Agniveer Army GD 3rd June 2026 (Shift 2) 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. Which article of the Indian Constitution prohibits trafficking in human beings and forced labour?

(a) Article 25
(b) Article 23
(c) Article 13
(d) Article 5

Q2. The first President of the Indian National Congress was

(a) A. O. Hume
(b) W. C. Banerjee
(c) Surendranath Banerjee
(d) Mahatma Gandhi

Q3. Who was the leader of the Paika Rebellion of 1817, a significant early armed resistance against British East India Company rule in Odisha?

(a) Chittu Singh
(b) Alluri Sitarama Raju
(c) Bakshi Jagabandhu
(d) Sidhu Murmu

Q4. Who was sworn in as the Chief Minister of Manipur in February 2026, following a period of President's Rule?

(a) N. Biren Singh
(b) Yumnam Khemchand Singh
(c) Conrad Sangma
(d) Neiphiu Rio

Q5. India created history by clinching its maiden ICC Women’s ODI World Cup title on November 2, 2025, defeating South Africa by 52 runs at the DY Patil Stadium, Navi Mumbai. Who was named the Player of the Match in the final?

(a) Harmanpreet Kaur
(b) Shafali Verma
(c) Deepti Sharma
(d) Laura Wolvaardt

Q6. Fundamental duties are _____ and not enforceable by law but are taken into account by the courts while adjudicating any matter.

(a) regulatory
(b) non-statutory
(c) statutory
(d) common

Q7. Which state entered the private space technology sector with the successful launch of its first-ever sounding rocket?

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

Q8. Which is a salt water lake located in Rajasthan?

(a) Sambhar Lake
(b) Chilka Lake
(c) Barapani
(d) Dal lake

Q9. What is the motto of 'Indian Air Force'?

(a) Sewa Paramo Dharma
(b) Nabha Sparsham Deeptam
(c) Sham-no Varuna
(d) Aakasey Satrun Jahi

Q10. _____ has been selected as the host for the 49th Yonex Sunrise Junior National Badminton Championship (U-19) for the year 2026.

(a) Manipur
(b) Sikkim
(c) Assam
(d) Meghalaya

Q11. Which river originates from the Amarkantak Plateau in Madhya Pradesh and flows westward?

(a) Son
(b) Narmada
(c) Tapi
(d) Godavari

Q12. Which of the following options correctly represents the longitudinal extent of Andaman & Nicobar Islands?

(a) 76°E - 78°E
(b) 80°E - 82°E
(c) 71°E - 74°E
(d) 92°E - 94°E

Q13. Who is known as the Grand Old Man of India?

(a) Lokmanya Tilak
(b) Dadabhai Naoroji
(c) C.R Das
(d) Subhash Chandra Bose

Q14. Which Indian state does the Thar Desert primarily cover?

(a) Gujarat and Maharashtra
(b) Rajasthan and Gujarat
(c) Rajasthan and Uttar Pradesh
(d) Rajasthan and Punjab

Q15. The Munda Rebellion (1899-1900) was fought against the British destruction of which traditional land system?

(a) Khuntkatti system
(b) Zamindari system
(c) Mahalwari system
(d) Ryotwari system

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GENERAL SCIENCE

Q16. What does the anther contain?

(a) Petal
(b) Antipodal cell
(c) Egg cell
(d) Pollen grains

Q17. Green spinach comprises _____ in abundance.

(a) Vitamin A
(b) Vitamin B
(c) Vitamin C
(d) All options are correct

Q18. Which part of the digestive system helps in the absorption of water and some salts from the undigested food materials?

(a) Small Intestine
(b) Large Intestine
(c) Pancreas
(d) Oesophagus

Q19. Which method of separation is used for separating heavier and lighter components by bowing air?

(a) Hand picking
(b) Sieving
(c) Winnowing
(d) Threshing

Q20. Which of the following hormones is produced by the thyroid gland?

(a) Thyroid-stimulating hormone
(b) Thyrotropin-releasing hormone
(c) Triiodothyronine
(d) Thyroglobulin

Q21. The materials through which objects can be seen, but not clearly are known as _____.

(a) conducting materials
(b) translucent materials
(c) transparent materials
(d) opaque materials

Q22. What are detergents made of ?

(a) Sodium salts of fatty acids
(b) Sodium salts of sulphonic acids
(c) Sodium salts of benzoic acid
(d) All of these

Q23. What is the method used for the separation of Solid components from a mixture of solids?

(a) Sedimentation
(b) Filtration
(c) Distillation
(d) Centrifugation

Q24. Galvanization is the process of coating a metal with -

(a) Enamel
(b) Tin
(c) Red oxide

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(d) Zinc

Q25. Goiter is caused mainly due to the deficiency of -

(a) Vitamin D
(b) Iodine
(c) Iron
(d) Calcium

Q26. Typhoid and cholera are typical examples of

(a) Infectious diseases
(b) Airborne diseases
(c) Waterborne diseases
(d) None of the above

Q27. What is the name of the force with which earth pulls everything towards itself?

(a) Air pressure
(b) Thrust
(c) Gravity
(d) Resistance

Q28. Reaction of an acid with a base is known as:

(a) Decomposition
(b) Combination
(c) Redox reaction
(d) Neutralization

Q29. Which disease is caused by deficiency of Vitamin 'A'?

(a) Hair fall
(b) Diarrhea
(c) Night blindness
(d) Weakness

Q30. At what temperature is the density of water maximum?

(a) 100 degree Celsius
(b) 4 degree Celsius
(c) 0 degree Celsius
(d) -4 degree Celsius

MATHEMATICS

Q31. Find the value of: $(\sqrt{3} + \sqrt{5})^2 + (\sqrt{3} - \sqrt{5})^2$

(a) 12
(b) 16
(c) 10
(d) 22

Q32. Find the area of a circle that has a circumference of 44 cm.

(a) 154 cm^2
(b) 121 cm2
(c) 100 cm2
(d) 138 cm2

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Q33. The fourth proportional to 8, 32 and 13 is:

(a) 39
(b) 40
(c) 26
(d) 52

Q34. Mode of data 4, 3, 12, 8, 7, 8, 8, 10, 13 is_____

(a) 13
(b) 8
(c) 10.5
(d) 12

Q35. A sum of money becomes Rs. 900 in 4 yr at 5% per annum on Simple Interest. The sum is?

(a) Rs. 550
(b) Rs. 650
(c) Rs. 750
(d) Rs. 500

Q36. Find the average of 312, 126, 100 and 99.

(a) 157.25
(b) 158.25
(c) 156.25
(d) 159.25

Q37. If the SP of an item is Rs.1500 and the CP is Rs.1250, find the profit %.

(a) 16.66%
(b) 19%
(c) 25%
(d) 20%

Q38. $2\sqrt{841}$ is equal to:

(a) 21
(b) 25
(c) 26
(d) 29

Q39. Simplify: $125 \div 25 \times 6 + 12 - 9$

(a) 28
(b) 36
(c) 33
(d) 23

Q40. LCM and HCF of two numbers are 168 and 6 respectively. If one of the numbers is 24, then find the other number.

(a) 42
(b) 45
(c) 44
(d) 40

Q41. An article was sold for Rs. 2100 at a profit of 25%. What is its cost price?

(a) Rs. 1,620
(b) Rs. 1,640
(c) Rs. 1,660
(d) Rs. 1,680

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Q42. 0.4 × 0.4 + 0.6 - 0.34 = ?

(a) 0.42
(b) 0.40
(c) 0.44
(d) 0.46

Q43. If Rohit can cover a distance of 1188 km in 22 hours, then what is the speed of Rohit?

(a) 54 m/s
(b) 25 m/s
(c) 15 m/s
(d) 48 m/s

Q44. $(34)^3$ is equal to:

(a) 39204
(b) 39304
(c) 40304
(d) 29304

Q45. In an Election, There are two candidates. If 10% votes are invalid and winner gets 54% of the total votes and wins by 360 votes ,then find total votes?

(a) 1000
(b) 2000
(c) 3000
(d) 4000

LOGICAL REASONING

Q46. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

187 − 4 ÷ 117 + 325 × 5 = ?

(a) 810
(b) 875
(c) 805
(d) 800

Q47. In a certain code language, 'TRAMP' is written as 'VOCJR' and 'BLANK' is written as 'DICKM'. How will 'AMPLE' be written in that language?

(a) DJSIH
(b) CJRIG
(c) BOSPJ
(d) CIRHG

Q48. S sits 17^(th) from the left and T sits 27^(th) from the right. What is the minimum number of persons between them if the number of total persons is 30?

(a) 10
(b) 25
(c) 24
(d) 12

Q49. Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number.

49 : 13 :: 56 : 11 :: 39 : ?

(a) 14
(b) 12

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(c) 15
(d) 16

Q50. Choose the odd one out.

(a) Lion
(b) Tiger
(c) Wolf
(d) Rabbit

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Article 23

The correct answer Article 23.

• Article 23 of the Indian Constitution prohibits trafficking in human beings and forced labour.

• The Right against Exploitation is enshrined in Articles 23 and 24 of the Indian Constitution.

• These are important Fundamental Rights that guarantee every citizen protection from any kind of forced labour.

• Everyone has the right to work, to free choice of employment, to just and favourable conditions of work, and to protection against unemployment.

• Everyone, without any discrimination, has the right to equal pay for equal work.

• Laws passed by the Parliament in pursuance of Article 23:

• Suppression of Immoral Traffic in Women and Girls Act, 1956

• Bonded Labour System (Abolition) Act, 1976

• Article 23 protects citizens not only against the State but also from private citizens.

Additional Information

• The right to equality is guaranteed by the Constitution in Articles 14 – 18.

• It provides for the equal treatment of everyone before the law, prevents discrimination on various grounds, treats everybody as equals in matters of public employment, and abolishes untouchability, and titles.

• Article 23(1):

• Traffic in human beings and the beggar and other similar forms of forced labour are prohibited and any contravention of this provision shall be an offence punishable in accordance with the law.

• Article 23(2):

• Nothing in this article shall prevent the State from imposing compulsory service for public purposes, and in imposing such service the State shall not make any discrimination on grounds only of religion, race, caste or class or any of them.

Q2. Answer: (b) W. C. Banerjee

The correct answer is WC Bannerjee.

• Indian National Congress (INC) was formed on 28th Dec 1885 in Mumbai and Womesh Chunder Bannerjee became its first president.

Key Points

• The Indian National Congress (INC) was founded in 1885, and in pre-independence India it grew to become one of the most powerful and prominent political parties.

• The First Session of the Indian National Congress (INC) was held in Bombay on 28 December 1885 and continued until 31 December.

• The First session of INC was attended by 72 members.

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• It was initiated by Allan Octavian Hume, a former British civil servant, with Dadabhai Naoroji and Dinshaw Wacha.

• The first INC president was Womesh Chandra Bonnerjee.

• He was born in Calcutta (now Kolkata), in the current state of West Bengal, on 29 December 1844.

• Lord Dufferin was the Viceroy of India during the foundation of INC.

Q3. Answer: (c) Bakshi Jagabandhu

The correct answer is Bakshi Jagabandhu.

Key Points

• Bakshi Jagabandhu, whose full name was Bakshi Jagabandhu Bidyadhar Mohapatra Bhramarbar Raya, was the legendary leader of the Paika Rebellion of 1817. He was the Buxi (military chief) of the Raja of Khurda. Hence, the option containing Bakshi Jagabandhu is the correct statement.

• The rebellion was an armed uprising against the British East India Company's rule in Odisha. It is often referred to as the "First War of Independence" by some historians and the Odisha government.

• The Paikas were the traditional landed militia of Odisha who enjoyed rent-free land (Paikan lands) in return for their military service to the Kingdom of Khurda.

• The rebellion was triggered in March 1817 when the British policies led to the takeover of Paikan lands, the introduction of a new currency system, and the heavy Salt Tax, which made life difficult for the local population.

• Under Bakshi Jagabandhu's leadership, the rebels attacked British symbols of authority, such as police stations and treasuries in Banapur and Khurda. The revolt quickly spread to other regions like Puri, Pipili, and Cuttack.

• Despite the bravery of the Paikas, the rebellion was eventually suppressed by the British forces by 1818. However, Bakshi Jagabandhu remained at large and continued guerrilla warfare until he surrendered in 1825. He died in 1829 while in custody at Cuttack.

Additional Information

• Chittu Singh: He was a prominent leader of the Ramosi Rebellion. The Ramosis, who served in the lower ranks of the Maratha army, revolted in 1822 in Satara, Maharashtra, against British rule and heavy land revenue assessments. Hence, statement A is incorrect.

• Alluri Sitarama Raju: He was a revolutionary who led the Rampa Rebellion of 1922 in the Godavari agency of Andhra Pradesh. He fought against the British Madras Forest Act of 1882, which restricted the free movement of tribal people in forests. He is celebrated as "Manyam Veerudu" (Hero of the Jungles). Hence, statement B is incorrect.

• Sidhu Murmu: Along with his brother Kanhu Murmu, he led the Santhal Rebellion (also known as the Santhal Hool) in 1855-56. This rebellion took place in the Rajmahal Hills (modern-day Jharkhand) against the oppressive Zamindari system and British colonial policies. Hence, statement D is incorrect.

Important Points

• The British East India Company conquered Odisha in 1803 after defeating the Marathas in the Second Anglo-Maratha War. This conquest led to the dethroning of the Raja of Khurda, which sowed the seeds of discontent.

• One of the major economic causes was the abolition of the Cowrie currency (shells) and the demand for taxes in Silver, which the peasants found nearly impossible to acquire.

• The Paika Rebellion is significant because it was a unified struggle involving tribal communities (like the Konds), the Paika militia, and local Zamindars against foreign rule.

• In 2017, the Government of India released a commemorative coin and a stamp to mark the 200th anniversary of this historic uprising.

Q4. Answer: (b) Yumnam Khemchand Singh

The correct answer is Yumnam Khemchand Singh.

Key Points

• Yumnam Khemchand Singh was sworn in as the Chief Minister of Manipur in February 2026 following a period of President's Rule in the state.

• President's Rule in Manipur was imposed due to political instability, marking a significant shift in governance for the state.

• Yumnam Khemchand Singh is a prominent leader and a former Speaker of the Manipur Legislative Assembly, showcasing his political experience.

• His appointment aimed to restore political stability and ensure effective governance in Manipur.

• The transition from President's Rule to the formation of a new government under Yumnam Khemchand Singh was viewed as a critical step toward normalizing the state's political landscape.

Additional Information

• President's Rule in India:

• President's Rule is imposed under Article 356 of the Indian Constitution when a state is unable to function according to the

constitutional provisions.

• During this period, the state legislature is suspended, and governance is directly taken over by the central government.

• President's Rule is often imposed due to political instability, breakdown of law and order, or failure of the state government to function effectively.

• Role of the Chief Minister:

• The Chief Minister is the executive head of a state government in India.

• He/she plays a crucial role in framing policies, implementing laws, and ensuring smooth administration of the state.

• The Chief Minister also acts as the chief advisor to the Governor of the state.

• Yumnam Khemchand Singh:

• Yumnam Khemchand Singh is a seasoned politician from Manipur and has served as the Speaker of the Manipur Legislative Assembly.

• He is known for his leadership skills and efforts to address various socio-political issues in the state.

• His tenure as the Chief Minister is expected to focus on development, stability, and inclusive governance.

• Governance in Manipur:

• Manipur is a northeastern state in India, with significant cultural and ethnic diversity.

• Governance in the state has often faced challenges due to its geographical location, ethnic issues, and political dynamics.

• Efforts to strengthen governance in Manipur include focusing on infrastructure development, education, and healthcare.

Important Points

• Article 356:

• This article allows the President of India to assume control of a state's administration if the state government fails to function according to constitutional norms.

• It requires parliamentary approval and can be extended for a maximum period of three years under certain conditions.

• Manipur Legislative Assembly:

• The legislative assembly is the law-making body of the state, consisting of elected representatives.

• It plays a critical role in governance, policy-making, and addressing state-specific issues.

• Restoration of Governance:

• The appointment of a new Chief Minister after President's Rule is aimed at restoring democratic governance in the state.

• This process involves forming a government with majority support in the legislative assembly.

Q5. Answer: (b) Shafali Verma

The correct answer is Shafali Verma.

In News

• India’s women’s cricket team won its first-ever ICC Women’s ODI World Cup by defeating South Africa by 52 runs on November 2, 2025, at DY Patil Stadium, Navi Mumbai.

Key Points

• Shafali Verma starred with an explosive 87 runs and took 2 wickets, earning her the Player of the Match award.

• Deepti Sharma scored a vital half-century and claimed a five-wicket haul, steering India’s dominance.

• Despite Laura Wolvaardt’s century, South Africa fell short by 52 runs.

• India bagged a prize of USD 4.48 million, while runners-up South Africa received USD 2.24 million.

• The BCCI announced a Rs. 51 crore cash reward for the Indian women’s team for their historic triumph.

Additional Information

• Event: ICC Women’s ODI World Cup 2025 Final

• Venue: DY Patil Stadium, Navi Mumbai

• Date: November 2, 2025

• Result: India beat South Africa by 52 runs

• Captain: Harmanpreet Kaur

Q6. Answer: (c) statutory

The correct answer is statutory.

Key Points

• Fundamental duties come under Part IVA and Article 51A.

• These duties are statutory and are not enforceable by law but are taken into account by the courts while adjudicating any matter.

• Fundamental Duties in the Constitution are inspired by USSR.

• Japan is the only democratic country, other than India, to have Fundamental duties in its Constitution.

• These duties were incorporated through the 42nd Constitutional Amendment Act, 1976 in the Constitution on the recommendations of the Swaran Singh Committee.

• Only 8 Fundamental duties were based on the Swaran Singh Committee recommendation while the 42nd Constitutional Amendment Act added 10 Fundamental duties in the Constitution.

• Later, the 86th Amendment Act, 2002 was passed that introduced one more fundamental duty in the Constitution. Now there are Eleven Fundamental duties in the Constitution.

• Rights and duties are correlative and inseparable.

Additional Information

List of Fundamental Duties of India

• It shall be the duty of every citizen of India —

1. To abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

2. To cherish and follow the noble ideals which inspired our national struggle for freedom;

3. To uphold and protect the sovereignty, unity, and integrity of India.

4. To defend the country and render national service when called upon to do so;

5. To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

6. To value and preserve the rich heritage of our composite culture;

7. To protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures;

8. To develop the scientific temper, humanism, and the spirit of inquiry and reform;

9. To safeguard public property and to abjure violence;

10. To strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavor and achievement;

11. Who is a parent or guardian, to provide opportunities for education to his child, or as the case may be, ward between the age of six to fourteen years.

Q7. Answer: (c) Gujarat

The correct answer is Gujarat.

In News

• On March 14, 2026, Gujarat marked its entry into space technology with its first sounding rocket launch from Dholera.

Key Points

• Developer: The rocket was developed by Omspace Rocket and Exploration (OSRE), an Ahmedabad-based startup.

• Achievement: The sub-orbital rocket reached an altitude of 3 kilometres and was safely recovered using a dual-parachute system.

• Technology: It featured a carbon fibre airframe, 3D-printed igniter, and a sugar-based solid propellant motor.

• Payload: The mission carried a mini-satellite to gather atmospheric and weather-related data.

• Regulatory Support: The launch was authorized by IN-SPACe and aligns with the Gujarat Spacetech Policy 2025–2030.

Additional Information

• Sounding Rocket

• A sounding rocket is an instrument-carrying rocket designed to take measurements and perform scientific experiments during its sub-orbital flight.

• IN-SPACe

• The Indian National Space Promotion and Authorization Center acts as a single-window nodal agency to promote and authorize private sector participation in Indian space activities.

Q8. Answer: (a) Sambhar Lake

• The Sambhar Salt Lake is India's largest inland salt lake.

• It is the bowl-shaped lake that encircles historical Sambhar Lake Town located 96 km south west of the city of Jaipur and 64 km northeast of Ajmer along National Highway 8 in Rajasthan.

Trick(Lakes in Rajasthan): Ramgarh ke Raja ne Sambha ko Talwar chalana sikhaya- Ra-Rajasmand Lake, Ra- Ramgarh Lake, Ta-Talwara Lake, Sa-Sambhar Salt Lake

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Q9. Answer: (b) Nabha Sparsham Deeptam

The Correct Answer is Option (2) i.e. Nabha Sparsham Deeptam.

Key Points

• The motto of the Indian Air Force is "Nabha Sparsham Deeptam" or "Touch the Sky with Glory".

• It was founded on 8^(th) October 1932. Its headquarters are in New Delhi.

• The present Chief of Air Staff of India is Vivek Ram Chaudhari as of Nov 2022.

Force	Motto	Translation	Founded In
Indian Army	Sewa Paramo Dharam	Service is our duty	1^(st) April 1895
Indian Navy	Sham-no Varuna	May the Lord of the Oceans, be auspicious unto us	5^(th) September 1612
Corps of Army Air Defence	Aakasey Saturn Jahi	Win over the enemy in the sky.	1939

Q10. Answer: (b) Sikkim

The correct answer is Sikkim.

In News

• Sikkim will host the 49th Yonex Sunrise Junior National Badminton Championship (U-19) in 2026, marking the first time the state is hosting this national event.

Key Points

• Schedule: The championship is scheduled to be held from 14 November to 21 November 2026.

• Categories: The tournament will include both Individual and Team competitions for the Under-19 age group.

• Organizing Body: The event is held under the aegis of the Badminton Association of India (BAI), led by President Himanta Biswa Sarma.

• Regional Impact: This is a major milestone for the Badminton Association of Sikkim (BAS), aimed at boosting the sporting landscape in the Northeast.

• Historical Context: This is the first time Sikkim has been granted the hosting rights for this prestigious junior national-level tournament.

Badminton Association of India (BAI)

• Apex Body

• The Badminton Association of India (BAI) is the governing body for badminton in India. It is responsible for organizing national tournaments and selecting players to represent India in international competitions like the Olympics, Thomas Cup, and Uber Cup.

Q11. Answer: (b) Narmada

The correct answer is Narmada River.

Key Points

• The Narmada River originates from the Amarkantak Plateau in the state of Madhya Pradesh, India.

• It flows in a westward direction, making it unique as most rivers in India flow eastward.

• The Narmada River is often referred to as the "Life Line of Madhya Pradesh and Gujarat."

• The river flows through the states of Madhya Pradesh, Maharashtra, and Gujarat before draining into the Arabian Sea.

• It is one of the most important rivers of peninsular India and is considered sacred by many communities.

Additional Information

• Characteristics of the Narmada River:

• The Narmada River is a rift valley river, flowing between the Vindhya and Satpura ranges.

• It is one of the few rivers in India that flows from east to west.

• The total length of the river is approximately 1,312 km, making it one of the longest rivers in India.

• The river is known for its unique marble rocks at Bhedaghat, near Jabalpur.

• The river is a crucial source for irrigation, hydropower, and drinking water for the states it traverses.

• Other Rivers Mentioned in the Options:

• Son River: The Son River originates from Amarkantak Plateau but flows eastward and joins the Ganga River. Hence, it is not the correct answer.

• Tapi River: This river flows westward like the Narmada but originates from the Satpura ranges in Madhya Pradesh, not the Amarkantak Plateau.

• Godavari River: Known as the "Dakshin Ganga," the Godavari originates from Trimbak in Maharashtra and flows eastward,

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eventually draining into the Bay of Bengal.

• Cultural Significance of the Narmada River:

• The river is considered sacred and is often referred to in Hindu mythology and scriptures.

• The Narmada Parikrama, a pilgrimage where devotees circumambulate the entire river, is considered an act of spiritual significance.

• Important Projects on Narmada:

• The Sardar Sarovar Dam is one of the largest projects on the river, providing water for irrigation and drinking purposes.

• Other projects include the Indira Sagar Dam and Omkareshwar Dam.

Important Points

• The Narmada is one of the seven holy rivers of India, including the Ganga, Yamuna, Saraswati, Godavari, Krishna, and Kaveri.

• Its basin supports diverse flora and fauna, including some endemic species.

• Hydroelectricity generated from its dams contributes significantly to power generation in the region.

• The river is also a source of livelihood for fishermen and supports agriculture in its basin.

Q12. Answer: (d) 92°E - 94°E

The correct answer is 92°E - 94°E.

Key Points

• The Andaman and Nicobar Islands are located in the southeastern part of the Bay of Bengal, forming an archipelago.

• The islands are situated between the longitudinal range of 92°E to 94°E, making this the correct answer.

• The archipelago consists of around 572 islands, of which only a few are inhabited. These islands are divided into two groups: the Andaman Islands and the Nicobar Islands.

• The Andaman and Nicobar Islands span a total geographical area of around 8,249 square kilometers. They extend over a distance of about 800 kilometers from north to south.

• The location of the islands provides strategic importance as it lies close to important international shipping routes in the Indian Ocean.

Additional Information

• Geographical Significance:

• The Andaman and Nicobar Islands are positioned between 6°N and 14°N latitude and 92°E and 94°E longitude.

• The islands are located to the east of the Indian mainland and are separated from it by the Bay of Bengal.

• Andaman Islands:

• The Andaman group lies to the north and consists of islands such as North Andaman, Middle Andaman, South Andaman, and Little Andaman.

• The capital city of the Andaman and Nicobar Islands, Port Blair, is situated in South Andaman Island.

• Nicobar Islands:

• The Nicobar group lies further south and consists of islands like Car Nicobar, Great Nicobar, and Little Nicobar.

• The southernmost point of India, Indira Point, is located in Great Nicobar Island.

• Strategic Importance:

• The Andaman and Nicobar Islands hold significant strategic importance due to their proximity to Southeast Asia and global shipping routes.

• The islands serve as a critical base for India's naval and defense operations in the Indian Ocean region.

Important Points

• Other Longitudinal Ranges in India:

• The Indian mainland lies between the longitudinal range of 68°7'E to 97°25'E.

• The westernmost point of India is located in Guhar Moti, Gujarat, while the easternmost point is in Kibithu, Arunachal Pradesh.

• Incorrect Options Explained:

• Option 1 (76°E - 78°E): This range lies in the western part of India, covering states like Karnataka and Goa, not the Andaman and Nicobar Islands.

• Option 2 (80°E - 82°E): This longitudinal range covers central Indian states like Madhya Pradesh and Uttar Pradesh.

• Option 3 (71°E - 74°E): This range is located in the westernmost region of India, covering parts of Gujarat and Rajasthan.

Q13. Answer: (b) Dadabhai Naoroji

The correct answer is option 2, i.e. Dadabhai Naoroji.

• Dadabhai Naroji known as the Grand Old Man of India was a Parsi intellectual, educator, cotton trader, and an early Indian political and social leader.

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• Dadabhai Naroji became the president of the Indian National Congress(INC) three times.

• Firstly, He presided over its (INC) second session in Kolkata (then Calcutta) in 1886, the second time he became the president of the Indian National Congress (INC) at Lahore in 1893 and, later, for the third time again in Kolkata in 1906.

• He is widely referred to as "The Grand Old Man of India" for his hard work to attain "Swaraj".

Extra facts:

• Subhas Chandra Bose:

• Subhas Chandra Bose started the greeting of ‘Jai Hind’.

• The Forward Bloc of the Indian National Congress was formed on June 22, 1939, by Netaji Subhas Chandra Bose, who had resigned from the presidency of the Indian National Congress on 29 April after being outmanoeuvred by Mohandas K. Gandhi.

• Subhash Chandra Bose and Sardul Singh Kavishar were the party's first president and vice-president respectively.

• It held its first conference in Nagpur from June 20-22, 1940 where it demanded complete independence to Indian.

• It had its own newspaper called Forward Bloc.

• Bal Gangadhar Tilak:

• Bal Gangadhar Tilak (or Lokmanya Tilak), born as Keshav Gangadhar Tilak, was an Indian nationalist, teacher, social reformer, lawyer, and an independence activist. He was the first leader of the Indian Independence Movement.

• The British colonial authorities called him "The father of the Indian unrest." He also advocated, “Swaraj is my Birth Right and I shall have it.”

• C.R Das:

• C R Das is known as 'Deshbandhu'.

• Chittaranjan Das was an Indian politician and the founder leader of the Swaraj Party in Bengal under British rule.

Q14. Answer: (b) Rajasthan and Gujarat

The correct answer is option 2,

Key Points

• The Thar Desert, also known as the Great Indian Desert, is the 17th largest desert in the world and primarily spans the state of Rajasthan, covering approximately 60% of its area.

• It also extends into parts of Gujarat, Punjab, and Haryana, but Rajasthan is the main state covered.

• Rajasthan's districts such as Jaisalmer, Barmer, Bikaner, and Jodhpur are most heavily impacted by the Thar Desert's arid conditions.

• The desert lies in the northwestern part of India and is bordered by the Aravalli mountain range in the southeast.

• The Thar Desert plays a crucial role in shaping the geography, climate, and cultural heritage of Rajasthan.

Additional Information

• Climate: The Thar Desert experiences extreme temperatures, ranging from 50°C during summers to near freezing in winters.

• Vegetation: It is characterized by xerophytic vegetation such as cacti, acacias, and thorny bushes adapted to arid conditions.

• Economy: Agriculture in the Thar region relies heavily on irrigation systems like the Indira Gandhi Canal, while tourism plays a significant role in districts like Jaisalmer.

• Wildlife: The desert is home to unique wildlife such as the Great Indian Bustard, Blackbuck, and Desert Fox, protected under various conservation initiatives.

• Human Settlements: Despite the harsh conditions, the desert supports a dense population, with many villages practicing traditional lifestyles and crafts such as pottery and textiles.

Q15. Answer: (a) Khuntkatti system

The correct answer is Khuntkatti system.

Key Points

• The Munda Rebellion (1899-1900), also known as the Ulgulan (Great Tumult), was an uprising led by Birsa Munda, a tribal leader and freedom fighter.

• The rebellion was a protest against the British destruction of the Khuntkatti land system, which was the traditional communal landholding system of the Munda tribe.

• The Khuntkatti system allowed the Mundas to collectively own land, which was managed by the village community.

• Under British rule, land was taken away from the tribal communities and handed over to Zamindars and moneylenders, leading to exploitation and displacement.

• Birsa Munda mobilized the tribal community to resist the British policies, fight against the landlords, and reclaim their ancestral lands under the Khuntkatti system.

Additional Information

• Zamindari System

• The Zamindari system was introduced by the British in India under the Permanent Settlement Act of 1793.

• Under this system, Zamindars (landlords) were made owners of vast tracts of land and were responsible for collecting revenue on behalf of the British government.

• This led to exploitation of peasants, as Zamindars often imposed heavy taxes and evicted farmers unable to pay the dues.

• The system contributed significantly to the impoverishment of rural India during British rule.

• Mahalwari System

• Introduced by the British in the early 19th century, the Mahalwari system was a revenue collection system implemented in certain parts of North India.

• In this system, revenue was collected from a village or group of villages (called Mahal) collectively, rather than from individual farmers.

• The village headman acted as an intermediary between the government and the farmers.

• Though it aimed to simplify revenue collection, it often led to exploitation and burdening of farmers with high taxes.

• Ryotwari System

• The Ryotwari system was introduced by the British in South India, particularly in Madras and Bombay Presidencies.

• Under this system, farmers (ryots) directly paid land revenue to the British government.

• The system eliminated intermediaries like Zamindars but still led to exploitation due to high revenue demands.

• It caused significant economic hardship for farmers, as they often had to sell their produce at lower prices to meet revenue obligations.

• Main Theme: Tribal Movements in Colonial India

• Tribal uprisings like the Munda Rebellion were crucial in resisting colonial exploitation and asserting the rights of indigenous communities.

• These movements highlighted the detrimental effects of British policies on tribal livelihoods and traditional socio-economic systems.

• Leaders like Birsa Munda became symbols of resistance and inspired future struggles for social and economic justice.

Q16. Answer: (d) Pollen grains

The correct answer is Pollen grains

Explanation:

• The anther is a part of the male reproductive structure in flowering plants, known as the stamen. It plays a crucial role in the process of sexual reproduction in plants.

• The main function of the anther is to produce and store pollen grains, which are the male gametophytes responsible for fertilization.

• Pollen grains contain the male gametes (sperm cells) that help in pollination and ultimately lead to the formation of seeds after fertilization.

Other options:

• Petal: Petals are colorful parts of the flower that primarily serve to attract pollinators like insects and birds.

• Antipodal Cell: Antipodal cells are part of the female reproductive structure in plants, specifically within the embryo sac of the ovule.

• Egg Cell: The egg cell is the female gamete located inside the ovule of a flower. It is involved in fertilization but is not related to the anther or the production of pollen grains.

Q17. Answer: (d) All options are correct

The correct answer is All of the above.

Key Points

Raw spinach/Green spinach

• is 91% water, 4% carbohydrates, 3% protein, and contains negligible fat.

• In a 100 g (3.5 oz) serving providing only 23 calories, spinach has a high nutritional value, especially when fresh, frozen, steamed, or quickly boiled.

• It is a rich source (20% or more of the Daily Value, DV) of vitamin A, vitamin C, vitamin K, magnesium, manganese, iron and folate.

• Spinach is a good source (10-19% of DV) of the B vitamins riboflavin and vitamin B6, vitamin E, calcium, potassium, and dietary fiber.

• Although spinach is touted as being high in iron and calcium content, and is often served and consumed in its raw form, raw spinach contains high levels of oxalates, which block absorption of calcium and iron in the stomach and small intestine.

• Spinach cooked in several changes of water has much lower levels of oxalates and is better digested and its nutrients absorbed

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more completely.

Q18. Answer: (b) Large Intestine

The correct answer is Large Intestine.

Important Points

• The digestive system of humans consists of the mouth, buccal cavity, pharynx, oesophagus, stomach, small intestine, large intestine, rectum, anus, and associated digestive glands.

• Digestion begins in the mouth.

• The oesophagus is the part that connects the mouth to the stomach.

• Protein digestion takes place in the Stomach.

• Simple sugars, alcohol, and medicines are absorbed in the stomach.

• The nutrients in digested food are absorbed from the small intestine.

• Maximum absorption occurs in the small intestine.

Key Points

• The large intestine helps in the absorption of water and some salts from the undigested food materials.

• The main functions of the large intestine are:

• Absorption of some water, minerals, and certain drugs.

• Secretion of mucus which helps in adhering the waste (undigested),

• Salivary glands, liver, gallbladder, and pancreas are associated with the alimentary canal.

Q19. Answer: (c) Winnowing

The correct answer is Winnowing

Key Points

• Winnowing: The process of separating heavier and lighter components of a mixture by wind or by blowing air is called winnowing.

• Threshing is the process of loosening the edible part of grain from the straw.

• It can be either done by hand, by using a treadle thresher or mechanized.

• Sieving is separating wanted elements from unwanted material it is done for characterizing the particle size.

• Hand Picking is a method of separating easily identifiable material from a mixture using our hands.

Image of Winnowing:

Q20. Answer: (c) Triiodothyronine

Correct Answer: Triiodothyronine

Rationale:

• Triiodothyronine, also known as T3, is a hormone produced by the thyroid gland. It plays a crucial role in regulating metabolism, heart rate, and body temperature. T3 is one of the two primary hormones produced by the thyroid, the other being thyroxine (T4).

• T3 is more active than T4 and is responsible for the majority of the thyroid hormone activity in the body. It influences various physiological processes, including growth and development, and energy consumption.

• The thyroid gland synthesizes T3 by adding three iodine atoms to the amino acid tyrosine. This hormone is then released into the bloodstream where it is transported to various tissues to exert its effects.

Explanation of Other Options:

Thyroid-stimulating hormone (TSH)

• Rationale: TSH is not produced by the thyroid gland. Instead, it is produced by the pituitary gland in the brain. Its primary function is to stimulate the thyroid gland to produce T3 and T4.

Thyrotropin-releasing hormone (TRH)

• Rationale: TRH is produced by the hypothalamus, another part of the brain, not the thyroid gland. It stimulates the pituitary gland to release TSH, which in turn stimulates the thyroid gland.

Thyroglobulin

• Rationale: Thyroglobulin is a protein produced by the thyroid gland and is used within the gland to produce T3 and T4. However, it is not a hormone itself.

Conclusion:

• Among the given options, Triiodothyronine (T3) is the hormone that is directly produced by the thyroid gland. It is essential for the regulation of various metabolic processes and overall body function.

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Q21. Answer: (b) translucent materials

The correct answer is translucent materials.

Key Points

• Translucent materials allow light to pass through them, but they scatter the light, making objects appear blurry or hazy.

• Examples of translucent materials include frosted glass, wax paper, and some plastics.

Additional Information

• Conducting materials, such as metals, allow electricity to flow through them easily.

• Transparent materials, such as clear glass or plastic, allow light to pass through them without scattering, making objects appear clear and sharp.

• Opaque materials, such as wood or metal, do not allow light to pass through them at all.

Q22. Answer: (b) Sodium salts of sulphonic acids

The correct answer is Sodium salts of sulphonic acids.

Key Points

• Detergent (also called synthetic detergent) is the sodium salt of a long-chain benzene sulfonic acid or the sodium salt of a long-chain alkyl hydrogen sulphate.

• These have cleansing properties in water.

• Detergents are also called Soapless Soap because it has all the properties of soap but it is not a soap.

• They do not form insoluble calcium and magnesium salts with hard water so they can be used for washing even with hard water.

Additional Information

• Biodegradable detergents, which can be destroyed by bacteria.

• Sodium alkyl benzene sulphonate is an example of biodegradable.

• Non-Biodegradable detergents, which can not be destroyed by bacteria.

• Cetyl methyl ammonium bromide is an example of non-biodegradable.

Q23. Answer: (b) Filtration

CONCEPT:

Separation of Solid-Solid Mixtures

• The separation of solid components from a mixture of solids is based on exploiting differences in their physical properties, such as particle size, color, shape, magnetic susceptibility, or the ability to undergo sublimation.

• Common techniques used for separating mixtures containing only solid components include:

• Handpicking

• Sieving

• Magnetic Separation

• Sublimation

EXPLANATION:

• To separate a mixture where all components are in the solid state, several specific methods can be applied depending on the nature of the solids:

• Handpicking: This method is used when the components of the mixture have distinct sizes, shapes, or colors and are present in small enough quantities to be removed by hand (e.g., separating stones or insects from grains).

• Sieving: This technique is employed when the solid particles in a mixture have different sizes. A sieve allows smaller particles to pass through its holes while retaining the larger particles (e.g., separating fine sand from pebbles).

• Magnetic Separation: This method is used if one component of the solid mixture possesses magnetic properties (such as iron, nickel, or cobalt). A magnet can be used to attract and separate the magnetic substance from non-magnetic solids.

• Sublimation: This process is used to separate a mixture of two solids where one component can change directly from a solid to a gaseous state upon heating (e.g., ammonium chloride, camphor, or iodine), while the other does not sublime.

Note on Filtration: While methods like filtration, sedimentation, and centrifugation are primarily used for solid-liquid mixtures, filtration can be part of a multi-step process for separating solids if one component is first dissolved in a suitable solvent.

Therefore, the separation of solid components from a mixture of solids is typically achieved using methods such as handpicking, sieving, magnetic separation, or sublimation.

So according to question statement, the correct answer will be

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Q24. Answer: (d) Zinc

The correct answer is Zinc.

Key Points

Explanation:

Galvanization

• The process of putting a protective zinc coating to iron to prevent rusting is known as galvanization.

• It extends the life of iron parts by establishing a membrane between the metal and the air, which prevents iron oxide from developing on its layer.

• Galvanization also provides greater corrosion protection to parts that are exposed to air.

• Galvanizing protects against rust and corrosion in several ways:

1. It acts as a barrier, preventing corrosive chemicals from reaching the iron beneath.

2. The zinc acts as a sacrificial anode, meaning that even if the coating is damaged, the exposed steel is still protected by the zinc that remains on it.

3. The zinc surface reacts with the environment to generate a dense, adhering patina that is impervious to moisture.

Q25. Answer: (b) Iodine

The correct answer is Iodine.

Key Points

• Goiter is an abnormal enlargement of the thyroid gland, located at the base of the neck.

• The primary cause of goiter is a deficiency of iodine in the diet, as iodine is essential for the production of thyroid hormones.

• The thyroid gland requires iodine to synthesize two critical hormones: thyroxine (T4) and triiodothyronine (T3), which regulate metabolism.

• Iodine deficiency leads to inadequate hormone production, causing the thyroid gland to enlarge in an attempt to trap more iodine from the bloodstream.

• In regions where iodine intake is sufficient, other conditions, such as autoimmune disorders (e.g., Hashimoto's thyroiditis) or thyroid nodules, may also cause goiter, but these are less common than iodine deficiency.

• Goiter can be prevented by ensuring a diet rich in iodine, such as through the use of iodized salt or foods naturally high in iodine, like fish, dairy products, and certain vegetables (e.g., seaweed).

Additional Information

• Importance of Iodine:

• Iodine is a trace element required for the synthesis of thyroid hormones, which play a critical role in growth, development, and metabolism.

• A lack of iodine can lead to several health issues, including goiter, hypothyroidism, and in severe cases, cretinism in children (a condition characterized by stunted physical and mental growth).

• The World Health Organization (WHO) recommends iodine intake of 150 micrograms/day for adults, 200 micrograms/day for pregnant women, and 90-120 micrograms/day for children.

• Other Causes of Goiter:

• While iodine deficiency is the most common cause, goiter can also result from:

• Autoimmune diseases like Graves' disease or Hashimoto's thyroiditis.

• Thyroid nodules or tumors.

• Excessive iodine intake, though this is rare.

• Certain medications or exposure to radiation.

• Prevention and Management:

• Preventing goiter largely involves maintaining adequate iodine intake. This is achieved through:

• Use of iodized salt, a common practice worldwide to combat iodine deficiency.

• Consumption of iodine-rich foods such as seafood, dairy products, and seaweed.

• In cases where goiter is caused by factors other than iodine deficiency, medical intervention such as hormone replacement therapy, surgery, or other treatments may be necessary.

• Global Efforts to Address Iodine Deficiency:

• The Universal Salt Iodization (USI) program has been widely implemented to ensure sufficient iodine intake in populations worldwide.

• According to the WHO, iodine deficiency has been significantly reduced in many countries due to such initiatives, though some regions still face challenges.

Important Points

• Symptoms of Goiter:

• The most visible symptom is swelling at the base of the neck.

• Other symptoms may include difficulty swallowing or breathing, hoarseness, and in some cases, hypothyroidism or hyperthyroidism symptoms.

• Iodine-Rich Foods:

• Seafood: Fish, shellfish, and seaweed are excellent natural sources of iodine.

• Dairy: Milk, cheese, and yogurt are also rich in iodine.

• Fortified Foods: In areas where iodine deficiency is common, foods like table salt are often fortified with iodine.

• Statistics:

• According to the Global Iodine Nutrition Scorecard by the Iodine Global Network (IGN), around 2 billion people worldwide are at risk of iodine deficiency.

• Pregnant women and children are the most vulnerable groups, as iodine deficiency during pregnancy can lead to severe developmental issues in the fetus.

Q26. Answer: (c) Waterborne diseases

The correct answer is Waterborne diseases.

Key Points

• Typhoid and cholera are typical examples of Waterborne diseases.

• Waterborne diseases:

• Waterborne diseases are conditions caused by pathogenic microorganisms that are transmitted in water.

• These diseases can be spread while bathing, washing, drinking water, or eating food exposed to contaminated water.

• A report by the United Nations says that more than three million people in the world die of water-related diseases due to contaminated water each year, including 1.2 million children.

• In India, over one lakh people die of water-borne diseases annually.

• It is reported that groundwater in one-third of India's 600 districts is not fit for drinking as the concentration of fluoride, iron, salinity, and arsenic exceeds the tolerance levels.

Important Points

• Typhoid:

• Typhoid is an infectious bacterial disease that mainly spreads through contaminated food or water.

• It is a serious disease spread through contaminated food and water causing high fever, abdominal pain, and diarrhoea.

• It can also spread due to poor hygienic conditions.

• The major symptoms of this disease are characterized by high fever, loss of appetite, and diarrhoea.

• Typhoid fever is caused by Salmonella typhi bacteria.

• In the Typhoid Widal test, a type of blood test is done to Identifies antibodies against Salmonella antigens.

Additional Information

• Infectious diseases:

• Infectious disease, in medicine, a process caused by an agent, often a type of microorganism, that impairs a person's health.

• In many cases, an infectious disease can be spread from person to person, either directly (e.g., via skin contact) or indirectly (e.g., via contaminated food or water).

• An infectious disease can differ from simple infection, which is the invasion of and replication in the body by any of various agents—including bacteria, viruses, fungi, protozoans, and worms—as well as the reaction of tissues to their presence or to the toxins that they produce.

• When health is not altered, the process is called subclinical infection.

• Thus, a person may be infected but not have an infectious disease.

• Airborne diseases:

• The airborne disease can spread when people with certain infections cough, sneeze, or talk, spewing nasal and throat secretions into the air.

• Some viruses or bacteria take flight and hang in the air or land on other people or surfaces.

• When you breathe in airborne pathogenic organisms, they take up residence inside you.

• You can also pick up germs when you touch a surface that harbours them, and then touch your own eyes, nose, or mouth.

• Because these diseases travel in the air, they're hard to control.

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Q27. Answer: (c) Gravity

The correct answer is Gravity.

• Gravity is the force by which a planet or other body draws objects toward its center.

• The force of gravity keeps all of the planets in orbit around the sun.

• Anything that has mass also has gravity. Objects with more mass have more gravity. Gravity also gets weaker with distance. So, the closer objects are to each other, the stronger their gravitational pull is.

• Earth's gravity comes from all its mass.

• All its mass makes a combined gravitational pull on all the mass in an object in its gravitational area.

• This gravitational pull causes an object to come back to earth if we throw it up in the air.

• We experience weight because for the same reason. And if we were on a planet with less mass than Earth, we would weigh less than we do on earth. That's the reason why our weight on the moon becomes 1/6th of our weight on earth.

• The planets revolve around the sun because of the gravitational force between the sun and the planet.

Additional Information

• Thrust:

• The force acting perpendicular to the surface of the object is called thrust.

• When any object is put into the water then the object will replace the water the same as its volume and the cause of which there is a force acting upwards, to balance this weight is called the thrust force.

• The effect of thrust is more on the smaller surface area than the thrust acting on a larger surface area.

• Thrust Force (FT) = Pressure (P) × Area (A)

• Resistance:

• The resistance of a metal conductor is always directly proportional to its length as the longer the conductor, the more will be its resistance.

• Resistance = Resistivity × Length / Area

Q28. Answer: (d) Neutralization

The correct answer is Neutralisation.

Key Points

• Neutralization

• Neutralization reactions can be defined as a chemical reaction in which an acid reacts with a base to produce a salt along with water.

• The reaction of an acid with a base is called a neutralization reaction. Hence, Option 4 is correct.

• For example, the reaction of hydrochloric acid(HCl) with sodium hydroxide(NaOH) produces a solution of sodium chloride(NaCl)(salt) and some additional water molecules.

• The neutralization of a strong base and strong acid has a pH equal to 7.

• The neutralization of a strong base and weak acid will be greater than 7.

• The neutralization of a strong acid and weak base will be less than 7.

Additional Information

• Decomposition reactions

• It can be defined as a reactant compound, which breaks down into two or more products.

• Many decomposition reactions happen all around us i.e. electrolysis of water to produce oxygen and hydrogen, decomposition of carbonic acid in soft drinks.

• Decomposition reactions can be either endothermic or endothermic.

• Combination reactions

• It is the opposite reaction of decomposition reactions in which two reactant molecules react to give one product.

• Redox reaction

• It can be defined as chemical reactions involving the transfer of electrons between the two reactants participating in it.

• In the above reaction, you can see on the product side that there is a loss of one electron by B and a gain of one electron by A.

• | Process | Conversion/Details |

Sublimation	**Solid directly changes into the gaseous state, without forming any liquid state**
Evaporation	Vaporization occurs on the surface of a liquid as it changes into the gas phase

Condensation	Conversion of gas to liquid.
Decantation	Process for the separation of mixtures of immiscible liquids or a liquid and a solid mixture such as a suspension.

Q29. Answer: (c) Night blindness

The correct answer is Night blindness.

Key Points

• Vitamin A is also called Retinol(Chemical name).

• Helps for good vision and maintains healthy eyes.

• Night blindness and Xerophthalmia are the deficiency diseases of Vitamin A.

• Vitamin A is abundant in green leafy vegetables.

• Vitamin A is a fat-soluble Vitamin.

• Vitamin A acts as an antioxidant.

• The term vitamin was coined by Casimir Funk.

• Vitamin is the nutrient which is also known as co-enzyme.

Q30. Answer: (b) 4 degree Celsius

The correct answer is 4 degree Celsius.

Key Points

• The density of water is maximum at 4 degree Celsius, which is approximately 1 g/cm³.

• This phenomenon occurs due to the unique property of water called anomalous expansion, where water expands below 4°C and contracts above it.

• At 4°C, water molecules are most efficiently packed, resulting in the highest density.

• As water is cooled below 4°C, hydrogen bonding causes the molecules to arrange in a structured lattice that decreases density.

• This property is crucial for aquatic life as it ensures that ice floats on liquid water, insulating the water below and preventing it from freezing completely.

Additional Information

• Anomalous Behavior of Water:

• Water exhibits anomalous expansion, meaning it expands as it cools below 4°C instead of contracting like most substances.

• This behavior is due to hydrogen bonding, which governs the molecular arrangement of water.

• Anomalous expansion plays a crucial role in environmental processes, such as the survival of aquatic organisms during winter.

Q31. Answer: (b) 16

Given:

$(\sqrt{3} + \sqrt{5})^2$

$(\sqrt{3} - \sqrt{5})^2$

Formula Used:

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

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

Calculation:

$\Rightarrow (\sqrt{3} + \sqrt{5})^2 + (\sqrt{3} - \sqrt{5})^2$

$\Rightarrow [\sqrt{3}^2 + 2(\sqrt{3} \times \sqrt{5}) + \sqrt{5}^2] + [\sqrt{3}^2 - 2(\sqrt{3} \times \sqrt{5}) + \sqrt{5}^2]$

$\Rightarrow [3 + 2\sqrt{15} + 5] + [3 - 2\sqrt{15} + 5]$

$\Rightarrow (3 + 5) + (3 + 5)$

$\Rightarrow 8 + 8$

$\Rightarrow 16$

Therefore The correct answer is 16.

Q32. Answer: (a) 154 cm²

Given:

Circumference = 44 cm

Formula Used:

Circumference = $2 \times \pi \times r$

Area = π × r²
Calculation:
=> 2 × π × r = 44
=> r = 44 ÷ (2 × π)
=> r = 44 ÷ (2 × 22/7)
=> r = 44 ÷ (44/7)
=> r = 44 × 7 ÷ 44
=> r = 7
=> Area = π × r²
=> Area = 22/7 × 7²
=> Area = 22 × 7
=> Area = 154 cm²
Therefore The correct answer is 154 cm².

Q33. Answer: (d) 52

Given:
First number = 8
Second number = 32
Third number = 13
Formula used:
Fourth proportional = (second number × third number)/first number
Calculation:
Fourth proportional = (second number × third number)/first number
=> (32 × 13)/8 = 52
Therefore The correct answer is 52.

Q34. Answer: (b) 8

Given:
Data: 4, 3, 12, 8, 7, 8, 8, 10, 13
Formula used:
Mode: The value that appears most frequently in a data set
Calculation:
Frequency of each data point:
• 4: 1
• 3: 1
• 12: 1
• 8: 3
• 7: 1
• 10: 1
• 13: 1
=> The value 8 appears most frequently (3 times)
Therefore The correct answer is option (2).

Q35. Answer: (c) Rs. 750

Given:
Amount = Rs. 900
Time = 4 years
Rate of interest = 5%
Formula used:
Amount = Principal + Interest
S.I = PRT/100
Calculation:
S.I = PRT/100

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S.I = (P × 4 × 5)/100
=> P/5
Now, According to the question,
Amount = Principal + Interest
=> P + (P/5) = Rs. 900
=> 6P/5 = Rs. 900
=> P = Rs. 150 × 5
=> Rs. 750
Therefore The sum is Rs. 750

Q36. Answer: (d) 159.25

Shortcut Trick
=> Pair smartly: (312 + 100) + (126 + 99)
=> = 412 + 225 = 637
=> Average = 637 ÷ 4
=> = 159.25
Therefore Answer = 159.25
Alternate Method
Given:
=> Numbers = 312, 126, 100, 99
Formula:
=> Average = (Sum of values) ÷ Number of values
Calculation:
=> Sum = 312 + 126 + 100 + 99 = 637
=> Count = 4
=> Average = 637 ÷ 4 = 159.25
Therefore Final Answer: 159.25
Additional Information
1. Average Formula: Average = Total Sum ÷ Number of items
2. Shortcut Tip: Pair numbers to simplify addition
3. Weighted Average: Used when values have different frequencies
4. Reverse Concept: Total = Average × Number of items

Q37. Answer: (d) 20%

Given:
SP = Rs.1500
CP = Rs.1250
Formula:
Profit % = (SP - CP)/CP × 100
Calculation:
Profit % = (1500 - 1250)/1250 × 100 = 20%
Therefore Margin % = 20%

Q38. Answer: (d) 29

Shortcut Trick
Step 1: The unit digit of 841 is 1, so the unit digit of its square root must be 1 or 9.
Step 2: Find the range of tens. $20^2 = 400$ and $30^2 = 900$.
Step 3: 841 lies between 400 and 900, so the root is 21 or 29.
Step 4: Since 841 is much closer to 900 (30^2) than 400 (20^2), the answer is 29.
Therefore The correct answer is 29.
Alternate Method
Given: Square root of 841 (√841)
We can find the square root using the prime factorization method or long division method.

=> Check for divisibility by prime numbers (2, 3, 5, 7, 11, 13, 17, 19, 23, 29...):

=> 841 is not divisible by 2, 3, 5, 7, 11, 13, 17, 19, or 23.

=> 841 ÷ 29 = 29

=> 841 = 29 × 29

=> √841 = √(29 × 29)

=> √841 = 29

Therefore The correct answer is 29.

Additional Information

Unit Digit of Squares

A perfect square ending in 1 results from a number ending in 1 or 9. Similarly, a square ending in 4 comes from a root ending in 2 or 8.

Estimation for Square Roots

Always compare the number to the squares of multiples of 10. Example: Since $20^2 = 400$ and $30^2 = 900$, any number between 400 and 900 has a square root between 20 and 30.

Squares ending in 5

To square any number (n5), calculate n × (n+1) and append 25. For example, 25^2: 2 × 3 = 6, so 625.

Q39. Answer: (c) 33

Shortcut Trick

Solve Division: 125 ÷ 25 = 5

Multiply result: 5 × 6 = 30

Perform Addition: 30 + 12 = 42

Subtract: 42 − 9 = 33

Therefore The correct answer is 33.

Alternate Method

Given: 125 ÷ 25 × 6 + 12 − 9

Formula: Apply the BODMAS rule (Division → Multiplication → Addition → Subtraction).

=> 125 ÷ 25 × 6 + 12 − 9

=> 5 × 6 + 12 − 9

=> 30 + 12 − 9

=> 42 − 9

=> 33

Therefore The correct answer is 33.

Additional Information

VBODMAS Rule

V (Vinculum), B (Brackets), O (Of), D (Division), M (Multiplication), A (Addition), S (Subtraction).

Left-to-Right Priority

When operators of the same priority level like Division and Multiplication appear together, solve from left to right.

Subtraction of Larger Numbers

If the negative term is larger than the positive sum, the result will be negative: a − b = −(b − a) where b > a.

Q40. Answer: (a) 42

Shortcut Trick

The product of two numbers is equal to the product of their LCM and HCF.

Second Number = (LCM × HCF) ÷ First Number

Second Number = (168 × 6) ÷ 24

Second Number = 168 ÷ 4 = 42

Therefore The correct answer is 42.

Alternate Method

Given:

LCM of the two numbers = 168

HCF of the two numbers = 6

First number = 24

Formula Used:

First Number × Second Number = LCM × HCF

Calculation:

=> 24 × Second Number = 168 × 6

=> 24 × Second Number = 1008

=> Second Number = 1008 ÷ 24

=> Second Number = 42

Therefore The correct answer is 42.

Additional Information

LCM and HCF of Fractions

LCM of fractions = (LCM of Numerators) ÷ (HCF of Denominators).

HCF of fractions = (HCF of Numerators) ÷ (LCM of Denominators).

Co-prime Numbers

Two numbers are co-prime if their HCF is 1. The LCM of two co-prime numbers is always equal to their product.

Relation Between HCF and LCM

The HCF of any two or more numbers is always a perfect divisor (factor) of their LCM.

Q41. Answer: (d) Rs. 1,680

Let the cost price be Rs. x

We know that profit % = (Selling price - cost price)/cost price × 100

=> 25 = (2100 - x)/x × 100

=> 25x + 100x = 210000

=> 125x = 210000

=> x = 1680

Therefore Cost price x = Rs. 1,680

Q42. Answer: (a) 0.42

Shortcut Trick

Apply BODMAS rule: Multiplication → Addition → Subtraction.

0.4 × 0.4 = 0.16

0.16 + 0.6 − 0.34 = 0.76 − 0.34 = 0.42

Therefore The correct answer is 0.42.

Alternate Method

Given expression: 0.4 × 0.4 + 0.6 − 0.34

Formula used: BODMAS (Bracket, Of, Division, Multiplication, Addition, Subtraction)

=> 0.16 + 0.6 − 0.34

=> 0.76 − 0.34

=> 0.42

Therefore The correct answer is 0.42.

Additional Information

BODMAS Rule

It defines the order of operations: Brackets, Orders, Division, Multiplication, Addition, then Subtraction.

Multiplication of Decimals

To multiply decimals, multiply as whole numbers then count total decimal places in factors to place the point in the product (0.4 × 0.4 = 0.16).

Addition/Subtraction of Decimals

Always align the decimal points vertically before performing addition or subtraction to ensure correct place value alignment.

Q43. Answer: (c) 15 m/s

Given:

Distance covered = 1188 km

Time taken = 22 hours

Concept:

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Unit conversion from Km/hr to m/s, then multiply from 5/18.
Unit conversion from m/s to Km/hr, then multiply from 18/5.
Formula used:
Distance = Speed × Time
Calculation:
=> Speed of Rohit = 1188/22 × 5/18 = 15 m/s
Therefore Speed of Rohit is 15 m/s

Q44. Answer: (b) 39304

Shortcut Trick
Identify the unit digit: 43 = 64, so the answer must end in 4.
Estimate the range: 303 = 27000 and 403 = 64000.
Since 34 is closer to 30, the result should be closer to 27000 than 64000.
Calculation: 343 = 34 × 34 × 34 = 1156 × 34 = 39304.
Therefore The correct answer is 39304.
Alternate Method
Given: Number = 34
Formula Used: (a + b)3 = a3 + 3a2b + 3ab2 + b3
Take a = 30 and b = 4:
=> 343 = (30 + 4)3
=> 343 = 303 + 3 × 302 × 4 + 3 × 30 × 42 + 43
=> 343 = 27000 + (3 × 900 × 4) + (3 × 30 × 16) + 64
=> 343 = 27000 + 10800 + 1440 + 64
=> 343 = 39304
Therefore The correct answer is 39304.
Additional Information
Cube of a Number
A cube is the result of multiplying a number by itself twice (n × n × n).
Unit Digit Property
If a number ends in 4, its cube will always end in 4 because 4 × 4 × 4 = 64.
Perfect Cube Estimation
To find a cube quickly, use nearest tens to estimate the range (e.g., 303 < 343 < 403).

Q45. Answer: (b) 2000

Given:
Percentage of invalid votes = 10%
Winner gets = 54% of total votes
Calculation:
Let the total number of voters be x.
So according to question,
54% of x = 36% of x + 360
=> 18% of x = 360
=> x = 36000/18
=> x = 2000
Therefore Total number of votes is 2000.
Alternate Method
Let the total votes be 100x
So valid votes = 90x
Winner gets = 54% of 100x = 54x
Loser gets = 90x - 54x = 36x
Difference = 54x - 36x = 18x
So, 18x = 360

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=> x = 20

Total votes = 100 × 20

=> 2000

Therefore Total number of votes is 2000

Q46. Answer: (d) 800

BODMAS Rule:

Decoding the given information:

Symbol	•	•	×	÷
Meaning	•	×	÷	•

Given equation: 187 − 4 ÷ 117 + 325 × 5 = ?

Now replacing the sign from left to right using BODMAS Rule, we get:

=> 187 × 4 + 117 − 325 ÷ 5 = ?

=> 187 × 4 + 117 − 65 = ?

=> 748 + 117 − 65 = ?

=> 865 − 65 = ?

=> 800 = ?

Hence, the correct answer is "Option 4".

Q47. Answer: (b) CJRIG

The alphabets and their positions are:

For 'TRAMP' is written as 'VOCJR'

And 'BLANK' is written as 'DICKM'

Similarly for the word 'AMPLE' is coded as:

Thus, the code language for the given the word is CJRIG.

Hence, the correct answer is "CJRIG".

Q48. Answer: (d) 12

Given,

Position of S from the left side → 17th

Position of T from the right side → 27th

EXPLANATION:

Sum of position of S and T value (44) > total people in the row(30)

=> 44 > 30

So, there is overlapping in between them.

Diagram:

Total number of person between S and T = Sum of positions of S and T - Total person in the row - 2

=> Total number of person between S and T = 44 - 30 - 2 = 12

So, there are 12 persons in between them.

Hence, 12 is the right answer.

Q49. Answer: (b) 12

The logic follows here is as,

Addition of digits of first number = second number

Hence, '12' is the correct answer.

Q50. Answer: (d) Rabbit

The logic followed here is:

Words	Meaning
Lion	Carnivorous
Tiger	Carnivorous

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Wolf	Carnivorous
Rabbit	Herbivorous

Except for option 4, all the others are Carnivorous animal, whereas option 4 is a Herbivorous animal.
Thus, rabbit is the odd one.
Hence, the correct answer is "Rabbit".

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