Agniveer Army GD 19 April 2023 (Shift 1) Memory-Based Paper. (Previous Year Paper)

Army GD Agniveer • 2023 • 50 questions • 60 minutes • Answer key and solutions

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GENERAL KNOWLEDGE

Q1. Where is the Harappan city of Kalibanga located?

(a) Pakistan
(b) Haryana
(c) Rajasthan
(d) Gujarat

Q2. Who took oath as the 22nd Governor of Maharashtra on 18 February 2023?

(a) C.P. Radhakrishnan
(b) Lakshman Prasad Acharya
(c) Ramesh Bais
(d) Phagu Chauhan

Q3. Who was the first speaker of Lok Sabha?

(a) Sardar Hukam Singh
(b) M. A. Ayyangar
(c) Neelam Sanjiva Reddy
(d) Ganesh Vasudev Mavalankar

Q4. Article 17 of the Indian constitution deals with _____.

(a) Abolition of Untouchability
(b) Protection of life and personal liberty
(c) Abolition of Titles
(d) Right to Education

Q5. Who gave the title of "Sardar" to Vallabh Bhai Patel?

(a) Mahatma Gandhi
(b) Vinoba Bhave
(c) Women of Bardoli
(d) Peasants of Gujarat

Q6. The joint naval exercise Varuna is between India and which of the following nations?

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

Q7. Santosh Trophy is related to?

(a) Football
(b) Cricket
(c) Chess

(d) Tennis

Q8. Which of the following won the Vijay Hazare Trophy at the Narendra Modi Stadium in Ahmedabad, Gujarat?

(a) Saurashtra
(b) Maharashtra
(c) Uttar Pradesh
(d) Kerala

Q9. As on 31^(st) May 2020, how many languages enjoy the status of classical language in India?

(a) 7
(b) 5
(c) 4
(d) 6

Q10. In which State is the Similipal Tiger Reserve Situated?

(a) Odisha
(b) Maharashtra
(c) Andhra Pradesh
(d) Madhya Pradesh

Q11. Who was the first Governor-General of India?

(a) Lord William Bentinck
(b) Lord William Dalhousie
(c) Lord William Cornwallis
(d) None of these

Q12. Statue of Unity is located in which state?

(a) Gujarat
(b) Meghalaya
(c) Punjab
(d) Haryana

Q13. In which of the following states is the Yumthang Valley located?

(a) Uttarakhand
(b) Himachal Pradesh
(c) Nagaland
(d) Sikkim

Q14. Who was the first finance minister of independent India?

(a) Jawaharlal Nehru
(b) Liaquat Ali
(c) R. K. Shanmukham Chetty
(d) John Mathai

Q15. The Pir Panjal range is situated in _____.

(a) Meghalaya
(b) Nagaland
(c) Jammu and Kashmir
(d) Uttarakhand

GENERAL SCIENCE

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Q16. Which of the following device is based upon magnetic effect of electric current?

(a) Electric bulb
(b) Electric fuse
(c) Electric bell
(d) Electric press

Q17. The female gametes in human is called

(a) Sperm
(b) Ova
(c) Embryo
(d) Zygote

Q18. The Blood is filtered in _____.

(a) Kidney
(b) Lungs
(c) Heart
(d) Intestine

Q19. Main organ of respiratory system in human body is _____?

(a) Lung
(b) Kidney
(c) Skin
(d) Heart

Q20. The green plants convert solar energy into:

(a) Mechanical energy
(b) Light energy
(c) Chemical energy
(d) Biological energy

Q21. When blue litmus was added to an unknown liquid in a test tube, it turned red. What was the liquid?

(a) An acid
(b) Water
(c) An alkali
(d) Saline

Q22. Sour tasting food is _____ in nature.

(a) Acidic
(b) Neutral
(c) Basic
(d) Alkaline

Q23. Which of the following is a chemical change?

(a) Heating of iron to red hot
(b) Magnetization of iron pieces
(c) Rusting of iron
(d) All of above

Q24. Which of the following is NOT an inflammable substance?

(a) Alcohol
(b) Oxygen
(c) LPG
(d) Petrol

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Q25. How many colours of light are in white light colour?

(a) 1
(b) 8
(c) 7
(d) 6

Q26. The image formed in a plane mirror is _____.

(a) diminished
(b) blurred and inverted
(c) laterally inverted
(d) magnified

Q27. In which of the following medium will sound travel at the fastest speed?

(a) In both liquid and gas
(b) Solid
(c) Liquid
(d) Gas

Q28. By which method does heat transfer from the Sun to the Earth?

(a) Driving
(b) Convection
(c) Operation
(d) Radiation

Q29. In which of the following type of organism autotrophic nutrition is found?

(a) Fungi
(b) Virus
(c) Protozoa
(d) Bacteria

Q30. Instrument used to measure earthquake is known as

(a) Seismograph
(b) Quakemeter
(c) Barometer
(d) None of the above

MATHS

Q31. Find the HCF of 36, 54 and 72.

(a) 18
(b) 3
(c) 6
(d) 12

Q32. If a : b : c = 3 : 4 : 8 & a + b + c = 2565 then a = ?

(a) 513
(b) 525
(c) 171
(d) 342

Q33. Find the average of square of the first five natural numbers.

(a) 11
(b) 10
(c) 12
(d) 15

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Q34. If $x + y = 5$, $xy = 10$ then find the value of $x^2 + y^2$

(a) 2
(b) 3
(c) 4
(d) 5

Q35. What is the volume of a cube (in cm^3) whose side is 3 cm?

(a) 27
(b) 64
(c) 8
(d) 9

Q36. In a family average weight of 5 members is 60 kg. If a member whose weight is 40 kg is gone. Then what is the average weight of 4 members?

(a) 55 kg
(b) 70 kg
(c) 65 kg
(d) 50 kg

Q37. 1/2× 14×2/7+9/4-2/8

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

Q38. Which of the following triplets does not represent the sides of a triangle?

(a) (3, 4, 5)
(b) (4, 7, 10)
(c) (3, 6, 8)
(d) (2, 3, 6)

Q39. A car covers 70 km at a speed of 35 km/hr and the next 120 km at a speed of 40 km/hr. Calculate its average speed.

(a) 30 km/hr
(b) 40 km/hr
(c) 36 km/hr
(d) 38 km/hr

Q40. Kimaya is reading a book that contains 350 pages. She has finished reading 36% pages. How many pages of the book does she still have to read?

(a) 255
(b) 224
(c) 250
(d) 270

Q41. The ratio of the ages of two persons is 3 : 4. If the age of one of them is greater than the other by 8 years, then what is the sum of their ages?

(a) 56 years
(b) 60 years
(c) 58 years
(d) 54 years

Q42. The diagonals of a rectangle ABCD meet at O. If AO = 3z+1, DO = 2z+3 then find the vlaue of z.

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

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(d) 4

Q43. 18 men can dig a road 12 meters long in 20 days. How long of a road can 12 men dig in 15 days?

(a) 8
(b) 6
(c) 26
(d) 36

Q44. 20% of 1500 is:

(a) 300
(b) 500
(c) 250
(d) 120

Q45. At simple interest, an amount becomes Rs. 1120 in 4 years and Rs. 1200 in 5 years. The principal amount is equal to -

(a) Rs. 800
(b) Rs. 850
(c) Rs. 750
(d) Rs. 900

LOGICAL REASONING

Q46. In a code language, ‘CANDLE’ is written as ‘3-1-14-4-12-5’ and ‘DARK’ is written as ‘4-1-18-11’. How will ‘LIGHT’ be written in that language?

(a) 12-9-8-7-20
(b) 11-6-7-8-20
(c) 12-9-7-8-20
(d) 12-7-8-9-20

Q47. Complete the following series.

F, J, N, R, ?

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

Q48. In a certain code, ANIMAL is coded as INALAM, then how is SAMPLE coded in the same way?

(a) MASELP
(b) ASMALE
(c) MALESP
(d) MSALEP

Q49. Choose the correct alternative Car : Garage :: Ship : _____

(a) Harbour
(b) Depot
(c) Airport
(d) Hangar

Q50. If E = 5, PEN = 35, then PAGE = ?

(a) 27
(b) 28
(c) 29
(d) 30

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) Rajasthan

The correct answer is Rajasthan.

• The Harappan city of Kalibanga is located in Rajasthan.

Key Points

• Kalibangan:

• It is located in the Hanumangarh district of Rajasthan.

• It is located on the banks of the river Ghaggar.

• It was excavated in the year 1953.

• B.B. Lal was the main archaeologist in the excavation

• The founding in Kalibangan was Mud-brick fortification, stone blade, cart wheel, a grave in the east-west direction, the discovery of a ploughed field, no drainage system, wall bifurcating citadel, fire altars.

Additional Information

• Chanhudaro is located in Sindh, Pakistan.

• Banawali is located in Fatehabad, Haryana.

• Lothal is located in Ahmedabad, Gujarat.

Q2. Answer: (c) Ramesh Bais

The correct answer is Ramesh Bais.

In News

• Ramesh Bais took oath as the 23rd Governor of Maharashtra on 18 February 2023.

Key Points

• Ramesh Bais:

• He has replaced Bhagat Singh Koshyari.

• Previously, he was the Governor of Jharkhand.

• He had earlier served as the Union Minister of State for Steel and Mines, Chemicals and Fertilizers, Information and Broadcasting, and Environment and Forests - independent charge.

• He was a 7-time BJP MP from Raipur in Chhattisgarh.

Additional Information

State	Governor
Jharkhand	C.P. Radhakrishnan
Sikkim	Lakshman Prasad Acharya
Meghalaya	Phagu Chauhan

Q3. Answer: (d) Ganesh Vasudev Mavalankar

The correct answer is Ganesh Vasudev Mavalankar.

Important Points

• Ganesh Vasudev Mavalankar also is known as Dadasaheb became the first speaker of Lok Sabha in the year 1952.

• Ganesh Vasudev Mavalankar was an independence activist, the Speaker of the Constituent Assembly of India.

• He was also appointed secretary of the Gujarat Provincial Congress Committee during 1921–22.

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• He was a co-founder of the Ahmadabad Education Society along with Kasturbhai Lalbhai and Amritlal Hargovindas.
• The current speaker of Lok Sabha is Om Birla of the Bharatiya Janata Party.

Additional Information

• Sardar Hukam Singh was former Governor of Rajasthan and the third speaker of Lok Sabha from 1962 to 1967.
• M. A. Ayyangar was the first Deputy Speaker of Lok Sabha, later he became the speaker of Lok Sabha in the Parliament.
• Neelam Sanjiva Reddy was the 6th President of India and the first Chief Minister of Andhra Pradesh.

Q4. Answer: (a) Abolition of Untouchability

The Correct Answer is Abolition of Untouchability.

Key Points

• The Fundamental Rights from the articles 12-35 have been classified under six categories:
• Right to Freedom
• Right to Equality
• Right against Exploitation
• Right to Freedom of Religion
• Cultural and Educational rights
• Right to constitutional remedies.

Additional Information

• Article 14 - Equality before the law
• Article 15 - Prohibition of discrimination on grounds of religion, race, caste, sex, or place of birth.
• Article 16 - Equality of opportunity in matters of public employment
• Article 17 - Abolition of untouchability
• Article 18 - Abolition of titles
• Article 19 - Protection of certain rights regarding freedom of speech, etc.
• Article 20 and 21 are the two articles (Fundamental Rights) of the Indian Constitution that are not suspended even during the National Emergency under Article 359.
• Article 20 gives protection in respect of conviction for offenses.
• Article 21 gives the right to life, personal liberty, and the right to die with dignity.
• Article 21A gives free education to all children aged, six to fourteen(6-14) years.

Q5. Answer: (c) Women of Bardoli

The correct answer is Women of Bardoli.

Key Points

• The Bardoli Satyagraha was a movement by the farmers of Bardoli, Gujarat against the unjust raising of taxes.
• It was led by Sardar Vallabh Bhai Patel.
• Kasturba Gandhi, Mani Ben Patel, Sharda Ben Shah, Sharda Mehta, etc. were the women participants of the Bardoli Satyagraha.
• The women of Bardoli gave him the title of “Sardar”.
• Under Patel, the Bardoli peasants resolved to refuse payments of the revised assessment until the Government appointed an independent tribunal or accepted the current amount as full payment.
• To organize the movement, Patel set up 13 workers’ camps in the taluqa.
• Bardoli Satyagraha Patrika was brought out to mobilize public

opinion.

• Sardar Vallabh Bhai Patel served as the first Deputy Prime Minister of India and the first Home Minister of India from 1947 to 1950.
• He is also called the "Unifier of India" and the "Iron Man of India".

Additional Information

• Vinoba Bhave was an Indian advocate of nonviolence and human rights.
• Often called Acharya, he is best known for the Bhoodan Movement.
• He is considered as National Teacher of India and the spiritual successor of Mahatma Gandhi.

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Q6. Answer: (c) France

The correct answer is France.

Key Points

• Varuna is a naval combat exercise between India and France.

• The Indian and French navies have been conducting bilateral maritime exercises since 1993.

• It was christened as 'VARUNA' in the year 2001.

Additional Information

• Bilateral Exercise with other Countries:

Country	Exercise
USA	Vajra Prahar and Yudh Abhyass
China	Hand in Hand
France	Varuna and Garuda
UK	Ajeya, Konkan and Indradhanush

Q7. Answer: (a) Football

The correct answer is Football.

Key Points

• The Santosh Trophy is an Indian football tournament in which the country's states along with some government institutions participate.

• It is held annually since 1941.

• Bengal was the first winner of the competition held in 1941.

Additional Information

Sports Trophies	Related Sports
Beighton Cup	Hockey
Ezra Cup	Polo
Deodhar Trophy	Cricket
B. C Roy Trophy	Football (National Junior)
Duleep Trophy	First Class Cricket
Durand Cup	Football

Q8. Answer: (a) Saurashtra

The correct answer is Saurashtra.

Key Points

• Saurashtra beat Maharashtra by 5 wickets in the final to win the Vijay Hazare Trophy at the Narendra Modi Stadium in Ahmedabad, Gujarat.

• The team won its first Ranji Trophy title in 2019-2020.

• The Player of the match in the final was given to Sheldon Jackson and the Player of the tournament was awarded to Ruturaj Gaikwad.

• The Vijay Hazare Trophy is also known as the Ranji One-Day Trophy.

Additional Information

• The Vijay Hazare Trophy is an annual limited-overs cricket domestic competition involving state teams from the Ranji Trophy plates organised by the Board of Control for Cricket in India.

• It was founded in 2002.

• Number of teams: 38

• First edition: 2002–03

• Madhya Pradesh won their maiden Ranji Trophy title in 2022 by defeating Mumbai by six wickets.

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Q9. Answer: (d) 6

The correct answer is 6.

Key Points

• A language that has a substantial and lengthy corpus of written literature, as well as its own autonomous literary tradition, is said to be classical.

• Classical languages have advantages such as the establishment of study centres and the provision of international awards for its scholars.

• Six languages currently hold the designation of "Classical":

• Tamil (announced in 2004),

• Sanskrit (2005),

• Kannada (2008),

• Telugu (2008),

• Malayalam (2013), and

• Odia (2014).

Additional Information

• The criteria for designating a language as "Classical" are as follows:

• High antiquity of its early texts/recorded history over a period of 1500–2000 years;

• A body of ancient literature/texts, which is regarded as a priceless legacy by generations of speakers;

• The literary tradition be original and not borrowed from another speech community;

• The classical language and literature being distinct from modern, there may also be a discontinuity between the classical language and its later forms or its offshoots."

Q10. Answer: (a) Odisha

The correct answer is Odisha.

Key Points

• Similipal National Park is a national park and a tiger reserve in the Mayurbhanj district in the Indian state of Odisha covering 2,750 km2 (1,060 sq mi).

• It is part of the Mayurbhanj Elephant Reserve, which includes three protected areas — Similipal Tiger Reserve, Hadgarh Wildlife Sanctuary with 191.06 km2 (73.77 sq mi), and Kuldiha Wildlife Sanctuary with 272.75 km2 (105.31 sq mi).

• Simlipal National Park derives its name from the abundance of red silk cotton trees growing in the area.

Additional Information

• Chief Minister of Odisha - Mohan Charan Majhi

• Governor of Odisha - Ganeshi Lal.

• Sex Ratio of Odisha - 979.

• Dances of Odisha - Chhau, Medha, Karma, Danda, etc.

• National Parks of Odisha - Ushakothi Wild Life Sanctuary, Bhitarkanika National Park, etc.

Q11. Answer: (a) Lord William Bentinck

The correct answer is Lord William Bentinck.

Key Points

• Lord William Bentinck was the first Governor-General of India.

• By the charter act of 1833, the Governor-General of Bengal was re-designated as the Governor-General of India.

• This made Lord William Bentinck, the first Governor-General of India.

• Lord William Bentinck has been credited for significant social and educational reforms in India including abolishing Sati Prata, suppressing female infanticide and human sacrifice.

Additional Information

• The first Governor-General of Bengal was Lord Warren Hastings.

• Lord Dalhousie was the Governor-General of India from 1848-56.

• He devised the policy of Doctrine of Lapse.

• Lord Canning was the first viceroy of India.

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Q12. Answer: (a) Gujarat

The correct answer is Gujarat.

• Statue of Unity is located in Gujarat.

Key Points

• The Statue of Unity is the world's tallest statue, with a height of 182 meters (597 feet) which is almost double the height (including the pedestal) of the Statue of Liberty, USA.

• It is located on the Narmada river-facing Sardar Sarovar Dam in Kevadiya colony, Narmada District in the Indian State of Gujarat.

• Famous sculptor Ram V. Sutar, a Padma Bhushan Awardee is the sculptor of the Statue of Unity.

• India’s largest engineering and construction company Larsen & Toubro (L&T) was assigned the responsibility for designing, engineering, procurement, construction, operation and maintenance of the project.

• The statue was inaugurated by Prime Minister Narendra Modi on 31 October 2018, the 143rd birth anniversary of Patel.

• The Statue was built in just 46 months.

• The previous tallest statue in India was the 41 m (135 ft) statue of Veera Abhaya Anjaneya Hanuman Swami at the Paritala Anjaneya Temple near Vijayawada in the state of Andhra Pradesh.

Q13. Answer: (d) Sikkim

The correct answer is Sikkim.

Key Points

• Yumthang Valley is located in the Sikkim state of India.

• Yumthang is popularly known as 'Valley of Flowers'.

• In the spring season, wildflowers such as primulas and Rhododendrons bathe the landscape in rich colors, making it a tourist hot spot.

• The Shingba Rhododendron Sanctuary over here has 24 species of Rhododendron flowers which bloom from April to May end.

Additional Information

State	Valleys
Jammu and Kashmir	Poonch Valley, Gulmarg, Dha Hanu Valley, Betaab Valley, Sindh Valley, Yusmarg Valley, Nubra Valley
Uttarakhand	Mana Valley, Pindar Valley, Darma Valley, Johar VAlley, Saur Valley, Tons Valley, Har Ki Doon Valley
Sikkim	Thangu Valley, Nathang Valley, YumeSamdong Valley, Yumthang Valley

Q14. Answer: (c) R. K. Shanmukham Chetty

The correct answer is R. K. Shanmukham Chetty.

Key Points

• R. K. Shanmukham Chetty was the first finance minister of independent India.

• Sir Ramasamy Chetty Kandasamy Shanmukham Chetty was an Indian lawyer, economist and politician who served as first Finance Minister of India from 1947 to 1948.

• He presented the first Union Budget of Independent India.

• He presented the first Union Budget of Independent India on 26th November 1947.

• He represented Indian employers at the International Labour Conference in Geneva in 1928, 1929, and 1932.

• He was the President of India's Central Legislative Assembly from 1933 to 1935.

• He died on 3rd March 1953.

Additional Information

Jawaharlal Nehru	India's first Prime Minister.
Liaquat Ali	first prime minister of Pakistan
John Mathai	India's first Railway Minister

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Q15. Answer: (c) Jammu and Kashmir

The correct answer is Jammu and Kashmir.

Key Points

• The Pir Panjal range is situated in Jammu and Kashmir.

• It is a part of the lesser Himalayan region.

• It includes Himachal Pradesh, Jammu and Kashmir, and Kashmir.

• The Pir Panjal Range starting from near Patni Top in Jammu and Kashmir all the way to Garhwal passes through Himachal Pradesh.

• Finally, there is the Dhauladhar range, also known as the Outer Himalayas or Lesser Himalayas.

• The Pir Panjal Range is a group of mountains in the Lesser Himalayan region, running from east-southeast (ESE) to west-northwest (WNW) across the Indian states of Himachal Pradesh and Jammu and Kashmir.

• The Himalayas show a gradual elevation towards the Dhauldhar and Pir Panjal ranges.

• Pir Panjal is the largest range of the lower Himalayas.

Additional Information

• Shiwalik

• It is a mountain range of the Outer Himalayas.

• The width of the hills of this range varies from 10 km to 50 km.

• Trans Himalayas

• Trans Himalayas is an extension of the Tibetan plateau around the Himalayas.

• It is broadly divided into the following range: Karakoram Range, Ladakh Range, Zaskar, and Kailash range.

• The Eastern Hills:

• The Himalayas bend sharply to the south beyond the Dihang gorge and move outwards to form a covering the eastern boundary of the country.

• They are known as 'the Eastern or Purvanchal Hills'.

• It extended to the northeastern states of India.

• They comprise sandstone and sediments.

• They are covered with dense forests.

• They comprise Patkai hills, Manipur hills, etc.

• Lesser Himalayas

• The Lesser Himalayas is also called Himachal.

• This range is found between the Great Himalayas and Shiwalik range.

Q16. Answer: (c) Electric bell

Concept:

Electric current:

• Electric current is the flow of electric charge in its path called circuit.

• The electric current has magnetic, heating, and chemical effects.

Heating effects of current:

• An electrical appliance gets heated after a few hours of use.

• The appliances offer resistance to the current.

• In overcoming the resistance heat is generated.

• This has many applications like an electric fuse, heater, iron, etc.

Magnetic effect of current:

• A current-carrying wire has a magnetic effect which was discovered by Hans Christian Oersted.

• When an electric current carrying wire is wrapped over a soft iron core, it acts as a magnet.

• Such kind of magnet is known as an electromagnet.

• If the current stops flowing, the magnetic effect vanishes.

• It is used in electric bells, cranes, etc.

Explanation:

Electric bell:

• Electric bell works on the magnetic effect of current, it uses an electromagnet to produce sound.

• It consists of an electromagnet, striker, and gong.

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• When the circuit is closed, the electromagnet attracts the striker towards it.

• The striker hits the gong and produces a sound.

Therefore, the electric bell device is based upon the magnetic effect of the electric current.

Key Points

• An electric bulb, electric press, and electric fuse work on the principle of the effect of electric current.

• An electrical fuse is a safety device that operates to provide protection against the overflow of current in an electrical circuit.

Q17. Answer: (b) Ova

Explanation:

• In the female reproductive system, the female produces eggs whereas the male having sperms. When they fuse forms a zygote.

• Which after fertilization converts into an embryo.

• Gamete: The gamete is also termed reproductive/sex cells. The female gamete is called ova/egg cells whereas the male gamete is sperm.

• Embryo: It is the early-stage development of the unborn baby of the multicellular organism.

• Egg: It is a female reproductive cell or ovaries, this is the part of the gamete.

• Ovum: Female reproductive cells ovum (singular) or ovaries (plural). When this fuse to sperms form a zygote.

• Out of these four gametes (Ovum/egg + sperm), Egg and Ovum are the same in meaning whereas the Embryo is the later developed process.

• The process of fusion of the male and the female gametes is called fertilisation.

Q18. Answer: (a) Kidney

The correct answer is Kidney.

• The kidneys play a crucial role in maintaining the body's internal environment by filtering waste products, excess ions, and water from the bloodstream to form urine.

• The kidneys are two bean-shaped organs, each about the size of a fist.

• Kidneys are located just below the rib cage, one on each side of your spine.

• Healthy kidneys filter about a half cup of blood every minute.

• The kidney also removes waste material, extra fluid and removes it from the body in form of Urine.

• kidneys also remove acid that is produced by the cells of the body and maintain a healthy balance of water, salts, and minerals—such as sodium, calcium, phosphorus, and potassium—in the blood.

• The kidney also helps in developing hormones that control blood pressure, make red blood cells, keeps bones stronger.

Additional Information

• The heart is responsible to provide oxygenated blood to every part of the body.

• Gall Blader stores the Urine and transfers the Urine to Ureters through two thin pipes.

• The gallbladder also stores bile produced by the liver.

• Bile juice is alkaline in nature which is used to digest food.

Q19. Answer: (a) Lung

The correct answer is Lung.

Key Points

• The respiratory system is a network of organs and tissues that helps our body to absorb oxygen from the air so our organs can work. It also cleans waste gases, such as carbon dioxide, from our blood.

• The parts of the respiratory system are as follows:

• Mouth and nose: Openings that pull air from outside your body into your respiratory system.

• Pharynx (throat): Tube that delivers air from your mouth and nose to the trachea (windpipe).

• Trachea: Passage connecting your throat and lungs.

• Bronchial tubes: Tubes at the bottom of your windpipe that connect into each lung.

• Lungs: Two organs that remove oxygen from the air and pass it into your blood.

• Diaphragm: Muscle that helps your lungs pull in air and push it out

• Ribs: Bones that surround and protect your lungs and heart

• Alveoli: Tiny air sacs in the lungs where the exchange of oxygen and carbon dioxide takes place.

• Bronchioles: Small branches of the bronchial tubes that lead to the alveoli.

• Larynx (voice box): Hollow organ that allows you to talk and make sounds when air moves in and out.

• Lungs are the main organ of the respiratory system because it performs the main function of exchange of oxygen and carbon

dioxide to/from our blood.

Additional Information

• The heart is a mesodermally derived organ, that is present in the thoracic cavity, in between the two lungs, slightly tilted to the left. It is protected by a double-walled membranous bag, pericardium, enclosing the pericardial fluid.

• Kidneys are the excretory organs in the majority of mammals including humans. Kidneys regulate water and electrolyte balance (osmoregulation) along with the excretion of metabolic waste and foreign chemicals.

• The skin is the largest organ of the body, with a total area of about 20 square feet.

Q20. Answer: (c) Chemical energy

The correct answer is chemical energy.

Key Points

• The plants convert a tiny amount of the light they receive into food energy.

• Plants convert light energy into chemical energy, (in molecular bonds), through a process known as photosynthesis.

Important Points

• Photosynthesis is the process by which green plants prepare their own food absorbing carbon dioxide, water, and minerals in the presence of sunlight.

• In this reaction water gets oxidised and NADP gets reduced.

Q21. Answer: (a) An acid

The correct answer is acid.

Key Points

• Acid

• Acids are substances that have a sour taste, have one or more replaceable hydrogen atoms, and turn blue litmus and methyl orange to red.

• Example: Hydrochloric acid, nitric acid, sulphuric acid, etc.

• Litmus:

• It is an indicator that shows a color change in the solution as the pH of the solution changes.

• It is used to identify whether a solution is acidic, basic, or neutral.

Additional Information

• Water

• It is vital for all known forms of life, even though it provides no calories or organic nutrients

• Its chemical formula is H2O.

• A Ph of pure water is 7.

• An alkali

• Base or alkali turn red litmus to blue, methyl orange to yellow, and have a bitter taste.

• These solutions are soapy to touch.

• Example: Potassium Hydroxide, Magnesium Hydroxide, Sodium Hydroxide, etc.

• Saline

• Saline or salts are the compounds obtained by the reaction of acid and base, such reactions are called neutralization reactions.

• Example: Sodium Chloride, Potash alum, etc.

Q22. Answer: (a) Acidic

The correct answer is Acidic.

Key Points

• The sour taste of organic food materials is mainly caused by the presence of acidic materials.

• Acids are sour in taste with a pH of less than 7.

• Examples are Vinegar, Tartaric acid, Citric acid and Malic acid.

• Acids give off H^+ ions in water.

• Acids turn blue litmus to red

Additional Information

• Bitter tasting food is basic in nature with a pH greater than 7.

• Examples are Ca(OH)2, NaOH, NaHCO3.

• Bases turn red litmus to blue.

• Alkaline gives off OH- ions in water.
• Acid and base react together to form salt and water and this reaction is known as neutralisation.
• Water is neutral with a pH value equal to 7.

Q23. Answer: (c) Rusting of iron

The correct answer is Rusting of Iron.

Key Points

• The five conditions of chemical change:
• colour change
• the formation of a precipitate
• formation of a gas
• odour change
• temperature change.
• Examples of chemical change are:-
• Burning wood, Souring milk, Mixing acid and base, Digesting food, Rusting of iron.

Additional Information

• A chemical change is a change of materials into another, new materials with different properties and one or more than one new substances are formed.
• It results when a substance combines with another to form a new substance (synthesis or either decomposes to form more substances).
• Chemical changes occur when a substance combines with another to form a new substance, called chemical synthesis or, alternatively, chemical decomposition into two or more different substances.
• These processes are called chemical reactions and, in general, are not reversible except by further chemical reactions.
• Some reactions produce heat and are called exothermic reactions and others may require heat to enable the reaction to occur, which are called endothermic reactions.
• Chemists categorize chemical changes into three main classes: inorganic chemical changes, organic chemical changes and biochemical changes.

Q24. Answer: (b) Oxygen

The correct answer is Oxygen.

• Inflammable substances are those substances which catch fire very easily and have a very low ignition temperature.
• Examples of flammable substances are alcohol, petrol, liquefied petroleum gas.

Key Points

• The properties of Inflammable materials are as follows:
• Inflammable materials have very low flash points.
• They are highly sensitive to flames.
• Inflammable materials have high vapor pressure due to which the flash point decreases and flammability increases.
• Inflammable substances are highly flammable in nature.

Q25. Answer: (c) 7

CONCEPT:

• White light: The light that contains all the wavelengths in the visible light range is called white light.
• It is the combination of seven light colors: 1. Violet, 2. Indigo 3. Blue, 4. Green, 5. Yellow, 6. Orange, 7. Red
• Dispersion of light: The splitting of a composite beam of light into its constituent colors is called dispersion of light.
• The dispersion of white light occurs because the colors of white light travel at different speeds through the glass prism.
• The dispersion was discovered by Sir Issac Newton.
• Newton discovered that light is made up of seven different colors.

EXPLANATION:

From the above discussion, we can say that,

• There are 7 different colours in white light. So option 3 is correct.

Q26. Answer: (c) laterally inverted

The correct answer is laterally inverted.

• The image formed in a plane mirror is laterally inverted.

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Key Points

• The image is virtual and laterally inverted.

• The size of the image is equal to that of the object.

• The distance of the image from the mirror is equal to the distance of the object from the mirror.

• If an object moves towards (or away from) a plane mirror with speed u, relative to the object, the image moves towards (or away) with a speed of 2u.

• If a plane mirror is rotated by an angle θ, keeping the incident ray fixed, the reflected ray is rotated by an angle 2θ.

Additional Information

• To see his full image in a plane mirror, a person requires a mirror of at least half of his height.

• The total number of images formed by two plane mirrors inclined an angle ‘X’

A= 360/X-1

• Where X is the angle between mirrors

• The image formed by a convex mirror is always virtual, erect, and diminished.

• Spherical mirrors are the mirrors in which the reflecting surface side is spherical.

• There are two types of spherical mirrors:

• convex mirror

• concave mirror

Q27. Answer: (b) Solid

option(2)

CONCEPT:

• Sound: It is a form of energy that travels through a medium or air and can be heard when it reaches our ears.

• The sound travels faster in solids.

EXPLANATION:

• In solids, molecules are very close to each other and tightly packed.

• As they are very close so they collide very quickly and cause high disturbance as a comparison between liquid and gases.

• Hence we can say that- in solid sounds travel faster than liquid and gas.

Additional Information

• Liquid: It is those types of matter in which molecules are not very close in comparison to solid.

• Gas: It is those types of matter in which molecules are free to move and have the very least force of attraction between the particles.

Q28. Answer: (d) Radiation

The correct answer is Radiation.

• Radiation is the method through which heat is transferred from the sun to the earth.

Key Points

• The heat that eventually causes the earth to warm actually comes from the sun.

• The sun is a huge ball of gases, mainly hydrogen. Every day, the hydrogen in the sun is converted into helium through millions and millions of chemical reactions. The by-product of these reactions is heat.

• The heat released from the sun's chemical reactions does not stay near the sun but rather radiates away from it and into space.

• So much energy is released through the reactions that some of it still can reach the earth, even though the earth is millions of miles away from the sun.

• The heat energy usually reaches earth in the form of light, and many of the sun's rays are in the ultraviolet spectrum. The transfer of heat in this way is known as thermal radiation.

Additional Information

• Some of the heat energy from the sun bounces back off the earth's atmosphere, but some of it gets through and reaches the earth's surface.

• The energy that does reach the earth's surface warms it.

• The extra energy causes chemical reactions, which give off the heat again as a by-product this heat is released through the same process of thermal radiation.

• Some of the heat energy is trapped by the greenhouse gases in the atmosphere, and the temperature of the earth rises.

Important Points

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Q29. Answer: (d) Bacteria

The correct answer is Bacteria.

Key Points

• The mode of nutrition in which organisms make food themselves from simple substances is called autotrophic (auto = self; Trophos = nourishment) nutrition.

• Some types of bacteria are autotrophs.

• Most autotrophs use a process called photosynthesis to make their food, like Algae, phytoplankton, and some bacteria also perform photosynthesis.

• Some bacteria make their own food by converting light energy, chemical energy or inorganic substances into usable energy that these single-celled organisms need to live.

• Ex- Plants, Tress, algae, Bactria etc.

Additional Information

Mode of Nutrition:

• Autotrophs are organisms that can produce their own food, using materials from inorganic sources by using basic energy 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, Banana are also examples of autotrophs.

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

• Examples are Protozoa, viruses, fungi etc.

Q30. Answer: (a) Seismograph

The correct answer is Seismograph.

Key Points

• A seismograph, or seismometer, is an instrument used to detect and record earthquakes.

• Generally, it consists of a mass attached to a fixed base.

• During an earthquake, the base moves and the mass does not.

• The motion of the base with respect to the mass is commonly transformed into an electrical voltage.

• The electrical voltage is recorded on paper, magnetic tape, or another recording medium.

Important Points

• A barometer is a scientific instrument used to measure atmospheric pressure.

Q31. Answer: (a) 18

Given:

The numbers are 36, 54 and 72

Concept used:

HCF(highest common factor): this is the largest positive integer that divides each integer. This is sometimes called the greatest common divisor(G.C.D)

Calculation:

Factor of 36 = 1 × 2 × 2 × 3 × 3

Factor of 54 = 1 × 2 × 3 × 3 × 3

Factor of 72 = 1 × 2 × 2 × 2 × 3 × 3

So from the above, we can say that the highest common integer = 3 × 3 × 2 =18

=> 18

Then HCF of 36, 54 and 72 is 18

Therefore The HCF of 36, 54 and 72 is 18.

Q32. Answer: (a) 513

Given:

a : b : c = 3 : 4 : 8

Let a = 3k, b = 4k, c = 8k

According to the question

a + b + c = 2565

=> 3k + 4k + 8k = 2565
=> 15k = 2565
=> k = 171
=> 3k = 3 × 171 = 513
Therefore a = 513

Q33. Answer: (a) 11

Given:
Average of square of first five natural numbers.
Concept used:
Average
Calculation
Average = (1 + 4 + 9 + 16 + 25)/5
Average = 55/5
Average = 11
Average of square of first n natural numbers = (n + 1)(2n + 1)/6
As per the question here n = 5
=> (5 + 1)(10 + 1)/6
Therefore 11 is the average.

Q34. Answer: (d) 5

Formula used:
$(a + b)^2 = a^2 + b^2 + 2ab$
Calculation:
Given that,
x + y = 5 -------(1)
xy = 10 -------(2)
By using the above identity
$(x + y)^2 = x^2 + y^2 + 2xy$
From equation (1) & (2)
$(5)^2 = x^2 + y^2 + 2 \times 10$
$25 = x^2 + y^2 + 20$
$x^2 + y^2 = 25 - 20 = 5$
Therefore The required value is 5.

Q35. Answer: (a) 27

Given:
Side of a cube = 3
Formula used:
Volume of cube = (side)3
Calculation:
According to the question:
Volume of cube = (side)3
=> (3)3 = 27 cm3
Therefore The volume of a cube is 27 cm3.

Q36. Answer: (c) 65 kg

Given:
Average weight of 5 members = 60 kg
Weight of a man who left = 40 kg
Concept:
Average = Total weight of the family / number of members
Calculation:

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=> Total weight of a family = 60 × 5 = 300
=> Weight of 4 members = 300 - 40 = 260
Therefore Average weight of 4 members = 260 / 4 = 65 kg

Q37. Answer: (d) 4

Concept Used:
Follow the BODMAS rule according to the table given below:
Calculation:
According to the question,
1/2× 14×2/7+9/4-2/8
=> (1/2 × 14 × 2/7) + 9/4 - 2/8
=> (2) + 9/4 - 1/4
=> 2/1 + 9/4 - 1/4
=> (8 + 9 - 1) / 4
=> (17 - 1) / 4
=> 16 /4 = 4
Therefore The correct answer is 4.

Q38. Answer: (d) (2, 3, 6)

Following condition is must in any triangle:
(Sum of 2 sides) > Third Side
In option 4: (2, 3, 6)
(2 + 3) < 6
That means it does not fulfil the necessary condition.
Therefore Triplets (2, 3, 6) does not represent the sides of a triangle.

Q39. Answer: (d) 38 km/hr

Shortcut Trick
Total Distance = 70 + 120 = 190 km
Total Time = (70 ÷ 35) + (120 ÷ 40) = 2 + 3 = 5 hours
Average Speed = Total Distance ÷ Total Time = 190 ÷ 5 = 38 km/hr
Therefore The correct answer is 38 km/hr.
Alternate Method
Given:
Distance 1 (d1) = 70 km, Speed 1 (s1) = 35 km/hr
Distance 2 (d2) = 120 km, Speed 2 (s2) = 40 km/hr
Formula Used:
Average Speed = (Total Distance) ÷ (Total Time)
Time = Distance ÷ Speed
Calculations:
=> Time taken for first part (t1) = 70 ÷ 35 = 2 hours
=> Time taken for second part (t2) = 120 ÷ 40 = 3 hours
=> Total Time (T) = t1 + t2 = 2 + 3 = 5 hours
=> Total Distance (D) = 70 + 120 = 190 km
=> Average Speed = 190 ÷ 5 = 38 km/hr
Therefore The correct answer is 38 km/hr.
Additional Information
Average Speed (Equal Distances)
If a body covers two equal distances at speeds x and y, the average speed is 2xy ÷ (x + y).
Relative Speed
For objects moving in the same direction, relative speed = s1 − s2. For opposite directions, relative speed = s1 + s2.
Unit Conversion
To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

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Q40. Answer: (b) 224

Calculation:

Number of pages in the book = 350

She read 36% pages = (36/100) × 350 = 126

Number of pages yet to read = 350 - 126 = 224

Therefore The correct answer is 224.

Q41. Answer: (a) 56 years

Short trick:

=> 4 – 3 = 1 → 8

Therefore 4 + 3 = 7 → 8 × 7 = 56 years

Detailed solution:

Let the age of the first person be 3x.

=> The age of the second person = 4x

=> The difference in their ages = 4x – 3x

=> x = 8

=> The sum of their ages = 3x + 4x = 7x = 56 years

Therefore The sum of their ages is 56 years.

Q42. Answer: (b) 2

Concept:

In a rectangle, the diagonals are equal in length and bisect each other, so we can use these properties to find the value of z.

Calculation:

Given that

AO = 3z + 1

OD = 2z + 3

We know that AO = OD. Therefore,

=> 3z + 1 = 2z + 3

=> z + 1 = 3

=> z = 2

Therefore The value of z is 2.

Q43. Answer: (b) 6

Shortcut Trick

Use the Chain Rule formula: (M1 × D1) / W1 = (M2 × D2) / W2

Here, (18 men × 20 days) / 12 m = (12 men × 15 days) / W2

360 / 12 = 180 / W2

30 = 180 / W2 => W2 = 180 / 30 = 6 m.

Therefore The correct answer is 6 m.

Alternate Method

Given:

Initial condition: M1 = 18 men, D1 = 20 days, W1 = 12 m

Final condition: M2 = 12 men, D2 = 15 days, W2 = ?

Formula Used:

(M1 × D1) / W1 = (M2 × D2) / W2

Calculations:

=> (18 × 20) / 12 = (12 × 15) / W2

=> 360 / 12 = 180 / W2

=> 30 = 180 / W2

=> W2 = 180 / 30

=> W2 = 6 m

Therefore The correct answer is 6 m.

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Additional Information

General Chain Rule Formula

The relation between Men (M), Days (D), Hours (H), Efficiency (E), and Work (W) is (M1 × D1 × H1 × E1) / W1 = (M2 × D2 × H2 × E2) / W2.

Direct and Inverse Proportions

Men and Days are inversely proportional (more men, fewer days), while Men and Work are directly proportional (more men, more work done).

Work and Wages

Wages are generally distributed in the ratio of Total Work done, which is proportional to (M × D × E).

Q44. Answer: (a) 300

Calculation:

According to the question, we have

20% of 1500

=> 1500 × (20/100)

=> 300

Therefore The 20% of 1500 is 300.

Q45. Answer: (a) Rs. 800

Given:

At simple interest, an amount becomes Rs. 1120 in 4 years and Rs. 1200 in 5 years

Formula used:

SI = (P × R × T)/100

A = P + SI

Calculation:

Interest in (5 - 4) years = 1200 - 1120 = Rs. 80

Interest in 1 year = Rs. 80

Interest in 4 years = 4 x 80 = 320

Amount in 4 years = 1120

Principal = Amount - Interest = 1120 - 320 = Rs. 800

Therefore The principal amount is equal to Rs. 800.

Q46. Answer: (c) 12-9-7-8-20

The position of the letters according to the English alphabet series:

The logic followed here is, according to the position of the English alphabet series.

The word CANDLE is written as 3-1-14-4-12-5

In the same way, DARK is written as 4-1-18-11

Similarly, LIGHT will be coded as

LIGHT is coded as 12-9-7-8-20

Hence, the correct answer is "option (3)".

Q47. Answer: (b) V

The logic followed here is:

Hence, the correct answer is "option (2)".

Q48. Answer: (a) MASELP

Logic:

Similarly,

Here, 'SAMPLE' is coded as 'MASELP' as per logic.

Hence, the correct answer is "MASELP".

Q49. Answer: (a) Harbour

The pattern followed in the given set is:

Car : Garage → Garage is the place where a car is parked.

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Similarly,

Harbour is a place where a place where a ship is parked.

Hence, the correct answer is "Option 1".

Q50. Answer: (c) 29

Here we use the table given below:

Logic:

E = 5

PEN = 16 + 5 + 14 = 35

Similarly,

PAGE = 16 + 1 + 7 + 5 = 29

Here, 'PAGE' is coded as '29' as per logic.

Hence, the correct answer is "29".

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