Army Soldier GD (Goa) 2019 Official Paper. (Previous Year Paper)

Army GD Agniveer • 2019 • 50 questions • 60 minutes • Answer key and solutions

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GENERAL KNOWLEDGE

Q1. On which date International Day of Non-violence is observed?

(a) 23 Mar
(b) 30 Jan
(c) 02 Oct
(d) 10 Dec

Q2. Where is the Headquarter of UNO located?

(a) Switzerland
(b) New York
(c) Geneva
(d) Paris

Q3. 'Fatehpur Sikri' was built by which ruler?

(a) Akbar
(b) Humanyun
(c) Babar
(d) Shahjahan

Q4. In which year the third battle of Panipat was Fought?

(a) 1739
(b) 1707
(c) 1761
(d) 1757

Q5. Who among the following was known as the 'Lady with the lamp'?

(a) Anne Besant
(b) Sarojini Naidu
(c) Florence Nightingale
(d) Indira Gandhi

Q6. Indian currency notes are printed in which city?

(a) Nagpur
(b) Mumbai
(c) New Delhi
(d) Nasik

Q7. Who appoints Attorney General of India?

(a) Governor
(b) Chief Justice of Supreme Court
(c) Prime Minister

(d) President

Q8. Which of the following rivers originate from 'Amarkantak'?

(a) Betwa
(b) Narmada
(c) Mahanadi
(d) Godavari

Q9. Upper House of the Indian Parliament is known as the _____?

(a) Lok Sabha
(b) Vidhan Paridash
(c) Rajya Sabha
(d) Vidhan Sabha

Q10. Who was the author of the book My Experiment with Truth?

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

Q11. Who among the following is often referred to as 'Black Pearl'?

(a) Pele
(b) Venus Williams
(c) Maradona
(d) Serena Williams

Q12. Who was the founder of Brahma Samaj?

(a) Raja Ram Mohan Roy
(b) Swami Vivekananda
(c) Dayananda Saraswati
(d) Jyoti Ba Phule

Q13. Which of the following is known as roof of the world?

(a) Pamir Mountains
(b) Mount Everest
(c) Shivalik Mountain Range
(d) Alps

Q14. The Gateway of India is located in:

(a) Kolkata
(b) Delhi
(c) Mumbai
(d) Bengaluru

Q15. Who conducts the elections of Lok Sabha in India?

(a) Election Commission
(b) Union Public Service Commission
(c) Parliament
(d) Delimitation Commission

GENERAL SCIENCE

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Q16. Which of the following is a non magnetic material?

(a) Iron
(b) Nickel
(c) Cobalt
(d) Tin

Q17. Measure of Frequency is _____?

(a) Meter
(b) Second
(c) Hertz
(d) Newton Meter

Q18. The process of rusting of iron is called _____?

(a) Reduction
(b) Galvanization
(c) Absorption
(d) Corrosion

Q19. The red colour of human blood is due to _____?

(a) Mayoglobin
(b) Immunoglobulin
(c) Heptoglobin
(d) Haemoglobin

Q20. Clouds float in the atmosphere because of their _____?

(a) Low Temperature
(b) Low Viscosity
(c) Low Pressure
(d) Low Density

Q21. Fish breath through _____.

(a) Lungs
(b) Gills
(c) Eye
(d) Skin

Q22. One Horse Power = _____ Watt?

(a) 546
(b) 746
(c) 846
(d) 648

Q23. L.P.G. is a hydrocarbon consisting of a mixture of _____?

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

Q24. The quantity of blood in human body is _____?

(a) 14%
(b) 7%
(c) 1%
(d) 90%

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Q25. After digestion, Protein is converted into _____?

(a) Glucose
(b) Sucrose
(c) Fat
(d) Amino Acid

Q26. Main organ of respiratory system in human body is _____?

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

Q27. The basic unit of life is the _____?

(a) Organ
(b) Organelle
(c) Tissue
(d) Cell

Q28. Typhoid is caused by _____?

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

Q29. The disease caused by the bite of a mad dog is called _____?

(a) Dengue Fever
(b) Cholera
(c) Malaria
(d) Rabies

Q30. Photosynthesis takes place in

(a) Roots of the plants
(b) Green parts of the plants
(c) Stems of the plants
(d) All parts of the plant

MATHEMATICS

Q31. A and B can do a piece of work in 12 days, C and A in 20 days and B and C in 15 days, then in how many days will they finish it working together?

(a) 15 days
(b) 5 days
(c) 20 days
(d) 10 days

Q32. Find the area of a circle made of 1 mtre wire?

(a) 796 cm^2
(b) 795.45 cm2
(c) 799 cm2
(d) 798 cm2

Q33. In the radius of a tyre is 7 cm, what distance will it travel in 50 rotations?

(a) 7 meter
(b) 50 meter
(c) 22 meter

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(d) 44 meter

Q34. Average salary of 20 workers in an office is Rs. 1900 per month, If manager's salary is added, average becomes Rs. 2000 per month. Find manager's salary?

(a) Rs. 4600
(b) Rs. 2400
(c) Rs. 4000
(d) Rs. 2220

Q35. Find the volume of a circular cylinder whose height is 15 cm and radius of the base is 7 cm?

(a) 2510 cm^3
(b) 2310 cm3
(c) 2410 cm3
(d) 2210 cm3

Q36. If the area of a rectangular region is 560 cm^2 and one of its side is 20 cm then find its perimeter?

(a) 97 cm
(b) 85 cm
(c) 96 cm
(d) 98 cm

Q37. The radius of a circle is 28 m. Find its area?

(a) 2464 m^2
(b) 2394 m2
(c) 2828 m2
(d) 2586 m2

Q38. Prashant incurred a loss of 75% on selling an article for Rs. 6800. What was the cost price of the article?

(a) Rs. 29000
(b) Rs. 27200
(c) Rs. 21250
(d) Rs. 25600

Q39. Fill in the blank from given options:- 39, 41, 43, 45, (__).

(a) 51
(b) 47
(c) 53
(d) 49

Q40. Find the least number which must be subtracted from 175 to make it a perfect square?

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

Q41. A number increased by itself and 5 gives 17, the number is _____?

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

Q42. A motor cycle covers a distance of 140 m in 18 seconds. Find its speed per hour in kms?

(a) 32 km/hr
(b) 24 km/hr
(c) 18 km/hr

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(d) 28 km/hr

Q43. In a music school, 70% students are boys. If the total girls are 255 then find out the number of boys?

(a) 595
(b) 850
(c) 540
(d) 575

Q44. If the product of the numbers is 4725 and their HCF is 15. What will be LCM of these number?

(a) 180
(b) 345
(c) 315
(d) 265

Q45. What is the greatest number that divides 30, 53, 99 to leave the same remainder?

(a) 19
(b) 13
(c) 21
(d) 23

LOGICAL REASONING

Q46. The average of three numbers is 27. The second is three times the first and the third number is five times the first. What is the sequence of the numbers?

(a) 27, 9, 45
(b) 9, 27, 45
(c) 24, 8, 40
(d) 8, 40, 24

Q47. From the given options fill the missing number in the sequence: 1, 9, 25, 49, (__), 121.

(a) 64
(b) 100
(c) 91
(d) 81

Q48. A man walks 1 km towards East and then he turns to South and walks 5 kms. Again he turns to East and walks 2 kms and then he turns to North and walks 9 kms. How far is he from his starting point?

(a) 7 kms
(b) 4 kms
(c) 3 kms
(d) 5 kms

Q49. If PALE is coded as 2134, EARTH is coded as 41590, how will PEARL be coded?

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

Q50. Arun said, "This girl is the wife of the grandson of my mother". How is Arun related to the girl?

(a) Father
(b) Husband
(c) Father-in-law
(d) Grandfather

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 02 Oct

The correct answer is 02 Oct.

Key Point

• International Day of Non-Violence is marked on 2 Oct, the birthday of Mahatma Gandhi, pioneer of philosophy & strategy of non-violence.

• It is an occasion to disseminate messages of non-violence, including through education and public awareness.

• International Day of Non-violence was established by UNGA by passing the resolution in 2007 in an effort to spread the message of non-violence.

Q2. Answer: (b) New York

The correct answer is New York.

Important Points

• The United Nations is an International organization founded in 1945.

• It is currently made up of 193 Member states.

• UNO Headquarters is located in New York, United States.

• The Mission and work of the United Nations are guided by the purposes and principles contained in its Founding Charter.

• Antonio Guterres serves as the Ninth Secretary-General of the United Nations. A member of the Portuguese Socialist Party, he served as Prime Minister of Portugal from 1995 to 2002.

• The Main Organs of the UN are the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice, and the UN Secretariat.

• The Five Permanent Members of the UN are- China, France, Russian Federation, The United Kingdom, and the United States, and Ten Non-Permanent Members are elected for Every two-year terms by the General Assembly.

Q3. Answer: (a) Akbar

The correct answer is Akbar.

Key Point

• Fatehpur Sikri is a city situated in Uttar Pradesh. It was founded by the Mughal Emperor Akbar.

• It was the capital city of the Mughal Empire from 1571- 1585.

• The places to visit here include the Buland Darwaza, Tomb of Salim Chishti, Jama Masjid, Ibadat Khana, and more.

Q4. Answer: (c) 1761

The correct answer is 1761.

Key Points

About The Battle of Panipat:

• The Third Battle of Panipat was fought between The Maratha Empire and The Afghan Army took place on 14 January 1761 at Panipat.

• The Battle was fought between Sadashiv Rao Bhau(The Maratha Empire) and Ahmad Shah Durrani (The Afghan Army).

• In this Battle, Three Indian allies were supported by The Afgan Army, The Rohilla of (Najib-Ud-Daulah), Afghans of (Doab Region), and Shuja-Ud-Daula (The Nawab of Awadh).

• The main Maratha Army was deployed in the Deccan side with the Peshwa(The Maratha Prime Minister).

• It is considered one of the largest and most fiercely fought battles in the 18th century.

• At last, the battle was won by the Afghan Army which was led by Ahmad Shah Durrani. This war was the result of declining of

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The Maratha Empire.

Notes:

• The last ruler of The Maratha Empire was Peshwa Bajirao 2.

Q5. Answer: (c) Florence Nightingale

The correct answer is Florence Nightingale.

Key Points

• The most famous nurse in history, Florence Nightingale is the founder of modern nursing.

• She is known as 'The Lady with the Lamp' – she played a significant role during the Crimean War between 1853 and 1856.

• She nursed wounded soldiers at night while carrying a lamp along with her, which led to the famous epithet.

Important Points

Madame Cama	**• Original name is Madam Bhikaiji Cama. - She was the first Indian to hoist an Indian flag on foreign land, Stuttgart in Germany. - She is known as the 'Mother of Indian Revolution' in Yemen. - She worked as a social worker during the Bombay Plague epidemic in 1897, she became ill herself and was sent to Britain in 1901 for treatment.**
Annie Besant	• Popularly known as Annie Wood. - She was a reputed theosophist, women's rights activist, writer, and orator. - In 1916, along with Lokmanya Tilak, she launched the Home Rule League. - She was selected as the first woman president of the Indian National Congress in 1917. - She was declared a World Teacher after her lecture on Theosophy in 1926.
Sarojini Naidu	• She is known as the Nightingale of India or "Bharatiya Kokila". - She played an important role in India's freedom struggle and promoted women's rights. Also a poet and a great politician. - In 1917, she established the Women's Indian Association (WIA). - The British government also awarded her the Kaisar-i-Hind Medal for her work during the plague epidemic in India. - She was the first woman Governor of India.

Additional Information

• In 1860, Florence Nightingale established her nursing school at St Thomas Hospital, London.

• It is the World's first nursing school that was in a hospital. Now it is a part of King's College, London.

• Some books written by the Sarojini Naidu are The Golden Threshold, Mohammad Jinnah: An Ambassador of Unity, The Indian Fantasy, The Royal Tombs of Golconda, The Snake Charmer, etc.

Q6. Answer: (d) Nasik

The correct answer is Nasik.

Key Points

• Indian currency notes are printed in Nashik, Maharastra.

• The two mills at Hoshangabad in Madhya Pradesh and Mysore, Karnataka design, produce and supply the paper on which currency is printed to printing presses.

• Two of the currency note printing presses are owned by the Government of India and two are owned by the Reserve Bank, through its wholly-owned subsidiary, the Bharatiya Reserve Bank Note Mudran Ltd.

• The government-owned presses are Nashik (Western India) and Dewas (Central India).

• The other two presses are at Mysore (Southern India) and Salboni (Eastern India).

• Coins are minted in four mints owned by the Government of India.

• The mints are located at Mumbai, Hyderabad, Calcutta, and Noida.

• The number of currency notes which are to be printed for each denomination is decided on the basis of projections for GDP growth rate, inflation, and electronic transactions. This data is called by 19 regional offices of the RBI.

Q7. Answer: (d) President

The correct answer is president.

Key Points

Attorney General of India:

• R. Venkataramani is the current attorney general of India.

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• He is the first law officer in the government of India.
• He is appointed by the President under Article 76 of the Constitution.
• He has the right to speak and take part in all the proceedings of both the houses of parliament including joint sittings.
• He has no right to vote.

Q8. Answer: (b) Narmada

The correct answer is Narmada.

Key Points

• The historical importance of Amarkantak has emerged as the place of origin of two rivers the Narmada River and Sone River.
• Johila River (Tributary of Son) also emerges from Amarkantak.
• The Amarkantak region is a unique natural heritage area and is the meeting point of the Vindhya and the Satpura Ranges, with the Maikal Hills being the fulcrum.
• The Achanakmar-Amarkantak Biosphere Reserve is the most dramatic and ecologically diverse landscape in the Chhattisgarh and Madhya Pradesh states of India.
• It was declared a Biosphere reserve in 2005.
• This is the 14th BR of the country and 2nd BR of Madhya Pradesh and 1st BR of Chhattisgarh.

Additional Information

• Narmada River -
• Is the longest river of Madhya Pradesh, followed by the Tapti.
• The Source of the Narmada is Narmada Kund which is located at Amarkantak in Anuppur District, Madhya Pradesh.
• The Narmada is also known as the Rewa.
• People from Madhya Pradesh depend fully on the Narmada River, they consider Narmada as the Life Line of Madhya Pradesh.
• It is one of the major rivers in India that run from east to west along with Tapti and the Mahi.
• It flows through the states of Madhya Pradesh (1,077 km), Maharashtra (74 km), and in Gujarat (161 km).
• Son River -
• The Son River rises in the Amarkantak Plateau.
• It passes along the Kaimur Range.
• It joins the Ganga near Danapur in Patna district of Bihar.
• It flows for a distance of 784 km from its source.
• The important tributaries of the Son are the Johilla, the Gopat, the Rihand, the Kanhar, and the North Koel.

Q9. Answer: (c) Rajya Sabha

The correct answer is Rajya Sabha.

Key Points

• Rajya Sabha-
• Rajya Sabha is known as the Upper house of the Indian Parliament.
• Article 80 of the Indian Constitution lays down the maximum strength of Rajya Sabha as 250, out of which 12 members are nominated by the President and 238 are representatives of the States and of the two Union Territories.
• Vice President of India will act as Ex-Officio Chairman of Rajya Sabha.
• Lok Sabha-
• Lok Sabha, the lower house of the Parliament of India has a maximum strength of 552 allotted by the Constitution of India.
• Out of these, 545 seats are currently occupied in Lok Sabha, in which 543 seats are elected by direct election. while a maximum of 2 seats is filled by nominated members of the Anglo-Indian Community by the President of India. (But In January 2020, the Anglo-Indian reserved seats in the Parliament and State Legislatures of India were abolished by the 104th Constitutional Amendment Act, 2019)
• Note-
• Money Bills can be introduced only in Lok Sabha.
• Money bills passed by the Lok Sabha are sent to the Rajya Sabha.
• The amendment suggested by the Rajya Sabha can either be accepted by the Lok Sabha or may be rejected.
• Before the introduction of the money bill in the Lok Sabha, the assent of the President is important.

Q10. Answer: (a) Mahatma Gandhi

The correct answer is Mahatma Gandhi.

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

to 1921.

Key Points

• It was written in weekly instalments and published in his journal Navjivan from 1925 to 1929.

• Its English translation also appeared in instalments in his other journal Young India.

• It was initiated at the insistence of Swami Anand and other close co-workers of Gandhi, who encouraged him to explain the background of his public campaigns.

• In 1998, the book was designated as one of the "100 Best Spiritual Books of the 20th Century" by a committee of global spiritual and religious authorities.

Additional Information

• Other Important authors and their work:-

Author	Books
Jawahar Lal Nehru	• Discovery of India - Before Freedom - Letters for a Nation - Glimpses of world history
Moti Lal Nehru	• The voice of freedom
Swami Vivekanand	• Karma yoga - My Master - Raja yoga - Jana yoga - Bhakti yoga - Meditation and its Methods.

Q11. Answer: (a) Pele

The correct answer is Pelé

Key Points

• Pele was a Brazilian football (soccer) player who was a member of three World Cup-winning Brazilian national teams (1958, 1962, and 1970).

• He was also known as Black pearl.

• Pele made his debut for the Brazilian national football (soccer) team in 1957 when he was 16 years old.

• In the 1958 World Cup semifinal against France, he scored a hat trick and two goals in the championship game against Sweden. After that, he was proclaimed a national treasure by the Brazilian government.

Q12. Answer: (a) Raja Ram Mohan Roy

The correct answer is Raja Ram Mohan Roy.

Key Points

• Raja Rammohan Rai is known as the "Founder of the Indian Renaissance".

• He established the "Brahma Samaj" in 1828 AD, which was based on modern western thoughts.

• According to Brahma Samaj "The God is one and it was centre and source of all good virtue".

Organization	Founder
Arya Samaj	Swami Dayanand Saraswati
Aligarh movement	Sir Syed Ahmad Khan
Prarthana Samaj	Atmaram Pandurang

Q13. Answer: (a) Pamir Mountains

The correct answer is the Pamir mountains.

Key Points

• The Pamir Mountains are a mountain range between Central Asia, South Asia, and East Asia, at the junction of the Himalayas with the Tian Shan, Karakoram, Kunlun, and the Hindu Kush.

• It is also called as the roof of the world.

• The Pamir Mountains lie mostly in the Gorno-Badakhshan province of Tajikistan.

• To the north, they join the Tian Shan mountains along the Alay Valley of Kyrgyzstan.

• To the south, they border the Hindu Kush mountains along Afghanistan's Wakhan Corridor.

Q14. Answer: (c) Mumbai

The Correct Answer is Mumbai.

Key Points

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• The Gateway of India is located in Mumbai.

• It was constructed in 1924.

• The main objective behind the construction of the Gateway of India was to commemorate the visit of King George V and Queen Mary to Bombay (Mumbai).

• In March 1911, Sir George Sydenham Clarke, who was then the Governor of Bombay, laid down the monument's foundation.

• The architectural design of the Gateway of India was done by the architect George Wittet.

Additional Information

• The India Gate is a war memorial located astride the Rajpath, New Delhi.

• It stands as a memorial to 70,000 soldiers of the British Indian Army who died between 1914 and 1921 in the First World War.

• It was designed by Sir Edwin Lutyens.

Q15. Answer: (a) Election Commission

The correct answer is Election Commission.

Key Points

About Lok Sabha-

• The First Lok Sabha was constituted on 13 April 1952 after India's first general election.

• First Session of this Lok Sabha commenced on 13 May 1952.

• The 1st Lok Sabha lasted its full tenure of five years and was dissolved on 4 April 1957.

• First Lok Sabha period - 13 April 1952- 4 April 1957

• First Lok Sabha Speaker - Shri G.V. Mavalankar

• Present Lok Sabha Speaker-OM Birla.

About Election Commission of India-

• It was formed on 25 January 1950.

• The headquarters of the Election Commission is in New Delhi.

• The First Chief Election Commissioner of India was Sukumar Sen.

• The President of India appoints the Chief Election Commissioner of the Election Commission.

• There are three members in the Election Commission which include a Chief Election Commissioner and two election commissioners.

• They are appointed for 6 years or can work only till the age of 65, whichever comes first.

• Shri Sushil Chandra is the current Chief Election Commissioner of India.

Q16. Answer: (d) Tin

The correct answer is Tin.

Key Points

• The materials which get attracted towards a magnet are magnetic. Examples of magnetic materials include iron, nickel, or cobalt.

• The materials which are not attracted towards a magnet are non-magnetic materials. Examples of non-magnetic materials include almost all nonmetals like rubber, feather, leather, etc, and some metals like tin, aluminum, copper, lead, zinc, etc.

Additional Information

• In a magnet, there are two poles, the north pole and the south pole. Like poles repel each other and unlike poles attract each other.

• Following are the common types of magnetism:

• Diamagnetism: A diamagnetic substance is one whose atoms have no permanent magnetic dipole moment. When an external magnetic field is applied to a diamagnetic substance, a weak magnetic dipole moment is induced in the direction opposite the applied field. For example, bismuth and silver.

• Paramagnetism: Each atom in a paramagnetic material has a magnetic moment which is randomly oriented as a result of thermal agitation. The application of a magnetic field creates a slight alignment of these moments and hence a low magnetization in the same direction as the applied field.

• Ferromagnetism: it is one of the strongest forms of magnetism. It is responsible for most of the magnetic behavior encountered in everyday life. Most permanent magnets are ferromagnetic, as are the metals that are attracted to them. Some examples of ferromagnetic materials include iron, cobalt, nickel, and gadolinium.

Q17. Answer: (c) Hertz

The correct answer is hertz.

Key Points

• Frequency refers to the number of occurrences of a periodic event per unit of time.

• It is measured in cycles/second or hertz.

• The frequency is mainly classified into two categories:

• Angular Frequency: the number of revolutions at a fixed interval of time.

• Spatial Frequency: It depends on the spatial coordinate.

It is inversely proportional to the wavelength.

It measures the characteristic of the structure that is periodic in space.

Important Points

UNIT	PARAMETER
Meter/second	• Speed. - The scalar measure of the rate of movement of a body is expressed either as the distance travelled divided by the time taken.
Radian	• Angle. - Measurement for angles is defined by the ratio of the length of the arc of a circle to the radius of that circle. - 180 degrees = PI radians.
Watt	• Power. - Named after James Watt. - One joule (J) of energy is used or produced per second. - 1 HP = 550 ft · lbf / s - 1 HP = 745.7 W

Q18. Answer: (d) Corrosion

The correct answer is Corrosion.

Key Points

• Corrosion is when a refined metal is converted to a more stable form such as its oxide, hydroxide, or sulfide state this leads to deterioration of the material. It may be a result of some chemical process or it may occur naturally also.

• Rust is a form of corrosion, but it specifically refers to the oxidation of iron or its alloys. Only metals with iron or its alloys can get rusted.

• Rust refers to the iron oxide that is produced in the process. For rusting to take place, there are certain necessary conditions. In the presence of oxygen and moisture or water, iron undergoes this reaction and form a series of iron oxide.

• The reddish-brown color compound, known as rust is formed. If rusting starts at one place, it will eventually spread, and the whole metal will eventually disintegrate.

Additional Information

• Corrosion in other metals:

• Aluminum: Aluminum corrodes to form a thin layer of aluminum oxide forms over the surface of the metal, which acts as a protective barrier. This barrier doesn't flake off like rust does, which prevents further corrosion of the aluminum in the future.

• Copper: Copper corrodes to produces a green color compound known as patina. This patina is desirable as it not only forms a protective barrier to further corrosion but has a visual appeal that consumers like.

Q19. Answer: (d) Haemoglobin

The correct answer is Haemoglobin.

Key Points

• The red colour of blood is due to the presence of haemoglobin in the blood.

• Haemoglobin is a protein that is made up of subunit 'hemes' which is red in colour and haemoglobin constitutes the maximum part of human blood.

• Haemoglobin is a fused protein in which a protein called globin and an iron ion are found.

• Haemoglobin present in RBC carries or transports oxygen from the lungs to the tissues.

• It also carries forward carbon dioxide from the tissues to the lungs.

• The transportation of CO_2 from the tissues to the lungs takes place in a very small amount nearly (10-20 per cent) by the protein globin of haemoglobin.

• The transportation of CO_2 in the form of bicarbonate takes place which is formed by the reaction of the carbonic anhydrase enzyme and RBC.

Additional Information

• RBC - Red Blood corpuscle

• WBC - White Blood corpuscle

• RBC is born in the Bone Marrow and destroyed in the spleen.

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• RBC and WBC are present in our body in the ratio of 600:1.

Q20. Answer: (d) Low Density

The correct answer is low density.

Key Points

CONCEPT:

• Cloud is a mass of minute water droplets or tiny crystals of ice formed by the condensation of the water vapour in free air at considerable elevations.

• As the clouds are formed at some height over the surface of the earth, they take various shapes.

• According to their height, expanse, density, and transparency or opaqueness clouds are grouped under four types:

1. cirrus

2. cumulus

3. stratus

4. nimbus.

EXPLANATION:

Clouds have very low density and high volume compared to the air, so they experience high buoyancy force from the surrounding air, to balance their weight.

$F_{(buoyancy)} = Volume \times \rho_{(air\ X)} g$

so they stay afloat due to buoyancy force from the surrounding air.

Q21. Answer: (b) Gills

The correct answer is Gills.

Key Points

• Fish gills are organs that allow fish to breathe underwater.

• Most fish exchange gases like oxygen and carbon dioxide using gills that are protected under gill covers on both sides of the pharynx (throat).

• Gills are tissues that are like short threads, protein structures called filaments.

Q22. Answer: (b) 746

The correct answer is 746.

Key Points

Explanation:

• The power of a machine is the rate of doing work or the rate at which it can perform work.

Power = (Work Done)/(Time(sec))

• The absolute unit of power is Watt (W).

1 Watt = 1J/s

• The practical unit of power is the Horse Power (H.P).

• One Horsepower is the amount of work a standard horse can do in one second.

• 1 Metric H.P = 735.5 Watts

• 1 British H.P = 746 Watts

Horsepower is defined by Scottish engineer James Watt in the eighteenth century.

Q23. Answer: (d) Propane and Butane

The correct answer is propane and butane.

Key Points

Explanation:

• Liquefied petroleum gas (LPG) mainly consists of propane and butane.

• It is odourless that's why Methyl Mercaptan is added to it so there may be a smell if LPG leaks from its storage container.

Fuel Gases	Major component	Uses
Compressed natural gas (CNG)	Methane Ethane	Can be used in place of gasoline, diesel fuel and liquefied petroleum gas (LPG)

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Liquefied petroleum gas (LPG)	Butane Propane	LPG is used for cooking. An alternative to electric heating, heating oil, or kerosene. As it is odourless Methyl Mercaptan is added to it so there may be a smell if LPG leaks from its storage container.

Q24. Answer: (b) 7%

The correct answer is 7%.

Key Points

• The amount of blood in the human body is generally equivalent to 7 per cent of body weight. The average amount of blood in your body is an estimate because it can depend on how much you weigh, your sex, and even where you live.

• Depending on the age, the following is the normal amount of blood found in the human body:

• Babies: Babies born full-term have about 75 millilitres (mL) of blood per kilogram of their body weight. If a baby weighs about 8 pounds (3.6 Kg), they'll have about 0.07 gallons (270 mL) of blood in their body.

• Children: The average 80-pound (36 Kg) child will have about 0.7 gallons (2,650 mL) of blood in their body.

• Adults: The average adult weighing 150 to 180 pounds (70 - 80 Kg) should have about 1.2 to 1.5 gallons (4,500 to 5,700 mL) of blood in their body.

• Pregnant women: To support their growing babies, pregnant women usually have anywhere from 30 to 50 per cent more blood volume than women who are not pregnant. This is about 0.3 to 0.4 additional gallons of blood.

• Sometimes the amount of blood in the human body can differ based on where the person lives. For example, people who live at high altitudes have more blood because there isn't as much oxygen at higher altitudes.

Q25. Answer: (d) Amino Acid

The correct answer is Amino acids.

Key Points

• In animal digestion proteins breaks downs to form amino acid.

• Amino acids are responsible for the breaking down of food.

• Amino acids are the building blocks of life.

• Examples of Amino acids are Glutamine, Tyrosine, and Tyrosine.

• Lipid molecules are a combination of oil and fats.

• Sugar is a source of energy for the human body.

Q26. 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

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(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.

Q27. Answer: (d) Cell

The correct answer is Cell.

Key Points

• Cell theory was a revolution in the evolution of animals on Earth. It is a very basic theory on which the kingdom of organisms depends because each organism, unicellular or multicellular starts with a cell, the basic unit of life.

Theory of evolution	Change in the generation of the hereditary characteristic by generation; it was given by Charles Darwin
Theory of inheritance	Also known as the Sutton-Boveri theory; it identifies the importance of chromosomes in carrying genetic inheritance from generation to generation
Theory of natural selection	It is the theory of survival as each organism depends upon some essential conditions to survive and it is the key mechanism of evolution through adaptation.

Q28. Answer: (c) Bacteria

The correct answer is Bacteria.

Key Points

• Bacteria are single-cell organisms that are neither plants nor animals. They usually measure a few micrometers in length and exist together in communities of millions.

• Typhoid is a bacterial infection that can lead to high fever, diarrhea, and vomiting. It is caused by the bacteria Salmonella typhi.

• The infection is often passed on through contaminated food and drinking water, and it is more prevalent in places where handwashing is less frequent.

Additional Information

• Diseases caused by Bacteria include - Cholera, Leprosy, TB, Plague, Anthrax, dysentery, diphtheria, etc.

• Diseases caused by Viruses include - HIV, Hepatitis, Polio, Influenza, Dengue, Corona, Ebola, etc.

• Diseases caused by Fungi include - Valley fever, Histoplasmosis, Ringworm, Athlete's foot, etc.

• Diseases caused by Protozoa include - Malaria, Giardia, ToxoPlasmosis, etc.

Q29. Answer: (d) Rabies

The correct answer is Rabies.

Key Points

• Rabies is caused by a dog bite.

• Rabies is an infectious viral disease, caused 99% by domestic dogs.

• The disease is almost always fatal following the onset of clinical symptoms.

• Rabies can affect both domestic and wild animals.

• It is spread to people through bites or scratches, usually via saliva.

• Rabies is a vaccine-preventable disease.

• Vaccinating dogs is the most cost-effective strategy for preventing rabies in people.

• Initial symptoms of rabies include a fever with pain and unusual or unexplained tingling, pricking, or burning sensation at the wound site.

• As the virus spreads to the central nervous system, progressive and fatal inflammation of the brain and spinal cord develops.

Q30. Answer: (b) Green parts of the plants

The correct answer is the green parts of the plant.

Key Points

Photosynthesis:

• It is the process by which green plants and some other organisms use sunlight to synthesize nutrients from carbon dioxide and water.

• In this process, plants use chlorophyll, carbon dioxide, water, sunlight and release oxygen.

• Plants prepare their food by the process called photosynthesis.

• During photosynthesis, plants trap solar energy or light energy with the help of chloroplast present in the green leaves and

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convert it into Chemical energy

• A pigment called chlorophyll is present in the chloroplasts which are required in trapping sunlight

• Plants utilize Carbon dioxide and Water for the synthesis of carbohydrates during photosynthesis, oxygen is liberated as a side product

• This gaseous exchange occurs through the stomata present on the leaf surface

These events can be demonstrated by the following equation:

$6CO_2 + 6H_2O \rightarrow$ (Sunlight, Chlorophyll) $C_6H_{12}O_6 + 6O_2$

Additional Information Some facts about photosynthesis:

• Leaves are green because of chlorophyll.

• Plants perform photosynthesis in organelles called chloroplasts.

• Photosynthesis is the reverse of cellular respiration.

• Photosynthesis makes the planet liveable.

Q31. Answer: (d) 10 days

Given:

Time taken by A and B = 12 days

Time taken by C and A = 20 days

Time taken by B and C = 15 days

Formula used:

Total work = Efficiency × Number of days

Calculation:

L.C.M of 12, 20 and 15 = 60 = Total work

Efficiency of A and B = 60/12 = 5 units/day

Efficiency of C and A = 60/20 = 3 units/day

Efficiency of B and C = 60/15 = 4 units/day

Total efficiency of 2A + 2B + 2C = (5 + 3 + 4) units/day

=> Total efficiency of 2 × (A + B + C) = 12 units/day

=> Total efficiency of (A + B + C) = 12/2 = 6 units/day

Time taken to finish the work together = 60/6 days

=> 10 days

Therefore The number of days taken to finish the work together is 10 days

Q32. Answer: (b) 795.45 cm2

Calculation:

Circumference of circle = 1 m = 100 cm

Formula used:

Circumference of circle = $2\pi r$

Area of circle = πr^2

Calculation:

According to question,

$2 \times (22/7) \times r = 100$ cm

=> r = 700/44 cm

=> 175/11 cm

Now, area of circle = $\pi \times (175/11) \times (175/11)$ cm²

=> $(22/7) \times (175/11) \times (175/11)$ cm²

=> 795.45 cm²

Therefore The area of circle is 795.45 cm²

Q33. Answer: (c) 22 meter

Given:

Radius of tyre = 7 cm

Total number of rotations = 50

Formula used:

Distance covered in 1 rotation = circumference of circle
Circumference of circle = 2πr
Calculation:
Total distance covered in 50 rotations = 2πr × 50
=> 2 × (22/7) × 7 × 50 cm
=> 2200 cm = 22 meter
Therefore The distance travelled in 50 rotations is 22 meter

Q34. Answer: (c) Rs. 4000

Given:
Average salary of 20 workers = Rs. 1900
Average salary of 20 workers and 1 manager = Rs. 2000
Formula used:
Total salary = Average salary × Number of persons
Calculation:
Total salary of 20 workers = 20 × Rs. 1900
=> Rs. 38,000
Total salary of 20 workers and 1 manager = Rs. 21 × 2000
=> Rs. 42,000
Salary of manager = Rs. 42,000 – Rs. 38,000
=> Rs. 4000
Therefore The salary of manager is Rs. 4000

Q35. Answer: (b) 2310 cm3

Given:
Height of cylinder = 15 cm
Radius of base = 7 cm
Formula used:
Volume of cylinder = $\pi r^2 h$
Calculation:
Volume of cylinder = $(22/7) \times 7^2 \times 15$ cm³
=> $22 \times 7 \times 15$ cm³
=> 2310 cm³
Therefore The volume of cylinder is 2310 cm³

Q36. Answer: (c) 96 cm

Given:
Area of rectangular region = 560 cm²
One side = 20 cm
Formula used:
Area of rectangle = Length × Breadth
Perimeter = 2 × (Length + Breadth)
Calculation:
560 cm² = Length × 20
=> Length = 560/20 cm
=> 28 cm
Perimeter of rectangle = 2 × (28 + 20) cm
=> 2 × 48 cm
=> 96 cm
Therefore The perimeter is 96 cm

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Q37. Answer: (a) 2464 m²

Given:

Radius of circle = 28 m

Formula used:

Area of circle = πr²

Calculation:

Area of circle = (22/7) × 28 × 28 cm²

=> 22 × 112 cm²

=> 2464 cm²

Therefore The area is 2464 cm²

Q38. Answer: (b) Rs. 27200

Given:

S.P = Rs. 6800

Loss% = 75%

Formula used:

C.P = S.P × [100/(100 – Loss%)]

Calculation:

C.P = Rs. 6800 × (100/25)

=> Rs. 27,200

Therefore The cost price of article is Rs. 27,200

Q39. Answer: (b) 47

Calculation:

The series follows following pattern

=> 39 + 2 = 41

=> 41 + 2 = 43

=> 43 + 2 = 45

=> 45 + 2 = 47

Therefore The required answer is 47

Q40. Answer: (c) 6

Calculation:

The nearest perfect square around 175 is 169

Least number to be subtracted = 175 – 169

=> 6

Therefore The least number which must be subtracted from 175 to make it a perfect square is 6

Q41. Answer: (b) 6

Calculation:

Let the number be x

According to question,

=> x + x + 5 = 17

=> 2x = 12

=> x = 6

Therefore The number is 6

Q42. Answer: (d) 28 km/hr

Given:

Distance covered = 140 m

Time = 18 seconds

Formula used:

Speed = Distance/Time taken

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Calculation:
Speed = 140/18 m/s
=> 70/9 m/s
=> (70/9) × (18/5) km/hr
=> 28 km/hr
Therefore The speed per hour is 28 km/hr

Q43. Answer: (a) 595

Given:
Percentage of boys = 70%
Total number of girls = 255
Calculation:
Percentage of girls = (100 – 70)%
=> 30%
According to the question,
=> 30% = 255
=> 70% = (255/30%) × 70%
=> 595
Therefore The number of boys is 595

Q44. Answer: (c) 315

Given:
Product of two numbers = 4725
HCF = 15
Formula used:
LCM × HCF = Product of two numbers
Calculation:
LCM × 15 = 4725
=> LCM = 4725/15
=> 315
Therefore The LCM of these numbers is 315

Q45. Answer: (d) 23

Concept Used:
Greatest divisor = HCF[(a – b), (b – c), (a – c)]; where a > b > c
Calculation:
=> greatest number = HCF [(99 – 53), (99 – 30), (53 – 30)]
=> greatest number = HCF [46, 69, 23] = 23
Therefore Required greatest number that will divide 99, 53 and 30 so as to leave the same remainder in each case is 23

Q46. Answer: (b) 9, 27, 45

Average of three numbers is 27
So, the sum of the three numbers = (27 × 3)
= 81
Let the first number be ‘a’.
The second is three times the first.
So, 2^(nd) number = 3a
The third number is five times the first.
So, 3^(rd) number = 5a
According to question:
(a + 3a + 5a) / 3 = 27
9a = 27 × 3
a = 81 ÷ 9

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a = 9

Therefore 1^(st) number = a = 9

2 ^(nd) number = 3a = 3 × 9 = 27

3^(rd) number = 5a = 5 × 9 = 45

Hence, '9, 27, 45' is the correct answer.

Q47. Answer: (d) 81

The logic is:

The above given series is square series of odd numbers.

Hence, '81' is the correct answer.

Q48. Answer: (d) 5 kms

According to given conditions,

Distance of the man from his starting point = $\sqrt{(3^2 + 4^2)}$ km

= $\sqrt{(9 + 16)}$ km

= $\sqrt{25}$ km

= 5 km

So, the man is 5 km far from his starting point.

Hence, '5 kms' is the correct answer.

Q49. Answer: (b) 24153

Given

P	A	L	E
2	1	3	4

E	A	R	T	H
4	1	5	9	0

Similarly,

P	E	A	R	L
2	4	1	5	3

Hence, '24153' is the correct answer.

Q50. Answer: (c) Father-in-law

Preparing the family tree using the following symbols,

According to given conditions,

From Case I: Arun is father-in-law of the girl.

From Case II: Arun is mother-in-law of the girl.

In the options, father-in-law is given.

So, Arun is father-in-law of the girl.

Hence, 'Father-in-law' is the correct answer.

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