SSC CHSL 2025 Tier-1 (Held On: 15 Nov, 2025 Shift 3) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2025 • 100 questions • 60 minutes • Answer key and solutions

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1 question is in Hindi and not printed here. Each one links to the online version, where you can read it.

ENGLISH LANGUAGE

Q1. Identify the part of the sentence that contains a grammatical error.

A. The companys latest report, B. which was released only this morning, C. provided the data that D. supports our initial hypothesis.

(a) The companys latest report
(b) which was released only this morning
(c) provided the data that
(d) supports our initial hypothesis.

Q2. Identify the part of the sentence that contains a grammatical error.

A. The reason for his failure B. is because he C. didn't study D. for the exam.

(a) The reason for his failure
(b) is because he
(c) didn't study
(d) for the exam.

Q3. Select the most appropriate synonym of the word: SURRENDER

(a) Resist
(b) Yield
(c) Confront
(d) Oppose

Q4. Fill in the blank with the most appropriate phrasal verb:

The investigation team will every detail before concluding the report.

(a) look over
(b) go through
(c) call off
(d) fall back

Q5. Select the most appropriate synonym of the word: Diffident

(a) Confident
(b) Bold
(c) Timid
(d) Assertive

Q6. Choose the correctly spelt word:

(a) Enthusiasm
(b) Enthusiam
(c) Enthuseam

(d) Enthusiasum

Q7. Which of the following sentences uses the word "bat" with the same meaning as in the following sentence?

"He took a swing with his new wooden bat"

(a) The bat is the only flying mammal.

(b) The coach handed him the bat before he went up to the plate.

(c) A furry little bat got into the attic last night.

(d) The bat's wingspan was surprisingly large.

Directions

Read the following passage and answer the questions based on it:

The mounting reality of climate migration represents a deep and vexing challenge to confront the ethical and planning paradigms of global society. As melting polar ice, desertification, and violent weather patterns make large areas unhabitable, millions are already being forced off their land, in the process creating a new generation of forced migrants who now have no official legal status as "climate refugees." The issue now is no longer whether this will occur, but how countries ought to act together and fairly. A thorough solution calls for a multi-faceted strategy: first, the creation of new international humanitarian and legal protocols to acknowledge and safeguard climate migrants and shift away from the present, limited definition of refugees. Second, it requires proactive, not reactive, policy, such as the establishment of legal and safe channels of resettlement, strong humanitarian assistance for uprooted persons, and serious investment in building climate resilience among those who are likely to be vulnerable, so that they are not displaced in the first place.

It puts in sharp relief the hard question of how the burden is to be shared. A strong case, based on the issue of climate justice, places the main burden on the industrialised world. They have been the biggest per-capita producers of greenhouse gases throughout history, something that is directly associated with the scale of the climate crisis. Their prosperity was primarily developed through carbon-polluting industries, and those are the same conditions responsible for destroying the least-developed countries, which have contributed minimal input to the crisis. Hence, an ethical and equitable response requires that these industrialized countries take the lead with both financial and logistical assistance. They must be leading the line in supporting adaptation projects in developing nations and having the resources necessary for the resettlement and integration of climate migrants. The international community has to eventually realize that the responsibility of climate change is not equally shared, and an equitable solution must involve people who caused the problem taking the initiative to mitigate the most destructive humanitarian effects of the problem.

Q8. According to the passage, what is the primary ethical dilemma posed by climate migration?

(a) Whether migrants should be allowed to resettle

(b) How the burden of climate migration should be shared

(c) Whether climate change is a natural occurrence

(d) How to prevent future climate change

Q9. in the passage, the word "vexing most nearly means:

(a) Annoying

(b) Uncertain

(c) Irritating

(d) Complex

Q10. What is meant by "climate justice as described in the passage?

(a) Fair distribution of global resources

(b) Accountability of industrialized nations for climate damage

(c) Equity in migration policies

(d) Global cooperation to reverse climate change

Q11. How does the passage characterize the current definition of "refugees" in the context of climate migration?

(a) It is too broad to include climate migrants

(b) It is narrow and insufficient to cover climate migrants

(c) It is accurate and universally accepted

(d) It is too rigid to address global migration

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Q12. What strategy is suggested in the passage to address climate migration?

(a) Reactive measures to control migration
(b) Proactive measures to prevent displacement
(c) Total ban on climate migration
(d) International immigration restrictions

Q13. Choose the correct meaning of the idiom: Fallen off the radar

(a) Gained attention
(b) Become unnoticed
(c) Avoided detection
(d) Gained popularity

Q14. Choose the correct meaning of the idiom: Dicing with death

(a) Taking extreme risks
(b) Playing a dangerous game
(c) Having a narrow escape
(d) Being in complete control

Q15. Which of the following sentences uses the word "board" with a different meaning from the others?

(a) The board of directors met yesterday.
(b) The captain had to board the ship.
(c) He nailed a picture of the board of directors on the wall.
(d) The board of directors decided to hire a new CEO.

Q16. Choose the correct one-word substitute for:

A person who loves collecting books.

(a) Bookworm
(b) Librarian
(c) Bibliophile
(d) Reader

Q17. Select the most appropriate antonym of the word: Innocuous

(a) Harmless
(b) Benign
(c) Harmful
(d) Safe

Q18. Select the most appropriate antonym of the word: Esoteric

(a) Arcane
(b) Common
(c) Mystica
(d) Obscure

Q19. Change the following sentence into the Active form.

The report could not be accessed without the proper security clearance.

(a) They could not access the report without the proper security clearance.
(b) The report cannot be accessed without the proper security clearance.
(c) Without the proper security clearance, the report was not accessed.
(d) The proper security clearance could not access the report.

Q20. Select the option that expresses the given sentence in indirect voice.

The director said, "The new actor will be arriving shortly."

(a) The director said that the new actor would be arriving shortly.
(b) The director said that the new actor will be arriving shortly.
(c) The director said that the new actor would arrive shortly.

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(d) The director said that the new actor had been arriving shortly.

Q21. Choose the most suitable option to replace the highlighted part of the sentence:

Each of the girls narrated their story

(a) Each of the girls narrated there story
(b) Each of the girls narrated his story
(c) Each of the girls narrated her story
(d) Each of the girls narrated their stories

Q22. Choose the correct passive voice transformation of the sentence:

My brother built this house in 2005.

(a) This house was built by my brother in 2005.
(b) This house is built by my brother in 2005.
(c) This house built by my brother in 2005.
(d) This house was being built by my brother in 2005.

Q23. Select the option that expresses the given sentence in direct voice.

The professor explained that although the theory had been considered correct for centuries, new findings now proved that it was flawed.

(a) The professor explained, "Although the theory had been considered correct for centuries, new findings now prove that it is flawed."
(b) The professor explained, "Although the theory was considered correct for centuries, new findings now prove that it is flawed."
(c) The professor explained, "Although the theory has been considered correct for centuries, new findings now prove that it is flawed."
(d) The professor explained, "Although the theory was considered correct for centuries, new findings then proved that it was flawed."

Q24. Rearrange the following sentence parts to form a meaningful and grammatically correct paragraph:

P. The old man, with his kind eyes and twisted hands, smiled softly.

Q. He had lived a whole life as a woodcarver, and his store was a museum of fragile works of art.

R. He held a tiny bird he was carving, his thumb caressing the slippery wood.

S. They all had a story, a memory, a piece of his soul.

(a) PQRS
(b) QPRS
(c) QSRP
(d) SQPR

Q25. Rearrange the following sentences to form a meaningful and grammatically correct paragraph:

P: She examined the old manuscript closely, observing the fading ink..

Q: After that, she turned the fragile pages carefully so as not to break them any more.

R: With a long history filled with tales, the book has been handed down through the centuries.

S: Before starting the restoration procedure, she got the equipment and supplies she would need ready.

(a) P, S, Q, R
(b) S, R, P, Q
(c) Q, S, P, R
(d) R, S, P, Q

GENERAL INTELLIGENCE

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Q26. If February 29, 2024, was a Thursday, what day of the week will February 29, 2028, be?

(a) Tuesday
(b) Saturday
(c) Sunday
(d) Monday

Q27. What is the product of the smallest prime number and the smallest odd composite number?

(a) 6
(b) 9
(c) 14
(d) 18

Q28. What is the result of 2.5 × 4.2 + 15.8 - 6.3?

(a) 19.5
(b) 20.0
(c) 18.0
(d) 17.5

Q29. The sum of three consecutive odd numbers is 69. What is the largest of these numbers?

(a) 21
(b) 23
(c) 25
(d) 27

Q30. The average weight of 4 boys is 45 kg. If a new boy with a weight of 55 kg joins them, what is the new average weight of the group?

(a) 46 kg
(b) 47 kg
(c) 48 kg
(d) 49 kg

Q31. Read the following statement carefully and identify the inference that follows.

Statement: The company has announced that it will be laying off 500 employees due to financial difficulties.

Inference:

1. The company is struggling to stay afloat.

II. The laid-off employees were not performing well.

III. The remaining employees will receive a pay raise.

(a) If only I follows
(b) If only II follows
(c) If both I and III follow
(d) If both II and III follow

Q32. Read the following statement carefully and identify the inference that follows.

Statement: The school has announced a new policy to promote gender equality.

Inference:

1. The school previously had a policy that discriminated against certain genders.

II. The new policy will have no impact on the students,

III. The school values gender equality and is taking steps to promote it.

(a) If only I follows
(b) If only III follows
(c) If both I and III follow
(d) If both II and III follow

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Q33. Directions: Pick the correct options from the given alternatives

11: 144 12:?

(a) 169
(b) 144
(c) 225
(d) 196

Q34. What will be the 5th term in the following series?

27, 81, 243, ...

(a) 729
(b) 2087
(c) 2187
(d) 2229

Q35. Select the correct option that will complete the series.

(4, 2), (9, 3), (16, 5), (25, 7), ?, (49, 13)

(a) (25, 9)
(b) (36, 9)
(c) (36, 11)
(d) (11,36)

Q36. Find the missing number pair in the following series. (2, 4), (3, 9), (5, 25), (7, 49), ?, (13, 169)

(a) (9,81)
(b) (11,121)
(c) (11,64)
(d) (121, 11)

Q37. Which one of the following numbers is divisible by both 11 and 13?

(a) 229
(b) 429
(c) 529
(d) 729

Q38. Directions: Pick the correct options from below.

27.5, 65, 126.5, 218, 345.5....?

(a) 435.5
(b) 480.5
(c) 515
(d) 520

Q39. Directions: Pick the correct options from below.

7.5, 11.5, ?, 17.5, 19.5

(a) 12
(b) 12.5
(c) 13
(d) 13.5

Q40. Directions: Pick the correct options from below.

0, 0.5, ?, 13.5, 32

(a) 1.5
(b) 3
(c) 4
(d) 6.5

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Q41. Complete the following series from the given options.

aab_ccaa_bbbcccaaa_bbbbcc_c

(a) baac
(b) abca
(c) bacc
(d) aacb

Q42. What comes next in the following series?

A1, B1, C2, D3, E5, F8, ?

(a) G9
(b) H10
(c) H12
(d) G13

Q43. What comes next in the following series?

A1, B1, C4, D9, E25, F64, ?

(a) G128
(b) G81
(c) G169
(d) H81

Q44. If: + → -,- → ×,× → +, / → / Then evaluate: 48 / (6 + 2) × (3 - 1) + 5 = ?

(a) 14
(b) 15
(c) 10
(d) 12

Q45. If: + → ×, - → ÷, × → +, / → - Then evaluate: [(12 + 6)×(9 - 3)] / (10 - 4) = ?

(a) 73.5
(b) 71.5
(c) 72.5
(d) 72

Q46. How many letter pairs are there in the word 'DESTRUCT' which has as many letters in both the forward direction and the backward direction as there are between them as per English alphabetical order?

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

Q47. From the given alternative words, select the word that cannot be formed using letters of the given word only once.

QUADRILATERAL

(a) QUARTER
(b) ALERT
(c) RETIRED
(d) ADULT

Q48. How many letter pairs are there in the word 'RECREATE' that have as many letters (in both the forward as well as the backward direction) as there are between them in the English alphabetical series?

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

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Q49. Identify the next number.

3, 6, 18, 72, ?

(a) 360
(b) 288
(c) 432
(d) 144

Q50. What comes next in the sequence?

2, 3, 5, 7, 11, 13,

(a) 17
(b) 18
(c) 21
(d) 23

QUANTITATIVE APTITUDE

Q51. Which one of the following is TRUE?

(a) All irrational numbers are real
(b) All real numbers are irrational
(c) Rational numbers are not real
(d) Integers are not rational

Q52. A right prism has a base that is a regular hexagon of side 6 cm. The height of the prism is 10 cm. A square cavity of side 2 cm is carved vertically through the center of the prism from top to bottom. Calculate the volume of the material remaining in the prism.

(a) 908.5 cm^3
(b) 895.3 cm^3
(c) 882.6 cm^3
(d) 867.2 cm^3

Q53. A glass manufacturer produces right prism blocks with a square base of side 10 cm and height 25 cm. If the selling price is Rs. 0.60 per cm^3 and the cost price is Rs. 0.40 per cm^3, what is the total profit earned on selling 12 such prisms?

(a) Rs. 5400
(b) Rs. 6000
(c) Rs. 6250
(d) *5800

Q54. A and B invest Rs. 50,000 and Rs. 40,000 respectively. After 6 months, A withdraws all of his capital. At the end of the year, what is their profit-sharing?

(a) 5:7
(b) 8:7
(c) 6:5
(d) 5:8

Q55. A started a business with Rs. 30,000. B joined after 5 months with Rs. 40,000. At the end of the year, what is their profit-sharing ratio?

(a) 5:9
(b) 9:7
(c) 4:5
(d) 7:8

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Q56. A right circular cylinder and a cone have the same base radius and height. What is the ratio of their volumes (cylinder: cone)?

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

Q57. The center of the circle that touches all triangle sides is:

(a) Incenter
(b) Centroid
(c) Circumcenter
(d) Orthocenter

Q58. If a cone is inscribed inside a cylinder of the same base and height, what is the ratio of the volume of the cone to that of the cylinder?

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

Q59. If 'x' = 3cos A + 4sin A and 'y' = 3sin A - 4cos A then find the value of 2(x 2 + y 2)

(a) 50
(b) 63
(c) 44
(d) 48

Q60. The ratio of the two angles of a triangle is 3:5, respectively. If the third angle of the triangle is 25% more than the sum of the given two angles of the triangle, then find the largest angle of the triangle.

(a) 100°
(b) 120°
(c) 80°
(d) 130°

Q61. ABC is a triangle where AB = 12 cm and ac = 18 cm. 'D' is a point on BC such that BD = CD. If the perimeter of the triangle is 48 cm, then find the length of AD.

(a) 2√11 cm
(b) √15 cm
(c) √22cm
(d) 3√17 cm

Q62. In triangle ABC, D and E are points on sides AB and AC respectively, such that DE || BC. If AD = 3 cm, DB = 6 cm, and AE = 4 cm, find EC.

(a) 8 cm
(b) 5 cm
(c) 6 cm
(d) 3 cm

Q63. An alloy contains zinc, copper and tin in the ratio 3:2:2 and another contains copper, tin and lead in the ratio 2:3: 5. If equal weights of both alloys are melted together to form a third alloy, then the weight of lead per kg in new alloy will be:

(a) 1 kg
(b) 0.75 kg
(c) 0.25 kg
(d) 0.50kg

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Q64. The cost of Type 1 wheat is Rs. 16 per kg, and Type 2 wheat is Rs. 24 per kg. If both Type 1 and Type 2 are mixed in the ratio of 3: 5, then the price per kg of the mixed variety of wheat is:

(a) 23 kg
(b) 22 kg
(c) 24 kg
(d) 21 kg

Q65. Sunil started a juice (lemon syrup + water) counter. Initially, he had 145 liters of juice, which had 30% water in it. He sold 22 liters of the juice. Then he added an equal amount of lemon syrup and water. Now the ratio of water to lemon syrup became 1:2. How much water was added later on?

(a) 9.25 litres
(b) 13.25 Litres
(c) 10.25 litres
(d) 12.3 litres

Q66. 6 liters of chocolate syrup are mixed in x liters of milk. If the syrup is 20% of the mixture, what is the value of x?

(a) 23 litres
(b) 24 litres
(c) 21 litres
(d) 26 litres

Q67. Amit can finish the work in 15 days, and Baban can finish the same work in 25 days. They work together for 5 days. The rest of the work was finished by Amit and Chetan in 4 days. How much time is required for Chetan to finish this work?

(a) 21 days
(b) 20 days
(c) 18 days
(d) 17 days

Q68. A can do a certain work in the same time that B and C together can do it. If A and B together could do it in 10 days and C alone in 40 days, then A alone could do it in:

(a) 16 days
(b) 19 days
(c) 14 days
(d) 13 days

Q69. A can finish the work in 16 days, and B can do the same work in 12 days. B worked for 8 days and left the job. In how many days, A alone finish the remaining work?

(a) 5 days 8 hours
(b) 7 days
(c) 4 days 10 hours
(d) 6 days

Q70. A rectangular tile having a perimeter of 224 cm has been used to pave a floor of length and breadth 25.6 m and 14.4 m, respectively. If the ratio of length to breadth of each tile is 4:3, then find the number of tiles required to pave the floor completely.

(a) 1800
(b) 1500
(c) 1600
(d) 1200

Q71. The area of a rectangle is 48 cm^2 more than that of a square. If the length of the rectangle is 4 cm more than the side of the square and the breadth of the rectangle is 2 cm less than the side of the square, then find the perimeter of both the square and the rectangle.

(a) 108 cm, 122 cm
(b) 112 cm, 116 cm

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(c) 145 cm, 156 cm
(d) 125 cm, 140 cm

Q72. Two circles C1 and C2 have radii 5 and 3 units, and their centers are 13 units apart. Then the number of common tangents they have is:
(a) 1
(b) 2
(c) 3
(d) 4

Q73. One of the angles of a quadrilateral is 84°. If the ratio of the remaining angles of a quadrilateral is 4:3:5, respectively, then find the difference between the smallest and largest angles.
(a) 16°
(b) 66°
(c) 46°
(d) 36°

Q74. If the graph of a linear equation passes through (0, -2) and has a slope -3, what is its equation?
(a) y = 3x - 2
(b) y = - 3x - 2
(c) y = - 3x + 2
(d) y = 3x + 2

Q75. A can complete the work in 12 days, B in 15 days, and C in 20 days They work in the following manner:
On the first day A works,
On the second day, B works,
On the third day, C works, The cycle repeats in the same same order.
In how many days will the work be completed?
(a) 5 days
(b) 10 days
(c) 15 days
(d) 20 days

GENERAL AWARENESS

Q76. What did kings often rewarded brahmanas with in the seventh century?
(a) Gold coins
(b) Land grants
(c) Cattle
(d) Horses

Q77. In early sixteenth-century, which ruler was known for the effective use of cannons in battles?
(a) Alauddin Khalji
(b) Sher Shah Sur
(c) Ibrahim Lodi
(d) Babur

Q78. The Petrapole-Benapole rail link connects which of the following country?
(a) India-Bhutan
(b) India-Nepal
(c) India-Bangladesh
(d) India-Myanmar

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Q79. The first high speed rail corridor is being implemented from Mumbai to Ahmedabad with technical and financial assistance from

(a) USA
(b) China
(c) France
(d) Japan

Q80. Who was the first woman to be awarded a Doctor of Science by an Indian University (Calcutta) in 1944?

(a) Asima Chatterjee
(b) Purnima Sinha
(c) Kamala Sohonie
(d) Bibha Chowdhary

Q81. Who served as the Prime Minister of India from 1991 to 1996?

(a) Charan Singh
(b) Rajiv Gandhi
(c) Gulzarilal Nanda
(d) P.V. Narasimha Rao

Q82. In July 2025, who was sworn in as governor of Goa?

(a) Kavinder Gupta
(b) Rajendra Arlekar
(c) Pusapati Ashok Gajapathi Raju
(d) Vinai Kumar Saxena

Q83. What is the total number of sections in Bharatiya Nagrik Suraksha Sanhita (BNSS), 2023?

(a) 531
(b) 558
(c) 258
(d) 333

Q84. A Centrally Sponsored Scheme, "ULLAS" seen in news in 2024 is related to which of the following?

(a) Agriculture
(b) E-vehicles
(c) Education
(d) Livestock Health

Q85. In India, the first hockey club came up in Calcutta in _____

(a) 1845-46
(b) 1855-56
(c) 1885-86
(d) 1895-96

Q86. Which team won the ICC Men's t20 World Cup 2024?

(a) India
(b) South Africa
(c) England
(d) Sri Lanka

Q87. Who won the Ranji trophy in 2024-25?

(a) Vidarbha
(b) Kerala
(c) Delhi
(d) Karnataka

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Q88. The Parvati Arga Bird Sanctuary is in which of the following state?

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

Q89. Commonwealth Games 2026 will be hosted in

(a) Glasgow
(b) Birmingham
(c) Auckland
(d) Perth

Q90. Durand Cup 2025 started in which month?

(a) July
(b) April
(c) June
(d) March

Q91. This question is in Hindi. Read it online.

Q92. "Chad Laho" is a popular traditional, season. -festival in Meghalaya, it is celebrated as a thanksgiving festival to God after the harvesting

(a) painting
(b) dance
(c) wrestling
(d) cooking

Q93. 'Gotipua Nacha' belongs to which of the following Indian state?

(a) Haryana
(b) Nagaland
(c) Tripura
(d) Odisha

Q94. What is the distance (in minutes) between the Sun and the Earth, in terms of light years?

(a) 5.861
(b) 8.311
(c) 9.461
(d) 12.653

Q95. Lagrange points are also known as points.

(a) Middle
(b) Libration
(c) Centre
(d) Shortcut

Q96. The statement given below signifies which of the law/principle given in the options.

"An object remains in a state of rest or of uniform motion in a straight line unless compelled to change that state by an applied force."

(a) First law of motion
(b) Second law of motion
(c) Third law of motion
(d) Bernoulli's principle

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Q97. Which company announced plans to launch a quantum computing centre in Amaravati, Andhra Pradesh, by March 2026?

(a) IBM
(b) Google
(c) Apple
(d) Accenture

Q98. In which of the following years the East India Company introduced the Permanent Settlement?

(a) 1765
(b) 1775
(c) 1793
(d) 1801

Q99. Which of the following organ is the longest part of the alimentary canal in the humans?

(a) Liver
(b) Small intestine
(c) Buccal cavity
(d) Oesophagus

Q100. The Harappans were the first in Eurasia to grow which crop?

(a) Tobacco
(b) Chilly
(c) Potato
(d) Cotton

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) The companys latest report

The correct answer is Option 1.

Key Points

• The primary issue in the sentence is the lack of a possessive apostrophe in the word "companys."
• To indicate that the report belongs to the company, the noun "company" must be in its possessive form.
• The correct spelling should be "company's" (singular possessive) to correctly modify the noun "report."
• Thus, the error is located in part A (Option 1) of the sentence.

Therefore, the correct answer is Option 1.

Correct Sentence: "The company's latest report, which was released only this morning, provided the data that supports our initial hypothesis."

Additional Information

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• B: "which was released only this morning," – This is a correctly structured non-restrictive relative clause providing additional information.

• C: "provided the data that" – This part uses the past tense "provided" correctly to describe an action that has already occurred.

• D: "supports our initial hypothesis." – This part is grammatically correct; "supports" is in the present tense because it describes a fact that remains true.

• Punctuation Rule: Singular nouns almost always form the possessive by adding an apostrophe and an "s" ('s).

Q2. Answer: (b) is because he

The correct answer is Option 2.

Key Points

• The primary issue in the sentence is the use of "is because" following the phrase "The reason."

• In formal English, the word "reason" itself implies a cause, making the word "because" redundant (a grammatical error known as a pleonasm).

• The noun "reason" should be followed by a complement clause beginning with "that" rather than the conjunction "because."

• Thus, the error is located in part B (Option 2) of the sentence.

Therefore, the correct answer is Option 2.

Correct Sentence: "The reason for his failure is that he didn't study for the exam."

Additional Information

• A: "The reason for his failure" – This serves as the subject of the sentence and is grammatically sound.

• C: "didn't study" – This is the correct past tense negative form of the verb.

• D: "for the exam." – This prepositional phrase correctly completes the thought.

• Redundancy Rule: Avoid using "the reason is because" in professional or academic writing; instead, use "the reason is that" or restructure the sentence to start with "He failed because..."

Q3. Answer: (b) Yield

The solution is in Hindi. Read it online.

Q4. Answer: (b) go through

The solution is in Hindi. Read it online.

Q5. Answer: (c) Timid

The solution is in Hindi. Read it online.

Q6. Answer: (a) Enthusiasm

The solution is in Hindi. Read it online.

Q7. Answer: (b) The coach handed him the bat before he went up to the plate.

The solution is in Hindi. Read it online.

Q8. Answer: (b) How the burden of climate migration should be shared

The correct answer is 'Option 2'.

Key Points

• Analyzing the passage:

• The passage explicitly states in the second paragraph: "It puts in sharp relief the hard question of how the burden is to be shared. A strong case, based on the issue of climate justice, places the main burden on the industrialised world."

• The text focuses on the ethical response required from industrialized nations because they are the largest historical producers of greenhouse gases. The central dilemma discussed is determining who is responsible for providing financial, logistical, and humanitarian support to those displaced by climate change.

Therefore, the correct answer is How the burden of climate migration should be shared.

Additional Information

• Option 1 (Whether migrants should be allowed to resettle): Incorrect. The passage assumes resettlement is necessary and focuses instead on establishing "legal and safe channels of resettlement," not debating whether they should be allowed to do so.

• Option 3 (Whether climate change is a natural occurrence): Incorrect. The passage treats climate change as a crisis heavily driven by the carbon-polluting industries of the industrialized world, not as a natural occurrence or a point of debate.

• Option 4 (How to prevent future climate change): Incorrect. While mitigation is mentioned, the primary focus of the passage and the specific ethical dilemma it highlights is the immediate humanitarian crisis of forced migration and how to equitably manage and fund the response.

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Q9. Answer: (d) Complex

The correct answer is 'Option 4'.

Key Points

• Analyzing the context:

• While the word "vexing" in everyday conversation often means annoying or frustrating, in a formal, academic context it refers to a problem or question that is highly difficult to resolve, deeply debated, and intricate.

• The passage describes climate migration as a challenge that confronts the "ethical and planning paradigms of global society," requiring new international laws, proactive policies, and complex global burden-sharing.

• Because the passage details the difficult, multi-faceted nature of solving this global crisis, "complex" best captures the meaning of a "vexing challenge" in this specific context.

Therefore, the correct answer is Complex.

Additional Information

• Option 1 (Annoying): Incorrect. This word is too trivial and casual to describe a massive global humanitarian and structural crisis.

• Option 2 (Uncertain): Incorrect. The passage explicitly states, "The issue now is no longer whether this will occur," meaning the reality of the situation is certain, not uncertain.

• Option 3 (Irritating): Incorrect. Similar to option 1, "irritating" downplays the profound severity and logistical difficulty of the challenge described.

Q10. Answer: (b) Accountability of industrialized nations for climate damage

The correct answer is 'Option 2'.

Key Points

• Analyzing "climate justice" in the passage:

• The passage explicitly links the concept of "climate justice" to the historical responsibility of wealthy nations. It states: "A strong case, based on the issue of climate justice, places the main burden on the industrialised world. They have been the biggest per-capita producers of greenhouse gases..."

• The text argues that because industrialized nations built their prosperity through carbon-polluting industries that are now destroying less-developed countries, an "ethical and equitable response" demands they provide the necessary financial and logistical assistance.

• Therefore, in this context, climate justice means holding the nations that caused the majority of the climate crisis accountable for repairing the damage and mitigating its effects.

Therefore, the correct answer is Accountability of industrialized nations for climate damage.

Additional Information

• Option 1 (Fair distribution of global resources): Incorrect because while resource distribution is a broad global issue, the passage specifically defines climate justice in terms of bearing the burden for historical greenhouse gas emissions.

• Option 3 (Equity in migration policies): Incorrect because migration policy equity is discussed in the first paragraph as part of a multi-faceted strategy, but the term "climate justice" in the second paragraph is specifically applied to the accountability of industrialized nations for causing the crisis.

• Option 4 (Global cooperation to reverse climate change): Incorrect because the passage primarily focuses on managing the humanitarian fallout (migration) and assigning responsibility for adaptation and resettlement, rather than reversing climate change itself.

Q11. Answer: (b) It is narrow and insufficient to cover climate migrants

The correct answer is 'Option 2'.

Key Points

• Analyzing the passage:

• The passage explicitly states that a thorough solution requires a "shift away from the present, limited definition of refugees."

• Earlier in the text, it notes that millions of displaced people currently "have no official legal status as 'climate refugees.'"

• This clearly indicates that the current legal definition is too "limited" (narrow) and therefore insufficient to provide official status and protection to people displaced specifically by climate change.

Therefore, the correct answer is It is narrow and insufficient to cover climate migrants.

Additional Information

• Option 1 (It is too broad to include climate migrants): Incorrect because the passage describes the definition as "limited," which is the opposite of broad. If it were too broad, climate migrants might already accidentally fall under it.

• Option 3 (It is accurate and universally accepted): Incorrect because the author argues for the "creation of new international humanitarian and legal protocols" to replace or update it, indicating it is currently inadequate.

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• Option 4 (It is too rigid to address global migration): Incorrect because the passage's critique is specifically focused on its failure to cover climate migrants, making Option 2 the most precise and text-supported choice.

Q12. Answer: (b) Proactive measures to prevent displacement

The correct answer is 'Option 2'.

Key Points

• Analyzing the passage:

• The passage explicitly advocates for a strategy that is forward-looking. It states that a thorough solution "requires proactive, not reactive, policy."

• Furthermore, it highlights the need for a "serious investment in building climate resilience among those who are likely to be vulnerable, so that they are not displaced in the first place."

• This clearly points to a strategy focused on anticipating the problem and putting proactive measures in place to prevent populations from being uprooted.

Therefore, the correct answer is Proactive measures to prevent displacement.

Additional Information

• Option 1 (Reactive measures to control migration): Incorrect because the text explicitly states the policy should be "proactive, not reactive."

• Option 3 (Total ban on climate migration): Incorrect because the author argues for the "establishment of legal and safe channels of resettlement," which is the opposite of a ban.

• Option 4 (International immigration restrictions): Incorrect because the passage supports creating "new international humanitarian and legal protocols to acknowledge and safeguard climate migrants," rather than restricting them.

Q13. Answer: (b) Become unnoticed

The solution is in Hindi. Read it online.

Q14. Answer: (a) Taking extreme risks

The solution is in Hindi. Read it online.

Q15. Answer: (b) The captain had to board the ship.

The solution is in Hindi. Read it online.

Q16. Answer: (c) Bibliophile

The solution is in Hindi. Read it online.

Q17. Answer: (c) Harmful

The solution is in Hindi. Read it online.

Q18. Answer: (b) Common

The solution is in Hindi. Read it online.

Q19. Answer: (a) They could not access the report without the proper security clearance.

The correct answer is Option 1.

Key Points

• Identify the Subject and Agent: In the passive sentence "The report could not be accessed...", the agent (who is doing the accessing) is missing. In such cases, we use a general pronoun like "They," "You," or "One" as the active subject.

• Identify the Verb and Tense: The verb is "could not be accessed" (Modal + be + V3). In the active voice, this becomes "could not access" (Modal + V1).

• Rearrange the Sentence: The placeholder subject "They" takes the action, "the report" becomes the direct object, and the conditional phrase "without the proper security clearance" remains at the end.

Therefore, the correct answer is Option 1.

Correct Sentence: "They could not access the report without the proper security clearance."

Additional Information

• Option 2: "cannot be accessed" – This changes the tense from the past possibility (could) to present (cannot) and remains in the passive voice.

• Option 3: "was not accessed" – This is still passive and changes the modal "could not" to a simple past statement of fact.

• Option 4: "The proper security clearance could not access..." – This is logically incorrect; a "clearance" is a status/document and cannot physically perform the action of accessing a report.

Q20. Answer: (a) The director said that the new actor would be arriving shortly.

The correct answer is Option 1.

Key Points

• Direct Speech: The director said, "The new actor will be arriving shortly."

• Key Conversions:

• Modal Verb Change (Backshifting):

• When the reporting verb is in the past ("said"), modal verbs in the direct speech must shift to their past forms.

• The modal "will" changes to "would."

• Tense Maintenance (Continuous Aspect):

• The original sentence is in the Future Continuous ("will be arriving").

• In indirect speech, the continuous aspect "be arriving" is preserved after the shifted modal "would."

• Conjunction:

• The comma and quotation marks are removed and replaced by "that" to connect the reporting clause with the reported statement.

Therefore, the correct answer is Option 1.

Correct Sentence: "The director said that the new actor would be arriving shortly."

Additional Information

• Option 2: Fails to shift the modal "will" to "would," which is necessary when the reporting verb is in the past.

• Option 3: Changes the aspect from continuous ("be arriving") to simple ("arrive"), which alters the original meaning of the speaker.

• Option 4: Uses the past perfect continuous ("had been arriving"), which incorrectly implies a past habitual action rather than a future planned arrival.

Q21. Answer: (c) Each of the girls narrated her story

The correct answer is 'Each of the girls narrated her story'.

Key Points

• The subject of the sentence is "Each of the girls," which is singular.

• The corresponding pronoun that aligns with the singular subject is "her" because the sentence refers to "girls" (females).

• Option 3 is the only grammatically correct choice that adheres to subject-pronoun agreement.

Therefore, the correct answer is Option 3.

Complete Sentence: "Each of the girls narrated her story."

Additional Information

• Option 1: "there story" is incorrect because "there" is an adverb, not a possessive pronoun.

• Option 2: "his story" is incorrect because it does not align with the gender reference to "girls."

• Option 4: "their stories" is incorrect because it assumes plural narration, while the subject "Each" is singular.

Q22. Answer: (a) This house was built by my brother in 2005.

The correct answer is Option 1.

Key Points

• Identify the Tense: The active sentence "built" is in the Simple Past Tense.

• Passive Structure for Simple Past: The formula is Object + was/were + Past Participle (V3) + by + Subject.

• Step 1: Identify the object "this house" and make it the new subject. Since "house" is singular, we use "was."

• Step 2: Use the third form (Past Participle) of the verb "build," which is "built."

• Step 3: Add the agent "by my brother" and the time reference "in 2005."

Therefore, the correct answer is Option 1.

Correct Sentence: "This house was built by my brother in 2005."

Additional Information

• Option 2: "is built" – This is the Present Simple Passive. It is incorrect because the action happened in the past (2005).

• Option 3: "built" – This lacks the auxiliary verb "was," making it grammatically incomplete as a passive sentence.

• Option 4: "was being built" – This is the Past Continuous Passive. It suggests the building was an ongoing process at that specific time, rather than a completed action.

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Q23. Answer: (c) The professor explained, "Although the theory has been considered correct for centuries, new findings now p...

The correct answer is Option 3.

Key Points

• Indirect Speech: The professor explained that although the theory had been considered correct for centuries, new findings now proved that it was flawed.

• Key Conversions:

• Tense Change (Forward-shifting):

• The past perfect passive "had been considered" shifts forward to the present perfect passive "has been considered" to show an action that started in the past and continues to the present moment of speaking.

• The simple past "proved" shifts forward to the simple present "prove."

• The simple past "was" shifts forward to the simple present "is."

• Time Expressions:

• The word "now" in the indirect speech suggests that at the time of the professor's original speech, the findings were current. Therefore, "now" is retained or restored in the direct speech.

• Punctuation:

• The conjunction "that" is removed and replaced with a comma and quotation marks to enclose the speaker's exact words.

Therefore, the correct answer is Option 3.

Correct Sentence: "The professor explained, 'Although the theory has been considered correct for centuries, new findings now prove that it is flawed.'"

Additional Information

• Option 1: Retains the past perfect ("had been considered"), which would imply the theory stopped being considered correct before another past event, rather than up until the moment of speaking.

• Option 2: Uses the simple past ("was considered"), which loses the "duration" aspect emphasized by "for centuries" in the original context.

• Option 4: Uses "then" and "proved" (past tense), which keeps the sentence in a reported/past perspective rather than converting it to the speaker's direct present perspective.

Q24. Answer: (a) PQRS

The correct answer is Option 1.

Key Points

• The paragraph is a character-driven narrative that moves from a general introduction of the person to their history, then to a specific action, and finally to a thematic reflection.

• Sentence P is the first sentence because it introduces the subject (the old man) and establishes his physical presence and mood:

• "The old man, with his kind eyes and twisted hands, smiled softly."

• Sentence Q follows to provide context and background for the man, explaining his profession and the setting of the scene:

• "He had lived a whole life as a woodcarver, and his store was a museum of fragile works of art."

• Sentence R is the third sentence as it transitions from the general store to the specific piece he is working on at this moment:

• "He held a tiny bird he was carving, his thumb caressing the slippery wood."

• Sentence S is the fourth sentence because the pronoun "They" refers back to the "works of art" mentioned in Q (and includes the bird in R), providing a sentimental conclusion to the passage:

• "They all had a story, a memory, a piece of his soul."

• The correct sequence is PQRS.

Coherent paragraph after rearrangement:

"The old man, with his kind eyes and twisted hands, smiled softly. He had lived a whole life as a woodcarver, and his store was a museum of fragile works of art. He held a tiny bird he was carving, his thumb caressing the slippery wood. They all had a story, a memory, a piece of his soul."

Q25. Answer: (d) R, S, P, Q

The correct answer is Option 4.

Key Points

• The paragraph follows a logical flow from the historical context of an object to the professional preparation and execution of its restoration.

• Sentence R is the first sentence as it introduces the subject (the book) and provides the necessary background information

regarding its age and significance:

• "With a long history filled with tales, the book has been handed down through the centuries."

• Sentence S follows by shifting the focus to the restorer's preparation, setting the stage for the work to come:

• "Before starting the restoration procedure, she got the equipment and supplies she would need ready."

• Sentence P is the third sentence because it describes the first active step of the restoration process—the detailed visual inspection:

• "She examined the old manuscript closely, observing the fading ink."

• Sentence Q is the fourth as it uses the transition phrase "After that" to indicate the next physical action taken after the initial examination:

• "After that, she turned the fragile pages carefully so as not to break them any more."

• The correct sequence is RSPQ.

Coherent paragraph after rearrangement:

"With a long history filled with tales, the book has been handed down through the centuries. Before starting the restoration procedure, she got the equipment and supplies she would need ready. She examined the old manuscript closely, observing the fading ink. After that, she turned the fragile pages carefully so as not to break them any more."

Q26. Answer: (a) Tuesday

Given: February 29, 2024 is Thursday.

Now, 2024 to 2028 = 4 years.

In 4 years:

2025 → 1 odd day

2026 → 1 odd day

2027 → 1 odd day

2028 (till Feb 29, leap year) → 2 odd days

Total odd days = 1 + 1 + 1 + 2 = 5 days.

And, 5 days = 5/7 = 0 week and 5 odd days.

So, February 29, 2028 = Thursday + 5 = Tuesday.

Hence, the correct answer is "Option 1".

Q27. Answer: (d) 18

The logic followed here is:

Logic: Identify the smallest prime number and the smallest odd composite number, then find their product.

Calculation:

Smallest prime number = 2

Smallest odd composite number = 9

Product = 2 × 9 = 18

Hence, the correct answer is Option 4.

Q28. Answer: (b) 20.0

BODMAS Table:

The logic followed here is:

Logic: Apply BODMAS (Multiplication first, then addition and subtraction).

Calculation:

2.5 × 4.2 = 10.5

Now,

10.5 + 15.8 − 6.3

=> 26.3 − 6.3 = 20.0

Hence, the correct answer is Option 2.

Q29. Answer: (c) 25

The logic followed here is:

Logic: Let the three consecutive odd numbers be (x − 2), x, (x + 2).

Calculation:

(x − 2) + x + (x + 2) = 69

=> 3x = 69

=> x = 23

Largest number = x + 2 = 25

Hence, the correct answer is Option 3.

Q30. Answer: (b) 47 kg

The logic followed here is:

Logic: Use the formula → Average = Total Sum ÷ Number of terms.

Calculation:

Total weight of 4 boys = 4 × 45 = 180

New total weight = 180 + 55 = 235

New number of boys = 5

New average = 235 ÷ 5 = 47 kg

Hence, the correct answer is Option 2.

Q31. Answer: (a) If only I follows

Given Statement:

The company has announced that it will be laying off 500 employees due to financial difficulties.

Conclusions:

I. The company is struggling to stay afloat –

True (The layoffs are due to financial difficulties, indicating the company is struggling).

II. The laid-off employees were not performing well –

False (There is no information about performance; layoffs are due to financial reasons).

III. The remaining employees will receive a pay raise – False (No information about pay raises is provided).

Hence, only conclusion I follows.

The correct answer is "Option 1".

Q32. Answer: (b) If only III follows

Given Statement:

The school has announced a new policy to promote gender equality.

Conclusions:

I. The school previously had a policy that discriminated against certain genders –

False (No information about previous policies is given).

II. The new policy will have no impact on the students –

False (The statement implies the policy is intended to promote gender equality, so some impact is expected).

III. The school values gender equality and is taking steps to promote it –

True (The announcement of the policy clearly shows the school's intent to promote gender equality).

Hence, only conclusion III follows.

The correct answer is "Option 2".

Q33. Answer: (a) 169

The logic followed here is:

Logic: The pattern is based on perfect squares of consecutive numbers.

11: 144 → 144 = 12^2

12: ? → Next number squared = 13^2 = 169

Hence, the correct answer is Option 1.

Q34. Answer: (c) 2187

The logic followed here is:

thus, "2187" will replace the question mark in the given series.

Hence, the correct option is "Option 3".

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Q35. Answer: (c) (36, 11)

The logic followed here is:
Logic: First numbers are perfect squares and second numbers follow prime numbers.
thus, "(36, 11)" will replace the question mark in the given series.
Hence, the correct option is "Option 3".

Q36. Answer: (b) (11,121)

The logic followed here is:
Logic: First numbers are prime numbers and second numbers are their squares.
thus, "(11,121)" will replace the question mark in the given series.
Hence, the correct option is "Option 2".

Q37. Answer: (b) 429

The logic followed here is:
Logic: A number divisible by both 11 and 13 must be divisible by their LCM.
LCM of 11 and 13 = 11 × 13 = 143
Now, check options:
229 ÷ 143 ≠ integer
429 ÷ 143 = 3
529 ÷ 143 ≠ integer
729 ÷ 143 ≠ integer
Hence, the correct answer is Option 2.

Q38. Answer: (c) 515

The logic followed here is:
thus, "515" will replace the question mark in the given series.
Hence, the correct option is "Option 3".

Q39. Answer: (d) 13.5

The logic followed here is:
thus, "13.5" will replace the question mark in the given series.
Hence, the correct option is "Option 4".

Q40. Answer: (c) 4

The logic followed here is:
thus, "4" will replace the question mark in the given series.
Hence, the correct option is "Option 3".

Q41. Answer: (a) baac

The logic followed here is:
Given Sequence: aab_ccaa_bbbcccaaa_bbbbcc_c
Now, putting the letters in the blank spaces given in the option one by one:
Option 1) baac
→ aabbcc / aaabbbccc / aaaabbbbcccc
→ pattern continues correctly with increasing letters
Option 2) abca
→ aab / abca / aaa / bbbbcc / c
→ pattern breaks
Option 3) bacc
→ aabbcc / aaabbbccc / aaacbbbbcccc
→ pattern breaks
Option 4) aacb
→ aab / aacb / aaa / bbbbcc / c
→ pattern breaks

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Hence, the correct answer is Option 1.

Q42. Answer: (d) G13

The logic followed here is:

Logic: Numbers follow the pattern if Fibonacci series (1, 1, 2, 3, 5, 8, 13)

So, 'G13' will replace the question mark in the given series.

Hence, the correct answer is "Option 4".

Q43. Answer: (c) G169

The logic followed here is:

So, 'G169' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

Q44. Answer: (c) 10

BODMAS Table:

Given equation: 48 ÷ (6 + 2) × (3 − 1) + 5 = ?

Now, if the operations are interchanged as: + → −, − → ×, × → +, ÷ → ÷, then:

=> 48 ÷ (6 − 2) + (3 × 1) − 5 = ?

=> 48 ÷ 4 + 3 − 5 = ?

=> 12 + 3 − 5 = ?

=> 15 − 5 = 10

Hence, the correct answer is "Option 3".

Q45. Answer: (c) 72.5

BODMAS Table:

Given equation: [(12 + 6) × (9 − 3) ÷ (10 − 4) = ?]

Now, if the operations are interchanged as: + → ×, − → ÷, × → +, ÷ → −, then:

=> [(12 × 6) + (9 ÷ 3) − (10 ÷ 4)]

=> 72 + 3 − 2.5 = ?

=> 75 − 2.5 = ?

=> 72.5

Hence, the correct answer is "Option 3".

Q46. Answer: (c) Two

Given word: DESTRUCT

Rule: Count pairs where the number of letters between them in the word is equal to the number of letters between them in the English alphabetical order (both forward and backward).

Letters D E S T R U C T

Now, checking valid pairs:

Valid pairs: (DE), (ST)

Total pairs = 2

Hence, the correct answer is Option (3).

Q47. Answer: (c) RETIRED

Given word: QUADRILATERAL

Rule:

Each letter can be used only once.

Letter Q U A D R I L A T E R A L

Count 1 1 3 1 2 1 2 3 1 1 2 3

Now, check each option:

Word	Letter Count Used	Result
QUARTER	Q(1), U(1), A(1), R(2), T(1), E(1)	Possible
ALERT	A(1), L(1), E(1), R(1), T(1)	Possible

RETIRED	R(2), E(2), T(1), I(1), D(1)	Not Possible
ADULT	A(1), D(1), U(1), L(1), T(1)	Possible

The word that cannot be formed is RETIRED.

Hence, the correct answer is Option 3.

Q48. Answer: (c) Two

Given word: RECREATE

Rule:

Count pairs where the number of letters between them in the word is equal to the number of letters between them in the English alphabetical order (both forward and backward).

Pair	Alphabet Gap	Word Gap
R – E	12	0
E – C	1	1
C – E	1	1
A – T	18	3
T – E	15	1

Valid pairs: (E, C), (C, E)

Total pairs = 2

Hence, the correct answer is Option 3.

Q49. Answer: (a) 360

The logic followed here is:

thus, "360" will replace the question mark in the given series.

Hence, the correct option is "Option 1".

Q50. Answer: (a) 17

The logic followed here is:

thus, "17" will replace the question mark in the given series.

Hence, the correct option is "Option 1".

Q51. Answer: (a) All irrational numbers are real

Concept Used:

1. Real numbers = Rational numbers U Irrational numbers.

2. Integers subset of Rational numbers subset of Real numbers.

Calculation:

=> All irrational numbers are a subset of real numbers.

=> Not all real numbers are irrational (e.g., rational numbers exist).

=> Rational numbers are a subset of real numbers.

=> Integers are also rational numbers.

Therefore The correct answer is Option 1.

Q52. Answer: (b) 895.3 cm^3

Given:

Side of hexagon = 6 cm

Height = 10 cm

Side of square = 2 cm

Formula Used:

Area of regular hexagon = $(3\sqrt{3} \div 2) \times a^2$

Volume = Base area × height

Calculation:

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=> Base area = (3√3 ÷ 2) × 6² = 54√3 ≈ 54 × 1.732 = 93.528
=> Volume of prism = 93.528 × 10 = 935.28
=> Volume of cavity = 2 × 2 × 10 = 40
=> Remaining volume = 935.28 - 40 = 895.28 ≈ 895.3
Therefore The correct answer is 895.3 cm³.

Q53. Answer: (b) Rs. 6000

Given:
Side of square base = 10 cm
Height = 25 cm
Selling price = 0.60 per cm³
Cost price = 0.40 per cm³
Number of prisms = 12
Formula Used:
Volume = base area × height
Profit = (SP - CP) × Volume × number of prisms
Calculation:
=> Volume = 10 × 10 × 25 = 2500
=> Profit per cm³ = 0.60 - 0.40 = 0.20
=> Profit per prism = 2500 × 0.20 = 500
=> Total profit = 500 × 12 = 6000
Therefore The correct answer is 6000.

Q54. Answer: (d) 5:8

Given:
A's investment = Rs. 50,000
B's investment = Rs. 40,000
A withdraws after 6 months.
Total duration = 12 months.
Formula Used:
Profit-sharing ratio = Investment × Time
Calculation:
=> A's share = Rs. 50,000 × 6
=> A's share = Rs. 3,00,000
=> B's share = Rs. 40,000 × 12
=> B's share = Rs. 4,80,000
=> Ratio of A : B = Rs. 3,00,000 : Rs. 4,80,000
=> Ratio of A : B = 5 : 8
Therefore The correct answer is 5:8.

Q55. Answer: (b) 9:7

Given:
A's investment = Rs. 30,000
B's investment = Rs. 40,000
A's investment period = 12 months
B's investment period = 12 - 5 = 7 months
Formula Used:
Profit-sharing ratio = (Investment of A × Time period of A) : (Investment of B × Time period of B)
Calculation:
=> A's contribution = 30,000 × 12 = 3,60,000
=> B's contribution = 40,000 × 7 = 2,80,000
=> Ratio = 3,60,000 : 2,80,000
=> Ratio = 360 : 280

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=> Ratio = 9 : 7

Therefore The correct answer is 9:7.

Q56. Answer: (c) 3:1

Given:

Base radius of cylinder = Base radius of cone = r

Height of cylinder = Height of cone = h

Formula Used:

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

Volume of cone = $(1/3)\pi r^2 h$

Ratio of volumes (cylinder: cone) = Volume of cylinder ÷ Volume of cone

Calculation:

=> Volume of cylinder = $\pi r^2 h$

=> Volume of cone = $(1/3)\pi r^2 h$

=> Ratio of volumes (cylinder: cone) = $[\pi r^2 h] \div [(1/3)\pi r^2 h]$

=> Ratio of volumes = 3:1

Therefore The correct answer is 3:1.

Q57. Answer: (a) Incenter

Concept Used:

The incenter is the point where the angle bisectors of a triangle meet.

This point is also the center of the incircle, which is the circle that touches all sides of the triangle internally.

Calculation:

=> The incenter is determined using the formula for internal angle bisectors.

=> It is equidistant from all sides of the triangle, making it the center of the incircle.

Therefore The correct answer is Incenter.

Q58. Answer: (d) 1:3

Shortcut Trick

The volume of a cone is always one-third the volume of a cylinder if they share the same base radius and vertical height.

Ratio = Volume of Cone : Volume of Cylinder

Ratio = (1/3) : 1

Ratio = 1 : 3

Therefore The correct answer is 1:3.

Alternate Method

Given:

Base radius of cylinder and cone = r

Height of cylinder and cone = h

Formula Used:

Volume of Cylinder = $\pi r^2 h$

Volume of Cone = $(1/3)\pi r^2 h$

Calculations:

=> Volume of Cone ($V_{(cone)}$) = $(1/3) \times \pi \times r^2 \times h$

=> Volume of Cylinder ($V_{(cylinder)}$) = $\pi \times r^2 \times h$

=> Ratio = $V_{(cone)} : V_{(cylinder)}$

=> Ratio = $[(1/3)\ \pi r^2 h] : [\pi r^2 h]$

=> Ratio = 1/3 : 1

=> Ratio = 1 : 3

Therefore The correct answer is 1:3.

Additional Information

Slant Height of a Cone

The slant height (l) of a cone is the distance from the apex to any point on the base circle, calculated as $l = \sqrt{(r^2 + h^2)}$.

Total Surface Area of Cylinder

The total surface area includes the curved surface and two circular bases, given by $2\pi rh + 2\pi r^2$.

Volume of a Sphere

If a sphere is also inscribed in the same cylinder (where $h = 2r$), its volume is $(4/3)\pi r^3$, making the volume ratio Cone : Sphere : Cylinder = 1 : 2 : 3.

Q59. Answer: (a) 50

Given:

$x = 3\cos A + 4\sin A$

$y = 3\sin A - 4\cos A$

Formula Used:

$(a + b)^2 = a^2 + 2ab + b^2$

$(a - b)^2 = a^2 - 2ab + b^2$

$\sin^2 A + \cos^2 A = 1$

Calculation:

$\Rightarrow x^2 = (3\cos A + 4\sin A)^2 = 9\cos^2 A + 24\sin A\cos A + 16\sin^2 A$

$\Rightarrow y^2 = (3\sin A - 4\cos A)^2 = 9\sin^2 A - 24\sin A\cos A + 16\cos^2 A$

$\Rightarrow x^2 + y^2 = (9\cos^2 A + 16\cos^2 A) + (9\sin^2 A + 16\sin^2 A)$

$\Rightarrow = 25\cos^2 A + 25\sin^2 A$

$\Rightarrow = 25(\cos^2 A + \sin^2 A) = 25$

$\Rightarrow 2(x^2 + y^2) = 2 \times 25 = 50$

Therefore The correct answer is 50.

Q60. Answer: (a) 100°

Given:

Ratio of two angles = 3:5

Third angle = 25% more than the sum of the two angles

Sum of angles in a triangle = 180°

Formula Used:

Sum of angles in a triangle = Angle 1 + Angle 2 + Angle 3

Third angle = Sum of given two angles + 25% of their sum

Calculation:

Let the two angles be 3x and 5x.

$\Rightarrow$ Sum of the two angles = $3x + 5x = 8x$

$\Rightarrow$ Third angle = $8x + 25\%$ of $8x = 8x + (25/100) \times 8x$

$\Rightarrow$ Third angle = $8x + 2x = 10x$

Sum of all angles = 180°

$\Rightarrow 3x + 5x + 10x = 180$

$\Rightarrow 18x = 180$

$\Rightarrow x = 10$

First angle = $3x = 3 \times 10 = 30°$

Second angle = $5x = 5 \times 10 = 50°$

Third angle = $10x = 10 \times 10 = 100°$

Therefore The correct answer is 100°.

Q61. Answer: (d) 3√17 cm

Given:

AB = 12

AC = 18

Perimeter = 48

BD = CD

Formula Used:

Median length = $(1 \div 2) \times \sqrt{(2b^2 + 2c^2 - a^2)}$

Calculation:

=> BC = 48 - (12 + 18) = 18
=> AD = (1 ÷ 2) × √(2×18² + 2×12² - 18²)
=> = (1 ÷ 2) × √(2×324 + 2×144 - 324)
=> = (1 ÷ 2) × √(648 + 288 - 324)
=> = (1 ÷ 2) × √612
=> = (1 ÷ 2) × √(36×17) = (1 ÷ 2) × 6√17
=> = 3√17
Therefore The correct answer is 3√17 cm.

Q62. Answer: (a) 8 cm

Given:
AD = 3
DB = 6
AE = 4
DE || BC
Formula Used:
Basic proportionality theorem = AD ÷ DB = AE ÷ EC
Calculation:
=> AD ÷ DB = AE ÷ EC
=> 3 ÷ 6 = 4 ÷ EC
=> 1 ÷ 2 = 4 ÷ EC
=> EC = 4 × 2 = 8
Therefore The correct answer is 8 cm.

Q63. Answer: (c) 0.25 kg

Given:
Alloy 1 ratio = 3 : 2 : 2
Alloy 2 ratio = 2 : 3 : 5
Equal weights mixed
Formula Used:
Fraction = Part ÷ Total parts
Calculation:
=> Total parts in alloy 1 = 3 + 2 + 2 = 7
=> Total parts in alloy 2 = 2 + 3 + 5 = 10
=> Lead in alloy 1 = 0
=> Lead in alloy 2 = 5 ÷ 10 = 1 ÷ 2
=> Take 1 kg each
=> Lead from alloy 1 = 0
=> Lead from alloy 2 = 1 × 1 ÷ 2 = 1 ÷ 2 kg
=> Total mixture = 2 kg
=> Lead per kg = (1 ÷ 2) ÷ 2 = 1 ÷ 4 = 0.25
Therefore The correct answer is 0.25 kg.

Q64. Answer: (d) 21 kg

Given:
Price1 = 16
Price2 = 24
Ratio = 3 : 5
Formula Used:
Mean Price = (a × x + b × y) ÷ (x + y)
Calculation:
=> Mean Price = (16 × 3 + 24 × 5) ÷ (3 + 5)
=> Mean Price = (48 + 120) ÷ 8

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=> Mean Price = 168 ÷ 8

=> Mean Price = 21

Therefore The correct answer is 21.

Q65. Answer: (d) 12.3 litres

Shortcut Trick

Remaining juice after selling 22 litres = 145 − 22 = 123 litres.

Initial Water = 30% of 123 = 36.9 litres | Lemon Syrup = 123 − 36.9 = 86.1 litres.

Let x be the equal amount added: (36.9 + x) / (86.1 + x) = 1 / 2.

Cross multiplying: 73.8 + 2x = 86.1 + x => x = 12.3 litres.

Therefore The correct answer is 12.3 litres.

Alternate Method

Given: Initial volume = 145 L, Water % = 30%, Sold = 22 L, Final ratio (W:L) = 1:2.

Step 1: Calculate quantities in the remaining mixture

=> Total remaining juice = 145 − 22 = 123 litres

=> Water in 123 L = 30% of 123 = 0.3 × 123 = 36.9 litres

=> Lemon Syrup in 123 L = 123 − 36.9 = 86.1 litres

Step 2: Apply the addition logic

=> Let x litres of water and x litres of lemon syrup be added.

=> New Water = 36.9 + x

=> New Lemon Syrup = 86.1 + x

=> Given Ratio (Water : Syrup) = 1 : 2

=> (36.9 + x) / (86.1 + x) = 1 / 2

=> 2 × (36.9 + x) = 86.1 + x

=> 73.8 + 2x = 86.1 + x

=> 2x − x = 86.1 − 73.8

=> x = 12.3 litres

Therefore The correct answer is 12.3 litres.

Additional Information

Mixture Concentration Rule

When a portion of a mixture is removed, the ratio of components in the remaining mixture remains the same as the original mixture.

Alligation Method

It is a rule used to find the ratio in which two or more ingredients at a given price/concentration must be mixed to produce a mixture of a desired price/concentration.

Percentage to Ratio Conversion

A concentration of n% of a substance means the ratio of that substance to the total mixture is n : 100.

Q66. Answer: (b) 24 litres

Shortcut Trick

The Syrup is 20% of the mixture, which means the Milk (x) constitutes the remaining 80%.

Ratio of Syrup : Milk = 20% : 80% = 1 : 4

Given that 1 unit (Syrup) = 6 litres.

Therefore, 4 units (Milk) = 4 × 6 = 24 litres.

Therefore The correct answer is 24 litres.

Alternate Method

Given:

Quantity of Syrup = 6 litres

Quantity of Milk = x litres

Syrup Percentage in the Mixture = 20%

Formula Used:

Percentage of a component = (Component Quantity ÷ Total Mixture Quantity) × 100

Calculations:

=> Total Mixture = (6 + x) litres

=> 20 = [6 ÷ (6 + x)] × 100

=> 20 ÷ 100 = 6 ÷ (6 + x)

=> 1 ÷ 5 = 6 ÷ (6 + x)

=> 6 + x = 6 × 5

=> 6 + x = 30

=> x = 30 − 6

=> x = 24 litres

Therefore The correct answer is 24 litres.

Additional Information

Percentage Composition

The percentage of any ingredient in a mixture is calculated as (Part ÷ Whole) × 100. If one part is P%, the other part in a two-component mixture must be (100 − P)%.

Ratio and Proportion in Mixtures

The amount of substances in a mixture can be expressed as a ratio. If Syrup is 20% and Milk is 80%, the ratio is 20:80 or 1:4, which simplifies many algebraic steps.

Dilution Principle

When more solvent (like milk) is added to a solute (like syrup), the quantity of the solute remains constant while its percentage concentration in the total volume decreases.

Q67. Answer: (b) 20 days

Given:

Amit time = 15 days

Baban time = 25 days

Together work time = 5 days

Remaining work done by Amit + Chetan in 4 days

Formula Used:

Work = LCM of times

Efficiency = Work ÷ Time

Calculation:

=> LCM of 15, 25 = 75

=> Amit efficiency = 75 ÷ 15 = 5

=> Baban efficiency = 75 ÷ 25 = 3

=> (Amit + Baban) efficiency = 5 + 3 = 8

=> Work done in 5 days = 8 × 5 = 40

=> Remaining work = 75 - 40 = 35

=> (Amit + Chetan) efficiency = 35 ÷ 4

=> (Amit + Chetan) efficiency = 8.75

=> Chetan efficiency = 8.75 - 5

=> Chetan efficiency = 3.75

=> Time taken by Chetan = 75 ÷ 3.75

=> Time = 20 days

Therefore The correct answer is 20 days.

Q68. Answer: (a) 16 days

Given:

(A + B) time = 10 days

C time = 40 days

A = B + C

Formula Used:

Work = LCM of times

Efficiency = Work ÷ Time

Calculation:

=> LCM of 10, 40 = 40
=> (A + B) efficiency = 40 ÷ 10 = 4
=> C efficiency = 40 ÷ 40 = 1
=> A efficiency = B + C
=> A = B + 1
=> A + B = 4
=> (B + 1) + B = 4
=> 2B + 1 = 4
=> 2B = 3
=> B = 1.5
=> A = 1.5 + 1 = 2.5
=> Time taken by A = 40 ÷ 2.5
=> Time = 16 days
Therefore The correct answer is 16 days.

Q69. Answer: (a) 5 days 8 hours

Given:
A time = 16 days
B time = 12 days
B worked = 8 days
Formula Used:
Work = LCM of times
Efficiency = Work ÷ Time
Calculation:
=> LCM of 16, 12 = 48
=> A efficiency = 48 ÷ 16 = 3
=> B efficiency = 48 ÷ 12 = 4
=> Work done by B in 8 days = 4 × 8 = 32
=> Remaining work = 48 - 32 = 16
=> Time taken by A = 16 ÷ 3
=> Time = 5 days 8 hours
Therefore The correct answer is 5 days 8 hours.

Q70. Answer: (d) 1200

Given:
Perimeter of tile = 224 cm
Length : Breadth = 4 : 3
Floor length = 25.6 m = 2560 cm
Floor breadth = 14.4 m = 1440 cm
Formula Used:
Perimeter = 2 × (l + b)
Area = Length × Breadth
Calculation:
=> 2 × (l + b) = 224
=> l + b = 112
=> Let l = 4x and b = 3x
=> 4x + 3x = 112
=> 7x = 112
=> x = 16
=> l = 64 cm and b = 48 cm
=> Area of tile = 64 × 48 = 3072 cm^2
=> Area of floor = 2560 × 1440 = 3686400 cm^2

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=> Number of tiles = 3686400 ÷ 3072
=> Number of tiles = 1200
Therefore The correct answer is 1200.

Q71. Answer: (b) 112 cm, 116 cm

Given:
Let side of square = x
Length of rectangle = x + 4
Breadth of rectangle = x - 2
Area difference = 48
Formula Used:
Area of square = x × x
Area of rectangle = Length × Breadth
Perimeter = 2 × (l + b)
Calculation:
=> (x + 4)(x - 2) - x × x = 48
=> (x^2 + 4x - 2x - 8) - x^2 = 48
=> 2x - 8 = 48
=> 2x = 56
=> x = 28
=> Perimeter of square = 4 × 28
=> Perimeter of square = 112 cm
=> Perimeter of rectangle = 2 × (28 + 4 + 28 - 2)
=> Perimeter of rectangle = 2 × (32 + 26)
=> Perimeter of rectangle = 2 × 58
=> Perimeter of rectangle = 116 cm
Therefore The correct answer is 112 cm and 116 cm.

Q72. Answer: (d) 4

Given:
Radius of C1 = 5
Radius of C2 = 3
Distance between centers = 13
Formula used:
If distance between centers > sum of radii => 4 common tangents
Calculations:
Sum of radii
=> 5 + 3 = 8
Compare with distance
=> 13 > 8
Condition satisfied
=> Circles are separate (non-intersecting)
=> Number of common tangents = 4
Therefore Total common tangents = 4

Q73. Answer: (c) 46°

Given:
One angle = 84°
Remaining angles ratio = 4 : 3 : 5
Formula Used:
Sum of angles of quadrilateral = 360°
Calculation:
=> Sum of remaining angles = 360 - 84 = 276

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=> 4x + 3x + 5x = 276

=> 12x = 276

=> x = 23

=> Angles = 4 × 23 = 92°, 3 × 23 = 69°, 5 × 23 = 115°

=> Difference = 115 - 69 = 46°

Therefore The correct answer is 46°.

Q74. Answer: (b) y = - 3x - 2

Given:

Slope = -3

Point = (0, -2)

Formula Used:

y = mx + c

Calculation:

=> -2 = -3 × 0 + c

=> c = -2

=> y = -3x - 2

Therefore The correct answer is y = -3x - 2.

Q75. Answer: (c) 15 days

Given:

A time = 12 days

B time = 15 days

C time = 20 days

Formula Used:

Work = LCM of times

Efficiency = Work ÷ Time

Calculation:

=> LCM of 12, 15, 20 = 60

=> A efficiency = 60 ÷ 12 = 5

=> B efficiency = 60 ÷ 15 = 4

=> C efficiency = 60 ÷ 20 = 3

=> Work done in 3 days (A + B + C) = 5 + 4 + 3 = 12

=> Work done in 15 days = 12 × 5 = 60

=> Total work = 60

=> Time = 15 days

Therefore The correct answer is 15 days.

Q76. Answer: (b) Land grants

The correct answer is Land grants.

Key Points

• In the seventh century, kings often rewarded Brahmanas by giving them land grants, which were called “brahmadeya”.

• These land grants were tax-free and were typically given to Brahmanas to ensure their loyalty and to spread religious and cultural practices.

• The land was either cultivated by the Brahmanas themselves or by hired laborers, and the produce from these lands was used for their sustenance.

• This practice was rooted in the belief that Brahmanas, being at the top of the Varna system, were the custodians of knowledge and religious duties, and rewarding them would ensure prosperity and blessings for the kingdom.

• Such grants played a crucial role in the expansion of Brahmanical traditions and the spread of Vedic culture across the Indian subcontinent.

Additional Information

• Land grants in early medieval India:

• The process of land grants became more institutionalized during the early medieval period, especially between the 4th and 13th centuries CE.

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• The grants were documented on copper plates and were given to Brahmanas, temples, or monasteries to strengthen the socio-religious order.

• These grants were often accompanied by privileges like exemption from taxes, and the grantees were given administrative control over the land.

• Role of Brahmanas:

• Brahmanas were considered the intellectual and spiritual elite, responsible for performing rituals, teaching, and preserving sacred texts like the Vedas.

• By granting land, kings sought to legitimize their rule and garner the support of this influential class.

• Other forms of rewards:

• While land grants were the most common form of reward, Brahmanas could also receive other benefits such as gold coins, cattle, or other valuable resources during special ceremonies like ashvamedha or rajasuya yajnas.

• Impact of land grants:

• Land grants significantly contributed to the development of agricultural settlements and the spread of the agrarian economy in previously uncultivated regions.

• This also led to the rise of a feudal-like structure in Indian society, where Brahmanas and other beneficiaries of land grants became powerful intermediaries.

Important Points

• Gold coins:

• Though gold coins were used as rewards, they were not as commonly given to Brahmanas as land grants during the seventh century.

• Gold coins were more often used for trade, paying soldiers, or as rewards for warriors and artisans.

• Cattle:

• Cattle were considered a symbol of wealth and were sometimes gifted to Brahmanas, but this was not a widespread or formal practice like land grants.

• Horses:

• Horses were valuable for military purposes and were typically given to warriors or rulers rather than Brahmanas.

Q77. Answer: (d) Babur

The correct answer is Babur.

Key Points

• Babur, the founder of the Mughal Empire in India, is credited with the effective use of cannons and gunpowder in battles, which marked a significant shift in Indian warfare.

• He used cannons strategically in the First Battle of Panipat (1526) against Ibrahim Lodi, which played a key role in his victory and the establishment of the Mughal Empire in India.

• Babur's artillery, under the guidance of Turkish gunmaster Ustad Ali Quli, was not only advanced for its time but also utilized in innovative formations, such as the "Tulughma" strategy, which involved encircling the enemy with cavalry and then bombarding them with cannon fire.

• Babur's victory at Panipat showcased the superiority of gunpowder weapons over traditional war elephants and cavalry-based armies, as seen in the forces of Ibrahim Lodi.

• The Mughal artillery under Babur set a precedent for future warfare in the subcontinent, making firearms and cannons a standard part of military strategies.

Additional Information

• Babur (1483–1530):

• Born in Fergana (modern Uzbekistan), Babur was a descendant of both Timur on his father's side and Genghis Khan on his mother's side.

• He established the Mughal Empire in India after defeating Ibrahim Lodi in the First Battle of Panipat in 1526.

• Babur's memoirs, the Baburnama, provide detailed accounts of his life, including his military campaigns and use of advanced weaponry.

• The First Battle of Panipat (1526):

• It was fought between Babur and Ibrahim Lodi, the Sultan of Delhi.

• The battle marked the beginning of the Mughal Empire in India.

• Babur's innovative use of field artillery, combined with his strategic military tactics, ensured his victory despite being outnumbered by Ibrahim Lodi's forces.

• Cannons and Gunpowder Technology:

• Babur introduced the use of modern gunpowder artillery in Indian warfare, which was a revolutionary advancement compared to

traditional weapons like swords and spears.

• Gunpowder weapons were already being used in the Ottoman Empire and Central Asia, and Babur brought this technology to India through his Turkish artillery experts.

• Comparison with Other Rulers:

• Alauddin Khalji: He ruled during the late 13th and early 14th centuries and did not use cannons as gunpowder technology was not prevalent in India during his time.

• Sher Shah Suri: Although he was a brilliant administrator and military strategist, he did not make significant contributions to the use of cannons in warfare.

• Ibrahim Lodi: He fought against Babur in the First Battle of Panipat but relied heavily on traditional weapons and war elephants, which proved ineffective against Babur's artillery.

Important Points

• The First Battle of Panipat (1526) is considered a landmark in Indian history as it introduced modern warfare with the use of cannons and firearms.

• Babur's success laid the foundation for Mughal dominance in India, which lasted for several centuries.

• His military tactics, such as the "Tulughma" strategy, showcased his innovative approach to warfare.

• The use of gunpowder weapons by Babur inspired other Indian rulers and dynasties to adopt similar technologies, changing the course of Indian military history.

Q78. Answer: (c) India-Bangladesh

The correct answer is India-Bangladesh.

Key Points

• The Petrapole-Benapole rail link is a vital connection between India and Bangladesh, facilitating trade and passenger movement between the two neighboring nations.

• This rail link connects Petrapole in West Bengal, India, to Benapole in Bangladesh. Petrapole is located in the North 24 Parganas district, while Benapole is in the Jessore district of Bangladesh.

• It is the largest land port in South Asia and serves as a key route for bilateral trade between India and Bangladesh. Most of the trade between the two countries happens through this corridor.

• The rail link was operational during the British era but was disrupted after the partition of India in 1947. It was revived in 2001 for freight movement and later extended for passenger train services.

• The Maitree Express and Bandhan Express are significant passenger trains that use this rail link, strengthening cultural and people-to-people ties between the two nations.

• This rail link has significantly contributed to enhancing economic cooperation and fostering diplomatic relations between India and Bangladesh.

Additional Information

• India-Bangladesh Relations:

• India was one of the first countries to recognize Bangladesh after its independence in 1971.

• Both nations share a 4,096 km-long border, which is the fifth-longest land border in the world.

• India and Bangladesh cooperate on various fronts, including trade, energy, water sharing, and security.

• The two countries signed the Land Boundary Agreement (LBA) in 2015 to resolve long-pending border disputes.

• Other Rail Links Between India and Bangladesh:

• Gede-Darshana Rail Link: Operational since the British era, this route facilitates cargo and passenger movement.

• Chilahati-Haldibari Rail Link: Reopened in 2021, this link connects North Bengal in India with northern Bangladesh.

• Radhikapur-Birol Rail Link: Primarily used for freight movement, this link connects the two countries through West Bengal and Dinajpur.

• Singhabad-Rohanpur Rail Link: Another freight corridor, it connects West Bengal (India) to Rajshahi (Bangladesh).

• Importance of the Petrapole-Benapole Rail Link:

• It facilitates the movement of goods such as textiles, chemicals, and agricultural products between the two countries.

• The link reduces transportation costs and boosts regional trade under the framework of SAARC and BIMSTEC.

• Passenger train services like the Maitree Express and Bandhan Express enhance cultural exchanges and strengthen bilateral relations.

• Trade Relations Between India and Bangladesh:

• Bangladesh is India’s largest trading partner in South Asia.

• India exports items like cotton, machinery, and iron and steel to Bangladesh, while importing jute products, fish, and textiles.

• Bilateral trade between the two countries crossed USD 10 billion in recent years, highlighting the strong economic ties.

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Important Points

• Connectivity Projects Between India and Bangladesh:

• India-Bangladesh Friendship Pipeline: Aimed at transporting diesel from India's Numaligarh Refinery to Bangladesh.

• Inland Waterways: The two countries have agreements to use each other's river routes for trade and transportation.

• Agartala-Akhaura Rail Link: This under-construction link will connect Tripura (India) with Bangladesh, further enhancing connectivity.

• Strategic Importance:

• The Petrapole-Benapole rail link plays a vital role in India's Act East Policy, which aims to strengthen ties with Southeast Asian nations through Bangladesh.

• It also supports regional connectivity initiatives under BIMSTEC and BBIN (Bangladesh, Bhutan, India, and Nepal).

Q79. Answer: (d) Japan

The correct answer is Japan.

Key Points

• The first high-speed rail corridor in India, also known as the Mumbai-Ahmedabad Bullet Train Project, is being implemented with technical and financial assistance from Japan.

• This project is a part of India's collaboration with Japan International Cooperation Agency (JICA), which is providing a loan covering 81% of the project cost at a highly concessional interest rate of 0.1% with a repayment period of 50 years, including a 15-year moratorium.

• The technology used for the high-speed rail is Japan's Shinkansen system, which is renowned for its safety, reliability, and efficiency in high-speed rail transport.

• The foundation stone for the project was laid on September 14, 2017, by Indian Prime Minister Narendra Modi and Japanese Prime Minister Shinzo Abe in Ahmedabad, Gujarat.

• The project aims to connect Mumbai (Maharashtra) and Ahmedabad (Gujarat), covering a distance of approximately 508 km, with a travel time of around 2-3 hours, significantly reducing the travel time compared to other modes of transport.

• The bullet train is expected to run at a speed of up to 320 km/h, making it a game-changer in India's transportation infrastructure.

Additional Information

• Shinkansen Technology:

• Developed by Japan, the Shinkansen is a high-speed rail network that started operations in 1964. It is known for its world-class safety records, with zero passenger fatalities due to derailments or collisions.

• It operates using advanced technology for speed, punctuality, and comfort. The aerodynamic design of trains reduces air resistance, enabling faster speeds.

• The Mumbai-Ahmedabad project will adopt this technology, including features such as earthquake detection systems and automated train control.

• Japan International Cooperation Agency (JICA):

• JICA is a governmental agency that coordinates Japan's Official Development Assistance (ODA) for developing countries.

• It is providing a soft loan to India for the Mumbai-Ahmedabad High-Speed Rail Corridor under extremely favorable terms.

• The agency has been a vital partner in India's infrastructure development, contributing to projects in sectors like transportation, energy, and water resources.

• Features of the Mumbai-Ahmedabad Bullet Train:

• The project includes 12 stations along the route, with key stops at Mumbai, Surat, Vadodara, and Ahmedabad.

• A significant portion of the corridor will be elevated, while a section will run underground, including a 21-km tunnel under the sea near Thane.

• The train will have business class and standard class coaches with various amenities for passenger comfort.

• Economic and Strategic Benefits:

• The project is expected to create employment opportunities and boost the Make in India initiative, as several components will be manufactured locally.

• It aims to promote economic integration between Maharashtra and Gujarat, two of India's most industrialized states.

• It will also strengthen India-Japan bilateral relations, showcasing technological and infrastructural cooperation.

• Other High-Speed Rail Projects in India:

• India plans to develop other high-speed rail corridors, including routes like Delhi-Varanasi, Delhi-Amritsar, and Mumbai-Nagpur, as part of its vision to improve transportation infrastructure.

• These corridors will enhance connectivity, reduce travel time, and contribute to the overall development of the regions.

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Q80. Answer: (a) Asima Chatterjee

The correct answer is Asima Chatterjee.

Key Points

• Asima Chatterjee was the first woman to be awarded a Doctor of Science (D.Sc.) by an Indian University, specifically by the University of Calcutta in 1944.

• She is renowned for her groundbreaking research in the field of organic chemistry, particularly in the areas of medicinal chemistry and phytomedicine.

• Her work focused on the development of drugs from natural sources, including anti-epileptic drugs, anti-malarial compounds, and other medicinal formulations derived from plants.

• She was a pioneer in the study of alkaloids and coumarins, which are compounds found in plants that have medicinal properties.

• Asima Chatterjee made significant contributions to the understanding of plant-based chemical compounds and their applications, which established her as a leading scientist in India and internationally.

Additional Information

• Achievements of Asima Chatterjee:

• She was the first woman to be elected as the General President of the Indian Science Congress in 1975.

• Her research earned her several prestigious awards, including the Padma Bhushan in 1975 for her contributions to science.

• She authored numerous research papers and contributed significantly to the advancement of phytochemistry (the study of plant-derived chemicals).

• She was instrumental in the development of the anti-malarial drug Ayush-64, which is still used in the treatment of malaria.

• Other Notable Female Scientists:

• Purnima Sinha: She was the first woman in India to receive a Ph.D. in physics from the University of Calcutta. Her work focused on X-ray crystallography.

• Kamala Sohonie: She was the first Indian woman to receive a Ph.D. in a scientific discipline. Her research focused on the effects of vitamins and nutrition on the human body.

• Bibha Chowdhary: She was a physicist who made significant contributions to particle physics and cosmic rays research.

• University of Calcutta:

• Established in 1857, it is one of the oldest universities in India.

• It has a rich history of producing notable alumni, including Nobel laureates like Rabindranath Tagore, C.V. Raman, and Amartya Sen.

• The university has played a significant role in advancing education and research in India, particularly in the fields of science and humanities.

Important Points

• Women in Indian Science:

• Indian women have made remarkable contributions to science despite facing significant socio-cultural challenges.

• Other notable women in Indian science include Janaki Ammal (botanist), Rukhmabai Raut (India's first female practicing doctor), and Tessy Thomas (the "Missile Woman of India").

• These women have paved the way for future generations by breaking barriers and making significant scientific advancements.

• Legacy of Asima Chatterjee:

• Her work in organic chemistry laid the foundation for the development of several medicinal compounds.

• She serves as an inspiration for young scientists, particularly women, encouraging them to pursue careers in STEM (Science, Technology, Engineering, and Mathematics).

Q81. Answer: (d) P.V. Narasimha Rao

The correct answer is P.V. Narasimha Rao.

Key Points

• P.V. Narasimha Rao served as the Prime Minister of India from 1991 to 1996, becoming the first Prime Minister from southern India.

• He is often referred to as the "Father of Indian Economic Reforms" for initiating and implementing crucial economic liberalization policies during his tenure.

• Rao’s government, with Dr. Manmohan Singh as Finance Minister, introduced reforms that dismantled the License Raj system, liberalized trade policies, and opened up India’s economy to foreign investment.

• He successfully managed the political instability caused by the BOP (Balance of Payments) crisis in 1991, steering India away from economic collapse.

• P.V. Narasimha Rao’s leadership also included initiatives in diplomatic relations, strengthening ties with countries such as the United States and China, and focusing on India’s technological advancements.

Additional Information

• Charan Singh:

• Charan Singh served as the Prime Minister of India from 1979 to 1980.

• He was a prominent leader of the Kisan movement and focused on agrarian policies to benefit farmers.

• His government was marked by political instability and lasted for a brief period, unable to implement significant reforms.

• Rajiv Gandhi:

• Rajiv Gandhi was the Prime Minister of India from 1984 to 1989.

• He emphasized technological advancement, introducing computers and telecommunications in India, laying the foundation for India's IT revolution.

• His tenure also witnessed challenges such as the Bofors scandal and political unrest in Punjab and Sri Lanka.

• Gulzarilal Nanda:

• Gulzarilal Nanda served as the interim Prime Minister of India twice: first in 1964 after Jawaharlal Nehru's death and again in 1966 after Lal Bahadur Shastri's death.

• Both his terms lasted for brief durations, and he focused on maintaining stability during transitions of power.

• P.V. Narasimha Rao's Economic Reforms:

• Rao's government introduced Foreign Direct Investment (FDI) policies to attract international capital.

• The Industrial Policy of 1991 abolished the License Raj and reduced bureaucratic control over industries.

• India's economic growth witnessed a significant boost during his tenure, making him a pivotal figure in modern Indian history.

Important Points

• Rao's Political Legacy:

• P.V. Narasimha Rao was the first Indian Prime Minister to head a minority government and complete a full term.

• He was also a skilled linguist, proficient in several Indian and foreign languages, reflecting his intellectual prowess.

• Economic Crisis of 1991:

• India faced a severe Balance of Payments (BOP) crisis, with foreign reserves plummeting to critical levels.

• Rao's government secured financial aid from the International Monetary Fund (IMF) by implementing structural reforms.

• Manmohan Singh's Role:

• As Finance Minister, Dr. Manmohan Singh played a crucial role in the economic reforms initiated under Rao's leadership.

• His policies focused on liberalization, privatization, and globalization, transforming India's economic landscape.

• Diplomatic Achievements:

• Rao's tenure saw the strengthening of India-US relations, with a focus on trade and defense cooperation.

• He also prioritized relations with China, initiating dialogue to resolve border disputes and enhance bilateral ties.

Q82. Answer: (c) Pusapati Ashok Gajapathi Raju

The correct answer is Pusapati Ashok Gajapathi Raju.

Key Points

• Pusapati Ashok Gajapathi Raju is a renowned Indian politician and a member of the Telugu Desam Party (TDP), known for his contributions to Indian politics and governance.

• He previously served as the Union Minister for Civil Aviation in the Government of India from 2014 to 2018 during the tenure of Prime Minister Narendra Modi.

• On July 2025, he was sworn in as the Governor of Goa, succeeding the previous governor and taking charge of the state's administrative and constitutional responsibilities.

• Governors in India are appointed by the President of India under Article 155 of the Constitution, and they act as the representatives of the central government in the states.

• Pusapati Ashok Gajapathi Raju is known for his administrative acumen, dedication to public service, and significant contributions to the aviation sector during his tenure as Union Minister.

Additional Information

• Role of Governors in India:

• Governors are appointed by the President of India and serve as the constitutional heads of the states.

• They perform various duties such as approving bills, summoning and dissolving state legislatures, and overseeing the implementation of central policies at the state level.

• Under Article 161, governors have the power to grant pardons, reprieves, or commutations of sentences for offenses under state law.

• Goa's Administrative Significance:

• Goa is India's smallest state by area and is known for its tourism industry, rich cultural heritage, and coastal economy.
• The governor plays a crucial role in ensuring administrative efficiency and constitutional governance in the state.
• Pusapati Ashok Gajapathi Raju's Contributions:
• As the Union Minister for Civil Aviation, he spearheaded reforms in India's aviation sector, including initiatives to enhance connectivity and streamline operations.
• He has been a prominent figure in Indian politics, representing the Vizianagaram constituency in Andhra Pradesh multiple times.
• Appointment Process of Governors:
• Governors are appointed by the President of India under Article 155 of the Constitution.
• The tenure of a governor is typically five years, but they can remain in office at the pleasure of the President.

Important Points

• Articles Related to Governors:
• Article 153: Provides for the appointment of a governor for each state.
• Article 155: States the procedure for appointing governors.
• Article 156: Discusses the tenure and conditions of service for governors.
• Article 161: Grants governors the power to pardon or commute sentences under state law.
• Governance in Goa:
• Known for its political stability and strong tourism-driven economy, Goa requires efficient governance to maintain its development trajectory.
• The role of the governor is pivotal in ensuring the smooth functioning of the state government and maintaining constitutional integrity.

Q83. Answer: (a) 531

The correct answer is 531.

Key Points

• Bharatiya Nagrik Suraksha Sanhita (BNSS), 2023, is a proposed reform of the Indian criminal justice system aimed at replacing the colonial-era Indian Penal Code (IPC).
• The draft BNSS, 2023, contains a total of 531 sections, which aim to modernize and simplify the legal framework for criminal law in India.
• It proposes changes to existing laws to ensure a more victim-centric approach and faster resolution of cases.
• The BNSS is part of a broader initiative to replace three key British-era laws: the IPC, the Code of Criminal Procedure (CrPC), and the Indian Evidence Act, with updated laws better suited to contemporary needs.
• The draft BNSS, along with two other laws – the Bharatiya Nyaya Sanhita and the Bharatiya Sakshya Adhiniyam – was introduced in August 2023 in the Lok Sabha by the Ministry of Home Affairs.

Additional Information

• Objective of BNSS:
• The BNSS aims to ensure a speedy trial of criminal cases, simplify procedures, and enhance transparency in the justice delivery system.
• It also proposes to address modern challenges like cybercrime and organized crime, which were not adequately covered under the IPC.
• Key Features of BNSS:
• Introduction of provisions for victim compensation and increased protection for women and children.
• Special emphasis on reducing delays in trials and ensuring the time-bound disposal of cases.
• Inclusion of modern technological tools to aid in investigation and trial processes.
• Comparison with IPC:
• The IPC, which was enacted in 1860, has 511 sections. The BNSS expands upon this with 531 sections to incorporate new offenses and streamline outdated provisions.
• Unlike the IPC, the BNSS focuses on victim-centric justice and enhanced safeguards against misuse of laws.
• Other Proposed Laws:
• Bharatiya Nyaya Sanhita (BNS): A replacement for the IPC, focusing on substantive criminal law.
• Bharatiya Sakshya Adhiniyam: A replacement for the Evidence Act, modernizing the rules of evidence in Indian courts.
• Implementation:
• The BNSS and other draft laws are yet to be passed by Parliament. Once enacted, they will significantly transform the legal framework of India.
• They will require extensive training and awareness programs for legal professionals to ensure effective implementation.

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Important Points

• Colonial Legacy: The IPC, CrPC, and Evidence Act were drafted during British rule and have been criticized for being outdated and not aligning with modern societal needs.

• Comprehensive Review: The BNSS is part of a larger effort by the Indian government to overhaul the criminal justice system comprehensively.

• Focus on Technology: The proposed laws emphasize the use of technology like AI and digital evidence to improve the efficiency and accuracy of investigations and trials.

• Stakeholder Involvement: The reforms were drafted after consultations with various stakeholders, including police, legal experts, and civil society organizations.

Q84. Answer: (c) Education

The correct answer is Education.

Key Points

• ULLAS stands for Understanding Lifelong Learning for All in Society, a centrally sponsored scheme aimed at promoting literacy and education in India.

• Launched in 2024, the scheme aligns with the goal of achieving universal literacy and enhancing the quality of education across the country.

• The initiative focuses on creating an inclusive learning environment by addressing educational needs at all levels, including primary, secondary, and adult education.

• ULLAS emphasizes the use of digital platforms and technology-driven tools to promote lifelong learning and skill development, ensuring accessibility and convenience for learners.

• The scheme also aims to bridge the gap between formal education and skill-based learning, contributing to an empowered and educated workforce.

Additional Information

• Objectives of ULLAS:

• The scheme aims to eradicate illiteracy among adults and ensure that every individual in society has access to quality education and skill development opportunities.

• It also aims to enhance employability through vocational training and skill-based education.

• Promoting digital literacy and the use of technology in learning is a key focus area under ULLAS.

• The initiative targets marginalized communities, ensuring equitable access to education for all sections of society.

• Features of ULLAS:

• The scheme integrates digital platforms, such as mobile applications and e-learning modules, to facilitate continuous learning.

• It encourages public-private partnerships (PPPs) to enhance the reach and effectiveness of the program.

• ULLAS also emphasizes teacher training and capacity building to improve the quality of education delivery.

• Periodic monitoring and evaluation mechanisms are in place to ensure the scheme’s success and sustainability.

• Other Government Education Schemes:

• Samagra Shiksha Abhiyan: Focuses on school education from preschool to senior secondary levels.

• National Education Policy (NEP) 2020: Aims to transform the Indian education system and promote holistic development.

• Skill India Mission: Enhances vocational training and skill development for youth to improve employability.

• Mid-Day Meal Scheme: Provides free meals to students in government schools to improve nutrition and attendance.

Important Points

• Significance of Education:

• Education is a fundamental right under Article 21A of the Indian Constitution, which mandates free and compulsory education for children aged 6-14 years.

• Literacy is a key driver of economic growth, social empowerment, and cultural progress.

• Government initiatives like ULLAS aim to achieve the United Nations Sustainable Development Goal 4 (SDG-4), which ensures inclusive and equitable quality education for all.

• Role of Technology in Education:

• Technology-driven education enhances accessibility, particularly in remote and rural areas.

• Digital platforms and tools like e-learning apps and virtual classrooms facilitate personalized learning experiences.

• Integration of Artificial Intelligence (AI) and Machine Learning (ML) in education can further optimize teaching methodologies and learning outcomes.

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Q85. Answer: (c) 1885-86

The correct answer is 1885-86.

Key Points

• The first hockey club in India was established in Calcutta (now Kolkata) in the year 1885-86, marking the beginning of organized hockey in the country.

• Hockey was introduced in India during the British colonial era, and initially, it gained popularity among the British soldiers and officials stationed in India.

• The establishment of the hockey club in Calcutta laid the foundation for the sport's development and growth in India.

• From Calcutta, hockey spread to other regions of India, leading to the formation of clubs in cities like Bombay (Mumbai) and Punjab.

• India later emerged as a global powerhouse in hockey, winning several international tournaments, including Olympic gold medals from 1928 to 1956.

Additional Information

• History of Hockey in India:

• Hockey was brought to India by the British during the colonial rule, and it quickly became popular among the locals.

• The first national-level hockey tournament, the Beighton Cup, was introduced in 1895 and remains one of the oldest tournaments in the sport.

• India's hockey team made its debut in the Olympics in 1928, winning the gold medal and establishing its dominance.

• Key Achievements of Indian Hockey:

• India won 8 Olympic gold medals in field hockey, making it one of the most successful teams in Olympic history.

• The Indian hockey team was renowned for its skillful and fast-paced gameplay, often referred to as the "golden era" from the 1920s to the 1950s.

• Notable players like Dhyan Chand contributed significantly to India's success in international hockey.

• Development of Hockey Infrastructure:

• Post-independence, efforts were made to develop hockey infrastructure in India, including the establishment of training academies and national tournaments.

• The Indian Hockey Federation (IHF) was formed in 1925 to oversee the administration and promotion of hockey in the country.

• Other Important Dates:

• The International Hockey Federation (FIH) was established in 1924 to regulate hockey worldwide.

• India's first appearance in the World Cup was in 1971, and it won the title in 1975.

Important Points

• Calcutta Hockey Club:

• The hockey club in Calcutta was one of the first organized attempts to promote the sport in India.

• This initiative played a crucial role in popularizing hockey in other regions of the country.

• Role of British Influence:

• The British introduced hockey in their colonies, including India, as a recreational activity for soldiers and officials.

• The sport eventually gained traction among Indians, leading to widespread participation.

• Spread of Hockey in India:

• Following the establishment of the Calcutta Hockey Club, other cities like Bombay and Punjab became prominent centers for hockey.

• These regions contributed significantly to the development of skilled players who represented India internationally.

Q86. Answer: (a) India

The correct answer is India.

Key Points

• India won the ICC Men's T20 World Cup 2024 by defeating South Africa in the final.

• The final was played on 29 June 2024 at the Kensington Oval, Bridgetown, Barbados.

• India scored 176/7 in 20 overs, while South Africa finished at 169/8, giving India a 7-run victory.

• This was India's second ICC Men's T20 World Cup title, the first being won in 2007 under the captaincy of MS Dhoni.

• Rohit Sharma captained the Indian team, while Jasprit Bumrah was named the Player of the Tournament for his outstanding bowling performance.

• Hence, the correct answer is Option 1 – India.

Additional Information

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• Host Countries: West Indies and the United States.
• Player of the Tournament: Jasprit Bumrah (India).
• Player of the Match (Final): Virat Kohli (India), who scored 76 runs.
• Winning Captain: Rohit Sharma.

Important Points

• Winner: India.
• Runner-up: South Africa.
• Final Venue: Kensington Oval, Bridgetown, Barbados.
• Result: India won by 7 runs.
• India's T20 World Cup Titles: 2007 and 2024 (till 2024)

Q87. Answer: (a) Vidarbha

The correct answer is Vidarbha.

Key Points

• Vidarbha won the Ranji Trophy for the 2024-25 season, continuing its legacy as one of the prominent teams in domestic cricket in India.
• The Ranji Trophy is India's premier first-class cricket championship, organized by the Board of Control for Cricket in India (BCCI). It was established in 1934.
• Vidarbha's victory is a testament to its strong squad, excellent coaching staff, and strategic planning throughout the tournament.
• Vidarbha became a force to reckon with in Indian domestic cricket after winning consecutive Ranji Trophy titles in the 2017-18 and 2018-19 seasons.
• The team’s success is often attributed to their focus on nurturing young talent and balancing experience within the squad. Their players excel in both batting and bowling departments.

Additional Information

• Ranji Trophy Format:
• The Ranji Trophy follows a league and knockout format, where teams compete in various rounds to reach the finals.
• Teams are divided into groups, and the top-performing teams from each group advance to the knockout stages.
• The championship represents the pinnacle of first-class cricket in India, serving as a platform for players to showcase their skills and gain selection for the Indian national team.
• Vidarbha Cricket Team:
• Vidarbha is a regional cricket team based in the Maharashtra state of India.
• The team is known for its consistent performances in domestic cricket, especially in the Ranji Trophy.
• Key players like Wasim Jaffer (former Indian cricketer) have contributed significantly to Vidarbha’s success in past seasons.
• Notable Ranji Trophy Teams:
• Karnataka: Known for its rich cricketing history and producing world-class players like Rahul Dravid and Anil Kumble.
• Delhi: A strong contender in domestic cricket, home to stars like Virat Kohli and Shikhar Dhawan.
• Kerala: An emerging team in Indian cricket, with a focus on developing young talent.
• Vidarbha: Established dominance in recent seasons, showcasing a balanced squad and strong leadership.
• Impact of Ranji Trophy:
• The Ranji Trophy serves as a stepping stone for players to enter international cricket, with many Indian legends starting their careers in this tournament.
• It helps identify talent from regional teams and ensures a steady pipeline of players for the Indian cricket team.

Important Points

• Historical Significance:
• The Ranji Trophy is named after Ranjitsinhji, a legendary Indian cricketer widely regarded as one of the greatest batsmen of his era.
• It has been instrumental in shaping India's cricketing culture and nurturing talent at the grassroots level.
• Recent Trends:
• The tournament has seen increased competitiveness with emerging teams like Vidarbha challenging traditional powerhouses such as Karnataka and Mumbai.
• Advanced coaching methods and fitness regimes have contributed to improved performances by domestic teams.

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Q88. Answer: (a) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• Parvati Arga Bird Sanctuary is located in the state of Uttar Pradesh, India.

• This sanctuary is situated near the river Ganga and provides a natural habitat for a variety of bird species.

• It is recognized for its rich biodiversity, particularly its bird population, which includes both resident and migratory species.

• The sanctuary spans over an area of approximately 108 hectares and is a popular destination for bird watchers and nature enthusiasts.

• Uttar Pradesh houses several notable bird sanctuaries, including the Nawabganj Bird Sanctuary and Sur Sarovar Bird Sanctuary, making it a significant state for avian conservation.

Additional Information

• Geographical Location:

• Parvati Arga Bird Sanctuary is located in the district of Barabanki, Uttar Pradesh.

• The sanctuary lies along the banks of the Ghaghara River, a tributary of the Ganga River.

• The region's wetland ecosystem makes it ideal for attracting a diverse range of bird species.

• Bird Population:

• The sanctuary is home to several species of birds, including kingfishers, herons, storks, geese, ducks, and many others.

• Migratory birds from regions such as Siberia and Central Asia visit the sanctuary during winters.

• The sanctuary provides a breeding ground for many aquatic and terrestrial bird species.

• Conservation Efforts:

• The sanctuary is protected under the Wildlife Protection Act, 1972, ensuring conservation of its biodiversity.

• Efforts are made to maintain the sanctuary's ecological balance and safeguard the habitat of its avian population.

• Eco-tourism initiatives are being promoted to raise awareness about the significance of bird sanctuaries.

• Uttar Pradesh's Biodiversity:

• Uttar Pradesh is known for its diverse ecosystems, ranging from wetlands to grasslands and forests.

• Notable wildlife sanctuaries in Uttar Pradesh include the Dudhwa National Park, Sohagi Barwa Wildlife Sanctuary, and Pilibhit Tiger Reserve.

• The state is a crucial part of the Gangetic Plains, contributing to India’s rich biodiversity.

Important Points

• Wetland Importance: Wetlands like the Parvati Arga Bird Sanctuary play a crucial role in maintaining ecological balance by supporting aquatic life and acting as a carbon sink.

• Tourism Potential: Bird sanctuaries in Uttar Pradesh are increasingly being recognized for their eco-tourism opportunities, attracting bird watchers and nature enthusiasts from across the globe.

• Conservation Challenges: Urbanization and pollution pose significant threats to the sanctuary, highlighting the need for sustainable development practices.

• Government Initiatives: Conservation programs under the Ministry of Environment, Forest and Climate Change aim to protect bird sanctuaries and promote biodiversity.

• Significance in Avian Research: Sanctuaries like Parvati Arga provide valuable data for ornithological studies and environmental research.

Q89. Answer: (a) Glasgow

The correct answer is Glasgow.

Key Points

• The 2026 Commonwealth Games (officially the XXIII Commonwealth Games) will take place in Glasgow, Scotland, from 23 July to 2 August 2026.

• Glasgow stepped in as the host city after the Australian state of Victoria withdrew its hosting rights in 2023 due to rising costs.

• Glasgow, Scotland (hosting for the second time in 12 years).

• The 2026 Games will feature 10 sports, down from the 19 included in Birmingham 2022.

Additional Information

• Commonwealth Games Overview:

• The Commonwealth Games, also known as the Friendly Games, were first held in 1930 in Hamilton, Canada.

• The event is governed by the Commonwealth Games Federation (CGF), which oversees its organization and development.

• Participants include athletes from 72 nations and territories that are members of the Commonwealth.

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• Sports featured in the games include athletics, swimming, badminton, cycling, hockey, and gymnastics, among others.

• Australia's History with Commonwealth Games:

• Australia has hosted the Commonwealth Games five times before: Sydney (1938), Perth (1962), Brisbane (1982), Melbourne (2006), and Gold Coast (2018).

• The Gold Coast 2018 Games introduced the concept of gender equality in sports, with an equal number of events for men and women.

• Australia is one of the most successful nations in the Commonwealth Games, consistently achieving top ranks in medal tallies.

Important Points

• Commonwealth Games Federation (CGF):

• The CGF oversees the organization of the Commonwealth Games and ensures adherence to its core values: humanity, equality, and destiny.

• The CGF's headquarters are located in London, United Kingdom.

• The federation ensures the inclusion of para-sports in the games, promoting inclusivity and diversity.

Q90. Answer: (a) July

The correct answer is July.

Key Points

• Durand Cup is one of the oldest football tournaments globally and the oldest in India, first held in 1888.

• The Durand Cup 2025 started in the month of July, continuing the tradition of being held annually during the monsoon season.

• This prestigious tournament is organized by the Indian Armed Forces and serves as a platform for both military and civilian football teams to compete.

• The event attracts teams from across the country, including clubs from the Indian Super League (ISL), I-League, and other regional leagues.

• The month of July is chosen strategically to align with the football calendar, ensuring participation by top-tier teams and players.

Additional Information

• History of Durand Cup:

• The tournament was named after Mortimer Durand, the then Foreign Secretary of British India.

• Initially started as a competition for military teams, it later evolved to include civilian clubs.

• It is recognized as a stepping stone for young and emerging football talent in India.

• Format of Durand Cup:

• Typically, the tournament features a group stage followed by knockout rounds.

• Teams are divided into groups, and the top teams progress to the quarterfinals, semifinals, and eventually the final.

• The competition follows standard football regulations set by the All India Football Federation (AIFF).

• Significance of Durand Cup:

• The Durand Cup holds immense cultural and historical importance in Indian football, symbolizing the rich legacy of the sport in the country.

• It serves as a preparatory tournament for clubs gearing up for the domestic football season.

• The event contributes to the development of football infrastructure and talent identification in India.

• Recent Developments:

• The Durand Cup has gained increased popularity in recent years, with matches being telecast live on national sports channels.

• It has witnessed participation from prominent clubs like Mohun Bagan, East Bengal, and Bengaluru FC.

• Efforts have been made to promote the tournament internationally, attracting attention from football enthusiasts worldwide.

Important Points

• Durand Cup 2025:

• The tournament emphasizes team performance, sportsmanship, and the promotion of football at the grassroots level.

• Held during July, it aligns with preparations for the Indian football season, including the I-League and Indian Super League.

• The event is funded and supported by the Ministry of Defence and other government bodies.

• Football in India:

• Football is increasingly becoming popular in India, with tournaments like Durand Cup playing a pivotal role in its growth.

• India has hosted international tournaments like the FIFA U-17 World Cup, boosting the sport's profile.

• Initiatives such as grassroots programs by AIFF aim to nurture young talent and expand the player base.

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Q91. Answer: (b)

The correct answer is Only II.

Key Points

• Statement I: Agra Fort is a UNESCO World Heritage Site. It was declared a World Heritage Site in 1983. Hence, this statement is incorrect.

• Statement II: Agra Fort served as the main residence of the emperors of the Mughal Dynasty until the capital was shifted to Delhi. This statement is correct.

• Agra Fort is located in Agra, Uttar Pradesh, and is one of the most significant forts in Indian history.

• It was constructed by Akbar the Great in the year 1565, and later modifications and additions were made by Shah Jahan.

• The fort is known for its architectural brilliance, featuring red sandstone and intricate designs, showcasing the Mughal style of construction.

Additional Information

• UNESCO World Heritage Status:

• Agra Fort was inscribed as a UNESCO World Heritage Site for its historical and architectural significance in 1983.

• It is recognized for its contribution to the Mughal architectural style and its importance in Indian history.

• Historical Significance:

• Agra Fort was the seat of power during the reign of Akbar, Jahangir, and Shah Jahan.

• Several important historical events took place in the fort, including Shah Jahan's imprisonment by his son Aurangzeb.

• The fort served as a military base, a royal residence, and a site for administrative activities.

• Architectural Features:

• Constructed primarily with red sandstone, the fort features intricate carvings and designs typical of Mughal architecture.

• Important structures within the fort include the Jahangir Mahal, Khas Mahal, Diwan-i-Am, and Diwan-i-Khas.

• The fort is semi-circular in shape and has two massive gates: the Delhi Gate and the Lahore Gate.

• Tourism Importance:

• Agra Fort is a major tourist attraction in India, drawing visitors from across the globe to witness its grandeur.

• It is located close to the Taj Mahal, making it an integral part of the Golden Triangle tourist circuit.

Important Points

• Agra Fort and the Mughal Dynasty:

• The fort symbolized the power and grandeur of the Mughal empire during its peak.

• It is closely associated with Akbar's administrative reforms and his efforts to consolidate the empire.

• Shah Jahan transformed parts of the fort to include white marble structures, showcasing his preference for lavish designs.

• Location and Accessibility:

• Agra Fort is situated along the banks of the Yamuna River in the city of Agra.

• It is easily accessible by road, rail, and air, making it a popular site for tourists and history enthusiasts.

• Architectural Influence:

• The fort's design influenced later constructions, including the Red Fort in Delhi.

• It reflects the blending of Persian, Timurid, and Indian architectural styles.

• Strategic Importance:

• Its thick walls and strategic location made it a vital military base for defending the empire.

• The fort was also used as a treasury to store wealth and valuable artifacts.

Q92. Answer: (b) dance

The correct answer is Option 2 (Dance).

Key Points

• Chad Laho is a popular and traditional festival celebrated in the northeastern state of Meghalaya, India. It is deeply rooted in the culture of the Khasi community.

• The festival serves as a thanksgiving ceremony to God after the harvesting season, showcasing gratitude and joy among the people.

• A significant feature of the Chad Laho festival is the traditional dance, which plays a central role in the celebration. The dance is performed by both men and women in vibrant traditional attire.

• Participants engage in synchronized movements and rhythmic steps, accompanied by local folk music, which adds to the festive atmosphere.

• The dance symbolizes harmony, unity, and the cultural heritage of the Khasi tribe, marking the conclusion of a successful

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harvest.

• This festival is not associated with activities such as painting, wrestling, or cooking but is primarily centered around traditional dance as its main attraction.

Additional Information

• Meghalaya:

• Meghalaya is a northeastern state in India known for its rich cultural heritage, scenic landscapes, and tribal traditions.

• The state is inhabited by indigenous tribes, including the Khasi, Garo, and Jaintia, each with unique festivals and cultural practices.

• Meghalaya's economy is largely dependent on agriculture, and festivals like Chad Laho play a significant role in the socio-cultural fabric of the region.

• Traditional Dance in Khasi Culture:

• Dance is an integral part of the Khasi tribe's cultural identity, often performed during festivals, rituals, and social gatherings.

• It reflects the tribe's connection to nature, spirituality, and community harmony.

• Khasi dances are typically accompanied by local musical instruments such as the duitara and drums.

• Harvest Festivals in India:

• Several Indian states celebrate harvest festivals, expressing gratitude for a successful harvest season.

• Examples include Pongal in Tamil Nadu, Lohri in Punjab, Makar Sankranti across India, and Onam in Kerala.

• These festivals often feature dances, songs, feasts, and rituals unique to each region's culture.

• Important Characteristics of Khasi Festivals:

• Khasi festivals emphasize community participation, traditional attire, and preservation of cultural values.

• They often revolve around agricultural activities, showcasing the tribe's connection to nature and the environment.

• Chad Laho stands out as a prominent example of a festival that combines spirituality, culture, and celebration.

Important Points

• Khasi Tribe:

• The Khasi people are predominantly found in the Khasi Hills region of Meghalaya.

• They follow a matrilineal system, where lineage and inheritance are traced through the mother.

• Traditional festivals like Chad Laho play a crucial role in preserving their cultural identity.

• Significance of Traditional Dance:

• Traditional dance in Chad Laho reflects the tribe's gratitude to God and serves as a medium of storytelling and cultural expression.

• It fosters a sense of unity and pride within the community.

• Such dances help preserve and pass down the tribe's heritage to younger generations.

Q93. Answer: (d) Odisha

The correct answer is Odisha.

Key Points

• Gotipua Nacha is a traditional dance form that belongs to the state of Odisha, India. It holds a significant place in the cultural heritage of the region.

• It is a precursor to the famous classical dance form of Odisha, known as Odissi. Gotipua is performed by young boys who dress up as girls, depicting feminine grace in their movements.

• The term "Gotipua" translates to "single boy" in Odia, as the dance is typically performed solo or in small groups.

• Traditionally, Gotipua dancers are trained from a young age in mathas (monasteries) or dance schools, where they are taught intricate movements, postures, and expressions.

• The dance form is characterized by acrobatic movements, intricate footwork, and stylized expressions, reflecting themes from Hindu mythology, particularly stories of Lord Krishna and Radha.

• Gotipua is performed during various cultural and religious festivals in Odisha, including the famous Jagannath Rath Yatra.

Additional Information

• Gotipua Dance Characteristics:

• The costume of Gotipua dancers includes a traditional Odia sari, ornaments, and makeup to resemble female performers.

• The dance involves intricate hand gestures (mudras), rhythmic movements, and acrobatics, symbolizing the divine love of Lord Krishna and Radha.

• Music for Gotipua is provided by a traditional orchestra, which includes instruments such as the mardala (a type of drum), harmonium, and flute.

• Difference Between Gotipua and Odissi:

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• While Gotipua is performed by young boys dressed as girls, Odissi is performed by both men and women and is recognized as one of the eight classical dance forms of India.

• Gotipua is more folk-oriented and acrobatic, whereas Odissi emphasizes graceful movements and spiritual expression.

• Other Dance Forms of Odisha:

• Besides Gotipua, Odisha is also famous for other dance forms like Odissi, Chhau, and Sambalpuri.

• Chhau Dance: A semi-classical dance form that combines martial arts and folk traditions, often performed with masks.

• Sambalpuri Dance: A vibrant folk dance originating from the Sambalpur region, known for its colorful costumes and energetic movements.

• Important Cultural Festivals in Odisha:

• Rath Yatra: The annual chariot festival of Lord Jagannath, celebrated in Puri, where Gotipua performances are often witnessed.

• Konark Dance Festival: A festival that showcases classical and traditional dance forms, including Gotipua, against the backdrop of the Sun Temple in Konark.

• Puri Beach Festival: A cultural extravaganza featuring traditional dances, music, and art forms of Odisha.

• Recognition and Preservation Efforts:

• Efforts are being made by cultural organizations and the government to preserve and promote Gotipua as a vital aspect of Odisha's cultural identity.

• Training centers and academies have been established to ensure that this traditional art form thrives among the younger generation.

Q94. Answer: (b) 8.311

The correct answer is 8.311 minutes.

Key Points

• Light travels at a constant speed of approximately 299,792 kilometers per second (km/s) in a vacuum, which is the speed of light.

• The average distance between the Earth and the Sun is around 149.6 million kilometers, also known as 1 Astronomical Unit (AU).

• To calculate the time it takes for light to travel this distance, the formula is: Time = Distance / Speed.

• Substituting the values:

Time = 149,600,000 km / 299,792 km/s ≈ 499 seconds.

• Converting seconds into minutes: 499 seconds ÷ 60 ≈ 8.311 minutes.

• Hence, the light from the Sun takes approximately 8.311 minutes to reach the Earth.

• This calculation demonstrates the immense speed of light and the vastness of space separating the Earth and the Sun.

Additional Information

• Speed of Light:

• The speed of light in a vacuum is approximately 299,792 km/s or around 186,282 miles per second.

• It is considered a universal constant in physics, denoted by the letter "c" in equations like Einstein's famous equation $E = mc^2$.

• Astronomical Unit (AU):

• An Astronomical Unit (AU) is a unit of measurement used in astronomy to describe distances within our solar system.

• 1 AU is approximately equal to the average distance between the Earth and the Sun, which is about 149.6 million kilometers (93 million miles).

• Light Year:

• A light year is a unit of distance that represents the distance light travels in one year.

• 1 light year is approximately 9.461 trillion kilometers or 5.879 trillion miles.

• It is primarily used to measure distances to stars and galaxies beyond our solar system.

• Sunlight and Earth:

• The energy from the Sun is crucial for life on Earth as it drives photosynthesis, weather patterns, and climate systems.

• The Sun’s light takes only about 8 minutes and 20 seconds to reach Earth, making it relatively instantaneous compared to the scale of the universe.

• Practical Implications:

• The 8.311 minutes delay in sunlight reaching Earth means any changes or disturbances on the Sun (like solar flares) are observed on Earth with this time lag.

• This delay is an important consideration in fields like astronomy and space science.

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Q95. Answer: (b) Libration

The correct answer is Libration.

Key Points

• Lagrange points, also referred to as Libration points, are specific positions in space where the gravitational forces of two large celestial bodies, such as the Earth and the Moon, balance the centrifugal force felt by a smaller object.

• These points allow an object to remain in a stable position relative to the two larger bodies without expending significant energy to maintain its position.

• There are a total of five Lagrange points, denoted as L1, L2, L3, L4, and L5, each having its own unique characteristics and applications in space exploration and satellite positioning.

• The term "Libration" is derived from the concept of oscillation or balance, indicating the equilibrium achieved at these points.

• These points are extensively used in space missions, such as placing satellites in stable orbits for scientific observation or communication purposes. For example, the James Webb Space Telescope is positioned near the L2 point.

Additional Information

• Characteristics of Lagrange Points:

• L1: Located between two celestial bodies, it is ideal for solar observation (e.g., SOHO satellite).

• L2: Positioned on the far side of the smaller body, providing a stable environment for deep-space telescopes like the James Webb Space Telescope.

• L3: Found on the opposite side of the larger body, it is less commonly used due to its instability.

• L4 and L5: These points form an equilateral triangle with the two celestial bodies and are highly stable, often hosting natural celestial objects like asteroids (Trojan asteroids).

• Applications of Lagrange Points:

• Used for placing satellites in stable orbits to reduce energy consumption and maintain observational accuracy.

• Scientific missions, such as studying solar activity, deep-space phenomena, and cosmic microwave background radiation.

• Future space exploration missions may use these points as staging areas for interplanetary travel or as refueling depots.

• History of the Concept:

• The concept of Lagrange points was first introduced by the mathematician Joseph-Louis Lagrange in 1772 in his work on the three-body problem.

• These points were mathematically predicted long before they were practically utilized in space missions.

• Examples of Spacecraft Utilizing Lagrange Points:

• SOHO (Solar and Heliospheric Observatory): Positioned at L1 for solar observation.

• James Webb Space Telescope: Located near L2 for observing distant galaxies and exoplanets.

• Gaia Space Observatory: Also positioned at L2 to map the Milky Way galaxy.

Important Points

• Why Lagrange Points Are Crucial:

• Lagrange points reduce the amount of fuel and energy needed for a spacecraft to maintain its position, making long-term missions more feasible.

• The stable environment at L4 and L5 points makes them potential candidates for future space colonies or research stations.

• Asteroids at Lagrange Points:

• Trojan asteroids are found at the L4 and L5 points of planets like Jupiter, providing valuable insights into the early solar system.

Q96. Answer: (a) First law of motion

The correct answer is First law of motion.

Key Points

• The statement "An object remains in a state of rest or of uniform motion in a straight line unless compelled to change that state by an applied force" is directly derived from Newton's First Law of Motion, also known as the Law of Inertia.

• Newton's First Law states that an object will continue to remain at rest or move in a uniform straight line unless acted upon by an external force. This law emphasizes the natural tendency of objects to resist changes in their motion.

• The concept of inertia is central to the First Law. Inertia is the property of an object that resists changes to its state of motion or rest.

• This principle is foundational in classical mechanics and applies to objects regardless of their size, mass, or velocity, provided no external forces like friction or gravity act on them.

• The law highlights the importance of external forces like push, pull, or friction in altering an object's motion. Without these forces, the object remains in its original state.

• Examples: A book lying on a table remains stationary until someone moves it, or a ball rolling on a smooth surface slows down

only due to external forces like friction or air resistance.

Additional Information

• Newton’s Laws of Motion:

• First Law (Law of Inertia): Explains the natural tendency of objects to resist changes in their motion.

• Second Law: States that the force acting on an object is equal to the mass of the object multiplied by its acceleration (F = ma).

• Third Law: States that for every action, there is an equal and opposite reaction.

• Inertia:

• Definition: The resistance of any physical object to changes in its state of motion or rest.

• Types: Inertia of rest, inertia of motion, and inertia of direction.

• Examples: A stationary car resists motion unless force is applied, and passengers moving forward suddenly when brakes are applied.

• Applications of the First Law:

• Design of safety features in vehicles like seat belts and airbags to counteract inertia during sudden stops or accidents.

• Space exploration, where objects in space remain in motion unless acted upon by external forces.

• Historical Context:

• The First Law of Motion was formulated by Sir Isaac Newton in 1687 and published in his seminal work Philosophiæ Naturalis Principia Mathematica.

• The concept of inertia was first discussed by Galileo Galilei, who laid the foundation for Newton’s work.

• Characteristics of Forces:

• Forces can be classified as contact forces (e.g., friction, tension) and non-contact forces (e.g., gravity, magnetic forces).

• The magnitude and direction of the force determine the change in the state of motion.

Important Points

• First Law of Motion: Establishes the concept of inertia and forms the basis for understanding external forces in classical mechanics.

• Connection to Real Life: Observed in everyday phenomena, such as stationary objects remaining at rest until moved or objects in motion slowing down due to external forces.

• Scientific Importance: Essential for designing systems in engineering, transportation, and space exploration.

• Historical Contributions: Galileo’s work on inertia was crucial for Newton’s formulation of the law.

• Practical Applications: Used in designing vehicles, spacecraft, and understanding celestial mechanics.

Q97. Answer: (a) IBM

The correct answer is IBM.

Key Points

• IBM announced its plans to establish a quantum computing centre in Amaravati, Andhra Pradesh, by March 2026.

• This centre is expected to serve as a hub for quantum research and innovation, fostering advancements in fields such as artificial intelligence (AI), data science, cryptography, and material science.

• Quantum computing leverages principles of quantum mechanics, offering computational capabilities far beyond traditional computers, addressing complex problems in industries like healthcare, finance, and logistics.

• IBM has been a global leader in quantum computing, having developed the IBM Q System One, the world's first integrated quantum computing system for commercial use.

• The quantum computing centre in Amaravati aligns with the Government of India's vision to promote cutting-edge technologies and attract investments in the tech sector.

Additional Information

• IBM:

• Founded: 1911 as the Computing-Tabulating-Recording Company (CTR); renamed IBM in 1924.

• Headquarters: Armonk, New York, USA.

• Specializations: Cloud computing, AI, blockchain, and quantum computing technologies.

• IBM has invested heavily in quantum computing research, offering cloud-based quantum computing services through the IBM Quantum Experience platform.

• Quantum Computing:

• Quantum computers use qubits instead of traditional bits, enabling them to perform multiple calculations simultaneously.

• Applications include drug discovery, optimization problems, cryptographic systems, and simulations.

• Quantum computing is expected to revolutionize industries by solving problems beyond the capabilities of classical computers.

• Amaravati, Andhra Pradesh:

• Planned as a modern capital city for Andhra Pradesh, Amaravati is envisioned to be a hub for innovation and technology.

• The establishment of the quantum computing centre in Amaravati will enhance its global reputation as a technology-driven city.

• Government Initiatives:

• The National Quantum Mission launched by the Government of India aims to promote research and development in quantum technologies.

• Such initiatives are designed to position India as a global leader in advanced technologies like quantum computing.

Important Points

• IBM Q System One: The world's first integrated quantum computing system designed for commercial use, enabling businesses to access advanced quantum computing capabilities.

• Quantum Mechanics: The foundational principle behind quantum computing, focusing on phenomena like superposition and entanglement.

• Global Quantum Initiatives: Countries like the USA, China, and India are investing heavily in quantum computing research to gain strategic advantages in technology.

• Andhra Pradesh's Tech Vision: The state aims to attract investments in emerging technologies and establish itself as a tech-driven region through projects like the IBM quantum computing centre.

Q98. Answer: (c) 1793

The correct answer is 1793.

Key Points

• The Permanent Settlement was introduced by the East India Company in the year 1793 during the tenure of Lord Cornwallis, the Governor-General of India.

• It was primarily implemented in the regions of Bengal, Bihar, and Odisha, and later extended to the northern parts of Madras and Varanasi.

• The settlement was designed to establish a fixed revenue system where landlords or Zamindars were made responsible for paying a fixed amount of land revenue to the British government.

• Under this system, the revenue amount was permanently fixed, meaning it would not change regardless of variations in agricultural production or economic conditions.

• The Zamindars were given hereditary rights to collect revenue from the peasants, turning them into intermediaries between the British government and the cultivators.

Additional Information

• Objectives of the Permanent Settlement:

• To ensure a stable revenue system for the East India Company by fixing the revenue permanently.

• To create a class of landlords or Zamindars who would be loyal to the British government and act as collaborators.

• To promote agricultural productivity by encouraging Zamindars to invest in land improvements, as they would retain the profits.

• Features of the Permanent Settlement:

• The revenue rates were fixed permanently, irrespective of economic changes or fluctuations in agricultural output.

• The Zamindars were given hereditary rights over the land and could pass their ownership to their descendants.

• If the Zamindars failed to pay the fixed revenue, their lands could be confiscated and auctioned by the government.

• Impact of the Permanent Settlement:

• It led to the emergence of a class of wealthy Zamindars, but many of them exploited the peasants through high rents and forced labor.

• The system discouraged agricultural innovation, as Zamindars focused more on maximizing revenue collection than improving land productivity.

• Peasants were often subjected to economic hardships, as they bore the brunt of fixed revenue demands even during periods of crop failure or natural calamities.

• Comparison with Other Revenue Systems:

• Unlike the Ryotwari system, where farmers directly paid revenue to the government, the Permanent Settlement created intermediaries like Zamindars.

• The Mahalwari system, implemented in northern India, involved village communities collectively paying revenue, which was periodically revised, unlike the fixed nature of the Permanent Settlement.

Important Points

• Lord Cornwallis:

• He served as the Governor-General of India from 1786 to 1793.

• He is known for introducing administrative reforms, including the Permanent Settlement, and strengthening the judicial system in

British India.

• Regions Covered:

• The Permanent Settlement was initially implemented in Bengal, Bihar, and Odisha and later extended to other parts of India.

• Criticism:

• The system was criticized for its adverse impact on peasants, who faced exploitation and suffered during poor harvests.

• It failed to achieve its objective of improving agricultural productivity, as Zamindars prioritized revenue collection over land development.

Q99. Answer: (b) Small intestine

The correct answer is Small intestine.

Key Points

• The small intestine is the longest part of the alimentary canal, measuring approximately 6-7 meters in length in an adult human.

• It is divided into three sections: duodenum, jejunum, and ileum, each specialized for different aspects of digestion and absorption.

• The primary function of the small intestine is to digest food and absorb nutrients like carbohydrates, proteins, fats, vitamins, and minerals into the bloodstream.

• The walls of the small intestine contain millions of tiny finger-like projections called villi, which significantly increase the surface area for nutrient absorption.

• The small intestine is highly vascularized, enabling the efficient transfer of absorbed nutrients to the circulatory system.

Additional Information

• Functions of the Small Intestine:

• The small intestine is responsible for 90% of nutrient absorption in the digestive system.

• Enzymes from the pancreas and bile from the liver are secreted into the duodenum to aid in the breakdown of fats, proteins, and carbohydrates.

• Its muscular walls help in the process of peristalsis, which moves food along the digestive tract.

• Comparison with Other Organs:

• Liver: The liver is the largest internal organ, but it is not part of the alimentary canal. Its primary function is to process nutrients, detoxify substances, and produce bile for fat digestion.

• Buccal Cavity: The buccal cavity (mouth) is the entry point of the alimentary canal and is responsible for mechanical digestion and mixing food with saliva.

• Oesophagus: The oesophagus is a muscular tube that connects the throat to the stomach. It is approximately 25 cm long and primarily helps in transporting food via peristalsis.

• Importance of Villi and Microvilli:

• The villi and microvilli of the small intestine are essential for maximizing nutrient absorption.

• They contain a network of blood capillaries and lymphatic vessels (lacteals) to facilitate the absorption of nutrients and fats, respectively.

• Diseases Related to the Small Intestine:

• Conditions like celiac disease affect the absorption of nutrients due to damage to the villi.

• Other disorders include Crohn's disease and small intestinal bacterial overgrowth (SIBO), which can impair digestion and absorption.

Important Points

• Length Comparison:

• The small intestine is much longer than the large intestine, which is approximately 1.5 meters in length. However, the large intestine has a larger diameter.

• Accessory Organs:

• The small intestine works closely with the liver, pancreas, and gallbladder, which secrete enzymes and bile to aid digestion.

• Critical Role in Health:

• The small intestine plays a crucial role in maintaining overall health by ensuring the body receives essential nutrients for energy, growth, and repair.

Q100. Answer: (d) Cotton

The correct answer is Cotton.

Key Points

• The Harappans, belonging to the Indus Valley Civilization (2500-1900 BCE), were among the first in Eurasia to cultivate cotton.

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• Excavations at sites like Mohenjo-Daro and Harappa revealed traces of cotton fibers and textiles, proving its early use in the region.

• Cotton cultivation was supported by the fertile soils of the Indus River basin and the advanced irrigation techniques of the Harappans.

• The Harappans were skilled in spinning and weaving cotton into textiles, which were used for clothing and trade.

• The domestication and cultivation of cotton by the Harappans contributed significantly to the textile industry, laying the foundation for its global importance.

Additional Information

• Indus Valley Civilization:

• The Indus Valley Civilization was one of the world's first urban civilizations, flourishing from 2500 BCE to 1900 BCE in South Asia.

• It was characterized by well-planned cities like Mohenjo-Daro, Harappa, and Lothal, advanced drainage systems, and thriving trade networks.

• The civilization's economy relied heavily on agriculture, with crops like wheat, barley, cotton, and sesame being cultivated.

• Cotton Cultivation:

• Cotton is a soft, fluffy fiber that grows in a boll around the seeds of the cotton plant (Gossypium).

• The Harappans were pioneers in its cultivation, using the fiber to create textiles for both local use and trade.

• Cotton later spread to other regions, including Mesopotamia and Egypt, and became a globally significant crop.

• Importance of Cotton in Trade:

• Cotton textiles were a key item of trade in the Indus Valley Civilization, facilitating exchanges with Mesopotamia and other ancient regions.

• Archaeological evidence of trade seals and artifacts suggests that cotton products were highly valued by neighboring civilizations.

• Other Crops in the Indus Valley:

• Besides cotton, the Harappans cultivated crops like wheat, barley, lentils, sesame, and dates, reflecting their agricultural diversity.

• They utilized advanced irrigation systems to manage water resources efficiently for farming.

Important Points

• Option 1: Tobacco

• Tobacco was not cultivated by the Harappans as it originated in the Americas and was introduced to Eurasia much later during the Columbian Exchange in the 16th century.

• Option 2: Chilly

• Chilly is also native to the Americas and became part of Eurasian agriculture after the Columbian Exchange.

• Option 3: Potato

• Potato, like tobacco and chilly, originated in the South American Andes and was introduced to Eurasia post-Columbian Exchange.

• Option 4: Cotton

• Cotton was extensively cultivated by the Harappans, making them pioneers in its use in Eurasia.

• Its early domestication by the Harappans laid the foundation for the global cotton industry.

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