 8 years

Now, substitute p = 8 in Equation 1:

=> q = 6 × 8 − 46

=> q = 48 − 46 = 2 years

Therefore The correct answer is 2 years.

Additional Information

Problems on Ages

If the current age is x, then age n years ago was (x − n) and age n years later will be (x + n).

Ratio in Ages

When the ratio of ages of two persons a and b is given as p : q, we can assume their ages to be pk and qk respectively, where k is a constant multiplier.

Linear Equations in Two Variables

An equation of the form ax + by + c = 0. Solving two independent equations simultaneously provides the unique values of the variables.

Q70. Answer: (b) 3

Shortcut Trick

For a number to be perfectly divisible by 3, the sum of its digits must be a multiple of 3.

Sum of digits of 934725 = 9 + 3 + 4 + 7 + 2 + 5 = 30.

Since 30 is perfectly divisible by 3, the number 934725 is also divisible by 3.

Therefore The correct answer is 3.

Alternate Method

Given:

Number = 934725

Method Used:

Check the standard divisibility rules for the given options (2, 3, 6, 10).

Calculations:

=> Divisibility by 2: The last digit is 5. Since it is not an even number, 934725 is not divisible by 2.

=> Divisibility by 6: A number must be divisible by both 2 and 3 to be divisible by 6. Since it is not divisible by 2, it cannot be divisible by 6.

=> Divisibility by 10: The last digit must be 0 for a number to be divisible by 10. Since it is 5, 934725 is not divisible by 10.

=> Divisibility by 3: The sum of digits must be perfectly divisible by 3.

=> Sum = 9 + 3 + 4 + 7 + 2 + 5 = 30

=> 30 is divisible by 3 (30 ÷ 3 = 10).

=> Hence, the number 934725 is divisible by 3.

Therefore The correct answer is 3.

Additional Information

Divisibility Rule of 4

A number is divisible by 4 if the number formed by its last two digits is divisible by 4.

Divisibility Rule of 9

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

Divisibility Rule of 11

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

Q71. Answer: (a) ZR - FN

The logic followed here is:

Hence, the correct answer is "Option 1"

Q72. Answer: (d) 692

The logic follows here,

Hence, the correct answer is "Option 4"

Q73. Answer: (c) Husband's sister

Using the following notations, we can draw the Family Tree,

R is sister of B and B is Husband of G.

Hence, the correct answer is "Option 3"

Q74. Answer: (b) Only conclusion (II) follows

The least possible diagram for the given statements is as follows

Conclusions:

(I): Some bats are bamboo. - False (As All bats are stick and all bamboo are stick but their is no relation between bats and bamboo may be it i spossible but not definte. Hence, it is false)

(II): Some sticks are bamboo. - True (All bamboo is stick means some bamboo is stick and some stick are bamboo is true.)

Only conclusion (II) follows.

Hence, the correct answer is "Option 2 "

Q75. Answer: (d) Three

Given: Seven boxes F, G, H, I, K, L, and O are kept one over the other but not necessarily in the same order.

• O is kept immediately above F.

• G is kept immediately above I.

• Only K is kept above L.

• Only two boxes are kept above O.

• G is not kept at the third position from the bottom.

The Final Arrangement is

K
L
O
F
H
G
I

Hence, the correct answer is "Option 4"

Q76. Answer: (d) Two

Given Series: (Left) / / 9 3 * > * ? 5 6 2 # 3 ^ 4 + 6 < + (Right)

Conditions: Another Number - Number - Symbol.

(Left) / / 9 3 * > * ? 5 6 2 # 3 ^ 4 + 6 < + (Right)

Thus, there are two such numbers are there, each of which is immediately preceded by another number and also immediately followed by a symbol.

Hence, the correct answer is "Option 4"

Q77. Answer: (d) 256

The logic follows here,

Hence, the correct answer is "Option 4"

Q78. Answer: (d) VZWV

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 4"

Q79. Answer: (c) 8

Given Number: 5237894

If 1 is added to each even digit and 2 is subtracted from each odd digit in the number,

New Number Formed:

Difference between the highest and lowest digits in the number = 9 - 1

= 8.

Hence, the correct answer is "Option 3"

Q80. Answer: (d) AIQ 38

The logic followed here is:

Hence, the correct answer is "Option 4"

Q81. Answer: (b) 52

The logic followed here is:

Position of Vimal from the top = 29^(th)

Position of Vimal from the bottom = 24^(th)

To find the total number of students in the class when the rank of one person from both ends is given, we use the formula:

Total number of students = (Rank from top) + (Rank from bottom) - 1

= 29 + 24 - 1

= 53 - 1 = 52

So, there are 52 students in the class.

Hence, the correct answer is "Option 2".

Q82. Answer: (d) ELM : GNL

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 4".

Q83. Answer: (d) 111

The logic follows here,

Hence, the correct answer is "Option 4"

Q84. Answer: (c) (35, 735, 21)

Logic : (First Number x Third Number) = Second Number

Similarly,

Hence, the correct answer is "Option 3"

Q85. Answer: (a) Only conclusion (I) follows.

The Possible Venn diagram,

Conclusions:

(I) Some banners are flexes. - True (All prints are banners, and All prints are flexes and Some banners are flexes is True).

(II) All flexes are prints. - False (All flexes are prints may be it is possible but not definte. Hence it is false)

Only conclusion (I) follows.

Hence, the correct answer is "Option 1"

Q86. Answer: (b) QKG

The logic followed here is:

Hence, the correct answer is "Option 2"

Q87. Answer: (c) TZU

The logic followed here is:

Hence, the correct answer is "Option 3"

Q88. Answer: (d) 50

Using BODMAS rule.

Given Equation : 42 + 75 × 3 − 11 ÷ 3 = ?

If '+' and '−' are interchanged and '×' and '÷' are interchanged

After interchanged

42 − 75 ÷ 3 + 11×3 = ?

42 − 25+ 11 ×3 = ?

42 − 25+ 33 = 50.

Hence, the correct answer is "Option 4"

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Q89. Answer: (c) U

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

• S sits third to the right of V.

• V sits second to the left of Q.

• U sits to the immediate left of R

The Final Arrangement

U sits immediate right of S.

Hence, the correct answer is "Option 3"

Q90. Answer: (a) HOLD - OHLD - DOHL

The logic follows here,

Similarly,

Hence, the correct answer is "Option 1"

Q91. Answer: (d) 17

Given : 25 A 5 D 10 B 3 C 42 = ?

If ‘A’ stands for ‘÷’, ‘B’ stands for ‘×’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘–’,

25 ÷ 5 - 10 × 3 + 42 = ?

5 - 10 × 3 + 42 = ?

5 - 30 + 42 = ?

17.

Hence, the correct answer is "Option 4"

Q92. Answer: (c) 5

‘GLUE’ is coded as ‘2475’

‘UNIT’ is coded as ‘1536’.

The code for ‘U’ in that language is 5.

Hence, the correct answer is "Option 3."

Q93. Answer: (a) HCG

The logic followed here is:

Hence, the correct answer is "Option 1"

Q94. Answer: (a) Northeast

• Town P is to the north of town Q.

• Town Q is to the east of town R.

• Town T is to the north of town P.

• Town S is to the east of town P

The Final Diagram,

Hence, the correct answer is "Option 1"

Q95. Answer: (b) Three

Given: (Left) 731 890 923 286 378 (Right)

Numbers is the sum of the 1st and 3rd digits greater than the 2nd digit.

731,923 and 378.

Hence, the correct answer is "Option 2"

Q96. Answer: (d) 26 km towards West

• Younis starts from Point A and drives 17 km towards East.

• He then takes a left turn, drives 6 km, turns right and drives 11 km.

• He then takes a right turn and drives 6 km.

• He takes a final right turn, drives 2 km and stops at Point P

The Final Diagram,

Hence, the correct answer is "Option 4"

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Q97. Answer: (d) R

A, B, C, D, Q, R and S are sitting around a circular table facing the centre of the table.

• Only two people sit between Q and B when counted from the right of Q.

• Only three people sit between A and C when counted from the right of C.

• B sits to the immediate right of C.

• R sits to the immediate right of S

The Final Arrangement is

Hence, the correct answer is "Option 4"

Q98. Answer: (a) F

Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

• No box is kept above W.

• Only three boxes are kept between W and F.

• Only one box is kept between E and V.

• V is kept immediately above F.

• Only four boxes are kept between E and X.

• G is kept at some place above U

The Final Arrangement,

W
E
G
V
F
U
X

F is second below G.

Hence, the correct answer is "Option 1"

Q99. Answer: (c) mk

'are you hungry' - 'mk tk jb'

'you came early' - 'cd ab mk'.

Code for You is mk.

Hence, the correct answer is "Option 3"

Q100. Answer: (c) One

Given number: 86435621

1 is added for each odd digit, and 1 is subtracted from each even digit of the number.

A new number is formed.

Only 5 is repeated more than once in the new number thus formed.

Hence, the correct answer is "Option 3"

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