Agniveer Army GD 2nd June 2026 (Shift 1) Memory-Based Paper (Previous Year Paper)

Army GD Agniveer • 2026 • 50 questions • 60 minutes • Answer key and solutions

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GENERAL KNOWLEDGE

Q1. The Union Cabinet approved the extension of the Jal Jeevan Mission (JJM 2.0) until which month and year?
- **(a)** June 2027
- **(b)** March 2027
- **(c)** December 2028
- **(d)** August 2029

Q2. The members in House of People from Union Territories shall not exceed by:
- **(a)** 530
- **(b)** 12
- **(c)** 238
- **(d)** 20

Q3. Apart from 30th January, on which other date is Martyrs' Day observed in India to honour Bhagat Singh, Rajguru and Sukhdev?
- **(a)** 15th March
- **(b)** 23rd March
- **(c)** 13th April
- **(d)** 9th August

Q4. Who is known as the 'Nightingale of India'?
- **(a)** Vijaya Laxmi Pandit
- **(b)** Indira Gandhi
- **(c)** Sarojini Naidu
- **(d)** Lata Mangeshkar

Q5. Which of the following is the highest rank in the Indian Army?
- **(a)** Field Marshal
- **(b)** Captain
- **(c)** General Major
- **(d)** Brigadier

Q6. When is the Navy day observed in India?
- **(a)** 1 December
- **(b)** 15 December
- **(c)** 19 December
- **(d)** 4 December

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Q7. Which phrase in the Preamble of the Indian Constitution directly indicates that the ultimate authority to enact and adopt the Constitution lies with the citizens?

(a) Sovereign, Socialist, Secular, Democratic Republic
(b) Justice, Liberty, Equality, and Fraternity
(c) Sarva Dharma Samabhava
(d) We, the People of India

Q8. The Dutch East India Company established its first factory in India in _____.

(a) Calicut
(b) Goa
(c) Petapuli
(d) Pondicherry

Q9. Meghalaya shares its border with which of the following countries?

(a) Myanmar
(b) Bangladesh
(c) Nepal
(d) China

Q10. Which part of the Indian Constitution talks about the Panchayats?

(a) IX
(b) X
(c) XI
(d) XII

Q11. Which is the largest continent in terms of area?

(a) Asia
(b) Africa
(c) Europe
(d) North America

Q12. Which of the following Indian women cricketers was crowned with the Wisden Cricketers' Almanack in April 2025?

(a) Smriti Mandhana
(b) Harmanpreet Kaur
(c) Mithali Raj
(d) Deepti Sharma

Q13. In which of the following regions did the Sanyasi and Fakir Rebellion start?

(a) Kerala
(b) West Bengal
(c) Maharashtra
(d) Uttar Pradesh

Q14. Which of the following Articles of the Kyoto Protocol allows for Emissions trading?

(a) Article 2
(b) Article 9
(c) Article 12
(d) Article 17

Q15. Who among the following established the Brahmo Samaj in 1828?

(a) Swami Dayananda Saraswati
(b) Raja Ram Mohan Roy
(c) Keshab Chandra Sen
(d) Ishwar Chandra Vidyasagar

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GENERAL SCIENCE

Q16. Most of the adolescent growth is in the _____.

(a) Glands
(b) Trunk and limbs
(c) Head and brain
(d) Fatty Tissues

Q17. Which of the following gases has the highest concentration in the atmosphere?

(a) Oxygen
(b) Nitrogen
(c) Argon
(d) Carbon dioxide

Q18. Which gland in the human body is called the master gland?

(a) Pancreas
(b) Thyroid
(c) Pituitary
(d) Spleen

Q19. What is the correct answer to explain the mechanism of inhalation during breathing in human beings?

(a) Air moves in, Ribs move in and Diaphragm moves down
(b) Air moves out, Ribs move out and Diaphragm moves up
(c) Air moves out, Ribs move out and Diaphragm moves down
(d) Air moves in, Ribs move out and Diaphragm moves down

Q20. Kwashiorkar is caused due to deficiency of which nutrient:

(a) Fat
(b) Protein
(c) Vitamin D
(d) Iron

Q21. Which of the following fungus is used in baking industry?

(a) Morels
(b) Black mold
(c) Yeast
(d) Mushroom

Q22. An object is dropped from a height onto the floor. Which one of the following remains uniform as it falls?

(a) Its acceleration
(b) Its momentum
(c) Its kinetic energy
(d) Its potential energy

Q23. Which of following is used to treat bacterial infection inside the human body?

(a) Anaesthetic
(b) Antibiotic
(c) Antiseptic
(d) Antipyretic

Q24. Which of the following vitamins helps to keep our skin and eyes healthy?

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

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Q25. Deficiency of Vitamin E causes

(a) Rickets
(b) Beriberi
(c) Pellagra
(d) Infertility

Q26. What disease is caused by insulin deficiency?

(a) Scleroderma
(b) Multiple Sclerosis
(c) Rheumatoid arthritis (RA)
(d) Diabetes mellitus

Q27. What is the role of a fuse in an electric circuit?

(a) To break the circuit if the current exceeds a safe level, preventing damage
(b) To not break the circuit if the current exceeds a safe level
(c) To increase the current when needed
(d) To cool down the wires during overheating

Q28. Vegetative propagation refers to formation of new plants from :

(a) Stem, flowers and fruits
(b) Stem, leaves and flowers
(c) Stem, roots and flowers
(d) Stem, roots and leaves

Q29. The conversion of liquid state into solid state is known as-

(a) Evaporation
(b) Freezing
(c) Sublimation
(d) Vapourisation

Q30. The sunlight used by green plants in photosynthesis is transformed into_____.

(a) Chemical energy
(b) Physical energy
(c) Both 1 and 2
(d) Neither 1 nor 2

MATHEMATICS

Q31. If A : B = 14 : 3 and B : C = 3 : 10, then find C : B : A.

(a) 10 : 3 : 14
(b) 14 : 3 : 10
(c) 8 : 7 : 21
(d) 7 : 5 : 18

Q32. The average price of three items of furniture is Rs. 5,240. If their prices are in the ratio 3 : 5 : 7, then the price (in Rs.) of the costliest item is:

(a) 7048
(b) 6144
(c) 5240
(d) 7336

Q33. Convert 3.375 into a fraction in simplest form.

(a) 27/8
(b) 13/4
(c) 26/7

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(d) 25/6

Q34. A person bought goods for Rs. 400 and sold them at a 20% loss. What was the selling price?

(a) Rs. 300
(b) Rs. 320
(c) Rs. 330
(d) Rs. 350

Q35. If the length of a rectangle is 5 cm more than the breadth and if the perimeter of the rectangle is 40 cm, then the length and breadth of the rectangle will be:

(a) 11.4 cm, 8.6 cm
(b) 10.5 cm, 9.5 cm
(c) 12.4 cm, 7.6 cm
(d) 12.5 cm, 7.5 cm

Q36. The L.C.M. of two numbers is 14560 and their H.C.F. is 13. If one of them is 416, the other is

(a) 450
(b) 455
(c) 465
(d) 445

Q37. Evaluate: 16 + 20 ÷ 5 - 3 × 3

(a) 10
(b) 11
(c) 13
(d) 14

Q38. The price of a cycle falls from Rs. 3000 to Rs. 2700. What is the percentage decrease?

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

Q39. The cost of 48 pencils is Rs. 1344. What will be the cost of 23 pencils?

(a) Rs. 644
(b) Rs. 646
(c) Rs. 645
(d) Rs. 647

Q40. Evaluate: 16 + 18 ÷ 6 - 3 × 3

(a) 12
(b) 9
(c) 10
(d) 13

Q41. The sum of two numbers is 86 and their difference is 12. Find the product of the two numbers.

(a) 1613
(b) 1913
(c) 1713
(d) 1813

Q42. If a : b = 1 : 4 and b : c = 1 : 4, then find the value of a : c.

(a) 16 : 1
(b) 1 : 16
(c) 4 : 1

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(d) 1 : 4

Q43. The average of the first 9 even natural numbers is:

(a) 10
(b) 9
(c) 13
(d) 11

Q44. A person invests Rs. 15,700 at a simple interest rate of 8% per annum. What will be the total interest earned after 3 years ?

(a) Rs. 3,920
(b) Rs. 3,768
(c) Rs. 3,600
(d) Rs. 3,840

Q45. How much distance will be covered in 2.5 hours at a speed of 40 km/h?

(a) 60 km
(b) 80 km
(c) 90 km
(d) 100 km

LOGICAL REASONING

Q46. Cinderella chose a sandal which was 37th from either end in a row of sandals. How many sandals were there in the row?

(a) 72
(b) 70
(c) 74
(d) 73

Q47. Select the option in which the words share the same relationship as that shared by the given pair of words.

Horses : Neigh

(a) Bears : Roar
(b) Elephants : Whine
(c) Donkeys : Chortle
(d) Camels : Grunt

Q48. Select the number that will come in the place of the question mark(?), if '+' and '−' are interchanged and '×' and '÷' are interchanged

61 − 42 × 6 ÷ 9 + 27 = ?

(a) 89
(b) 84
(c) 101
(d) 97

Q49. Five persons A, B, C, D and E are sitting in a row facing north (not necessarily in the same order). One person sits between B and C. One person sits between E and A. One person sits between B and D. E sits immediate right of D. Who sits at the extreme ends?

(a) B and C
(b) C and D
(c) C and E
(d) B and E

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Q50. Select the option that is related to the third letter - cluster in the same way as the second letter - cluster is related to the first letter - cluster.

LOTTERY : WQMTBTF :: SECULAR : ?

(a) BDRTQZK
(b) GTFUCUM
(c) FGTUUCM
(d) DFTUSBM

ANSWER KEY

1	c	2	d	3	b	4	c	5	a	6	d	7	d	8	c	9	b	10	a
11	a	12	a	13	b	14	d	15	b	16	b	17	b	18	c	19	d	20	b
21	c	22	a	23	b	24	a	25	d	26	d	27	a	28	d	29	b	30	a
31	a	32	d	33	a	34	b	35	d	36	b	37	b	38	b	39	a	40	c
41	d	42	b	43	a	44	b	45	d	46	d	47	d	48	d	49	b	50	c

SOLUTIONS

Q1. Answer: (c) December 2028

The correct answer is December 2028.

In News

• The Union Cabinet has approved the extension of the Jal Jeevan Mission (JJM 2.0) period up to December 2028 with an enhanced outlay of Rs. 8.69 lakh crore.

Key Points

• Extended Timeline & Outlay: The mission has been extended to December 2028. The total outlay has been enhanced to Rs. 8.69 lakh crore, with the Central Government assistance increasing to Rs. 3.59 lakh crore.

• Structural Shift: The mission is transitioning from mere infrastructure creation to a service delivery model, focusing on sustainable rural piped potable water supply and drinking water governance.

• Digital Framework: A new national digital framework called “Sujalam Bharat” will be instituted. Every village will be assigned a unique Service Area ID to map the water supply from source to tap.

• Community Engagement: The programme introduces “Jal Arpan” for formal handover of schemes to Gram Panchayats and “Jal Utsav” as an annual community-led maintenance and review event.

• Impact Assessment: According to the World Health Organization, the mission is estimated to prevent 400,000 diarrheal deaths and save 5.5 crore hours of daily drudgery for women.

Additional Information

• Progress Since Launch

• In 2019, only 17% (3.23 crore) of rural households had tap water. As of March 2026, approximately 81.61% (15.80 crore) households are reported to have tap water connections.

• Viksit Bharat @2047 Vision

• Jal Jeevan Mission 2.0 aligns with the vision of a developed India by ensuring 24x7 rural drinking water supply through a citizen-centric utility-based approach.

• Economic Benefits

• Research by the International Labour Organisation and IIM Bangalore suggests the mission has the potential to generate 59.9 lakh direct employment opportunities.

Q2. Answer: (d) 20

The correct answer is 20.

Key Points

• The maximum number of members in the House of the People (Lok Sabha) from Union Territories is limited to 20, as per Article 81 of the Indian Constitution.

• These members are chosen by direct election from constituencies within the Union Territories.

• Representation of Union Territories in the Lok Sabha ensures inclusive governance and reflects the federal character of the Indian Constitution.

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• The allocation of seats for Union Territories is determined under the Representation of the People Act, 1950.

• The Constitution empowers the Parliament to regulate the manner of representation of Union Territories in the Lok Sabha.

Additional Information

• House of the People (Lok Sabha):

• It is the lower house of the Parliament of India, consisting of representatives elected by the people.

• The total maximum strength of the Lok Sabha is 552 members, including 530 from states, 20 from Union Territories, and 2 nominated members from the Anglo-Indian community (if applicable).

• Union Territories:

• These are regions governed directly by the Central Government of India.

• As of 2023, there are 8 Union Territories in India, including Delhi, Chandigarh, and Puducherry.

• Representation of the People Act, 1950:

• This act provides for the allocation of seats and delimitation of constituencies for elections to the Lok Sabha and State Legislative Assemblies.

• It also regulates the qualification of voters and other election-related provisions.

• Article 81 of the Indian Constitution:

• It specifies the composition of the Lok Sabha, including the maximum number of seats allocated to states and Union Territories.

• The representation in Lok Sabha is based on population, ensuring proportional representation.

Q3. Answer: (b) 23rd March

The correct answer is 23rd March.

Key Points

• Martyrs' Day, also known as Shaheed Diwas, is observed on 23rd March every year to pay homage to the great revolutionaries Bhagat Singh, Shivaram Rajguru, and Sukhdev Thapar.

• On this day in 1931, these three young freedom fighters were hanged by the British Government in the Lahore Central Jail.

• They were executed for their involvement in the Lahore Conspiracy Case, specifically for the assassination of British police officer John Saunders in 1928 to avenge the death of Lala Lajpat Rai.

• Although the execution was originally scheduled for 24th March 1931, the British authorities carried it out 11 hours early, on the evening of 23rd March, due to the fear of a massive public uprising.

• The bodies of the three martyrs were secretly cremated by the authorities near the Sutlej River in Ferozepur, Punjab.

• While 30th January is observed as Martyrs' Day to mark the assassination of Mahatma Gandhi in 1948, 23rd March is specifically dedicated to the sacrifice of these three revolutionaries. Hence, the correct answer is 23rd March.

Additional Information

• Bhagat Singh and the HSRA:

• Bhagat Singh was a charismatic Indian revolutionary who played a crucial role in the Hindustan Socialist Republican Association (HSRA), which was founded in 1928 at Feroz Shah Kotla, Delhi.

• In April 1929, Bhagat Singh and Batukeshwar Dutt threw non-lethal bombs into the Central Legislative Assembly to protest against the Public Safety Bill and the Trade Dispute Bill.

• Their intent was not to kill but "to make the deaf hear," and they surrendered voluntarily to use the court trials as a platform to spread their revolutionary ideas.

• Other Significant Dates in the Options:

• 13th April: This date marks the Jallianwala Bagh Massacre that occurred in 1919 in Amritsar, where British troops under General Dyer fired on a peaceful gathering.

• 9th August: This date is associated with the launch of the Quit India Movement in 1942 and the Kakori Train Action (Conspiracy) in 1925.

• 15th March: This day is observed as World Consumer Rights Day globally, but it does not hold a specific national Martyrs' Day status in India.

• Other Martyrs' Days in India:

• 21st October: Observed as Police Martyrs' Day (Police Commemoration Day) to remember the policemen killed by Chinese troops at Hot Springs in Ladakh in 1959.

• 17th November: Observed in Odisha to commemorate the death anniversary of Lala Lajpat Rai, the "Lion of Punjab."

• 19th November: The birthday of Rani Lakshmibai is often observed as Martyrs' Day in the region of Jhansi to honor those who fell in the Rebellion of 1857.

Important Points

• Legal Background: The trio was tried under a special tribunal constituted by the Viceroy Lord Irwin through an ordinance, bypassing the regular court process to ensure a swift execution.

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• Legacy: The slogan "Inquilab Zindabad" (Long Live the Revolution) was popularized by Bhagat Singh and became the war cry of the Indian independence movement.

• National Tribute: Every year, the Prime Minister and other leaders pay floral tributes at the National Martyrs Memorial located in Hussainiwala (Ferozepur district, Punjab), where the trio was cremated.

Q4. Answer: (c) Sarojini Naidu

The correct answer is Sarojini Naidu.

Key Points

• Sarojini Naidu was also known as the Bharat Kokila or the Nightingale of India.

• She was called the Nightingale of India or Bharatiya Kokila because her poems are rich in imagery and emotions.

• She was a poet, orator, freedom fighter, crusader for equality, and lover of nature.

• She was the vibrant and articulate voice of India at gatherings across the globe.

• She has many firsts to her credit, including being the first Indian woman to become the President of the Indian National Congress and the first woman to become the governor of an Indian state.

• Sarojini Naidu was a prolific poet whose volumes of poetry included The Golden Threshold (1905), The Bird of Time (1912), and her collected poems, published as The Sceptred Flute (1928) and The Feather of the Dawn (1961).

Additional Information

• Vijaya Laxmi Pandit was an Indian politician and diplomat.

• She was the first woman to hold several high-level positions in the Indian government, including serving as India's ambassador to the United States and the United Nations.

• Indira Gandhi was an Indian politician who served as the Prime Minister of India for three terms from 1966 to 1977 and then again from 1980 until her assassination in 1984.

Mistake Points

• Lata Mangeshkar is a singer famous as the 'nightingale of India' for her melody voice.

• who is widely regarded as one of the greatest singers in the history of Indian music Born on September 28, 1929, in Indore, India.

Q5. Answer: (a) Field Marshal

• Field Marshal is a five–star general officer rank and the highest attainable rank in the Indian Army.

• Field Marshal is ranked immediately above general, but not exercised in the regular army structure. It is a largely ceremonial or wartime rank, having been awarded only twice.

Indian Army	Indian Navy	Indian Air Force
General	Admiral	Air Chief Marshal
Lieutenant General	Vice Admiral	Air Marshal
Major General	Rear Admiral	Air Vice Marshal
Brigadier	Commodore	Air Commodore
Colonel	Captain	Group Captain
Lieutenant Colonel	Commander	Wing Commander
Major	Lieutenant Commander	Squadron Leader
Captain	Lieutenant	Flight Lieutenant
Lieutenant	Sub-Lieutenant	Flying Officer

Q6. Answer: (d) 4 December

The correct answer is Wed Dec 04 2024 00:00:00 GMT+0530 (India Standard Time).

Key Points

• Navy Day in India is celebrated on December 4th every year.

• This day is observed to commemorate the launch of Operation Trident during the Indo-Pak War of 1971.

• During Operation Trident, the Indian Navy inflicted heavy damage on the Pakistan Naval forces in Karachi.

• The day is marked by various events such as parades, naval exhibitions, and other activities to honor the navy's contributions.

Additional Information

• Operation Trident

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• Operation Trident was a naval offensive operation launched by the Indian Navy on the night of December 4, 1971, during the Indo-Pak War.

• The operation involved the use of missile boats and resulted in the sinking of several Pakistani vessels, including the destroyer PNS Khaibar.

• This successful operation significantly weakened the Pakistani Navy and boosted the morale of the Indian armed forces.

• Indo-Pak War of 1971

• The Indo-Pak War of 1971 was a military conflict between India and Pakistan that lasted for 13 days, from December 3 to December 16, 1971.

• The war resulted in the creation of Bangladesh, formerly known as East Pakistan.

• The Indian armed forces played a crucial role in the liberation of Bangladesh and the defeat of Pakistani forces.

• Indian Navy

• The Indian Navy is the naval branch of the Indian Armed Forces and is responsible for safeguarding the nation's maritime borders.

• It plays a vital role in securing India's interests in the Indian Ocean region and beyond.

• The Indian Navy conducts various operations, including humanitarian assistance, disaster relief, and anti-piracy missions.

Q7. Answer: (d) We, the People of India

The correct answer is We, the People of India.

Key Points

• The opening words of the Preamble, 'We, the People of India', directly signify that the ultimate authority and sovereignty to enact and adopt the Constitution lie with the citizens of India.

• This phrase establishes that the Constitution derives its power and legitimacy not from any external monarch or authority, but from the collective will of the people themselves.

• The phrase emphasizes the concept of Popular Sovereignty, meaning the people are the source of all political power in the country. Hence, the phrase 'We, the People of India' is correct.

• The concluding lines of the Preamble, 'do hereby adopt, enact and give to ourselves this Constitution', further confirm that the document is a self-imposed charter ordained by the sovereign citizens.

• Sovereign, Socialist, Secular, Democratic Republic describes the nature of the Indian state rather than the source of its authority. Hence, statement 1 is incorrect.

• Justice, Liberty, Equality, and Fraternity represent the core objectives that the Constitution seeks to achieve for its citizens. Hence, statement 2 is incorrect.

• Sarva Dharma Samabhava is a Gandhian principle of secularism (equal respect for all religions) and, while it is the essence of the Indian state, it is not a literal phrase found in the Preamble. Hence, statement 3 is incorrect.

Additional Information

• Source and Origin: The Preamble is based on the 'Objectives Resolution', which was drafted and moved by Pandit Jawaharlal Nehru on 13 December 1946 and adopted by the Constituent Assembly on 22 January 1947.

• Amending the Preamble: The Preamble has been amended only once in the history of independent India by the 42nd Constitutional Amendment Act, 1976. This amendment added three new words: 'Socialist', 'Secular', and 'Integrity'.

• Legal Significance: In the landmark Kesavananda Bharati case (1973), the Supreme Court of India ruled that the Preamble is an integral part of the Constitution and can be amended under Article 368, as long as the basic structure of the Constitution remains intact.

• Nature of the Indian State:

• Sovereign: India is an independent state with no external interference in its internal or external affairs.

• Socialist: Aims to achieve socialistic ends through democratic means.

• Secular: All religions in India have the same status and support from the state.

• Democratic: The Constitution establishes a form of government that gets its authority from the will of the people through elections.

• Republic: The head of the state (President) is an elected official and not a hereditary monarch.

Important Points

• Date of Adoption: The Preamble explicitly mentions 26 November 1949 as the date when the people of India adopted, enacted, and gave to themselves the Constitution. This day is now celebrated as Constitution Day (Samvidhan Divas).

• Borrowed Ideals: The concept of a Preamble was borrowed from the Constitution of the USA. The ideals of Justice (social, economic, and political) were inspired by the Russian Revolution (1917), while the ideals of Liberty, Equality, and Fraternity were taken from the French Revolution (1789-1799).

• Non-Justiciability: The Preamble is non-justiciable, meaning its provisions are not enforceable in a court of law; however, it

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serves as a guiding light for the judiciary to interpret other Articles of the Constitution.

Q8. Answer: (c) Petapuli

The correct answer is Petapuli.

Key Points

• Petapuli was the first location where the Dutch East India Company established its factory in India. It was set up in the early 17th century.

• The Dutch East India Company, also known as the Vereenigde Oost-Indische Compagnie (VOC), started operations in India primarily for the purpose of trade, especially in spices.

• Petapuli, located in Tamil Nadu, was chosen due to its strategic location and proximity to spice-producing areas. Hence, option 3 is correct.

• The Dutch East India Company was among the first European powers to establish trading posts in India, alongside the Portuguese and the British.

• Other locations such as Calicut and Goa were primarily associated with Portuguese influence, while Pondicherry was a French colony. Hence, the other options are incorrect.

Additional Information

• Dutch East India Company:

• The Dutch East India Company was founded in 1602 by the Dutch Republic to manage its trade in Asia.

• It was primarily involved in trading spices, textiles, and other goods. India became an important region for trading due to its diverse resources.

• The company established several factories in India, including those in Masulipatnam, Chinsurah, and Nagapattinam, apart from Petapuli.

• Importance of Petapuli:

• Petapuli became the first base for the Dutch in India, enabling them to establish a strong foothold in the region for trading.

• It was located near spice-producing areas, making it a strategic choice for trade in pepper, cardamom, and other spices.

• Other European Powers in India:

• The Portuguese were the first European power to arrive in India, with their base in Goa.

• The British East India Company arrived later, establishing its first factory at Surat in 1612.

• The French established their primary base in Pondicherry, which became a significant center for French influence.

Important Points

• Trade Items:

• The Dutch primarily traded in spices, including pepper, cinnamon, cloves, and nutmeg, which were highly valuable in Europe.

• They also traded in textiles and indigo, which were produced in various parts of India.

• Decline of Dutch Influence:

• The Dutch influence in India started declining after the rise of the British East India Company, which became the dominant European power.

• By the 18th century, Dutch operations were limited to a few trading posts.

• Legacy:

• The Dutch left behind an influence on Indian architecture, cuisine, and culture, especially in regions where they were established.

• Their trading practices also contributed to the development of trade systems in India during the colonial era.

Q9. Answer: (b) Bangladesh

The correct answer is Bangladesh

Key Points

• Meghalaya is a northeastern Indian state which shares its boundaries with Bangladesh in the west and south.

• It also shares its boundary with Indian state Assam in the north and east.

• It does not share its borders with Bhutan, Nepal, or Myanmar.

State	Capital
Tripura	Agartala
Sikkim	Gangtok
Assam	Dispur

Meghalaya	Shillong
Mizoram	Aizawl
Nagaland	Kohima

Q10. Answer: (a) IX

The correct answer is IX.

Key Points

• Part IX of the Indian Constitution talks about the Panchayats.

• The 73rd Amendment (1992) provided the Constitutional status to the Panchayati Raj Institutions in India.

• The Constitutional status was provided through the insertion of Article 243 to Part IX of the Indian Constitution.

• The act came into force with effect from in 1993, which has a 3-tier system of Panchayati Raj for all states having a population of over 20 lakh.

• The three-tier system of Panchayati Raj consists of:

1. Village-level Panchayats

2. Block-level Panchayats

3. District-level Panchayats.

Q11. Answer: (a) Asia

The correct answer is Asia.

Key Points

• Asia is the largest continent in the world by area, spanning approximately 44.58 million square kilometers.

• It covers about 30% of Earth's total land area and around 8.7% of the Earth's total surface area.

• Asia is home to some of the world's most populous countries, including China and India, which together account for over a third of the global population.

• The continent is bordered by the Arctic Ocean to the north, the Pacific Ocean to the east, and the Indian Ocean to the south.

• Asia is characterized by diverse climates, cultures, and ecosystems, making it a region of immense geographical and cultural significance.

Additional Information

• Other Major Continents by Area:

• Africa: The second-largest continent, covering approximately 30.37 million square kilometers.

• North America: The third-largest continent, spanning about 24.71 million square kilometers.

• South America: Covers around 17.84 million square kilometers.

• Europe: Covers approximately 10.18 million square kilometers, making it the sixth-largest continent.

• Geographical Features of Asia:

• Asia has the highest point on Earth, Mount Everest (8,848.86 meters), located in the Himalayas.

• The lowest point on land, the Dead Sea shoreline (approximately -430 meters below sea level), is also in Asia.

• It contains vast deserts (e.g., the Gobi Desert), lush rainforests, and the Siberian tundra.

• Population and Economy:

• Asia is the most populous continent, with over 4.7 billion people as of 2023.

• It hosts some of the world's largest economies, including China, Japan, and India.

• The continent is a hub for technology, manufacturing, and agriculture.

• Historical and Cultural Significance:

• Asia is the birthplace of major world religions, including Hinduism, Buddhism, Islam, and Christianity.

• It has been a center for ancient civilizations, such as the Indus Valley, Mesopotamia, and Chinese dynasties.

Q12. Answer: (a) Smriti Mandhana

The correct answer is Smriti Mandhana.

Key Points

• The prestigious Wisden Cricketers' Almanack, in its April 2025 edition, named Indian star batter Smriti Mandhana as one of its Five Cricketers of the Year.

• She became only the second Indian woman cricketer to receive this honor, following in the footsteps of Harmanpreet Kaur, who was featured in the 2023 edition.

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• Mandhana's selection was primarily based on her prolific scoring and leadership during the 2024 international season, where she demonstrated exceptional form across Tests, ODIs, and T20Is.

• The Cricketers of the Year award is a tradition that dates back to 1889, and it is generally based on a player's influence on the English cricket season or their outstanding global impact during the previous year.

• Smriti Mandhana has been a consistent performer for India and played a pivotal role in major victories, including her contributions to the Royal Challengers Bangalore (RCB) in the Women's Premier League (WPL) and the national team's success in multi-format series. Hence, the correct answer is Smriti Mandhana.

Additional Information

• Wisden Cricketers' Almanack:

• Often referred to as the "Bible of Cricket," it is a cricket reference book published annually in the United Kingdom since 1864.

• The Five Cricketers of the Year is the oldest individual award in cricket, and a player can typically win it only once in their lifetime.

• Smriti Mandhana's Career Profile:

• Born on July 18, 1996, in Mumbai, Maharashtra, she is an elegant left-handed opening batter.

• She was named the ICC Women's Cricketer of the Year twice, in 2018 and 2021, receiving the Rachael Heyhoe Flint Award.

• In 2018, she was conferred with the Arjuna Award by the Government of India for her outstanding achievements in sports.

• She serves as the vice-captain of the Indian National Team and has been one of the most expensive players in the WPL auction history.

• Other Notable Mentioned Players:

• Harmanpreet Kaur: The captain of the Indian women's team, she was the first Indian woman to be named a Wisden Cricketer of the Year in 2023.

• Mithali Raj: A legendary former captain of the Indian team, she is the highest run-scorer in Women's International Cricket and retired from all formats in 2022.

• Deepti Sharma: A versatile all-rounder known for her off-spin and middle-order batting, she has consistently been ranked among the top all-rounders by the ICC.

Important Points

• Significance of the Award: The inclusion of Indian women in Wisden highlights the rising global profile of the Women's game in India following the success of the Women's Premier League (WPL) launched in 2023.

• Global Recognition: Apart from Mandhana, the 2025 Wisden edition also recognized other international stars for their contributions to the sport during the 2024-25 cycle.

Q13. Answer: (b) West Bengal

The correct answer is West Bengal.

Key Points

• The Sanyasi and Fakir Rebellion took place in the late 18th century, primarily in the Bengal region, which includes present-day West Bengal and Bangladesh.

• It was one of the earliest series of revolts against the British East India Company's rule, lasting roughly from 1763 to 1800.

• The rebellion was triggered by the Great Bengal Famine of 1770, which caused immense suffering and led to the death of millions. The British continued to demand high land revenue despite the catastrophe.

• The Sanyasis (Hindu ascetics) and Fakirs (Muslim mendicants) traditionally moved across the region, collecting alms from local zamindars and peasants while traveling to holy sites.

• The British East India Company viewed these groups as "lawless mendicants" and "vagabonds" and imposed heavy restrictions on their movement and pilgrimage rights.

• The movement was characterized by guerrilla warfare, where the rebels raided Company factories and treasuries to provide relief to the starving population.

• Prominent leaders of the rebellion included Majnum Shah (the leader of the Fakirs), Bhabani Pathak, and Devi Chaudhurani.

• The rebellion was notable for the unity between Hindu Sanyasis and Muslim Fakirs against a common colonial oppressor.

• Bankim Chandra Chattopadhyay's famous novel 'Anandamath' (1882) is based on the Sanyasi Rebellion. The national song of India, 'Vande Mataram', is featured in this novel.

• The rebellion was eventually suppressed by the British under the leadership of Warren Hastings after long-drawn military campaigns.

Additional Information

• Kerala: This region witnessed the Moplah Rebellion (1921), which was an armed revolt by Mappila Muslims against British authorities and local landlords.

• Maharashtra: This state was the center of several uprisings like the Ramosi Uprising (1822) led by Chittur Singh and the Bhil

Rebellion. It also became a major hub for the Indian National Movement in later years.

• Uttar Pradesh: Known as the heartland of the Revolt of 1857, with major centers in Meerut, Kanpur, Lucknow, and Jhansi. It also saw the Eka Movement and various peasant struggles in the early 20th century.

Q14. Answer: (d) Article 17

The correct answer is Article 17.

Key Points

• Article 17 of the Kyoto Protocol explicitly provides for the mechanism of Emissions Trading.

• Emissions Trading allows Annex I countries (developed nations and economies in transition) to trade their assigned amount units (AAUs) with other countries.

• The system is designed to help countries meet their greenhouse gas reduction targets in a cost-effective manner.

• It is part of the Kyoto Protocol's three market-based mechanisms: Emissions Trading, Clean Development Mechanism (CDM), and Joint Implementation (JI).

• The trading system operates under the principle of cap-and-trade, where countries with surplus emission allowances can sell them to countries exceeding their targets.

Additional Information

• Kyoto Protocol:

• Adopted in 1997 and entered into force in 2005, it is an international treaty aimed at reducing greenhouse gas emissions.

• It binds developed countries to emission reduction targets, recognizing their historical responsibility for global warming.

• Emissions Trading Mechanism:

• Also known as carbon trading, this market-based approach allows countries to trade emission allowances to meet their reduction commitments.

• It helps incentivize the reduction of emissions through financial mechanisms.

• Clean Development Mechanism (CDM):

• Under Article 12, CDM allows developed countries to invest in emission reduction projects in developing countries and earn certified emission reduction (CER) credits.

• It promotes sustainable development and technology transfer.

• Joint Implementation (JI):

• Under Article 6, JI enables developed countries to invest in emission reduction projects in other developed countries or economies in transition.

• Countries receive emission reduction units (ERUs) for their investments.

• Cap-and-Trade System:

• It sets a limit (cap) on total emissions and allows entities to trade allowances within this cap.

• Entities that reduce emissions below their allocated cap can sell surplus allowances to others.

Q15. Answer: (b) Raja Ram Mohan Roy

The correct answer is Raja Ram Mohan Roy.

Key Points

• Raja Ram Mohan Roy established the Brahmo Samaj in 1828 in Calcutta (now Kolkata).

• The Brahmo Samaj was a social and religious reform movement in India during the 19th century, aimed at eradicating social evils such as caste discrimination, sati, and child marriage.

• Raja Ram Mohan Roy is often referred to as the "Father of Modern India" due to his contributions to social reform and modernization.

• He advocated for the abolition of sati (the practice of widow self-immolation) and worked with the British government to ensure its legal prohibition in 1829.

• The Brahmo Samaj was based on the principles of monotheism and rejected idol worship, rituals, and the caste system, promoting rationality and individualism instead.

• Raja Ram Mohan Roy also emphasized the importance of education and the empowerment of women, advocating for women's rights, including the right to property and education.

• He played a significant role in introducing Western education and modern scientific approaches to Indian society.

• The Brahmo Samaj became a platform for discussing social reform and spreading ideas of liberal thought and rationalism in Indian society.

• Hence, the correct answer is Raja Ram Mohan Roy.

Additional Information

• About Raja Ram Mohan Roy:

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• Raja Ram Mohan Roy (1772–1833) was a prominent social reformer and thinker of the Bengal Renaissance.

• He was fluent in several languages, including Bengali, Sanskrit, Persian, Arabic, and English, which enabled him to study various religious and philosophical texts.

• Roy was instrumental in modernizing Indian society by introducing Western ideals of democracy, liberty, and equality.

• Significance of Brahmo Samaj:

• The Brahmo Samaj promoted the idea of universal brotherhood and sought to eliminate caste and gender discrimination in Indian society.

• It opposed superstitions, meaningless rituals, and idol worship, focusing on rationality and ethical living.

• The movement laid the foundation for many subsequent reform movements in India, including those led by Swami Vivekananda and Ramakrishna Paramhansa.

• Other Reform Movements:

• Raja Ram Mohan Roy also collaborated with the British government to legalize the Abolition of Sati (1829), marking a significant achievement in his reformist journey.

• He was a supporter of the freedom of press and established the Sambad Kaumudi, a weekly newspaper that raised awareness about social and political issues.

Important Points

• Swami Dayananda Saraswati:

• He founded the Arya Samaj in 1875, which also focused on social reform but emphasized Vedic traditions and values.

• Keshab Chandra Sen:

• He was a prominent leader of the Brahmo Samaj but joined later and introduced several reforms within the movement.

• Ishwar Chandra Vidyasagar:

• A contemporary of Raja Ram Mohan Roy, he worked for widow remarriage and women's education but was not associated with the Brahmo Samaj.

Q16. Answer: (b) Trunk and limbs

Adolescence is a stage of rapid physical growth and development. During this period, the body undergoes significant changes in height, weight, and proportions. Growth does not occur uniformly in all parts of the body but follows a specific pattern.

Key Points

• Most of the adolescent growth occurs in the trunk and limbs. During adolescence, there is a noticeable increase in height due to the rapid growth of long bones in the arms and legs.

• The trunk also develops to achieve adult body proportions. This phase is often referred to as a growth spurt, where limbs grow faster initially, followed by the trunk.

• These changes give adolescents their characteristic body shape.

Hint

• Glands are involved in hormonal changes but not in overall physical growth in size.

• Head and brain growth is more prominent in early childhood rather than adolescence.

• Fatty tissues may increase but are not the primary area of growth.

Hence, the correct answer is 'Trunk and limbs'.

Q17. Answer: (b) Nitrogen

The correct answer is Nitrogen.

Key Points

• Nitrogen constitutes the highest concentration in Earth's atmosphere, accounting for approximately 78% of the total atmospheric gases.

• It is followed by oxygen, which makes up about 21% of the atmosphere.

• Argon, a noble gas, accounts for 0.93% of the atmosphere.

• Carbon dioxide is present in trace amounts, approximately 0.04%, although it plays a significant role in the greenhouse effect and climate change.

• The dominance of nitrogen in the atmosphere is crucial for maintaining Earth's climate and supporting life, as it contributes to the nitrogen cycle, which is essential for plant growth and ecosystem balance.

Additional Information

• Nitrogen:

• Nitrogen is a chemically inert gas under normal conditions, which makes it ideal for preserving Earth's atmosphere and preventing rapid chemical reactions.

• It is a vital component of the nitrogen cycle, which includes processes like nitrogen fixation, nitrification, and denitrification,

essential for soil fertility and plant growth.

• Nitrogen is used industrially in producing ammonia, fertilizers, and explosives, and also as a coolant in cryogenic applications.

• Oxygen:

• Oxygen is critical for respiration in living organisms and is involved in combustion processes.

• It exists primarily in diatomic form (O2) and is also present in trace amounts as ozone (O3), which forms the ozone layer that protects Earth from harmful ultraviolet radiation.

• Industrial uses include metal cutting, welding, and medical oxygen therapy.

• Argon:

• Argon is a noble gas, meaning it is chemically inert and does not react under normal conditions.

• It is used in industries such as welding, lighting (in incandescent and fluorescent bulbs), and as a protective atmosphere for growing silicon and germanium crystals in semiconductor production.

• Carbon Dioxide:

• Carbon dioxide is a greenhouse gas that plays a crucial role in regulating Earth's temperature through the greenhouse effect.

• It is utilized in industries for carbonated beverages, fire extinguishers, and plant growth in controlled environments.

• Human activities, such as burning fossil fuels and deforestation, have increased CO2 levels, contributing to global warming and climate change.

Important Points

• Composition of Earth’s Atmosphere:

• Besides nitrogen (78%) and oxygen (21%), other gases like argon, carbon dioxide, neon, helium, methane, krypton, and hydrogen are present in trace amounts.

• The atmosphere also contains water vapor, varying from 0% to 4%, depending on location and climatic conditions.

• These trace gases play a significant role in climate dynamics, weather patterns, and supporting life on Earth.

• Role of Nitrogen in Agriculture:

• Nitrogen is an essential nutrient for plants, being a key component of chlorophyll (necessary for photosynthesis) and amino acids (building blocks of proteins).

• It is supplied to crops through fertilizers such as urea and ammonium nitrate.

• Climate Change Impact:

• Carbon dioxide and other greenhouse gases are responsible for global warming, leading to climate change effects like rising sea levels, melting glaciers, and extreme weather events.

• Efforts like afforestation, renewable energy adoption, and carbon capture technologies are crucial for mitigating these effects.

Q18. Answer: (c) Pituitary

• The pituitary gland is called the "master gland” of the endocrine system, because it controls the functions of the other endocrine glands.

• The pituitary gland is about the size of a pea and is located at the base of the brain.

• It is called as master gland because its secretion regulates and controls the secretion of the other endocrine glands such as thyroid gland, adrenal gland, pancreas etc. The hormones of this gland are also required for the different activities in the body.

Q19. Answer: (d) Air moves in, Ribs move out and Diaphragm moves down

Concept :

Breathing:

• We take in air through our nostrils. When we inhale air, it passes through our nostrils into the nasal cavity.

• From the nasal cavity, the air reaches our lungs through the windpipe.

• Lungs are present in the chest cavity This cavity is surrounded by ribs on the sides.

• A large, muscular sheet called a diaphragm forms the floor of the chest cavity.

• Breathing involves the movement of the diaphragm and the rib cage.

Explanation:

• During inhalation, ribs move up and outwards and the diaphragm moves down.

• This movement increases space in our chest cavity and air rushes into the lungs.

• The lungs get filled with air.

Additional Information

• Cockroaches have small openings on their sides which are called spiracles and act as respiratory organs.

• Earthworms breathe through their skin.

• Frogs have a pair of lungs for respiration and they can also breathe through their skin.

Q20. Answer: (b) Protein

The correct answer is Protein.

Key Points

• Deficiency of protein causes Kwashiorkar (red-haired body) and Marasmus in infants.

• Protein is the primary foodstuffs and made up of amino acids.

• Protein is synthesised on the ribosome as a linear sequence of amino acids which are held together by peptide bonds.

• Sources of Proteins are Milk, eggs, fish, meat, pulses and soybeans.

Additional Information

• Fat:

• Fats are found in adipose tissues.

• General Formulae of Fat is C57 H110O6.

• Iron:

• Iron is required for hemoglobin and cytochrome synthesis.

• Iron gives the red colour to RBC.

• Iron is essential for both transportations of oxygen to tissue and for the operation of oxidative systems within the tissue cells.

• Vitamin D:

• The Scientific name of Vitamin D is Calciferol.

• Deficiency of Vitamin D results in impaired bone mineralization and leads to bone softening diseases, ricket in children and osteomalacia in adults.

Q21. Answer: (c) Yeast

The correct answer is yeast.

Key Points

• Fungi used in bakeries are yeasts.

• These are unicellular fungi that respire anaerobically and produce a large amount of carbon dioxide.

• The release of carbon dioxide makes the dough rise and gives a puffed-up appearance.

Additional Information

• Microbes belong to diverse organisms – bacteria, fungi, protozoa, and viruses.

• Microbes influence man's life in several ways- they are found in clothes, jams, shoes, dead wood, food products, soil, etc.

• Yeast- it is used as a fermentation agent in the bakery (bread industry) and brewery (wine industry). So, Saccharomyces cerevisiae is also called “Baker’s yeast”.

• Agaricus- it is called “gill fungi” because gills-like pores are present in its fruiting body. It is also called a fairy ring because its fruiting body looks like a ring.

• Mucor- it is called bread mold. It grows on bread. The tip of the mycelium is black colored. Therefore, this fungus looks black-colored.

• Pythium- Causes “Damping-off’’ disease in tobacco and “vegetable crops”.

• Mushrooms belong to the class basidiomycetes as they contain puffball-type structures.

• Their scientific name is Agaricus

• They are terrestrial and lead a saprophytic and parasitic mode of life.

• Black Mold:

• They are Stachybotrys chartarum.

• It is a species of microfungus that produces its conidia in slime heads.

Q22. Answer: (a) Its acceleration

The correct answer is its acceleration.

Key Points

• An object that is moving only because of the action of gravity is said to be free-falling and its motion is described by Newton's second law of motion.

• Newton's second law of motion: The second law states that the acceleration of an object is dependent upon two variables - the net force acting upon the object and the mass of the object.

• The acceleration of the freely falling object is constant and equal to the acceleration due to gravity.

• During free fall of the object, gravitational force acts on the body in a downward direction always and so the acceleration of the object remains in a vertically downward direction which is constant with time.

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• The most remarkable and unexpected fact about falling objects is that, if air resistance and friction are negligible, then in a given location all objects fall toward the center of Earth with the same constant acceleration, independent of their mass.

• The force of gravity causes objects to fall toward the center of Earth. The acceleration of free-falling objects is therefore called the acceleration due to gravity.

• g= 9.81 m/sec²

Q23. Answer: (b) Antibiotic

The correct answer is Antibiotic.

Key Points

• Antibiotics are used to treat or stop some kinds of bacterial infections. They work by killing bacteria or stopping them from reproducing and lay out.

• Antibiotics either kill bacteria or end them multiplying.

• Antibiotics aids the body's immune system to fight bacteria.

• Bacterial infections are frequently treated with topical antibiotics put in directly to the skin or with oral antibiotics.

Additional Information

• Anaesthetic, also spelt anaesthetic, is any representative that produces a local or common loss of sensation, counting pain.

• An antiseptic is a material that stops or hang up the growth of microorganisms.

• Antipyretic is a negotiator that reduces fever.

Q24. Answer: (a) Vitamin A

The correct answer is Vitamin A.

Key Points

• Vitamin A:

• This vitamin is crucial for maintaining the health of both your skin and eyes.

• It is a fat-soluble vitamin that plays an essential role in ensuring normal vision.

• It produces pigments in the retina of the eye and promotes good vision, especially in low light.

• It also helps the heart, lungs, kidneys, and other organs function properly.

• Moreover, it is involved in the regulation of the immune system.

• For the skin, vitamin A helps to speed up healing, prevent breakouts, and support the skin's immune system, promoting natural moisturising.

Additional Information

Vitamin	Role in Skin Health	Role in Eye Health
Vitamin C	As an antioxidant, helps to protect the skin from damaging free radicals caused by UV exposure. Aids in the skin's natural regeneration process and helps prevent dry skin.	Supports the health of blood vessels in the eye and might decrease the risk of cataracts.
Vitamin D	May contribute to skin health by managing the growth of cells and reducing inflammation.	Some research points to vitamin D deficiency being associated with an increased risk of age-related macular degeneration, but its role in eye health is less established.
Vitamin B (B3, B5, B7, B2, B6, B9, B12)	B3 and B5 improve skin hydration, reduce redness and inflammation, and boost skin elasticity. B7 promotes healthy hair, skin, and nails.	B2 helps prevent cataracts. A combination of B6, B9, and B12 might reduce the risk of age-related macular degeneration.

Q25. Answer: (d) Infertility

The correct answer is Infertility.

• Deficiency of Vitamin E causes Infertility.

• Vitamin E deficiency may also be caused by a very low-fat diet.

• Vitamin E was discovered by Evans and Bishop in 1922.

• Beriberi is a disease caused by a vitamin B-1 deficiency.

• Rickets is a bone disorder caused by a deficiency of vitamin D.

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• Pellagra is a disease caused by a lack of vitamin niacin (vitamin B3).

Additional InformationImportant Vitamins, their Chemical names, and sources:

Vitamin	Chemical Name	Sources
Vitamin A	Retinol	Ripe yellow fruits, leafy vegetables, carrots
Vitamin B2	Riboflavin	Wholemeal grains, brown rice, vegetables
Vitamin C	Ascorbic acid	Many fruits and vegetables, liver
Vitamin D	Cholecalciferol	Eggs, liver, sunlight
Vitamin E	Tocopherols	Many fruits and vegetables, nuts.
Vitamin K	Phylloquinone	Leafy green vegetables such as spinach

Q26. Answer: (d) Diabetes mellitus

The correct answer is Diabetes Mellitus.

Important Points

• Insulin is a type of Peptide hormone.

• It is produced by the beta cells of the pancreatic islets.

• The hormone is recognized as the main anabolic hormone of the body.

• It is responsible to regulate the metabolism of carbohydrates, fats, and protein.

Key Points

• Diabetes mellitus is a metabolic disease that causes high blood sugar.

• The insulin moves sugar from the blood cells into the other cells and used it as a form of energy.

• Diabetic patient doesn't make enough insulin or can't effectively use the insulin it does make.

• Some of the important types of diabetes include -

1. Autoimmune diabetes

2. Prediabetes

3. Gestational diabetes

Additional Information

Diabetes insipidus (DI) and Diabetes mellitus (DM) are conditions characterized by abnormal regulation of fluids and sugars in the body, but they have different causes, symptoms, and treatments.

• Diabetes Insipidus (DI) is caused by deficiency of ADH (Antidiuretic Hormone).

• DI is primarily caused by a deficiency of antidiuretic hormone (ADH), also known as vasopressin. ADH is responsible for regulating the balance of water in the body.

Diabetes Mellitus (DM) is caused by Insufficient Insulin or Insulin Ineffectiveness: DM is characterized by insufficient insulin production (Type 1 DM) or ineffective use of insulin by the body's cells (Type 2 DM).

• Type 1 Diabetes: Results from the immune system destroying insulin-producing beta cells in the pancreas.

• Type 2 Diabetes: Develops when the body's cells become resistant to insulin or when the pancreas fails to produce enough insulin.

Key Differences:-

a)Hormonal Involvement:-

• DI: Involves a deficiency of ADH.

• DM: Involves insufficient insulin or insulin ineffectiveness.

b)Urine Characteristics:-

• DI: Results in dilute urine.

• DM: Causes the presence of glucose in the urine.

Q27. Answer: (a) To break the circuit if the current exceeds a safe level, preventing damage

The correct answer is To break the circuit if the current exceeds a safe level, preventing damage.

Key Points

• An electric fuse is a crucial safety device used in electrical circuits to protect appliances and the building from excessive current.

• The primary function of a fuse is to break the circuit by melting when the flow of current exceeds a predefined safe limit. Hence,

the statement in option 1 is correct.

• It is always connected in series with the live wire of the circuit, ensuring that all current entering the appliance must first pass through the fuse.

• A fuse consists of a thin wire or strip made of a material with a low melting point and high resistance, such as an alloy of tin and lead.

• When the current is too high (due to short-circuiting or overloading), the temperature of the fuse wire rises rapidly according to Joule's heating effect, causing it to melt and interrupt the flow of electricity.

Additional Information

• Fuse Rating: Every fuse is assigned a current rating (measured in Amperes), such as 5A for light circuits and 15A for heavy appliances like air conditioners or geysers. The rating indicates the maximum current the fuse can carry without melting.

• Material Properties: The fuse wire must have a low melting point so that it reacts quickly to heat. It also needs high resistivity compared to the copper wires used in house wiring to ensure sufficient heat is generated locally at the fuse.

• Short Circuit vs. Overloading:

• Short circuiting occurs when the live wire and neutral wire come into direct contact, causing a massive surge in current.

• Overloading occurs when too many high-power appliances are connected to a single socket, drawing more current than the wires can handle.

• Modern Alternatives: In modern electrical installations, Miniature Circuit Breakers (MCBs) are often used instead of traditional fuses. Unlike fuses, which must be replaced once blown, MCBs simply trip and can be reset manually.

Important Points

• Joule's Law of Heating: The heat produced in the fuse is governed by the formula H = I^2Rt, where I is the current, R is the resistance, and t is the time. This law explains why a sudden increase in current (I) leads to a rapid increase in heat (H).

• Placement: A fuse is always placed at the beginning of the circuit to ensure that the entire system downstream is protected if the fuse blows.

• Analysis of other options:

• Option 2 is incorrect because the very purpose of a fuse is to break the circuit under unsafe conditions.

• Option 3 is incorrect because a fuse does not act as a transformer or booster; it cannot increase current.

• Option 4 is incorrect because a fuse does not provide cooling; it responds to heat by sacrificing itself (melting) to stop the current.

Q28. Answer: (d) Stem, roots and leaves

The correct answer is Stem, roots and leaves.

Key Points

• Vegetative propagation is a type of asexual reproduction in which new plants are produced from the vegetative parts of the parent plant, such as stems, roots, and leaves.

• In this process, the reproductive organs (flowers) are not involved, and there is no seed formation or fertilization. Hence, the statement that new plants form from stems, roots, and leaves is correct.

• Plants like Potato, Ginger, and Bryophyllum utilize this method for reproduction. Because the new plants are produced from a single parent, they are genetically identical to the parent plant, often referred to as clones.

• Flowers and fruits are specifically associated with sexual reproduction, which involves the fusion of male and female gametes to produce seeds. Hence, options including flowers and fruits are incorrect.

• This method allows plants to bypass the seed dormancy period, leading to faster growth and maturation compared to plants grown from seeds.

Additional Information

• Propagation through Roots:

• Certain plants have modified adventitious roots that can develop into new plants.

• Examples include Sweet potato, Dahlia, and Tapioca. These roots store nutrients and contain buds that sprout when placed in moist soil.

• Propagation through Stems:

• The stem is the most common vegetative part used for propagation. Underground stems like tubers (e.g., Potato), rhizomes (e.g., Ginger and Turmeric), and bulbs (e.g., Onion and Garlic) are highly effective.

• Sub-aerial stems such as runners (e.g., Grasses) and stolons (e.g., Strawberry) also facilitate the spread of the plant across the soil surface.

• Propagation through Leaves:

• Some plants develop epiphyllous buds along their leaf margins.

• A classic example is Bryophyllum (Sprout Leaf Plant). When a leaf falls on moist soil, each bud can grow into a new,

independent plantlet.

• Economic Importance:

• Vegetative propagation is widely used in horticulture and agriculture to maintain the purity of a variety.

• It is essential for cultivating seedless varieties of plants such as Banana, Grapes, Sugar cane, and Orange.

Important Points

• Artificial Methods of Vegetative Propagation:

• Cutting: A part of the stem or root is cut and planted in soil (e.g., Rose, Sugar cane).

• Layering: A branch is bent to the ground and covered with soil to develop roots while still attached to the parent (e.g., Jasmine).

• Grafting: Joining parts from two different plants (the scion and the stock) so they grow as a single plant (e.g., Mango, Citrus).

• Advantages and Disadvantages:

• Advantages: It is a rapid method of multiplication; it ensures genetic consistency; and it allows for the survival of plants in environments where seed germination is difficult.

• Disadvantages: Lack of genetic variation makes the entire population susceptible to the same diseases or environmental changes; it can lead to overcrowding around the parent plant.

Q29. Answer: (b) Freezing

The correct answer is Freezing

Key Points

• The conversion of liquid state into solid state is known as Freezing.

• During freezing, the temperature of the liquid decreases until it reaches its freezing point, where it changes into a solid.

• Freezing is the opposite process of melting, where a solid turns into a liquid.

Additional Information

• Evaporation is the process of a liquid turning into a gas at a temperature below its boiling point.

• Sublimation is the process where a solid changes directly into a gas without passing through the liquid state.

• Vaporization is the process where a liquid changes into a gas, and it includes both evaporation and boiling.

Q30. Answer: (a) Chemical energy

The correct answer is Chemical energy.

Important Points

• Photosynthesis is a process by which green plants and certain other organisms convert light energy into chemical energy.

• The energy from the sun is transformed into chemical energy which is passed along in the food chain.

• When the sunlight falls on the leaves of the plant, photosynthesis takes place.

• The energy absorbed by the plants from the sun helps in the building of simple sugars that are converted into starch for storage.

• When we consume these plants, the stored chemical energy is transferred to us which helps us in performing basic life processes like growing, moving, and breathing.

Q31. Answer: (a) 10 : 3 : 14

Given:

A : B = 14 : 3

B : C = 3 : 10

Formula used:

Combined Ratio = A : B : C (if B is common)

Calculation:

Since the value of B is 3 in both ratios:

=> A : B : C = 14 : 3 : 10

To find C : B : A, reverse the order:

=> C : B : A = 10 : 3 : 14

Therefore The ratio C : B : A is 10 : 3 : 14.

Q32. Answer: (d) 7336

Shortcut Trick

Ratio of prices = 3 : 5 : 7

Average of ratio parts = (3 + 5 + 7) ÷ 3 = 5 units

Average value → 5 units = Rs. 5,240

1 unit = 5,240 ÷ 5 = 1,048

Price of costliest item (7 units) = 7 × 1,048 = Rs. 7,336

Therefore The correct answer is Rs. 7336.

Alternate Method

Given: Average price of 3 items = Rs. 5,240; Price ratio = 3 : 5 : 7.

Formula: Total Sum = Average × Number of items

3 units 5 units 7 units (Costliest) Total = 15 units = Avg × 3 Price Distribution Scale

=> Total price of 3 items = 5,240 × 3 = 15,720

=> Sum of ratio parts = 3 + 5 + 7 = 15 units

=> 15 units = Rs. 15,720

=> 1 unit = 15,720 ÷ 15 = 1,048

=> Price of costliest item = 7 × 1,048

=> Price = Rs. 7,336

Therefore The correct answer is Rs. 7336.

Additional Information

Relationship between Average and Sum

The sum of 'n' observations is always equal to the Average × n. If values are in a ratio, divide the sum by the total number of ratio parts to find the value of one unit.

Weighted Average

When different groups have different averages, the combined average = (n1a1 + n2a2) ÷ (n1 + n2).

Properties of Ratios

Multiplying or dividing all terms of a ratio by the same non-zero number does not change the ratio. To find an individual share: (Individual ratio ÷ Total ratio) × Total Value.

Q33. Answer: (a) 27/8

Shortcut Trick

Break the given decimal into its integer and fractional parts:

3.375 = 3 + 0.375

Recall the standard decimal conversion for eighths: 0.375 = 3/8

=> 3.375 = 3 + 3/8 = (3 × 8 + 3) ÷ 8

=> 3.375 = 27/8

Therefore The correct answer is 27/8.

Alternate Method

Given:

Decimal value = 3.375

Method Used:

To convert a decimal to a fraction, write the entire number without the decimal point over 1 followed by as many zeros as there are decimal places, and then simplify.

Calculations:

=> Since 3.375 has 3 decimal places, we write it over 1000.

=> 3.375 = 3375 / 1000

=> To simplify, divide both the numerator and denominator by 25:

=> Numerator: 3375 ÷ 25 = 135

=> Denominator: 1000 ÷ 25 = 40

=> The fraction becomes 135 / 40.

=> Now, divide both by 5 to reduce it further:

=> Numerator: 135 ÷ 5 = 27

=> Denominator: 40 ÷ 5 = 8

=> The fraction in its simplest form is 27/8.

Therefore The correct answer is 27/8.

Additional Information

Common Decimal Equivalents

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Memorizing common base-8 fractions speeds up calculations in exams: 1/8 = 0.125, 3/8 = 0.375, 5/8 = 0.625, and 7/8 = 0.875.

Proper vs Improper Fractions

A proper fraction has a numerator smaller than its denominator (e.g., 3/8). An improper fraction has a numerator greater than or equal to its denominator (e.g., 27/8). Mixed numbers can be formed directly from improper fractions.

Converting Repeating Decimals

For non-terminating but repeating decimals, place the repeating digits over an equal number of 9s instead of 10s. Example: 0.444... = 4/9, and 0.3636... = 36/99 = 4/11.

Q34. Answer: (b) Rs. 320

Shortcut Trick

At a 20% loss, the Selling Price (SP) is 80% of the Cost Price (CP).

SP = 80% × 400

SP = 0.8 × 400 = 320

Therefore The correct answer is Rs. 320.

Alternate Method

Given: Cost Price (CP) = Rs. 400, Loss Percentage = 20%

Formula Used: Selling Price (SP) = CP − (Loss% × CP / 100)

=> Cost Price (CP) = Rs. 400

=> Loss Percentage = 20%

=> Loss Amount = (20/100) × 400 = Rs. 80

=> Selling Price (SP) = CP − Loss

=> SP = 400 − 80 = 320

Therefore The correct answer is Rs. 320.

Additional Information

Profit and Loss Percentage

Profit = SP − CP and Loss = CP − SP. Both percentages are always calculated on the Cost Price (CP) unless stated otherwise.

Direct Calculation of Selling Price

For profit, SP = CP × (100 + P%)/100. For loss, SP = CP × (100 − L%)/100.

Marked Price and Discount

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

Q35. Answer: (d) 12.5 cm, 7.5 cm

Shortcut Trick

Sum of Length (L) and Breadth (B) = Perimeter ÷ 2 = 40 ÷ 2 = 20 cm.

Difference between Length and Breadth (L − B) = 5 cm.

Length (L) = (Sum + Difference) ÷ 2 = (20 + 5) ÷ 2 = 12.5 cm.

Breadth (B) = (Sum − Difference) ÷ 2 = (20 − 5) ÷ 2 = 7.5 cm.

Therefore The correct answer is 12.5 cm, 7.5 cm.

Alternate Method

Given:

Perimeter (P) = 40 cm

Length (L) = Breadth (B) + 5 cm

Formula Used:

Perimeter of a rectangle = 2 × (Length + Breadth)

Calculations:

=> 2 × (L + B) = 40

=> L + B = 20

=> (B + 5) + B = 20

=> 2B + 5 = 20

=> 2B = 20 − 5

=> 2B = 15

=> B = 7.5 cm

=> L = B + 5 = 7.5 + 5 = 12.5 cm

Therefore The correct answer is 12.5 cm, 7.5 cm.

Additional Information

Area of Rectangle

The total space occupied by the rectangle is given by Area = Length × Breadth.

Diagonal of Rectangle

The distance between opposite corners is d = √(L² + B²).

Square Property

A rectangle becomes a square when Length = Breadth, and its perimeter is 4 × Side.

Q36. Answer: (b) 455

Given:

The L.C.M. of two numbers is 14560 and their H.C.F. is 13.

One of the numbers is 416.

Formula Used:

Product of two numbers = L.C.M. × H.C.F.

Calculation:

Let the other number be x.

Product of the two numbers = 416 × x

Using the formula:

Product of two numbers = L.C.M. × H.C.F.

=> 416 × x = 14560 × 13

=> 416 × x = 189280

=> x = 189280 / 416

=> x = 455

The other number is 455.

Q37. Answer: (b) 11

Shortcut Trick

=> 20 ÷ 5 = 4, 3 × 3 = 9

=> Expression = 16 + 4 − 9

=> = 20 − 9 = 11

Therefore Answer = 11

Alternate Method

Given:

16 + 20 ÷ 5 − 3 × 3

Concept Used:

BODMAS rule

Calculation:

=> 16 + 4 − 3 × 3

=> 16 + 4 − 9

=> 20 − 9

=> 11

Therefore The correct answer is 11.

Additional Information

BODMAS: Division & multiplication before addition/subtraction

Order: Solve ÷ and × from left to right

Basic Rule: Always simplify step-by-step

Exam Tip: Avoid doing addition first

Q38. Answer: (b) 10%

Shortcut Trick

The Price of the cycle decreases from Rs. 3000 to Rs. 2700.

Reduction in value = 3000 − 2700 = Rs. 300.

Reduction Ratio = 300 ÷ 3000 = 1/10.
As 1/10 is equivalent to 10%.
Therefore The correct answer is 10%.
Alternate Method
Given:
Initial Price of the cycle = Rs. 3000
Final Price of the cycle = Rs. 2700
Formula Used:
Percentage Decrease = [(Initial Price − Final Price) ÷ Initial Price] × 100
Calculations:
=> Amount of Decrease = 3000 − 2700
=> Amount of Decrease = Rs. 300
=> Percentage Decrease = (300 ÷ 3000) × 100
=> Percentage Decrease = (1 ÷ 10) × 100
=> Percentage Decrease = 10%
Therefore The correct answer is 10%.
Additional Information
Percentage Change Rule
To find the percentage change, always divide the difference by the Original (Base) Value, never by the new value.
Successive Percentage
If a value changes by a% and then by b%, the net change is given by the formula [a + b + (ab/100)]%.
Fraction to Percentage Conversion
Key fractions: 1/2 = 50%, 1/4 = 25%, 1/5 = 20%, 1/8 = 12.5%, and 1/10 = 10%.

Q39. Answer: (a) Rs. 644

Given:
Cost of 48 pencils = Rs. 1344
Number of pencils required = 23
Formula used:
Cost of 1 pencil = Total cost ÷ Total number of pencils
Cost of required pencils = Cost of 1 pencil × Number of required pencils
Calculation:
Cost of 1 pencil = Rs. 1344 ÷ 48
=> Cost of 1 pencil = Rs. 28
Cost of 23 pencils = Rs. 28 × 23
=> Cost of 23 pencils = Rs. 644
Therefore The correct answer is option 1.

Q40. Answer: (c) 10

Shortcut Trick
Apply BODMAS: solve division and multiplication first
18 ÷ 6 = 3 and 3 × 3 = 9
Expression becomes: 16 + 3 − 9
16 + 3 = 19, then 19 − 9 = 10
Therefore Answer = 10
Alternate Method
Given:
16 + 18 ÷ 6 − 3 × 3
Concept Used:
BODMAS rule
Calculation:
16 + 18 ÷ 6 - 3 × 3

=> 16 + 3 − 3 × 3
=> 16 + 3 − 9
=> 19 − 9
=> 10
Therefore The correct answer is 10.
Additional Information
BODMAS Rule
Order: Brackets → Orders → Division → Multiplication → Addition → Subtraction
Left to Right Rule
Division and multiplication are solved from left to right when both appear
Sign Simplification
After higher operations, solve addition and subtraction sequentially
Common Error
Avoid solving left to right blindly without following BODMAS

Q41. Answer: (d) 1813

Shortcut Trick
Product of two numbers = [(Sum + Difference) ÷ 2] × [(Sum − Difference) ÷ 2]
Given Sum = 86 and Difference = 12.
First number = (86 + 12) ÷ 2 = 49
Second number = (86 − 12) ÷ 2 = 37
Product = 49 × 37 = 1813
Therefore The correct answer is 1813.
Alternate Method
Let the two numbers be x and y (where x > y).
Given:
x + y = 86
x − y = 12
Calculations:
=> Adding the two equations: (x + y) + (x − y) = 86 + 12
=> 2x = 98
=> x = 98 ÷ 2 = 49
=> Substituting x = 49 in the first equation: 49 + y = 86
=> y = 86 − 49 = 37
=> Product of the numbers = x × y = 49 × 37
=> Product = 1813
Therefore The correct answer is 1813.
Additional Information
Algebraic Identity for Product
The product of two numbers can be found using the identity: $4xy = (x + y)^2 − (x − y)^2$.
Sum and Difference Rule
If the sum (S) and difference (D) of two numbers are known, the larger number is (S + D) ÷ 2 and the smaller number is (S − D) ÷ 2.
Difference of Squares
The difference of the squares of two numbers is equal to the product of their sum and their difference: $x^2 − y^2 = (x + y)(x − y)$.

Q42. Answer: (b) 1 : 16

Given:
a : b = 1 : 4
b : c = 1 : 4
Formula Used:
Ratio multiplication

Calculation:
=> a : b = 1 : 4
=> b : c = 1 : 4
=> a : c = (1 × 1) : (4 × 4)
=> a : c = 1 : 16
Therefore The correct answer is 1 : 16.

Q43. Answer: (a) 10

Shortcut Trick
The average of the first n even natural numbers is given by the formula (n + 1).
Here, the number of terms n = 9.
Average = 9 + 1 = 10.
Therefore The correct answer is 10.
Alternate Method
Given:
First 9 even natural numbers: 2, 4, 6, 8, 10, 12, 14, 16, 18.
Number of terms (n) = 9
Formula Used:
Sum of first n even numbers = n(n + 1)
Average = Sum of numbers ÷ Total numbers
Calculations:
=> Sum of first 9 even numbers = 9 × (9 + 1)
=> Sum = 9 × 10 = 90
=> Average = 90 ÷ 9
=> Average = 10
Therefore The correct answer is 10.
Additional Information
Average of first n natural numbers
The average of the first n natural numbers starting from 1 is (n + 1) ÷ 2.
Average of first n odd natural numbers
The average of the first n odd natural numbers (1, 3, 5, ...) is always equal to n.
Average of numbers in A.P.
For any sequence in Arithmetic Progression, Average = (First term + Last term) ÷ 2.

Q44. Answer: (b) Rs. 3,768

Shortcut Trick
Effective Interest Rate = Rate × Time = 8% × 3 = 24%
Total Simple Interest = 24% of Rs. 15,700
Interest = 0.24 × 15,700 = Rs. 3,768
Therefore The correct answer is Rs. 3,768.
Alternate Method
Given:
Principal (P) = Rs. 15,700
Rate of Interest (R) = 8% per annum
Time (T) = 3 years
Formula Used:
Simple Interest (SI) = (P × R × T) ÷ 100
Calculations:
=> SI = (15,700 × 8 × 3) ÷ 100
=> SI = 157 × 8 × 3
=> SI = 157 × 24
=> SI = Rs. 3,768

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Therefore The correct answer is Rs. 3,768.

Additional Information

Simple Interest vs Compound Interest

Simple Interest is calculated only on the principal, whereas Compound Interest is calculated on the principal and the accumulated interest of previous periods.

Total Amount Formula

The total amount (A) at the end of the term is the sum of the Principal and the Simple Interest: A = P + SI = P × (1 + RT/100).

Rate of Interest Calculation

If the interest and time are known, the rate can be found using R = (SI × 100) ÷ (P × T).

Q45. Answer: (d) 100 km

Shortcut Trick

Distance = Speed × Time

Distance = 40 × 2.5

Distance = 100 km

Therefore The correct answer is 100 km.

Alternate Method

Given:

Speed = 40 km/h

Time = 2.5 hours

Formula Used:

Distance = Speed × Time

Calculations:

=> Distance = 40 × 2.5

=> Distance = 40 × (5/2)

=> Distance = 20 × 5

=> Distance = 100 km

Therefore The correct answer is 100 km.

Additional Information

Basic Relation

Speed = Distance ÷ Time | Time = Distance ÷ Speed.

Unit Conversion

To convert km/h to m/s, multiply the speed by 5/18. To convert m/s to km/h, multiply by 18/5.

Average Speed

Average Speed = Total Distance ÷ Total Time. If a person travels two equal distances at speeds x and y, Average Speed = 2xy ÷ (x + y).

Q46. Answer: (d) 73

As Cinderella chose a sandal which was 37th from either end in a row of sandals,

There were 36 sandals toward its right and 36 sandals toward its left,

EXPLANATION:

The total number of sandals = 36(towards left of chosen sandal) + 36(towards right of chosen sandal) + 1(chosen sandal) = 73

Hence, “73” is the correct answer.

Q47. Answer: (d) Camels : Grunt

Here relation between animals and their sound is given.

Horses : Neigh → The sound made by horse is called neigh. (Animal – sound)

1) Bears : Roar → A lion roars, the sound of a bear is called growl.

2) Elephants : Whine → The sound made by elephant is called trumpet, while the sound made by mosquitoes is called whine.

3) Donkeys : Chortle → The sound made by kangaroos is called chortle, while donkeys make hee-haw bray sound.

4) Camels : Grunt → The sound made by camel is called grunt.

So, only ‘Camels : Grunt’ shows the same relation as ‘Horses : Neigh’.

Hence, ‘Camels : Grunt’ is the correct answer.

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Q48. Answer: (d) 97

BODMAS Table:

After decoding signs:

Signs	Decoded signs
•	•
•	•
×	÷
÷	×

Given equation: 61 − 42 × 6 ÷ 9 + 27 = ?

After interchanging the signs then:

=> 61 + 42 ÷ 6 × 9 - 27 = ?

=> ? = 61 + 7 × 9 - 27

=> ? = 61 + 63 - 27

=> ? = 124 - 27 = 97

Hence, the correct answer is "97".

Q49. Answer: (b) C and D

1) One person sits between B and C

2) One person sits between E and A.

3) One person sits between B and D.

4)E sits immediate right of D

Hence, C and D sits at the extreme ends

Q50. Answer: (c) FGTUUCM

The logic followed here is :-

LOTTERY : WQMTBTF

Similarly,

SECULAR : ?

Hence, the correct answer is "Option 3".

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