Army Soldier GD Punjab Regt Centre (Ramgarh Cantt) 2020 Official Paper. (Previous Year Paper)

Army GD Agniveer • 2020 • 50 questions • 60 minutes • Answer key and solutions

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GENERAL KNOWLEDGE

Q1. How many countries are members of 'SAARC'?

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

Q2. East India Company was formed in which year ?

(a) 1605
(b) 1598
(c) 1600
(d) 1602

Q3. The first Bullet train in India will connect _____.

(a) Ahmedabad and Mumbai
(b) Delhi and Mumbai
(c) Ahmedabad and Agra
(d) Delhi and Ahmedabad

Q4. Who invented the 'Computer' ?

(a) Fahrenheit
(b) Einstein
(c) Grenville
(d) Charles Babbages

Q5. "One People, One state, One leader" was the policy of _____.

(a) Mussolini
(b) Lenin
(c) Stalin
(d) Hitler

Q6. Where is 'National Museum of India' located?

(a) Delhi
(b) Bangalore
(c) Chennai
(d) Patna

Q7. The deepest ocean of the world is _____.

(a) Pacific Ocean
(b) Indian Ocean
(c) Atlantic Ocean

(d) Arctic Ocean

Q8. Who was the Father of Russian Revolution ?

(a) Adolf Hitler
(b) Lenin
(c) George Washington
(d) Max Muller

Q9. Mohun Bagan is a team of which of the following sports?

(a) Basketball
(b) Football
(c) Cricket
(d) Hockey

Q10. Which among following is the capital of Chhattisgarh ?

(a) Bilaspur
(b) Bengaluru
(c) Raipur
(d) Hyderabad

Q11. Which is the largest population state of India?

(a) Madhya Pradesh
(b) Rajashthan
(c) Maharashtra
(d) Uttar Pradesh

Q12. What is the name of largest irrigation canal in India ?

(a) Upper Bari Doab Canal
(b) Yamuna Canal
(c) Indira Gandhi Canal
(d) Sirhand Canal

Q13. In which state is 'Akshardham Temple' located ?

(a) Tamil Nadu
(b) Gujarat
(c) Andhra Pradesh
(d) Haryana

Q14. 'Kalahari' desert is located in which country ?

(a) South Africa
(b) Chile
(c) Saudi Arabia
(d) India

Q15. The tenure of Vice president is of how many years ?

(a) 6 years
(b) 5 years
(c) 2 years
(d) 3 years

GENERAL SCIENCE

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Q16. The heating element in an electric heater is made of which metal ?

(a) Nichrome
(b) Lead
(c) Silver
(d) Copper

Q17. Speed of sound in air at 0 degree centigrade is _____.

(a) 211 mtr/sec
(b) 332 mtr/sec
(c) 350 mtr/sec
(d) 330 mtr/sec

Q18. Deficiency of Vitamin 'C' in the body causes which disease ?

(a) Pelegra
(b) Scurvy
(c) Goiter
(d) Night Blindness

Q19. What is the percentage of Oxygen in Air ?

(a) 46%
(b) 31%
(c) 21%
(d) 78%

Q20. Main constituent of Natural Gas is _____.

(a) Butane
(b) Methane
(c) Ethane
(d) Propane

Q21. Speed of sound is measured in _____.

(a) Hours
(b) Decibel
(c) Joule
(d) Metre/second

Q22. The eyes of patient suffering from jaundice turns to which colour ?

(a) Orange
(b) Yellow
(c) Blue
(d) Red

Q23. Which of the following metal was first used by Man on the Earth?

(a) Iron
(b) Copper
(c) Gold
(d) Aluminum

Q24. What is the chemical formula of common salt ?

(a) Ca
(b) NaCl
(c) KCl
(d) H2O

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Q25. The unit of measuring Astronomical Distance is _____.

(a) Kilometer
(b) Meter
(c) Light Year
(d) Nautical Mile

Q26. Which of following is NOT an electronic device ?

(a) Radio
(b) Bulb
(c) Television
(d) Computer

Q27. What is the unit of Resistance ?

(a) Watt
(b) Ampere
(c) Ohm
(d) Coulomb

Q28. Which of the following gases in involve in soft drinks?

(a) H_2
(b) CO_2
(c) O_2
(d) N_2

Q29. 32° Fahrenheit equals _____.

(a) 48° C
(b) 100° C
(c) 24° C
(d) 0° C

Q30. When blue litmus paper is kept in acetic acid, the blue litmus paper turns to which colour ?

(a) Red
(b) yellow
(c) Violet
(d) Light Green

MATHEMATICS

Q31. If Raj bought an umbrella for Rs. 100 and sold it for a profit of Rs. 10 then find the selling price of umbrella ?

(a) Rs. 90
(b) Rs. 115
(c) Rs. 110
(d) Rs. 100

Q32. What will be the mean of first 5 positive odd integers?

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

Q33. From the given options complete the series -7, 14, 28, 56, ().

(a) 110
(b) 112
(c) 115
(d) 100

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Q34. HCF of two numbers is 11 and their LCM is 693. If one number is 77, find the other number ?

(a) 94
(b) 89
(c) 99
(d) 92

Q35. How many rectangular plots of dimensions 40 m by 60 m can be made from a rectangular field of dimensions 120 m by 180 m ?

(a) 9
(b) 3
(c) 4
(d) 2

Q36. What will be the sum of the greatest and smallest numbers of four digits ?

(a) 8999
(b) 11110
(c) 10999
(d) 11111

Q37. If 20 people can do a work in 20 days then in how many days the same work can be completed by 40 people ?

(a) 30
(b) 10
(c) 25
(d) 40

Q38. If perpendicular of a right angled triangle is 8 cm and its area is 20 cm^2, then length of base is ?

(a) 40 cm
(b) 05 cm
(c) 20 cm
(d) 08 cm

Q39. Salary of a man was Rs. 20,000. the same was increased by 14%, find the new salary ?

(a) 25600
(b) 22800
(c) 21600
(d) 24800

Q40. Convert 35 meter/sec into km/h ?

(a) 126
(b) 140
(c) 136
(d) 130

Q41. What is the remainder when 496 is divided by 6 ?

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

Q42. Which of the following is perfect square ?

(a) 1935
(b) 730
(c) 1520
(d) 1681

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Q43. Solve: 25% of 100 = ?

(a) 25
(b) 30
(c) 20
(d) 35

Q44. If 5 is added to twice of a number it becomes 6, then the number is ?

(a) 50
(b) 0.5
(c) 5
(d) 0.25

Q45. A sum of money becomes Rs. 900 in 4 years at 5% per annum on Simple interest.What is the sum?

(a) Rs. 550
(b) Rs. 560
(c) Rs.750
(d) Rs.500

LOGICAL REASONING

Q46. Mohan walked 4 kms forward towards East then turned right and walked 3 kms. Again he turned right and walked 4 kms. After this he turned back, now in which direction is he facing ?

(a) West
(b) North
(c) South
(d) East

Q47. From the given options fill the blank space: 10, 16, 21, 25, (_)

(a) 31
(b) 28
(c) 29
(d) 27

Q48. Karim ranks 16^(th) from the top in a class of 49 students. What is the rank from the bottom ?

(a) 33
(b) 32
(c) 34
(d) 35

Q49. 6 persons can finish a work in 7days, so 21 persons will finish that work in how many days ?

(a) 3
(b) 7
(c) 6
(d) 2

Q50. If PALE is coded as 2134, EARTH is coded as 41590, how will PEARL be coded ?

(a) 29530
(b) 24153
(c) 23145
(d) 25430

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) 8

The correct answer is 8.

• 8 countries are members of 'SAARC'.

Key Points

• South Asian Association for Regional Cooperation (SAARC):

• It was established with the signing of the SAARC Charter in Dhaka on 8 December 1985.

• The Headquarters of the Association is in Kathmandu, Nepal.

• Its member countries are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka

• Afghanistan became the newest member of SAARC at the 14th annual summit in 2007.

• SAARC comprises 3% of the world's area, 21% of the world's population, and 3.8% of the total global economy.

• Its objectives are to promote welfare and accelerate the economic growth of the people of South Asia.

• SAARC Charter Day is observed every year on 8th December.

Important Points

• | SAARC Member States | SAARC Observer States |

1. Afghanistan 2. Bangladesh 3. Bhutan 4. India 5. Maldives 6. Nepal 7. Pakistan 8. Sri Lanka	**1. Australia 2. China 3. European union 4. Iran 5. Japan 6. Mauritius 7. United States 8. Myanmar 9. Republic of Korea**

Q2. Answer: (c) 1600

The correct answer is 1600.

• The 'East India Company' was formed in 1600.

Key Points

• The Governor and company of merchants of London trading into the East Indies, popularly known as the English East India Company, were formed in 1600 AD.

• Captain William Hawkins arrived at Jahangir’s court in 1609 AD to seek permission to open a factory in Surat.

• A Farman was issued by Jahangir, permitting the English to build a factory in Surat.

• In 1613, a permanent factory of East India Company was established at Surat.

• In 1616, the company established its first factory in the south in Masulipattanam.

Additional Information

• The Dutch East India Company established factories in India at Masulipatnam in 1605 AD, Pulicat (1610 AD), Surat (1616 AD), Bimlipatam (1641 AD), Karaikal (1645 AD).

• The Danes arrived in India in 1616 AD.

• They established settlement at Tranquebar (Tamil Nadu) in 1620 AD and Serampore (Bengal) in 1676 AD.

• Serampore was their headquarters.

• The French East India Company was formed in 1664 AD by Colbert under state patronage during the reign of Louis XIV.

Q3. Answer: (a) Ahmedabad and Mumbai

The correct answer is Ahmedabad and Mumbai.

• The first Bullet train in India will connect Ahmedabad and Mumbai.

Key Points

• In September 2017, Prime Minister Narendra Modi and Shinzo Abe laid the foundation stone of the bullet train project.

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• Due to their appearance and speedJapan's Shinkansen high-speed trains are referred to as bullet trains. Any train of speed above 250 km/h is termed as the Bullet train.

• The Mumbai-Ahmedabad bullet train route is a 508-kilometer stretch.

• - It is a term generally used to describe a high-speed train of speeds above 250 Kmph.

• India’s first bullet train will run in the Mumbai and Ahmedabad high-speed rail corridor, whose construction began in September 2017.

• It is a 508 km long high-speed rail corridor building with the help of Japan.

• The train will run at a speed of 320kmph and is expected to be completed by 2022.

Additional Information

• Shinkansen Technology:

• Shinkansen means new trunk lines in literal terms, which refers to the high-speed rail network in Japan.

• The train attains a high speed without having to compromise on comfort and safety, through the use of this technology.

• Unlike conventional rail lines, Shinkansen routes are strictly off-limits to any other kind of traffic.

• This network makes use of viaducts and tunnels to go through the obstacles, rather than going around them, thereby saving time spent on covering the distance.

• Due to the lighter vehicles used, chances of damage to the tracks are minimal. These trains offer fast acceleration & deceleration and are electric multiple units.

• Route Map of the Bullet Train:

Q4. Answer: (d) Charles Babbages

The correct answer is Charles Babbage.

Key Points

• Charles Babbage

• He was an English polymath, is often thought of as the man who invented computers. Hence, Option 1 is correct.

• From 1822 until he died in 1871, he designed 3 computers, but never actually constructed any of them, due to lack of funding.

• In 1822 Babbage started working on a Difference Engine its purpose was to compute polynomial functions.

• If completed it would have had some 25,000 parts, weighed 13,600 kg (15 short tons), and been 2.4 m (8 ft) tall.

• Between 1847–1849 Babbage created drawings for the Difference Engine No. 2, a second computer.

• Finally, In 1991, the British Science museum constructed the design from Babbage’s original plans. Amazingly, it worked! It took 6 years to build, weighs 4535.92kg (five short tons), measures 2.1 m, 3.4 m, 0.5 m (6’11 × 11’2 × 1’8), and has 8,000 parts.

Additional Information

• George Grenville was a British Whig statesman who rose to the position of Prime Minister of Great Britain. Grenville was born into an influential political family and first entered Parliament in 1741 as an MP for Buckingham.

• The Fahrenheit temperature scale is used in the United States; the Celsius, or centigrade, scale is employed in most other countries and for scientific purposes worldwide.

• The conversion formula for a temperature that is expressed on the Celsius (°C) scale to its Fahrenheit (°F) representation is °F = (9/5 × °C) + 32.

• Albert Einstein was a German-born theoretical physicist, widely acknowledged to be one of the greatest physicists of all time.

• Einstein is known for developing the theory of relativity, but he also made important contributions to the development of the theory of quantum mechanics.

Q5. Answer: (d) Hitler

The correct answer is Hitler.

Key Points

• Adolf Hitler

• He was a German politician, the 'leader of the Nazi Party' and 'Chancellor of Germany' from 1933-1945, and 'leader of Nazi Germany' from 1934-1945.

• As a tyrant of the German Reich, he started World War II in Europe with the conquest of Poland in September in the year 1939 and was a dominant figure of the Jewish Holocaust.

• Hitler gained 'popularity and support' by attacking the 'Treaty of Versailles and promoting anti-Semitism' (discrimination against the Jews), 'Pan-Germanism' (unifying Germans in a single State), and 'anti-communism with enigmatic oratory' and 'Nazi propaganda'.

• He often condemned communism and 'global capitalism' as part of the 'Jewish conspiracy.

• One people, One state, One leader was the policy of Adolf Hitler.

• Adolf Hitler was the leader of the Nazi Party and the Führer of Germany. Under his leadership, Germany’s invasion of Poland in

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1939 led to the outbreak of World War II.

• By 1941 Nazi forces had occupied much of Europe.

• Mein Kampf (My Struggle) was written by Adolf Hitler.

• Adolf Hitler assumed the title of Der Führer.

Additional Information

• Joseph Stalin

• He was the secretary-general of the Communist Party of the Soviet Union.

• Benito Mussolini

• He was a dictator from Italy. He was a politician and journalist who founded and led the National Fascist Party in Italy.

• Benito Mussolini was an Italian political leader who later became the fascist dictator of Italy from 1925 to 1945.

• He assumed the title of II Duke.

• Vladimir Lenin

• He served as the first and founding head of government of Soviet Russia from 1917 to 1924 and of the Soviet Union from 1922 to 1924.

• He had one of the biggest influences on the international communist movement.

Q6. Answer: (a) Delhi

The correct answer is Delhi.

Key Points

• The National Museum of India is located in New Delhi.

• The National Museum, New Delhi as we see it today in the majestic building on the corner of Janpath and Maulana Azad Road is the prime museum in the country.

• The blueprint for establishing the National Museum in Delhi had been prepared by the Maurice Gwyer Committee set up by the Government of India in 1946.

• On the auspicious day of the 15th August 1949, the National Museum was formally inaugurated by the Governor-General of India, Shri R.C. Rajagopalachari, and it was announced that till a permanent building for housing the National Museum was constructed, the Museum would continue to function in the Rashtrapati Bhawan.

• It continued to be looked after well by the Director-General of Archaeology until the Ministry of Education, the Government of India declared it a separate institution to grow in its collections that were sought painstakingly.

• It received several gifts but artifacts were collected mainly through its Art Purchase Committee.

• In the meanwhile, the foundation of the present building was laid by Pt. J.L. Nehru, Prime Minister of India, on the 12th May 1955, and the new building where works of art were displayed elegantly on scientific lines, was handed over to Museum authorities in June 1960.

• The Museum was formally thrown open to the public on December 18, 1960. And it is now within the administrative control and fully financed by the Department of Culture, Ministry of Human Resource Development, Government of India.

Image of the Museum:

Additional Information

• Chennai:

• Located on the Bay of Bengal in eastern India, is the capital of the state of Tamil Nadu.

• The city is home to Fort St. George, built-in 1644 and now a museum showcasing the city’s roots as a British military garrison and East India Company trading outpost, when it was called Madras.

• Religious sites include Kapaleeshwarar Temple, adorned with carved and painted gods, and St. Mary’s, a 17th-century Anglican church.

• Bengaluru:

• Also called Bangalore is the capital of India's southern Karnataka state.

• The center of India's high-tech industry, the city is also known for its parks and nightlife.

• By Cubbon Park, Vidhana Soudha is a Neo-Dravidian legislative building.

• Former royal residences include 19th-century Bangalore Palace, modeled after England’s Windsor Castle, and Tipu Sultan’s Summer Palace, an 18th-century teak structure.

• Patna:

• It is an ancient city that sprawls along the south bank of the Ganges River in Bihar, northeast India.

• The state capital, it’s home to Bihar Museum, a contemporary landmark exhibiting bronze sculptures and old coins from the region.

• Nearby, Indo-Saracenic–style Patna Museum displays a casket believed to contain the Buddha’s ashes. Close to the river, the

Golghar is a domed colonial granary overlooking the city.

• Delhi:

• India’s capital territory is a massive metropolitan area in the country’s north.

• In Old Delhi, a neighborhood dating to the 1600s, stands the imposing Mughal-era Red Fort, a symbol of India, and the sprawling Jama Masjid mosque, whose courtyard accommodates 25,000 people.

• Nearby is Chandni Chowk, a vibrant bazaar filled with food carts, sweets shops, and spice stalls.

• The largest Museum of India is the National Museum, Kolkata.

• Central Museum Authority is located in New Delhi.

• The biggest museum in the world is the British Museum (London).

Q7. Answer: (a) Pacific Ocean

The correct answer is the Pacific Ocean.

• The deepest ocean in the world is the Pacific Ocean.

Key Points

Pacific Ocean:

• It is the deepest ocean with an average depth of 4,200 m.

• The Mariana Trench is the world’s deepest trench with a depth of 11,033 meters (36,201 feet).

• Most of the islands of this Ocean are of volcanic or coral origin.

Additional Information

Atlantic Ocean:

• The Atlantic Ocean has the longest coastline.

• The Atlantic Ocean is the busiest Ocean for trade and commerce.

Indian Ocean:

• The Indian Ocean is deeper than the Atlantic Ocean.

• It contains numerous continental islands; Madagascar and Sri Lanka are being the largest ones.

• Some of the islands of volcanic origin are those of Mauritius, Andaman and Nicobar, Seychelles, Maldives and Lakshadweep are of coral origin.

Arctic Ocean:

• It lies within the Arctic Circle, hence the name Arctic Ocean.

• The North Pole lies in the middle of the Arctic Ocean.

• It is the shallowest of all oceans, with an average depth of 1,500 m.

• It has less salinity than all the oceans have.

All the oceans in the world:

Q8. Answer: (b) Lenin

The correct answer is Lenin.

Key Points

• Russian Revolution

• Vladimir Lenin, also called Vladimir Ilich Lenin, original name Vladimir Ilich Ulyanov founder of the Russian Communist Party (Bolsheviks), inspirer, and leader of the Bolshevik Revolution (1917), and the architect, builder, and first head (1917–24) of the Soviet state. Hence, Option 3 is correct.

• He was the founder of the organization known as Comintern (Communist International) and the posthumous source of Leninism, the doctrine codified and conjoined with Karl Marx’s works by Lenin’s successors to form Marxism-Leninism, which became the Communist worldview.

• The Russian Revolution of 1917 was one of the most significant events of the twentieth century that ended centuries of monarchy in Russia and brought forth the first constitutionally communist state in the world.

• The Russian Revolution was made in October 1917.

• It is also known as the Bolshevik Revolution. It was a proletarian-socialist revolution, inspired by the ideals of communism the Russian Revolution aimed at the creation of a socialist society in Russia.

• Leadership to this revolution was provided by the Russian Social Democratic Labour Party, particularly the Bolsheviks.

• The peasantry also played a significant role. In fact, the Russian Revolution was brought about by the working people of Russia, because they were the most oppressed and therefore most interested in a total transformation of the social and political system which exploited them.

Additional Information

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• George Washington was an American political leader, military general, statesman, and Founding Father of the United States, who served as the first president of the United States from 1789 to 1797.

• Friedrich Max Müller was a German-born philologist and Orientalist, who lived and studied in Britain for most of his life. He was one of the founders of the western academic disciplines of Indian studies and religious studies. Müller wrote both scholarly and popular works on the subject of Indology.

• Vladimir Ilyich Ulyanov, better known by his alias Lenin, was a Russian revolutionary, politician, and political theorist. He served as the first and founding head of government of Soviet Russia from 1917 to 1924 and of the Soviet Union from 1922 to 1924.

• Adolf Hitler was an Austrian-born German politician who was the dictator of Germany from 1933 to 1945. He rose to power as the leader of the Nazi Party, becoming Chancellor in 1933 and then assuming the title of Führer und Reichskanzler in 1934.

Q9. Answer: (b) Football

The correct answer is Football.

• 'Mohun Bagan' is a Football team.

Key Points

• Mohun Bagan is a sports club known for its association football team and one of the oldest football clubs in Asia.

• Mohun Bagan Athletic Club was founded in August 1889.

• Bhupendra Nath Bose was the first president of the club.

• In 1911, Mohun Bagan Athletic Club became the first Indian team to win IFA Shield.

• It has won National League/I-League five times and Federation Cup for a record fourteen times.

Logo of the Club:

Q10. Answer: (c) Raipur

The correct answer is Raipur.

• Raipur is the capital of Chhattisgarh.

Key Points

• Governor: Anusuiya Uikey

• Chief minister: Vishnu Deo Sai

• Chhattisgarh shares its borders with Uttar Pradesh, Jharkhand, Odisha, Telangana, Maharashtra, and Madhya Pradesh.

Additional Information

• Bilaspur in Chattisgarh was the capital of a Gond kingdom

• Hyderabad is the capital of Telangana.

• Bengaluru is the capital of Karnataka.

All the States Capital in India:

Q11. Answer: (d) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• According to the Census 2011, Uttar Pradesh is the state of India with a population of approximately 19.98 Crores.

• The population of Uttar Pradesh state is 199,812,341.

• The density of Uttar Pradesh state is 829 per sq km.

• It ranks first in the most populated state in India.

• As per details from Census 2011, Maharashtra has a population of 11.24 Crores, an increase from the figure of 9.69 Crore in the 2001 census.

• The population of Maharashtra forms 9.28 percent of India in 2011.

• Maharashtra is the second largest populated state in India.

• The total population of Maharashtra as per the 2011 census is 112,374,333 of which males and females are 58,243,056 and 54,131,277 respectively.

• In 2001, total population of Maharashtra, was 96,878,627 in which males were 50,400,596 while females were 46,478,031.

• As per details from Census 2011, Bihar has the third-largest population in India.

• It has a population of 10.41 Crores, an increase from the figure of 8.30 Crore in the 2001 census.

• The total population of Bihar as per the 2011 census is 104,099,452 of which males and females are 54,278,157 and 49,821,295 respectively.

• Andhra Pradesh has a population of 8.46 Crores in 2011.

• It ranks tenth in the most populated state in India.

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• The total population of Andhra Pradesh as per the 2011 census is 84,580,777 of which males and females are 42,442,146 and 42,138,631 respectively.

• The population of Andhra Pradesh forms 6.99 percent of India in 2011. In 2001, the figure was 7.41 percent.

Additional Information

• India's population has jumped to 1.21 billion, showing an increase by more than 181 million during the 2001-2011 decade.

• According to the provisional data of Census 2011, India's population accounts for the world's 17.5 percent population.

Population Density data of India:

Q12. Answer: (c) Indira Gandhi Canal

The correct answer is the Indira Gandhi canal.

Key Points

• Canal:

• It is a man-made waterway that enables the movement of boats and ships from one body of water to another.

• Canals are also used for irrigation and other human uses to convey water.

• Canals can be divided into two categories, waterways used for navigation or transport, and water ducts used for irrigation and consumption of drinking water and other general uses.

• The canal is also known as navigation when it parallels the river and separates part of its waters and drainage basin and leverages its resources by constructing dams and locks to raise and lengthen its slow water levels while remaining in its valley.

• Indira Gandhi canal:

• This Canal is India's longest canal and the world's biggest irrigation project. Hence, Option 4 is correct.

• Indira Gandhi Canal is 649 km long and consists of Rajasthan feeder canal and Rajasthan main canal and runs 167 km in Punjab and Haryana and 492 km in Rajasthan.

• It is a huge canal in northwestern India that carries water from the Harike Barrage on the Sutlej River to the Thar Desert of Rajasthan.

• Upper Bari Doab canal :

• Originates at Madhopur, near Pathankot.

• t was the first canal to be excavated for irrigation purposes in Punjab; at that time, however, it was simply known as the Bari Doab Canal system.

• The prefix Upper was only added when a second canal was dug, known as the Lower Bari Doab Canal. .Emperor Shah Jahan dug this 130-mile-long canal to carry water from the River Ravi to his garden in Lahore.

• Yamuna canal:

• Satluj Yamuna Link Canal or SYL, as it is popularly called, is a 214 kilometer (133 mi) long canal under construction in India to connect the rivers Sutlej and Yamuna.

• The plan did, however, face challenges and was referred to the Supreme Court of India.

• River water sharing between the states of Punjab and Haryana is established.

• Sirhind canal:

• The Sirhind Canal is a large irrigation canal in Punjab state, India that carries water from the Sutlej River.

• It is one of the Indus river system's oldest and largest irrigation works and was inaugurated in 1882 CE.

• The canal, which was built between 1958 and 1961, is 149.53 km long in the Punjab districts of Ferozepur, Muktsar, and Faridkot.

• To be agriculturally viable, Rajasthan requires extensive irrigation.

• The state receives a great deal of water from the Punjab Rivers, from the Western Yamuna Canal in Haryana and the Agra Canal in Uttar Pradesh, and from the Gujarat and Madhya Pradesh projects of Sabarmati and Narmada Sagar.

Q13. Answer: (b) Gujarat

The correct answer is Gujarat.

Key Points

• Swaminarayan Akshardham:

• It is located in Gandhinagar, Gujarat, India is a large Hindu temple complex inspired by Yogiji Maharaj (1892-1971) the fourth spiritual successor of Swaminarayan, and created by Pramukh Swami Maharaj (1921-2016), the fifth spiritual successor of Swaminarayan according to the denomination of Swaminarayan Hinduism.

• Located in the capital of Gujarat, the complex was built over 13 years and is a tribute to Swaminarayan and his life and teachings. Hence, Option 2 is correct.

• At the center of the 23-acre complex is the Akshardham mandir, which is built from 6,000 metric tons of pink sandstone from Rajasthan.

• The complex's name refers to the divine abode of Swaminarayan in the BAPS philosophy; followers of Swaminarayan believe that the jiva or soul goes to Akshardham after attaining moksha, or liberation. BAPS followers worship Swaminarayan as God almighty.

• Inspired by HH Yogiji Maharaj (1892-1971 CE)

• Created by His Holiness Pramukh Swami Maharaj (1921-2016 CE).

• Constructed by Bochasanwasi Shri Akshar Purushottam Swaminarayan Sanstha (BAPS).

• 8,000,000+ volunteer hours from 4000+ volunteers around the world went into making the complex

• The mandir was built from intricately carved sandstone.

Confusion Points

• 'Akshardham' means the divine abode of God. It is hailed as an eternal place of devotion, purity, and peace.

• Swaminarayan Akshardham at New Delhi is a Mandir – an abode of God, a Hindu house of worship, and a spiritual and cultural campus dedicated to devotion, learning, and harmony.

• Timeless Hindu spiritual messages, vibrant devotional traditions, and ancient architecture all are echoed in its art and architecture.

• The mandir is a humble tribute to Bhagwan Swaminarayan (1781- 1830), the avatars, devas, and great sages of Hinduism.

• The traditionally-styled complex was inaugurated on 6 November 2005 with the blessings of HH Pramukh Swami Maharaj and through the devoted efforts of skilled artisans and volunteers.

• Opened 6th November 2005

• Constructed by Bochasanwasi Shri Akshar Purushottam Swaminarayan Sanstha (BAPS)

• Inspired by HH Yogiji Maharaj (1892-1971 CE)

• Created by His Holiness Pramukh Swami Maharaj

• More than 300,000,000 volunteer hours went into making the complex

• Over 8,000 volunteers from across the world participated in building it

• Mandir built from intricately carved sandstone and marble

• Exhibitions on Hinduism, including Bhagwan Swaminarayan's life and teachings such as prayer, compassion, and non-violence.

• Open gardens, water bodies, and step-well styled courtyard

Image of the Akshardham Temple:

Q14. Answer: (a) South Africa

The solution is in Hindi. Read it online.

Q15. Answer: (b) 5 years

The correct answer is 5 years.

Key Points

• Vice-President

• Part V of the Constitution of India under Chapter I (Executive) also discusses the office of the Vice-President of India. The Vice-President of India is the second-highest constitutional office in the country.

• Article 63: The Vice-President of India

• There shall be a Vice-President of India.

• Article 64: The Vice-President is to be an ex-officio Chairman of the Council of States.

• Article 65: The Vice-President to act as President or to discharge his functions during casual vacancies in the office, or during the absence of President.

• Article 66: Election of Vice-President

• Article 67: Term of office of Vice-President

• The Vice-President shall hold office for a term of five years from the date on which he enters upon his office. Hence, Option 4 is correct.

• Article 68: Time of holding the election to fill a vacancy in the office of Vice-

• Article 69: Oath or affirmation by the Vice-President

• Article 70: Discharge of President’s functions in other contingencies

• Article 71: Matters relating to, or connected with, the election of a President or Vice-President

Additional Information

• S. Radhakrishnan was the first V.P of India and he held the post twice from 1952-1957 and then from 1957-1962. Md. Hamid Ansari has replicated that i.e. from 2007-2012 and 2012- continuing.

• Shri Krishan Kant was the only V.P to have died in office.

• The V.P.s who went on to become the Presidents – Dr. S. Radhakrishnan, Zakir Hussain, V.V. Giri, R. Venkataraman, S.D. Sharma, K.R. Narayanan.

• Because of the limited powers and functions, the V.P of India is also at times termed as HIS SUPERFLUOUS HIGHNESS.

• Current Vice President of India - Jagdeep Dhankhar

All vice presidents of India to date:

Q16. Answer: (a) Nichrome

The correct answer is Nichrome.

Key Points

• Nichrome

• It is a metal alloy made up of around 20 percent of chromium and 80 percent nickel.

• The key to the workings of an electrical heating element is the role of the nichrome in it.

• Nichrome has fast emerged as the leading alloy to be used in terms of electrical heating elements.

• For an electric iron heater element should have higher resistance, high melting point, and high specific heat.

• An element should have high resistance so that it can hold its configuration in a high voltage current. It should have a high melting point such that it can sustain high temperatures.

• Nichrome is used as a heating element in electric iron which is an alloy consisting 80% of Nickel and 20% of Chromium melting point of this element is 1400 degrees Celsius with high resistance which makes this element best for use as a heating element. Hence, Option 1 is correct.

• The reason which makes the Nichrome best for heating elements is when it is heated in the air it develops an outer layer of chromium oxide which makes it stable in air and this chromium layer helps the element from oxidizing further during heating.

Additional Information

• Copper

• It is a chemical element with the symbol Cu and atomic number 29.

• It is a soft, malleable, and ductile metal with very high thermal and electrical conductivity.

• A freshly exposed surface of pure copper has a pinkish-orange color.

• Silver

• It is a chemical element with the symbol Ag and atomic number 47.

• A soft, white, lustrous transition metal, it exhibits the highest electrical conductivity, thermal conductivity, and reflectivity of any metal.

• Lead

• It is a chemical element with the symbol Pb and atomic number 82.

• It is a heavy metal that is denser than most common materials.

• Lead is soft and malleable, and also has a relatively low melting point.

• When freshly cut, lead is silvery with a hint of blue it tarnishes to a dull gray color when exposed to air.

Q17. Answer: (b) 332 mtr/sec

The correct answer is 332 mtr/sec.

Key Points

• Speed of sound

• The speed of sound is the distance traveled in a given amount of time by sound waves.

• The speed of sound given as 343 meters per second is observed under a certain set of conditions, specifically, through dry air at 20°C.

• Sound speeds vary with the temperature of the air, humidity, and even the consistency of the air.

• Sound has a slower speed at lower temperatures for a given medium.

• The particles in the medium travel more slowly at a lower temperature, so it takes longer to transfer the energy of the sound waves.

• The speed of sound decreases by 0.6 m/s for every 1 degree Celsius that the temperature decreases.

• At 0 degrees Celsius, the speed of sound is around 331.5 m/s. Hence, Option 2 is correct.

• For each degree-Celsius temperature rise, the speed of sound rises by 0.6 meters per second (m/s).

Q18. Answer: (b) Scurvy

The correct answer is Scurvy.

Key Points

• Scurvy
• Severe vitamin C deficiency causes scurvy. Hence, Option 2 is correct.
• Scurvy in infants is rare because breast milk usually supplies enough vitamin C and infant formulas are fortified with the vitamin.
• Scurvy is rare in the United States but may occur in alcoholics and older people who are malnourished.

Additional Information

• Pellagra
• It is a disease that occurs when a person does not get enough niacin (one of the B complex vitamins) or tryptophan (an amino acid).
• Pellagra is a disease caused by a lack of vitamin niacin (vitamin B3).
• Symptoms include inflamed skin, diarrhoea, dementia, and sores in the mouth.
• A goitre
• Commonly develops as a result of iodine deficiency or inflammation of the thyroid gland.
• Not all goitres cause symptoms.
• Symptoms that do occur might include swelling and coughing.
• Rarely, symptoms may include throat tightness or trouble breathing.
• A small goitre that doesn't cause symptoms may not need treatment.
• In some cases, medication or surgery is required.
• Night blindness (nyctalopia)
• It is your inability to see well at night or in poor light such as in a restaurant or movie theatre.
• It is often associated with an inability to quickly adapt from a well-illuminated to a poorly illuminated environment.

Q19. Answer: (c) 21%

The correct answer is 21%.

Key Points

• Oxygen
• Nitrogen gas contributes the maximum amount to the atmospheric gases, the rest of the gases occupy a minimal amount of the atmosphere which is less than 1%.
• The second most abundant gas in the atmosphere is oxygen.
• Oxygen is present in 21% of the atmosphere.
• Along with air, it holds many tiny dust particles called aerosols.
• Air carrying a large amount of these particles is termed air pollution and forms soot in the atmosphere.
• The major source of oxygen in the atmosphere is trees, tiny ocean plants called phytoplankton, and some bacteria.
• Phytoplankton lives under the water where they use sunlight and carbon dioxide to make food and release oxygen as a by-product.
• Oxygen is present in two forms- oxygen O2 and ozone O3.
• Ozone is the upper layer of the atmosphere that protects us from the harmful radiation of the sun.
• Aloe vera is a plant that releases oxygen at night and that purifies the air also removing toxins like aldehyde and benzene.

Q20. Answer: (b) Methane

The correct answer is Methane.

Key Points

• The natural gas:
• It is formed by the decomposition of plants and animal matter with intense heat and pressure under the surface of the earth.
• This process takes millions of years to form natural gas.
• Natural gas is used as a fertilizer of ethanol and generates electricity that can be used in the home and offices.
• Natural gas is also very beneficial because it produces less pollution and consists of fewer impurities.
• Natural gas is a mixture consisting primarily of methane, including the different amounts of other higher alkanes and a small amount of carbon dioxide, nitrogen, hydrogen sulfide, or helium.
• Natural gas is an example of non-renewable gas.
• We can also say that natural gas is almost a pure methane gas that is colorless and highly flammable because the concentration of methane in natural gas is about 70% - 90%. Hence, Option 2 is correct.
• Whereas other molecules such as propane, butane, and hexane are also present in the natural gas but a small amount.
• That's why methane is considered the major group in natural gas.

• Moreover, other than these molecules 8 % of carbon dioxide, 0,2 % of oxygen, and 5% of nitrogen are found in natural gas.

Additional Information

• Butane

• It is primarily used as a gasoline mixture, either alone or in a propane mixture, and as a feedstock for ethylene and butadiene production, Butane like propane comes from natural gas or petroleum refineries, and the two gases are usually found together.

• The butane is stored under pressure as a liquid. When the curler is switched on, butane is released and changes to a gas.

• Methane

• When natural methane reaches the surface of the atmosphere is called atmospheric methane and can be found under the seafloor as well as below the ground.

• It is odorless or has a sweet oil-type smell and has no color.

• It is a flammable non-toxic gas.

• It is a tetrahedral molecule that has four equivalent C-H bonds.

• It is produced by colonic anaerobes. Alessandro Volta an Italian physicist was the first to scientifically identify methane in the year 1776.

• Ethane

• It is a saturated hydrocarbon found in the gaseous state.

• Ethane is the second simplest alkane followed by methane.

• It contains 2 carbon atoms and 6 hydrogen atoms.

• So the formula for ethane is C2H6.

• It is prepared by laboratory method using sodium propionate.

• Ethane is the most important gaseous fuel.

• Natural gas components of ethane and heavier hydrocarbons are quite easily separated from the gas stream and liquefied under moderate pressure.

• Propane

• It is also called n-Propane, or Dimethylmethane, or Propyl hydride.

• It is a gas molecular entity and acts as a food propellant.

• Propane was discovered in the year 1857 by Marcellin Berthelot who was a French chemist.

• Propane is a colorless gas that has a faint petroleum-like odor.

• It is soluble in ethyl ether, chloroform, water, and benzene.

• It is usually obtained as a by-product of two other processes viz petroleum refining and natural gas processing.

• It is widely used as a fuel.

Image of Natural Gas Constituents:

Q21. Answer: (d) Metre/second

The correct answer is Metre/Second.

Confusion Points

• The loudness of a sound relates the intensity of any given sound to the intensity at the threshold of hearing.

• It is measured in decibels (dB).

• The threshold of human hearing has an intensity of about. 0000000000001 watts per meter squared and corresponds to 0 decibels.

Mistake Points

• Students might get confused by this type of question. Here we are not talking about the loudness of sound. We are talking about speed.

• The speed is simply the distance traveled by the time taken. So, the unit is m / s.

Key Points

• Sound waves travel through a medium by alternately contracting and expanding the parts of the medium in which it travels.

• We know that speed is calculated using the simple formula

• Speed = Distance/Time

• The speed of sound is defined as the distance traveled per unit of time by any sound.

• The speed of sound is defined as the dynamic propagation of sound waves.

• This depends on the characteristics of the medium through which the propagation takes place.

• Speed of sound is used for describing the speed of sound waves in an elastic medium.

• The speed of sound is an essential parameter used in a variety of fields in Physics.

• The speed of sound refers to the distance traveled per unit time by a sound wave propagating through a medium.

• The speed of sound is the distance traveled per unit of time by a sound wave as it propagates through an elastic medium.

• At 20 °C (68 °F), the speed of sound in air is about 343 meters per second (1,235 km/h; 1,125 ft/s; 767 mph), or a kilometer in 2.9 s or a mile in 4.7 s. Hence, Option 4 is correct.

Additional Information

• An hour (symbol: h; also abbreviated hr)

• It is a unit of time conventionally reckoned as 1⁄24 of a day and scientifically reckoned as 3,599–3,601 seconds, depending on conditions.

• A decibel

• It is a relative unit of measurement equal to one-tenth of a bel.

• It expresses the ratio of two values of a power or root-power quantity on a logarithmic scale.

• Two signals whose levels differ by one decibel have a power ratio of 101/10 or root-power ratio of 10½^0.

• Joule

• The unit of work or energy in the International System of Units (SI); is equal to the work done by a force of one newton acting through one meter.

• Named in honor of the English physicist James Prescott Joule, it equals 10^7 ergs or approximately 0.7377 foot-pounds.

Q22. Answer: (b) Yellow

The correct answer is Yellow.

Key Points

• Jaundice

• It is a disease that causes the yellowish discoloration of the skin, sclerae (white part of the eye), and other mucous membranes. Hence, Option 2 is correct.

• Additionally, body fluids may also change to yellow color.

• Technically, it is also called icterus.

• It is caused due to the accumulation of bilirubin in the blood and body's tissues.

• Bilirubin is a waste product that is generated when red blood cells break down.

• It is then transported to the liver through the bloodstream where it is then combined with a digestive fluid called bile.

• Usually, bilirubin is discharged through the stool and the remaining is excreted through urine.

• But if bilirubin cannot be propelled through the liver, it gets accumulated in the blood causing Jaundice.

• Jaundice symptoms:

• Skin and sclerae color changes to yellow

• Urine color also changes to yellow

• Itching of the skin

• Following symptoms may be observed in the initial stages of jaundice:

• Fever

• Abdominal pain

• Vomitings

• Weight loss

• Drowsiness, agitation, and confusion

Q23. Answer: (b) Copper

The correct answer is Copper.

Key Points

• Copper

• Copper was first used by man over 10,000 years ago. Hence, Option 2 is correct.

• A copper pendant discovered in what is now northern Iraq has been dated about 8700 B.C.

• For nearly five millennia copper was the only metal known to man, and thus had all the metal applications.

• Early copper artifacts, first decorative, then utilitarian, were undoubtedly hammered out from "native copper," pure copper found in conjunction with copper-bearing ores in a few places around the world.

• By 5000 BC, the dawn of metallurgy had arrived, as evidence exists of the smelting of simple copper oxide ores such as malachite and azurite.

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• Around 3500 BC the first signs of bronze usage by the ancient Sumerians started to appear in the Tigris Euphrates valley in Western Asia.

• One theory suggests that bronze may have been discovered when copper and tin-rich rocks were used to build campfire rings.

• By 3000 B.C., silver and lead were being used and the alloying of copper had begun, first with arsenic and then with tin.

• The earliest-known iron artifacts are nine small beads dated to 3200 BC, which were found in burials in Egypt. They have been identified as meteoric iron shaped by careful hammering.

Additional Information

• Iron

• It is a chemical element with the symbol Fe and atomic number 26.

• It is a metal that belongs to the first transition series and group 8 of the periodic table.

• It is, by mass, the most common element on Earth, right in front of oxygen, forming much of Earth's outer and inner core.

• Gold

• It is a chemical element with the symbol Au and atomic number 79, making it one of the higher atomic number elements that occur naturally.

• In a pure form, it is a bright, slightly reddish yellow, dense, soft, malleable, and ductile metal.

• Chemically, gold is a transition metal and a group 11 element.

• Aluminum

• It is a chemical element with the symbol Al and atomic number 13.

• Aluminum has a density lower than those of other common metals, at approximately one-third that of steel.

• It has a great affinity towards oxygen and forms a protective layer of oxide on the surface when exposed to air.

• Aluminum visually resembles silver, both in its color and in its great ability to reflect light.

• It is soft, non-magnetic, and ductile. It has one stable isotope, Al, this isotope is very common, making aluminum the twelfth most common element in the Universe.

Q24. Answer: (b) NaCl

The correct answer is NaCl.

Key Points

• Common Salt

• Sodium chloride, commonly known as salt, is an ionic compound with the chemical formula NaCl, representing a 1:1 ratio of sodium and chloride ions. With molar masses of 22.99 and 35.45 g/mol respectively, 100 g of NaCl contains 39.34 g Na and 60.66 g Cl.

• It is formed by the chemical reaction between hydrochloric acid and sodium hydroxide.

• NaOH + HCl → NaCl + H2O

• The Chemical Formula of common salt is NaCl. Hence, Option 2 is correct.

• Molar mass: 58.44 g/mol

• Melting point: 801 °C

• Density: 2.16 g/cm³

• Boiling point: 1,465 °C

• Soluble in: Water, Ammonia, Ethanol, Glycerol, Methanol, Formic acid, Propylene glycol, Formamide

Additional Information

• H2O

• The chemical formula of water is H2O. It is also called dihydrogen monoxide.

• The 2 is the subscript for H symbolizes the presence of 2 Hydrogen atoms.

• Thus, we can say that there is hydrogen bonding in water.

• Therefore, water contains two hydrogen atoms and one oxygen.

• KCl

• Potassium chloride is a metal halide salt composed of potassium and chlorine.

• It is odorless and has a white or colorless vitreous crystal appearance.

• The solid dissolves readily in water, and its solutions have a salt-like taste.

• Potassium chloride can be obtained from ancient dried lake deposits.

• Formula: KCl

• Ca

• Calcium is a chemical element with the symbol Ca and atomic number 20.

• As an alkaline earth metal, calcium is a reactive metal that forms a dark oxide-nitride layer when exposed to air.

• Its physical and chemical properties are most similar to its heavier homologs strontium and barium.

Q25. Answer: (c) Light Year

The great answer is Light Year.

Key Points

• The unit of measuring Astronomical Distance

• The magnitudes in which the units of a quantity are expressed are based more on the convenience of the user rather than the actual base unit.

• Depending on the magnitude of the powers of the basic unit, there are two kinds of units:

• Microscopic and Macroscopic.

• Microscopic units are in powers less than 1/10. Examples are centi-, milli-, micro-and nano Macroscopic units are in powers above 10 like kilo, mega, Giga, Tera, etc.

• However, for extremely large powers such as astronomical distances which have very high powers of kilometers, two special units of length are derived. They are: Parsec and Light Year

• Parsec is used to measure distances outside the solar systems. One parsec is equal to 31 trillion kilometers.

• Another astronomical unit mentioned here is the light year.

• The light-year is a unit of length used to express astronomical distances and is equivalent to about 9.46 trillion kilometers or 5.88 trillion miles.

• As defined by the International Astronomical Union, a light-year is a distance that light travels in a vacuum in one Julian year. Hence, Option 3 is correct.

• It is defined as the distance traveled by light in the time interval of 1 year.

• 1 light-year = 9.46 trillion kilometres = 9.46*10¹5 m. Hence, the unit parsec is greater than a light-year.

Additional Information

• The kilometer

• Spelled kilometer in American English is a unit of length in the metric system, equal to one thousand meters.

• The meter or meter

• It is the base unit of length in the International System of Units.

• The SI unit symbol is m.

• The meter is currently defined as the length of the path traveled by light in a vacuum in 1/299 792 458 of a second.

• A nautical mile

• It is a unit of length used in air, marine, and space navigation, and for the definition of territorial waters.

• Historically, it was defined as the meridian arc length corresponding to one minute of latitude.

• Today the international nautical mile is defined as exactly 1852 meters.

• A nautical mile is based on the circumference of the earth and is equal to one minute of latitude.

• It is slightly more than a statute (land measured) mile (1 nautical mile = 1.1508 statute miles)

Q26. Answer: (b) Bulb

The correct answer is The bulb.

Key Points

• Electronic Device

• The device which controls the flow of electrons is called an electronic device.

• These devices are the principal building squares of electronic circuits.

• Hardware has different branches incorporate, computerized gadgets, simple hardware, miniature hardware, nanoelectronics, optoelectronics, coordinated circuit, and semiconductor gadget.

• Gadgets are characterized as gadgets run by electric force or the field of concentrating such things.

• An illustration of gadgets is radios, PCs, and TVs. Electronic hardware, frameworks, and so on.

• The bulb is not an electronic device because it does not have any current controlling semiconductor device. Hence, Option 2 is correct.

• An electric bulb is an electric device that consists of a glass casing, a filament through which the current passes, contact wires, and a base.

• The filament is made up of tungsten and the bulb is filled with argon gas. All other options have some semiconductor devices like transistors, diodes, etc.

Additional Information

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• Radio

• It is the technology of signaling and communicating using radio waves.

• Radio waves are electromagnetic waves of frequency between 30 hertz and 300 gigahertz.

• A computer

• It is a machine that can be programmed to carry out sequences of arithmetic or logical operations automatically.

• Modern computers can perform generic sets of operations known as programs.

• These programs enable computers to perform a wide range of tasks.

• Television (TV)

• Sometimes shortened to tele or telly, is a telecommunication medium used for transmitting moving images in monochrome (black and white), or color, and in two or three dimensions and sound.

• The term can refer to a television set, a television show, or the medium of television transmission.

• An incandescent light bulb

• Incandescent lamp, or incandescent light globe is an electric light with a wire filament heated until it glows.

• The filament is enclosed in a glass bulb with a vacuum or inert gas to protect the filament from oxidation

Q27. Answer: (c) Ohm

The correct answer is Ohm.

Key Points

• Resistance

• It is a term that students come across often when they study electric currents. While electric current has two factors namely conductance and resistance we will have a quick look at the latter here on this page. Talking about resistance, it is basically defined as the obstruction that a substance causes to the flow of electric current.

• Resistance is represented by the letter R and has the dimension length squared mass per time cubed electric current squared.

• The SI unit of resistance is the ohm, which is defined as a volt per ampere. Hence, Option 3 is correct.

• The name has been kept in remembrance of German physicist George Simon Ohm. The unit is sometimes written out as a word or symbolized by the uppercase Greek letter omega. Ohm has the following formula;

• $\Omega = V/A = 1/S = W/(A^2) = (V^2)/W = s/F = (J\cdot s)/(C^2) = (kg\cdot m^2)/(s\cdot C^2) = J/(s\cdot A^2) = (kg\cdot m^2)/(s^3\cdot A^2)$

• in which the following units also appear: ampere (A), Siemens (S), volt (V), watt (W), second (s), meter (m), joule (J), farad (F), kilogram (kg), and Coulomb (C).

• There is something called specific resistance or resistivity which is measured by the unit ohm-meter or ohm-m.

Additional Information

• The coulomb is the International System of Units unit of electric charge.

• Under the 2019 redefinition of the SI base units, which took effect on 20 May 2019, the coulomb is exactly 1/ elementary charges.

• The same number of electrons has the same magnitude but opposite sign of charge, that is, a charge of −1 C.

• The ampere, often shortened to amp, is the base unit of electric current in the International System of Units.

• It is named after André-Marie Ampère, a French mathematician and physicist, considered the father of electromagnetism.

• A watt is a unit of power or radiant flux. In the International System of Units, it is defined as a derived unit of 1 kg?m²?s^-³ or, equivalently, 1 joule per second. It is used to quantify the rate of energy transfer.

• The watt is named after James Watt, an 18th-century Scottish inventor.

Q28. Answer: (b) CO2

The correct answer is CO2.

Key Points

• As we know that when we open a bottle of soft drink the effervescence comes out. This is due to the gas present in soft drinks.

• Carbon dioxide is dissolved in soft drinks. Hence, Option 2 is correct.

• The greater the solubility of carbon dioxide in a solvent is due to the chemical similarity between the solvent and the carbon dioxide gas.

• There are some factors by which we can increase the solubility of gas- Effect of pressure- according to Henry's law, the mass of the gas dissolved in a given volume of the liquid at constant temperature is directly proportional to the pressure of the gas present in the liquid.

• As we increase the pressure the solubility of the gas increases in the liquid - Effect of temperature- The solubility of gas increases with a decrease in temperature.

• The dissolution of gas in a liquid is exothermic.

• So, according to Le Chatelier's principle, if we decrease the temperature equilibrium shifts toward the right.

• There are some applications of Henry's law. - The scuba divers always carry cylinders filled with air diluted with helium to avoid bends. When air enters the lungs, the partial pressure of oxygen is high. Thus, oxygen is released from oxyhemoglobin which is utilized for the function of the cell.

Additional Information

• Nitrogen (N2)

• It is a colorless, odorless, and tasteless gas that makes up 78.09% (by volume) of the air we breathe.

• It is nonflammable and will not support combustion. Nitrogen gas is slightly lighter than air and slightly soluble in water.

• It is commonly thought of and used as an inert gas, but it is not truly inert.

• Oxygen

• It is the chemical element with the symbol O and atomic number 8.

• It is a member of the chalcogen group in the periodic table, a highly reactive nonmetal, and an oxidizing agent that readily forms oxides with most elements as well as with other compounds.

• Hydrogen

• It is the chemical element with the symbol H and atomic number 1.

• With a standard atomic weight of 1.008, hydrogen is the lightest element in the periodic table.

• Hydrogen is the most abundant chemical substance in the universe, constituting roughly 75% of all baryonic mass.

• Carbon dioxide

• It is an acidic colorless gas with a density about 53% higher than that of dry air.

• Carbon dioxide molecules consist of a carbon atom covalently double bonded to two oxygen atoms. It occurs naturally in Earth's atmosphere as a trace gas.

Q29. Answer: (d) 0° C

The correct answer is 0°C.

Key Points

• Celsius scale

• The Celsius scale is nowadays set in such a way that Zero degrees C is the temperature at which ice melts.

• At the other end of the scale, 100 degrees Celsius is the boiling point of water.

• In this scale, a lower fixed point (ice point) is designated as 0° and the upper fixed point (steam point) is designated as 100°.

• The temperature measured on this scale was all in degrees Celsius (°C).

• Formula (32°F - 32) × 5/9 = 0°C.

• 32 degrees Fahrenheit is equal to 0 degrees Celsius. Hence, Option 4 is correct.

Additional Information

• Fahrenheit scale

• The change in temperature of 1°F corresponds to a change of less than 1°C on the Celsius scale.

• On the Fahrenheit scale, water freezes at 32 degrees and boils at 212 degrees. The boiling and freezing point are therefore 180 degrees apart.

• Normal body temperature is considered to be 98.6 °F (in real life it fluctuates around this value).

• Absolute zero is defined as -459.67°F.

• Kelvin scale

• We also know the Kelvin temperature scale as the thermodynamic scale.

• On the Kelvin scale, the boiling point of the water is considered to be 373.15 K and its freezing point is 273.15 K.

• Whereas it was assumed that at 0 K there is no relative motion of particles,

• The change in temperature of 1° K corresponds to a change of less than 1°C on the Celsius scale.

Important Points

• Conversion Formulas

• Celsius

• °C = (°F - 32) × 5/9

• °C = K - 273.15

• Fahrenheit

• °F = (°C × 9/5) + 32

• °F = ((K - 273.15) x 9/5) + 32

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• Kelvin
• K = °C + 273.15
• K = ((°F - 32) × 5/9) + 273.15

Q30. Answer: (a) Red

The correct answer is Red.

Key Points

• Litmus paper
• The blue litmus will turn red or pink when it comes into contact with an acidic solution below pH 4.5.
• Between 4.5 and 8.3 the paper will be purple. Above 8.3 it will stay blue. Supplied in a plastic vial, about 100 paper strips/vial.
• Litmus paper is NOT used to determine the pH level of a solution. If you need to find out the pH level, the correct test paper to use is the pH paper.
• Acetic acid or Ethanoic acid is a weak acid.
• The formula for acetic acid is CH3COOH. Since acetic acid is a weak acid it will turn blue litmus paper into red color. Hence, Option 1 is correct.
• A 1.0 M solution (about the concentration of domestic vinegar) has a pH of 2.4.

Additional Information

• Litmus paper is an indicator used to detect the presence of acids or bases in a solution.
• Acids turn blue litmus into red and bases turn red litmus into blue color.
• Litmus is also available in the form of a solution.
• The litmus solution is a purple dye solution. It is extracted from a plant called Lichen.

Q31. Answer: (c) Rs. 110

Given:

Cost Price of Umbrella (CP) = Rs. 100

Profit (P) = Rs. 10

Formula Used:

Selling price (SP) = Cost Price + Profit

Calculation:

SP = 100 + 10

=> Rs. 110

Therefore The selling price of umbrella is Rs. 110.

Q32. Answer: (a) 5

Given:

The first 5 odd natural numbers are 1, 3, 5, 7, 9

Formula Used:

Sum of n terms of an Arithmetic Progression (AP) = (n/2){(2 × First term) + (n - 1) × common difference}

Mean = (sum of given observations)/(number of given observations)

Calculations:

Common difference = 3 - 1 = 2

=> Sum of 5 terms of given AP = (5/2){2 + (4 × 2)}

=> Sum of 5 terms of given AP = 25

=> Mean = 25/5

Therefore The mean of the first 5 positive odd integers is 5.

Shortcut Trick

The given numbers are 1, 3, 5, 7, 9

We know that mean of the numbers which are in Arithmetic Progression is the middle term of the given series

Therefore The mean of the first 5 positive odd integers is 5.

Alternate Method

We know that the sum of n odd natural numbers = n2

Mean = (sum of given observations)/(number of given observations)

=> Mean = n2/n

=> Mean = n

Therefore The mean of the first 5 positive odd integers is 5.

Key Points

The mean of the numbers which are in arithmetic progression = (First term + Last term)/2

Q33. Answer: (b) 112

Calculation:

7 × 20 = 7 × 1 = 7

7 × 21 = 7 × 2 = 14

7 × 22 = 7 × 4 = 28

7 × 23 = 7 × 8 = 56

7 × 24 = 7 × 16 = 112

Therefore The next value in the series is 112.

Q34. Answer: (c) 99

Given:

HCF of two numbers = 11

LCM of two numbers = 693

One number = 77

Formula:

Product of two numbers (x × y) = LCM × HCF

Calculation:

Let first number be x

and other number be y

According to Question

Product of Two Numbers (x × y) = 693 × 11

=> 77 × y = 693 × 11

=> y = (693 × 11)/77

=> y = 7623/77

=> y = 99

Therefore Other number is 99

Q35. Answer: (a) 9

Given:

The dimensions of a larger rectangular field,

Length = 180 m, Breadth = 120 m

The dimensions of a smaller rectangular field

Length = 60 m, Breadth = 40 m

Formula used:

Area = Length × Breadth

Calculation:

The area of larger rectangular field = 120 × 180 m2

=> 21600 m2

The area of smaller rectangular field = 60 × 40 m2

=> 2400 m2

The number of rectangular plots can be made = 21600/2400

=> 9

Therefore The rectangular plots of dimensions 40 m by 60 m can be made 9.

Q36. Answer: (c) 10999

Given:

Number of digits = 4

Concept:

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The greatest number of four-digit = 9999
The smallest number of four-digit = 1000
Calculation:
According to Question
The sum of the greatest and smallest number of four-digit = 9999 + 1000
=> 10999
Therefore The sum of the greatest and smallest number of four-digit is 10999.

Q37. Answer: (b) 10

M1 × D1 = M2 × D2
=> 20 × 20 = 40 × D2
=> D2 = 400 ÷ 40
=> D2 = 10 Days
Therefore The same work can be completed by 40 people in 10 days.
Traditional Method:
Since 20 people can do work in 20 days
So, 1 person can do the work in 20 × 20 days
=> 40 people can do the work = (20 × 20)/40
=> 40 people can do the work = 400/40
=> 40 people can do the work = 10 days
Therefore The same work can be completed by 40 people in 10 days.

Q38. Answer: (b) 05 cm

Given:
Height (perpendicular) of the triangle = 8 cm
Area of the triangle = 20 cm2
Formula used:
Area of triangle = (1/2) × b × h
b = Base of the triangle
h = Height of the triangle
Calculation:
According to the question,
20 cm2 = (1/2) × b × 8cm
=> b = 40/8 = 5 cm
Therefore The required length of the base of the triangle is 5 cm.

Q39. Answer: (b) 22800

Given:
salary of a man = Rs. 20,000
Increment in salary = 14%
Formula Used:
Increased salary = Old salary + increment in salary
calculation:
Increment of salary by 14%
14% of Rs 20,000 = 2800
=> New salary of a man = 20,000 + 2800
=> Rs. 22,800
Therefore The new salary of man will be Rs. 22800.

Q40. Answer: (a) 126

Concept:
If speed is given in m/s and we have to convert it in km/hr
Then we need to multiply the given speed by 18/5.

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Calculation:
Speed in km/hr is = 35 × (18/5)
=> 7 × 18 = 126 km/hr
Therefore The speed in km/hr is 126 km/hr.
Given:
Speed = 35 m/s
Calculation:
Speed of any object in m/s shows that the object travels a particular distance in unit second.
=> 35 m/s means in 1 sec that object travels 35 m
=> In 60 seconds the object travels 35 × 60 = 2100 m
=> In 60 min the object travels 2100 × 60 m = 126000 m
Now, 126000 m = 126000 ÷ 1000 Km
=> 126 km
Therefore The speed in km/hr is 126 km/hr.

Q41. Answer: (c) 4

Given:
Dividend = 496, Divisor = 6
Formula Used:
Dividend = Divisor × Quotient + Remainder
Calculation:
We can write 496 = 6 × 82 + 4
Here, Divisor = 6, Quotient = 82 and Remainder = 4
Therefore Remainder is 4.

Q42. Answer: (d) 1681

Shortcut Trick
It is important to remember that:
=> If a square number ended with ‘00’ then the number might be a perfect square.
=> The square of a number whose one's digit is '5' ends with '25'.
=> So, options 730, 1520, and 1935 are ruled out. As these can’t be a perfect square.
Therefore 1681 is a perfect square.
As we know, 402 = 1600 and 502 = 2500
=> 1681 lies between squares of 402 and 502 and is a square of '41'.
Perfect squares never end with 2, 3, 7, and 8.

Q43. Answer: (a) 25

Calculation:
25% of 100
=> 100 × 25/100
=> 25
Therefore The value of 25% of 100 will be 25.

Q44. Answer: (b) 0.5

Given:
The number to be added is 5.
The Resultant number is 6.
Calculation:
Let the number be 'x'.
Now, According to the question
2x + 5 = 6
=> 2x = 6 - 5
=> 2x = 1

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=> x = 1/2

=> x = 0.5

Therefore The number is 0.5.

Q45. Answer: (c) Rs.750

Given:

Amount(A) = Rs. 900

Interest rate(r) = 5% p.a. SI

Time(t) = 4 years

Sum(P) = ?

Formula Used:

A = P + (P × r × t)/ 100

Calculation:

A=P + (P × r × t)/100

=> 900 = P + (P × 5 × 4)/ 100

=> 900 = P + P/ 5

=> 6P/ 5 = 900

=> P = 900 × (5/6) = 750

Therefore The sum is Rs.750

Shortcut Trick

Interest rate = 5% = 1/20

If we consider,

Sum = 20 unit

Then,

Interest for 1 year = 1 unit

Interest for 4 year = 4 units

Amount = (20 + 4) = 24 units

24 unit → Rs. 900

20 unit → Rs. 900 × (20/24) = Rs. 750

Therefore The sum is Rs.750

Q46. Answer: (d) East

According to the given information :

Mohan is facing the "East".

Q47. Answer: (b) 28

The pattern follows here is :

Hence, the next term will be "28".

Q48. Answer: (c) 34

According to the given information :

Total students in the class = 49

Karim's rank from the top = 16

Karim's rank from the bottom = Total students - Rank from the top + 1

Karim's rank from the bottom = 49 - 16 + 1 = 34.

Hence, the correct answer is "34".

Q49. Answer: (d) 2

Given:

6 persons can finish work in 7 days.

Concept used:

Total work = Number of persons × time duration × Person's capacity

Calculations

Let the working capacity of each person is x units

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Total work = 6 × 7 × x
=> 42x units
Now, time taken by 21 persons to complete this work :
42x = 21 × x × Number of days
=> Number of days = 42x/21x
=> 2 days
Therefore Option 4 is the correct answer.

Q50. Answer: (b) 24153

The logic follows here is :

Letter	P	A	L	E
Code	2	1	3	4

Letter	E	A	R	T	H
Code	4	1	5	9	0

Thus, using the corresponding codes :

Letter	P	E	A	R	L
Code	2	4	1	5	3

Hence, the correct answer is "24153".

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