RRB NTPC (UG) CBT-I Official Paper (Held On: 28 Aug, 2025 Shift 3) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. The Himalayan Mountain ranges stretch in a west-east direction from the Indus River to which major Indian river?

(a) Godavari
(b) Brahmaputra
(c) Ganga
(d) Yamuna

Q2. Which AI-driven anti-drone system was deployed at India's largest naval port in Karnataka in May 2025 to protect critical infrastructure?

(a) AeroGuard
(b) SkyNet
(c) Indrajaal Infra
(d) DroneShield

Q3. Which military division had become rare in warfare during the Gupta period despite being part of the army in texts?

(a) Infantry
(b) Chariot
(c) Cavalry
(d) Elephant

Q4. Which crop is primarily associated with plantation agriculture in Kerala?

(a) Wheat
(b) Rubber
(c) Cotton
(d) Rice

Q5. In which of the following groups of states are the lower regions of the Western Ghats located where subtropical vegetation is found?

(a) Madhya Pradesh, Maharashtra and Karnataka
(b) Gujarat, Maharashtra and Kerala
(c) Kerala, Tamil Nadu and Karnataka
(d) Andhra Pradesh, Kerala and Goa

Q6. What is the function of the keyboard shortcut Ctrl + Z?

(a) Redo an action
(b) Undo the last action
(c) Close the window
(d) Zoom the window

Q7. Alauddin Khilji introduced the Dagh and Huliyah systems to control the army. What was Huliyah associated with?

(a) Soldier's salary
(b) Soldier's description
(c) Land revenue
(d) Horse branding

Q8. Who authored the book 'The Churn' that was released in April 2025?

(a) Bandaru Dattatreya
(b) Himanshu Roy
(c) Arvind Kumar
(d) Dr. Vijay Darda

Q9. Which sector was the dominant contributor to India's GDP immediately after independence in 1947?

(a) Foreign trade
(b) Services
(c) Industrial
(d) Agriculture

Q10. The process by which traits are passed from parents to offspring is known as _____.

(a) mutation
(b) heredity
(c) hybridisation
(d) linkage

Q11. Which architectural style, introduced by the British, combines Indian traditional elements with Gothic, Victorian and Neo-Classical forms?

(a) Indo-Saracenic
(b) Colonial Neo-Baroque
(c) Gothic Revival
(d) Victorian Classical

Q12. In which of the following years was the Saansad Adarsh Gram Yojana (SAGY) launched with the aim to translate the comprehensive vision of Mahatma Gandhi about an ideal Indian village into reality, keeping in view the present context?

(a) 2009
(b) 2014
(c) 2006
(d) 2012

Q13. Which of the following Bollywood actresses was honoured at the inaugural Global Vanguard Honour, 2025, held in Los Angeles?

(a) Nitanshi Goel
(b) Deepika Padukone
(c) Priyanka Chopra
(d) Pratibha Ranta

Q14. Which of the following pairs correctly classifies one input and one output device?

(a) Keyboard – Output device, Printer – Input device
(b) Microphone – Input device, Monitor – Output device
(c) Mouse – Output device, Scanner – Input device
(d) Joystick – Output device, Speaker – Input device

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Q15. Which city in Assam issued evacuation notices to residents in landslide-prone areas due to continuous rainfall in June 2025?

(a) Silchar
(b) Dibrugarh
(c) Jorhat
(d) Guwahati

Q16. For the implementation of which of the following did the Central Government estimate a total requirement of Rs. 2.31 lakh crore over a five year period from 2010-11 to 2014-15?

(a) Right to Education Act
(b) Right to Information Act
(c) Ayushman Bharat Scheme
(d) Sarva Shiksha Abhiyan

Q17. During the colonial period in India, the Vernacular Press Act (1878) was introduced by _____.

(a) Lord Curzon
(b) Lord Wellesley
(c) Lord Lytton
(d) Lord Ripon

Q18. Which of the following subjects is addressed by the Tenth Schedule of the Indian Constitution?

(a) Panchayati Raj system
(b) Emergency powers and procedures
(c) Official languages
(d) Provisions related to anti-defection

Q19. Which of the following years saw the foundation of the Home Rule League and its phenomenal success?

(a) 1909
(b) 1916
(c) 1906
(d) 1919

Q20. Which of the following organisations is tasked with providing certification to films before their public release in India?

(a) Film and Television Institute of India
(b) National Film Development Corporation
(c) Children's Film Society, India
(d) Central Board of Film Certification

Q21. Which of the following is a feature of the State Legislative Council (Vidhan Parishad) in India?

(a) It can be dissolved like the Legislative Assembly
(b) The people directly elect their members
(c) It has a fixed term of five years
(d) It is a permanent body and cannot be dissolved

Q22. Under the Ayushman Vaya Vandana Yojana launched in October 2024, every Indian citizen aged 70 years and above will get free health insurance up to what amount every year?

(a) Rs. 7.5 lakh
(b) Rs. 8 lakh
(c) Rs. 5 lakh
(d) Rs. 3 lakh

Q23. The exchange of gases at the alveoli and tissues occurs by which process?

(a) Osmosis
(b) Decantation
(c) Diffusion

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(d) Filtration

Q24. Which artist was recognised as the Global Recording Artist of the Year 2024 by the IFPI?

(a) Billie Eilish
(b) Taylor Swift
(c) Beyoncé
(d) Olivia Rodrigo

Q25. Why is air transport less popular for freight movement in India?

(a) It is widely available in rural and remote villages.
(b) It requires minimal infrastructure for operation.
(c) It is expensive and ideal only for light, high-value goods.
(d) It is slower and less efficient than water transport

Q26. India launched chip-enabled biometric e-passports in _____ cities as of April 2025.

(a) 13
(b) 11
(c) 15
(d) 9

Q27. Events of Khelo India Youth Games 2025 were NOT conducted in which of the following cities of Bihar?

(a) Bhagalpur
(b) Gaya
(c) Samastipur
(d) Rajgir

Q28. Which of the following is NOT a Central Armed Police Force?

(a) Indo-Tibetan Border Police
(b) Border Security Force
(c) Central Reserve Police Force
(d) Criminal Investigation Department

Q29. When was the National Human Rights Commission (NHRC) established to investigate cases of human rights violations in India?

(a) 12 October 1993
(b) 10 December 1994
(c) 15 January 1995
(d) 20 February 1996

Q30. Who is responsible for the administration of Union Territories like Chandigarh and Lakshadweep?

(a) The President of India
(b) Prime Minister of India directly
(c) Elected Chief Ministers of the Union Territories
(d) Governors of neighbouring states

Q31. What is the preferred unit used in the scientific literature to express the ratio between two sound intensities?

(a) Phon
(b) Pascal
(c) Hertz
(d) Decibels

Q32. Which anniversary of the Meter Convention was celebrated by the Department of Consumer Affairs, Government of India on 20 May 2025?

(a) 125th
(b) 155th
(c) 100th

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(d) 150th

Q33. The western coastal plains are an example of:

(a) tectonic coast
(b) submerged coast
(c) volcanic coast
(d) emergent coast

Q34. India is set to invest over US$360 billion in renewable energy and infrastructure by.

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

Q35. What is the name of India's first satellite, which completed 50 years in April 2025 and was launched in 1975?

(a) Rohini
(b) INSAT-1A
(c) Bhaskara
(d) Aryabhata

Q36. Pick the INCORRECT statement regarding the life of Birsa Munda.

(a) He urged people to destroy the Europeans.
(b) He advised his people to bring back the Golden Age of Mundas.
(c) Birsa was born in the forests of Madhya Pradesh.
(d) He had joined the local missionary school.

Q37. As per India Justice Report 2025, how many judges does India have per million population?

(a) 10
(b) 17
(c) 21
(d) 15

Q38. In which year was the Industrial Policy Resolution that gave importance to the public sector adopted?

(a) 1951
(b) 1956
(c) 1947
(d) 1991

Q39. According to the Henley Passport Index released in January 2025, what is India's global passport ranking for 2025?

(a) 85th
(b) 88th
(c) 83rd
(d) 80th

Q40. When and where were the flight trials of the ULPGM-V3 missile conducted?

(a) Rajasthan (Pokhran), 24 July 202
(b) Maharashtra (Pune), 27 July 2025
(c) Odisha (Chandipur), 26 July 2025
(d) Andhra Pradesh (Kurnool), 25 July 2025

MATHEMATICS

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Q41. M and N start a business. M invests Rs. 17,000 more than N for 6 months and N invests for 5 months. M's share is Rs. 498 more than that of N, out of a total profit of Rs. 1,494. Find the capital contributed by M.

(a) Rs. 42,500
(b) Rs. 42,326
(c) Rs. 42,661
(d) Rs. 42,304

Q42. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 4% per month for 10 months.

(a) Rs. 40
(b) Rs. 60
(c) Rs. 480
(d) Rs. 80

Q43. Simplify the given expression.

$x(7x - 5) + 3(x^2 - 2) + 14$

(a) $-10\ x^2 - 5x + 8$
(b) $10\ x^2 - 5x - 8$
(c) $10\ x^2 - 5x + 8$
(d) $-10\ x^2 - 5x - 8$

Q44. Pipe P can fill 4/5 part of a tank in 12 hours and pipe Q can fill 2/7 part of the same tank in 30 hours. Both P and Q were kept open for 5 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 8 hours.

Pipes P, Q and R together can fill the empty tank in:

(a) 17 hours
(b) 35 hours
(c) 43 hours
(d) 18 hours

Q45. The average of first 163 even numbers is

(a) 165
(b) 163.5
(c) 164.5
(d) 164

Q46. The value of is

5/3 + (1/(1+4/9)) - 2/5

(a) 384/191
(b) 382/195
(c) 379/201
(d) 380/197

Q47. The product of two consecutive natural numbers is 110. The greater of the two numbers is:

(a) 3
(b) 5
(c) 11
(d) 7

Q48. The value of $\sqrt{121} + \sqrt{0.0225} - \sqrt{5.76}$

(a) 13.05
(b) 12.62
(c) 8.75
(d) 5.35

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Q49. Simplify: $(\tan^2 \beta \operatorname{cosec}^2 \beta)/(1+\tan^2 \beta)$

(a) -1
(b) tan ?
(c) 1
(d) sec ?

Q50. The HCF and LCM of two numbers are 72 and 432, respectively. If one of the numbers is 144, find the other one.

(a) 216
(b) 144
(c) 72
(d) 288

Q51. In triangle ABC, BD ? AC at D and angle DBC = 58°. E is a point on BC such that angle CAE = 16°. What is the measure of angle AEB?

(a) 42°
(b) 49°
(c) 52°
(d) 48°

Q52. What is the volume of a cylindrical container that has a base radius of 3.5 metres and a height of 5.2 metres?

(a) 67.3π cubic metres
(b) 65.4π cubic metres
(c) 63.7π cubic metres
(d) 68.6π cubic metres

Q53. Find the mean proportional of 96 and 54.

(a) 71
(b) 69
(c) 75
(d) 72

Q54. The value of $7^2 + \sqrt{(8^2)} - 5\sqrt{(16)} - 14$ is

(a) 16
(b) 31
(c) 23
(d) 26

Q55. Pipe A can fill a tank in 11 hours, pipe B can fill the same tank in 24 hours and pipe C can fill the same tank in 19 hours. The time taken by them to fill the same tank if they operate together is::

(a) 4371/929 hours
(b) 7371/929 hours
(c) 5371/929 hours
(d) 9371/929 hours

Q56. A trader offers one kitchen set free with each kitchen set purchased at the marked price. If he still makes a profit of 20%, at what percentage above the cost price has the trader marked the kitchen set?

(a) 50%
(b) 150%
(c) 140%
(d) 40%

Q57. The number 716710501 is divisible by which of the following?

(a) 20
(b) 16
(c) 19

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(d) 13

Q58. The number of prime numbers between 374 and 381, both included, is:

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

Q59. By how much is 65% of 75 greater than 3/5 of 45?

(a) 19.75
(b) 18.75
(c) 15.75
(d) 21.75

Q60. By selling an article at 5/14 of its actual selling price, Hitesh incurs a loss of 25%. If he sells it at 58% of its actual selling price, then the profit percentage is:

(a) 23.1%
(b) 23.7%
(c) 22.5%
(d) 21.8%

Q61. 8 years ago, the age of a father was 20 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

(a) 8
(b) 12
(c) 16
(d) 7

Q62. The average weight of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 75 kg and 37 kg is:

(a) 53.4 kg
(b) 50.4 kg
(c) 52.4 kg
(d) 51.4 kg

Q63. Train A leaves station M at 6:30 AM and reaches station N at 3:30 PM on the same day. Train B leaves station N at 8:30 AM and reaches station M at 2:30 PM on the same day. Find the time when trains A and B meet.

(a) 11:18 AM
(b) 12:18 PM
(c) 11:38 AM
(d) 11:08 AM

Q64. A book is sold at three successive discounts of 8%, 4%, and 5%. If the marked price of the book is Rs. 3,125, find its net selling price.

(a) Rs. 2,622
(b) Rs. 2,492
(c) Rs. 2,594
(d) Rs. 2,465

Q65. Find the circumference (in m) of the largest circle that can be drawn completely inside a rectangle whose dimensions are given as 63 m and 116 m.

(Take $\pi = 22/7$)

(a) 202
(b) 200
(c) 190
(d) 198

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Q66. Pallavi bought a toy for Rs. 578, decorated it at a cost of Rs. 14 and sold the toy for Rs. 476. Find the loss or profit percentage.

(a) 725/37% profit
(b) 735/37% profit
(c) 725/37% loss
(d) 725% loss

Q67. If the interest earned during the 2nd year on a certain sum is Rs. 6,534, and the rate of interest is 20% per annum compounded annually, then the sum is:

(a) Rs. 28,030
(b) Rs. 27,630
(c) Rs. 28,205
(d) Rs. 27,225

Q68. The current population of a town is 14,568. It increases by 25% and 60% in two successive years but decreases by 50% in the third year. What is the population of the town at the end of the third year?

(a) 14,568
(b) 14,563
(c) 14,565
(d) 14,573

Q69. X, Y and Z invest a sum in the ratio of 16 : 82 : 2, respectively. If they earned a total profit of Rs. 2,750 at the end of the year, then what is the difference between share of Y and Z?

(a) Rs. 2,200
(b) Rs. 2,159
(c) Rs. 2,191
(d) Rs. 2,122

Q70. A man goes to Nagpur from Visakhapatnam at a speed of 3 km/hr and returns to Visakhapatnam at speed of 6 km/hr, through the same route. What is his average speed (in km/hr) of the entire journey?

(a) 4
(b) 3
(c) 2
(d) 7

GENERAL INTELLIGENCE AND REASONING

Q71. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) SL-XQ
(b) CW-HA
(c) GZ-LE
(d) WP-BU

Q72. Each of the digits in the number 3147569 is arranged in the ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

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Q73. This question is based on the five, three-digit numbers given below.

(Left) 666 714 792 824 596 (Right)

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

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

What will be the resultant if the second digit of the highest number is added to the second digit of the lowest number?

(a) 7
(b) 13
(c) 9
(d) 11

Q74. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

11, 96

10, 75

(a) 9, 56
(b) 13, 134
(c) 12, 120
(d) 14, 172

Q75. In a row of 161 students facing north, Mr. Into is 98th from the left end. If Mr. Toni is 20th to the right of Mr. Into, what is Mr. Toni's position from the right end of the line?

(a) 43rd
(b) 41st
(c) 42nd
(d) 44th

Q76. JM 8 is related to FI 11 in a certain way. In the same way, LO 19 is related to HK 22. To which of the following is UX 27 related, following the same logic?

(a) QT 30
(b) . PT 33
(c) QT 33
(d) PT 30

Q77. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

ROP 1, VST 3, ZWX 5, DAB 7, ?

(a) HGF 9
(b) HEF 11
(c) HEF 9
(d) HGF 11

Q78. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

IGE 13, LJH 17, OMK 21, RPN 25, ?

(a) UTS 29
(b) VTQ 28
(c) USQ 29
(d) VTS 29

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Q79. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All actors are dancers.

Some dancers are magicians.

Conclusions:

(I) All dancers are actors.

(II) No magician is a dancer.

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

Q80. In a certain code language, ‘FLAG’ is coded as ‘7239’ and ‘ALIF’ is coded as ‘3289’. What is the code for ‘I’ in the given code language?

(a) 9
(b) 3
(c) 2
(d) 8

Q81. 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) CELS
(b) JMSZ
(c) NQWD
(d) SVBI

Q82. Each of the digits in the number 817594326 is arranged in ascending order from left to right. Which of the following digits will be fourth from the left?

(a) 5
(b) 6
(c) 4
(d) 3

Q83. M is the son of L. L is the father of D. D is the brother of N. N is the sister of A. A is the daughter of K. K is the mother of Q. N is married to S. S is the father of C. How is L related to C?

(a) Father's father
(b) Mother's father
(c) Father's brother
(d) Mother's brother

Q84. In a certain code language, ‘TAME’ is coded as ‘4257’ and ‘MIND’ is coded as ‘1365’. What is the code for ‘M’ in the given code language?

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

Q85. Kabir, Sumit, Ranvir, Madhu, Samir and Tanvi are sitting around a circle, facing the centre. Ranvir sits second to the right of Samir. Samir sits second to the right of Madhu. Sumit sits to the immediate left of Samir. Kabir sits second to the left of Tanvi. Who sits to the immediate right of Kabir?

(a) Tanvi
(b) Ranvir

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(c) Samir
(d) Sumit

Q86. Six people, A, B, C, D, E and F are sitting in a row, facing north. Only two people sit to the right of C. A sits second to the left of D. B sits to the immediate right of E. F sits on the extreme right end of the line. How many people sit between B and F?

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

Q87. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

Some Magpies are Swans.

No Swans are Seagulls.

Conclusions:

I: Some Magpies are Seagulls.

II: No Seagulls are Magpies.

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

Q88. QERG is related to WJVJ in a certain way based on the English alphabetical order. In the same way, OYHS is related to UDLV. To which of the given options is GNTB related, following the same logic?

(a) MSXE
(b) MSEX
(c) MSWE
(d) MXEW

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

82, 83, 85, 89, 97, ?

(a) 112
(b) 113
(c) 121
(d) 131

Q90. Each of the digits in the number 9254631 is arranged in ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q91. Kiya ranked 7th from the bottom and 15th from the top in her class. How many students are there in her class?

(a) 22
(b) 21
(c) 20
(d) 19

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Q92. 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) LP-GI
(b) NR-IL
(c) QU-LO
(d) JN-EH

Q93. What should come in place of the question mark (?) in the given series?

425 300 236 209 201 ?

(a) 200
(b) 182
(c) 172
(d) 152

Q94. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

8 − 3 + 63 × 3 ÷ 14 = ?

(a) 24
(b) 17
(c) 12
(d) 30

Q95. Refer to the following number and symbol series and answer the question that follows.

Counting to be done from left to right only.

(Left) 8 € 1 @ % 5 5 3 % © 2 € £ 7 1 # 8 % 8 7 2 @ (Right)

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

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

Q96. What should come in place of the question mark (?) in the given series?

312 320 329 ? 350 362

(a) 336
(b) 339
(c) 337
(d) 341

Q97. Seven boxes, A, B, C, D, M, N and O, are kept one over the other but not necessarily in the same order. Only three boxes are kept above C. Only one box is kept between O and C. Only three boxes are kept between O and N. N is kept at some place above C. A is kept immediately below N. B is kept at one of the places above D. M is not kept immediately above or below O.

Which box is kept at the lowermost position?

(a) M
(b) D
(c) O
(d) A

Q98. Hanish starts from Point A and drives 12 km towards the north. He then takes a right turn, drives 8 km, turns right and drives 17 km. He then takes a right turn and drives 10 km. He takes a final right turn, drives 5 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

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(a) 2 km to the east
(b) 3 km to the wes
(c) 3 km to the east
(d) 2 km to the west

Q99. URKE is related to QOGB in a certain way based on the English alphabetical order. In the same way, EFUS is related to ACQP. To which of the given options is SWIJ related, following the same logic?

(a) OTEG
(b) OTYU
(c) OGET
(d) OETY

Q100. Town J is to the south of Town K. Town L is to the east of Town K. Town M is to the north of Town L. Town N is to the east of Town M. Town O is to the northeast of Town N. What is the position of Town O with respect to Town J?

(a) Northeast
(b) Southwest
(c) South
(d) Southeast

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Brahmaputra

The correct answer is Brahmaputra.

Key Points

• The Himalayan Mountain range is one of the youngest mountain ranges in the world, extending in a west-east direction from the Indus River in the west to the Brahmaputra River in the east.

• The Brahmaputra River originates in the Angsi Glacier in Tibet (China) and enters India through Arunachal Pradesh, flowing across Assam and Bangladesh before emptying into the Bay of Bengal.

• The Himalayas act as a natural barrier and determine the flow direction of rivers like the Indus, Ganga, Yamuna, and Brahmaputra, influencing the major river systems in India.

• The Brahmaputra basin supports diverse ecosystems and is crucial for agriculture, transportation, and water resources in northeastern India and Bangladesh.

• Both the Indus River and the Brahmaputra River are considered geographic boundaries marking the extent of the Himalayan range, making the Brahmaputra the eastern boundary. Hence, the statement is correct.

Additional Information

• Himalayan Mountains:

• The Himalayas are divided into three parallel ranges: Greater Himalayas (Himadri), Lesser Himalayas (Himachal), and Shivaliks.

• They are known for their geographic, climatic, and ecological significance, influencing monsoon patterns and river systems in

South Asia.

• The Himalayas cover approximately 2,400 km across five countries: India, Nepal, Bhutan, China, and Pakistan.

• Brahmaputra River:

• The Brahmaputra is known as the Tsangpo in Tibet, Dihang in Arunachal Pradesh, and eventually Brahmaputra in Assam.

• It flows for about 2,900 km, making it one of the longest rivers globally and a vital water source for millions.

• The Brahmaputra is prone to seasonal flooding due to heavy monsoons, impacting agriculture and settlements in Assam and Bangladesh.

• Other Major Rivers Associated with the Himalayas:

• Indus River: Originates in Tibet, flows through India and Pakistan, and forms the western boundary of the Himalayas.

• Ganga River: Originates from the Gangotri Glacier, flows through northern India, and is one of India's most sacred rivers.

• Yamuna River: A tributary of the Ganga, it originates from the Yamunotri Glacier and flows through northern India.

• Important Points:

• The Himalayas play a critical role in shaping the geography and hydrology of the Indian subcontinent.

• Rivers originating in the Himalayas are vital for irrigation, hydroelectric power, transportation, and drinking water.

• The unique climatic conditions created by the Himalayas significantly impact biodiversity and ecosystems in the region.

Q2. Answer: (c) Indrajaal Infra

The correct answer is Indrajaal Infra.

Key Points

• Indrajaal Infra is India's first autonomous drone defense system designed to counter various types of aerial threats like drones, UAVs, and loitering munitions effectively.

• It was deployed at India's largest naval port in Karnataka in May 2025 to protect critical infrastructure from potential drone-based attacks.

• The system employs artificial intelligence (AI) and machine learning (ML) technologies to detect, classify, and neutralize aerial threats autonomously.

• Indrajaal Infra is capable of providing a comprehensive defense solution covering up to 1000-2000 square kilometers, which is particularly beneficial for large-scale installations like naval bases, oil refineries, and defense establishments.

• The system integrates advanced technologies such as radar systems, electro-optical sensors, jamming mechanisms, and kinetic interceptors to ensure robust protection against evolving threats.

Additional Information

• AeroGuard:

• AeroGuard is a drone technology platform primarily focused on commercial and civilian applications.

• It specializes in drone surveillance, mapping, and agricultural operations rather than defense solutions.

• While it provides advanced drone functionalities, it lacks the capabilities required for autonomous defense against aerial threats.

• SkyNet:

• SkyNet is a term often associated with fictional AI systems from popular culture, such as the "Terminator" series.

• Although the name has been used for various real-world AI projects, it is not related to India's drone defense systems.

• DroneShield:

• DroneShield is an international company specializing in counter-drone technology, offering solutions like drone detection and mitigation systems.

• Its focus is primarily on commercial and military drone defense, but it has not been deployed at India's naval base in Karnataka.

• DroneShield products are widely used globally but are not specific to India’s defense infrastructure.

• Indrajaal Infra:

• Indrajaal Infra was developed by an Indian defense tech firm to provide an indigenous solution for protecting critical assets.

• The system incorporates advanced AI-driven technologies for autonomous threat management, making it a pioneering innovation in India.

• Its deployment marks a significant milestone in India's defense capabilities, especially in combating modern aerial threats.

Important Points

• AI in Defense:

• Artificial intelligence is increasingly being integrated into defense systems to enhance autonomous decision-making, surveillance, and threat neutralization.

• AI technologies like machine learning and predictive analytics are used to improve the accuracy and efficiency of defense mechanisms against evolving threats.

• Drone Threats:

• The rise of unmanned aerial vehicles (UAVs) has necessitated the development of robust counter-drone systems to protect national security.

• Drones can be used for surveillance, smuggling, or even delivering payloads, making them a significant threat to critical infrastructure.

• India's Naval Port in Karnataka:

• Karnataka houses one of India's largest naval bases, which is crucial for maritime security and strategic operations.

• Deploying systems like Indrajaal Infra ensures the safety of personnel and assets at such vital installations.

Q3. Answer: (b) Chariot

The correct answer is Chariot.

Key Points

• During the Gupta period, the military structure of the empire included four main divisions as described in ancient texts: Infantry, Chariots, Cavalry, and Elephants.

• However, by the Gupta period, the use of chariots had become rare, as they were increasingly considered less effective in warfare compared to other divisions like cavalry and elephants.

• The decline of chariots in warfare was due to advancements in technology and changes in military tactics. Cavalry, which was faster and more mobile, had largely replaced chariots on the battlefield.

• Texts like the Arthashastra and other historical sources continue to mention chariots as part of the army, but their use was more symbolic or ceremonial during this period.

• The other military divisions, such as Infantry, Cavalry, and Elephants, remained prominent and were critical components of the Gupta military system.

Additional Information

• Chariot Warfare:

• Chariots were a significant part of ancient Indian warfare, especially during the Vedic period and earlier periods of history.

• They were primarily used in open plains where mobility and speed could be effectively utilized.

• By the Gupta era, advancements in military tactics and the development of better-equipped cavalry units rendered chariots obsolete for practical warfare.

• Cavalry:

• The Gupta army relied heavily on cavalry for its speed and mobility. Horses were easier to maneuver and could traverse various terrains more effectively than chariots.

• Cavalry units were equipped with swords, spears, and bows, making them versatile in combat.

• Elephants in Warfare:

• Elephants were a crucial component of the Gupta military strategy, used for their strength and ability to instill fear in enemy troops.

• They were often armored and carried soldiers equipped with bows and spears on their backs.

• Infantry:

• The infantry was the backbone of the Gupta military, consisting of foot soldiers armed with swords, shields, bows, and arrows.

• They were responsible for holding and defending positions during battles.

• Symbolic Role of Chariots:

• Despite their decline in practical use, chariots retained a symbolic role in ceremonies and rituals, representing power and prestige.

• They were also depicted in art and literature as a mark of heroic and divine figures.

Important Points

• Gupta Military Advancements:

• The Gupta empire is renowned for its military organization, including innovations in weaponry and strategy.

• Their use of cavalry and elephants demonstrated a shift towards more dynamic and effective methods of warfare.

• Decline of Chariots Globally:

• The decline of chariots was not limited to India; it was a global phenomenon. By the time of the Roman Empire and later, chariots were largely replaced by cavalry.

• This change was driven by the development of saddles, stirrups, and other technologies that enhanced the effectiveness of mounted soldiers.

Q4. Answer: (b) Rubber

The correct answer is Rubber.

Key Points

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• Rubber is the primary crop associated with plantation agriculture in Kerala, contributing significantly to the economy of the state.

• Kerala accounts for more than 90% of India's total natural rubber production, making it the largest rubber-producing state in the country.

• The state's climatic conditions, such as high humidity, consistent rainfall, and warm temperatures, are highly suitable for the cultivation of rubber trees.

• Rubber plantations in Kerala are primarily concentrated in areas like Kottayam, Pathanamthitta, and Ernakulam, which are known for their fertile soils and favorable conditions.

• Rubber is widely used in the production of industrial goods such as tires, footwear, and other latex-based products, making it an economically significant crop for the state.

Additional Information

• Wheat:

• Wheat is a staple food crop of India, primarily grown in northern states such as Punjab, Haryana, and Uttar Pradesh.

• It requires a cool and moist climate during the growing period and warm, dry weather at the time of harvesting, conditions not favorable in Kerala's tropical climate.

• Wheat is not a significant crop in Kerala due to unsuitable climatic and soil conditions.

• Cotton:

• Cotton is primarily grown in states like Gujarat, Maharashtra, and Madhya Pradesh, which have black soil suitable for its cultivation.

• It requires a warm climate and moderate rainfall, conditions that differ from Kerala's high-rainfall regions.

• Kerala is not a significant producer of cotton.

• Rice:

• Rice is another important crop in Kerala and is a staple food for the population.

• Rice cultivation in Kerala is primarily conducted in wetlands and is supported by the state's abundant water resources.

• Despite its significance, rice is not classified as a plantation crop, unlike rubber.

• Plantation Agriculture:

• Plantation agriculture refers to the large-scale cultivation of cash crops such as tea, coffee, rubber, and spices.

• These crops are grown for commercial purposes and often require significant investment and labor.

• Kerala is also known for other plantation crops like tea, coffee, and spices, in addition to rubber.

Important Points

• Kerala’s Climatic Suitability:

• Kerala's tropical climate, characterized by high rainfall (200–300 cm annually) and warm temperatures, is ideal for rubber tree cultivation.

• The state has fertile, well-drained laterite soils that support the growth of rubber plantations.

• Economic Significance of Rubber:

• The rubber industry contributes significantly to Kerala's GDP and provides employment to thousands of people.

• It supports ancillary industries such as latex processing and manufacturing of rubber-based products.

• Global Rubber Production:

• Globally, rubber is mainly produced in countries like Thailand, Indonesia, and Malaysia.

• India ranks among the top producers, with Kerala being the leading contributor.

Q5. Answer: (c) Kerala, Tamil Nadu and Karnataka

The correct answer is Kerala, Tamil Nadu and Karnataka.

Key Points

• The Western Ghats is a mountain range located along the western coast of India, spanning several states including Kerala, Tamil Nadu, Karnataka, Maharashtra, and Goa.

• Subtropical vegetation in the lower regions of the Western Ghats is primarily found in the states of Kerala, Tamil Nadu, and Karnataka, owing to their tropical climate and high rainfall.

• These regions are known for their rich biodiversity, including a variety of subtropical plants, trees, and wildlife. The Western Ghats is a UNESCO World Heritage Site due to its ecological significance.

• The subtropical vegetation in these states consists of species like teak, rosewood, and various medicinal plants, which thrive in the warm and humid climate.

• Kerala, Tamil Nadu, and Karnataka are located in the southern part of India, where the Western Ghats' elevation and climatic conditions support subtropical vegetation. Other states, such as Gujarat and Madhya Pradesh, are not part of the lower regions of the Western Ghats where subtropical vegetation is prevalent.

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Additional Information

• Western Ghats:

• The Western Ghats is also known as the Sahyadri Hills in Maharashtra and Karnataka.

• It is one of the eight "hottest hotspots" of biological diversity in the world, featuring numerous endemic species of flora and fauna.

• The mountain range extends from Gujarat and Maharashtra in the north to Kerala and Tamil Nadu in the south.

• It influences the monsoon winds and serves as a critical water catchment area for peninsular India.

• Vegetation in the Western Ghats:

• The vegetation includes tropical rainforests, subtropical forests, and montane forests depending on the altitude and climatic conditions.

• Subtropical vegetation, particularly in Kerala, Tamil Nadu, and Karnataka, includes species such as jackfruit, mango, teak, and rosewood.

• The Western Ghats also host agricultural crops like coffee, spices, and rubber, which thrive in the region's climate.

• Kerala:

• Kerala receives heavy rainfall due to its location on the windward side of the Western Ghats, supporting lush subtropical and tropical vegetation.

• It is home to several national parks and wildlife sanctuaries like Periyar Wildlife Sanctuary.

• Tamil Nadu:

• The Nilgiri Hills in Tamil Nadu form part of the Western Ghats and feature rich subtropical vegetation.

• The state is also known for tea plantations and its biodiversity hotspots.

• Karnataka:

• Karnataka's Western Ghats regions, such as Coorg and Chikmagalur, are famous for coffee plantations and subtropical flora.

• The state's forests are home to endemic species and medicinal plants.

Important Points

• UNESCO World Heritage:

• The Western Ghats was designated as a UNESCO World Heritage Site in 2012 due to its ecological importance and biodiversity.

• The mountain range is divided into 39 sites, including national parks, wildlife sanctuaries, and reserve forests.

• Climate and Geography:

• The Western Ghats' climate varies from tropical in the lower regions to subtropical and temperate at higher altitudes.

• The average annual rainfall in the Western Ghats ranges from 1500 mm to 3500 mm, supporting diverse vegetation types.

• Biodiversity:

• The range hosts more than 7,400 species of plants, animals, birds, and insects, including several endangered species.

• It is an important region for conservation efforts in India.

Q6. Answer: (b) Undo the last action

The correct answer is Undo the last action.

Key Points

• Ctrl + Z is a commonly used keyboard shortcut for the "Undo" function, which reverses the most recent action performed in a software application.

• It is widely used across multiple platforms, including Microsoft Office Suite, text editors, graphic design tools, and web browsers.

• This shortcut provides a quick way to correct mistakes, such as accidental deletions or formatting errors, without navigating through menus.

• Ctrl + Z is supported in most operating systems like Windows, macOS (as Command + Z), and Linux, ensuring cross-platform usability.

• This function is reversible for multiple actions in some applications, depending on the software's history limit for undos. Hence, the correct answer is "Undo the last action."

Additional Information

• Redo Function:

• The Redo function is the opposite of Undo, allowing users to reverse an Undo action. The shortcut for Redo is usually Ctrl + Y in Windows and Command + Shift + Z in macOS.

• It is useful for reapplying changes that were mistakenly undone.

• Other Common Keyboard Shortcuts:

• Ctrl + X: Cuts the selected text or object.

• Ctrl + C: Copies the selected text or object.

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• Ctrl + V: Pastes the copied or cut content.
• Ctrl + S: Saves the current document or project.
• Ctrl + A: Selects all the content in the current document or window.
• Undo Function in Graphic Design:
• In applications like Adobe Photoshop or Illustrator, Ctrl + Z toggles between Undo and Redo for the last action.
• For multiple undos, users can use Ctrl + Alt + Z (Windows) or Command + Option + Z (macOS).
• Functionality Across Platforms:
• On Windows, Ctrl + Z works universally for Undo operations.
• On macOS, the equivalent shortcut is Command + Z.
• Linux operating systems also support Ctrl + Z in most software.

Q7. Answer: (b) Soldier's description

The correct answer is Soldier's description.

Key Points

• Alauddin Khilji, the second ruler of the Khilji Dynasty, introduced several military and administrative reforms to strengthen his empire.
• The term Huliyah refers to the detailed documentation of a soldier's physical description, including personal features, to ensure authenticity and prevent fraudulent enlistment.
• The purpose of the Huliyah system was to maintain a disciplined and trustworthy army by identifying and recording accurate details of each soldier.
• Dagh, another system introduced by Alauddin Khilji, involved the branding of horses to ensure that only quality and government-approved horses were used in the army.
• The combination of the Dagh and Huliyah systems helped Alauddin Khilji effectively control and monitor his military forces.

Additional Information

• Alauddin Khilji's Reforms:
• Military Reforms: Alauddin Khilji implemented strict measures to ensure discipline in the army, such as paying soldiers in cash instead of land grants to reduce corruption.
• Market Reforms: He introduced market regulation to control prices of essential goods, ensuring fair distribution to the army and civilians.
• Taxation Reforms: He levied heavy taxes on the peasantry, particularly in the form of land revenue, to fund his extensive military campaigns.
• Functions of Dagh System:
• The Dagh system involved the branding of horses to ensure that only government-approved horses were used in the army.
• This prevented the substitution of inferior or stolen horses, thereby maintaining the quality of cavalry forces.
• Purpose of Huliyah System:
• The Huliyah system was established to maintain a record of soldiers' physical features, such as height, complexion, and scars, to prevent impersonation or fraudulent enlistment.
• This helped in ensuring the authenticity and reliability of the enlisted soldiers within the empire.
• Comparison to Other Empires:
• Similar systems of military management were seen in other empires, such as the Mughal Mansabdari system, where ranks and salaries were determined based on service and contribution to the empire.

Important Points

• Alauddin Khilji's reign: 1296–1316 CE, marked as one of the most significant periods in the Delhi Sultanate due to his administrative and military innovations.
• Historical Significance: The Dagh and Huliyah systems are considered early examples of institutional military reforms in India.
• Legacy: Alauddin Khilji's reforms laid the foundation for centralized control over the army and administration, influencing future rulers of the subcontinent.

Q8. Answer: (d) Dr. Vijay Darda

The correct answer is Dr. Vijay Darda.

Key Points

• Dr. Vijay Darda is the author of the book 'The Churn', which was released in April 2025. The book addresses significant issues and transformations in modern society.
• Dr. Vijay Darda is a renowned journalist, author, and politician from India. He has a distinguished career and has been associated with various significant contributions to literature and media.

• The book 'The Churn' explores the dynamics of societal changes, political shifts, and the challenges faced in contemporary times. It is a reflection of the author's deep understanding of national and global issues.

• Dr. Vijay Darda is also known for his role as the Chairman of Lokmat Media Group, one of India's leading media organizations, which further establishes his authority and credibility in the field of journalism and literature.

• Option 4, Dr. Vijay Darda, is thus the correct answer based on the context provided.

Additional Information

• Dr. Vijay Darda:

• Dr. Vijay Darda is a well-known figure in Indian journalism and politics. He has been recognized with several awards for his contributions to media and literature.

• He has also served as a Member of Parliament (Rajya Sabha) and has been involved in numerous social and political initiatives.

• As the Chairman of Lokmat Media Group, he has played a pivotal role in promoting responsible journalism and addressing key issues affecting society.

• Theme of 'The Churn':

• The book delves into the transformational changes occurring in society, politics, and the economy.

• It examines the challenges and opportunities presented by globalization, technological advancements, and socio-political shifts.

• The author uses his extensive experience in media and politics to provide unique insights into these issues.

• Other options:

• Bandaru Dattatreya: He is an Indian politician and has served as the Governor of Haryana. He is not associated with the book 'The Churn'.

• Himanshu Roy: He was a senior Indian Police Service (IPS) officer known for his work in law enforcement. He is not linked to the field of literature.

• Arvind Kumar: He is a common name, and there is no evidence of any notable person by this name being associated with 'The Churn'.

• Importance of Books like 'The Churn':

• Books that address societal changes play a significant role in fostering awareness and understanding among readers.

• They provide valuable perspectives on contemporary issues, helping individuals and policymakers make informed decisions.

• Such works also contribute to the field of literature by presenting insightful analyses of national and global challenges.

Q9. Answer: (d) Agriculture

The correct answer is Agriculture.

Key Points

• In 1947, immediately after India's independence, the economy was predominantly agrarian. Agriculture was the most significant contributor to the nation's GDP, accounting for over 50% of the total GDP.

• The majority of the Indian population, approximately 70%, was directly or indirectly engaged in agricultural activities, making it the backbone of the economy.

• India's agricultural sector was largely dependent on traditional farming methods, with limited mechanization and reliance on monsoons for irrigation.

• Industrial and service sectors were relatively underdeveloped at the time. Industrialization was in its nascent stage, and services like trade and finance catered to a smaller segment of society.

• The colonial policies of the British had adversely impacted the agricultural sector, leading to stagnation in productivity and rural poverty. Despite this, agriculture remained the primary livelihood source for the majority of the population.

Additional Information

• Agriculture in Post-Independence India:

• Agriculture relied heavily on traditional practices such as bullock-driven ploughs, manual sowing, and harvesting.

• Food insecurity was a significant issue due to low agricultural productivity, leading to frequent famines and dependence on food imports like the PL-480 scheme from the United States.

• Key challenges included lack of irrigation facilities, poor infrastructure, and fragmented landholdings, which hindered large-scale farming.

• Industrial Sector:

• The industrial sector contributed a smaller percentage to the GDP in 1947, with industries primarily focused on textiles, jute, and iron and steel.

• Post-independence, the government took initiatives to boost industrialization through Five-Year Plans and the establishment of public sector enterprises.

• Service Sector:

• The services sector, including trade, finance, and education, was not a significant contributor to GDP at the time of

independence.

• With time, the sector grew due to increased urbanization and investment in infrastructure, becoming a dominant contributor to GDP in the following decades.

• Important Points:

• India's first Five-Year Plan (1951-56) focused heavily on agriculture and irrigation to address food shortages and improve productivity.

• The Green Revolution in the 1960s significantly transformed the agricultural landscape, enhancing productivity and reducing dependency on food imports.

• By the 1990s, the share of agriculture in GDP began to decline as the industrial and service sectors grew rapidly.

Q10. Answer: (b) heredity

The correct answer is heredity.

Key Points

• Heredity refers to the biological process through which traits and characteristics are passed down from parents to their offspring via genetic material (DNA).

• This process involves the transmission of genes, which are specific sequences of DNA that determine physical and behavioral traits like eye color, hair texture, height, and susceptibility to diseases.

• Gregor Mendel, often known as the "Father of Genetics," first studied heredity in the mid-19th century through experiments on pea plants. His work laid the foundation for understanding how traits are inherited.

• Heredity is governed by the laws of genetics, including the concepts of dominant and recessive traits, as explained in Mendelian inheritance.

• It plays a crucial role in evolution and biodiversity by enabling variations in traits, which are essential for the survival and adaptation of species in changing environments.

Additional Information

• Mutation:

• A mutation refers to a change in the DNA sequence, which can lead to new genetic variations.

• While mutations can contribute to evolution, they are not the primary mechanism for passing traits from parents to offspring.

• Mutations can be caused by factors like radiation, chemicals, or errors during DNA replication.

• Hybridization:

• Hybridization is the process of crossing two genetically different organisms to produce a hybrid with combined traits.

• This process is commonly used in agriculture to create crops with improved qualities, such as higher yield or disease resistance.

• Hybridization does not represent the regular inheritance of traits in natural reproduction.

• Linkage:

• Linkage refers to the tendency of genes that are located close to each other on the same chromosome to be inherited together.

• This phenomenon was first observed by Thomas Hunt Morgan during experiments with fruit flies.

• While linkage affects the inheritance of certain traits, it is not the overall process of heredity.

• Important Points:

• DNA: The molecule responsible for carrying genetic information and determining traits.

• Chromosomes: Structures within cells that house DNA and genes.

• Genes: Segments of DNA that encode specific traits.

• Inheritance: The process by which genetic material is passed from one generation to the next.

Q11. Answer: (a) Indo-Saracenic

The correct answer is Indo-Saracenic.

Key Points

• Indo-Saracenic architecture is an architectural style that emerged during the British colonial period in India, blending Indian traditional elements with Gothic, Victorian, and Neo-Classical forms.

• This style was primarily used for public buildings such as railway stations, courthouses, universities, and museums during the late 19th and early 20th centuries.

• The Indo-Saracenic style is characterized by features like domes, arches, minarets, and intricate carvings, inspired by Mughal and Hindu architecture, combined with European structural techniques.

• Renowned architects such as Robert Fellowes Chisholm and Henry Irwin played a significant role in developing this style.

• Examples of Indo-Saracenic architecture include the Victoria Memorial in Kolkata, Chennai's Madras High Court, and the Gateway of India in Mumbai.

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Additional Information

• Colonial Neo-Baroque:

• This style is influenced by the Baroque architecture of Europe but adapted to colonial settings.

• It is characterized by grand facades, symmetry, and ornate detailing but lacks the Indian traditional elements found in Indo-Saracenic architecture.

• Examples include some colonial-era churches and administrative buildings in India.

• Gothic Revival:

• The Gothic Revival style emerged in the 19th century and was inspired by medieval Gothic architecture.

• It features pointed arches, ribbed vaults, and flying buttresses.

• In India, Gothic Revival was primarily used for churches and educational institutions, such as the University of Mumbai.

• Victorian Classical:

• This style emphasizes simplicity and proportion, inspired by the classical architecture of ancient Greece and Rome.

• Victorian Classical buildings often feature columns, pediments, and symmetrical designs.

• Examples include the Raj Bhavan in Kolkata and other colonial-era administrative buildings.

• Important Points:

• The Indo-Saracenic style reflects the British attempt to blend Indian traditions with Western architectural practices, creating a hybrid style.

• It was particularly used for monumental buildings to symbolize imperial power and cultural inclusivity.

Q12. Answer: (b) 2014

The correct answer is 2014.

Key Points

• The Saansad Adarsh Gram Yojana (SAGY) was launched on 11 October 2014 by the Government of India.

• The scheme was introduced by Prime Minister Narendra Modi and aims to develop model villages across India through the adoption and development by Members of Parliament (MPs).

• The vision of SAGY is inspired by Mahatma Gandhi's ideals of an ideal Indian village, integrating modern technology with traditional practices.

• Under SAGY, MPs are encouraged to adopt villages and develop them into model villages by focusing on areas such as health, education, sanitation, livelihood, and infrastructure.

• The program specifically aims at holistic development and ensuring basic amenities, quality education, and sustainable livelihoods in the selected villages.

Additional Information

• Features of Saansad Adarsh Gram Yojana:

• The scheme aims at developing rural areas into model villages with better infrastructure, sustainable practices, and community participation.

• Each MP is expected to adopt one village in their constituency and work towards its development under the scheme.

• The focus is on creating villages with adequate physical and social infrastructure, better connectivity, and improved governance.

• The villages adopted are developed in a phased manner, addressing needs like healthcare, education, sanitation, skill development, and renewable energy.

• Mahatma Gandhi's Vision of an Ideal Village:

• Gandhi envisioned villages as self-reliant units with education, sanitation, and basic infrastructure ensuring the dignity of individuals.

• He believed in the idea of "Gram Swaraj," where villages would have local governance and self-sustainability.

• SAGY reflects Gandhi’s vision by integrating modern technologies and practices into the traditional village setup.

• Implementation of SAGY:

• The scheme is implemented through a collaborative effort between government departments, local authorities, and community members.

• It includes the preparation of a Village Development Plan (VDP) focusing on the long-term sustainable growth of the selected village.

• The MPs play a crucial role in mobilizing resources and ensuring effective implementation of projects in the adopted villages.

• Other Rural Development Schemes:

• Pradhan Mantri Gram Sadak Yojana (PMGSY): Focuses on providing all-weather road connectivity to unconnected villages.

• National Rural Livelihood Mission (NRLM): Promotes sustainable livelihoods through skill development and self-employment.

• Swachh Bharat Abhiyan: Aims at improving sanitation and eliminating open defecation through the construction of toilets in rural

areas.

Important Points

• Key Highlights:

• Eligible MPs: Both Lok Sabha and Rajya Sabha MPs can participate in SAGY.

• The scheme promotes community participation and empowers villagers to take an active role in decision-making and implementation.

• Monitoring and Evaluation: Regular progress reports and evaluations are conducted to ensure effective implementation of the scheme.

• Impact of SAGY:

• Improved access to basic amenities like clean drinking water, sanitation, and electricity in adopted villages.

• Enhanced focus on education and skill development for sustainable livelihoods.

• Promotion of renewable energy and sustainable practices in rural areas.

Q13. Answer: (c) Priyanka Chopra

The correct answer is Priyanka Chopra.

Key Points

• Priyanka Chopra is a globally recognized Indian actress, producer, and philanthropist known for her significant contributions to cinema and humanitarian work.

• In 2025, Priyanka Chopra was honoured at the inaugural Global Vanguard Honour held in Los Angeles, acknowledging her influence and achievements in promoting diversity and global representation.

• The Global Vanguard Honour celebrates individuals who have made groundbreaking contributions to their respective fields, and Priyanka Chopra's work in Bollywood, Hollywood, and her activism for gender equality earned her this prestigious recognition.

• Priyanka Chopra has also been a recipient of various international awards, including her recognition as a UNICEF Goodwill Ambassador, showcasing her commitment to social causes.

• Her career spans both Indian and international platforms, making her one of the most influential celebrities representing India on a global scale.

Additional Information

• Priyanka Chopra:

• Born on 18 July 1982, Priyanka Chopra is an acclaimed Indian actress and former Miss World (2000).

• She has acted in numerous Bollywood films, including Bajirao Mastani, Barfi, and Mary Kom, earning critical and commercial success.

• She gained international fame with her role in the American TV series Quantico and appeared in Hollywood films like Baywatch and Isn't It Romantic.

• Priyanka Chopra is actively involved in humanitarian work and has supported causes such as education for girls, gender equality, and child welfare through her foundation, the Purple Pebble Pictures.

• Global Vanguard Honour:

• This prestigious award recognizes individuals who have significantly contributed to their respective fields on a global level.

• It emphasizes the importance of diversity, inclusion, and representation in various industries.

• Being the inaugural event, the 2025 Global Vanguard Honour marked a milestone in recognizing global achievements across cultures and professions.

• The event was held in Los Angeles, a city widely regarded as the epicenter of entertainment and global culture.

• Bollywood Actresses (Other Options):

• Nitanshi Goel: A young Indian actress known for her work in television but not a recipient of any global awards like Priyanka Chopra.

• Deepika Padukone: Another renowned Bollywood actress known for her performances and advocacy for mental health awareness but not associated with the 2025 Global Vanguard Honour.

• Pratibha Ranta: A lesser-known actress in Bollywood primarily associated with television shows and regional cinema.

Important Points

• Priyanka Chopra's Global Impact:

• She is one of the few Indian actresses to transition successfully from Bollywood to Hollywood, breaking barriers for South Asian representation.

• Priyanka Chopra's philanthropic efforts include her association with UNICEF, advocating for child rights, and being a staunch supporter of gender equality.

• Recognition of Indian Talent Globally:

• The honour reflects the growing influence of Indian artists on global platforms and highlights India's contribution to arts and

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culture.

• Award ceremonies like the Global Vanguard Honour aim to celebrate diversity and inclusion, encouraging cross-cultural collaborations.

Q14. Answer: (b) Microphone – Input device, Monitor – Output device

The correct answer is Microphone – Input device, Monitor – Output device.

Key Points

• Microphone:

• A microphone is classified as an input device because it captures sound signals and converts them into electrical signals.

• It is used in various applications such as recording audio, communication (e.g., video conferencing), and controlling devices via voice commands.

• Function: It collects external sound signals (audio input) and transmits them to the computer or connected device for processing.

• This classification aligns with its role in sending data to the system rather than receiving it. Hence, Microphone is correctly classified as an Input device.

• Monitor:

• A monitor is classified as an output device because it displays visual information generated by the computer.

• It serves as the primary interface for users to interact with the computer through text, images, videos, or graphical content.

• Function: It outputs processed data in the form of visuals, enabling users to read or interpret the information.

• This classification aligns with its role in displaying data received from the computer. Hence, Monitor is correctly classified as an Output device.

• Other Options:

• Keyboard: It is an input device as it sends data (text, commands) to the computer. Incorrect pairing.

• Printer: It is an output device as it produces hard copies of data from the computer. Incorrect pairing.

• Mouse: It is an input device as it sends positional and command data to the computer. Incorrect pairing.

• Speaker: It is an output device as it produces sound from processed audio data. Incorrect pairing.

• Hence, the correct answer is Microphone – Input device, Monitor – Output device.

Additional Information

• Input Devices:

• Definition: Devices that send data or signals to the computer for processing.

• Examples: Keyboard, mouse, microphone, scanner, joystick.

• Function: These devices capture raw data from the user or external environment and transmit it to the computer.

• Applications: Used in typing, gaming, voice recognition, and scanning documents.

• Output Devices:

• Definition: Devices that receive processed data from the computer and display or produce results.

• Examples: Monitor, printer, speaker, projector.

• Function: These devices display visual or audio information or produce hard copies of processed data.

• Applications: Used in visual display (monitor), audio output (speakers), and printing documents (printer).

• Combined Input-Output Devices:

• Definition: Devices that can perform both input and output functions.

• Examples: Touchscreen, external storage devices (e.g., pen drives).

• Function: These devices allow users to input data while simultaneously receiving output data.

• Classification of Devices:

• Importance: Proper classification helps in understanding the role and functionality of devices in a computer system.

• Usage: Essential for designing efficient computer setups based on user requirements.

Important Points

• Microphone: Converts sound waves into electrical signals using electromagnetic or piezoelectric methods.

• Monitor: Displays visual output using technologies like LED, LCD, or CRT screens.

• Keyboard: Uses mechanical or membrane switches to send signals corresponding to key presses.

• Speaker: Produces sound by converting digital signals into mechanical vibrations.

• Printer: Uses ink or laser technology to create hard copies of digital data.

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Q15. Answer: (d) Guwahati

The correct answer is Guwahati.

Key Points

• Guwahati, the largest city in Assam, issued evacuation notices to residents living in landslide-prone areas in June 2025 due to continuous rainfall. This step was taken to prevent loss of life and property in the wake of persistent heavy rains.

• Assam, including Guwahati, is highly susceptible to natural disasters such as floods and landslides during the monsoon season, which typically extends from June to September.

• In June 2025, the state witnessed incessant rainfall, leading to waterlogging, landslides, and the displacement of people in vulnerable areas.

• The Assam government and local authorities have taken proactive measures, including issuing evacuation orders, to minimize the risk to human life and ensure preparedness during such emergencies.

• Guwahati's terrain includes hilly regions, which are prone to landslides, especially during periods of heavy and continuous rainfall, making it necessary for authorities to act swiftly in such situations.

Additional Information

• Geography of Guwahati:

• Guwahati is located in the northeastern state of Assam, on the banks of the Brahmaputra River.

• The city is surrounded by hills, including the Shillong Plateau, which makes it prone to landslides during heavy rainfall.

• Causes of Landslides in Assam:

• Continuous rainfall during the monsoon season is one of the primary causes of landslides in Assam.

• Anthropogenic activities, such as deforestation, unregulated construction, and mining, further increase the risk of landslides in the region.

• The hilly terrain of Assam, particularly in areas like Guwahati, is naturally vulnerable to landslides due to its geological structure.

• Impact of Landslides:

• Landslides cause loss of life and property, disrupt transportation and infrastructure, and displace communities.

• They also lead to environmental degradation, such as soil erosion and the destruction of vegetation.

• Mitigation Measures:

• The Assam government has been implementing measures such as early warning systems, reforestation programs, and stricter regulations on construction in vulnerable areas.

• Evacuation plans and disaster preparedness training are regularly conducted to reduce the impact of natural disasters.

• Important Points:

• In 2025, Assam experienced above-average monsoon rainfall, leading to widespread disruptions in several regions, including Guwahati.

• Evacuation notices are a critical part of disaster management and are issued to protect lives during high-risk situations like landslides and floods.

• The National Disaster Response Force (NDRF) and State Disaster Response Forces (SDRF) often play a crucial role in rescue and relief operations during such events.

Q16. Answer: (a) Right to Education Act

The correct answer is Right to Education Act.

Key Points

• The Right to Education (RTE) Act, enacted in 2009, provides free and compulsory education to children aged 6 to 14 years under Article 21A of the Constitution of India.

• The Central Government estimated a total financial requirement of Rs. 2.31 lakh crore over a five-year period (2010-11 to 2014-15) for implementing the provisions of the RTE Act.

• The act emphasizes on ensuring that no child is denied education due to financial constraints and mandates that private schools reserve 25% of their seats for children from economically weaker sections.

• It promotes the establishment of neighborhood schools and the removal of barriers such as discrimination and lack of access, thus ensuring inclusive education for all.

• The RTE Act also includes provisions for infrastructure development in schools, teacher training, and quality education standards.

Additional Information

• Right to Education Act:

• The RTE Act is a significant milestone in Indian education policy, ensuring free and compulsory education to children aged 6 to 14 years.

• The act mandates schools to meet specific infrastructure standards, including classrooms, toilets, drinking water, and

playgrounds.

• It also specifies pupil-teacher ratios to ensure quality education and better learning outcomes for students.

• The act prohibits physical punishment, mental harassment, and discrimination based on caste, gender, or disability.

• It encourages active participation of parents, community members, and local authorities in school management through School Management Committees (SMCs).

• Ayushman Bharat Scheme:

• Launched in 2018, Ayushman Bharat aims to provide health insurance coverage of Rs. 5 lakh per family per year for secondary and tertiary care hospitalization.

• It is targeted at economically vulnerable families and supports the goal of universal health coverage.

• This scheme is not directly related to education but addresses healthcare needs.

• Right to Information Act:

• The Right to Information (RTI) Act, enacted in 2005, empowers citizens to seek information from public authorities, ensuring transparency and accountability in governance.

• It is not linked to the financial allocation mentioned in the question as it pertains to governance rather than education.

• Sarva Shiksha Abhiyan (SSA):

• Initiated in 2001, SSA focuses on universalizing elementary education by providing access to schools, improving infrastructure, and ensuring teacher availability.

• While related to education, the financial allocation in question specifically pertains to the RTE Act.

Important Points

• Key Legal Framework:

• The Right to Education Act falls under Article 21A of the Indian Constitution, making education a fundamental right for children.

• This act has significantly contributed to reducing dropout rates and increasing enrollment in schools across India.

• It emphasizes the importance of inclusive education by mandating the inclusion of children from marginalized communities.

• Budgetary Allocations:

• The financial requirements for implementing the RTE Act were shared between the Central and State Governments, ensuring adequate resources for schools.

• The allocation highlights the government's focus on improving access to education and infrastructure development for schools.

Q17. Answer: (c) Lord Lytton

The correct answer is Lord Lytton.

Key Points

• The Vernacular Press Act was introduced in 1878 by Lord Lytton, who served as the Viceroy of India from 1876 to 1880.

• This act was specifically targeted at suppressing the freedom of the Indian-language press, which was critical of British policies and governance in India.

• The act empowered the government to confiscate printing presses, materials, and publications if they were found to be publishing materials deemed seditious.

• The act was widely criticized for being draconian and suppressive, as it was designed to curb dissent and prevent the Indian press from expressing nationalist ideas.

• It excluded the English-language press, showcasing the discriminatory nature of the legislation and the colonial government's intent to suppress indigenous voices.

Additional Information

• Lord Lytton:

• Lord Lytton was appointed as the Viceroy of India in 1876 by the British government.

• His tenure is marked by controversial policies such as the Grand Delhi Durbar (1877) to proclaim Queen Victoria as Empress of India and the implementation of the Vernacular Press Act.

• He faced criticism for his handling of the Great Famine of 1876-78, where millions of Indians died due to inadequate relief measures.

• Significance of Vernacular Press Act:

• The act was seen as an attack on the freedom of expression and a tool to control the growing wave of nationalism in India.

• It led to widespread resentment among Indians, who viewed it as a blatant attempt to silence their voices.

• The act intensified the demand for freedom of the press and contributed to the political awakening of Indians against colonial rule.

• Other Colonial Acts Related to Press:

• The Press Act of 1910 was another restrictive legislation aimed at curbing nationalist sentiments through the press.

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• Later, the Indian Press Act of 1931 imposed further restrictions due to the rise of revolutionary movements and nationalist activities.

• These acts collectively highlight the colonial government's efforts to suppress dissent and control public opinion in India.

• Impact of Vernacular Press Act:

• The act fueled the nationalist movement, as leaders and activists began to demand greater freedom and rights for Indians.

• It led to the emergence of underground publications and alternative ways of spreading nationalist ideas.

• Eventually, the press played a crucial role in India's struggle for independence, highlighting the importance of freedom of expression in colonial India.

Important Points

• Lord Curzon:

• He served as the Viceroy of India from 1899 to 1905.

• Lord Curzon is known for the controversial Partition of Bengal in 1905, aimed at dividing Hindus and Muslims.

• He also focused on administrative reforms and the preservation of Indian monuments.

• Lord Wellesley:

• He served as the Governor-General of India from 1798 to 1805.

• Lord Wellesley is known for his expansionist policies and the introduction of the Subsidiary Alliance system.

• He played a significant role in establishing British dominance over Indian princely states.

• Lord Ripon:

• Lord Ripon was the Viceroy of India from 1880 to 1884.

• He is celebrated for his liberal policies, including the Repeal of the Vernacular Press Act in 1882.

• He introduced the Local Self-Government Act and is often called the "Father of Local Self-Government in India."

Q18. Answer: (d) Provisions related to anti-defection

The correct answer is Provisions related to anti-defection.

Key Points

• The Tenth Schedule of the Indian Constitution was added by the 52nd Amendment Act of 1985 and is popularly known as the Anti-Defection Law.

• It contains provisions to prevent political defection by Members of Parliament (MPs) and Members of the Legislative Assembly (MLAs).

• The primary aim of the Tenth Schedule is to ensure political stability by discouraging elected representatives from switching parties for personal gains.

• Under the Anti-Defection Law, a member can be disqualified if they voluntarily give up the membership of their party or vote against the party's directive without prior permission.

• The decision regarding disqualification under the Tenth Schedule is made by the Speaker or Chairman of the respective House, whose decision is subject to judicial review.

Additional Information

• Anti-Defection Law:

• The Anti-Defection Law was enacted to address the issue of instability caused by defections by legislators after elections.

• The law applies to both Parliament and State Legislatures in India.

• A legislator is deemed to have defected if they join another party, abstain from voting on key issues against their party's directives, or voluntarily give up their party membership.

• Exemptions are made for merger cases where at least two-thirds of the members of a party agree to merge with another party.

• Role of Speaker/Chairman:

• The Speaker or Chairman of the House decides on disqualification cases under the Anti-Defection Law.

• While their decision is final, it is subject to judicial review, ensuring accountability.

• There have been instances where the judiciary intervened in cases of delayed or biased decisions under the law.

• Challenges and Criticism:

• The law has been criticized for not addressing the issue of internal democracy within political parties.

• It has been observed that party leaderships often misuse the law to suppress dissent within the party.

• Delay in decision-making by presiding officers has often led to political instability.

• Significance:

• The Anti-Defection Law plays a crucial role in ensuring the stability of governments and promoting loyalty to party ideologies.

• It prevents unscrupulous practices like horse-trading of legislators and unethical political alliances.

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Important Points

• The Tenth Schedule was introduced in 1985 during the tenure of Prime Minister Rajiv Gandhi.

• The law has been amended several times to address evolving political challenges.

• Judicial review has emerged as a critical aspect of ensuring the proper implementation of the Anti-Defection Law.

• While the law has largely succeeded in curbing defections, critics argue that it needs further reform to enhance the democratic functioning of political institutions.

Q19. Answer: (b) 1916

The correct answer is 1916.

Key Points

• The Home Rule Movement was initiated in 1916 by prominent leaders Bal Gangadhar Tilak and Annie Besant to demand self-governance for India within the British Empire.

• Bal Gangadhar Tilak established the Home Rule League in Pune in April 1916, while Annie Besant established her Home Rule League in September 1916 in Madras.

• The movement aimed at achieving Swaraj (self-rule) by mobilizing public opinion and creating awareness about India's political rights.

• The Home Rule Leagues conducted extensive campaigns, including lectures, pamphlets, and public meetings, to educate Indians about their rights and encourage political participation.

• The movement gained significant popularity and marked a turning point in the Indian freedom struggle, uniting various sections of society in the demand for self-governance.

Additional Information

• Home Rule League by Tilak:

• Location: Tilak's Home Rule League was headquartered in Pune.

• Focus: It concentrated on Maharashtra, Karnataka, Berar, and Central Provinces.

• Methodology: Tilak emphasized the use of traditional festivals and cultural programs to inspire patriotism and unite Indians.

• Home Rule League by Annie Besant:

• Location: Annie Besant's league was headquartered in Madras.

• Focus: It covered the rest of India, excluding areas targeted by Tilak's League.

• Publications: Besant used her influential newspapers like The New India and Commonweal to promote the objectives of the movement.

• Impact of the Movement:

• The Home Rule Movement played a significant role in creating a nationwide political consciousness.

• It laid the foundation for the Non-Cooperation Movement led by Mahatma Gandhi in the 1920s.

• The movement also led to greater participation of Indians in legislative councils under the Montagu-Chelmsford Reforms of 1919.

• Other Relevant Facts:

• The Home Rule Movement drew inspiration from the Irish Home Rule Movement.

• The British government suppressed the movement using repressive measures, including the arrest of leaders like Tilak.

• Annie Besant became the first woman president of the Indian National Congress in 1917 due to her efforts in the movement.

Important Points

• Tilak's Contribution:

• Tilak popularized slogans like "Swaraj is my birthright and I shall have it" to inspire Indians.

• He used cultural events like Ganapati festivals and Shivaji Jayanti to connect with the masses.

• Annie Besant's Role:

• Besant's intellectual approach and writings influenced educated Indians to demand self-rule.

• Her efforts earned her widespread recognition and paved the way for future leaders.

• Significance:

• The Home Rule Movement was the first attempt to organize Indians across regions for a common political goal.

• It demonstrated the power of mass mobilization and the importance of political education in the freedom struggle.

Q20. Answer: (d) Central Board of Film Certification

The correct answer is Central Board of Film Certification.

Key Points

• The Central Board of Film Certification (CBFC), also known as the Censor Board, is a statutory body under the Ministry of Information and Broadcasting, Government of India.

• It is tasked with the responsibility of examining, certifying, and regulating films for public exhibition in accordance with the provisions of the Cinematograph Act of 1952.

• The CBFC assigns certifications to films, such as U (Universal), UA (Parental guidance for children under 12 years), A (Adult), and S (Restricted to specialized audiences, such as doctors or scientists).

• The Board ensures that films adhere to the cultural, social, and legal sensitivities of the country and do not contain content that could incite communal disharmony or disrupt public order.

• Headquartered in Mumbai, the CBFC operates through regional offices across India, including locations such as Chennai, Kolkata, Bengaluru, and Hyderabad.

Additional Information

• Film and Television Institute of India (FTII):

• Located in Pune, Maharashtra, FTII is an autonomous institute under the Ministry of Information and Broadcasting.

• It provides training in various aspects of film and television, such as direction, editing, cinematography, and acting.

• FTII is not involved in certifying films but is a prominent institute for nurturing talent in the Indian film and television industry.

• National Film Development Corporation (NFDC):

• The NFDC is a central agency established in 1975 to promote and organize the integrated development of the Indian film industry.

• It primarily focuses on financing and producing films that are artistically and culturally significant.

• The NFDC facilitates international co-productions and markets Indian cinema globally but does not handle film certification.

• Children's Film Society, India (CFSI):

• Established in 1955, CFSI is a government organization aimed at producing and promoting quality films for children.

• It organizes film festivals and screenings for children across the country but does not have any role in certifying films.

• Cinematograph Act, 1952:

• The Cinematograph Act provides the legal framework for the certification of films in India.

• It lays down guidelines to prevent films from depicting obscenity, defamation, or content that could harm public morality or disturb communal harmony.

• The Act empowers the CBFC to enforce these guidelines and classify films accordingly.

Important Points

• The CBFC is composed of a Chairperson and other members appointed by the Government of India, who ensure that the Board's decisions align with societal standards and legal requirements.

• Films certified by the CBFC include movies for theatrical release, television, and online streaming platforms.

• The CBFC certification process allows filmmakers to appeal if they disagree with the assigned certification, through the Film Certification Appellate Tribunal (FCAT) or other legal mechanisms.

• In recent years, debates on censorship versus certification have brought the CBFC into the limelight, with calls for reforms to make the process more transparent and liberal.

Q21. Answer: (d) It is a permanent body and cannot be dissolved

The correct answer is It is a permanent body and cannot be dissolved..

Key Points

• The State Legislative Council (Vidhan Parishad) is a permanent body as per the provisions of the Indian Constitution. It cannot be dissolved like the Legislative Assembly. Hence, statement 1 is incorrect.

• Members of the State Legislative Council are not directly elected by the people. Instead, they are elected through various processes like nomination and elections by specific groups (e.g., MLAs, graduates, teachers). Hence, statement 2 is incorrect.

• The Legislative Council does not have a fixed term of five years. Members have staggered terms, with one-third retiring every two years. Hence, statement 3 is incorrect.

• The Legislative Council is indeed a permanent body and cannot be dissolved. It continues to exist unless abolished by the Parliament as per Article 169 of the Constitution. Hence, statement 4 is correct.

• Statement 5 is not relevant to the functioning of the Legislative Council as it does not provide any additional information related to its features. Hence, it is not applicable.

Additional Information

• State Legislative Council Formation:

• The State Legislative Council is established under Article 168 of the Indian Constitution. Not all states have a Legislative Council; it exists in states like Bihar, Uttar Pradesh, Karnataka, and a few others.

• The creation or abolition of a Legislative Council requires the Parliament to pass a law under Article 169.

• Composition:

• The Legislative Council's members are elected and nominated from different categories:

• One-third of the members are elected by the MLAs.
• One-third are elected by graduates and teachers.
• One-sixth are nominated by the Governor for their expertise in specific fields like science, art, social service, etc.
• Role and Functions:
• The Legislative Council acts as a reviewing body for legislation passed by the Legislative Assembly.
• It can delay legislation by up to 14 days, but cannot reject it outright.
• Important Points:
• Unlike the Rajya Sabha, the Legislative Council is often criticized for being less effective and for adding to the cost of governance.
• To abolish or create a Legislative Council, the concerned state assembly must pass a resolution by a special majority.

Q22. Answer: (c) Rs. 5 lakh

The correct answer is Rs. 5 lakh.

Key Points

• The Ayushman Vaya Vandana Yojana is a government-backed pension scheme designed to ensure financial security for senior citizens aged 70 years and above.
• Under this scheme, beneficiaries receive free health insurance coverage of up to Rs. 5 lakh annually.
• It aims to provide a safety net for senior citizens, covering hospitalization expenses for both secondary and tertiary healthcare services.
• The scheme was introduced to address the financial burden of healthcare costs for elderly citizens in India, ensuring their access to quality medical services.
• It is fully funded by the Government of India and implemented through designated channels such as insurance providers and healthcare institutions.

Additional Information

• Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY):
• Ayushman Bharat is a flagship health insurance scheme launched by the Government of India to provide free healthcare access to economically vulnerable families.
• This scheme offers health insurance coverage of up to Rs. 5 lakh per family per year, catering to low-income groups.
• It covers both secondary and tertiary care hospitalization across empanelled public and private hospitals.
• The scheme is fully financed by the Indian government and serves as an essential step toward achieving universal healthcare.
• Eligibility Criteria for Ayushman Vaya Vandana Yojana:
• This scheme is specifically designed for Indian citizens aged 70 years and above.
• The beneficiaries must not be covered under other government-backed insurance schemes like ESIC or EPFO.
• It requires proper verification documents such as Aadhaar cards and financial statements to ensure transparency and eligibility.
• Implementation and Management:
• The scheme is implemented through agencies such as the Life Insurance Corporation (LIC) and other government-approved organizations.
• Hospitals empanelled under the scheme are required to provide cashless treatment to beneficiaries.
• The government closely monitors the scheme's implementation to ensure its effective reach among eligible citizens.
• Significance of Rs. 5 lakh Coverage:
• The coverage of Rs. 5 lakh annually addresses the financial challenges faced by senior citizens due to expensive healthcare.
• This amount is sufficient to cover most hospitalization expenses, including surgeries and critical care treatments.
• It significantly reduces out-of-pocket expenses for elderly citizens, enabling them to access quality healthcare without financial stress.

Important Points

• Government Initiative:
• The scheme aligns with India's commitment to improving healthcare access for vulnerable sections of society.
• It complements other government initiatives like AB-PMJAY and National Health Mission aimed at achieving universal health coverage.
• Healthcare Financing:
• The scheme is fully financed by the government, ensuring its sustainability and widespread impact.
• It reduces dependency on private insurance providers, making healthcare more accessible to economically weaker sections.
• Focus on Senior Citizens:

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• By targeting citizens aged 70 years and above, the scheme addresses the specific healthcare needs of elderly individuals.

• It ensures that senior citizens can live with dignity and without financial worries related to health emergencies.

Q23. Answer: (c) Diffusion

The correct answer is Diffusion.

Key Points

• Diffusion is the process by which gases like oxygen and carbon dioxide move across the alveolar and capillary membranes from areas of higher concentration to areas of lower concentration.

• In the lungs, oxygen from the alveoli diffuses into the blood because the concentration of oxygen is higher in the alveoli compared to the blood.

• Similarly, carbon dioxide diffuses from the blood into the alveoli due to its higher concentration in the blood than in the alveoli.

• This exchange of gases is facilitated by the thin walls of the alveoli and the extensive network of capillaries surrounding them.

• Diffusion is a passive process, meaning it does not require energy and occurs naturally along the concentration gradient.

Additional Information

• Osmosis:

• Osmosis refers to the movement of water molecules across a semipermeable membrane from an area of lower solute concentration to higher solute concentration.

• Unlike diffusion, osmosis specifically involves water and is not responsible for gas exchange in the lungs.

• Decantation:

• Decantation is a physical process used to separate mixtures, such as separating solids from liquids or two immiscible liquids.

• It is not applicable to the biological process of gas exchange in the human body.

• Filtration:

• Filtration involves the physical separation of particles through a filter medium, often relying on size exclusion.

• This process does not play a role in the exchange of gases in the lungs or tissues.

• Alveolar Structure:

• The alveoli are tiny air sacs in the lungs where gas exchange occurs.

• They are surrounded by a dense network of capillaries, ensuring close contact between the blood and the air for efficient diffusion.

• The walls of the alveoli are extremely thin (one cell thick), which aids in the rapid exchange of gases.

• Significance of Diffusion:

• Diffusion is essential for maintaining the oxygen supply to tissues and removing carbon dioxide from the body.

• This process ensures that cells receive adequate oxygen for cellular respiration, which is crucial for energy production.

Important Points

• The concentration gradient is the driving force for diffusion in the lungs. Oxygen moves from the alveoli (high concentration) into the blood (low concentration), while carbon dioxide moves from the blood (high concentration) into the alveoli (low concentration).

• Any damage or disease affecting the alveoli, such as emphysema or pulmonary fibrosis, can impair gas exchange by reducing the surface area available for diffusion.

• The presence of surfactant in the alveoli prevents collapse and maintains efficient gas exchange.

• Diffusion is influenced by factors such as the thickness of the alveolar membrane, the partial pressure of gases, and the surface area available for exchange.

Q24. Answer: (b) Taylor Swift

The correct answer is Taylor Swift.

Key Points

• Taylor Swift was recognized as the Global Recording Artist of the Year 2024 by the International Federation of the Phonographic Industry (IFPI), a prestigious accolade in the global music industry.

• The IFPI Global Recording Artist of the Year Award is presented annually to the artist who demonstrates exceptional performance across physical sales, digital downloads, and streaming platforms worldwide.

• This achievement marks a significant milestone for Taylor Swift, who has been a dominant figure in the global music scene with her massive success across albums like "Midnights" and re-recordings of her previous albums.

• The recognition is based on worldwide consumption data collected by IFPI, making it one of the most comprehensive awards in the music industry.

• Taylor Swift is known for her versatility, with her music spanning across genres like country, pop, and indie, and her ability to connect with audiences globally through storytelling and relatable lyrics.

Additional Information

• About Taylor Swift:

• Taylor Swift is an American singer-songwriter born on December 13, 1989, in Pennsylvania, USA. She began her career as a country artist and later transitioned to pop music.

• She has released numerous critically acclaimed albums, including "Fearless," "1989," "Reputation," "Lover," "Folklore," "Evermore," and "Midnights."

• Her re-recordings, such as "Red (Taylor's Version)" and "Speak Now (Taylor's Version)," have also achieved massive commercial success.

• She is one of the world's best-selling music artists, having sold over 200 million records worldwide as of 2023.

• About IFPI:

• The International Federation of the Phonographic Industry (IFPI) is a global organization representing the recording industry worldwide.

• It is responsible for tracking and analyzing global music consumption data, including physical sales, digital downloads, and streams.

• The IFPI's Global Recording Artist of the Year Award recognizes the success of artists based on comprehensive data from various music platforms.

• Other Nominees:

• Artists like Billie Eilish, Beyoncé, and Olivia Rodrigo were also strong contenders for the title, showcasing their impact on the global music scene.

• However, Taylor Swift's extensive global reach and massive fanbase gave her a significant edge over others.

• Impact of Taylor Swift's Music:

• Her ability to connect with diverse audiences has made her a global icon, and her albums often break streaming and sales records.

• Her lyrics often touch on themes like love, heartbreak, self-discovery, and empowerment, resonating with millions worldwide.

Important Points

• Global Recognition: Taylor Swift has previously won the IFPI Global Recording Artist Award multiple times, solidifying her position as one of the most influential artists in the music industry.

• Re-recordings: Her decision to re-record her earlier albums to regain ownership of her master recordings has been both a commercial and critical success.

• Streaming Success: Taylor Swift consistently breaks records on platforms like Spotify and Apple Music, often achieving billions of streams within weeks of an album release.

• Philanthropy: In addition to her music, Taylor Swift is known for her charitable contributions, supporting causes like education, disaster relief, and LGBTQ+ rights.

Q25. Answer: (c) It is expensive and ideal only for light, high-value goods.

The correct answer is It is expensive and ideal only for light, high-value goods.

Key Points

• High Cost of Air Transport: Air transport is significantly more expensive compared to other modes of freight transport, such as road, rail, or water. This high cost limits its use primarily to light and high-value goods like electronics, jewelry, and pharmaceuticals.

• Suitability for Specific Goods: Due to its cost, air freight is ideal for goods that are time-sensitive or perishable, such as flowers or medical supplies. This makes it unsuitable for bulkier, low-value commodities such as agricultural produce or construction materials.

• Limited Accessibility: Air transport infrastructure is concentrated in urban and metropolitan areas. Rural and remote regions in India lack the necessary airport facilities, making it an impractical option for freight movement in such areas.

• Infrastructure Requirements: Unlike other modes of transport, air transport requires complex and expensive infrastructure, such as airports, air traffic control systems, and advanced security measures, which further increases its operational costs.

• Environmental Concerns: Air transport contributes significantly to carbon emissions, making it less environmentally friendly compared to other modes of transportation. This further restricts its widespread adoption for freight movement in India.

Additional Information

• Comparison with Other Modes of Transport:

• Road Transport: Road transport is widely used for freight movement in India due to its extensive network and ability to provide last-mile connectivity. It is cost-effective for short and medium distances.

• Rail Transport: Railways are cost-efficient for transporting heavy and bulk goods over long distances. India's rail network is one of the largest in the world, making it a preferred mode for industries.

• Water Transport: Waterways are the cheapest mode of transport for bulk commodities. However, their usage in India is limited to

specific routes like the Ganga and Brahmaputra rivers and coastal shipping.

• Examples of Goods Transported by Air:

• High-value goods such as gold, diamonds, and other precious metals.

• Perishable commodities like fruits, vegetables, seafood, and flowers.

• Time-sensitive products such as pharmaceuticals and organs for transplant.

• Electronics and luxury items like smartphones, laptops, and branded accessories.

• Challenges in Expanding Air Freight in India:

• Lack of Infrastructure: Many regions lack airports or cargo handling facilities, limiting the reach of air freight services.

• High Operational Costs: The cost of fuel, maintenance, and skilled manpower increases the overall expense of air transport.

• Regulatory Hurdles: Complex customs and regulatory procedures can delay air freight operations.

• Government Initiatives:

• The UDAN (Ude Desh Ka Aam Naagrik) scheme aims to improve regional air connectivity and make air travel affordable for the masses.

• Development of dedicated freight corridors and modernization of airports to handle cargo efficiently.

• Incentives for using environmentally friendly aircraft and technologies to reduce the carbon footprint of air transport.

Q26. Answer: (a) 13

The correct answer is 13 cities.

Key Points

• India launched chip-enabled biometric e-passports to enhance security and reduce the risk of passport forgery and identity theft.

• As of April 2025, these e-passports have been issued in 13 cities, ensuring better accessibility for citizens across major urban centers.

• These e-passports use a secure microchip embedded in the passport, which stores essential data such as personal details and biometric information, making them tamper-proof.

• The initiative aims to improve the efficiency of immigration processes by enabling faster verification of identity at international airports and border checkpoints.

• The scheme is implemented under the authority of the Ministry of External Affairs (MEA) in collaboration with the Indian Security Press (ISP) in Nashik, responsible for manufacturing these passports.

Additional Information

• Features of Chip-enabled Biometric e-passports:

• Equipped with a Radio Frequency Identification (RFID) chip and an embedded antenna for storing biometric data.

• The data on the chip includes a digital photograph of the passport holder and other identifying information, encrypted to prevent unauthorized access.

• The passports comply with the guidelines of the International Civil Aviation Organization (ICAO) for machine-readable travel documents.

• Enhanced security features include digital signatures that verify the authenticity of the passport and its holder.

• Advantages of Biometric e-passports:

• Improved efficiency in immigration processes through faster and more accurate identity verification.

• Reduced chances of passport forgery and identity theft due to the highly secure design.

• Facilitates seamless international travel by streamlining entry and exit procedures at airports.

• Supports the Indian government’s objective of enhancing digital governance and adopting advanced technologies.

• Implementation and Rollout:

• The Indian Security Press (ISP), Nashik, is responsible for printing biometric e-passports.

• The rollout began in a phased manner, initially targeting major cities and then expanding to other regions.

• Applicants can apply for e-passports through the Passport Seva Kendra (PSK) or online via the official portal.

• Comparison with Regular Passports:

• Regular passports rely on manual verification and are more vulnerable to tampering.

• Biometric e-passports offer enhanced security and use advanced features like RFID chips and ICAO-compliant designs.

• They also ensure faster processing times at immigration desks.

Q27. Answer: (c) Samastipur

The correct answer is Samastipur.

Key Points

• The Khelo India Youth Games 2025 is a national-level sporting event aimed at promoting sports culture and identifying young talent across India.

• The event's hosting locations were distributed across various cities of Bihar, including Bhagalpur, Gaya, and Rajgir, which are well-known for their cultural and historical significance.

• Samastipur was not selected as one of the cities to host the sporting events for Khelo India Youth Games 2025 due to logistical reasons or lack of adequate sports infrastructure. Hence, Samastipur was excluded.

• The inclusion of cities like Bhagalpur and Gaya in hosting the events highlights the emphasis on promoting sports in regions with adequate infrastructure and accessibility.

• Khelo India Youth Games is part of the larger Khelo India initiative, which aims to build a strong sports ecosystem in India by nurturing talent from the grassroots.

Additional Information

• Khelo India Youth Games:

• Initiated under the Khelo India Programme, these games aim to identify and nurture young sporting talent across India.

• The event covers a wide range of sports disciplines, including archery, athletics, badminton, boxing, swimming, wrestling, and hockey.

• It provides a platform for athletes under the age of 18 years to showcase their talent and gain recognition.

• The games also serve as a stepping stone for athletes aiming to represent India at international sporting events.

• Bihar as a Sporting Hub:

• Bihar, with cities like Gaya and Rajgir, has been increasingly recognized for its efforts in improving sports infrastructure.

• Rajgir, known for its scenic beauty and historical significance, has modernized its facilities to host events.

• Gaya, being a prominent cultural and educational hub, also possesses facilities that can support multi-disciplinary sporting events.

• Bhagalpur, another city, is known for its efforts in promoting sports among youth and creating awareness about physical fitness.

• Infrastructure Development in Bihar:

• The government of Bihar has been actively working to build sports complexes, stadiums, and training facilities in cities like Patna, Gaya, and Rajgir.

• Special attention has been given to creating grassroots-level programs under the Khelo India initiative to encourage youth participation.

• Exclusion of Samastipur:

• Samastipur, despite its cultural and regional importance, lacks adequate facilities to host large-scale sporting events.

• Sports infrastructure development has been slower in comparison to other cities like Rajgir and Gaya.

• The exclusion reflects the need for focused investment in sports facilities in smaller cities to ensure equitable development.

Important Points

• Khelo India Programme:

• Launched by the Ministry of Youth Affairs and Sports, the Khelo India initiative aims to improve India's overall sports culture.

• It focuses on talent identification, infrastructure development, and training support for young athletes.

• Under this program, promising athletes receive financial assistance and opportunities to train with experienced coaches.

• Sports Infrastructure Challenges:

• Many smaller cities, like Samastipur, face challenges in developing sports facilities due to limited funding and geographical constraints.

• Efforts are being made to bridge this gap through government initiatives and private sector investments.

Q28. Answer: (d) Criminal Investigation Department

The correct answer is Criminal Investigation Department.

Key Points

• The Central Armed Police Forces (CAPFs) are under the administrative control of the Ministry of Home Affairs (MHA), Government of India. They are responsible for safeguarding the internal security of the country.

• Examples of CAPFs include the Indo-Tibetan Border Police (ITBP), Border Security Force (BSF), and Central Reserve Police Force (CRPF).

• The Criminal Investigation Department (CID), on the other hand, is not a part of the Central Armed Police Forces. It is a state-level law enforcement agency that investigates criminal cases within the state.

• The CID is a specialized unit of the state police departments and works under the jurisdiction of the state governments, not the Ministry of Home Affairs.

• Thus, among the options provided, the Criminal Investigation Department does not fall under the category of Central Armed Police Forces (CAPFs).

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Additional Information

• Indo-Tibetan Border Police (ITBP):

• The ITBP was raised in October 1962 following the Sino-Indian War.

• It is primarily responsible for guarding the India-China border and ensuring security in the Himalayan region.

• The ITBP also handles disaster management and provides relief in areas affected by natural calamities.

• Border Security Force (BSF):

• The BSF was established on 1 December 1965 to secure India's borders with Pakistan and Bangladesh.

• It acts as the first line of defense for the country and is involved in border patrolling, preventing illegal activities, and countering infiltration.

• Central Reserve Police Force (CRPF):

• The CRPF was formed in 1939 and is the largest paramilitary force in India.

• It is tasked with maintaining internal security, counter-insurgency operations, and assisting state police forces.

• The CRPF also manages elections in sensitive areas and ensures the safety of critical infrastructure.

• Criminal Investigation Department (CID):

• The CID was established by the British government in 1902 for investigating and solving major criminal cases.

• It operates at the state level and includes specialized branches like the Anti-Human Trafficking Unit, Cyber Crime Unit, and Fingerprint Bureau.

• The CID officers are typically state police officers who receive additional training in criminal investigation techniques.

Q29. Answer: (a) 12 October 1993

The correct answer is 12 October 1993.

Key Points

• The National Human Rights Commission (NHRC) was established on 12 October 1993 under the provisions of the Protection of Human Rights Act (PHRA), 1993.

• The NHRC is an independent statutory body tasked with the investigation and protection of human rights violations in India.

• It was created to ensure compliance with the Universal Declaration of Human Rights and other international human rights treaties.

• The Commission is responsible for protecting rights such as life, liberty, equality, and dignity guaranteed by the Constitution or enforceable by law.

• The NHRC has the power to intervene in cases of human rights violations by public authorities, review laws, recommend policies, and conduct awareness programs.

Additional Information

• Composition of NHRC:

• The NHRC consists of a Chairperson, who is a retired Chief Justice of India, and other members such as former judges, experts in human rights, and representatives from civil society.

• The Chairperson and members are appointed by the President of India based on recommendations from a selection committee.

• The Commission has a team of officers to assist in investigations, research, and administrative work.

• Protection of Human Rights Act, 1993:

• This Act was enacted to provide for the establishment of NHRC, State Human Rights Commissions, and Human Rights Courts.

• The Act defines human rights as rights related to life, liberty, equality, and dignity guaranteed by the Constitution of India.

• It empowers the NHRC to investigate complaints, visit detention facilities, and provide recommendations to authorities.

• Functions of NHRC:

• Conducting investigations into human rights violations and recommending corrective measures.

• Reviewing laws and policies to ensure they align with human rights principles.

• Organizing educational and awareness programs to promote human rights culture in society.

• Encouraging compliance with international human rights treaties and conventions.

• International Context:

• The NHRC aligns with India's commitments to the Universal Declaration of Human Rights (1948).

• It works to address human rights violations in accordance with international treaties like the Covenant on Civil and Political Rights and the Covenant on Economic, Social, and Cultural Rights.

Important Points

• State Human Rights Commissions:

• Alongside NHRC, State Human Rights Commissions are established to address human rights issues at the state level.

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• These commissions work in collaboration with NHRC to ensure human rights protection throughout India.

• Human Rights Courts:

• The PHRA, 1993 provides for the establishment of Human Rights Courts to expedite trials related to human rights violations.

• These courts function under the supervision of the NHRC.

• Key Challenges:

• Limited enforcement powers, as the NHRC can only recommend actions and cannot enforce its decisions directly.

• Overburdened with cases and complaints, leading to delays in resolution.

• Insufficient funding and resources for effective functioning.

Q30. Answer: (a) The President of India

The correct answer is The President of India.

Key Points

• The President of India is responsible for the administration of Union Territories (UTs) under Article 239 of the Indian Constitution. This article clearly establishes that the administration of Union Territories is vested in the President, who exercises this authority through an administrator appointed by them.

• Union Territories like Chandigarh and Lakshadweep do not have the same status as states, and their administration is directly overseen by the Central Government.

• The President appoints an Administrator or Lieutenant Governor to carry out executive functions on behalf of the Central Government in these territories.

• Unlike states, Union Territories do not have full-fledged elected governments (with some exceptions like Delhi and Puducherry, which have special provisions). Hence, their administration is directly overseen by the President of India through appointees.

• The governance of Union Territories ensures that the Central Government retains direct control over strategically important or smaller regions that may not be viable as independent states.

Additional Information

• Governance of Union Territories:

• There are currently 8 Union Territories in India: Andaman and Nicobar Islands, Chandigarh, Dadra and Nagar Haveli & Daman and Diu, Lakshadweep, Delhi, Puducherry, Jammu & Kashmir, and Ladakh.

• Among these, Delhi and Puducherry have legislatures and elected governments with limited powers, while the remaining UTs are governed directly by the Central Government.

• The administrators or Lieutenant Governors appointed by the President act as the representative of the Central Government in these territories.

• Role of the President:

• The President's role in Union Territories is defined under Article 239 and Article 239A of the Constitution of India.

• For Union Territories without legislatures, the President exercises executive powers through administrators.

• In territories with legislatures (like Delhi and Puducherry), the President's role is limited to appointing the Lieutenant Governor and overseeing certain legislative and executive matters.

• Exceptions in Administration:

• In Delhi, the elected government has powers over most areas except police, public order, and land, which remain under the purview of the Central Government through the Lieutenant Governor.

• Puducherry has a similar structure but with less friction between the elected government and the central authority.

• Important Articles of the Constitution:

• Article 239: Provides for the administration of Union Territories by the President of India.

• Article 239A: Deals with the creation of legislatures or Council of Ministers for certain Union Territories like Delhi and Puducherry.

• Examples:

• In Chandigarh, the Administrator is generally the Governor of Punjab, who acts on behalf of the President of India.

• In Lakshadweep, an Administrator appointed by the President oversees the governance and implements policies as per the directions of the Central Government.

Important Points

• Union Territories vs. States:

• States have full-fledged governments with legislative, executive, and judicial powers, while Union Territories are under the direct control of the Central Government.

• Union Territories were created for administrative convenience, strategic purposes, or to protect the cultural and social uniqueness of small regions.

• Historical Context:

• Union Territories were introduced in the Constitution of India to administer areas that could not be merged with existing states due to their unique geographical, cultural, or political characteristics.

• The concept was inspired by the need to manage smaller regions or territories that were not viable as independent states.

Q31. Answer: (d) Decibels

The correct answer is Decibels.

Key Points

• Decibels (dB) are the preferred unit for expressing the ratio between two sound intensities. It is widely used in scientific literature, acoustics, and engineering fields.

• The decibel scale is logarithmic, meaning a small change in decibels represents a significant change in sound intensity. It helps in expressing very large or very small ratios conveniently.

• Decibels are calculated using the formula: 10 × log10(P2/P1), where P2 and P1 represent two sound intensities or powers.

• This unit is commonly used for measuring sound levels, electrical power, and signal strength, making it versatile across multiple scientific domains.

• Decibels simplify the representation of sound levels, where 0 dB is the threshold of hearing, and values like 120 dB represent sounds at the threshold of pain.

Additional Information

• Phon:

• Phon is a unit used to measure the perceived loudness of sound by humans. It accounts for the sensitivity of the human ear to different frequencies but is not typically used in calculating sound intensity ratios.

• The phon scale is based on comparisons to a reference tone of 1 kHz.

• Pascal:

• Pascal (Pa) is the SI unit of pressure. It is used to measure the pressure exerted by sound waves, not the ratio between two sound intensities.

• For sound, pressure levels are expressed in micropascals (μPa), but this is more relevant to physical pressure than intensity ratios.

• Hertz:

• Hertz (Hz) is the SI unit for frequency, representing the number of cycles of a sound wave per second. It is used to describe the pitch of a sound, not the intensity.

• Frequency ranges like 20 Hz to 20 kHz are considered the audible range for humans.

• Applications of Decibels:

• Decibels are widely used in acoustics to measure sound pressure levels and noise pollution.

• They are also employed in electronics to express signal-to-noise ratios, amplifier gains, and attenuation.

• In telecommunications, decibels are used to quantify signal power and transmission loss.

Important Points

• Logarithmic Nature:

• The logarithmic nature of decibels enables efficient representation of very large or small sound intensity ratios.

• It also reflects human perception of sound, where doubling the sound intensity does not equate to doubling the perceived loudness.

• Thresholds:

• The threshold of hearing is approximately 0 dB, while the threshold of pain is around 120 dB.

• Common sound levels include 60 dB for normal conversation and 90 dB for heavy traffic noise.

• Decibels in Other Fields:

• In electrical engineering, decibels express the power gain of amplifiers or attenuation of filters.

• In telecommunications, they measure signal loss or gain during transmission.

Q32. Answer: (d) 150th

The correct answer is 150th.

Key Points

• The Meter Convention, also known as the Convention of the Metre, was signed on 20 May 1875 by seventeen countries.

• This international treaty established the framework for global collaboration in the science of measurement and the development of the metric system.

• The Department of Consumer Affairs, Government of India, celebrated the 150th anniversary of the Meter Convention on 20 May 2025.

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• The Meter Convention led to the creation of the International Bureau of Weights and Measures (BIPM), located in Sèvres, France.

• This anniversary highlights the importance of uniformity in measurements, which plays a critical role in science, technology, trade, and industry on a global scale.

Additional Information

• Meter Convention:

• The Meter Convention was signed in 1875 in Paris, France. It laid the foundation for standardizing measurements globally.

• The treaty originally focused on the metric system, but today it covers a broader range of measurements including mass, length, time, temperature, and more.

• International Bureau of Weights and Measures (BIPM):

• The BIPM is responsible for maintaining international standards of measurement and ensuring consistency worldwide.

• It provides a platform for member states to discuss and develop global measurement standards.

• India is one of the member states contributing to the efforts of BIPM.

• Metric System:

• The metric system is a decimal-based system of measurement used globally in science, engineering, and everyday life.

• Units like the meter for length, kilogram for mass, and second for time are part of the system.

• World Metrology Day:

• 20 May is celebrated annually as World Metrology Day to commemorate the signing of the Meter Convention.

• The theme for World Metrology Day changes each year to highlight advancements in metrology and its applications.

• Importance of Standardization:

• Standardized measurements are essential for ensuring fairness in trade, improving scientific research, and enhancing technological development.

• They facilitate international collaboration and compatibility in various industries.

Important Points

• The Meter Convention initially had 17 member countries, but today it has expanded to include over 100 member states.

• India became a signatory to the Meter Convention on 27 May 1957 and has actively participated in global metrology initiatives.

• The metric system has become the universal standard, simplifying international trade and communication.

• Celebrating the 150th anniversary emphasizes the historical significance and ongoing relevance of the Meter Convention in modern times.

Q33. Answer: (b) submerged coast

The correct answer is submerged coast.

Key Points

• The western coastal plains of India are classified as a submerged coast, formed due to the submergence of landmass below sea level.

• This type of coastline is characterized by narrow plains and the absence of significant elevation. The western coastal plains stretch along the Arabian Sea.

• The submergence has led to the creation of features such as estuaries, which are common along the western coast. Examples include the estuaries of rivers like Narmada, Mahi, and Tapi.

• Submerged coasts often have deep natural harbors, making them favorable for ports and maritime activities. Mumbai, a prominent port city, is an example located along the western coast.

• This coastal region is divided into Konkan, Karnataka, and Kerala coasts, each with unique geographical features influenced by submergence.

Additional Information

• Tectonic Coast:

• These coasts are formed due to tectonic activities such as faulting, folding, or volcanic eruptions.

• Tectonic coasts often exhibit features like elevated shorelines, cliffs, and platforms. An example is the coasts formed near tectonic plate boundaries, such as the Pacific Ring of Fire.

• The western coastal plains are not tectonic in nature, as they have been shaped by submergence rather than tectonic movements.

• Volcanic Coast:

• Volcanic coasts are formed due to the deposition of lava and ash from volcanic eruptions.

• Examples include the coasts of volcanic islands such as Hawaii or the Icelandic coast.

• The western coastal plains are not volcanic; no significant volcanic activity has shaped their formation.

• Emergent Coast:
• Emergent coasts are formed when land is elevated above sea level due to tectonic uplift or lowering of sea levels.
• Such coasts often feature cliffs, wave-cut platforms, and raised shorelines. Examples include the Chilean coast.
• The western coastal plains do not exhibit emergent features but are rather submerged coasts.
• Submerged Coast:
• Submerged coasts, like the western coastal plains, are formed due to the sinking of land or rise in sea levels.
• They often feature estuaries and deep natural harbors, making them conducive for maritime trade.
• Submerged coasts are commonly found along passive continental margins, such as the western coast of India.

Important Points

• Western Coastal Plains:
• These plains are divided into the Konkan Coast (Maharashtra-Goa), the Kannada Coast (Karnataka), and the Malabar Coast (Kerala).
• They are narrow and have an average width of 50-100 km.
• Prominent rivers like Narmada, Mahi, and Periyar form estuaries along this coast.
• Natural Harbors:
• The western coastal plains host important harbors such as Mumbai, Mangalore, and Kochi.
• These harbors are crucial for trade and economic activities in India.

Q34. Answer: (d) 2030

The correct answer is 2030.

Key Points

• India's renewable energy investment: India has committed to investing over US$360 billion in renewable energy and infrastructure by the year 2030 to achieve its climate goals and energy transition targets.
• The government aims to achieve 500 GW of non-fossil fuel capacity by 2030, as announced during the 2021 United Nations Climate Change Conference (COP26).
• This investment aligns with India’s Nationally Determined Contributions (NDCs) under the Paris Agreement to reduce the carbon intensity of its GDP by 33-35% by 2030 compared to 2005 levels.
• India is focusing on developing solar energy, wind energy, green hydrogen, and energy storage systems as part of its renewable energy strategy.
• The government has also introduced policies like the Production Linked Incentive (PLI) scheme for solar manufacturing to support the renewable energy sector and meet the 2030 targets.

Additional Information

• Paris Agreement and Nationally Determined Contributions:
• India is a signatory to the Paris Agreement, which aims to limit global temperature rise to below 2°C above pre-industrial levels.
• Under the agreement, India has pledged to achieve 40% of its installed electricity capacity from non-fossil fuel sources by 2030.
• The government has also committed to creating an additional carbon sink of 2.5–3 billion tonnes of CO_2 equivalent through forest and tree cover by 2030.
• India's Renewable Energy Initiatives:
• India is the third-largest producer of renewable energy globally and has set ambitious targets to reduce dependence on fossil fuels.
• Key initiatives include the National Solar Mission, Wind Energy Programme, and National Green Hydrogen Mission.
• India's current renewable energy capacity is around 175 GW, and it is expected to reach 500 GW by 2030.
• Green Hydrogen Mission:
• Launched in 2022, the Green Hydrogen Mission aims to make India a global hub for green hydrogen production.
• It supports the production of hydrogen through renewable energy sources, reducing carbon emissions in industries like steel and cement.
• The mission involves creating export opportunities for green hydrogen and aims to achieve 5 million tonnes annual production by 2030.
• International Collaboration:
• India collaborates with countries like the United States, Germany, and Australia for renewable energy projects.
• Global initiatives like the International Solar Alliance (ISA), founded by India and France, promote solar energy deployment worldwide.
• India has secured funding from international organizations like the World Bank and Asian Development Bank for renewable energy infrastructure.

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Important Points

• Challenges in Renewable Energy Development:

• India faces challenges in renewable energy development, including land acquisition issues, grid connectivity, and high costs of advanced technology.

• The transition to renewable energy also requires skilled manpower and better policy frameworks.

• Despite these challenges, the government is working on regulatory reforms and financial incentives to boost investment.

• Economic and Environmental Benefits:

• Investing in renewable energy will help reduce India's dependence on imported fossil fuels, improving energy security.

• It will also create employment opportunities in sectors like solar manufacturing, installation, and maintenance.

• Renewable energy plays a crucial role in achieving sustainable development by reducing greenhouse gas emissions.

Q35. Answer: (d) Aryabhata

The correct answer is Aryabhata.

Key Points

• Aryabhata was India’s first satellite, launched on 19 April 1975. It marked a significant milestone in India’s journey in space exploration.

• The satellite was named after the renowned Indian mathematician and astronomer Aryabhata, symbolizing India’s rich heritage in science and mathematics.

• Aryabhata was launched from the Soviet Union using a Kosmos-3M rocket. India did not have its own launch capability at the time.

• The satellite was developed by the Indian Space Research Organisation (ISRO), showcasing India’s emerging capabilities in satellite technology and space research.

• The primary objectives of Aryabhata were to conduct experiments in space sciences and gather data on solar physics and atmospheric studies. However, it faced technical issues shortly after launch.

Additional Information

• Rohini:

• Rohini satellites were a series of satellites launched by ISRO from 1980 to 1994.

• The first successful satellite of the series, Rohini RS-1, was launched in 1980 aboard India’s first satellite launch vehicle, SLV-3.

• These satellites were used for remote sensing applications like mapping and resource management.

• INSAT-1A:

• INSAT-1A was launched in 1982 as part of the Indian National Satellite System (INSAT).

• It was primarily designed for telecommunications, weather forecasting, and broadcasting services.

• The satellite faced technical issues shortly after launch, leading to its decommissioning.

• Bhaskara:

• Bhaskara-I and Bhaskara-II were Indian satellites launched in 1979 and 1981, respectively.

• They were dedicated to remote sensing applications and gathered data on hydrology, forestry, and oceanography.

• These satellites demonstrated India’s advancements in Earth observation technology.

• India’s Space Program:

• ISRO was established in 1969, and Aryabhata was its first major achievement in satellite technology.

• India’s space program has since evolved, with notable missions like Chandrayaan, Mangalyaan, and the Gaganyaan human spaceflight program.

• ISRO has developed capabilities to independently launch satellites using vehicles like PSLV and GSLV.

Important Points

• Aryabhata’s Legacy:

• Aryabhata laid the foundation for India’s space program, inspiring subsequent advancements in satellite technology and space exploration.

• The satellite’s launch was a testament to India-Soviet collaboration during the Cold War era.

• Despite technical setbacks, Aryabhata symbolized India’s ambition and potential in the global space race.

• ISRO’s Achievements:

• ISRO is now recognized globally for its cost-effective and innovative space missions.

• India successfully launched its Mars Orbiter Mission (Mangalyaan) in 2013, becoming the first country to reach Mars on its maiden attempt.

• ISRO’s Chandrayaan-3 mission in 2023 successfully landed on the Moon’s south pole, a historic achievement.

Q36. Answer: (c) Birsa was born in the forests of Madhya Pradesh.

The correct answer is 3) Birsa was born in the forests of Madhya Pradesh..

Key Points

• Birsa Munda was born on 15 November 1875 in the village of Ulihatu, which is located in the current Jharkhand state, not in Madhya Pradesh. Hence, the statement "Birsa was born in the forests of Madhya Pradesh" is incorrect.

• He urged his people to destroy the European influence and their exploitative practices, which were adversely affecting the tribal communities. This statement is correct.

• Birsa Munda inspired his followers to bring back the Golden Age of the Munda community, emphasizing traditional tribal values and the rejection of British and missionary influence. This statement is also correct.

• Birsa Munda received his early education at a local missionary school, where he was introduced to Christianity. However, he later rejected Christianity and returned to his traditional tribal roots. This statement is correct.

• His role as a tribal leader and his rebellion against the British earned him the title of ‘Dharti Abba’ (Father of the Earth).

Additional Information

• Birsa Munda and the Tribal Movement:

• Birsa Munda led the Ulgulan (The Great Rebellion) against the British in the late 19th century, which was one of the most significant tribal uprisings in colonial India.

• He fought against the exploitation of tribal lands by the British and moneylenders, opposing the ‘Zamindari’ system.

• His movement aimed to restore tribal rights over their land and abolish exploitative practices like forced labor (‘Beth Begari’).

• Birsa’s Ideology and Legacy:

• He advocated for a return to tribal roots and the rejection of foreign religions, calling for the revival of ‘Sarhul’ and other traditional tribal practices.

• He envisioned an egalitarian society free from oppression and exploitation, emphasizing the need for self-rule by tribal communities.

• Birsa’s contribution is remembered annually on his birth anniversary, celebrated as ‘Birsa Munda Jayanti’.

• Important Facts about Birsa Munda:

• Birsa Munda is the only tribal leader in India whose portrait hangs in the Central Hall of the Indian Parliament.

• His rebellion led to the passing of the Chotanagpur Tenancy Act, 1908, which prohibited the transfer of tribal lands to non-tribals.

• He died at a young age of 25 years on 9 June 1900, but his legacy continues to inspire tribal movements in India.

• Important Points:

• The Jharkhand state was carved out of Bihar on 15 November 2000 in recognition of tribal contributions, coinciding with Birsa Munda’s birth anniversary.

• Birsa’s life and legacy are part of the school curriculum in many Indian states to educate children about tribal heritage and resistance movements.

• Several institutions, including Birsa Agricultural University and Birsa Institute of Technology, are named in his honor.

Q37. Answer: (d) 15

The correct answer is 15.

Key Points

• As per the India Justice Report 2025, India has 15 judges per million population, highlighting a significant shortage in judicial manpower.

• The report is a comprehensive analysis of the justice delivery system in India, covering areas like police, judiciary, prisons, and legal aid.

• This ratio demonstrates the challenges India faces in ensuring timely justice due to the limited number of judges compared to its large population.

• The judge-to-population ratio is an important metric used globally to assess the adequacy of judicial resources available to citizens.

• Efforts to increase the number of judges are ongoing, but the gap remains wide, impacting the efficiency of the Indian judicial system.

Additional Information

• India Justice Report:

• The India Justice Report is published by Tata Trusts in collaboration with various organizations like the Centre for Social Justice and Common Cause.

• It ranks states based on their performance in delivering justice through police, judiciary, prisons, and legal aid.

• The report uses quantitative indicators to assess the functioning and effectiveness of the justice system.

• Judicial Manpower in India:

• India has a longstanding issue of a shortage of judges, which leads to delays in case resolution and contributes to a large backlog of cases.

• Compared to developed countries like the United States (which has over 100 judges per million population), India’s ratio is significantly lower.

• To address this, the Indian government has been working to increase judicial appointments and improve infrastructure.

• Challenges in the Indian Judicial System:

• The judicial system faces challenges such as case backlog, limited infrastructure, and slow recruitment processes.

• Lack of digitalization and poor connectivity in rural areas further hinder judicial efficiency.

• Judicial reforms, including the use of technology and better resource allocation, are crucial to addressing these challenges.

• Government Initiatives:

• The National Judicial Infrastructure Authority of India (NJIAI) is proposed to enhance judicial infrastructure.

• Efforts like e-Courts aim to digitize records and streamline case management.

• Regular training programs and workshops are conducted for judicial officers to improve efficiency and knowledge.

Q38. Answer: (b) 1956

The correct answer is 1956.

Key Points

• The Industrial Policy Resolution of 1956 was a landmark policy document in India's industrial development history.

• It emphasized the importance of the public sector in achieving economic growth and self-reliance.

• The resolution classified industries into three categories based on their ownership: exclusive government ownership, mixed ownership (government and private), and private ownership, with priority given to public enterprises.

• The resolution was based on the principles of socialist economic policies and aimed to establish a socialistic pattern of society.

• This policy aimed to achieve balanced regional development and reduce income inequalities in the country.

Additional Information

• Industrial Policy Resolution of 1948:

• This was the first industrial policy introduced by the Indian government after Independence.

• It provided a framework for industrial development and prioritized the public sector's role while allowing private sector participation.

• Though it was significant, it lacked detailed categorizations and emphasis on socialist principles.

• Industrial Policy Resolution of 1956:

• It marked a shift towards a socialist economic structure.

• The policy categorized industries into three schedules: Schedule A (exclusively government-owned), Schedule B (joint ownership), and Schedule C (private sector).

• It aimed at reducing regional disparities and fostering balanced development across India.

• Industrial Policy of 1991:

• This policy was introduced amidst the economic liberalization and globalization era.

• It shifted focus from government ownership to encouraging private sector participation.

• The policy emphasized economic reforms, deregulation, and foreign investment.

• Public Sector Enterprises:

• Public sector enterprises in India were established to promote self-reliance and ensure equitable distribution of resources.

• Examples include BHEL, SAIL, and ONGC, which played a significant role in industrial development.

Important Points

• Socialist Pattern of Society:

• The Industrial Policy Resolution of 1956 aimed to establish a socialist pattern, where the public sector would dominate key industries.

• It was inspired by India's commitment to social equity and economic development.

• Balanced Regional Development:

• The resolution focused on reducing regional disparities by promoting industrialization in underdeveloped areas.

• Importance of Public Sector:

• The policy highlighted the role of public enterprises in ensuring economic stability and self-sufficiency.

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Q39. Answer: (a) 85th

The correct answer is 85th.

Key Points

• The Henley Passport Index is a global ranking of countries based on the freedom of travel their passports provide, measuring the number of destinations citizens can access visa-free.

• As per the Henley Passport Index released in January 2025, India's passport ranks 85th globally, reflecting improvements in visa-free access compared to previous years.

• The ranking evaluates 199 passports and 227 destinations, considering visa-free access, visa-on-arrival, and e-visa policies.

• India's ranking at 85th indicates an expansion in its global mobility and a positive shift in international relations with various countries.

• Countries with stronger passports such as Japan, Singapore, and Germany rank at the top, offering their citizens access to a higher number of visa-free destinations globally.

Additional Information

• Henley Passport Index:

• The index is published by Henley & Partners, a global leader in residence and citizenship planning.

• It is based on data from the International Air Transport Association (IATA), which provides the most comprehensive travel information globally.

• The index is updated quarterly and is considered one of the most reliable rankings for measuring global mobility.

• India's Passport Improvements:

• India's passport ranking has improved over the years due to strengthened diplomatic relations and visa liberalization agreements with several countries.

• In 2022, India ranked 87th, and its improved rank in 2025 reflects an increase in visa-free or visa-on-arrival access.

• Indian passport holders can now travel to destinations such as Maldives, Nepal, Bhutan, and Mauritius without a visa.

• Top-Ranking Countries:

• Japan, Singapore, and Germany lead the rankings due to their citizens' access to over 190+ destinations visa-free.

• Japan consistently ranked first for several years due to its strong global presence and bilateral agreements.

• Impact of Passport Rankings:

• Passport rankings reflect a country's economic power, diplomatic strength, and international mobility.

• Higher rankings enhance a nation's global presence and facilitate easier business, tourism, and cultural exchange opportunities.

Important Points

• Visa-Free Travel:

• Visa-free travel allows citizens to enter a country without obtaining a visa beforehand, simplifying international mobility.

• Visa policies depend on factors such as diplomatic relations, security concerns, and economic agreements between countries.

• Henley Index Methodology:

• Each country is awarded points based on the number of destinations its citizens can access without a visa.

• Destinations offering visa-on-arrival or electronic travel authorization also contribute to the rankings.

Q40. Answer: (d) Andhra Pradesh (Kurnool), 25 July 2025

The correct answer is Andhra Pradesh (Kurnool), 25 July 2025.

Key Points

• The flight trials of the ULPGM-V3 missile were conducted in Kurnool, Andhra Pradesh on 25 July 2025, showcasing advancements in missile technology.

• The ULPGM-V3 missile is a next-generation, precision-guided munition developed to enhance defense capabilities and improve target accuracy.

• This trial was part of a larger effort by the Indian defense sector to modernize and test new technologies under challenging conditions to ensure operational reliability.

• Kurnool, Andhra Pradesh, has been a preferred location for defense trials due to its suitable terrain and controlled environment, which are critical for testing advanced weaponry.

• This successful flight trial marked a significant milestone in strengthening India's defense systems and achieving self-reliance in advanced missile technology.

Additional Information

• ULPGM-V3 Missile:

• The Ultra-Light Precision-Guided Munition (ULPGM-V3) is designed for highly accurate strikes, minimizing collateral damage.

• It integrates advanced navigation systems, including GPS and inertial navigation, for superior targeting performance.

• The missile is capable of being launched from various platforms, including aircraft, UAVs, and ground systems.
• Its development aligns with India's commitment to achieving Atmanirbhar Bharat (self-reliant India) in defense technologies.
• Kurnool as a Test Location:
• Kurnool is located in Andhra Pradesh, offering a controlled environment ideal for conducting defense trials.
• The area has been used for various defense experiments due to its geographical isolation and suitable terrain.
• It provides a secure and safe space for testing advanced technologies without risk to civilian populations.
• India's Efforts in Missile Development:
• India has been actively developing advanced missile systems under organizations like DRDO (Defense Research and Development Organisation).
• Efforts focus on creating indigenous systems to reduce dependency on foreign technologies.
• Examples include the BrahMos missile, Akash missile, and Agni series, which have significantly improved India's defense capabilities.
• Global Importance of Precision-Guided Munitions:
• Precision-guided munitions are crucial for modern warfare, ensuring minimal collateral damage and high mission success rates.
• They are widely used in counter-terrorism operations, strategic strikes, and defense scenarios.
• Countries like the USA, Russia, and China have heavily invested in the development of such systems.

Important Points

• Missile Classification:
• Missiles are classified based on their range, speed, and purpose (e.g., surface-to-air, air-to-surface, or ballistic missiles).
• Precision-guided missiles are designed for enhanced accuracy and minimal collateral damage, using advanced targeting systems.
• Defense Modernization:
• India has been continuously modernizing its defense capabilities to address evolving security challenges.
• Programs like Make in India have encouraged the domestic production of advanced technologies.

Q41. Answer: (a) Rs. 42,500

Shortcut Trick

Profit ratio M : N = (1494 + 498) ÷ 2 : (1494 − 498) ÷ 2 = 996 : 498 = 2 : 1

Investment ratio = (Profit ratio) ÷ (Time ratio) = (2 ÷ 6) : (1 ÷ 5) = 1/3 : 1/5 = 5 : 3

Difference in investment parts = 5 − 3 = 2 parts = Rs. 17,000

1 part = Rs. 8,500 => M's investment = 5 parts = 5 × 8,500 = Rs. 42,500

Therefore The correct answer is Rs. 42,500.

Alternate Method

Given:

Total profit = Rs. 1,494

M's profit share is Rs. 498 more than N's profit share.

M's investment time = 6 months, N's investment time = 5 months.

Formula Used:

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

Partner M

Capital: x + 17000

Time: 6 months

Profit: Rs. 996

Partner N

Capital: x

Time: 5 months

Profit: Rs. 498

Profit Ratio M : N = 2 : 1

Calculations:

=> Let N's profit be y.

=> M's profit = y + 498

=> y + (y + 498) = 1494

=> 2y = 996 => y = 498

=> M's profit = 498 + 498 = 996

=> Profit Ratio (M : N) = 996 : 498 = 2 : 1

=> Let N's investment be x. Then M's investment = x + 17000.

=> [(x + 17000) × 6] ÷ [x × 5] = 2 ÷ 1

=> 6x + 102000 = 10x

=> 4x = 102000

=> x = 25500

=> M's capital = x + 17000 = 25500 + 17000 = 42500

Therefore The correct answer is Rs. 42,500.

Additional Information

Compound Partnership

When partners invest different amounts for different time periods, the profit is divided in the ratio of the product of their capital and time: P1 : P2 = (C1 × T1) : (C2 × T2).

Active and Sleeping Partners

An active partner manages the business and receives a fixed salary or a specific percentage of the total profit. The remaining profit is then distributed among all partners based on their capital and time investments.

Capital Formula

If the profit ratio and time ratio are given, the ratio of capital investments can be derived by dividing the profit ratio by the time ratio: C1 : C2 = (P1 ÷ T1) : (P2 ÷ T2).

Q42. Answer: (c) Rs. 480

Shortcut Trick

Total interest percentage for 10 months = 4% × 10 = 40%

Simple Interest = 40% of Rs. 1,200

Simple Interest = (40 ÷ 100) × 1200 = Rs. 480

Therefore The correct answer is Rs. 480.

Alternate Method

Given:

Principal (P) = Rs. 1,200

Rate of Interest (R) = 4% per month

Time (T) = 10 months

Formula Used:

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

Principal

Rs. 1,200

4% / month

for 10 months

Interest

Rs. 480

Calculation:

=> SI = (1200 × 4 × 10) ÷ 100

=> SI = 12 × 40

=> SI = Rs. 480

Therefore The correct answer is Rs. 480.

Additional Information

Unit Consistency in SI Formula

Ensure the Rate (R) and Time (T) are in the same time units before calculating. If R is per month, T must be in months. If R is per annum, T must be in years.

Compound Interest (CI) Formula

Amount = P(1 + R÷100)^T. Unlike Simple Interest, Compound Interest is calculated on the principal as well as the accumulated interest of previous periods.

Difference Between SI and CI

For 2 years, the difference between CI and SI on a certain principal P at rate R is derived using the formula: Difference = $P(R \div 100)^2$.

Q43. Answer: (c) $10x^2 - 5x + 8$

Shortcut Trick

Expand the brackets using the distributive property directly:

=> $7x^2 - 5x + 3x^2 - 6 + 14$

Combine the like terms for x^2 and constants:

=> $10x^2 - 5x + 8$

Therefore The correct answer is $10x^2 - 5x + 8$.

Alternate Method

Given:

Expression: $x(7x - 5) + 3(x^2 - 2) + 14$

Calculations:

=> Multiply x into $(7x - 5)$ to expand the first term: $7x^2 - 5x$

=> Multiply 3 into $(x^2 - 2)$ to expand the second term: $3x^2 - 6$

=> Substitute these expanded values back into the expression:

=> $7x^2 - 5x + 3x^2 - 6 + 14$

=> Group the terms with x^2, x, and the numerical constants together:

=> $(7x^2 + 3x^2) - 5x + (-6 + 14)$

=> Add the coefficients for similar terms:

=> $10x^2 - 5x + 8$

Therefore The correct answer is $10x^2 - 5x + 8$.

Additional Information

Distributive Property

The rule states that multiplying a sum or difference by a term gives the same result as multiplying each term individually: $a(b - c) = ab - ac$.

Combining Like Terms

Terms with the exact same variables and exponents can be combined by adding or subtracting their numerical coefficients: $ax^n + bx^n = (a + b)x^n$.

BODMAS Rule

Always follow the order of Brackets, Orders (powers), Division, Multiplication, Addition, and Subtraction when evaluating or simplifying any mathematical expression.

Q44. Answer: (b) 35 hours

Shortcut Trick

Total time for P = 12 × 5/4 = 15 h and total time for Q = 30 × 7/2 = 105 h.

Let total capacity = LCM(15, 105) = 105 units => P's efficiency = 7, Q's efficiency = 1.

Work done by P and Q in 5 hours = 5 × (7 + 1) = 40 units.

R empties 40 units in 8 hrs => R's efficiency = −40 ÷ 8 = −5 units/hr.

Combined efficiency (P + Q + R) = 7 + 1 − 5 = 3 units/hr => Total time = 105 ÷ 3 = 35 hours.

Therefore The correct answer is 35 hours.

Alternate Method

Given:

=> Time taken by pipe P to fill 4/5 part = 12 hours

=> Total time taken by pipe P to fill the tank = 12 × 5/4 = 15 hours

=> Time taken by pipe Q to fill 2/7 part = 30 hours

=> Total time taken by pipe Q to fill the tank = 30 × 7/2 = 105 hours

=> Work done by P and Q in 5 hours = 5 × (1/15 + 1/105) = 5 × (8/105) = 8/21 part

=> Pipe R empties 8/21 part of the tank in 8 hours.

=> Time taken by R alone to empty the full tank = 8 × 21/8 = 21 hours

Pipe	Hours	Total Work	Efficiency

P	15	105	7
Q	105	1	
R	21	−5	

=> Total efficiency of P, Q, and R together = 7 + 1 − 5 = 3 units/hour

=> Total time taken to fill the tank together = Total Work ÷ Combined Efficiency

=> Time = 105 ÷ 3 = 35 hours

Therefore The correct answer is 35 hours.

Additional Information

Pipes & Cisterns Concept

If a pipe can fill a tank in x hours and another can empty it in y hours, the net part filled in 1 hour is (1/x − 1/y).

LCM Method for Total Work

Taking the LCM of individual completion times gives a convenient Total Work value, making efficiencies integer values for easier calculation.

Combined Efficiency

The overall rate of work when multiple pipes are open simultaneously is the algebraic sum of their individual efficiencies (inflow is positive, outflow is negative).

Q45. Answer: (d) 164

Shortcut Trick

The average of the first 'n' even numbers can be directly found using the formula: (n + 1).

Here, the total number of terms (n) = 163.

Average = 163 + 1 = 164.

Therefore The correct answer is 164.

Alternate Method

Given:

The sequence consists of the first 163 even numbers.

Formula Used:

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

Last Term (l) = a + (n − 1)d

Average of First 163 Even Numbers

1st Term

2

4

6

163rd Term

326

...

Average = 164

Average = (First + Last) ÷ 2

Calculations:

=> First even number (a) = 2

=> Common difference (d) = 2

=> Total number of terms (n) = 163

=> Last term (163^(rd) even number) = 2 + (163 − 1) × 2

=> Last term = 2 + 162 × 2 = 2 + 324 = 326

=> Average = (2 + 326) ÷ 2

=> Average = 328 ÷ 2 = 164

Therefore The correct answer is 164.

Additional Information

Average of First 'n' Odd Numbers

The average of the first 'n' odd numbers is strictly equal to n.

Average of First 'n' Natural Numbers

The average of the first 'n' natural numbers is calculated using the formula (n + 1) ÷ 2.

Sum of Consecutive Even Numbers

The total sum of the first 'n' even numbers is calculated as n × (n + 1).

Q46. Answer: (b) 382/195

Shortcut Trick

Solve the complex fraction first: 1 ÷ (1 + 4/9) = 1 ÷ (13/9) = 9/13.

Rewrite the expression: 5/3 + 9/13 − 2/5.

Find the LCM of 3, 13, and 5, which is 195.

Convert to a common denominator: (325 + 135 − 78) / 195.

Simplify the numerator: 460 − 78 = 382.

Therefore The correct answer is 382/195.

Alternate Method

Given:

5/3 + 1 / (1 + 4/9) − 2/5

Calculations:

First, simplify the denominator of the middle term:

=> 1 + 4/9 = (9 + 4) / 9 = 13/9

Substitute this back into the middle term:

=> 1 / (13/9) = 9/13

Now, rewrite the full expression:

=> 5/3 + 9/13 − 2/5

Find the least common multiple (LCM) of the denominators 3, 13, and 5:

=> LCM(3, 13, 5) = 3 × 13 × 5 = 195

Convert each fraction to have the common denominator of 195:

=> 5/3 = (5 × 65) / (3 × 65) = 325/195

=> 9/13 = (9 × 15) / (13 × 15) = 135/195

=> 2/5 = (2 × 39) / (5 × 39) = 78/195

Combine the fractions into a single expression:

=> (325 + 135 − 78) / 195

=> (460 − 78) / 195

=> 382/195

Therefore The correct answer is 382/195.

Additional Information

BODMAS Rule

Always follow the sequence of Brackets, Orders, Division/Multiplication, and Addition/Subtraction when simplifying mathematical expressions.

Fraction Addition and Subtraction

To add or subtract fractions with different denominators, determine their Least Common Multiple (LCM) first to equalize the denominators.

Reciprocal of a Fraction

The reciprocal of any fraction a/b is b/a. Dividing 1 by a fraction simply flips the numerator and the denominator.

Q47. Answer: (c) 11

Shortcut Trick

The product of two consecutive numbers x and (x + 1) is slightly greater than x2.

The perfect square closest to 110 is 100, which is 102.

Thus, the two consecutive natural numbers are 10 and 11.

Verification: 10 × 11 = 110.

The greater number among 10 and 11 is 11.

Therefore The correct answer is 11.

Alternate Method

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Given:

The product of two consecutive natural numbers is 110.

Formula Used:

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

Calculations:

=> x(x + 1) = 110

=> x2 + x − 110 = 0

=> x2 + 11x − 10x − 110 = 0

=> x(x + 11) − 10(x + 11) = 0

=> (x − 10)(x + 11) = 0

=> x = 10 or x = −11

Since the numbers are natural numbers, x must be positive.

=> x = 10

=> The greater consecutive number is x + 1 = 10 + 1 = 11.

Therefore The correct answer is 11.

Additional Information

Consecutive Natural Numbers

Numbers that follow each other in order without any gaps, starting from 1. They are represented algebraically as n, n+1, n+2, etc.

Quadratic Equation Roots

For a quadratic equation ax2 + bx + c = 0, roots can be found by factorisation. The sum of roots is −b ÷ a, and the product of roots is c ÷ a.

Nature of Roots

The discriminant D = b2 − 4ac determines root nature. If D > 0, roots are real and distinct. If D = 0, roots are real and equal.

Q48. Answer: (c) 8.75

Shortcut Trick

Directly calculate the square roots for the expression:

√121 = 11

√0.0225 = 0.15

√5.76 = 2.4

Expression = 11 + 0.15 − 2.4 = 11.15 − 2.4 = 8.75

Therefore The correct answer is 8.75.

Alternate Method

Given:

Expression: √121 + √0.0225 − √5.76

Calculations:

=> Convert the decimal numbers into fractions to find their square roots easily:

=> √121 = 11

=> √0.0225 = √(225 ÷ 10000) = 15 ÷ 100 = 0.15

=> √5.76 = √(576 ÷ 100) = 24 ÷ 10 = 2.4

=> Now substitute these values back into the given expression:

=> 11 + 0.15 − 2.4

=> 11.15 − 2.4

=> 8.75

Therefore The correct answer is 8.75.

Additional Information

Square Roots of Decimals

Count the number of decimal places in the number. The square root will have exactly half the number of decimal places. For example, 0.0225 has 4 decimal places, so its square root (0.15) has 2 decimal places.

Common Square Roots

Memorizing perfect squares up to 30 is crucial for exam simplification. For instance, $15^2 = 225$, $24^2 = 576$, and $25^2 = 625$.

BODMAS Rule

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Always follow the order: Brackets, Orders (powers and roots), Division, Multiplication, Addition, and Subtraction. In this expression, roots are evaluated first, then addition, and finally subtraction.

Q49. Answer: (c) 1

Shortcut Trick

Substitute an angle, say $\beta = 30°$, into the expression to quickly evaluate it.

Numerator = $\tan^2 30° \times \operatorname{cosec}^2 30° = (1/\sqrt{3})^2 \times 2^2 = 1/3 \times 4 = 4/3$

Denominator = $1 + \tan^2 30° = 1 + (1/\sqrt{3})^2 = 1 + 1/3 = 4/3$

Expression = $(4/3) \div (4/3) = 1$

Therefore The correct answer is 1.

Alternate Method

Given:

$(\tan^2 \beta \times \operatorname{cosec}^2 \beta) \div (1 + \tan^2 \beta)$

Formula Used:

$1 + \tan^2 \theta = \sec^2 \theta$

$\tan \theta = \sin \theta / \cos \theta$

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

$\sec \theta = 1 / \cos \theta$

Calculations:

=> Numerator = $\tan^2 \beta \times \operatorname{cosec}^2 \beta$

=> Numerator = $(\sin^2 \beta / \cos^2 \beta) \times (1 / \sin^2 \beta)$

=> Numerator = $1 / \cos^2 \beta = \sec^2 \beta$

=> Denominator = $1 + \tan^2 \beta$

=> Denominator = $\sec^2 \beta$

=> Expression = Numerator ÷ Denominator

=> Expression = $\sec^2 \beta / \sec^2 \beta = 1$

Therefore The correct answer is 1.

Additional Information

Pythagorean Identities

$\sin^2 \theta + \cos^2 \theta = 1$ | $\sec^2 \theta - \tan^2 \theta = 1$ | $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$

Reciprocal Identities

$\sin \theta = 1 / \operatorname{cosec} \theta$ | $\cos \theta = 1 / \sec \theta$ | $\tan \theta = 1 / \cot \theta$

Quotient Identities

$\tan \theta = \sin \theta / \cos \theta$ | $\cot \theta = \cos \theta / \sin \theta$

Q50. Answer: (a) 216

Shortcut Trick

Product of two numbers = HCF × LCM

144 × Second number = 72 × 432

Second number = (72 × 432) ÷ 144

Second number = 432 ÷ 2 = 216

Therefore The correct answer is 216.

Alternate Method

Given:

HCF = 72

LCM = 432

First number = 144

Formula Used:

First number × Second number = HCF × LCM

Calculations:

=> 144 × Second number = 72 × 432

=> Second number = (72 × 432) ÷ 144

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=> Second number = 432 ÷ 2

=> Second number = 216

Therefore The correct answer is 216.

Additional Information

Product Rule of HCF and LCM

The product of the Highest Common Factor (HCF) and the Least Common Multiple (LCM) of two numbers is always equal to the product of the two numbers. Formula: HCF(a, b) × LCM(a, b) = a × b.

Co-prime Numbers

Two numbers are called co-prime if their HCF is 1. For any pair of co-prime numbers, their LCM is always equal to their direct product.

HCF and LCM of Fractions

HCF of fractions = (HCF of numerators) ÷ (LCM of denominators) | LCM of fractions = (LCM of numerators) ÷ (HCF of denominators).

Q51. Answer: (d) 48°

Shortcut Trick

In right-angled triangle BDC, angle C = 90° − angle DBC.

=> angle C = 90° − 58° = 32°.

For triangle AEC, angle AEB is the exterior angle at E.

By Exterior Angle Theorem, angle AEB = angle CAE + angle C.

=> angle AEB = 16° + 32° = 48°.

Therefore The correct answer is 48°.

Alternate Method

A

B

C

D

E

58°

32°

16°

48°

Given:

=> In triangle ABC, BD perpendicular to AC at D.

=> angle DBC = 58°

=> E is on BC such that angle CAE = 16°

Step-by-step Calculation:

=> In right-angled triangle BDC (since BD perpendicular to AC):

=> angle BDC = 90°

=> The sum of interior angles in triangle BDC is 180°.

=> angle C = 180° − 90° − angle DBC

=> angle C = 180° − 90° − 58° = 32°

=> Now, consider triangle AEC.

=> angle AEB is the exterior angle at vertex E for triangle AEC.

=> According to the exterior angle theorem, the exterior angle of a triangle is equal to the sum of the two opposite interior angles.

=> angle AEB = angle CAE + angle C

=> angle AEB = 16° + 32° = 48°

Therefore The correct answer is 48°.

Additional Information

Exterior Angle Theorem

The exterior angle of a triangle is equal to the sum of the two opposite interior angles. Formula: angle Exterior = angle A + angle B.

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Angle Sum Property of a Triangle

The sum of all internal angles of any given triangle is always exactly 180°. angle A + angle B + angle C = 180°.

Altitude of a Triangle

An altitude is a line segment drawn from a vertex of a triangle perpendicular to the opposite side, forming a 90° angle with it.

Q52. Answer: (c) 63.7π cubic metres

Shortcut Trick

The volume of a cylinder can be calculated directly by multiplying the base area by the height.

Volume = π × r² × h

Volume = π × (3.5)² × 5.2

Volume = π × 12.25 × 5.2 = 63.7π

Therefore The correct answer is 63.7π cubic metres.

Alternate Method

Given:

Base radius of the cylinder (r) = 3.5 m

Height of the cylinder (h) = 5.2 m

Formula Used:

Volume of a cylinder = π × r² × h

r = 3.5 m

h = 5.2 m

Volume = ?

Calculations:

=> Volume = π × (3.5)² × 5.2

=> Volume = π × 12.25 × 5.2

=> Volume = π × 63.7

=> Volume = 63.7π

Therefore The correct answer is 63.7π cubic metres.

Additional Information

Curved Surface Area of a Cylinder

The curved (lateral) surface area of a cylinder does not include the top and bottom circular bases. It is calculated using the formula 2πrh.

Total Surface Area of a Cylinder

The total surface area includes both the curved surface and the areas of the two circular bases. The formula used is 2πr(r + h).

Volume of a Cone

A cone that shares the same base radius and height as a cylinder will hold exactly one-third of the cylinder's volume. Its formula is (1/3)πr²h.

Q53. Answer: (d) 72

Shortcut Trick

The mean proportional of two numbers a and b is √(a × b).

=> Mean proportional = √(96 × 54)

=> √(16 × 6 × 9 × 6)

=> 4 × 6 × 3 = 72

Therefore The correct answer is 72.

Alternate Method

Given:

The two given numbers are 96 and 54.

Formula Used:

If x is the mean proportional between a and b, then a : x :: x : b.

=> x² = a × b

=> x = √(a × b)

96

First Term

:

x

Mean

::

x

Mean

:

54

Third Term

Proportion: 96 : x = x : 54

$x^2 = 96 \times 54$

Calculations:

=> Let the required mean proportional be x.

=> $x^2 = 96 \times 54$

=> $x = \sqrt{(96 \times 54)}$

=> $x = \sqrt{(16 \times 6 \times 9 \times 6)}$

=> $x = \sqrt{(16 \times 36 \times 9)}$

=> $x = 4 \times 6 \times 3$

=> $x = 72$

Therefore The correct answer is 72.

Additional Information

Third Proportional

The third proportional to two numbers a and b is the number c such that a : b :: b : c. This gives $c = b^2 \div a$.

Fourth Proportional

The fourth proportional to three numbers a, b and c is the number x such that a : b :: c : x. This gives $x = (b \times c) \div a$.

Compound Ratio

For two given ratios a : b and c : d, their compound ratio is formed by multiplying the corresponding terms together as (a × c) : (b × d).

Q54. Answer: (c) 23

Shortcut Trick

Apply the BODMAS rule to solve powers and roots directly in one line:

=> $7^2 + \sqrt{(8^2)} - 5\sqrt{(16)} - 14$

=> $49 + 8 - (5 \times 4) - 14$

=> $57 - 20 - 14 = 23$

Therefore The correct answer is 23.

Alternate Method

Given:

Expression: $7^2 + \sqrt{(8^2)} - 5\sqrt{(16)} - 14$

Formula Used:

BODMAS Rule: Brackets, Orders (powers and roots), Division, Multiplication, Addition, Subtraction.

Calculations:

=> $7^2 + \sqrt{64} - 5 \times 4 - 14$

=> $49 + 8 - 20 - 14$

=> $57 - 20 - 14$

=> $37 - 14$

=> 23

Therefore The correct answer is 23.

Additional Information

BODMAS Rule

Always solve mathematical expressions in a strict order: Brackets first, followed by Orders (like powers and square roots), then Division, Multiplication, Addition, and finally Subtraction to avoid calculation errors.

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Square Root Properties

The square root of a perfect square simplifies exactly to its base integer. For example, $\sqrt{(x^2)} = x$. In this expression, $\sqrt{(8^2)}$ can be directly written as 8 without first squaring it to 64.

Q55. Answer: (c) 5371/929 hours

Shortcut Trick

Total Capacity = LCM(11, 24, 19) = 5016 units

Combined efficiency = (5016 ÷ 11) + (5016 ÷ 24) + (5016 ÷ 19)

Combined efficiency = 456 + 209 + 264 = 929 units/hr

Time taken together = Total Capacity ÷ Combined efficiency = 5016 ÷ 929

Time taken together = 5 ^(371)/929 hours

Therefore The correct answer is 5 ^(371)/929 hours.

Alternate Method

Given:

=> Time taken by pipe A = 11 hours

=> Time taken by pipe B = 24 hours

=> Time taken by pipe C = 19 hours

Formula Used:

=> Total Work = Time × Efficiency

Calculations:

=> Let the total work (capacity of the tank) be the LCM of 11, 24, and 19.

=> LCM(11, 24, 19) = 11 × 24 × 19 = 5016

Pipe	Hours	Total Work	Efficiency
A	11	5016	456
B	24	209	
C	19	264	

=> Total efficiency when operating together = 456 + 209 + 264 = 929 units/hr

=> Time taken to fill the tank together = Total Work ÷ Total Efficiency

=> Time taken = 5016 ÷ 929

=> Time taken = 5 ^(371)/929 hours

Therefore The correct answer is 5 ^(371)/929 hours.

Additional Information

Pipes and Cisterns Basics

If a pipe can fill a tank in x hours, then the part of the tank filled by the pipe in 1 hour is 1/x.

Inlet and Outlet Pipes

An inlet pipe fills the tank (positive efficiency), while an outlet pipe empties the tank (negative efficiency). The net work done is the algebraic sum of their combined efficiencies.

Time and Work LCM Method

The Total Work is practically assumed to be the LCM of individual completion times. The efficiency of each unit is then calculated as Total Work ÷ Time, helping avoid complex fraction calculations.

Q56. Answer: (c) 140%

Shortcut Trick

Buy 1 get 1 free means 1 item is free out of 2 total items.

Discount % = (Free items ÷ Total items) × 100 = (1 ÷ 2) × 100 = 50%.

Using the direct ratio formula: CP / MP = (100 − Discount%) / (100 + Profit%)

CP / MP = (100 − 50) / (100 + 20) = 50 / 120 = 5 / 12

Markup % = [(MP − CP) / CP] × 100 = [(12 − 5) / 5] × 100 = (7 / 5) × 100 = 140%.

Therefore The correct answer is 140%.

Alternate Method

Given:

Offer: Buy 1 kitchen set, get 1 free.
Profit earned = 20%.
Buy 1 (Paid)
Customer pays
1 MP
Get 1 (Free)
Customer gets
without cost
Total items given = 2
Effective Selling Price (SP) = 1 MP
Calculations:
=> Let the Cost Price (CP) of 1 kitchen set be 100.
=> The trader gives 2 kitchen sets in total (1 paid + 1 free).
=> Total Cost Price for the trader = 2 × 100 = 200.
=> The trader earns a 20% profit on his total cost.
=> Total Selling Price (SP) = Total CP × (100 + Profit%) ÷ 100
=> Total SP = 200 × (100 + 20) ÷ 100 = 200 × 1.20 = 240.
=> The customer only pays for 1 item at its Marked Price (MP).
=> Therefore, MP of 1 kitchen set = Total SP = 240.
=> CP of 1 kitchen set is 100.
=> Markup % = [(MP − CP) ÷ CP] × 100
=> Markup % = [(240 − 100) ÷ 100] × 100 = (140 ÷ 100) × 100 = 140%.
Therefore The correct answer is 140%.
Additional Information
Buy X Get Y Free Discount
The effective discount percentage is calculated on the total number of items provided to the customer: D% = [Y ÷ (X + Y)] × 100.
CP and MP Relationship
When both profit percentage and discount percentage are known, the direct ratio of Cost Price to Marked Price is: CP / MP = (100 − Discount%) / (100 + Profit%).
Markup Percentage
The percentage by which the Marked Price is raised above the original Cost Price: Markup % = [(MP − CP) ÷ CP] × 100.

Q57. Answer: (d) 13

Shortcut Trick
For divisibility by 13, find the alternating sum of blocks of 3 digits from right to left.
Number: 716710501 → Blocks: 501, 710, 716
Alternating sum = (716 + 501) − 710 = 1217 − 710 = 507
Since 507 ÷ 13 = 39 (perfectly divisible), the number is divisible by 13.
Therefore The correct answer is 13.
Alternate Method
Given:
Number = 716710501
Method Used:
Apply basic divisibility rules to eliminate options.
Calculations:
=> The given number 716710501 ends with 1, which is an odd digit.
=> Since it is an odd number, it cannot be divided by any even number.
=> Hence, options 20 and 16 are directly eliminated.
=> Now, check for divisibility by 13 using the block method.
=> Split the number into blocks of 3 digits from right to left: 501, 710, and 716.
=> Sum of the odd-placed blocks = 716 + 501 = 1217
=> Sum of the even-placed blocks = 710

=> Difference = 1217 − 710 = 507

=> Check if 507 is a multiple of 13: 507 = 13 × 39

=> Because 507 is divisible by 13, the entire number 716710501 is completely divisible by 13.

Therefore The correct answer is 13.

Additional Information

Divisibility Rule of 7

Double the last digit and subtract it from the remaining truncated number. If the result is divisible by 7, the original number is divisible by 7.

Divisibility Rule of 11

The difference between the sum of digits at odd places and the sum of digits at even places must be 0 or a multiple of 11.

Combined Rule for 7, 11, and 13

A large number is divisible by 7, 11, or 13 if the alternating sum of blocks of 3 digits from right to left is divisible by 7, 11, or 13 respectively.

Q58. Answer: (d) 1

Shortcut Trick

Check odd numbers between 374 and 381: 375, 377, 379, and 381.

375 is divisible by 5, and 381 by 3 (sum of digits = 12).

377 = 13 × 29, so only 379 is not perfectly divisible by any prime.

Thus, 379 is the only prime number in the given range.

Therefore The correct answer is 1.

Alternate Method

Given:

Range of numbers: 374 to 381 (both included).

Method Used:

Test the divisibility of numbers by prime factors up to their approximate square root.

Calculations:

=> All even numbers in this range are divisible by 2 and thus composite: 374, 376, 378, 380.

=> The remaining odd numbers to check are: 375, 377, 379, 381.

=> 375 ends in 5, so it is divisible by 5.

=> For 381, the sum of its digits is 3 + 8 + 1 = 12. Since 12 is a multiple of 3, 381 is divisible by 3.

=> For 377, test prime numbers up to √377 ≈ 19:

=> 377 ÷ 13 = 29. Therefore, 377 is a composite number.

=> For 379, test prime numbers up to √379 ≈ 19 (which are 2, 3, 5, 7, 11, 13, 17, 19):

=> 379 is not perfectly divisible by any of these prime numbers.

=> Thus, 379 is the only prime number in the given range.

Therefore The correct answer is 1.

Additional Information

Prime Number

A positive integer greater than 1 that has exactly two positive divisors: 1 and itself.

Divisibility Test for Primes

To verify if a number N is prime, divide it by all prime numbers up to √N. If none perfectly divide it, N is prime.

Divisibility Rule of 3

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

Q59. Answer: (d) 21.75

Shortcut Trick

First value = 65% of 75 = 0.65 × 75 = 48.75

Second value = 3/5 of 45 = 3 × 9 = 27

Required difference = 48.75 − 27 = 21.75

Therefore The correct answer is 21.75.

Alternate Method

65% of 75 = 48.75

3/5 of 45 = 27

Difference = 21.75

Given:

First value = 65% of 75

Second value = 3/5 of 45

Calculations:

=> First value = (65 ÷ 100) × 75

=> First value = 0.65 × 75 = 48.75

=> Second value = (3 ÷ 5) × 45

=> Second value = 3 × 9 = 27

=> Required Difference = First value − Second value

=> Required Difference = 48.75 − 27

=> Required Difference = 21.75

Therefore The correct answer is 21.75.

Additional Information

Percentage Calculation

x% of y can be calculated as (x ÷ 100) × y. Alternatively, x% of y is always equal to y% of x.

Fraction to Decimal

To simplify calculations, commonly used fractions can be converted to percentages or decimals. For example, 3/5 is equivalent to 60% or 0.6.

BODMAS Rule

Calculations should systematically follow the order of Brackets, Orders (powers/roots), Division, Multiplication, Addition, and Subtraction.

Q60. Answer: (d) 21.8%

Shortcut Trick

Let Cost Price (CP) = 100 units.

Selling at a 25% loss gives Selling Price (SP1) = 75 units.

Given SP1 is 5/14 of Actual SP => Actual SP = 75 × (14 / 5) = 210 units.

New Selling Price SP2 = 58% of Actual SP = 0.58 × 210 = 121.8 units.

Since CP = 100 and SP2 = 121.8, Profit% = 121.8 − 100 = 21.8%.

Therefore The correct answer is 21.8%.

Alternate Method

Given:

First selling price (SP1) = 5/14 of Actual SP

Loss percentage = 25%

Second selling price (SP2) = 58% of Actual SP

Formula Used:

CP = SP × [100 / (100 − Loss%)]

Profit% = [(SP − CP) / CP] × 100

SP1

75

CP

100

SP2

121.8

Actual SP

210

−25%

+21.8%

5/14 × Actual SP

58% × Actual SP

Calculations:
=> Let Actual SP be x.
=> First Selling Price, SP1 = 5*x*/14
=> Cost Price (CP) = (5*x*/14) × (100 / 75)
=> CP = (5*x*/14) × (4/3) = 20*x*/42 = 10*x*/21
=> Second Selling Price, SP2 = 58% of x = 58*x*/100 = 29*x*/50
=> Profit = SP2 − CP = 29*x*/50 − 10*x*/21
=> Profit = (609*x* − 500*x*) / 1050 = 109*x* / 1050
=> Profit% = [(109*x* / 1050) / (10*x*/21)] × 100
=> Profit% = (109 / 1050) × (21 / 10) × 100
=> Profit% = (109 / 500) × 100 = 109 / 5 = 21.8%
Therefore The correct answer is 21.8%.
Additional Information
Marked Price & Discount
Discount is always calculated on the Marked Price (MP). The formula is: SP = MP × (100 − Discount%) / 100.
Successive Discounts
When two successive discounts of a% and b% are applied, the equivalent single discount percentage is: [a + b − (a × b)/100]%.
Profit & Loss Basics
Profit and Loss are always calculated on the Cost Price (CP). Profit% = [(SP − CP) / CP] × 100, and Loss% = [(CP − SP) / CP] × 100.

Q61. Answer: (b) 12

Shortcut Trick
Let F and S be the ages of the father and son. We will track the expression (F − 2S) over time.
8 years ago, F − 2S = 20.
Every year, both F and S increase by 1, so the expression (F − 2S) decreases by exactly 1 every year.
Current value of (F − 2S) at present = 20 − 8 = 12.
For the father to be exactly twice his son's age, the value of (F − 2S) must become 0.
The time required to reduce from 12 to 0 at a rate of 1 per year is exactly 12 years.
Therefore The correct answer is 12 years.
Alternate Method
Given:
Let the present age of the father be F years and the son be S years.
8 years ago, Father's age = (F − 8) years and Son's age = (S − 8) years.
8 Years Ago
F − 8 = 2(S − 8) + 20
Present
F, S
After x Years
F + x = 2(S + x)
• 8 years
• x years
Calculations:
=> F − 8 = 2 × (S − 8) + 20
=> F − 8 = 2S − 16 + 20
=> F − 8 = 2S + 4
=> F − 2S = 12 --- (Equation 1)
Let after x years, the father's age be twice the son's age.
=> F + x = 2 × (S + x)
=> F + x = 2S + 2x
=> x = F − 2S
Substituting the value of (F − 2S) from Equation 1 into the above expression:

=> x = 12

Therefore The correct answer is 12 years.

Additional Information

Constant Age Difference

The absolute difference between the ages of two individuals is constant at any point in time, past or future. If person A is older than B by 5 years today, they will always be 5 years older.

Convergence of Age Ratios

As both individuals grow older by the exact same amount each year, the ratio of their ages continuously moves closer to 1:1 further into the future.

Present Age Variable Setup

For simple formulation, always assume present ages as variables like x and y. Then, t years ago ages are (x − t) and (y − t), and t years later they are (x + t) and (y + t).

Tracking Age Multipliers

If finding when one age will be k times the other, tracking the expression (A − k × B) is faster. Since both ages increase by 1 per year, the expression changes by (1 − k) each year.

Q62. Answer: (d) 51.4 kg

Shortcut Trick

Let the assumed average weight be 50 kg.

Deviations from 50 kg: −10, −1, +6, +25, −13.

Net deviation = (−10 − 1 + 6 + 25 − 13) = +7.

Average deviation = +7 ÷ 5 = +1.4 kg.

Actual average = 50 + 1.4 = 51.4 kg.

Therefore The correct answer is 51.4 kg.

Alternate Method

Given:

Weights of 5 family members = 40 kg, 49 kg, 56 kg, 75 kg, 37 kg

Total number of members (n) = 5

40

W1

49

W2

56

W3

75

W4

37

W5

Avg = 51.4 kg

Formula Used:

Average = Sum of all observations ÷ Total number of observations

Calculations:

=> Sum of weights = 40 + 49 + 56 + 75 + 37

=> Sum of weights = 257 kg

=> Average = 257 ÷ 5

=> Average = 51.4 kg

Therefore The correct answer is 51.4 kg.

Additional Information

Average (Mean)

The average is the central or typical value in a discrete set of data. It is calculated algebraically as: Average = Sum of Values ÷ Number of Values.

Deviation Method

An assumed mean is selected to simplify calculations. Actual Average = Assumed Average + (Net Deviation ÷ Number of

Observations).

Combined / Weighted Average

Used when merging different groups with varying counts. Formula: Combined Average = (A1n1 + A2n2) ÷ (n1 + n2).

Q63. Answer: (a) 11:18 AM

Shortcut Trick

Total time for Train A = 9 hrs and Train B = 6 hrs. Let total distance = LCM(9, 6) = 18 units.

Speed of A = 18 ÷ 9 = 2 units/hr, and Speed of B = 18 ÷ 6 = 3 units/hr.

Train A travels alone for 2 hours (6:30 AM to 8:30 AM), covering 2 × 2 = 4 units.

Remaining distance = 18 − 4 = 14 units.

Time to meet after 8:30 AM = 14 ÷ (2 + 3) = 2.8 hrs = 2 hrs 48 mins.

Meeting time = 8:30 AM + 2 hrs 48 mins = 11:18 AM.

Therefore The correct answer is 11:18 AM.

Alternate Method

Given:

Train A leaves station M at 6:30 AM and reaches station N at 3:30 PM.

Train B leaves station N at 8:30 AM and reaches station M at 2:30 PM.

Total Distance = 18 units

Train A

Station M

6:30 AM

9 hours

Train B

Station N

8:30 AM

6 hours

8:30 AM

4 units

Meeting (11:18 AM)

5.6 units

8.4 units

Calculations:

=> Total time taken by Train A = 3:30 PM − 6:30 AM = 9 hours.

=> Total time taken by Train B = 2:30 PM − 8:30 AM = 6 hours.

=> Let the total distance between station M and station N be D = 18 units (LCM of 9 and 6).

=> Speed of Train A = 18 ÷ 9 = 2 units/hour.

=> Speed of Train B = 18 ÷ 6 = 3 units/hour.

=> Train A leaves 2 hours earlier than Train B. Distance covered by Train A in these 2 hours = 2 units/hour × 2 hours = 4 units.

=> Remaining distance = 18 − 4 = 14 units.

=> Relative speed when both trains are moving towards each other = Speed of A + Speed of B = 2 + 3 = 5 units/hour.

=> Time taken to meet = Remaining distance ÷ Relative speed = 14 ÷ 5 = 2.8 hours.

=> 2.8 hours = 2 hours + 0.8 × 60 minutes = 2 hours 48 minutes.

=> The meeting time will be 2 hours 48 minutes after 8:30 AM.

=> Meeting time = 8:30 AM + 2 hours 48 minutes = 11:18 AM.

Therefore The correct answer is 11:18 AM.

Additional Information

Relative Speed Concept

When two moving bodies travel in opposite directions towards each other, their relative speed is calculated as the sum of their individual speeds (S1 + S2).

Average Speed

If two equal distances are covered at varying speeds x and y, the Average Speed is given by (2 × x × y) ÷ (x + y). For unequal distances, use Average Speed = Total Distance ÷ Total Time.

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Meeting Point Rule

If two objects start simultaneously from points A and B towards each other and take respective times t1 and t2 to reach their destinations after meeting, then (Speed of A) ÷ (Speed of B) = √(t2 ÷ t1).

Q64. Answer: (a) Rs. 2,622

Shortcut Trick

Net SP = MP × (100 − D1)% × (100 − D2)% × (100 − D3)%

Net SP = 3125 × (92 ÷ 100) × (96 ÷ 100) × (95 ÷ 100)

Net SP = 3125 × (23 ÷ 25) × (24 ÷ 25) × (19 ÷ 20)

Net SP = 5 × 23 × 24 × (19 ÷ 20)

Net SP = 23 × 6 × 19 = 2622

Therefore The correct answer is Rs. 2,622.

Alternate Method

Given:

Marked Price (MP) of the book = Rs. 3,125

Successive discounts = 8%, 4%, and 5%

Rs. 3125

MP

−8%

Rs. 2875

−4%

Rs. 2760

−5%

Rs. 2622

Net SP

Calculations:

=> First discount = 8% of Rs. 3,125 = (8 ÷ 100) × 3125 = Rs. 250

=> Price after first discount = 3125 − 250 = Rs. 2,875

=> Second discount = 4% of Rs. 2,875 = (4 ÷ 100) × 2875 = Rs. 115

=> Price after second discount = 2875 − 115 = Rs. 2,760

=> Third discount = 5% of Rs. 2,760 = (5 ÷ 100) × 2760 = Rs. 138

=> Net Selling Price = 2760 − 138 = Rs. 2,622

Therefore The correct answer is Rs. 2,622.

Additional Information

Equivalent Discount of Two Successive Discounts

When two successive discounts d1% and d2% are given, the single equivalent discount is calculated as: D = d1 + d2 − (d1 × d2) ÷ 100.

Marked Price vs Selling Price

Discount is always calculated on the Marked Price (MP) of an article. If D% is the discount, the Selling Price (SP) is obtained as: SP = MP × (100 − D) ÷ 100.

Commutative Property of Successive Discounts

The order in which successive discounts are applied does not affect the final selling price. For example, applying 8%, then 4%, yields the exact same net selling price as applying 4%, then 8%.

Q65. Answer: (d) 198

Shortcut Trick

The largest circle that can be drawn inside a rectangle has its diameter equal to the breadth of the rectangle.

Diameter of the circle (d) = Breadth of the rectangle = 63 m.

Circumference of the circle = π × d = (22/7) × 63

Circumference = 22 × 9 = 198 m.

Therefore The correct answer is 198 m.

Alternate Method

Given:

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Length of the rectangle (l) = 116 m

Breadth of the rectangle (b) = 63 m

Formula Used:

Circumference of a circle = 2 × π × r = π × d

l = 116 m

b = 63 m

d = 63 m

Calculations:

=> For a circle to be inscribed completely inside a rectangle, its maximum possible diameter is limited by the smaller side of the rectangle.

=> Maximum diameter of the circle (d) = Breadth of the rectangle = 63 m

=> Radius (r) = 63/2 m

=> Circumference = 2 × π × r

=> Circumference = 2 × (22/7) × (63/2)

=> Circumference = (22/7) × 63

=> Circumference = 22 × 9

=> Circumference = 198 m

Therefore The correct answer is 198 m.

Additional Information

Largest Circle inside a Square

The diameter of the largest circle inscribed completely in a square is exactly equal to the side of the square.

Largest Square inside a Circle

The diagonal of the largest square inscribed in a circle is exactly equal to the diameter of the circle.

Key Circle Formulas

Area = π × r² | Circumference = 2 × π × r (where r represents the radius of the circle).

Q66. Answer: (c) 725/37% loss

Shortcut Trick

Total CP = 578 + 14 = Rs. 592

Ratio of CP : SP = 592 : 476 = 148 : 119

Loss in ratio = 148 − 119 = 29 parts

Loss % = (29 ÷ 148) × 100 = 725/37%

Therefore The correct answer is 725/37% loss.

Alternate Method

Given:

Purchase price of the toy = Rs. 578

Decoration cost = Rs. 14

Selling price (SP) = Rs. 476

Formula Used:

Total CP = Purchase price + Decoration cost

Loss % = (Loss ÷ Total CP) × 100

Total Cost Price (CP) = Rs. 592

Bought: Rs. 578

• Rs. 14

Selling Price (SP)

SP = Rs. 476

Loss: Rs. 116

Calculations:

=> Total CP = 578 + 14 = Rs. 592

=> Loss = Total CP − SP

=> Loss = 592 − 476 = Rs. 116

=> Loss % = (116 ÷ 592) × 100

=> Loss % = (29 ÷ 148) × 100

=> Loss % = 29 × (25 ÷ 37) = 725/37%

Therefore The correct answer is 725/37% loss.

Additional Information

Overhead Expenses

Any additional costs incurred on the product such as transportation, repairs, or decoration are always added to the initial purchase price to determine the effective Total Cost Price (CP).

Base Rule for Profit & Loss

Both profit and loss percentages are strictly calculated on the Total Cost Price unless specified otherwise: Loss % = (Loss ÷ Total CP) × 100.

Condition for Loss

A transaction results in a loss when the effective total investment (Total CP) is strictly greater than the revenue generated (Selling Price). Difference formula: Loss = CP − SP.

Q67. Answer: (d) Rs. 27,225

Shortcut Trick

Rate = 20% per annum.

Effective CI rate for the 1st year = 20%

Effective CI rate for the 2nd year alone = 20% + (20% of 20%) = 24%

Given, 24% of Principal = Rs. 6,534

=> Principal = (6534 ÷ 24) × 100 = 272.25 × 100

Therefore The correct answer is Rs. 27,225.

Alternate Method

Given:

Rate of interest (R) = 20% per annum compounded annually

Interest earned during the 2nd year = Rs. 6,534

Formula Used:

Amount after 1 year, A1 = P × (1 + R/100)

Interest for the 2nd year = A1 × (R/100)

Principal = P

1st Year Interest

20% of P = 0.20P

2nd Year Interest

24% of P = Rs. 6534

=> P = 6534 ÷ 0.24 = Rs. 27225

Calculations:

Let the required principal sum be P.

=> Amount after the 1st year (A1) = P × (1 + 20/100) = 1.2P

The compound interest for the 2nd year is exactly equal to the interest calculated on the total amount present at the end of the 1st year.

=> Interest for 2nd year = A1 × (20/100)

=> Interest for 2nd year = 1.2P × 0.2 = 0.24P

We are given that this interest is Rs. 6,534.

=> 0.24P = 6534

=> P = 6534 ÷ 0.24

=> P = 653400 ÷ 24 = 27225

Therefore The correct answer is Rs. 27,225.

Additional Information

Compound Interest Formula

Amount = $P(1 + R/100)^n$, where P is the principal, R is the rate of interest, and n is the time period. The total compound interest is CI = Amount − Principal.

Interest for the n^(th) Year

The compound interest earned exactly in the n^(th) year is simply the simple interest evaluated for 1 year on the accumulated

amount existing at the end of the (n−1)^(th) year.

Effective Rate Method

For a rate of R% compounded annually, the effective total interest rate for 2 years is given by (R + R + R²/100)%. The effective interest rate for the 2nd year alone is directly given by (R + R²/100)%.

Q68. Answer: (a) 14,568

Shortcut Trick

Convert the successive percentage changes directly into fraction multipliers to calculate the final population in one step.

Multiplying factors: +25% → 5/4, +60% → 8/5, and −50% → 1/2

Net Multiplier = 5/4 × 8/5 × 1/2 = 40/40 = 1

Population after 3 years = Initial Population × Net Multiplier = 14,568 × 1 = 14,568

Therefore The correct answer is 14,568.

Alternate Method

Given:

Initial Population (P) = 14,568

Successive percentage rates: R1 = +25%, R2 = +60%, R3 = −50%

Formula Used:

Final Population = P × (1 + R1/100) × (1 + R2/100) × (1 + R3/100)

Start

14568

+25%

× 5/4

Year 1

18210

+60%

× 8/5

Year 2

29136

−50%

× 1/2

Year 3

14568

Net Multiplier = 5/4 × 8/5 × 1/2 = 1

Calculations:

=> Final Population = 14568 × (1 + 25/100) × (1 + 60/100) × (1 − 50/100)

=> Final Population = 14568 × (125/100) × (160/100) × (50/100)

=> Final Population = 14568 × (5/4) × (8/5) × (1/2)

=> Final Population = 14568 × (40/40)

=> Final Population = 14568 × 1 = 14568

Therefore The correct answer is 14,568.

Additional Information

Successive Percentage Change

When a value changes successively by a%, b%, and c%, the final value is efficiently calculated by multiplying the initial value with their corresponding fractional multipliers: Final = Initial × (1 ± a/100) × (1 ± b/100) × (1 ± c/100).

Equivalent Successive Change Formula

For any two successive percentage changes A% and B%, the net combined percentage change can be found directly using the formula: Net % = A + B + (A × B)/100.

Symmetric Increase and Decrease

When a quantity is increased and then subsequently decreased by the exact same percentage value (e.g., +x% followed by −x%), there will always be a net loss given directly by x²/100 %.

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Q69. Answer: (a) Rs. 2,200

Shortcut Trick

Total investment ratio parts = 16 + 82 + 2 = 100

Difference in ratio parts of Y and Z = 82 − 2 = 80

Since time is the same, profit difference = (80 ÷ 100) × Total Profit

Difference = 0.8 × 2750 = 2200

Therefore The correct answer is Rs. 2,200.

Alternate Method

Given:

Investment ratio of X, Y and Z = 16 : 82 : 2

Total profit earned at the end of the year = Rs. 2,750

Formula Used:

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

Profit Share (Total = 100 parts = Rs. 2,750)

X: 16

Y: 82

Z: 2

Difference Y − Z = 82 − 2 = 80 parts

Calculations:

=> Profit sharing ratio of X, Y and Z = 16 : 82 : 2

=> Total ratio parts = 16 + 82 + 2 = 100 parts

=> Value of 100 parts = Rs. 2,750

=> Value of 1 part = 2750 ÷ 100 = Rs. 27.5

=> Difference in ratio parts of Y and Z = 82 − 2 = 80 parts

=> Difference in profit = 80 × 27.5

=> Difference = Rs. 2,200

Therefore The correct answer is Rs. 2,200.

Additional Information

Simple Partnership

When all partners invest their capital for the same duration, the profit is shared entirely based on the proportion of their capital investments.

Compound Partnership

When partners invest capital for different time durations, the profit sharing ratio equals the product of their capital and respective time periods (C1T1 : C2T2 : C3T3).

Working vs Sleeping Partner

A working partner actively manages the business and receives a predefined salary or percentage from the profit. The remainder is distributed according to capital investments. A sleeping partner only invests without active involvement.

Q70. Answer: (a) 4

Shortcut Trick

When two equal distances are covered at speeds x and y, the average speed for the entire journey is given by the formula:

Average Speed = (2 × x × y) ÷ (x + y)

Here, x = 3 km/hr and y = 6 km/hr.

Average Speed = (2 × 3 × 6) ÷ (3 + 6) = 36 ÷ 9 = 4 km/hr.

Therefore The correct answer is 4 km/hr.

Alternate Method

Given:

Speed from Visakhapatnam to Nagpur (v1) = 3 km/hr

Speed from Nagpur to Visakhapatnam (v2) = 6 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Visakhapatnam

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Nagpur
Speed = 3 km/hr
Speed = 6 km/hr
Distance = d
Average Speed = ?
Calculations:
Let the distance between the two cities be d km.
=> Total Distance = Forward distance + Return distance = d + d = 2d km
=> Time taken for forward journey = Distance ÷ Speed = d/3 hr
=> Time taken for return journey = Distance ÷ Speed = d/6 hr
=> Total Time = d/3 + d/6
=> Total Time = (2d + d)/6 = 3d/6 = d/2 hr
=> Average Speed = Total Distance ÷ Total Time
=> Average Speed = 2d ÷ (d/2)
=> Average Speed = 2d × 2 ÷ d
=> Average Speed = 4 km/hr
Therefore The correct answer is 4 km/hr.
Additional Information
Average Speed for 3 Equal Distances
If three equal distances are covered at speeds x, y, and z, the formula for Average Speed = 3xyz ÷ (xy + yz + zx).
Average Speed for Unequal Distances
When different distances are covered, Average Speed = Total Distance ÷ Total Time = (d1 + d2 + d3) ÷ (t1 + t2 + t3).
Relative Speed
When two bodies move in opposite directions, Relative Speed = S1 + S2. When moving in the same direction, Relative Speed = |S1 − S2|.

Q71. Answer: (b) CW-HA

The logic followed here is:
Option 1) SL-XQ
Option 2) CW-HA
Option 3) GZ-LE
Option 4) WP-BU
Here, 'CW-HA' is odd among the given options.
Hence, the correct answer is "Option 2".

Q72. Answer: (b) Two

Given numbers: 3147569
Digits in ascending order: 1 3 4 5 6 7 9
So, Two digits (4 and 9) remain in the same positions.
Hence, the correct answer is 'Option 2'.

Q73. Answer: (d) 11

Given: (Left) 666 714 792 824 596 (Right)
Numbers: 666, 714, 792, 824, 596
Highest number = 824
Lowest number = 596
Now,
Second digit of 824 = 2
Second digit of 596 = 9
So, Sum = 2+9= 11
Hence, the correct answer is 'Option 4'.

Q74. Answer: (a) 9, 56

The logic followed here is:

Logic: Third number = First number + Second number + 1

11, 96

=> $11^2 = 121$

121 − 25 = 96

10, 75

=> $10^2 = 100$

100 − 25 = 75

Now, checking the options:

Option 1) 9, 56

=> $9^2 = 81$

81 − 25 = 56

Option 2) 13, 134

=> $13^2 = 169$

169 − 25 = 144 ≠ 134

Option 3) 12, 120

=> $12^2 = 144$

144 − 25 = 119 ≠ 120

Option 4) 14, 172

=> $14^2 = 196$

196 − 25 = 171 ≠ 172

Hence, the correct option is "Option 1"

Q75. Answer: (d) 44th

Given: In a row of 161 students facing north.

Mr. Into's position from the left = 98th.

Mr. Toni is 20th to the right of Mr. Into:

Toni's position from left = 98 + 20 = 118

Now convert this to position from the right:

Position from right = Total – Position from left + 1 = 161 – 118 + 1 = 44

Hence, the correct answer is "Option 1".

Q76. Answer: (a) QT 30

The logic followed here is:

For, JM 8 is related to FI 11

For, LO 19 is related to HK 22

Similarly, for UX 27

So, UX 27 will be related to QT 30

Hence, the correct answer is "Option 1".

Q77. Answer: (c) HEF 9

The logic followed here is:

So, 'HEF 9' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

Q78. Answer: (c) USQ 29

The logic followed here is:

So, 'USQ 29' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

Q79. Answer: (d) Neither conclusion (I) nor (II) follows

The least possible Venn diagram for the given statement is:

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Conclusions:

(I) All dancers are actors → Does not follow (As all actors are dancers. So it is possible but not definite.)

(II) No magician is a dancer → Does not follow (As some dancers are magicians. As some part of dancers is common with magicians, therefore it is false.)

Thus, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 4".

Q80. Answer: (d) 8

The logic followed here is:

'FLAG' is coded as '7239'

F	L	A	G
7	2	3	9

'ALIF' is coded as '3289'

A	L	I	F
3	2	8	9

The letters common to both words are: F, L, A. (3 letters)

The digits common to both codes are: 7239 and 3289 = 2,3,9. (3 digits)

So, 8 is the code for 'I' in the given code language.

Hence, the correct answer is 'Option 4'.

Q81. Answer: (a) CELS

The logic followed here is:

Option 1) CELS

Option 2) JMSZ

Option 3) NQWD

Option 4) SVBI

Here, 'CELS' is odd among the given options.

Hence, the correct answer is "Option 1".

Q82. Answer: (c) 4

The logic followed here is:

Given Number: 817594326

Digits in the number: 8, 1, 7, 5, 9, 4, 3, 2, 6

Arrange in ascending order: 1, 2, 3, 4, 5, 6, 7, 8, 9

So, Fourth from the left = 4

Hence, the correct answer is 'Option 3'.

Q83. Answer: (b) Mother's father

Family Chart:

Given:

M is the son of L.

L is the father of D.

D is the brother of N.

N is the sister of A.

A is the daughter of K.

K is the mother of Q.

N is married to S.

S is the father of C.

So, L is the 'Mother's father' of C.

Hence, the correct answer is "Option 2".

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Q84. Answer: (c) 5

The logic followed here is:

'TAME' is coded as '4257'

T	A	M	E
4	2	5	7

'MIND' is coded as '1365'

M	I	N	D
1	3	6	5

Common letter in both words is M.

Codes are 4257 and 1365. The only digit that appears in both codes is 5.

So, M = 5.

Hence, the correct answer is 'Option 3'.

Q85. Answer: (b) Ranvir

Given: Kabir, Sumit, Ranvir, Madhu, Samir and Tanvi are sitting around a circle, facing the centre.

2) Ranvir sits second to the right of Samir.

3) Samir sits second to the right of Madhu.

4) Sumit sits to the immediate left of Samir.

5) Kabir sits second to the left of Tanvi.

So, Ranvir sits to the immediate right of Kabir

Hence, the correct answer is "Option 2".

Q86. Answer: (d) Three

Given: Six people, A, B, C, D, E and F are sitting in a row, facing north.

1) Only two people sit to the right of C.

2) A sits second to the left of D.

3) B sits to the immediate right of E.

4) F sits on the extreme right end of the line.

So, Three people sit between B and F.

Hence, the correct answer is "Option 4".

Q87. Answer: (a) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram for the given statement is:

Conclusions:

I. Some Magpies are Seagulls → Does not follow.(As some Magpies are Swans and no Swans are Seagulls. So it is possible but not definite.)

II. No Seagulls are Magpies → Does not follow.(As some Magpies are Swans and no Swans are Seagulls. It is possible that some Magpies (who are not Swans) could be Seagulls.)

Thus, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 1".

Q88. Answer: (a) MSXE

The logic followed here is:

For, QERG is related to WJVJ

For, OYHS is related to UDLV

Similarly, for GNTB

So, GNTB will be related to MSXE

Hence, the correct answer is "Option 1".

Q89. Answer: (b) 113

The logic followed here is:

thus, "113" will replace the question mark in the given series.

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Hence, the correct option is "Option 2".

Q90. Answer: (b) Two

The logic followed here is:
Given Number: 9254631
Digits in ascending order: 1 2 3 4 5 6 9
Two digits (the 2nd and the 4th) remain in the same positions.
Hence, the correct answer is 'Option 2'.

Q91. Answer: (b) 21

The logic followed here is:
Kiya's rank from the top = 15th
Kiya' s rank from the bottom = 7th
Total students = (rank from top) + (rank from bottom) − 1
Total students = 15 + 7 − 1
Total students = 22 − 1
Total students = 21
Hence, the correct answer is 'Option 2'.

Q92. Answer: (a) LP-GI

The logic followed here is:
Option 1) LP-GI
Option 2) NR-IL
Option 3) QU-LO
Option 4) JN-EH
Here, 'LP-GI' is odd among the given options.
Hence, the correct answer is "Option 1".

Q93. Answer: (a) 200

The logic followed here is:
thus, "200" will replace the question mark in the given series.
Hence, the correct option is "Option 1".

Q94. Answer: (b) 17

BODMAS Table:
Given equation: 8 − 3 + 63 × 3 ÷ 14 = ?
Now, if '+' and '-' and '×' and '÷' are interchanged, then:
=> 8 × 3 − 63 ÷ 3 + 14 = ?
=> 24 − 21 + 14 = ?
=> 24 − 21 + 14= 3 + 14 = 17
Hence, the correct answer is "Option 2".

Q95. Answer: (b) 2

Given: (Left) 8 € 1 @ % 5 5 3 % © 2 € £ 7 1 # 8 % 8 7 2 @ (Right)
Now,
Numbers which is immediately preceded by a number and also immediately followed by a number.
So, Needed pattern is: Number - Number - Number.
There are 2 Numbers which is immediately preceded by a number and also immediately followed by a number.
Hence, the correct answer is 'Option 2'.

Q96. Answer: (b) 339

The logic followed here is:
thus, "339" will replace the question mark in the given series.
Hence, the correct option is "Option 2".

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Q97. Answer: (b) D

Given: Seven boxes, A, B, C, D, M, N and O, are kept one over the other but not necessarily in the same order.

1) Only three boxes are kept above C.

2) Only one box is kept between O and C.

3) Only three boxes are kept between O and N.

4) N is kept at some place above C.

5) A is kept immediately below N.

6) B is kept at one of the places above D.

7) M is not kept immediately above or below O.

M
N
A
C
B
O
D

So, there are 'D' box is kept at the lowermost position

Hence, the correct answer is "Option 2".

Q98. Answer: (a) 2 km to the east

Given:

Hanish starts from Point A and drives 12 km towards the north.

He then takes a right turn, drives 8 km,

turns right and drives 17 km.

He then takes a right turn and drives 10 km.

He takes a final right turn, drives 5 km and stops at Point P.

So, 2 km to the east in order to reach Point A again.

Hence, the correct answer is "Option 1".

Q99. Answer: (a) OTEG

The logic followed here is:

For, URKE is related to QOGB

For, EFUS is related to ACQP

Similarly, for SWIJ

So, SWIJ will be related to OTEG

Hence, the correct answer is "Option 1".

Q100. Answer: (a) Northeast

Given:

Town J is to the south of Town K.

Town L is to the east of Town K.

Town M is to the north of Town L.

Town N is to the east of Town M.

Town O is to the northeast of Town N.

So, Northeast is the position of Town O with respect to Town J.

Hence, the correct answer is "Option 1".

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