Agniveer Army GD 23 April 2024 (Shift 2) Memory-Based Paper (Previous Year Paper)

Army GD Agniveer • 2024 • 50 questions • 60 minutes • Answer key and solutions

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GENERAL KNOWLEDGE

Q1. Where is the famous hill station Ranikhet located?

(a) Rajasthan
(b) Uttar Pradesh
(c) Himachal Pradesh
(d) Uttarakhand

Q2. How many emergency provisions are contained in Indian Constitution?

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

Q3. The Indigo Revolt took place in the year 1859 in _____.

(a) Bihar
(b) Bombay
(c) Bengal
(d) Central Province

Q4. Who was the author of the book My Experiment with Truth?

(a) Mahatma Gandhi
(b) Tara Ali Beg
(c) Maulana Abul Kalam azad
(d) Govind Vallabh Pant

Q5. Jim Corbett National Park is in which state of India?

(a) Punjab
(b) Himachal Pradesh
(c) Uttarakhand
(d) Uttar Pradesh

Q6. Where was the 'Azad Hind Fauj' founded?

(a) Singapore
(b) Thailand
(c) Britain
(d) Italy

Q7. Bombay High is known for the production of?

(a) Steel
(b) Coal
(c) Gold

(d) Petroleum

Q8. Who is the Home Minister of India?

(a) Amit Shah
(b) V. K. Singh
(c) Nitin Gadkari
(d) Venkaiah Naidu

Q9. Who is the current Air Force chief?

(a) Arup Raha
(b) Manoj Mukund Naravane
(c) Rakesh Kumar Singh Bhadauria
(d) Vivek Ram Chaudhari

Q10. Where was the final of the 2023 ODI World Cup held?

(a) Delhi
(b) Ahmedabad
(c) Allahabad
(d) Mumbai

Q11. Onam is a festival celebrated in which Indian state?

(a) Karnataka
(b) Kerala
(c) Goa
(d) Tamil Nadu

Q12. As per the census 2011, which state has the highest total literacy rate in India?

(a) Tamil Nadu
(b) Karnataka
(c) Kerala
(d) Sikkim

Q13. Abhinav Bharat Society was founded by?

(a) Taraknath Bose
(b) Ras Behari Bose
(c) Chandrashekar Azad
(d) V D Savarkar

Q14. Where will the Asian Football Cup be held in 2027?

(a) UAE
(b) Iran
(c) Saudi Arabia
(d) Kuwait

Q15. Which Article ensures Abolition of Untouchability ?

(a) Article 16
(b) Article 17
(c) Article 18
(d) Article 19

GENERAL SCIENCE

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Q16. What distinguishes a plant cell from an animal cell?

(a) Nucleus
(b) Presence of Cytoplasm
(c) Presence of Cell Membrane
(d) Presence of Cell Wall

Q17. Which of the following is an Autotroph?

(a) Deer
(b) Zooplankton
(c) Squirrel
(d) Algae

Q18. Sperms in males are produced in-

(a) Urethra
(b) Testes
(c) Epididymis
(d) Penis

Q19. Which mineral salt is found in hemoglobin?

(a) None of these
(b) Iron
(c) Iodine
(d) Phosphorus

Q20. Malaria is caused by :

(a) Plasmodium
(b) Bacteria
(c) Culex mosquito
(d) Virus

Q21. Which of the following is used in Pencil?

(a) Charcoal
(b) Lead
(c) Silica
(d) Graphite

Q22. Which type of bond is present in water?

(a) Covalent bond
(b) Hydrogen Bond
(c) Metallic bond
(d) Ionic Bond

Q23. Which of the following is highly compressible?

(a) Solid
(b) Gas
(c) Liquid
(d) None of the above

Q24. The pH value of milk is _____.

(a) 2.4
(b) 3.8
(c) 6.6
(d) 8.0

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Q25. Which of the following is NOT an allotrope of carbon?

(a) Methane
(b) C-60 Buckminster fullerene
(c) Graphite
(d) Diamond

Q26. What is the SI unit of energy?

(a) Newton
(b) Joule
(c) Mole
(d) Ampere

Q27. A car increases its speed from 54 km/h to 90 km/h in 10s. Its acceleration is-

(a) 1 ms-2
(b) 3 ms-2
(c) 0.5 ms-2
(d) 7 ms^(-2)

Q28. Fans and lamps in domestic installation are connected in:

(a) Series
(b) Parallel
(c) Series and parallel combination
(d) None of the above

Q29. Which of the following substances has the highest density?

(a) Thermocol
(b) Steam
(c) Oil
(d) Ice

Q30. Who is credited with the discovery of the concept of electric charge?

(a) Michael Faraday
(b) Benjamin Franklin
(c) Thomas Edison
(d) Nikola Tesla

MATHS

Q31. What is the sum of 5/4 and 2/3?

(a) 14/9
(b) 23/12
(c) 12/13
(d) 15/23

Q32. "What is the average of 10, 10, 0, 10, and 10?"

(a) 8
(b) 10
(c) 0
(d) 40

Q33. If the ratio of x to y is 2:3, what would be the ratio of y to x?

(a) 3 : 5
(b) 3 : 2
(c) 1 : 1
(d) 2 : 1

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Q34. What is the least common multiple (LCM) of 6 and 4?

(a) 35
(b) 24
(c) 30
(d) 12

Q35. What is 45% converted into a fraction?

(a) 1/4
(b) 9/20
(c) 1/25
(d) 1/2

Q36. Evaluate : 0·25 + 1.47 - 0.46 = ?

(a) 2.24
(b) 3.44
(c) 5.62
(d) 1.26

Q37. What is the term for a shape with five sides?

(a) Square
(b) Triangle
(c) Octagon
(d) Pentagon.

Q38. What is the ratio of the ages of a father and his son if their ages are 35 and 7 years respectively?

(a) 1 : 5
(b) 2 : 3
(c) 5 : 1
(d) 5 : 7

Q39. What is the fifth number if the average of five numbers is 12 and the sum of four of those numbers is 50?

(a) 35
(b) 55
(c) 10
(d) 20

Q40. What number, when multiplied by 6, equals 72?

(a) 24
(b) 26
(c) 36
(d) 12

Q41. What is the time period required to earn a simple interest of Rs 200 on a principal amount of Rs 2000 at a rate of 10%?

(a) 2 years
(b) 5 years
(c) 10 years
(d) 1 year

Q42. If one person can complete a task in 50 days, how many days will it take for five people to complete the same task?

(a) 12 days
(b) 22 days
(c) 5 days
(d) 10 days

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Q43. What is the amount donated by a girl from her income of 25,000 rupees, if she donates 10% of it?

(a) Rs.5000
(b) Rs.250
(c) Rs.2500
(d) Rs.2000

Q44. What is the number if its fifth part is 4?

(a) 35
(b) 25
(c) 15
(d) 20

Q45. What will be the quantity of water in 50 liters of milk if it contains 20% water?

(a) 14 liters
(b) 22 liters
(c) 5 liters
(d) 10 liters

LOGICAL REASONING

Q46. What would be Ram's position from the end of the line if he occupies the 13th position from the front in a line of 29 people?

(a) 18th
(b) 16th
(c) 20th
(d) 17th

Q47. Complete the following series.

F, J, N, R, ?

(a) S
(b) V
(c) U
(d) W

Q48. In a certain code language, if 'D' = 4 and 'AND' = 19, than how will 'ADM' be written in that language?

(a) 17
(b) 18
(c) 19
(d) 20

Q49. Arrange the following words according to dictionary, and find the word that comes on just second place in dictionary?

(a) Conclusion
(b) Concentrate
(c) Confidence
(d) Count

Q50. In a certain code, CODE is written as 900. How will RACE be written in that code?

(a) 18135
(b) 62
(c) 20181914
(d) 270

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Uttarakhand

The correct answer is Uttarakhand.

Key Points

• Ranikhet is at an altitude of 1,869 meters above sea level and is within sight of the western peaks of the Himalayas.

• Ranikhet is a hill station and cantonment town in Almora district in the Indian state of Uttarakhand.

• Mankameshwar, Haidakhan Temple, Jhula Devi and Ram Mandir are the revered temples near Ranikhet.

Additional Information

• The Aravalli Range is a mountain range in Northwestern India, running approximately 670 km in a southwest direction, starting near Delhi, passing through southern Haryana and Rajasthan, and ending in Gujarat.

• The highest peak is Guru Shikhar at 1,722 meters.

• Malwa Plateau, plateau region in north-central India.

• It is bounded by the Madhya Bharat Plateau and Bundelkhand Upland to the north, the Vindhya Range to the east and south, and the Gujarat Plains to the west of volcanic origin, the plateau comprises central Madhya Pradesh state and southeastern Rajasthan state.

• Dodda Betta is the highest mountain in the Nilgiri Mountains at 2,637 meters (8,652 feet).

• There is a reserved forest area around the peak.

• It is 9 km from Ooty, on the Ooty-Kotagiri Road in the Nilgiris District of Tamil Nadu, India.

• Mahendragiri is a mountain in the Rayagada subdivision of the district of Gajapati, Odisha, India.

• It is situated amongst the Eastern Ghats at an elevation of 1,501 meters.

• The Western Ghats

• The Western Ghat is a region where there is a high number of species and biodiversity.

Q2. Answer: (c) 3

The correct answer is the 3

Key Points

• Emergency Provisions of the Indian Constitution

• These provisions are contained in Part XVIII of the Constitution from Article 352 to 360.

• The Constitution of India has three types of emergencies:

1. National Emergency: This emergency is provided in Article 352 and the President of India can declare a national emergency when the security of India is threatened on the grounds of wars, external aggression, or armed rebellion.

2. State Emergency:

• It is provided in Article 356 and popularly known as Presidents Rule.

• It empowers the President to issue a proclamation if he is satisfied that a situation has arisen in which the government of a state cannot be worked according to the provisions of the constitution.

3. Financial Emergency

• It is provided in Article 360 and empowers the President to proclaim a financial emergency if he is not satisfied with a situation that has arisen and the financial stability or credit of India or any part of its territory is threatened.

Important Points

• Things borrowed from the Government of India Act, 1935

• Federal Scheme.

• Office of Governor.

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• Judiciary.
• Public Service Commissions.
• Emergency Provisions.
• Administrative Details.

Additional Information

Sources	Provisions Borrowed
Weimer Constitution of Germany	1. Suspension of Fundamental Rights during the emergency.
Constitution of Soviet Union	1. The ideals of justice(economic, social, and political) stated in the Preamble. 2. Five-Year Plans.
Constitution of U.S.A.	1. Fundamental Rights. 2. Supreme Court. 3. Judicial Review. 4. Independence of Judiciary. 5. The preamble of the Constitution. 6. Impeachment of President. 7. Functions of President and Vice-President. 8. Removal of Supreme Court and High Court Judges.

Confusion Points

• The Emergency provisions are taken from GOI 1935 ACT
• The suspension of fundamental rights during the Emergency is taken from the Weimar Constitution of Germany.

Q3. Answer: (c) Bengal

The correct answer is Bengal.

Key Points

The Indigo Rebellion (Neel Bidroho) started in Bengal in March 1859 and was a revolt by the farmers against British planters who had forced them to grow indigo under terms that were greatly unfavorable to the farmers.

• The indigo farmers revolted in the Nadia district of Bengal by refusing to grow indigo.
• They attacked the policemen who intervened.
• The planters, in response to this, increased the rents and evicted the farmers which led to more agitations.
• In April 1860, all the farmers in the Barasat division of the districts Nadia and Pabna went on a strike and refused to grow indigo.
• The strike spread to other parts of Bengal.
• The anger of the peasants exploded in 1859 when led by Digambar Biswas and Bishnu Biswas of Nadia district, they decided not to grow indigo under duress and resisted the physical pressure of the planters.
• The revolt was suppressed and many farmers were slaughtered by the government and some of the zamindars.
• The revolt was backed by the Bengali intelligentsia, Muslims, and missionaries. The whole of the rural population supported the revolt.
• The press also supported the revolt and played its part in portraying the plight of the farmers and fighting for their cause.

From the above, we can conclude that the 'Indigo Revolt' took place in Bengal in March 1859.

Q4. Answer: (a) Mahatma Gandhi

The correct answer is Mahatma Gandhi.

• The Story of My Experiments with Truth is the autobiography of Mahatma Gandhi, covering his life from early childhood through to 1921.

Key Points

• It was written in weekly instalments and published in his journal Navjivan from 1925 to 1929.
• Its English translation also appeared in instalments in his other journal Young India.
• It was initiated at the insistence of Swami Anand and other close co-workers of Gandhi, who encouraged him to explain the background of his public campaigns.
• In 1998, the book was designated as one of the "100 Best Spiritual Books of the 20th Century" by a committee of global spiritual and religious authorities.

Additional Information

• Other Important authors and their work:-

Author	Books
Jawahar Lal Nehru	• Discovery of India - Before Freedom - Letters for a Nation - Glimpses of world history

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Moti Lal Nehru	• The voice of freedom
Swami Vivekanand	• Karma yoga - My Master - Raja yoga - Jana yoga - Bhakti yoga - Meditation and its Methods.

Q5. Answer: (c) Uttarakhand

The correct answer is Uttarakhand.

Key Points

• Jim Corbett National Park is the oldest national park in India.

• It established in 1936 to protect the endangered Bengal tiger.

• It is located in the Nainital district and Pauri Garhwal district of Uttarakhand.

• It was initially named Hailey National Park, after Sir Malcolm Hailey, the then governor of the United Provinces (present-day Uttar Pradesh and Uttarakhand).

• Later, it was renamed Ramganga National Park and finally Jim Corbett National Park in the late 1950s, after Jim Corbett, a well-known British hunter, tracker, naturalist, and author who had played a key role in its establishment.

Additional Information

• Punjab:

• Punjab is a primarily agricultural state and is famous for its cuisine.

• The state is the site of the Golden Temple, a significant Sikh shrine, and is also known for its Bhangra music and dance.

• Himachal Pradesh:

• It is Located in the western Himalayas, this state is renowned for its breathtaking mountain landscapes

• It is popular hill stations like Shimla (the state capital), Manali, and Dharamshala.

• Uttar Pradesh:

• This is the most populous state in India.

• It is known for its rich history and is home to several important cultural and historical sites, including the Taj Mahal in Agra and the holy cities of Varanasi, Mathura, and Allahabad.

Q6. Answer: (a) Singapore

• Indian National Army, also known as Azad Hind Fauj came into existence on 21st October 1943 in Singapore.

• This organization was based on the concepts of Subhash Chandra Bose.

• Azad Hind Fauz was formed by Mohan Singh.

• Elected President and founding father of Azad Hind Fauj was Rash Behari Bose.

Q7. Answer: (d) Petroleum

The correct answer is petroleum.

Key Points

• Bombay High is an offshore oil and natural gas field located in the Arabian Sea, off the coast of Maharashtra, India.

• Discovered in 1974, it is one of the largest oil and gas fields in the country and has played a pivotal role in India's hydrocarbon production.

• The field is situated approximately 160 kilometers west of the Mumbai coast.

• Petroleum being a Hydrocarbon will be the solution to this Question.

• It is to be noted that not just Petroleum but this field is source of Natural Gas and is crucial for meeting the country's growing energy demands

Q8. Answer: (a) Amit Shah

The correct answer is Amit Shah.

Key Points

• Amitbhai Anilchandra "Amit" Shah is an Indian politician from Gujarat and the current Minister of Home Affairs (MHA) in the 2nd Modi government.

• He is also the President of the Bharatiya Janata Party (BJP).

Important Points

• Home Minister of India - Amit Shah

• Defence Minister of India - Rajnath Singh

• Finance Minister of India - Nirmala Sitharaman

• Railway Minister of India - Ashwini Vaishnaw
• Agriculture and Farmer Welfare Minister of India - Shivraj Singh Chouhan
• Education Minister of India - Dharmendra Pradhan

Q9. Answer: (d) Vivek Ram Chaudhari

The correct answer is Vivek Ram Chaudhari.

Key Points

• Vivek Ram Chaudhari
• Air Chief Marshal Vivek Ram Chaudhari, PVSM AVSM VM ADC is an air officer of the Indian Air Force.
• He currently serves as the Chief of the Air Staff (CAS).
• He took over as the 27th CAS succeeding Air Chief Marshal Rakesh Kumar Singh Bhadauria on 30 September 2021.
• He earlier served as the 45th Vice Chief of the Air Staff and as the Air Officer Commanding-in-Chief Western Air Command.
• During his career, Chaudhari has been awarded:
• the Vayu Sena Medal in 2004
• the Ati Vishisht Seva Medal in 2015
• the Param Vishisht Seva Medal in 2021

Additional Information

• Arup Raha
• Air Chief Marshal Arup Raha, PVSM, AVSM, VM, ADC, D.Litt. was the 21st Chief of the Air Staff of the Indian Air Force.
• He was also the Chairman of the Chiefs of Staff Committee.
• In 2018, the state-run Sidho Kanho Birsha University awarded Arup Raha with an honorary D.Litt.
• Manoj Mukund Naravane
• General Manoj Mukund Naravane PVSM AVSM SM VSM ADC is a retired Indian Army General.
• He served as the 27th Chief of the Army Staff (COAS).
• He also served the temporary Chairman of the Chiefs of Staff Committee from 15 December 2021.
• The general served as the 40th Vice Chief of Army Staff (VCOAS) of the Indian Army.
• Rakesh Kumar Singh Bhadauria
• Air Chief Marshal Rakesh Kumar Singh Bhadauria PVSM AVSM VM ADC is a retired Indian Air Force officer.
• He served as the Chief of the Air Staff of the Indian Air Force.
• He retired on 30 September 2021 and was succeeded by Air Chief Marshal Vivek Ram Chaudhari.

Q10. Answer: (b) Ahmedabad

The correct answer is Ahmedabad.

Key Points

• The final match of the ICC Cricket World Cup 2023 was played between India and Australia on Sunday, 19 November 2023 at Narendra Modi Stadium, Ahmedabad.
• Australia won the toss and decided to field first.
• India scored 240 runs for 10 wickets in 50 overs.
• In the second inning, Australia scored 241 runs for 4 wickets in 43 overs and won the match by 6 wickets.
• Travis Head of Australia was named the Player of the Match for his match-winning century.

Therefore, the correct statement is “Australia won the World Cup by 6 wickets”

Q11. Answer: (b) Kerala

The correct answer is Kerala.

• Onam:
• It is a harvest festival of Kerala.
• It is celebrated to commemorate the arrival of King Mahabali.
• The festival lasts for ten days.
• It is also a harvest festival and falls on the 22nd Nakshatra Thiruvonam in the Malayalam calendar month of Chingam, which in Gregorian calendar overlaps with August–September.

Important festivals of different sates are:

States	Festivals celebrated

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Karnataka	Makar Sankranthi, Hampi festival, Hoysala Mahotsava and Karaga.
Kerala	Onam, Thrissur Pooram, Arattu, and Aranmula Uthrattathi.
Goa	Shigmo, Sao Joao festival, Goa Carnival and Easter
Tamil Nadu	Mahamaham, Thaipusam, Karthigai Deepam, Thiruvaiyaru Festival.

Q12. Answer: (c) Kerala

The correct answer is Kerala.

Key Points

• As per the census 2011, Kerala has the highest total literacy rate in India.

• Literacy rate in Kerala has seen upward trend and is 94.00 percent as per 2011 population census.

• Of that, male literacy stands at 96.11 percent while female literacy is at 92.07 percent.

• As per details from Census 2011, Kerala has population of 3.34 Crores, an increase from figure of 3.18 Crore in 2001 census.

Additional Information

• The Census 2011 is the 15th National census survey conducted by the Census Organization of India.

• C. Chandramouli is the Commissioner & Registrar General of the Indian 2011 Census.

• The 2011 Indian National Census has been conducted in 2 phases - house listing and population.

• The national census survey covered all the 28 states of the country and 7 Union territories including 640 districts, 497 cities, 5767 tehsils & over 6 lakh villages.

Q13. Answer: (d) V D Savarkar

The Correct Answer is V D Savarkar.

• Vinayak Damodar Savarkar founded the Abhinav Bharat Society.

Key Points

Abhinav Bharat

• VD Savarkar or Vinayak Damodar Savarkar was born on May 28, 1883, in Bhagur, a village near Nashik in Maharashtra.

• Savarkar was also associated with the India House and founded the Free India Society.

• The airport at Port Blair in Andaman and Nicobar's capital was renamed Veer Savarkar International Airport in 2002.

Additional Information

Taraknath Das

• Taraknath Das was an Indian revolutionary and internationalist scholar.

• He was a pioneering immigrant on the west coast of North America and discussed his plans with Tolstoy while organising the Asian Indian immigrants in favour of the Indian independence movement.

Ras Behari Bose

• Rash Behari Bose was the founding father of Indian National Army (Azad Hind Fauz) which was later capitalized by Subhash Chandra Bose.

• Jugantar was also founded by Behari Bose.

Chandrashekar Azad

• Chandrashekar Azad was a member of the Hindustan Republican Association (HRA).

• He was also involved in Kakori Conspiracy.

Q14. Answer: (c) Saudi Arabia

The correct answer is Saudi Arabia.

Key Points

• The 2027 Asian Football Cup will be held in Saudi Arabia.

• Saudi Arabia won the hosting rights for the 2027 Asian Nations Cup during the 33rd Congress of the Asian Football Confederation (AFC) held in Manama, Bahrain.

• Saudi Arabia was the only bidder after India withdrew its bid in December 2022.

• The Kingdom obtained 43 out of 45 votes to host the tournament.

• The announcement was made by the Crown Prince Mohammed bin Salman, who emphasized the opportunity to shape the future of football in Saudi Arabia and Asia.

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• The Saudi Arabia 2027 committee revealed plans for new and developed stadiums to host the tournament.

• The Asian Football Cup is held once every four years.

Q15. Answer: (b) Article 17

The correct answer is Article 17.

Key Points

• Article 17 of the Indian Constitution eliminates the practice of untouchability.

• Untouchability" is abolished and its practice in any form is forbidden.

• The enforcement of any disability arising out of "Untouchability" shall be an offense punishable in accordance with the law.

Additional Information

• Article 16 in the Constitution of India refers to equality of opportunity in government jobs.

• Article 16(1) provides for equality of opportunity for all citizens in matters relating to 'employment or appointment' to any office under the State

• Article 16(2) provides that there cannot be any discrimination on grounds only of religion, race, caste, sex, descent, place of birth, residence or any of them.

• Article 18 deals with the Abolition of titles.

• No title, not being a military or academic distinction, shall be conferred by the State

• No citizen of India shall accept any title from any foreign State.

• No person who is not a citizen of India shall, while he holds any office of profit or trust under the State, accept without the consent of the President any title from any foreign State.

• No person holding any office of profit or trust under the State shall, without the consent of the President, accept any present, emolument, or office of any kind from or under any foreign State.

• Article 19 deals with the Protection of certain rights regarding freedom of speech, etc.

• All citizens shall have the right.

• To freedom of speech and expression

• To assemble peaceably and without arms

• To form associations or unions;

• To move freely throughout the territory of India;

• Freedom to reside and settle in any area of the country or to leave it

• To practise any profession, or to carry on any occupation, trade, or business.

Q16. Answer: (d) Presence of Cell Wall

The correct answer is Option 4.

Key Points

• The cell wall is the outer covering of a cell. It surrounds the plasma membrane of plant cells and provides tensile strength and protection against mechanical and osmotic stress.

• The cell wall is present in plant cells and absent in animal cells. Hence, the correct answer is Option 4.

Additional Information

• The plasma membrane (also called the cell membrane) is the membrane found in all cells that separates the interior of the cell from the outside environment.

• In bacterial and plant cells, a cell wall is attached to the plasma membrane on its outside surface.

• The plasma membrane is present in both plant cells and animal cells.

• A vacuole is a membrane-bound cell organelle.

• In animal cells, vacuoles are generally small and help sequester waste products.

• In plant cells, vacuoles help maintain water balance.

Q17. Answer: (d) Algae

The correct answer is Algae.

Key Points

• Plants are autotrophs, which means they produce their own food.

• They use the process of photosynthesis to transform water, sunlight, and carbon dioxide into oxygen, and simple sugars that the plant uses as fuel.

Additional Information

• Autotrophs are organisms that can produce their own food, using materials from inorganic sources by using basic energy

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sources such as sunlight.

• Plants are the main example of autotrophs, using photosynthesis.

• Some autotrophs, such as green plants and algae, are phototrophs, they convert electromagnetic energy from sunlight into chemical energy in the form of glucose. So, Spinach, Tomato, and Banana are also examples of autotrophs.

• Heterotrophic: Animals and most other organisms take in ready-made food prepared by plants. They are called heterotrophs (heteros = other).

• Examples are Protozoa, viruses, fungi, dogs, birds, fish, humans, etc.

Q18. Answer: (b) Testes

The correct answer is Testes.

Key Points

• Male reproductive system:

• The testes are responsible for making testosterone, the primary male sex hormone, and for producing sperm.

• Sperms are small unicellular structures with a head, middle piece, and tail.

• Sperm production occurs in the testicles.

• The transfer of sperms into the female genital tract (insemination) and fusion of male and female gametes leads to the formation of zygote.

• The male reproductive system includes a pair of testes along with accessory ducts, glands, and the external genitalia.

• The male sex accessory ducts include rete testis, vasa efferentia, epididymis, and vas deferens.

Additional Information

• Urethra is a duct that transmits urine from the bladder to the exterior of the body during urination.

• Penis is an exterior sex organ of the male which is made of a special type of spongy tissue.

Q19. Answer: (b) Iron

The correct answer is Iron.

Key Points

• Hemoglobin (Hb) is a protein found in red blood cells that carries oxygen in your body and gives blood its red color.

• Hemoglobin levels vary from person to person. Men usually have higher levels than women.

• With the assistance of external chemical factors, the Hemoglobin molecules take up oxygen molecules within the lungs and then send them to our body's varied tissues.

• Iron is the main constituent of hemoglobin.

• The normal Hb level for males is 14 to 18 g/dl; females are 12 to 16 g/dl.

Additional Information

• The biggest regulator of oxygen affinity in Hemoglobin is that the oxygen itself.

• If in the lungs, the oxygen levels are high, the Hemoglobin shows a greater affinity towards the oxygen molecules, and as it bounds to more oxygen, this property of affinity increases and vice versa.

• When the Oxyhemoglobin binds to the utmost capacity, it becomes saturated, but its affinity towards oxygen increases, whereas when this binding loose oxygen molecule, the affinity decreases.

• This regulation activity is named Cooperativity. It is a crucial function because it allows the utmost amount of Hemoglobin to be carried to the tissues and allows deoxyhemoglobin, releasing the oxygen tissue.

Image of Hemoglobin process:

Q20. Answer: (a) Plasmodium

Explanation:

• Malaria is caused by a protozoan Plasmodium (P. vivax, P. malaria, and P. falciparum)

• P. falciparum causes the most serious and fatal malignant malaria.

• The Vector of malaria is the female Anopheles mosquito which transfers the sporozoites (an infectious form of plasmodium).

• The sporozoites mainly attack red blood cells, the liver, and the spleen of the human body.

• It ruptures the RBCs and releases a toxin called haemozoin, which is responsible for high recurring fever, chills, and shivering.

• Malarial Symptoms: Temperature falls and rises at fixed time intervals, Chills, Sweating, Headache, and Nausea.

• Treatment is by antimalarial drugs like quinine, chloroquine.

• Plasmodium is the protozoan responsible for malaria, Female anopheles mosquito is the vector or carrier of the plasmodium, so the correct answer would be plasmodium.

• However, if plasmodium is not given in the options then, the female anopheles mosquito will be considered correct.

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Additional Information

• Culex is a mosquito genus that serves as a vector for viruses that cause many diseases like the West Nile virus, Japanese encephalitis.

• A virus is a submicroscopic infectious agent that can only replicate inside a living cell.

• Viruses infect all types of life forms, from animals and plants to microorganisms, including bacteria and archaea.

Q21. Answer: (d) Graphite

The correct answer is Graphite.

Key Points

• Graphite is used in pencil because it is extremely brittle.

• By applying a small amount of pressure on graphite it breaks thus used as an extremely excellent tool for writing.

• Graphite and clay are used and the proportion of graphite to clay is adjusted according to the hardness required.

Additional Information

• Graphite is a non-metal that is conducting in nature and lubricating in nature.

• Graphite has slippery layers of carbon bound by weak covalent forces. it is extremely soft. Due to these reasons, it is used to make pencils.

• Graphite produces black marks which are used in drawing as well as writing.

• Uses of Graphite:

• Writing Materials as in Pencil lead.

• Lubricants in high temperature.

• Nuclear Reactors as an absorber of neutrons.

• In Batteries as electrodes.

• Graphene Sheets i.e 100 times stronger and 10 times lighter than steel.

Q22. Answer: (b) Hydrogen Bond

The correct answer is Hydrogen Bond.

Key Points

• There are 4 hydrogen bonds in the water molecules.

• 2 bonds are within the same molecule and 2 with the neighboring molecule. Hence 4 H-bond.

• So option 2 is correct.

Additional Information

• Hydrogen bonds: Hydrogen bonds are the dipole-dipole interactions that occur when a Hydrogen is bonded to a very electronegative atom like oxygen, Nitrogen.

• There are two types of H-bonds:

1. Intermolecular hydrogen bonding: This type of bonding takes place between two separate molecules, such as in water, alcohols.

2. Intramolecular Hydrogen bonding: This bonding takes place between the atoms of the same molecule.

Q23. Answer: (b) Gas

The Correct answer is Gas.

Explanation:

• The given statements are properties of gases.

• Gases are highly compressible. They can be compressed by exerting pressure.

• Gases exert constant pressure on the walls of the container.

• Gases have large intermolecular spaces, they have very large volumes compared to their mass.

• Therefore gases have a much lower density than liquids and solids.

• They can easily form homogeneous mixtures.

Q24. Answer: (c) 6.6

The correct answer is 6.6.

Key Points

• The pH value of milk is 6.5-6.7. Milk is acidic in nature.

• The pH value of milk changes over a period of time. As milk goes sour, it becomes more acidic and the PH value gets lower.

• If the cow has inflammation of a breast (mastitis), the pH of the milk would be higher.

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• Evaporated or condensed milk is slightly more acidic than regular milk.

Q25. Answer: (a) Methane

Methane is not an allotrope of carbon, it is a hydrocarbon compound with the formula CH4. An allotrope cannot be a compound and hence, methane is the right answer.

Allotrope of carbon:

• The term allotrope refers to one or more forms of a chemical element that occurs in the same physical state.

• The different forms arise from different ways, atoms may be bonded together.

• There are many allotropes of carbon.

• These include diamond, graphite, graphene, carbon nanotubes, fullerenes, and carbon nanobuds.

• Graphite-

• It is an allotrope of carbon used both as a lubricant and as a lead in pencils.

• Fullerene

• It was discovered by Richard Smalley in 1985.

• A form of carbon having a large spheroidal molecule consisting of a hollow cage of sixty or more atoms, of which buckminsterfullerene was the first known example.

• Fullerenes are produced chiefly by the action of arc discharge between carbon electrodes in an inert atmosphere.

• Harold Kroto, Robert Curl, and Richard Smalley were given the Nobel prize in chemistry 1996, for the discovery of this carbon allotrope, fullerene C60.

• The allotrope defines the basic structural arrangement of carbon atoms in a lattice.-

Q26. Answer: (b) Joule

The correct answer is Joule.

• The ability to work in an object is called the energy of that object.

• Energy is a scalar quantity.

• Its SI unit is the Joule.

Key Points

Fundamental Units		
Physical Quantities	SI unit	Symbol
Length	Metre	m
Mass	Kilogram	kg
Time	Second	s
Electric Current	Ampere	A
Temperature	Kelvin	K
Luminous Intensity	Candela	cd
Amount of Substance	Mole	mol

Important Points

Derived Units		
Physical Quantities	Definition	SI unit
Velocity	Displacement per Unit Time	m/s
Acceleration	Change in Velocity per Unit Time	m/s^2
Force	Mass × Acceleration	Newton
Work or Energy	Force × Distance	N.m = Joule
Momentum	Mass × Velocity	N.s

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Q27. Answer: (a) 1 ms-2

The correct answer is 1 ms-2

CONCEPT:

• Acceleration

• It is the first derivative of velocity with respect to time and the second derivative of position with respect to time. Because it has both magnitude and direction, acceleration is a vector quantity.

• Types of Acceleration

• Uniform and Non-uniform Acceleration: In a circle where speed stays the same, but the direction changes, the body's velocity changes, and the body is said to be moving faster.

• Average Acceleration: The total change in velocity divided by the total time it took for the change is the definition of the average acceleration over time.

where a is the vector quantity, Δv is the velocity, and Δt is the time.

• To convert speed from km/h to m/s, we multiply it by 5/18.

Calculation:

Given:

Vi = 54 km/h = 54×5/18 = 15m/s

Vf = 90 km/h = 90×5/18 = 25m/s

a = (Δ v)/(Δ t) = (v_f - v_i)/(Δ t)

a = (25 -15)/10= 1~m/s²

Q28. Answer: (b) Parallel

The correct answer is Parallel.

Key Points

• If lamps are connected in parallel, we can have different switches for different lamps.

• Also, if one lamp fails, the current will still flow in another lamp.

• This is not possible in series, as all lamps will be connected by single path in that case.

So, the correct option is 2: Fans and lamps in the domestic installation are connected in parallel.

Additional Information

Series and Parallel Connection:

Series Connection	Parallel Connection
Resistors are connected in such a way that the same current is passing across them.	Resistors are connected in such a way that potential difference is the same Across them.
Equivalent Resistance of n resistors connected in series is given as R = R1 + R2 + R3 .....Rn	Equivalent Resistance of n resistors Connected in Parallel is given as 1/(R_(eq)) = 1/R1 + 1/R2 + 1/R3 .... 1/(R_(eq)) = 1/R1 + 1/R2 + 1/R3.....1/R_n 1R=1R1+1R2+1R3.....+1Rn1R=1R1+1R2+1R3.....+1Rn
If the connection is broken in between, no current will flow in the path.	If the connection is broken in any particular branch, only that branch will be disconnected. Current will keep on flowing in other branches.
Circuit Diagram:	Circuit Diagram:

Q29. Answer: (d) Ice

The correct answer is Ice.

Key Points

• Ice has a higher density compared to thermocol, steam, and oil, when considering common conditions.

• The density of ice is approximately 0.92 g/cm³, which means it is less dense than liquid water but denser than the other substances listed.

• Its unique crystalline structure, which forms when water freezes, contributes to its density.

• Despite being less dense than water, making it float, ice is denser than the other substances given in the options.

Additional Information

• Thermocol: Also known as polystyrene foam, is very light with a much lower density, used mainly for insulation and packaging.

• Steam: The gaseous phase of water, has a significantly lower density than its liquid or solid forms, making it the least dense of the options.

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• Oil: Most types of oil float on water because they have lower densities. Their densities vary based on the type but generally are less than water's density.

Q30. Answer: (b) Benjamin Franklin

The correct answer is Benjamin Franklin.

Key Points

• Benjamin Franklin is credited with the discovery of the concept of electric charge through his experiments in the mid-18th century.

• His most famous experiment involved flying a kite during a thunderstorm to prove that lightning is a form of electrical discharge.

• Franklin introduced the terms "positive" and "negative" charge and proposed the law of conservation of charge.

• His work laid the foundation for the understanding of electricity and the development of various electrical technologies.

Additional Information

• Michael Faraday is celebrated for his discoveries of electromagnetic induction and the laws of electrolysis.

• Thomas Edison was an inventor known for developing the practical electric light bulb and the phonograph.

• Nikola Tesla contributed to the development of the alternating current (AC) electrical supply system.

Q31. Answer: (b) 23/12

Given:

First Fraction = 5/4

Second Fraction = 2/3

Formula Used:

Sum of two fractions = (Numerator1 × Denominator2 + Numerator2 × Denominator1) / (Denominator1 × Denominator2)

Calculation:

Numerator1 = 5, Denominator1 = 4

Numerator2 = 2, Denominator2 = 3

=> Sum = ((5 × 3) + (2 × 4)) / (4 × 3)

=> Sum = (15 + 8) / 12

=> Sum = 23 / 12

The sum of 5/4 and 2/3 is 23/12.

Q32. Answer: (a) 8

Given:

Numbers: 10, 10, 0, 10, and 10.

Formula Used:

Average = (Sum of all numbers) / (Total count of numbers)

Calculation:

Sum of numbers = 10 + 10 + 0 + 10 + 10

=> Sum = 40

Total count = 5

Average = Sum / Count

=> Average = 40 / 5

=> Average = 8

The average of 10, 10, 0, 10, and 10 is 8.

Q33. Answer: (b) 3 : 2

Given:

The ratio of x to y = 2:3

Formula Used:

If the ratio of x to y is a:b, then the ratio of y to x is b:a.

Calculation:

The ratio of x to y = 2:3

=> The ratio of y to x = 3:2

The ratio of y to x is 3:2.

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Q34. Answer: (d) 12

Given:

Number 1 = 6

Number 2 = 4

Formula Used:

LCM = Least Common Multiple of two numbers

Calculation:

Find prime factorization:

6 = 2 × 3

4 = 2^2

Take the highest power of all prime factors:

=> LCM = 2^2 × 3

=> LCM = 4 × 3

=> LCM = 12

The least common multiple (LCM) of 6 and 4 is 12.

Q35. Answer: (b) 9/20

Given:

Percentage = 45%

Formula Used:

Percentage to Fraction = Percentage / 100

Calculation:

Convert 45% into a fraction:

=> 45% = 45 / 100

Simplify the fraction:

=> 45 / 100 = 9 / 20

45% converted into a fraction is 9/20.

Q36. Answer: (d) 1.26

Given:

0.25 + 1.47 - 0.46 = ?

Formula Used:

Basic arithmetic operation: Addition and subtraction.

Calculation:

=> 0.25 + 1.47 - 0.46

=> (0.25 + 1.47) - 0.46

=> 1.72 - 0.46

=> 1.26

The correct answer is 1.26, which is Option 4.

Q37. Answer: (d) Pentagon.

Given:

The question asks for the name of a shape with five sides.

Formula Used:

Understanding geometric shapes based on the number of sides:

• Triangle: 3 sides

• Square: 4 sides

• Pentagon: 5 sides

• Octagon: 8 sides

Calculation:

To solve the question:

Count the number of sides mentioned: Pentagon has 5 sides.

The correct answer is option 4: Pentagon.

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Q38. Answer: (c) 5 : 1

Given:
Father's age = 35 years
Son's age = 7 years
Formula Used:
Ratio of ages = Father's age : Son's age
Calculation:
Ratio of ages = Father's age : Son's age
=> Ratio of ages = 35 : 7
=> Ratio of ages = (35 ÷ 7) : (7 ÷ 7)
=> Ratio of ages = 5 : 1
The ratio of the ages of the father and his son is 5 : 1.

Q39. Answer: (c) 10

Given:
Average of five numbers = 12
Sum of four numbers = 50
Formula Used:
Average = Total Sum / Number of Numbers
Total Sum = Average × Number of Numbers
Fifth Number = Total Sum - Sum of Four Numbers
Calculation:
Total Sum = Average × Number of Numbers
=> Total Sum = 12 × 5
=> Total Sum = 60
Fifth Number = Total Sum - Sum of Four Numbers
=> Fifth Number = 60 - 50
=> Fifth Number = 10
The fifth number is 10.

Q40. Answer: (d) 12

Given:
The number to be multiplied by 6 equals 72.
Formula Used:
Number × 6 = 72
Calculation:
Let the number be x.
From the formula:
=> x × 6 = 72
=> x = 72 / 6
=> x = 12
The correct number is 12.

Q41. Answer: (d) 1 year

Given:
Principal Amount (P) = Rs 2000
Simple Interest (SI) = Rs 200
Rate of Interest (R) = 10%
Formula Used:
Simple Interest (SI) = (P × R × T) / 100
Calculation:
Rearranging the formula to calculate Time (T):
=> T = (SI × 100) / (P × R)

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Substitute the given values:
=> T = (200 × 100) / (2000 × 10)
=> T = 20000 / 20000
=> T = 1 year
The time period required is 1 year.

Q42. Answer: (d) 10 days

Given:
One person can complete the task in 50 days.
Number of people = 5.
Formula Used:
Work done = Number of people × Days.
Days required = Total Work / Work done by 1 day.
Calculation:
Work done by 1 person in 1 day = 1 / 50.
Work done by 5 people in 1 day = 5 × (1 / 50).
Work done by 5 people in 1 day = 5 / 50.
Work done by 5 people in 1 day = 1 / 10.
Total work = 1 (since the task is 1 complete unit).
Days required = 1 / (1 / 10).
=> Days required = 10.
It will take 10 days for 5 people to complete the task.

Q43. Answer: (c) Rs.2500

Given:
Income of the girl = 25,000 rupees
Percentage donated = 10%
Formula Used:
Amount Donated = Income × (Percentage Donated / 100)
Calculation:
Amount Donated = 25,000 × (10 / 100)
=> Amount Donated = 25,000 × 0.1
=> Amount Donated = 2,500 rupees
The amount donated by the girl is 2,500 rupees.

Q44. Answer: (d) 20

Given:
The fifth part of the number = 4
Formula Used:
Number = Fifth part × 5
Calculation:
Let the number be x.
The fifth part of the number = x / 5
Given, x / 5 = 4
=> x = 4 × 5
=> x = 20
The correct number is 20.

Q45. Answer: (d) 10 liters

Given:
Total quantity of milk = 50 liters
Percentage of water in milk = 20%
Formula Used:

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Quantity of water = (Percentage of water × Total quantity of milk) / 100
Calculation:
Quantity of water = (20 × 50) / 100
=> Quantity of water = (1000) / 100
=> Quantity of water = 10 liters
The quantity of water in 50 liters of milk is 10 liters.

Q46. Answer: (d) 17th

Total number of people = 29
Ram's position from the front = 13
Position from the end = Total number of people − Position from the front + 1.
Position from the end = 29 - 13 + 1.
=> 30 - 13 = 17.
Thus, Ram's position from the end of the line is 17th.
Hence, the correct answer is "Option 4".

Q47. Answer: (b) V

The logic followed here is:
Hence, the correct answer is "option (2)".

Q48. Answer: (b) 18

The positional value of the English alphabet is given below:
The logic followed here is: Sum of positional values
D = 4 (Positional Value)
AND = 1 + 14 + 4 = 19
Similarly,
ADM = 1 + 4 + 13 = 18
Hence, the correct answer is "option (2)".

Q49. Answer: (a) Conclusion

Option(1) is correct.
According to the sequence in the dictionary:
Concentrate
Conclusion
Confidence
Count
So, Conclusion comes in second place in the dictionary.
Hence, the correct answer is option(1) i.e. Conclusion.

Q50. Answer: (d) 270

Logic for CODE is,
C × O × D × E = 3 × 15 × 4 × 5 = 900
Similarly,
R × A × C × E = 18 × 1 × 3 × 5 = 270.
Hence, code for RACE is 270.

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