RRB NTPC (UG) CBT-I Official Paper (Held On: 07 Aug, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Which Indian author won the 2025 International Booker Prize for the short story collection 'Heart Lamp'?

(a) Jeet Thayil
(b) Deepa Bhasthi
(c) Banu Mushtaq
(d) Pratibha Satpathy

Q2. Which of the following quantities remains unchanged when a charged particle moves in a magnetic field?

(a) Direction of velocity
(b) Kinetic energy
(c) Momentum direction
(d) Angular momentum

Q3. Which of the following is responsible for managing shortcut links and desktop visual layout?

(a) Windows Shell
(b) Command Prompt
(c) Task Scheduler
(d) File Explorer

Q4. India has unveiled a comprehensive plan worth Rs. 9.15 lakh crore (US$ 109.50 billion) to enhance its power infrastructure and meet a projected demand of 458 GW by _____.

(a) 2034
(b) 2036
(c) 2032
(d) 2030

Q5. Under the Government of India Act, 1919, which subjects were transferred to Indian ministers?

(a) Police and Revenue
(b) Judiciary and Foreign Affairs
(c) Education and Health
(d) Defence and Railways

Q6. Which of the following factors best explains the formation of ox-bow lakes along river courses?

(a) Sudden uplift of riverbeds by tectonic activity
(b) Tectonic uplift disrupting the flow
(c) Glacial retreat leaving depressions
(d) Lateral erosion on the outer banks and deposition on the inner banks

Q7. Which neighbouring country did India accuse of supporting cross-border infiltration attempts in Jammu and Kashmir in early 2025?

(a) Pakistan
(b) Bangladesh
(c) Sri Lanka
(d) Nepal

Q8. Which of the following countries will restrict the Mt. Everest Permit to only those who have already climbed 7000 m?

(a) Mongolia
(b) USA
(c) Japan
(d) Nepal

Q9. The Contact Process is used for the manufacturing of which of the following chemicals?

(a) Ammonia
(b) Nitric acid
(c) Hydrochloric acid
(d) Sulphuric acid

Q10. During the rule of which of the following Mughal rulers did Sunnis and Shias meet in one mosque and Christians and Jews in one church to pray, thus following the principle of 'universal peace' (sulh-i kul)?

(a) Jahangir
(b) Babar
(c) Humayun
(d) Akbar

Q11. In which of the following Indian states does the Jagar dance form has its primary roots?

(a) Himachal Pradesh
(b) Bihar
(c) Jammu and Kashmir
(d) Uttarakhand

Q12. The Third Battle of Panipat in 1761 was fought between Ahmad Shah Abdali and which Indian power?

(a) Mughals
(b) Rajputs
(c) British
(d) Marathas

Q13. In which of the following cities' suburban trains was Kavach 5.0 launched in April 2025 to enable more trains to run safely and efficiently?

(a) Lucknow
(b) Mumbai
(c) New Delhi
(d) Chennai

Q14. Which policy initiative aims to digitise all Primary Agricultural Credit Societies (PACS)?

(a) National Digital Agri Mission
(b) e-Kisan Portal
(c) Co-op Net
(d) PACS Digitization Project

Q15. Pamban Port is located in which state of India?

(a) Tamil Nadu
(b) Maharashtra
(c) Karnataka

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(d) Kerala

Q16. What does the shortcut key Ctrl + S do in most software applications?

(a) Saves the current document
(b) Starts a new page
(c) Searches for text in a document
(d) Selects all content

Q17. Who was the first Chief Election Commissioner of India?

(a) Sukumar Sen
(b) V Narahari Rao
(c) HK Kripalani
(d) MC Setalvad

Q18. Where was the 2025 Regional Forum on Sustainable Development (RFSD) for the UNECE region held on April 2–3?

(a) Oslo
(b) Geneva
(c) Vienna
(d) Brussels

Q19. Where was the BrahMos Aerospace Integration and Testing Facility inaugurated on 11 May 2025?

(a) Hyderabad, Telangana
(b) Bengaluru, Karnataka
(c) Lucknow, Uttar Pradesh
(d) Pune, Maharashtra

Q20. Who translated the book 'Heart Lamp' into English, making it the first Kannada work to win the 2025 International Booker Prize?

(a) Deepa Bhasthi
(b) Meena Kandasamy
(c) Arshia Sattar
(d) Annie Zaidi

Q21. Which of the following movements is also known as the 'Ulgulan' or the 'Great Tumult' movement?

(a) Munda uprising
(b) Kol rebellion
(c) Santhal rebellion
(d) Chuar uprising

Q22. Which of the following is considered the first full-length Indian feature film, released in 1913?

(a) Raja Harishchandra
(b) Alam Ara
(c) Keechaka Vadham
(d) Sant Tukaram

Q23. Which Indian state had the highest Human Development Index (HDI) value according to the NITI Aayog's SDG India Index 2023?

(a) Maharashtra
(b) Tamil Nadu
(c) Kerala
(d) Gujarat

Q24. Which DRDO-developed system, inducted into the Indian Army in 2024, played a crucial role in air defence during Operation Sindoor in 2025?

(a) Akashteer
(b) Barak-8

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(c) Akash
(d) QRSAM

Q25. What evidence supports the layered structure of the Earth's interior?
(a) Fossil records
(b) Magnetic poles
(c) Volcanic eruptions
(d) Seismic wave behaviour

Q26. Which of the following was a major drawback of the Indian economy at the time of independence?
(a) Self-sufficiency in food grains
(b) High unemployment and poverty
(c) Strong infrastructure
(d) High industrial output

Q27. Who is the director of the Indian film 'Tanvi: The Great', which had its world premiere at the Cannes Film Market during the 78th Cannes Film Festival in 2025?
(a) Anupam Kher
(b) Kiran Rao
(c) Shabana Azmi
(d) Naseeruddin Shah

Q28. Which of the following diseases is caused by protozoa?
(a) Polio
(b) Typhoid
(c) Chicken Pox
(d) Malaria

Q29. Which method best characterises the approach of the Moderates?
(a) Armed revolution
(b) Guerrilla warfare
(c) Petition and prayer
(d) Cultural renaissance

Q30. Which term refers to the pre-monsoon showers that occur with a sudden rise in temperature, especially in southern India?
(a) Nor'wester
(b) Mango showers
(c) Break in monsoon
(d) Loo

Q31. Which of the following is the first biosphere reserve established in India?
(a) Nilgiri
(b) Sundarbans
(c) Nanda Devi
(d) Gulf of Mannar

Q32. In March 2025, the Defence Ministry signed contracts with which two companies for the procurement of 155 mm/52 calibre Advanced Towed Artillery Gun System (ATAGS)?
(a) Bharat Forge Ltd and Tata Advanced Systems Ltd
(b) Larsen & Toubro Ltd and MTAR Technologies Ltd
(c) Mahindra Defence Systems Ltd and Kalyani Strategic Systems Ltd
(d) Bharat Dynamics Ltd and Hindustan Aeronautics Ltd

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Q33. In which list of the Seventh Schedule does the Central Government have exclusive power to legislate?

(a) State List
(b) Concurrent List
(c) Union List
(d) Residual List

Q34. The Aguada Fort, which is a monument to Portuguese construction and engineering, is situated in which of the following states of India?

(a) Gujarat
(b) Goa
(c) Maharashtra
(d) Tamil Nadu

Q35. The National Multidimensional Poverty Index, published by NITI Aayog, measures poverty beyond income by considering multiple deprivations. Which of the following dimensions is NOT included in India's National Multidimensional Poverty Index (MPI)?

(a) Education
(b) Employment
(c) Health
(d) Standard of living

Q36. Which new electricity trading tool did India propose in 2025 to help companies meet renewable energy targets?

(a) Renewable Energy Certificates (RECs)
(b) Green Energy Tariffs
(c) Time-of-Day Net Metering
(d) Virtual Power Purchase Agreements (VPPAs)

Q37. Which Indian startup unveiled a system to run AI without advanced chips in April 2025?

(a) Ziroh Labs
(b) BharatPe
(c) Closeloop Technology
(d) Eka Software

Q38. Which Schedule of the Constitution deals with the administration of Scheduled Areas and Tribes?

(a) Sixth Schedule
(b) Fifth Schedule
(c) Eleventh Schedule
(d) Ninth Schedule

Q39. What is used to measure a decent standard of living in HDI?

(a) Population density
(b) Monthly salary
(c) GDP per capita in PPP US Dollars
(d) Availability of luxury goods

Q40. Which of the following multinational air combat exercises did the Indian Air Force (IAF) participate in at Al Dhafra Air Base in the UAE from 21 April to 8 May 2025?

(a) Red Flag
(b) Iron Fist
(c) Desert Flag-10
(d) Blue Flag-5

MATHEMATICS

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Q41. By selling 6 rubber-bands for a rupee, a man loses 40%. To gain 20% how many must he sell for a rupee?

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

Q42. A number, when increased by 100%, gives 2780. The number is:

(a) 1390
(b) 695
(c) 4170
(d) 2780

Q43. The product of two consecutive natural numbers is 210. The greater of the two numbers is:

(a) 21
(b) 7
(c) 15
(d) 34

Q44. Given that 149^(0.59) = ×, 149^(0.94) = y and ×^z = y^6, then the value of z is close to:

(a) 9.29
(b) 7.39
(c) 9.56
(d) 11.02

Q45. The average of first 151 even numbers is

(a) 152
(b) 151.5
(c) 152.5
(d) 153

Q46. In an election between two candidates, 80% of the registered voters cast their vote and 5% of the votes polled were found invalid. The winning candidate got 75% of the valid votes and won the election by a margin of 1805 votes. How many voters were registered?

(a) 4750
(b) 4751
(c) 4748
(d) 4749

Q47. Pipe A can fill a tank in 16 hours, pipe B can fill the same tank in 25 hours and pipe C can fill the same tank in 12 hours. The time taken by them to fill the same tank if they operate together is::

(a) 5 85/223 hours
(b) 385/223 hours
(c) 1 85/223 hours
(d) 985/223 hours

Q48. Find the mean proportional of 25 and 16.

(a) 18
(b) 20
(c) 17
(d) 22

Q49. Ram went to a shop and observed that the list price of a fan is Rs. 3,600. If the retailer has bought the fan for Rs. 2,800, then find the trade discount (correct to one decimal place).

(a) 20%
(b) 19.8%

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(c) 24.6%
(d) 22.2%

Q50. In covering a distance of 182 km, Salaj takes 4 hours more than Kevin. If Salaj doubles his speed, then he would take 9 hours less than Kevin. Salaj's speed is:
(a) 7 km/hr
(b) 13 km/hr
(c) 11 km/hr
(d) 3 km/hr

Q51. Anubhav and Gaurav start a business. Anubhav invests Rs. 55,000 more than Gaurav for 2 months and Gaurav invests for 5 months. Anubhav's share is Rs. 1,431 more than that of Gaurav, out of a total profit of Rs. 7,155. Find the capital contributed by Anubhav.
(a) Rs. 90,000
(b) Rs. 75,000
(c) Rs. 80,000
(d) Rs. 70,000

Q52. The LCM of the numbers 2.7 and 0.096 is:
(a) 216
(b) 2.16
(c) 21.6
(d) 0.216

Q53. The H.C.F. and the L.C.M. of two numbers are 2 and 492, respectively. If one of the numbers is 82, find the other one.
(a) 93
(b) 102
(c) 31
(d) 12

Q54. Simplify the following.
$2((4/2)\ x^2-21\ x+15)-4(x^2+5\ x-15)$
(a) -62x - 90
(b) 62x + 90
(c) -62x + 90
(d) 62x - 90

Q55. By selling an article at 2/5 of its actual selling price, Manav incurs a loss of 24%. If he sells it at 88% of its actual selling price, then the profit percentage is:
(a) 67.2%
(b) 67.3%
(c) 67.9%
(d) 69.4%

Q56. Ishaan and Meghna have to travel from Delhi to Kanpur in their respective cars. Ishaan is driving at 77 km/hr while Meghna is driving at 33 km/hr. Find the time taken by Meghna to reach Kanpur if Ishaan takes 12 hours.
(a) 28 hours
(b) 34 hours
(c) 33 hours
(d) 29 hours

Q57. X, Y and Z invested a sum in the ratio of 86 : 60 : 24, respectively. If they earned a total profit of Rs. 4,590 at the end of the year, what is the difference between the shares of Y and Z?
(a) Rs. 1,065
(b) Rs. 994

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(c) Rs. 864
(d) Rs. 972

Q58. Which of the following numbers is divisible by 24?
(a) 7991987
(b) 7340390
(c) 6830904
(d) 7132978

Q59. A product is sold for Rs. 3,400 after a 15% discount. What was the original marked price?
(a) Rs. 4,100
(b) Rs. 3,900
(c) Rs. 4,000
(d) Rs. 3,800

Q60. If $\sin\theta = 1/2$, then $13 \times \text{cosec}^2\theta - 3 \times \cot^2\theta - 15$ is equal to:
(a) 68
(b) 56
(c) 26
(d) 28

Q61. Naman and Omar can complete a certain piece of work in 13 and 4 days, respectively. They started to work together, and after 2 days, Omar left. In how many days will Naman complete the remaining work?
(a) 4.5
(b) 6
(c) 6.5
(d) 5

Q62. Find the value of: 83^(−6) ÷ 83^(16) × 83^(−8)
(a) 83^(−26)
(b) 83^(−40)
(c) 83^(−30)
(d) 83^(−20)

Q63. The average weight (in kg) of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 73 kg and 38 kg is:
(a) 51.2
(b) 52.2
(c) 50.2
(d) 53.2

Q64. An exterior angle and an interior angle of a regular polygon are in the ratio of 1 : 8. What is the number of sides of the polygon?
(a) 12
(b) 24
(c) 18
(d) 6

Q65. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 3% per month for 12 months.
(a) Rs. 36
(b) Rs. 56
(c) Rs. 432
(d) Rs. 72

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Q66. The number of prime numbers lying between 303 and 311, both included, is:

(a) 5
(b) 2
(c) 7
(d) 3

Q67. The volume of a right circular cylinder is 8624 cm^3. If the radius and height of the cylinder are equal, then find the height of the cylinder. (Use $\pi = 22/7$)

(a) 12 cm
(b) 15 cm
(c) 14 cm
(d) 13 cm

Q68. Find the simple interest (in Rs.) on Rs. 4,000 at 7.5% per annum rate of interest deposited on 7 February 2024 and withdrawn on 8 April 2024.

(a) 49
(b) 50
(c) 51
(d) 48

Q69. If 3 times the mother's age is 26 years more than 5 times her daughter's age, and 2 times the daughter's age is 2 years less than the mother's age, then what is the difference (in years) between the ages of the mother and the daughter?

(a) 25
(b) 20
(c) 23
(d) 22

Q70. Find the volume (in cm^3) of a sphere having a diameter of 22 cm, giving your answer correct to two places of decimal.

Take $\pi = 22/7$.

(a) 5567.52
(b) 5587.52
(c) 5597.52
(d) 5577.52

GENERAL INTELLIGENCE AND REASONING

Q71. 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 6 $ $ 7 © £ $ 1 * 5 4 3 3 $ 6 @ # # # 8 % (Right)

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

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

Q72. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

Some penguins are sharks.

Some sharks are dolphins.

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Conclusions (I): No shark is a penguin.

Conclusions (II): Some penguins are dolphins.

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

Q73. KGDL is related to IEBJ in a certain way based on the English alphabetical order. In the same way, NJGO is related to LHEM. To which of the given options is QMJR related, following the same logic?

(a) OKPH
(b) KOHP
(c) KOPH
(d) OKHP

Q74. If 2 is added to each even digit and 1 is subtracted from each odd digit in the number 7364592, what will be the sum of the digits which are first from the left and first from the right in the new number thus formed?

(a) 9
(b) 12
(c) 10
(d) 8

Q75. H, I, J, K, U, V and W are sitting around a circular table facing the centre of the table. Only four people sit between U and V when counted from the right of U. U sits third to the left of W. K sits third to the left of H. I is an immediate neighbour of both V and W. How many people sit between J and I when counted from the right of J?

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

Q76. Veer starts from Point Y and drives 34 km towards north. He then takes a left turn, drives 20 km. He then turns left and drives 40 km. He takes a final left turn, drives 20 km and stops at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90° turns only unless specified.)

(a) 6 km towards north
(b) 7 km towards south
(c) 4 km towards east
(d) 8 km towards west

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

178 142 117 101 92 ?

(a) 63
(b) 75
(c) 81
(d) 88

Q78. What should come in place of the question mark (?) in the given series?

499 500 502 505 509 ?

(a) 515
(b) 513
(c) 514
(d) 516

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Q79. Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

Only X is kept above W. Only two boxes are kept between W and G. Only U is kept below F. V is not kept immediately above G. How many boxes are kept between E and U?

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

Q80. Refer to the following number and symbol series and answer the question that follows. All numbers are single-digit numbers. Counting to be done from left to right only.

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

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

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

Q81. 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) NK-PL
(b) JG-LI
(c) FC-HD
(d) RO-TP

Q82. In a row of people all facing north, Cherry is 25^(th) from the right end. Dinesh is 28^(th) from the right end. Dinesh is exactly between Cherry and Lina. If Lina is 11th from the left end of the line, how many people are there in the row?

(a) 40
(b) 41
(c) 42
(d) 39

Q83. Deepti starts from point A and walks 5 km towards west. She takes a left turn and walks 2 km. She then takes a right turn and walks 3 km. She then takes a final right turn and walks 2 km and reaches a point B. How far (shortest distance) and towards which direction should she walk in order to reach point A again? (All turns are 90 degrees turns only unless specified.)

(a) 2 km west
(b) 8 km east
(c) 2 km east
(d) 5 km east

Q84. Kartik ranked 19^(th) from the top and 27^(th) from the bottom in his class. How many students are there in his class?

(a) 45
(b) 47
(c) 44
(d) 46

Q85. Each of the digits in the number 8357416 is arranged in ascending order from left to right. What will be the sum of the digits which are second from the left and second from the right in the new number thus formed?

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

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Q86. A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table. Only four people sit between C and J when counted from the right of C. C sits third to the left of B. A sits third to the left of D. L is an immediate neighbour of both J and B. How many people sit between K and L when counted from the right of K?

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

Q87. In a certain code language, 'OPEN' is coded as '4627' and 'EARS' is coded as '1375'. What is the code for 'E' in the given code language?

(a) 6
(b) 1
(c) 5
(d) 7

Q88. In a certain code language, 'KNOW' is coded as '8901' and 'KNOT' is coded as '9028'. What is the code for 'W' in the given code language?

(a) 8
(b) 9
(c) 1
(d) 0

Q89. What should come in place of the question mark (?) in the given series?

260, 310, 460, 710, 1060, ?

(a) 1560
(b) 1510
(c) 1460
(d) 1410

Q90. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the pair in which the numbers are related in the same way as are the numbers of the following pairs.

(Note: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g., 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

24, 16

48, 32

(a) 72, 36
(b) 84, 56
(c) 60, 20
(d) 96, 62

Q91. 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) RWS
(b) OTP
(c) UZV
(d) MRO

Q92. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statement(s) 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 detergents are towels.

All detergents are conditioners.

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Conclusions:

(I) Some towels are conditioners.

(II) All conditioners are detergents.

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

Q93. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

VPM 153, QUJ 145, LZG 137, GED 129, BJA 121, ?

(a) WOX 113
(b) VOY 115
(c) UPY 115
(d) XNW 113

Q94. What will come in place of the question mark (?) in the following equation, if '+' and '÷' are interchanged and '−' and '×' are interchanged?

11 − 3 × 88 + 8 ÷ 10 = ?

(a) 38
(b) 23
(c) 32
(d) 16

Q95. MOLK is related to RTQP in a certain way based on the English alphabetical order. In the same way, GIFE is related to LNKJ. To which of the given options is VXUT related, following the same logic?

(a) AYZC
(b) AYZS
(c) ACZY
(d) ACYZ

Q96. S is the mother of R. R is the brother of P. P is the wife of I. I is the father of O. How is S related to O?

(a) Mother's mother
(b) Mother's sister
(c) Mother's father
(d) Mother's brother

Q97. If 2 is added to each even digit and 2 is subtracted from each odd digit in the number 3659247, then what will be the sum of all the even digits in the new number thus formed?

(a) 18
(b) 14
(c) 12
(d) 16

Q98. XSLE is related to CWQI in a certain way based on the English alphabetical order. In the same way, RIFU is related to WMKY. To which of the given options is GUUG related, following the same logic?

(a) LZXS
(b) LYZK
(c) LYXZ
(d) LZXD

Q99. 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) KMI

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(b) HJF
(c) EGB
(d) NPL

Q100. What should come in place of the question mark (?) in the given series based on the English alphabetical order?
QMS NJP KGM HDJ ?
(a) FEI
(b) IAG
(c) GEI
(d) EAG

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) Banu Mushtaq

The Correct answer is Banu Mushtaq.

Key Points

• Banu Mushtaq is an emerging Indian author renowned for her unique storytelling and compelling narratives.

• Her short story collection, 'Heart Lamp', was critically acclaimed for its deep exploration of human emotions and cultural nuances.

• The collection earned her the prestigious 2025 International Booker Prize, making her one of the few Indian authors to receive this honor.

• The International Booker Prize celebrates the finest works of fiction translated into English from different languages worldwide, emphasizing global literary excellence.

• 'Heart Lamp' stood out for its portrayal of diverse perspectives and rich storytelling, showcasing Indian culture on a global platform.

• The achievement highlights the growing recognition of Indian literature in the international literary community.

• This milestone serves as an inspiration for aspiring authors across India and beyond, encouraging literary innovation and creativity.

Additional Information

• Jeet Thayil

• Jeet Thayil is a celebrated Indian author and poet, best known for his novel 'Narcopolis', which was shortlisted for the Man Booker Prize in 2012.

• His works often explore themes of addiction, spirituality, and urban life.

• Deepa Bhasthi

• Deepa Bhasthi is an Indian writer, critic, and translator who has contributed extensively to literature and journalism.

• She is recognized for her essays and articles focusing on art, culture, and socio-political issues.

• Pratibha Satpathy

• Pratibha Satpathy is an eminent Odia poet and writer, well-known for her contributions to Indian regional literature.

• She has received several awards, including the Sahitya Akademi Award, for her literary works.

Q2. Answer: (b) Kinetic energy

The correct answer is Kinetic energy.

Key Points

• When a charged particle moves in a magnetic field, the force acting on it is always perpendicular to its velocity.

• Since the magnetic force does no work (due to being perpendicular to displacement), there is no change in the magnitude of the velocity, and hence the kinetic energy remains constant.

• The motion of the particle in the magnetic field results in a circular or helical trajectory, depending on the initial velocity and angle with the field.

• The magnetic field causes the particle to change its direction continuously, but not its speed.

• This principle is used in many applications, such as cyclotrons and other particle accelerators, where particles are made to move in circular paths without changing their energy.

Additional Information

• Direction of velocity

• The direction of velocity of the charged particle changes continuously because of the perpendicular force exerted by the magnetic field.

• This change in direction results in a circular or helical motion, depending on the initial conditions.

• Momentum direction

• The momentum direction also changes continuously because the velocity direction is changing due to the magnetic force.

• However, the magnitude of momentum remains constant as the speed is unchanged.

• Angular momentum

• The angular momentum of the particle about the center of its circular trajectory changes due to the magnetic force acting as the centripetal force.

• This leads to periodic motion, as seen in devices like mass spectrometers.

Q3. Answer: (a) Windows Shell

The Correct answer is Windows Shell.

Key Points

• The Windows Shell is a user interface that provides access to file systems, applications, and other essential elements of the operating system.

• It is responsible for managing the desktop visual layout, including icons, shortcut links, taskbars, and windows.

• It includes tools such as the Start Menu, File Explorer, and Taskbar, which are essential for interacting with the system.

• The Windows Shell acts as an intermediary between the user and the operating system, allowing users to perform tasks such as opening applications, navigating directories, and managing files.

• It supports graphical user interface (GUI) elements, making it easier for users to interact with the computer without relying solely on commands.

• By managing shortcut links and desktop icons, it ensures quick access to frequently used programs and files.

• The Windows Shell is customizable, allowing users to personalize their desktop environment, such as changing themes, arranging icons, or modifying taskbar settings.

• It is a core component of the Windows operating system and has evolved significantly from earlier versions to provide a more intuitive experience.

Additional Information

• Command Prompt

• The Command Prompt is a text-based interface used to execute commands in Windows.

• It is primarily used for administrative tasks, troubleshooting, and running batch scripts.

• While powerful, it is not responsible for managing the desktop layout or shortcut links.

• Task Scheduler

• The Task Scheduler is a Windows feature used to schedule and automate tasks such as backups, updates, or running specific programs.

• It does not manage desktop icons or shortcut links but focuses on automating background operations.

• File Explorer

• File Explorer is a file management tool in Windows that allows users to navigate, organize, and manage files and folders.

• While it is integral to Windows, it does not handle the visual layout of the desktop or shortcut links.

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Q4. Answer: (c) 2032

The Correct answer is 2032.

Key Points

• India has outlined a comprehensive plan worth Rs. 9.15 lakh crore (equivalent to US$109.50 billion) to strengthen its power infrastructure.

• This plan aims to meet the projected power demand of 458 GW by the year 2032.

• The initiative focuses on enhancing the country's power generation capacity, modernizing transmission networks, and ensuring energy security.

• The government intends to achieve this target by leveraging renewable energy sources such as solar, wind, and hydroelectric power.

• This development aligns with India's commitments under the Paris Agreement to reduce carbon emissions and transition towards a clean energy economy.

• The initiative is also expected to bolster economic growth, create employment opportunities, and ensure universal electricity access.

• In 2023, India's installed power generation capacity stands at approximately 417.68 GW, indicating significant progress towards the 2032 target.

Additional Information

• Key focus areas under this plan:

• Development of green energy corridors to integrate renewable energy into the national grid.

• Upgrading distribution infrastructure to reduce power losses.

• Promoting energy storage technologies such as batteries to ensure grid reliability.

• Encouraging private sector investments in the energy sector.

• Global Comparison:

• India's power infrastructure development plan is one of the largest globally, reflecting its position as the third-largest energy consumer in the world.

• Countries like China and the USA have also implemented similar large-scale infrastructure programs to meet their growing energy demands.

Q5. Answer: (c) Education and Health

The Correct answer is Education and Health.

Key Points

• Under the Government of India Act, 1919, the concept of Dyarchy was introduced in the provinces. It divided the provincial subjects into two categories: Reserved and Transferred.

• The subjects under the Transferred List were managed by Indian ministers who were responsible to the legislative councils, while the subjects under the Reserved List were handled by the British officials.

• Education and Health were among the key subjects included in the Transferred List, allowing Indian ministers to exercise administrative control over them.

• This act marked a significant step in the process of decentralization and gradual transfer of power to Indians, although the scope of autonomy was still limited.

• The inclusion of Education and Health in the Transferred List aimed to improve social conditions and empower Indian leaders to address these critical areas.

• The act also laid the foundation for further reforms leading to the Government of India Act, 1935, which provided a broader framework for provincial autonomy.

• The Government of India Act, 1919 is also known as the Montagu-Chelmsford Reforms, named after Edwin Montagu (Secretary of State for India) and Lord Chelmsford (Viceroy of India).

Additional Information

• Police and Revenue

• These subjects were placed under the Reserved List, meaning they remained under the direct control of British officials.

• Police was considered a critical sector for maintaining law and order, while Revenue was essential for the financial stability of the colonial government.

• Judiciary and Foreign Affairs

• Judiciary and Foreign Affairs were entirely under British control as they were deemed highly sensitive and strategic areas.

• Foreign Affairs dealt with international relations, which were exclusively handled by the British government.

• Defence and Railways

• Defence was a crucial area for ensuring the security of the empire, and it remained under British control.

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• Railways were considered vital for administrative efficiency, military movement, and economic activities, and hence were not transferred to Indian ministers.

Q6. Answer: (d) Lateral erosion on the outer banks and deposition on the inner banks

The Correct answer is Lateral erosion on the outer banks and deposition on the inner banks.

Key Points

• Ox-bow lakes are formed due to the meandering nature of rivers, which is a natural process in the middle and lower courses of rivers.

• Lateral erosion occurs on the outer banks of a river bend, where the velocity of water is higher, causing the banks to erode and the bend to become more pronounced over time.

• At the same time, deposition happens on the inner banks of the bend, where the water velocity is lower, leading to the accumulation of sediments.

• This process eventually creates an extreme curve in the river, and when the neck of the meander becomes very narrow, the river may cut through it during a flood or high flow event, forming a new, straighter channel.

• The abandoned meander loop, isolated from the main river, forms an ox-bow lake.

• Ox-bow lakes are characteristic features of low-lying floodplains where rivers flow gently.

• This process is a combination of fluvial erosion and deposition, driven by the natural dynamics of the flowing water.

Additional Information

• Sudden uplift of riverbeds by tectonic activity

• Tectonic activity can alter river courses, but it does not typically result in the formation of ox-bow lakes.

• Sudden uplift may lead to the formation of features like waterfalls or gorges, but not ox-bow lakes.

• Tectonic uplift disrupting the flow

• Tectonic uplift can modify river systems by creating or altering gradients, but this process is not related to the creation of ox-bow lakes.

• Glacial retreat leaving depressions

• Glacial retreat can lead to the formation of features like kettle lakes and moraines, which are different from ox-bow lakes formed in fluvial systems.

• This process is associated with glacial landscapes rather than river meandering.

Q7. Answer: (a) Pakistan

The Correct answer is Pakistan.

Key Points

• India has often accused Pakistan of supporting cross-border infiltration attempts, particularly in the region of Jammu and Kashmir.

• This accusation is rooted in the longstanding conflict between the two nations regarding the Kashmir issue, which dates back to the partition of British India in 1947.

• Pakistan has been accused of providing support to militant groups and separatists operating in Jammu and Kashmir, which has led to tensions and border skirmishes.

• The infiltration often involves militants crossing the Line of Control (LoC), a de facto border between Indian-administered and Pakistan-administered Jammu and Kashmir.

• India has taken measures to counter cross-border infiltration, such as implementing advanced surveillance technologies, constructing border fencing, and deploying additional troops along the LoC.

• International organizations and countries often urge both nations to resolve their differences through diplomatic channels and peaceful negotiations.

• The issue of cross-border infiltration is a significant aspect of the larger India-Pakistan bilateral relations, which are marked by periodic escalations and efforts for peace.

• The involvement of Pakistan in such activities is often condemned by India during international forums, aiming to garner support against terrorism and cross-border militancy.

Additional Information

• Bangladesh

• Bangladesh shares a long border with India but is not known for cross-border infiltration attempts in Jammu and Kashmir.

• India and Bangladesh have generally maintained a cooperative relationship, especially in resolving border disputes and addressing issues like illegal immigration.

• The Ganga water-sharing treaty and joint efforts to curb terrorism reflect their collaborative approach.

• Sri Lanka

• Sri Lanka is an island nation located to the south of India and does not share a land border with India.
• Its geographical position makes it irrelevant to cross-border infiltration issues in Jammu and Kashmir.
• India and Sri Lanka collaborate on maritime security and other regional concerns in the Indian Ocean.
• Nepal
• Nepal shares a porous border with India but is not directly involved in infiltration attempts in Jammu and Kashmir.
• India and Nepal have a unique relationship based on historical, cultural, and geographical ties.
• There have been concerns about smuggling and illegal activities along the border, but these are unrelated to the Kashmir issue.

Q8. Answer: (d) Nepal

The correct answer is Nepal.

Key Points

• Nepal has decided to restrict permits for climbing Mount Everest to only those climbers who have prior experience of scaling a peak of at least 7,000 meters.
• This decision was made to ensure the safety of climbers and to regulate the increasing number of climbers attempting to summit the world's highest peak.
• Mount Everest, which stands at an elevation of 8,848.86 meters, is located in the Himalayas and is shared by Nepal and Tibet (China).
• The restriction aims to reduce the risks associated with inexperienced climbers, as Everest expeditions are known for their harsh conditions, including altitude sickness, avalanches, and unpredictable weather.
• Climbers will now need to demonstrate their prior experience and fitness level, making climbing permits a more regulated process.
• Nepal is home to eight of the world's fourteen highest peaks, making it a hub for mountaineering enthusiasts worldwide.
• This restriction also addresses concerns about overcrowding on Everest, which has led to dangerous situations in the past, including long traffic jams near the summit.

Additional Information

• Mongolia
• Mongolia is a landlocked country in East Asia, known for its vast steppes and nomadic culture.
• It is not associated with Mount Everest or any major mountain climbing activities.
• USA
• The USA is a country in North America and is home to notable peaks such as Denali (formerly Mount McKinley).
• It is not related to Mount Everest, which is located in the Himalayas.
• Japan
• Japan is an island nation in East Asia, known for its iconic peak, Mount Fuji.
• Japan is not involved in issuing permits for Mount Everest.

Q9. Answer: (d) Sulphuric acid

The Correct answer is Sulphuric acid.

Key Points

• The Contact Process is an industrial method used for the manufacturing of sulphuric acid, one of the most widely used chemicals in the world.
• It involves the catalytic oxidation of sulphur dioxide (SO_2) to sulphur trioxide (SO_3) using a vanadium pentoxide (V_2O_5) catalyst.
• The process consists of three main steps:
• Production of sulphur dioxide by burning sulphur or roasting sulphide ores.
• Conversion of sulphur dioxide to sulphur trioxide in the presence of a catalyst.
• Absorption of sulphur trioxide in concentrated sulphuric acid to form oleum, which is then diluted to produce sulphuric acid.
• Sulphuric acid is a highly versatile chemical used in various industries, including the manufacture of fertilizers, chemicals, petroleum refining, and wastewater treatment.
• The Contact Process is preferred over older methods such as the Lead Chamber Process due to its higher efficiency and production of purer sulphuric acid.
• The chemical equation for the key step in the process is: $2SO_2 + O_2 \rightarrow 2SO_3$ (in the presence of a catalyst).

Additional Information

• Ammonia
• Ammonia is manufactured using the Haber Process, not the Contact Process.
• It is a key ingredient in the production of fertilizers such as urea and ammonium nitrate.

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• The Haber Process involves the reaction of nitrogen (N2) and hydrogen (H2) gases under high pressure and temperature, using an iron catalyst.

• Nitric acid

• Nitric acid is manufactured using the Ostwald Process, not the Contact Process.

• The Ostwald Process involves the oxidation of ammonia to produce nitric acid.

• Nitric acid is widely used in the production of explosives, fertilizers, and other chemicals.

• Hydrochloric acid

• Hydrochloric acid is typically produced as a byproduct of industrial processes, such as the manufacture of chlorine or polyvinyl chloride (PVC).

• It is used in a variety of applications, including metal cleaning, pH control, and production of organic compounds.

Q10. Answer: (d) Akbar

The Correct answer is Akbar.

Key Points

• Akbar, the third Mughal emperor, was known for his policy of religious tolerance and the concept of 'Sulh-i Kul', which translates to 'Universal Peace'.

• He implemented Sulh-i Kul as a way to promote harmony among different religious communities, including Sunnis, Shias, Hindus, Christians, and Jews.

• Under Akbar's reign, people of different faiths often prayed together in a single mosque or church, showcasing his commitment to the principle of religious pluralism.

• Akbar established the Ibadat Khana (House of Worship) at Fatehpur Sikri, where he invited scholars and religious leaders from various faiths to engage in discussions and debates.

• He abolished the Jizya tax, which was levied on non-Muslims, as part of his inclusive policies.

• Akbar’s reign marked a significant shift in the Mughal empire's approach to governance, emphasizing secularism and cultural integration.

• His efforts to unify diverse communities under the Mughal empire were instrumental in maintaining political stability and fostering cultural growth during his rule.

Additional Information

• Jahangir

• Jahangir, Akbar’s son, was known more for his patronage of the arts and architecture than for religious tolerance or innovative governance policies.

• His reign was marked by the consolidation of Mughal rule and artistic achievements like the construction of the Shalimar Gardens in Kashmir.

• While he continued Akbar's policies, he did not introduce any significant religious reforms akin to Sulh-i Kul.

• Babar

• Babar, the founder of the Mughal dynasty, was primarily focused on establishing his empire in India rather than promoting religious tolerance.

• Babar’s achievements include the victory at the First Battle of Panipat and laying the foundation of Mughal rule in India.

• Humayun

• Humayun, the second Mughal emperor, faced significant challenges during his reign, including exile and the loss of his kingdom to Sher Shah Suri.

• His contributions were more focused on reclaiming his throne and stabilizing the empire than on religious reforms or tolerance.

Q11. Answer: (d) Uttarakhand

The Correct answer is Uttarakhand.

Key Points

• Jagar dance form has its primary roots in the state of Uttarakhand, located in northern India.

• It is an integral part of the cultural heritage of Uttarakhand, particularly among the Kumaoni and Garhwali communities.

• The Jagar is not just a dance but also a ritualistic performance that involves storytelling and invoking spirits.

• It is performed as part of ceremonies to appease ancestral spirits or deities and seek blessings.

• The dance is often accompanied by folk music, traditional instruments such as the dhol and damau, and chanting by the performers.

• Jagar rituals highlight the spiritual beliefs and practices of the people of Uttarakhand, deeply rooted in their faith.

• Performers often recount stories of local deities, legendary heroes, and folklore during the dance, making it a form of oral tradition.

• It is considered a medium of communication between the human world and the spiritual realm, showcasing the region's mystical traditions.

Additional Information

• Himachal Pradesh

• Himachal Pradesh is known for its rich cultural heritage and various traditional dance forms such as Nati, which is recognized as one of the largest folk dances in the world.

• Nati is performed during special occasions and festivals in Himachal Pradesh but is distinct from the Jagar dance.

• The state is famous for its Himalayan landscapes and hill station tourism.

• Bihar

• Bihar is known for its folk traditions, including Bhojpuri dance forms such as Kajri and Jhumar.

• Bihar's cultural heritage is also reflected in its celebrations of festivals like Chhath Puja and Sonepur Mela.

• Jagar is not a traditional dance form associated with Bihar.

• Jammu and Kashmir

• Jammu and Kashmir boast a unique cultural heritage, with dance forms such as Rouf and Bhand Pather being popular.

• Rouf is a folk dance performed during spring or Eid celebrations, while Bhand Pather is a form of traditional theater.

• Jagar is not rooted in the cultural traditions of Jammu and Kashmir.

Q12. Answer: (d) Marathas

The Correct answer is Marathas.

Key Points

• The Third Battle of Panipat was fought on 14 January 1761, marking one of the largest and bloodiest battles in Indian history.

• The battle took place between Ahmad Shah Abdali (also known as Ahmad Shah Durrani), the founder of the Durrani Empire, and the Marathas, who were the dominant Indian power at the time.

• The Marathas were led by Sadashivrao Bhau, the cousin of the Peshwa, along with key commanders like Vishwasrao and Malharrao Holkar.

• The primary reason for the conflict was the Maratha Empire's expansionist policy, which brought them into conflict with Abdali, who sought to protect his influence in the northern regions of India.

• The battle was significant as it marked the decline of the Maratha Empire and opened the way for the eventual rise of British dominance in India.

• The Third Battle of Panipat ended in a decisive victory for Ahmad Shah Abdali, resulting in the loss of thousands of Maratha soldiers and significant political changes in India.

• The battle is remembered for its massive scale, high casualties, and its impact on Indian politics and society in the 18th century.

Additional Information

• Mughals

• The Mughals were a prominent empire in India but by the 18th century, their power had significantly declined, and they were not directly involved in the Third Battle of Panipat.

• The Mughal Empire was established by Babur in 1526 and reached its zenith under Akbar, Jahangir, Shah Jahan, and Aurangzeb.

• Rajputs

• The Rajputs were a warrior class known for their resistance against foreign invasions, but they were not the central power in the Third Battle of Panipat.

• They were primarily based in regions like Rajasthan, and their influence had decreased by the 18th century.

• British

• The British were not involved in the Third Battle of Panipat as their focus was on consolidating their power through the East India Company during this period.

• Their major involvement in Indian politics began after events like the Battle of Plassey (1757) and the Battle of Buxar (1764).

Q13. Answer: (b) Mumbai

The Correct answer is Mumbai.

Key Points

• Mumbai, the financial capital of India, has one of the busiest suburban train networks, often referred to as the "lifeline of the city."

• The Kavach 5.0 technology introduced in April 2025 aims to enhance the safety and efficiency of train operations, ensuring more trains can run without compromising passenger safety.

• Kavach is an indigenous automatic train protection system developed by India, offering features like collision prevention, signal passing at danger prevention, and speed regulation.

• The suburban trains in Mumbai cater to a massive daily ridership of millions, making it an ideal location for deploying such advanced technology to address the challenges of crowded train operations.

• The implementation of Kavach 5.0 is expected to reduce delays, enhance punctuality, and improve the overall efficiency of train services.

• The initiative aligns with India's goals of modernizing its railway infrastructure under the National Rail Plan (NRP) and contributing to sustainable urban transport systems.

• Mumbai’s suburban railway system is operated by Western Railways and Central Railways, both of which play a crucial role in the city’s daily transportation needs.

• The deployment of Kavach 5.0 reflects the Indian Railways' commitment to leveraging technology-driven solutions for urban mobility challenges.

Additional Information

• Lucknow

• Lucknow, the capital city of Uttar Pradesh, has a growing metro rail system but does not have a significant suburban train network compared to cities like Mumbai.

metro rail services for urban transportation.

• New Delhi

• New Delhi has a robust urban transportation system, including the Delhi Metro, but its suburban rail network is not as extensive as Mumbai’s.

• Delhi primarily relies on metro services and intercity rail connections rather than a standalone suburban train system.

• Chennai

• Chennai has a suburban train network, but it does not face the same level of congestion and operational challenges as Mumbai.

• The suburban trains in Chennai primarily serve commuters traveling between the city and its outskirts.

Q14. Answer: (d) PACS Digitization Project

The Correct answer is PACS Digitization Project.

Key Points

• The PACS Digitization Project is a significant policy initiative aimed at modernizing and digitizing all Primary Agricultural Credit Societies (PACS) across India.

• It seeks to bring technological advancements to PACS, which are vital institutions for providing credit and financial services to farmers at the grassroots level.

• The initiative is expected to enhance the efficiency, transparency, and accessibility of PACS operations, thereby benefiting millions of farmers.

• The project involves the integration of digital tools, software, and databases to streamline processes such as loan disbursement, repayment tracking, and record management.

• PACS play a critical role in ensuring the success of India's agricultural sector, and their digitization aligns with the country's broader agenda of promoting digital transformation and financial inclusion.

• This initiative is being implemented under the guidance and support of the Indian government to strengthen rural credit infrastructure and improve the socio-economic conditions of farmers.

• The digitization of PACS will also facilitate better coordination with other financial institutions, leading to improved access to government schemes and programs.

Additional Information

• National Digital Agri Mission

• The National Digital Agri Mission aims to create a digital ecosystem for agriculture in India, focusing on data-driven solutions for farmers.

• It includes initiatives for crop monitoring, weather forecasting, and resource optimization, but does not focus on the digitization of PACS.

• e-Kisan Portal

• The e-Kisan Portal is an online platform designed to provide information and services to farmers, such as weather updates, market prices, and farming techniques.

• It is primarily an information dissemination tool and is not directly involved in digitizing PACS.

• Co-op Net

• Co-op Net focuses on building a network of cooperative institutions for enhanced collaboration and resource-sharing.

• While it may support technological integration, it is not exclusively dedicated to the digitization of PACS.

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Q15. Answer: (a) Tamil Nadu

The Correct answer is Tamil Nadu.

Key Points

• Pamban Port is located in the state of Tamil Nadu, India.

• Pamban is situated on the Pamban Island, also known as Rameswaram Island, which lies between the Indian mainland and Sri Lanka.

• Pamban Port is renowned for its proximity to the historic Pamban Bridge, which connects the mainland with Rameswaram Island.

• The port plays a crucial role in facilitating local trade and fishing activities, as it is located near the Bay of Bengal.

• Pamban Island is a significant religious destination, housing the Rameswaram Temple, which is dedicated to Lord Shiva.

• The location is strategically important as it serves as a gateway for maritime activities between India and Sri Lanka.

• The area is also known for its natural beauty and tourism, attracting visitors from across the globe.

Additional Information

• Maharashtra

• Maharashtra is home to several major ports such as Mumbai Port and Jawaharlal Nehru Port (JNPT), which are among the busiest ports in India.

• Mumbai Port is one of the oldest ports in India, situated on the western coast along the Arabian Sea.

• These ports primarily handle large-scale trade and industrial activities.

• Karnataka

• Karnataka has prominent ports such as New Mangalore Port, located on the western coast along the Arabian Sea.

• This port is crucial for the export of agricultural products, minerals, and petrochemicals.

• Karnataka is also known for its rich cultural heritage and coastal tourism.

• Kerala

• Kerala is famous for its ports like Cochin Port, situated on the western coast along the Arabian Sea.

• Cochin Port is a major hub for trade, particularly spices, seafood, and oil.

• Kerala is also known for its scenic backwaters and maritime activities.

Q16. Answer: (a) Saves the current document

The correct answer is Saves the current document.

Key Points

• The shortcut key Ctrl + S is widely used in most software applications such as Microsoft Word, Excel, PowerPoint, and other text or code editors.

• It performs the function of saving the current document or file to prevent the loss of data.

• When you press Ctrl + S, the application stores the content of the document to a specific storage location such as a hard drive, SSD, or cloud storage.

• In the case of a new document, the application will prompt the user to choose a file name and location for saving.

• Regularly using Ctrl + S while working on a document ensures that your progress is saved and reduces the risk of losing data due to unexpected interruptions like power outages or software crashes.

• It is a universal shortcut that works across various operating systems such as Windows, macOS (using Command + S), and Linux.

• In applications like Integrated Development Environments (IDEs), using Ctrl + S can also trigger processes like compiling or saving changes to a code file.

Additional Information

• Starts a new page

• This function is typically performed by Ctrl + Enter in applications like Microsoft Word.

• It creates a new blank page in the document starting from the cursor's current position.

• Searches for text in a document

• Searching for text in a document is commonly achieved using the shortcut key Ctrl + F.

• This opens a search dialog box where users can type the text they are looking for within the document.

• Selects all content

• The shortcut for selecting all content in a document is Ctrl + A.

• It highlights all the text, images, and other elements in a document or file.

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Q17. Answer: (a) Sukumar Sen

The Correct answer is Sukumar Sen.

Key Points

• Sukumar Sen was the first Chief Election Commissioner (CEC) of India. He held this position from 21 March 1950 to 19 December 1958.

• He was instrumental in conducting the first-ever general elections in India during 1951–52, which was a massive and historic task for a newly independent nation.

• Sukumar Sen was an alumnus of the University of London and a member of the prestigious Indian Civil Service (ICS) of the 1921 batch.

• He is credited with organizing elections in a country with a population of approximately 173 million voters at that time, many of whom were illiterate and unfamiliar with the electoral process.

• To address the challenge of illiteracy, symbols were introduced on ballot papers to help voters identify their preferred candidates or parties.

• His leadership and administrative skills were widely recognized for successfully conducting elections in a diverse and complex country like India.

• He also served as the Chief Election Commissioner for Sudan's first parliamentary elections in 1953, showcasing his expertise on an international level.

• The work done by Sukumar Sen laid the foundation for the robust electoral system that India follows to this day.

Additional Information

• V Narahari Rao

• He was the first Comptroller and Auditor General (CAG) of India from 1948 to 1954.

• His work was primarily focused on auditing government accounts and ensuring financial accountability in India.

• HK Kripalani

• He was a prominent freedom fighter and an active member of the Indian National Congress.

• He was not associated with the Election Commission of India.

• MC Setalvad

• MC Setalvad was the first Attorney General of India, serving from 1950 to 1963.

• He played a key role in advising the government on legal and constitutional matters.

Q18. Answer: (b) Geneva

The Correct answer is Geneva.

Key Points

• The 2025 Regional Forum on Sustainable Development (RFSD) for the UNECE region was hosted in Geneva.

• UNECE stands for the United Nations Economic Commission for Europe, which works towards fostering sustainable development and economic cooperation in the European region.

• The forum focused on evaluating and accelerating the progress of the Sustainable Development Goals (SDGs) within the UNECE region.

• It serves as a platform for dialogue, knowledge exchange, and collaboration among member states, stakeholders, and organizations.

• Geneva, Switzerland, is well-known for being a hub for international diplomacy and the location of several United Nations offices, making it a suitable venue for such global forums.

• The forum aligns with the 2030 Agenda for Sustainable Development, which aims to address global challenges such as poverty, inequality, and climate change.

• Discussions during the forum included topics like climate action, innovation, and partnerships to achieve sustainable growth.

Additional Information

• Oslo

• Oslo is the capital city of Norway and is renowned for its role in peace-building efforts, including hosting the Nobel Peace Prize ceremonies.

• While Oslo is a significant city for international cooperation, it is not the host location for the 2025 RFSD.

• Vienna

• Vienna, the capital of Austria, is recognized as a center for international organizations, including the UN Office on Drugs and Crime (UNODC) and the International Atomic Energy Agency (IAEA).

• Although Vienna is an important city for global forums, it was not chosen for the 2025 RFSD.

• Brussels

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• Brussels is the capital of Belgium and serves as the headquarters for the European Union (EU) and NATO.
• It is a prominent city for European governance but was not the venue for the 2025 RFSD.

Q19. Answer: (c) Lucknow, Uttar Pradesh

The Correct answer is Lucknow, Uttar Pradesh.

Key Points

• The BrahMos Aerospace Integration and Testing Facility was inaugurated in Lucknow, Uttar Pradesh on 11 May 2025.
• This facility is aimed at the integration and testing of BrahMos missiles, which are considered one of the fastest and most precise cruise missiles in the world.
• Lucknow was chosen strategically as part of the UP Defense Corridor, an initiative of the Government of Uttar Pradesh aimed at promoting defense manufacturing and boosting the local economy.
• The BrahMos missile is a joint venture between India's DRDO (Defense Research and Development Organisation) and Russia's NPO Mashinostroyeniya.
• The facility will play a crucial role in strengthening India's defense capabilities and fostering self-reliance in defense production.
• This step aligns with India's 'Make in India' initiative, promoting indigenous manufacturing and technological advancements.
• The BrahMos missile is capable of being launched from land, air, sea, and submarine platforms, making it versatile and pivotal for modern warfare.

Additional Information

• Hyderabad, Telangana
• Hyderabad is a major hub for aerospace and defense manufacturing in India.
• It is home to many facilities of DRDO, including the Advanced Systems Laboratory (ASL), which works on missile technologies.
• Despite being an important location for defense projects, the BrahMos facility was not inaugurated here.
• Bengaluru, Karnataka
• Bengaluru is referred to as the Silicon Valley of India and is also a significant hub for aerospace and defense industries.
• It houses facilities like Hindustan Aeronautics Limited (HAL) and ISRO, which contribute to the country's defense and space advancements.
• The BrahMos facility, however, was not inaugurated in Bengaluru.
• Pune, Maharashtra
• Pune is known for its industrial base and defense training institutions like the National Defence Academy (NDA).
• It also houses the DRDO's Armament Research and Development Establishment (ARDE), which focuses on armament systems.
• The BrahMos facility was not established here despite its significance in defense manufacturing.

Q20. Answer: (a) Deepa Bhasthi

The Correct answer is Deepa Bhasthi.

Key Points

• Deepa Bhasthi is a renowned Indian writer and translator with expertise in Kannada literature.
• She translated the Kannada book 'Heart Lamp' into English, making it accessible to a global audience.
• This translation marked a significant milestone as it became the first Kannada work to win the 2025 International Booker Prize.
• The International Booker Prize is a prestigious literary award that recognizes the best translated works from around the world, highlighting the importance of translation in global literature.
• Deepa Bhasthi's efforts bridged the gap between regional Indian literature and international recognition, showcasing the richness of Kannada literary heritage.
• The book 'Heart Lamp' explores themes of human emotions, spirituality, and cultural depth, resonating with readers worldwide.
• Her contribution has not only brought fame to Kannada literature but has also inspired other translators to bring Indian regional literature to the forefront of global literary forums.

Additional Information

• Meena Kandasamy
• Meena Kandasamy is an Indian poet, writer, and translator known for her work in feminism and social justice.
• Her works often focus on issues such as caste oppression, gender inequality, and political activism.
• She has translated Tamil literature into English but is not associated with the translation of 'Heart Lamp'.
• Arshia Sattar
• Arshia Sattar is an Indian author and translator, well-known for her translations of Sanskrit epics, including the Ramayana.
• She has contributed significantly to Indian literature by making ancient texts accessible to contemporary audiences.
• However, she did not translate 'Heart Lamp' into English.

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• Annie Zaidi

• Annie Zaidi is a celebrated Indian author, playwright, and journalist.

• Her works have won numerous awards, and she is known for exploring themes of identity, loss, and resilience.

• Despite her literary prominence, she is not linked to the translation of 'Heart Lamp'.

Q21. Answer: (a) Munda uprising

The Correct answer is Munda uprising.

Key Points

• The Munda uprising, also known as 'Ulgulan' or the 'Great Tumult', was a significant tribal rebellion led by Birsa Munda in the late 19th century.

• This movement was primarily against the exploitative practices of the British colonial administration and the landlord system that oppressed the tribal communities.

• The Munda uprising occurred in the region of Chotanagpur plateau, which is located in present-day Jharkhand.

• Birsa Munda, a charismatic tribal leader, aimed to establish a 'Munda Raj' and advocated for the rights of the tribal people over their land and resources.

• It was driven by the desire to end the forced labor system (Beth Begari), exploitative revenue collection, and the interference of landlords in tribal land ownership.

• The movement also had a strong religious aspect, as Birsa Munda sought to revive tribal traditions and eliminate the influence of missionary Christianity.

• The rebellion gained momentum in the 1890s and eventually led to social and legal reforms in tribal areas, though it was suppressed by the British in 1900.

• The legacy of Birsa Munda and the rebellion continues to inspire tribal movements and struggles for justice in India.

Additional Information

• Kol rebellion

• The Kol rebellion took place in 1831-1832 in the region of Chotanagpur.

• It was led by the Kol tribes against the British authorities and moneylenders.

• The rebellion arose due to the exploitation of tribal lands and resources and the introduction of revenue systems that marginalized the tribal communities.

• Santhal rebellion

• The Santhal rebellion, also known as the Santhal Hul, occurred in 1855-1856.

• It was led by Sido and Kanhu Murmu in the region of present-day Jharkhand.

• The rebellion was against the exploitative practices of Zamindars, moneylenders, and the British colonial government.

• Chuar uprising

• The Chuar uprising occurred in the late 18th century, primarily in the region of Bengal and Odisha.

• It involved the tribal Chuar community revolting against the British revenue policies and exploitation.

• The rebellion was motivated by the loss of tribal lands and livelihoods due to British expansion and economic policies.

Q22. Answer: (a) Raja Harishchandra

The Correct answer is Raja Harishchandra.

Key Points

• Raja Harishchandra is considered the first full-length Indian feature film, released in 1913.

• It was directed and produced by Dadasaheb Phalke, who is regarded as the Father of Indian Cinema.

• The film is based on the legendary story of King Harishchandra, known for his commitment to truth and justice.

• It was a silent film, as the era of talkies (films with synchronized sound) had not yet begun in India.

• The movie was released on May 3, 1913, at the Coronation Cinema in Mumbai (then Bombay).

• It is considered a landmark in Indian cinema, marking the birth of the film industry in the country.

• The film had a runtime of approximately 40 minutes and was created using indigenous techniques and resources.

• Dadasaheb Phalke used his own finances for the production, showcasing his passion for filmmaking.

• The Indian government honors his contributions to cinema with the Dadasaheb Phalke Award, India's highest award in the field of films.

Additional Information

• Alam Ara

• Alam Ara was the first Indian sound film (talkie), released in 1931.

• It was directed by Ardeshir Irani and is remembered for its use of sound technology.

• The film featured dialogues and songs, which were a novelty at that time.
• Keechaka Vadham
• Keechaka Vadham was a silent film, released in 1917, directed by R. Nataraja Mudaliar.
• It was the first Tamil film and is based on an episode from the Mahabharata.
• Sant Tukaram
• Sant Tukaram was a Marathi film, released in 1936.
• It was directed by Vishnupant Damle and Sheikh Fattelal.
• The film was the first Indian film to gain international recognition at the Venice Film Festival.

Q23. Answer: (c) Kerala

The Correct answer is Kerala.

Key Points

• Kerala has consistently topped various indices related to Human Development in India, including the NITI Aayog's SDG India Index.
• The state's high literacy rate, which is one of the highest in India, contributes significantly to its strong HDI ranking.
• Kerala's healthcare system is robust, with high life expectancy and low infant mortality rates, which are key indicators in HDI calculations.
• The state has a well-developed system of social welfare, including initiatives aimed at reducing poverty and inequality.
• Gender equality is notable in Kerala, with better representation of women in education and the workforce compared to other Indian states.
• The state's focus on sustainable development aligns with the goals of the SDG India Index, further enhancing its HDI ranking.
• Kerala's achievements in sectors such as education, health, and social infrastructure are supported by government policies and programs aimed at inclusive growth.

Additional Information

• Maharashtra
• Maharashtra is one of the most industrialized states in India, contributing significantly to the country's GDP.
• While Maharashtra performs well in economic indicators, it faces challenges in areas such as healthcare and education compared to Kerala.
• The state has urban-rural disparities that impact its overall HDI ranking.
• Tamil Nadu
• Tamil Nadu is known for its strong industrial base and infrastructure development.
• The state has made significant progress in areas like education and healthcare, but does not surpass Kerala in HDI rankings.
• Tamil Nadu has been actively working on improving socio-economic indicators through various welfare schemes.
• Gujarat
• Gujarat is renowned for its economic growth and development, particularly in the industrial and agricultural sectors.
• Despite its economic achievements, Gujarat faces challenges in areas like education, health, and gender equality, which impact its HDI ranking.

Q24. Answer: (a) Akashteer

The Correct answer is Akashteer.

Key Points

• Akashteer is an advanced air defence system developed by DRDO (Defence Research and Development Organisation) of India.
• It was inducted into the Indian Army in the year 2024 to strengthen the nation's air defence capabilities.
• Akashteer is specifically designed to counter aerial threats, including fighter jets, helicopters, drones, and missiles.
• The system played a crucial role in Operation Sindoor in 2025, showcasing its effectiveness in neutralizing enemy aerial threats.
• It is equipped with advanced radar technology and surface-to-air missiles (SAMs) to ensure high precision and efficiency in targeting.
• The development of Akashteer represents India's focus on achieving self-reliance in defence technology under the "Make in India" initiative.
• This system is an evolution of the earlier Akash missile system, incorporating enhanced features and capabilities.
• Akashteer is a part of India's layered air defence system, providing a medium-range solution for protecting vital assets and locations.
• The system is mobile and can be deployed quickly, ensuring readiness for real-time threats.

Additional Information

• Barak-8
• Barak-8, also known as the LRSAM (Long Range Surface-to-Air Missile), is a joint development between India and Israel.
• It is designed to defend against airborne threats such as aircraft, helicopters, drones, and missiles.
• This system is primarily used by the Indian Navy for ship-based air defence.
• Akash
• Akash is an earlier version of the surface-to-air missile system developed by DRDO.
• It has a range of 25 km and is used to target medium-range aerial threats.
• The Akash system has been deployed by both the Indian Army and the Indian Air Force.
• QRSAM
• QRSAM (Quick Reaction Surface-to-Air Missile) is another air defence system developed by DRDO.
• It is designed for short-range engagements and has a range of 25-30 km.
• QRSAM provides rapid deployment capability and is used to protect moving armoured formations.

Q25. Answer: (d) Seismic wave behaviour

The Correct answer is Seismic wave behaviour.

Key Points

• Seismic waves are vibrations produced by earthquakes or artificial explosions, which travel through the Earth's interior.
• Analysis of seismic wave behaviour provides vital information about the layered structure of the Earth.
• There are two types of seismic waves: Primary (P) waves, which are faster and travel through solids, liquids, and gases, and Secondary (S) waves, which travel only through solids.
• The fact that S-waves do not travel through the Earth's outer core confirms that it is made of liquid material.
• P-wave refraction and velocity changes indicate the presence of different layers such as the crust, mantle, and core.
• Seismic data has helped identify the Mohorovičić Discontinuity (Moho), which is the boundary between the crust and mantle, and the Gutenberg Discontinuity, which separates the mantle and core.
• Seismologists use global seismic networks to study wave propagation, enabling the mapping of Earth's internal layers.
• These observations provide critical evidence for the Earth's layered composition, including the distinction between the solid inner core and the liquid outer core.

Additional Information

• Fossil records
• Fossil records provide evidence for the evolution of life and past environmental conditions but do not directly support the Earth's layered structure.
• They are used in paleontology to study the history of life on Earth.
• Fossils are found in sedimentary rocks, offering insights into the geological history of specific regions.
• Magnetic poles
• Magnetic poles are related to the Earth's magnetic field, which is generated by the movement of molten iron in the outer core.
• While magnetic studies provide indirect evidence of the core's composition, they do not offer detailed insights into the layered structure of the Earth.
• The phenomenon of magnetic pole reversal has been recorded in volcanic rocks and used for dating geological events.
• Volcanic eruptions
• Volcanic eruptions provide surface evidence of magma originating from the Earth's mantle.
• While eruptions help study mantle dynamics, they do not comprehensively explain the Earth's layered structure.
• Ring of Fire, offering insights into tectonic processes.

Q26. Answer: (b) High unemployment and poverty

The correct answer is High unemployment and poverty.

Key Points

• At the time of independence, India's economy was severely underdeveloped, marked by widespread poverty and unemployment.
• The colonial policies led to the destruction of traditional industries, such as handicrafts and textiles, leaving millions of workers jobless.
• Agriculture, which was the mainstay of the Indian economy, suffered from low productivity, outdated methods, and lack of irrigation facilities.
• The absence of proper industrialization further compounded the issue, as there were limited employment opportunities outside agriculture.
• India's per capita income at the time of independence was extremely low, reflecting the economic disparity and widespread

poverty.

• Lack of education and vocational training further prevented people from securing well-paying jobs or improving their living standards.

• The social fabric was strained due to the economic inequality, leading to challenges in nation-building and economic recovery.

• Post-independence, the government focused on addressing these issues through measures like land reforms, industrialization, and five-year plans to boost employment and reduce poverty.

Additional Information

• Self-sufficiency in food grains

• India was far from achieving self-sufficiency in food grains at the time of independence.

• The country was heavily dependent on imports and food aid to meet its domestic food requirements.

• The introduction of the Green Revolution in the 1960s helped India achieve self-sufficiency in food production.

• Strong infrastructure

• India had very at the time of independence.

• Most of the infrastructure developed by the British was aimed at serving their colonial interests, such as railways for transporting raw materials.

• Post-independence, India focused on developing infrastructure through initiatives like the Five-Year Plans.

• High industrial output

• India's industrial output was at the time of independence.

• The colonial policies restricted industrial growth, leading to the decline of traditional industries and minimal modern industrialization.

• Post-independence, India adopted policies to promote industrial growth, including the establishment of.

Q27. Answer: (a) Anupam Kher

The correct answer is Anupam Kher.

Key Points

• Anupam Kher is a renowned Indian actor, director, and producer who has worked in multiple Indian and international films.

• He has won several prestigious awards, including two National Film Awards and eight Filmfare Awards for his exceptional performances.

• Anupam Kher is known for his diverse roles in Bollywood and Hollywood. He is also celebrated for his contributions to Indian theatre and cinema.

• His film 'Tanvi: The Great' premiered at the 78th Cannes Film Festival, a prestigious global platform for showcasing cinematic excellence.

• The Cannes Film Market is an integral part of the Cannes Film Festival, allowing filmmakers to network, showcase their work, and gain international recognition.

• The premiere of 'Tanvi: The Great' at such a significant event underlines Anupam Kher’s ability to create meaningful and globally appreciated cinema.

• Anupam Kher has also been a recipient of the Padma Shri (2004) and Padma Bhushan (2016), two of India’s highest civilian honors, for his contribution to the arts.

Additional Information

• Kiran Rao

• Kiran Rao is an Indian filmmaker, screenwriter, and producer.

• She is known for her debut directorial film 'Dhobi Ghat' (2010) and her contribution as a producer for movies like 'Lagaan' and 'Dangal'.

• Shabana Azmi

• Shabana Azmi is a legendary Indian actress known for her work in parallel cinema.

• She has won five National Film Awards for Best Actress and is a recipient of the Padma Shri and Padma Bhushan.

• Naseeruddin Shah

• Naseeruddin Shah is a veteran actor in Indian cinema, known for his work in theatre, parallel cinema, and mainstream Bollywood.

• He is a recipient of the Padma Shri, Padma Bhushan, and multiple National Film Awards.

Q28. Answer: (d) Malaria

The Correct answer is Malaria.

Key Points

• Malaria is a disease caused by a type of protozoan parasite called Plasmodium.

• The infection is transmitted to humans through the bite of an infected female Anopheles mosquito, which acts as a vector for the disease.

• There are several species of Plasmodium that cause malaria, including P. falciparum, P. vivax, P. ovale, and P. malariae. Of these, P. falciparum is the most severe and life-threatening.

• The symptoms of malaria include fever, chills, headache, nausea, vomiting, muscle pain, and extreme fatigue. In severe cases, it can lead to complications such as cerebral malaria, organ failure, and even death.

• Malaria is most common in tropical and subtropical regions, including parts of Asia, Africa, and South America. It poses a significant public health challenge, particularly in developing countries.

• Preventive measures include using insecticide-treated mosquito nets (ITNs), indoor spraying of insecticides, and taking antimalarial medications when traveling to high-risk areas.

• The treatment of malaria involves the use of antimalarial drugs, such as chloroquine, artemisinin-based combination therapies (ACTs), and others, depending on the type of Plasmodium and drug resistance in the region.

• Global initiatives like the World Health Organization's (WHO) Global Malaria Programme aim to reduce the incidence and mortality of malaria through prevention, control, and treatment efforts.

Additional Information

• Polio

• Polio, or poliomyelitis, is caused by the poliovirus, which is a virus, not a protozoan.

• The disease primarily affects children under the age of 5 and can lead to paralysis or even death in severe cases.

• Polio spreads through contaminated water or food and is preventable through the oral polio vaccine.

• Typhoid

• Typhoid is caused by the bacterium Salmonella typhi, making it a bacterial infection rather than one caused by a protozoan.

• It spreads through contaminated food and water and causes symptoms such as high fever, abdominal pain, weakness, and rash.

• Chicken Pox

• Chicken Pox is caused by the varicella-zoster virus, which is a virus and not a protozoan.

• The disease is characterized by an itchy rash, fever, and fatigue and primarily affects children.

• A vaccine is available to prevent chicken pox.

Q29. Answer: (c) Petition and prayer

The Correct answer is Petition and prayer.

Key Points

• The Moderates were early leaders of the Indian National Congress, who believed in achieving political reform through peaceful and constitutional methods.

• Their approach was characterized by petitioning the British Government to address grievances, promoting dialogue, and seeking justice through legal and administrative frameworks.

• They advocated for political reforms, including greater representation for Indians in legislative councils and administrative bodies.

• The Moderates believed in the power of public opinion and sought to mobilize support through speeches, writings, and public meetings.

• Notable Moderate leaders such as Dadabhai Naoroji, Gopal Krishna Gokhale, and Surendranath Banerjee emphasized the use of petitions and resolutions to articulate demands.

• Their strategy was influenced by the belief that the British government would ultimately respond to reasoned arguments and moral persuasion.

• The Moderates focused on addressing issues like economic exploitation, administrative inefficiencies, and social reforms through non-confrontational means.

• While their methods laid the foundation for organized political movements in India, they were criticized for being overly reliant on British goodwill and lacking mass appeal. This eventually led to the rise of the more assertive Extremists within the freedom movement.

Additional Information

• Armed revolution

• Armed revolution refers to the use of violent means, such as weapons and organized uprisings, to overthrow oppressive regimes.

• This approach was adopted by some revolutionary groups like Bhagat Singh and Subhas Chandra Bose during later phases of the Indian independence movement.

• The Moderates, however, strictly opposed violence and preferred constitutional methods.

• Guerrilla warfare

• Guerrilla warfare involves small-scale, irregular military tactics, often used by revolutionaries against larger, organized forces.

• While guerrilla tactics were employed during certain movements in India, such as the Chittagong Armoury Raid, it was not part of the Moderate strategy.

• Cultural renaissance

• Cultural renaissance refers to the revival of art, literature, and traditions to instill national pride and cultural awareness.

• This was an important aspect of movements like the Bengal Renaissance, led by figures like Raja Ram Mohan Roy, but it was not the primary approach of the Moderates.

Q30. Answer: (b) Mango showers

The correct answer is Mango showers.

Key Points

• Mango showers refer to the pre-monsoon rainfall experienced in parts of southern India, typically in the months of March, April, and May.

• These showers are named "Mango showers" as they are crucial for the ripening of mangoes, a major summer fruit in India.

• They are caused by the convectional activity due to the sudden increase in temperature during the pre-monsoon season.

• States like Kerala, Karnataka, and Tamil Nadu experience these showers, which are also locally referred to as 'April rains' in some regions.

• These rains are usually brief and accompanied by thunderstorms, offering temporary relief from the sweltering heat of summer.

• In addition to aiding the mango crop, these showers also benefit other cash crops like coffee and spices in the region.

• While beneficial for agriculture, these rains can occasionally cause minor damage to standing crops due to their intensity in some areas.

Additional Information

• Nor'wester

• Nor'westers, also called 'Kalbaisakhi', are violent pre-monsoon thunderstorms that occur in the eastern parts of India, particularly in West Bengal, Bihar, Odisha, and Assam.

• They are associated with strong winds, lightning, and hail, which can cause significant damage to property and crops.

• Despite their destructive nature, they also bring much-needed respite from the heat and are vital for crops like jute, paddy, and tea.

• Break in monsoon

• The term 'Break in monsoon' refers to a period of weak or no rainfall during the monsoon season in India, typically caused by the shift of the monsoon trough to the foothills of the Himalayas.

• This phenomenon is common in the months of July and August and can lead to a temporary dry spell in central and northern India.

• Loo

• Loo is a hot and dry wind that blows over the plains of northern and northwestern India during the summer months, particularly in the states of Rajasthan, Haryana, Punjab, and Uttar Pradesh.

• It is known for its scorching heat and can cause severe dehydration and heatstroke in humans.

Q31. Answer: (a) Nilgiri

The Correct answer is Nilgiri.

Key Points

• The Nilgiri Biosphere Reserve was the first biosphere reserve established in India in the year 1986.

• It is located in the Western Ghats and encompasses parts of the states of Tamil Nadu, Kerala, and Karnataka.

• The Nilgiri Biosphere Reserve is part of the UNESCO World Network of Biosphere Reserves since 2000.

• This reserve is known for its rich biodiversity, including a variety of endemic flora and fauna.

• It is home to flagship species like the Nilgiri Tahr, Asian Elephant, and the Tiger.

• The Nilgiri Biosphere Reserve is an important conservation area for tropical moist forests, tropical dry forests, and shrublands.

• It also forms a critical part of the Western Ghats, which is one of the eight “hottest hotspots” of biological diversity in the world.

Additional Information

• Sundarbans

• The Sundarbans is a UNESCO World Heritage Site and is famous for its mangrove forests.

• It is home to the Royal Bengal Tiger and is located in the delta region of the Ganges, Brahmaputra, and Meghna rivers.

• It is also known for its salt-tolerant plant species and extensive network of tidal waterways.

• Nanda Devi

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• The Nanda Devi Biosphere Reserve is located in the state of Uttarakhand.
• It is also a UNESCO World Heritage Site and includes the Nanda Devi and Valley of Flowers National Parks.
• It is characterized by its alpine meadows and the Nanda Devi peak, the second-highest mountain in India.
• Gulf of Mannar
• The Gulf of Mannar Biosphere Reserve is located along the coast of Tamil Nadu.
• It is known for its marine biodiversity, including coral reefs, seagrass beds, and mangroves.
• It is home to species like the Dugong and Green Turtle.

Q32. Answer: (a) Bharat Forge Ltd and Tata Advanced Systems Ltd

The correct answer is Bharat Forge Ltd and Tata Advanced Systems Ltd.

Key Points

• The Defence Ministry of India signed contracts in March 2025 with Bharat Forge Ltd and Tata Advanced Systems Ltd for the procurement of the 155 mm/52 calibre Advanced Towed Artillery Gun System (ATAGS).
• The ATAGS is an indigenously developed artillery gun system designed to boost India's defense manufacturing capabilities under the Make in India initiative.
• It is developed by the Defence Research and Development Organisation (DRDO) in collaboration with private sector companies like Bharat Forge Ltd and Tata Advanced Systems Ltd.
• The gun has a range of up to 48 kilometers, making it one of the most advanced artillery systems in its category.
• It features automated gun alignment, advanced firing system capabilities, and a high degree of mobility, making it suitable for varied terrains.
• The partnership signifies a significant step towards self-reliance in defense production and aligns with India's aim to reduce dependency on imports in the defense sector.
• The procurement of ATAGS is expected to enhance the firepower of the Indian Army significantly and cater to its requirements for modern artillery systems.

Additional Information

• Larsen & Toubro Ltd and MTAR Technologies Ltd
• Larsen & Toubro (L&T) is a major player in India's defense and infrastructure sectors, known for its contribution to naval shipbuilding and missile systems.
• MTAR Technologies, based in Hyderabad, specializes in precision engineering and has contributed to key defense and space programs, including ISRO and DRDO projects.
• However, these companies were not involved in the ATAGS procurement.
• Mahindra Defence Systems Ltd and Kalyani Strategic Systems Ltd
• Mahindra Defence Systems Ltd is known for its expertise in armored vehicles and defense mobility solutions.
• Kalyani Strategic Systems Ltd, part of the Kalyani Group, is a leading provider of artillery systems and other defense equipment.
• While Kalyani Strategic Systems Ltd is involved in artillery development, it was not selected for this specific contract.
• Bharat Dynamics Ltd and Hindustan Aeronautics Ltd
• Bharat Dynamics Ltd (BDL) specializes in missile systems, including the manufacture of Akash and Nag missiles.
• Hindustan Aeronautics Ltd (HAL) is India's premier aerospace and defense company, known for producing aircraft like Tejas and Dhruv helicopters.
• Neither of these companies is involved in artillery systems like the ATAGS.

Q33. Answer: (c) Union List

The Correct answer is Union List.

Key Points

• The Union List is one of the three lists defined in the Seventh Schedule of the Indian Constitution.
• It contains subjects on which only the Central Government has the exclusive power to legislate.
• The Union List currently includes 100 subjects (originally 97), which are of national importance.
• Some of the key subjects in the Union List include defense, foreign affairs, atomic energy, railways, banking, and currency.
• The Union List ensures a strong central authority to maintain national integrity and address subjects that require uniformity across the country.
• The legislative power over these subjects is outlined in Article 246(1) of the Constitution.
• The idea of the Union List is inspired by the federal structure of government in other countries, such as the United States and Canada.

Additional Information

• State List
• The State List includes subjects of local and regional importance on which only the State Legislatures can legislate.
• It contains 66 subjects, such as police, public health, agriculture, and local government.
• The legislative power over the State List is defined in Article 246(2) of the Constitution.
• Concurrent List
• The Concurrent List contains subjects on which both the Central and State Governments can legislate.
• It contains 47 subjects, including education, forests, marriage, and adoption.
• In case of a conflict between the Union and State laws on a Concurrent List subject, the Union law prevails.
• Residual List
• The Residual Powers refer to subjects that are not mentioned in any of the three lists (Union, State, or Concurrent).
• These powers are vested in the Central Government as per Article 248 of the Constitution.
• Examples of residual subjects include cyberspace, e-commerce, and biotechnology.

Q34. Answer: (b) Goa

The Correct answer is Goa.

Key Points

• The Aguada Fort is located in the state of Goa, India.
• It is a famous 17th-century Portuguese fort that stands as a symbol of Portuguese engineering and architecture.
• The fort was constructed in 1612 to guard against the entry of ships into the Mandovi River and to protect the region from Dutch and Maratha invasions.
• The name "Aguada" is derived from the Portuguese word meaning "water," as the fort had a freshwater spring within its premises, which served as a crucial water source for ships.
• The fort includes a four-story lighthouse, which was built in 1864 and is one of the oldest lighthouses in Asia.
• It is strategically located in Sinquerim Beach, offering panoramic views of the Arabian Sea.
• The fort has been divided into two sections: one serving as a defense fortification and the other serving as a water storage facility.
• Today, Aguada Fort is a popular tourist destination and a historical landmark in Goa.

Additional Information

• Gujarat
• Gujarat is known for its famous forts such as the Junagadh Fort, but it does not house the Aguada Fort.
• It is located in western India and is famous for its historical monuments, temples, and industrial hubs.
• Maharashtra
• Maharashtra is home to several forts like the Shivneri Fort and Raigad Fort, but the Aguada Fort is not located here.
• The state is renowned for its Maratha history and architectural heritage.
• Tamil Nadu
• Tamil Nadu is famous for its ancient forts such as the Vellore Fort, but it does not include the Aguada Fort.
• The state is known for its Dravidian-style temples and rich cultural history.

Q35. Answer: (b) Employment

The Correct answer is Employment.

Key Points

• The National Multidimensional Poverty Index (MPI) is a measurement tool developed by NITI Aayog in collaboration with global methodologies to measure poverty beyond income.
• It uses a multidimensional approach to assess poverty by considering several deprivations that individuals face simultaneously.
• India's MPI is composed of three dimensions: Education, Health, and Standard of Living, which are further divided into 12 indicators.
• The dimension of Employment is not included in India's MPI. The MPI focuses on broader aspects of poverty such as lack of education, insufficient healthcare, and inadequate living conditions, rather than employment status.
• For example, under the Education dimension, indicators include years of schooling and school attendance. Under Health, it includes nutrition and child mortality. Standard of Living includes indicators like access to electricity, drinking water, sanitation, and housing.
• The MPI aims to provide a comprehensive understanding of poverty and guide targeted interventions to improve people's quality of life.

Additional Information

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• Education
• The Education dimension in India's MPI includes indicators such as years of schooling and school attendance.
• It highlights the importance of access to basic education in ensuring overall development and reducing multidimensional poverty.
• Health
• The Health dimension includes critical indicators like nutrition and child mortality.
• This reflects the role of healthcare accessibility and nutrition in alleviating poverty and improving life expectancy.
• Standard of Living
• The Standard of Living dimension focuses on basic amenities such as access to electricity, drinking water, sanitation, housing, cooking fuel, and assets.
• This dimension highlights the importance of infrastructure and facilities for enhancing the quality of life.

Q36. Answer: (d) Virtual Power Purchase Agreements (VPPAs)

The Correct answer is Virtual Power Purchase Agreements (VPPAs).

Key Points

• Virtual Power Purchase Agreements (VPPAs) are innovative contracts that allow companies to purchase renewable energy virtually, without requiring a physical connection to a power source.
• They function as a type of financial agreement where a company agrees to pay a fixed price for energy generated by a renewable energy project.
• VPPAs help organizations meet their renewable energy targets by offsetting their carbon footprint and supporting clean energy initiatives.
• These agreements are particularly beneficial for companies operating in multiple locations as they provide flexibility and scalability across geographies.
• India's proposal of VPPAs in 2025 aims to encourage private sector participation in achieving climate goals and transitioning to cleaner energy sources.
• VPPAs contribute to the development of renewable energy projects by providing long-term financial security to developers.
• Such agreements are increasingly popular in industries striving to align with sustainability standards and corporate social responsibility goals.

Additional Information

• Renewable Energy Certificates (RECs)
• RECs are tradable instruments that represent proof that electricity was generated from a renewable energy source.
• They are commonly used to meet regulatory requirements or voluntary commitments to renewable energy use.
• While beneficial, RECs do not directly involve energy purchase agreements like VPPAs.
• Green Energy Tariffs
• These tariffs allow customers to purchase electricity from renewable sources through their utility provider.
• They are typically offered at a premium rate and are designed for customers seeking to support sustainable energy production.
• Unlike VPPAs, Green Energy Tariffs are more localized and do not involve complex financial agreements.
• Time-of-Day Net Metering
• This mechanism allows users to adjust their electricity consumption based on time-based pricing models.
• It encourages energy use during off-peak hours to reduce costs and grid strain.
• While advantageous for energy management, it does not directly pertain to virtual energy contracts.

Q37. Answer: (a) Ziroh Labs

The Correct answer is Ziroh Labs.

Key Points

• Ziroh Labs is an Indian startup that focuses on data security and privacy-enhancing technologies.
• In April 2025, Ziroh Labs unveiled a system designed to run Artificial Intelligence (AI) models without relying on advanced chips such as GPUs.
• The innovation leverages homomorphic encryption, which allows computations on encrypted data without decrypting it, ensuring data security.
• This technology is particularly beneficial for organizations dealing with sensitive data, such as in healthcare, finance, and government sectors.
• Ziroh Labs' solution is designed to make AI accessible and affordable, even in scenarios with limited hardware resources.
• Such innovations highlight India's growing role in the global AI ecosystem and its focus on developing indigenous technologies.
• The approach also addresses concerns of energy efficiency, as advanced chips like GPUs are resource-intensive.

• This development positions Ziroh Labs as a key player in the field of privacy-focused AI solutions.

Additional Information

• BharatPe

• BharatPe is a leading Indian fintech company that provides merchants with QR code-based payment systems and other financial services.

• It focuses on enabling small retailers to accept payments digitally and access working capital.

• While it is an influential startup, its core operations are not related to AI model development or systems running without advanced chips.

• Closeloop Technology

• Closeloop Technology is a company specializing in providing custom software development, mobile app development, and web development services.

• Their focus is on creating innovative software solutions for businesses rather than AI hardware or chip-independent systems.

• Eka Software

• Eka Software is an Indian company known for its cloud-based solutions for commodity management, risk management, and business analytics.

• Their work primarily revolves around enterprise software, not AI systems or chip-independent technology.

Q38. Answer: (b) Fifth Schedule

The Correct answer is Fifth Schedule.

Key Points

• The Fifth Schedule of the Indian Constitution provides for the administration and control of Scheduled Areas and Scheduled Tribes across multiple states, excluding the northeastern states.

• It deals with provisions related to the governance, protection, and welfare of tribal populations in these areas.

• Under this schedule, the President of India has the authority to declare certain areas as Scheduled Areas and make modifications to the laws applicable there.

• The Governor of a state is empowered to regulate the transfer of land by or among Scheduled Tribes and manage their resources.

• A Tribal Advisory Council is mandated to be set up in states having Scheduled Areas to advise on matters related to tribal welfare.

• The Fifth Schedule is particularly significant for safeguarding the rights and interests of tribal communities, ensuring their cultural and economic development.

• This schedule applies to states such as Madhya Pradesh, Odisha, Rajasthan, Jharkhand, Maharashtra, and others where tribal populations are prominent.

Additional Information

• Sixth Schedule

• The Sixth Schedule of the Indian Constitution deals with the administration of tribal areas in the northeastern states, including Assam, Meghalaya, Tripura, and Mizoram.

• It provides for the creation of Autonomous District Councils to govern these areas and ensure local self-governance for tribal communities.

• The councils have legislative, judicial, and executive powers to manage land, forests, and other resources within their jurisdiction.

• Eleventh Schedule

• The Eleventh Schedule was added to the Constitution by the 73rd Constitutional Amendment Act of 1992.

• It contains provisions related to Panchayati Raj institutions and specifies 29 subjects under their jurisdiction, including agriculture, education, health, and rural development.

• Ninth Schedule

• The Ninth Schedule was introduced by the First Amendment Act of 1951 to protect laws related to land reforms and abolishment of the zamindari system from judicial review.

• It provides immunity to certain laws from being challenged on the grounds of violation of fundamental rights.

Q39. Answer: (c) GDP per capita in PPP US Dollars

The Correct answer is GDP per capita in PPP US Dollars.

Key Points

• GDP per capita in PPP (Purchasing Power Parity) US Dollars is a crucial metric for assessing the decent standard of living as per the Human Development Index (HDI).

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• It represents the average income of an individual in a country, adjusted for the cost of living and inflation, making it a more accurate measure for international comparisons.

• The HDI, developed by the United Nations Development Programme (UNDP), uses this metric to quantify the economic dimension of human development.

• The use of PPP ensures that the measure accounts for differences in the cost of goods and services between countries, rather than using nominal GDP which may not reflect true purchasing power.

• A higher GDP per capita in PPP generally indicates better access to resources, higher income levels, and improved living standards, which are key components of a decent standard of living.

• By incorporating this economic indicator, the HDI provides a more holistic view of development that goes beyond traditional measures like economic growth alone.

Additional Information

• Population density

• Population density refers to the number of people per unit area (e.g., per square kilometer) of land.

• It is used to study the distribution of populations but does not directly measure the standard of living.

• Monthly salary

• Monthly salary is an individual-level income metric and does not account for broader economic factors like inflation or purchasing power in a country.

• It is not used in international comparisons to measure the standard of living.

• Availability of luxury goods

• The availability of luxury goods reflects consumption patterns but is not a reliable indicator of overall living standards for an entire population.

• It is more associated with wealth distribution among a small segment of society rather than a universal measure of well-being.

Q40. Answer: (c) Desert Flag-10

The Correct answer is Desert Flag-10.

Key Points

• The Indian Air Force (IAF) participated in the multinational air combat exercise Desert Flag-10 at the Al Dhafra Air Base in the United Arab Emirates (UAE).

• This exercise was held between 21 April and 8 May 2025.

• Desert Flag is an annual multinational exercise hosted by the UAE Air Force, which focuses on enhancing interoperability and cooperation among participating nations.

• The exercise provides an opportunity for the IAF to train with air forces from various countries and improve its operational capabilities.

• Participation in such exercises allows the IAF to test its state-of-the-art aircraft, technology, and operational strategies in a multinational environment.

• The event also helps foster diplomatic relations and strengthen military partnerships between India and other participant nations.

Additional Information

• Red Flag

• The Red Flag exercise is a premier air combat training exercise hosted by the United States Air Force (USAF).

• It is conducted at the Nellis Air Force Base in Nevada, USA.

• The exercise is designed to provide realistic combat training in a simulated war environment and involves advanced air combat tactics and operations.

• Iron Fist

• Iron Fist is a biennial military exercise conducted by the Indian Air Force.

• The exercise demonstrates the firepower capabilities of the IAF, including fighter jets, transport aircraft, and helicopters.

• It is aimed at showcasing the operational readiness of the IAF to defend the country.

• Blue Flag-5

• Blue Flag is a multinational air exercise hosted by the Israeli Air Force (IAF).

• It focuses on enhancing strategic cooperation, interoperability, and learning from other air forces.

• The fifth edition of the exercise, Blue Flag-5, involved participants from several countries.

Q41. Answer: (c) 3

Shortcut Trick

Use the direct formula: Q1 × (100 − L1) / Price1 = Q2 × (100 + P2) / Price2

Here, Q1 = 6, L1 = 40%, Price1 = 1, P2 = 20%, Price2 = 1
=> 6 × (100 − 40) / 1 = Q2 × (100 + 20) / 1
=> 6 × 60 = Q2 × 120
=> 360 = 120 × Q2 => Q2 = 3
Therefore The correct answer is 3 rubber-bands.
Alternate Method
Given:
Selling 6 rubber-bands for Re. 1 results in a loss of 40%.
Desired profit = 20%.
SP1 (40% Loss)
Value = 60% of CP
Qty = 6 per Re. 1
SP2 (20% Gain)
Value = 120% of CP
Qty = 3 per Re. 1
Value × 2
Qty ÷ 2
Calculations:
=> Let the Cost Price (CP) of 6 rubber-bands be x.
=> Selling Price (SP) of 6 rubber-bands = Re. 1
=> Loss = 40%
=> CP × (100 − 40) / 100 = SP
=> x × 60 / 100 = 1
=> x = 100 / 60 = 5/3 rupees
=> To gain 20%, the new SP for 6 rubber-bands must be:
=> New SP = CP × (100 + 20) / 100
=> New SP = (5/3) × (120/100) = (5/3) × (6/5) = 2 rupees
=> Thus, he must sell 6 rubber-bands for Rs. 2 to gain 20%.
=> Therefore, for Re. 1, he must sell = 6 ÷ 2 = 3 rubber-bands.
Therefore The correct answer is 3 rubber-bands.
Additional Information
Price and Quantity Relation
When the total expenditure remains constant, Price and Quantity are inversely proportional to each other (Price prop. to 1 / Quantity).
Universal Formula
Quantity1 × (100 ± P/L%)1 ÷ Price1 = Quantity2 × (100 ± P/L%)2 ÷ Price2
Calculating CP from SP
CP = (SP × 100) / (100 − Loss%) or CP = (SP × 100) / (100 + Profit%).

Q42. Answer: (a) 1390

Shortcut Trick
Increasing a number by 100% means the number is doubled, becoming 200% of itself.
200% of the number = 2780
100% of the number = 2780 ÷ 2 = 1390
Therefore The correct answer is 1390.
Alternate Method
Original (x)
Increase (+x)
Total = 2x = 2780
Given:
A number, when increased by 100%, gives 2780.
Formula Used:

Final Value = Original Value × (1 + Percentage Increase ÷ 100)

Calculations:

=> Let the required number be x.

=> Final value = x + (100% of x)

=> Final value = x + x

=> 2x = 2780

=> x = 2780 ÷ 2

=> x = 1390

Therefore The correct answer is 1390.

Additional Information

Percentage Increase

When a value is increased by R%, the new value becomes (100 + R)% of the original value.

Base Value Concept

In percentage problems, the original or initial value is always considered as the base value of 100%.

Fraction Equivalent

An increase of 100% is equivalent to adding the full value itself, which is a fractional increase of 1/1, making the final value twice the original.

Q43. Answer: (c) 15

Shortcut Trick

The product of two consecutive natural numbers n × (n + 1) is slightly greater than n2.

Find a perfect square closest to 210 to approximate the numbers.

We know that 142 = 196 and 152 = 225.

Since 196 < 210 < 225, the two consecutive numbers are exactly 14 and 15.

The greater of the two consecutive numbers is 15.

Therefore The correct answer is 15.

Alternate Method

Given:

The product of two consecutive natural numbers is 210.

Calculation:

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

=> x × (x + 1) = 210

=> x2 + x = 210

=> x2 + x − 210 = 0

=> x2 + 15x − 14x − 210 = 0

=> x(x + 15) − 14(x + 15) = 0

=> (x − 14)(x + 15) = 0

Since x is a natural number, it must be positive. Thus, x cannot be −15.

=> x = 14

The smaller number is 14, and the greater number is x + 1 = 15.

Therefore The correct answer is 15.

Additional Information

Natural Numbers

Natural numbers are the set of positive integers starting from 1 (1, 2, 3, 4, ...). They do not include zero, fractions, or negative numbers.

Consecutive Numbers

Consecutive numbers are numbers that follow each other continuously from smallest to largest with a constant difference of 1 (e.g., n, n+1, n+2).

Quadratic Equation Roots

A quadratic equation ax2 + bx + c = 0 has two roots. If the constant term is negative while a is positive, the roots will have opposite signs.

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Q44. Answer: (c) 9.56

Shortcut Trick

Let the variable × be denoted as x. Given, x = 1490.59, y = 1490.94 and xz = y6

Directly substitute x and y to get: (1490.59)z = (1490.94)6

Equating the exponents since the bases are equal: 0.59 × z = 0.94 × 6

z = 5.64 ÷ 0.59 = 564 ÷ 59

z ≈ 9.559...

Therefore The correct answer is 9.56.

Alternate Method

Given:

x = 1490.59

y = 1490.94

xz = y6

Formula Used:

Law of Indices: (am)n = am × n

If am = an, then m = n (for a > 0, a ≠ 1)

Calculations:

=> Substitute the values of x and y in the equation xz = y6

=> (1490.59)z = (1490.94)6

=> 1490.59z = 1490.94 × 6

=> 1490.59z = 1495.64

Since the bases on both sides are equal, we can equate the exponents:

=> 0.59z = 5.64

=> z = 5.64 ÷ 0.59

=> z = 564 ÷ 59

=> z ≈ 9.5593

=> z ≈ 9.56

Therefore The correct answer is 9.56.

Additional Information

Law of Exponents (Power of a Power)

When raising a power to another power, you multiply the exponents: (am)n = am × n

Law of Exponents (Equality Rule)

If two terms with the same positive base (other than 1) are equal, their exponents must be equal: If ax = ay, then x = y.

Law of Exponents (Product Rule)

When multiplying two terms with the same base, you add the exponents: am × an = am + n

Q45. Answer: (a) 152

Shortcut Trick

The average of the first n even numbers is directly calculated using the formula: (n + 1).

Here, the number of terms n = 151.

Average = 151 + 1 = 152.

Therefore The correct answer is 152.

Alternate Method

2

1st

4

6

302

151st

Average = (2 + 302) ÷ 2 = 152

Given:

The sequence consists of the first 151 even numbers.

Formula Used:
For an Arithmetic Progression (A.P.), Average = (First term + Last term) ÷ 2
nth term of A.P., $T_n = a + (n - 1)d$
Calculation:
=> First even number (a) = 2
=> Common difference (d) = 2
=> Number of terms (n) = 151
=> Last term (l) = a + (n − 1)d
=> Last term = 2 + (151 − 1) × 2
=> Last term = 2 + 150 × 2 = 302
=> Average = (2 + 302) ÷ 2
=> Average = 304 ÷ 2 = 152
Therefore The correct answer is 152.
Additional Information
Average of First n Natural Numbers
The average of the first n consecutive natural numbers is given by the formula: (n + 1) ÷ 2.
Average of First n Odd Numbers
The average of the first n consecutive odd numbers is exactly equal to n.
Sum of First n Even Numbers
The total sum of the first n even numbers is calculated as n(n + 1).
Average of Consecutive Numbers
For any sequence of continuous consecutive numbers, continuous even numbers, or continuous odd numbers, the average is always strictly the middle value.

Q46. Answer: (a) 4750

Shortcut Trick
Let the total registered voters be 100x.
Votes cast = 80% of 100x = 80x, Valid votes = 95% of 80x = 76x.
Winner gets 75% of valid votes => Loser gets 25% of valid votes.
Winning Margin = (75% − 25%) = 50% of valid votes.
Margin = 50% of 76x = 38x = 1805 => x = 1805 ÷ 38 = 47.5
Therefore The correct answer is 4750.
Alternate Method
Given:
Percentage of registered voters who cast their vote = 80%
Percentage of invalid votes = 5% of cast votes
Winner gets 75% of valid votes and wins by 1805 votes.
Registered: 100x
Cast: 80x
Not Cast: 20x
Valid: 76x
Invalid: 4x
Win: 57x
Lose: 19x
Margin = 57x − 19x = 38x
38x = 1805
x = 47.5
Therefore 100x = 4750
Calculations:
Let the total number of registered voters be V.
=> Total cast votes = 80% of V = 0.80 V
=> Valid votes = (100% − 5%) of cast votes = 95% of 0.80 V

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=> Valid votes = 0.95 × 0.80 V = 0.76 V

=> Winning candidate's vote share = 75% of valid votes.

=> Losing candidate's vote share = (100% − 75%) = 25% of valid votes.

=> Winning margin = (75% − 25%) = 50% of valid votes.

=> Margin = 0.50 × 0.76 V = 0.38 V

=> 0.38 V = 1805

=> V = 1805 ÷ 0.38 = 180500 ÷ 38 = 4750

Therefore The correct answer is 4750.

Additional Information

Election Voting Tree

Elections follow a structured percentage split: Registered Voters → Cast Votes → Valid Votes → Candidates. Percentage losses (not cast, invalid) must be subtracted successively at each step.

Successive Percentages

Instead of calculating intermediate values individually, successive percentage chains can be written in a single equation. Final Value = Base × (1 − Loss1%) × (1 − Loss2%).

Winning Margin

When there are exactly two candidates, if the winner gets x% of the valid votes, the loser naturally gets (100 − x)%. The winning margin in terms of percentage is always (2x − 100)% of valid votes.

Q47. Answer: (a) 5 85/223 hours

Shortcut Trick

Total Capacity = LCM(16, 25, 12) = 1200 units

Combined efficiency = (1200 ÷ 16) + (1200 ÷ 25) + (1200 ÷ 12) = 75 + 48 + 100 = 223 units/hour

Time taken together = Total Capacity ÷ Combined efficiency = 1200 ÷ 223 = 5 ^(85)/223 hours

Therefore The correct answer is 5 ^(85)/223 hours.

Alternate Method

Given:

Time taken by Pipe A = 16 hours

Time taken by Pipe B = 25 hours

Time taken by Pipe C = 12 hours

Formula Used:

Total Work = LCM of individual times

Efficiency = Total Work ÷ Time

Time Taken = Total Work ÷ Total Efficiency

Pipe	Time (Hours)	Total Work (Units)	Efficiency (Units/Hour)
A	16	1200	75
B	25	48	
C	12	100	

Calculation:

=> Total Efficiency of A, B, and C = 75 + 48 + 100 = 223 units/hour

=> Total time taken together = Total Work ÷ Total Efficiency

=> Time taken = 1200 ÷ 223

=> Time taken = 5 ^(85)/223 hours

Therefore The correct answer is 5 ^(85)/223 hours.

Additional Information

Inlet vs Outlet Pipes

Inlet pipes add water to the tank (positive efficiency), while outlet pipes drain water from the tank (negative efficiency). The net efficiency is the algebraic sum of all pipes in operation.

Work Equivalency Principle

If a pipe takes x hours to fill a tank, its 1 hour work is 1/x. When multiple pipes operate together, their combined 1 hour work is computed as 1/T = 1/x + 1/y + 1/z.

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Q48. Answer: (b) 20

Shortcut Trick

The mean proportional of two numbers a and b is directly given by the square root of their product: √(a × b).

=> Mean proportional = √(25 × 16)

=> Mean proportional = 5 × 4

=> Mean proportional = 20

Therefore The correct answer is 20.

Alternate Method

Given:

First number (a) = 25

Second number (b) = 16

Formula Used:

If x is the mean proportional between a and b, they form a continuous proportion: a : x :: x : b

25

16

Area = 400

Rectangle (a × b)

Equivalent to

x

x

Area = x^2

Square (x^2)

Calculations:

=> Let the mean proportional be x.

=> 25 : x = x : 16

=> 25 ÷ x = x ÷ 16

=> x^2 = 25 × 16

=> x^2 = 400

=> x = √400

=> x = 20

Therefore The correct answer is 20.

Additional Information

Third Proportional

If a : b :: b : c, then c is called the third proportional to a and b. It is calculated using the formula: c = b^2 ÷ a.

Fourth Proportional

If a : b :: c : d, then d is called the fourth proportional to a, b, and c. It is calculated using the formula: d = (b × c) ÷ a.

Duplicate & Triplicate Ratio

The duplicate ratio of a : b is defined as a^2 : b^2, while the triplicate ratio is defined as a^3 : b^3.

Q49. Answer: (d) 22.2%

Shortcut Trick

Trade Discount = List Price − Buying Price

Discount = 3600 − 2800 = 800

Discount % = (Discount ÷ List Price) × 100

Discount % = (800 ÷ 3600) × 100 = 200 ÷ 9 ≈ 22.2%

Therefore The correct answer is 22.2%.

Alternate Method

Given:

List Price (MP) of the fan = Rs. 3,600

Buying Price (SP) of the fan = Rs. 2,800

Formula Used:

Discount = MP − SP

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Discount % = (Discount ÷ MP) × 100
MP
Rs. 3600
SP
Rs. 2800
Discount = Rs. 800
Discount % = (800 ÷ 3600) × 100 = 22.2%
Calculations:
=> Discount = 3600 − 2800 = Rs. 800
=> Discount % = (800 ÷ 3600) × 100
=> Discount % = 80000 ÷ 3600
=> Discount % = 200 ÷ 9
=> Discount % = 22.222... %
=> Correct to one decimal place, Discount % ≈ 22.2%
Therefore The correct answer is 22.2%.
Additional Information
Marked Price (MP)
The price on the label of an article is known as the marked price. Discount is always calculated on the marked price.
Successive Discount
If two successive discounts of a% and b% are given, then the single equivalent discount = [a + b − (a × b) ÷ 100]%.
Selling Price (SP) Formula
SP = MP × (100 − Discount%) ÷ 100.

Q50. Answer: (a) 7 km/hr

Shortcut Trick
When Salaj's speed is doubled, his time taken becomes exactly half.
Total time difference for Salaj = 4 hours (more than Kevin) + 9 hours (less than Kevin) = 13 hours.
Since doubling the speed reduces the time by half, this 13 hours reduction is exactly half of his normal time.
Therefore, Salaj's normal time = 13 × 2 = 26 hours.
Salaj's normal speed = Distance ÷ Time = 182 ÷ 26 = 7 km/hr.
Therefore The correct answer is 7 km/hr.
Alternate Method
Given:
Total distance = 182 km
Let Salaj's normal time be T_S and Kevin's time be T_K.
Formula Used:
Speed = Distance ÷ Time
Distance = 182 km
Salaj (Normal)
Time = T
Kevin
Time = T − 4
Salaj (Doubled Speed)
Time = T/2 = T − 13
Calculations:
=> In the normal case, Salaj takes 4 hours more than Kevin.
=> T_S − T_K = 4 → T_K = T_S − 4 ... (Equation i)
=> When speed is doubled, Salaj's new time becomes T_S / 2
=> In this case, Salaj takes 9 hours less than Kevin: T_K − (T_S / 2) = 9
=> Substituting the value of T_K from Equation (i):
=> (T_S − 4) − (T_S / 2) = 9
=> T_S / 2 = 9 + 4

=> T_S / 2 = 13

=> T_S = 26 hours

=> Salaj's normal speed = Distance ÷ Time

=> Salaj's normal speed = 182 ÷ 26 = 7 km/hr

Therefore The correct answer is 7 km/hr.

Additional Information

Inverse Relation of Speed and Time

For a constant distance, speed is inversely proportional to time (Speed prop. to 1 / Time). If speed is multiplied by a factor 'n', the time taken is divided by 'n'.

Relative Speed

When two bodies move in the same direction, their relative speed is the difference of their individual speeds |S1 − S2|. In opposite directions, it is S1 + S2.

Average Speed

When equal distances are covered at speeds a and b, Average Speed = (2 × a × b) ÷ (a + b). For unequal distances, it is Total Distance ÷ Total Time.

Q51. Answer: (b) Rs. 75,000

Shortcut Trick

Profit ratio of Anubhav to Gaurav = (7155 + 1431)/2 : (7155 − 1431)/2 = 4293 : 2862 = 3 : 2

Capital ratio = (Profit ratio) ÷ (Time ratio) = (3/2) : (2/5) = 15 : 4

Difference in capital ratio = 15 − 4 = 11 parts

11 parts = Rs. 55,000 => 1 part = Rs. 5,000

Anubhav's capital = 15 parts = 15 × 5,000 = Rs. 75,000

Therefore The correct answer is Rs. 75,000.

Alternate Method

Given:

Total profit = Rs. 7,155

Difference in profit = Rs. 1,431

Time of Anubhav = 2 months, Time of Gaurav = 5 months

Formula Used:

Profit Ratio = (Capital of A × Time of A) : (Capital of B × Time of B)

Anubhav

Gaurav

Capital: x + 55K

Time: 2 months

Profit Ratio: 3

Capital: x

Time: 5 months

Profit Ratio: 2

VS

Capital Ratio = 15 : 4

Calculations:

=> Anubhav's profit + Gaurav's profit = Rs. 7,155

=> Anubhav's profit − Gaurav's profit = Rs. 1,431

=> 2 × Anubhav's profit = 8586 => Anubhav's profit = Rs. 4,293

=> Gaurav's profit = 7155 − 4293 = Rs. 2,862

=> Ratio of profit = 4293 : 2862 = 3 : 2

Let Gaurav's capital be x, so Anubhav's capital is x + 55000.

=> [(x + 55000) × 2] / (x × 5) = 3 / 2

=> 4 × (x + 55000) = 15x

=> 4x + 220000 = 15x

=> 11x = 220000

=> x = 20000

=> Capital contributed by Anubhav = 20000 + 55000 = Rs. 75,000

Therefore The correct answer is Rs. 75,000.

Additional Information

Profit Sharing in Partnership

When investments are made for different time periods, the profit is distributed in the ratio of the product of capital and time for each partner. Formula: P1 : P2 = (C1 × T1) : (C2 × T2).

Working vs Sleeping Partner

A working partner manages the business and usually receives a specific percentage of the profit or a fixed salary before the remaining profit is divided based on capital ratios.

Finding Capital from Profit

If the profit ratio and time ratio are known, the capital ratio can be found by dividing the respective profit parts by the time parts: C1 : C2 = (P1 / T1) : (P2 / T2).

Q52. Answer: (c) 21.6

Shortcut Trick

Convert decimals to their simplest fractional forms: 2.7 = 27/10 and 0.096 = 96/1000 = 12/125.

LCM of fractions = LCM of numerators ÷ HCF of denominators.

=> LCM(27, 12) = 108

=> HCF(10, 125) = 5

=> Result = 108 ÷ 5 = 21.6

Therefore The correct answer is 21.6.

Alternate Method

Given:

Numbers: 2.7 and 0.096

Method Used:

Convert decimals to integers by multiplying by a power of 10, find their LCM, and divide the result by the same power of 10.

Calculations:

=> The maximum number of decimal places is 3 (in 0.096). So, multiply both numbers by 1000 to convert them to integers.

=> 2.7 × 1000 = 2700

=> 0.096 × 1000 = 96

=> Prime factorization of 2700 = $2^2 \times 3^3 \times 5^2$

=> Prime factorization of 96 = $2^5 \times 3^1$

=> LCM(2700, 96) = $2^5 \times 3^3 \times 5^2$

=> LCM(2700, 96) = 32 × 27 × 25 = 21600

=> To find the LCM of the original decimal numbers, divide the result by 1000:

=> LCM = 21600 ÷ 1000 = 21.6

Therefore The correct answer is 21.6.

Additional Information

LCM of Fractions

Fractions must be reduced to their simplest form first. LCM = (LCM of numerators) ÷ (HCF of denominators).

HCF of Fractions

Fractions must be reduced to their simplest form first. HCF = (HCF of numerators) ÷ (LCM of denominators).

LCM of Decimals

Convert decimals into integers by multiplying them with the highest power of 10 present in any decimal, find the LCM, and then divide the result by the same power of 10.

Product of Two Numbers

For any two numbers a and b: LCM(a, b) × HCF(a, b) = a × b.

Q53. Answer: (d) 12

Shortcut Trick

Second Number = (H.C.F. × L.C.M.) ÷ First Number

=> Second Number = (2 × 492) ÷ 82

=> Second Number = 984 ÷ 82 = 12

Therefore The correct answer is 12.

Alternate Method

Given:

H.C.F. of two numbers = 2

L.C.M. of two numbers = 492

First Number = 82

Formula Used:

First Number × Second Number = H.C.F. × L.C.M.

Calculations:

=> 82 × Second Number = 2 × 492

=> 82 × Second Number = 984

=> Second Number = 984 ÷ 82

=> Second Number = 12

Therefore The correct answer is 12.

Additional Information

Co-prime Numbers

Two numbers are said to be co-prime if their H.C.F. is 1. The L.C.M. of two co-prime numbers is always their product.

H.C.F. and L.C.M. of Fractions

H.C.F. of fractions = (H.C.F. of Numerators) ÷ (L.C.M. of Denominators).

L.C.M. of fractions = (L.C.M. of Numerators) ÷ (H.C.F. of Denominators).

Relation between H.C.F. and L.C.M.

For any two natural numbers A and B, their H.C.F. always completely divides their L.C.M.

Q54. Answer: (c) -62x + 90

Shortcut Trick

Simplify the fraction inside the bracket: 4 ÷ 2 = 2.

Expand both brackets directly: $4x^2 - 42x + 30 - 4x^2 - 20x + 60$.

Cancel $4x^2$ and $-4x^2$.

Combine the remaining terms: $(-42x - 20x) + (30 + 60) = -62x + 90$.

Therefore The correct answer is $-62x + 90$.

Alternate Method

Given:

Expression: $2((4/2)x^2 - 21x + 15) - 4(x^2 + 5x - 15)$

Calculation:

=> Simplify the fraction inside the first bracket: 4 ÷ 2 = 2

=> Expression becomes: $2(2x^2 - 21x + 15) - 4(x^2 + 5x - 15)$

=> Multiply terms inside the first bracket by 2:

=> $4x^2 - 42x + 30$

=> Multiply terms inside the second bracket by −4:

=> $-4x^2 - 20x + 60$

=> Now, combine both expanded parts:

=> $(4x^2 - 4x^2) + (-42x - 20x) + (30 + 60)$

=> $0 - 62x + 90$

=> $-62x + 90$

Therefore The correct answer is $-62x + 90$.

Additional Information

BODMAS Rule

Follow the exact order: Brackets, Orders (powers/roots), Division, Multiplication, Addition, Subtraction to solve expressions systematically.

Algebraic Like Terms

Only terms with the exact same variable and power can be added or subtracted together (e.g., $4x^2$ and $-4x^2$).

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Distributive Property

When multiplying a number outside a bracket, multiply it by every term inside: a(b + c) = ab + ac.

Q55. Answer: (a) 67.2%

Shortcut Trick

Let the Actual Selling Price (SP) = 100 units.

Selling at 2/5 means SP = 40 units, which results in a 24% loss (i.e., 76% of CP).

Since 40 units → 76% of CP => 1 unit → 1.9% of CP.

If sold at 88% of Actual SP, the New SP = 88 units.

Value of 88 units = 88 × 1.9% of CP = 167.2% of CP.

Profit % = 167.2% − 100% = 67.2%.

Therefore The correct answer is 67.2%.

Alternate Method

Given:

Selling an article at 2/5 of its actual SP causes a 24% loss.

The new selling price is 88% of the actual SP.

Formula Used:

SP = CP × (100 − Loss%) ÷ 100

Profit% = [(New SP − CP) ÷ CP] × 100

× 2/5

× 0.88

−24% Loss

+67.2% Profit

2/5 of SP

76% of CP

CP

100%

88% of SP

167.2% of CP

Actual SP

190% of CP

Calculations:

=> Let the actual Selling Price (SP) be 100x and Cost Price be CP.

=> First Selling Price = 100x × (2 ÷ 5) = 40x

=> Since loss is 24%, the selling price is equivalent to 76% of CP.

=> 40x = 76% of CP => CP = 40x ÷ 0.76 = 1000x ÷ 19

=> New Selling Price = 88% of 100x = 88x

=> Profit = New SP − CP = 88x − (1000x ÷ 19) = (1672x − 1000x) ÷ 19 = 672x ÷ 19

=> Profit % = [(672x ÷ 19) ÷ (1000x ÷ 19)] × 100

=> Profit % = (672 ÷ 1000) × 100 = 67.2%

Therefore The correct answer is 67.2%.

Additional Information

Successive Percentage Change

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

Marked Price and Discount

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

Dishonest Dealer Concept

If a dealer claims to sell at Cost Price but uses false weight, Profit% = (True Weight − False Weight) ÷ False Weight × 100.

Q56. Answer: (a) 28 hours

Shortcut Trick

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

Ratio of speeds (Ishaan : Meghna) = 77 : 33 = 7 : 3
Ratio of time taken (Ishaan : Meghna) = 3 : 7
Ishaan's time = 3 units = 12 hours => 1 unit = 4 hours
Meghna's time = 7 units = 7 × 4 = 28 hours.
Therefore The correct answer is 28 hours.
Alternate Method
Given:
Speed of Ishaan = 77 km/hr
Speed of Meghna = 33 km/hr
Time taken by Ishaan = 12 hours
Formula Used:
Distance = Speed × Time
Delhi
Kanpur
Distance (D) = Constant
Ishaan
77 km/hr | 12 hr
Meghna
33 km/hr | T hr
Calculations:
=> Distance covered by Ishaan = 77 × 12
=> Distance = 924 km
=> Since both travel the same distance, distance covered by Meghna = 924 km
=> Time taken by Meghna = Distance ÷ Speed of Meghna
=> Time taken by Meghna = 924 ÷ 33
=> Time taken by Meghna = 28 hours
Therefore The correct answer is 28 hours.
Additional Information
Unit Conversion
To convert speed from km/hr to m/s, multiply the value by 5 ÷ 18. To convert from m/s to km/hr, multiply by 18 ÷ 5.
Average Speed
When traveling two equal distances at different speeds S1 and S2, the Average Speed is given by (2 × S1 × S2) ÷ (S1 + S2).
Relative Speed
If two bodies move in the same direction, their relative speed is the difference of their individual speeds (S1 − S2). If they move in opposite directions, it is the sum of their speeds (S1 + S2).

Q57. Answer: (d) Rs. 972

Shortcut Trick
Simplified investment ratio of X, Y and Z = 43 : 30 : 12
Total parts = 43 + 30 + 12 = 85 parts
Value of 85 parts = Rs. 4590 → 1 part = 4590 ÷ 85 = Rs. 54
Difference in shares of Y and Z = 30 − 12 = 18 parts
Required difference = 18 × 54 = Rs. 972
Therefore The correct answer is Rs. 972.
Alternate Method
Given:
Investment ratio of X, Y and Z = 86 : 60 : 24
Total profit earned at the end of the year = Rs. 4590
43 parts
X
30 parts
Y

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12 parts

Z

Total Profit = 85 parts = Rs. 4590

Calculations:

Since the time period of investment is not mentioned, it is assumed to be the same for all three partners. Therefore, the profit will be distributed in the exact ratio of their investments.

=> Profit Ratio of X, Y and Z = 86 : 60 : 24

=> Simplified Profit Ratio = 43 : 30 : 12

=> Total sum of ratios = 43 + 30 + 12 = 85 parts

=> 85 parts = Rs. 4590

=> 1 part = 4590 ÷ 85 = Rs. 54

Now, we need to find the difference between the profit shares of Y and Z.

=> Difference in parts = 30 parts (Y's share) − 12 parts (Z's share) = 18 parts

=> Difference in amount = 18 × 54

=> Difference in amount = Rs. 972

Therefore The correct answer is Rs. 972.

Additional Information

Simple Partnership

When partners invest their capital for the identical time period, the profits or losses are distributed precisely in the ratio of their invested capitals. Formula: P1 : P2 = C1 : C2

Compound Partnership

When partners invest for varying time intervals, the profit share is determined by the product of the capital invested and the time period. Formula: P1 : P2 = (C1 × T1) : (C2 × T2)

Working vs Sleeping Partner

A working partner actively runs the business and usually takes a fixed salary or commission from the profit before the remainder is split. A sleeping partner merely invests capital without taking part in management operations.

Q58. Answer: (c) 6830904

Shortcut Trick

For divisibility by 24, a number must be divisible by its co-prime factors 3 and 8.

Check divisibility by 8 (last 3 digits): 904 ÷ 8 = 113. Only 6830904 is divisible by 8.

Check divisibility by 3 (sum of digits): 6 + 8 + 3 + 0 + 9 + 0 + 4 = 30. Divisible by 3.

Hence, 6830904 is divisible by both 3 and 8.

Therefore The correct answer is 6830904.

Alternate Method

Given:

Numbers to check: 7991987, 7340390, 6830904, 7132978

Concept Used:

If a number is exactly divisible by a composite number, it must be divisible by all its co-prime factors.

The co-prime factors of 24 are 3 and 8. So, the number must be completely divisible by both 3 and 8.

Calculations:

=> Divisibility by 8 check for Option 1: 7991987 is an odd number, so it is not divisible by 8.

=> Divisibility by 8 check for Option 2: 7340390 ends in 390. Since 390 ÷ 8 = 48.75, it is not divisible by 8.

=> Divisibility by 8 check for Option 4: 7132978 ends in 978. Since 978 ÷ 8 = 122.25, it is not divisible by 8.

=> Divisibility by 8 check for Option 3: 6830904 ends in 904. Since 904 ÷ 8 = 113, it is divisible by 8.

=> Divisibility by 3 check for Option 3: Sum of the digits = 6 + 8 + 3 + 0 + 9 + 0 + 4 = 30.

=> Since 30 ÷ 3 = 10, the sum of the digits is fully divisible by 3.

=> Therefore, 6830904 is divisible by both 3 and 8, making it divisible by 24.

Therefore The correct answer is 6830904.

Additional Information

Divisibility Rule of 3

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

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Divisibility Rule of 8

A number is divisible by 8 if the number formed by its last three digits is a multiple of 8.

Co-Prime Factors Check

To check if a number is divisible by a larger composite number (like 36 or 72), check its divisibility by the co-prime factors of that number (e.g., for 36, check 4 and 9; for 72, check 8 and 9).

Co-Prime Numbers

Two numbers are considered co-prime if their Highest Common Factor (HCF) is exactly 1.

Q59. Answer: (c) Rs. 4,000

Shortcut Trick

Given Discount = 15%

=> Selling Price = 100% − 15% = 85% of Marked Price

=> 85% = Rs. 3,400

=> 100% = (3400 ÷ 85) × 100 = Rs. 4,000

Therefore The correct answer is Rs. 4,000.

Alternate Method

Given:

Selling Price (SP) = Rs. 3,400

Discount = 15%

Formula Used:

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

SP = Rs. 3,400 (85%)

15%

Discount

MP = 100%

Calculations:

=> MP = (3400 × 100) ÷ (100 − 15)

=> MP = (3400 × 100) ÷ 85

=> MP = 40 × 100

=> MP = Rs. 4,000

Therefore The correct answer is Rs. 4,000.

Additional Information

Marked Price & Discount

Discount is an allowance given to the buyer and is always calculated on the Marked Price (MP) of an article, not on the Cost Price (CP).

Successive Discounts

When two consecutive discounts of a% and b% are given, the equivalent single discount is given by: [a + b − (a × b)÷100]%.

Relationship Between CP, MP, Profit% and Discount%

A highly useful direct ratio relation is: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

Q60. Answer: (d) 28

Shortcut Trick

Given $\sin\theta = 1/2$, the angle θ must be 30°.

For $\theta = 30°$, the value of $\operatorname{cosec} 30° = 2$ and $\cot 30° = \sqrt{3}$.

Substitute these values directly into the given expression:

=> $13 \times (2)^2 - 3 \times (\sqrt{3})^2 - 15$

=> $52 - 9 - 15 = 28$

Therefore The correct answer is 28.

Alternate Method

Given:

$\sin\theta = 1/2$

Formula Used:

$\operatorname{cosec}\theta = 1 / \sin\theta$

$\cot^2\theta = \operatorname{cosec}^2\theta - 1$

Calculation:

=> $\operatorname{cosec}\theta = 1 / (1/2) = 2$

=> $\operatorname{cosec}^2\theta = (2)^2 = 4$

=> $\cot^2\theta = 4 - 1 = 3$

Now, substitute the squared values into the expression: $13 \times \operatorname{cosec}^2\theta - 3 \times \cot^2\theta - 15$

=> $13 \times 4 - 3 \times 3 - 15$

=> $52 - 9 - 15$

=> $52 - 24$

=> 28

Therefore The correct answer is 28.

Additional Information

Basic Trigonometric Identities

The three core identities are: $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \operatorname{cosec}^2\theta$.

Reciprocal Trigonometric Ratios

The reciprocal trigonometric ratios are: $\operatorname{cosec}\theta = 1 / \sin\theta$, $\sec\theta = 1 / \cos\theta$, and $\cot\theta = 1 / \tan\theta$.

Values for Common Angles

For 30°, the standard values are $\sin 30° = 1/2$, $\cos 30° = \sqrt{3}/2$, and $\tan 30° = 1/\sqrt{3}$.

Q61. Answer: (a) 4.5

Shortcut Trick

Total work = LCM(13, 4) = 52 units, so Naman's efficiency = 4 units/day and Omar's efficiency = 13 units/day.

Work done by both in 2 days = (4 + 13) × 2 = 34 units.

Remaining work to be done = 52 − 34 = 18 units.

Time taken by Naman to finish the remaining work = 18 ÷ 4 = 4.5 days.

Therefore The correct answer is 4.5 days.

Alternate Method

Given:

=> Time taken by Naman to complete the work = 13 days

=> Time taken by Omar to complete the work = 4 days

=> They worked together for 2 days before Omar left.

Calculations:

Person	Days	Total Work	Efficiency
Naman	13	52	4
Omar	4	13	

=> Combined efficiency of Naman and Omar = 4 + 13 = 17 units/day

=> Work completed by both working together in 2 days = 17 × 2 = 34 units

=> Remaining work = 52 − 34 = 18 units

=> Time taken by Naman to complete the remaining work = Remaining Work ÷ Naman's efficiency

=> Time = 18 ÷ 4 = 4.5 days

Therefore The correct answer is 4.5 days.

Additional Information

Pipes and Cisterns

This concept is identical to Time & Work logic, but an inlet pipe has positive efficiency while an outlet pipe (leak) has negative efficiency.

Work and Wages

Wages are always distributed in the ratio of the total work done by each person. If they work for the same number of days, wages are distributed in the ratio of their efficiencies.

Alternate Days Work

When individuals work on alternate days, calculate the total work done in one complete cycle (e.g., 2 days) and scale it up to reach close to the total work before calculating the remainder.

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Q62. Answer: (c) 83^(−30)

Shortcut Trick

By applying the laws of exponents directly from left to right for the same base:

=> a^m ÷ a^n × a^p = a^(m − n + p)

=> 83^(−6 − 16 + (−8))

=> 83^(−30)

Therefore The correct answer is 83^(−30).

Alternate Method

Given:

Expression: 83^(−6) ÷ 83^(16) × 83^(−8)

Formula Used:

Law of Quotient: a^m ÷ a^n = a^(m − n)

Law of Product: a^m × a^n = a^(m + n)

Calculation:

According to the BODMAS rule, division and multiplication have the same precedence, so we evaluate the expression from left to right.

=> (83^(−6) ÷ 83^(16)) × 83^(−8)

Applying the Law of Quotient for the first part:

=> 83^(−6 − 16) × 83^(−8)

=> 83^(−22) × 83^(−8)

Now, applying the Law of Product:

=> 83^(−22 + (−8))

=> 83^(−30)

Therefore The correct answer is 83^(−30).

Additional Information

Law of Power of a Power

When a power is raised to another power, you multiply the exponents: $(a^m)^n$ = a^(m × n)

Negative Exponent Rule

A negative exponent denotes the reciprocal of the base raised to the positive exponent: a^(−n) = 1 ÷ a^n

Zero Exponent Rule

Any non-zero base raised to the power of zero is always equal to 1: a^0 = 1

Order of Operations (BODMAS)

Operations of equal priority like Division and Multiplication are always solved strictly from left to right unless brackets dictate otherwise.

Q63. Answer: (a) 51.2

Shortcut Trick

Let the assumed average be 50 kg.

Deviations of the weights from 50 = (40 − 50), (49 − 50), (56 − 50), (73 − 50), and (38 − 50)

Net deviation = −10 − 1 + 6 + 23 − 12 = +6

Average = Assumed average + (Net deviation ÷ 5)

Average = 50 + (6 ÷ 5) = 50 + 1.2 = 51.2 kg

Therefore The correct answer is 51.2 kg.

Alternate Method

Given:

Weights of 5 family members = 40 kg, 49 kg, 56 kg, 73 kg, and 38 kg.

Formula Used:

Average = Sum of all observations ÷ Total number of observations

40

49

56

73

38

Avg = 51.2

Weights of 5 Family Members (in kg)

Calculations:

=> Sum of all weights = 40 + 49 + 56 + 73 + 38

=> Sum of all weights = 256 kg

=> Total members = 5

=> Average = 256 ÷ 5

=> Average = 51.2 kg

Therefore The correct answer is 51.2 kg.

Additional Information

Deviation Method for Averages

It simplifies large calculations by picking an assumed average 'A'. The actual average is derived using: Actual Average = A + (Sum of deviations ÷ Total items).

Combined Average

If group 1 has n1 items with an average of A1 and group 2 has n2 items with an average of A2, then the Combined Average = (n1 × A1 + n2 × A2) ÷ (n1 + n2).

Operations on Averages

If every observation in a dataset is increased, decreased, multiplied, or divided by a constant value 'k', the new average changes identically by applying the same operation with 'k'.

Q64. Answer: (c) 18

Shortcut Trick

The sum of an interior and an exterior angle of a regular polygon is always 180°.

Ratio of Exterior : Interior = 1 : 8 => Total ratio parts = 1 + 8 = 9.

Exterior angle = (1 ÷ 9) × 180° = 20°.

Number of sides (n) = 360° ÷ Exterior angle = 360° ÷ 20° = 18.

Therefore The correct answer is 18.

Alternate Method

Given:

Ratio of an exterior angle to an interior angle = 1 : 8

Formula Used:

Interior angle + Exterior angle = 180°

Number of sides (n) = 360° ÷ Exterior angle

Interior = 8x

Exterior = 1x

Vertex

Straight line = 180°

Calculations:

=> Let the exterior angle be x and the interior angle be 8x.

=> We know that angles on a straight line add up to 180°.

=> x + 8x = 180°

=> 9x = 180°

=> x = 20° (Exterior angle)

=> The sum of all exterior angles of any regular polygon is exactly 360°.

=> Number of sides (n) = 360° ÷ x

=> n = 360° ÷ 20°

=> n = 18

Therefore The correct answer is 18.

Additional Information

Sum of Interior Angles

The sum of all interior angles of a polygon with n sides is given by the formula: Sum = (n − 2) × 180°.

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Sum of Exterior Angles

The sum of exterior angles of any convex polygon is always 360°, regardless of the number of sides. This property directly helps find the number of sides.

Number of Diagonals

The total number of diagonals that can be drawn in an n-sided polygon is given by the formula: D = n(n − 3) ÷ 2.

Q65. Answer: (c) Rs. 432

Shortcut Trick

Total interest rate for 12 months = 3% × 12 = 36%

Simple Interest = 36% of Principal

SI = 36% of 1200

SI = 36 × 12 = 432

Therefore The correct answer is Rs. 432.

Alternate Method

Given:

Principal (P) = Rs. 1,200

Rate of Interest (R) = 3% per month

Time (T) = 12 months

Time = 0

P = Rs. 1200

Time = 12 months

SI = Rs. 432

Rate = 3% per month

Total Interest = 12 × 3% = 36%

36% of 1200 = 432

Formula Used:

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

Note: Since the rate is given per month and time is in months, we use T = 12 directly.

Calculations:

=> SI = (1200 × 3 × 12) ÷ 100

=> SI = 12 × 36

=> SI = 432

Therefore The correct answer is Rs. 432.

Additional Information

Compound Interest Formula

When interest is compounded annually, Amount = P(1 + R/100)^T. The Compound Interest is calculated as Amount − P.

Difference between SI and CI for 2 Years

For a given principal P and rate R%, the difference between CI and SI for exactly 2 years is given by the formula D = P(R/100)².

Rule of 72

A quick formula to estimate the number of years required to double the invested money at a given annual interest rate (R). Time to double ≈ 72 ÷ R years.

Q66. Answer: (b) 2

Shortcut Trick

Numbers from 303 to 311: 303, 304, 305, 306, 307, 308, 309, 310, 311.

Eliminate even numbers and numbers ending in 5: 303, 307, 309, 311.

Check divisibility by 3 (sum of digits): 303 (sum 6) and 309 (sum 12) are multiples of 3.

Remaining numbers are 307 and 311, which are not divisible by primes up to √311 (7, 11, 13, 17).

Thus, 307 and 311 are the only prime numbers.

Therefore The correct answer is 2.

Alternate Method

Given:

Range of numbers: 303 to 311 (both included)

Concept Used:

A prime number has only two distinct divisors: 1 and itself.

To check if a number N is prime, we divide it by all prime numbers ≤ √N.

Calculations:

=> List of numbers to check: 303, 304, 305, 306, 307, 308, 309, 310, 311.

=> Even numbers (304, 306, 308, 310) are divisible by 2.

=> Number ending in 5 (305) is divisible by 5.

=> Remaining odd numbers: 303, 307, 309, 311.

=> Checking divisibility by 3 (sum of digits must be a multiple of 3):

=> 303 → 3 + 0 + 3 = 6 (Divisible by 3)

=> 309 → 3 + 0 + 9 = 12 (Divisible by 3)

=> Remaining numbers to check for primality: 307 and 311.

=> Approximate square root of 311 ≈ 17.6.

=> Prime numbers ≤ 17 are 2, 3, 5, 7, 11, 13, 17.

=> Checking 307: Not divisible by 7, 11, 13, 17. Hence, 307 is a prime number.

=> Checking 311: Not divisible by 7, 11, 13, 17. Hence, 311 is a prime number.

=> Total count of prime numbers = 2.

Therefore The correct answer is 2.

Additional Information

Prime Numbers

A prime number is a natural number greater than 1 that cannot be formed by multiplying two smaller natural numbers. It has exactly two divisors: 1 and itself.

Primality Test

To check if a given number N is prime, find the approximate square root of N. Divide N by all prime numbers less than or equal to √N. If N is not divisible by any of these primes, it is a prime number.

Co-Prime Numbers

Two numbers are said to be co-prime (or mutually prime) if the only positive integer that divides both of them is 1. Their Highest Common Factor (HCF) is always 1.

Composite Numbers

Numbers that have more than two factors are called composite numbers. The number 1 is neither prime nor composite.

Q67. Answer: (c) 14 cm

Shortcut Trick

When the radius and height of a cylinder are equal (r = h), the volume simplifies to πh^3.

=> $\pi h^3 = 8624$

=> $(22/7) \times h^3 = 8624$

=> $h^3 = 8624 \times 7 \div 22 = 2744$

=> $h = \sqrt[3]{2744} = 14$ cm

Therefore The correct answer is 14 cm.

Alternate Method

Given:

Volume of the right circular cylinder = 8624 cm^3

Radius of the cylinder (r) = Height of the cylinder (h)

Formula Used:

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

h

r = h

Calculations:

=> Volume = $\pi \times r^2 \times h$

Substitute r = h in the formula:

=> Volume = $\pi \times h^2 \times h$

=> 8624 = πh^3

=> 8624 = (22/7) × h^3

=> h^3 = 8624 × (7 ÷ 22)

=> h^3 = 392 × 7

=> h^3 = 2744

=> h = $\sqrt[3]{2744}$

=> h = 14 cm

Therefore The correct answer is 14 cm.

Additional Information

Curved Surface Area of a Cylinder

The area of the curved surface (excluding bases) is given by the formula 2πrh.

Total Surface Area of a Cylinder

The total area including the two circular bases is given by the formula 2πr(r + h).

Volume of a Cone

A cone with the same base radius and height as a cylinder has exactly one-third of its volume: (1/3)πr^2h.

Q68. Answer: (b) 50

Shortcut Trick

Days between 7 Feb 2024 and 8 Apr 2024 = 22 (Feb) + 31 (Mar) + 8 (Apr) = 61 days.

Since 2024 is a leap year (366 days), Time (T) = 61 ÷ 366 = 1/6 years.

SI = (Principal × Rate × Time) ÷ 100

SI = (4000 × 7.5 × 1/6) ÷ 100

SI = 30000 ÷ 600 = 50

Therefore The correct answer is Rs. 50.

Alternate Method

Given:

Principal (P) = Rs. 4,000

Rate of Interest (R) = 7.5% per annum

Date of deposit = 7 February 2024

Date of withdrawal = 8 April 2024

Formula Used:

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

7 Feb

29 Feb

31 Mar

8 Apr

22 Days

31 Days

8 Days

Principal: Rs. 4000 | Rate: 7.5% p.a.

Total Time = 61 Days

Calculations:

=> Total days in February 2024 (Leap Year) = 29 days

=> Days the money was in the bank in February = 29 − 7 = 22 days

=> Days in March = 31 days

=> Days in April = 8 days

=> Total Number of days (T) = 22 + 31 + 8 = 61 days

=> As 2024 is a leap year, total days in the year = 366

=> Time in years (T) = 61 ÷ 366 = 1 ÷ 6 years

=> SI = (4000 × 7.5 × 1) ÷ (100 × 6)

=> SI = (40 × 7.5) ÷ 6

=> SI = 300 ÷ 6 = 50

Therefore The correct answer is Rs. 50.

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Additional Information

Rule for Counting Days

While computing interest, either the day of deposit is excluded and the day of withdrawal is included, or vice versa. They are never both counted.

Leap Year Identification

A year is a leap year (366 days) if it is divisible by 4. If it is a century year (like 1900, 2000), it must be divisible by 400. February in a leap year has 29 days.

Simple Interest Amount

The total final amount at the end of the given time period is calculated as: Amount = Principal + Simple Interest.

Q69. Answer: (d) 22

Shortcut Trick

Let Mother's age be M and Daughter's be D. Given: 2D = M − 2 => M = 2D + 2.

Substitute M into the first equation: 3(2D + 2) = 5D + 26.

6D + 6 = 5D + 26 => D = 20 years.

M = 2(20) + 2 = 42 years. Difference = 42 − 20 = 22 years.

Therefore The correct answer is 22 years.

Alternate Method

Given:

Let the present age of the mother be M years and the daughter be D years.

First condition: 3M = 5D + 26

Second condition: 2D = M − 2

Age Difference Visualization

Mother's Age: 42 years

Daughter's Age: 20 yrs

Diff = 22 years

Calculations:

=> From the second condition, M = 2D + 2

=> Substitute this value of M in the first equation:

=> 3(2D + 2) = 5D + 26

=> 6D + 6 = 5D + 26

=> 6D − 5D = 26 − 6

=> D = 20

=> The daughter's age is 20 years.

=> Substitute D = 20 in M = 2D + 2:

=> M = 2(20) + 2

=> M = 40 + 2 = 42

=> The mother's age is 42 years.

=> Difference between their ages = M − D

=> Difference = 42 − 20 = 22 years

Therefore The correct answer is 22 years.

Additional Information

Linear Equations in Two Variables

A system of two linear equations can be solved rapidly using the substitution method. By isolating one variable in terms of the other, we can reduce the problem to a single-variable equation.

Problems on Ages

In age-related problems, always define variables for the present age first. Use standard linear equations to represent the conditions given like 'n times older' or 'x years less'.

Difference in Ages

The difference between the ages of any two individuals is an absolute constant. It remains exactly the same throughout their lifetimes, regardless of whether you refer to the past or the future.

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Q70. Answer: (d) 5577.52

Shortcut Trick

Radius of the sphere (r) = Diameter ÷ 2 = 22 ÷ 2 = 11 cm

Volume = (4/3) × π × r³

Volume = (4/3) × (22/7) × 11³ = (88 × 1331) ÷ 21

Volume = 117128 ÷ 21 = 5577.5238...

Rounding off to two decimal places, we get 5577.52 cm³

Therefore The correct answer is 5577.52 cm³.

Alternate Method

Given:

Diameter of the sphere = 22 cm

π = 22/7

O

r = 11 cm

Diameter = 22 cm

Formula Used:

Volume of a sphere = (4/3) × π × r³

Where r is the radius of the sphere.

Calculations:

=> Radius (r) = Diameter ÷ 2 = 22 ÷ 2 = 11 cm

=> Volume = (4/3) × (22/7) × (11)³

=> Volume = (4/3) × (22/7) × 1331

=> Volume = (88 × 1331) ÷ 21

=> Volume = 117128 ÷ 21

=> Volume ≈ 5577.5238 cm³

=> Volume correct to two decimal places = 5577.52 cm³

Therefore The correct answer is 5577.52 cm³.

Additional Information

Surface Area of a Sphere

The total surface area of a sphere is given by the formula 4 × π × r².

Volume of a Hemisphere

A hemisphere is exactly half of a sphere. Its volume is given by (2/3) × π × r³.

Total Surface Area of a Hemisphere

The total surface area of a hemisphere includes the curved surface and the flat circular base, given by 3 × π × r².

Q71. Answer: (c) 2

Given: (Left) 9 6 $ $ 7 © £ $ 1 * 5 4 3 3 $ 6 @ # # # 8 % (Right)

Now,

Symbols are there each of which is immediately preceded by a number and also immediately followed by a number

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

There are 2 symbols are there each of which is immediately preceded by a number and also immediately followed by a number

Hence, the correct answer is 'Option 2'.

Q72. Answer: (a) Neither conclusion (I) nor (II) follows.

Given Statement:

Some penguins are sharks.

Some sharks are dolphins.

The least possible Venn diagram for the given statement is:

Conclusions:

I: No shark is a penguin. This contradicts the first statement ("Some penguins are sharks"), which implies "Some sharks are penguins." Therefore, Conclusion (I) does not follow.

II: Some penguins are dolphins. This is true in Diagram II, but false in Diagram I. Since it is not true in all possible diagrams, Conclusion (II) does not follow.

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So, Neither conclusion I nor II follow.
Hence, the correct answer is "Option 1".

Q73. Answer: (d) OKHP

The logic followed here is:
For, 'KGDL is related to IEBJ '
For, 'NJGO is related to LHEM'
Similarly, for 'QMJR'
So, 'QMJR' will be related to 'OKHP'
Hence, the correct answer is "Option 4".

Q74. Answer: (c) 10

Given numbers: 7364592,
If 2 is added to each even digit and 1 is subtracted from each odd digit in the number, we get 6286484
The new number is 6286484.
Digit first from the left: 6
Digit first from the right: 4
Sum = 6 + 4 = 10
The sum of the digits is 10.
Hence, the correct answer is 'Option 3'

Q75. Answer: (a) Two

Given: H, I, J, K, U, V and W are sitting around a circular table facing the center of the table.
1) Only four people sit between U and V when counted from the right of U.
2) U sits third to the left of W.
3) K sits third to the left of H.
4) I is an immediate neighbour of both V and W.
So, J will sit on the remaining place.
Here,2 people sit between J and I when counted from the right of J
Hence, the correct answer is "Option 1".

Q76. Answer: (a) 6 km towards north

Given:
Veer starts from Point Y and drives 34 km towards north.
He then takes a left turn, drives 20 km.
He then turns left and drives 40 km.
He takes a final left turn, drives 20 km and stops at Point Z.
So, Veer must cover the 6 km distance by driving 6 km towards the North.
Hence, the correct answer is "Option 1".

Q77. Answer: (d) 88

The logic followed here is:
thus, "88" will replace the question mark in the given series.
Hence, the correct option is "Option 4".

Q78. Answer: (c) 514

The logic followed here is:
thus, "514" will replace the question mark in the given series.
Hence, the correct option is "Option 3".

Q79. Answer: (d) Two

Given: Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.
1) Only X is kept above W.
2) Only two boxes are kept between W and G.

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3) V is not kept immediately above G.

X
W
V
G

Similarly, filling up the remaining positions:

Only U is kept below F

E is at Position 4 and U is at Position 7.

The boxes kept between E and U are G (Pos 5) and F (Pos 6).

X
W
V
E
G
F
U

So, there are 'Two' boxes are kept between E and U.

Hence, the correct answer is "Option 4".

Q80. Answer: (c) 3

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

Now,

numbers, which is immediately preceded by a symbol and also immediately followed by number

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

There are 3 symbol, which is immediately preceded by a number and also immediately followed by another number

Hence, the correct answer is 'Option 3'.

Q81. Answer: (b) JG-LI

The logic followed here is:

Option 1) NK-PL

Option 2) JG-LI

Option 3) FC-HD

Option 4) RO-TP

Here, 'RO-TP' is odd among the given options.

Hence, the correct answer is "Option 2".

Q82. Answer: (b) 41

Given:

In a row of people all facing north

Cherry is 25th from the right end.

Dinesh is 28th from the right end.

Dinesh is exactly between Cherry and Lina.

Lina is 11th from the left end of the line

People between Cherry and Dinesh = 28 - 25 - 1 = 2

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So Lina's rank = Dinesh + people between Dinesh and Lina +1
= 28 + 2 + 1 = 31
So, Total People = 11 + 31 - 1 = 41
So, there are '41' people are there in the row
Hence, the correct answer is "Option 2".

Q83. Answer: (b) 8 km east

According to the given information,
1. Deepti starts from point A and walks 5 km towards west.
2. She takes a left turn and walks 2 km.
3. She then takes a right turn and walks 3 km.
4. She then takes a final right turn and walks 2 km and reaches a point B.
So, to reach the point A, Deepti should walk 3 + 5 = 8 km in East direction.
Hence, the correct answer is "Option 2".

Q84. Answer: (a) 45

Given:
Rank from top = 19
Rank from bottom = 27
Total students=Rank from top+Rank from bottom−1
Total students= 19 + 27 − 1= 45.
Hence, the correct answer is 'Option 1'.

Q85. Answer: (b) 10

Given numbers: 8357416
Digits in 8357416 are:
8, 3, 5, 7, 4, 1, 6
Arrange in ascending order: 1, 3, 4, 5, 6, 7, 8
Second from the left = 3
Second from the right = 7
So, Sum = 3 + 7 = 10
Hence, the correct answer is 'Option 2'

Q86. Answer: (c) Two

Given: A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table.
1) Only four people sit between C and J when counted from the right of C.
2) C sits third to the left of B.
3) A sits third to the left of D.
4) L is an immediate neighbour of both J and B.
Thus, There are Two people sit between K and L when counted from the right of K
Hence, the correct answer is "Option 3".

Q87. Answer: (d) 7

Two terms and their corresponding codes are provided to us:
OPEN → 4627
EARS = 1375
So, We must figure out the code for the letter "E."
'E' is common in both words, and '7' is common in both codes.
So, Code for E is 7.
Hence, the correct answer is Option 4.

Q88. Answer: (c) 1

The logic followed here is:
For, ‘KNOW’ is coded as ‘8901’

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K	N	O	W
8	9	0	1

For, ‘KNOT’ is coded as ‘9028’

K	N	O	T
9	0	2	8

So, 1 is the code for ‘W’ in the given code language

Hence, the correct answer is "Option 3".

Q89. Answer: (b) 1510

The logic followed here is:

thus, "1510" will replace the question mark in the given series.

Hence, the correct option is "Option 2".

Q90. Answer: (b) 84, 56

The logic followed here is:

Logic: Multiply the first number by 2/3 to get the second number.

24, 16

24 × (2/3) = 16

48, 32

48 × (2/3) = 32

Now, checking the options:

Option 1) 72, 36

72 × (2/3) = 48 (not 36) → Incorrect

Option 2) 84, 56

84 × (2/3) = 56 → Correct

Option 3) 60, 20

60 × (2/3) = 40 (not 20) → Incorrect

Option 4) 96, 62

96 × (2/3) = 64 (not 62) → Incorrect

Hence, the correct option is "Option 2"

Q91. Answer: (d) MRO

The logic followed here is:

Option 1) RWS

Option 2) OTP

Option 3) UZV

Option 4) MRO

Here, 'MRO' is odd among the given options.

Hence, the correct answer is "Option 4".

Q92. Answer: (b) Only conclusion (I) follows.

Given Statements:

All detergents are towels.

All detergents are conditioners.

The least possible Venn diagram for the given statement is:

Conclusions:

(I) Some towels are conditioners:

Since all Detergents are Towels, and all Detergents are Conditioners, the Detergents form the part of the Towels that are also Conditioners.

Thus, there is an overlap. (I) logically follows.

(II) All conditioners are detergents:

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This is the converse of Statement 2.
The statements do not provide enough information to guarantee this is true.
There may be conditioners that are not detergents. (II) does not follow.
So, Only conclusion (I) follows.
Hence, the correct answer is "Option 2".

Q93. Answer: (a) WOX 113

The logic followed here is:
So, 'WOX 113' will replace the question mark in the given series.
Hence, the correct answer is "Option 1".

Q94. Answer: (c) 32

BODMAS Table:
Given equation: 11 − 3 × 88 + 8 ÷ 10 = ?
Now, '+' ↔ '÷' (interchanged) and '−' ↔ '×' (interchanged), then:
=> 11 × 3 − 88 ÷ 8 + 10 = ?
=> 33 − 11 + 10 = ?
=> 22 + 10
= 32
Hence, the correct answer is "Option 3".

Q95. Answer: (c) ACZY

The logic followed here is:
For, 'MOLK is related to RTQP'
For, 'GIFE is related to LNKJ'
Similarly, for 'VXUT'
So, 'VXUT'' will be related to 'ACZY'
Hence, the correct answer is "Option 3".

Q96. Answer: (a) Mother's mother

Family Chart:
Given:
S is the mother of R.
R is the brother of P.
P is the wife of I.
I is the father of O.
So, S is the Mother's mother of O.
Hence, the correct answer is "Option 1".

Q97. Answer: (a) 18

Given numbers: 3659247
If 2 is added to each even digit and 2 is subtracted from each odd digit in the number
The new number is 1837465
Even digits in the number = 8, 4, 6
Sum = 8+4+6 = 18
Hence, the correct answer is 'Option 1'

Q98. Answer: (b) LYZK

The logic followed here is:
For, 'XSLE is related to CWQ'
For, 'RIFU is related to WMKY'
Similarly, for 'GUUG'
So, 'GUUG' will be related to 'LYZK'
Hence, the correct answer is "Option 2".

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Q99. Answer: (c) EGB

The logic followed here is:

Option 1) KMI

Option 2) HJF

Option 3) EGB

Option 4) NPL

Here, 'EGB' is odd among the given options.

Hence, the correct answer is "Option 3".

Q100. Answer: (d) EAG

The logic followed here is:

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

Hence, the correct answer is "Option 4".

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