Agniveer Army GD 4th June 2026 (Shift 2) Memory-Based Paper (Previous Year Paper)

Army GD Agniveer • 2026 • 50 questions • 60 minutes • Answer key and solutions

Take this paper as a timed mock test

Practise under exam conditions, then review your answers after you submit.

yourmocktest.com/pyq/army-gd-agniveer/agniveer-army-gd-4th-june-2026-shift-2-memory-base…

Scan the QR code or click the link to open it.

YourMockTest.com — Free Study Material

GENERAL KNOWLEDGE

Q1. Who gave the slogan- "Swaraj is my birthright and I shall have it"

(a) Bhagat Singh
(b) Sukhdev
(c) Bal Gangadhar Tilak
(d) Raj Guru

Q2. Article 18 of the Indian Constitution deals with which of the following rights?

(a) Equality before law
(b) Abolition of untouchability
(c) Right to education
(d) Abolition of titles

Q3. In which season do the dry and hot winds known as 'Loo' blow in the afternoon?

(a) The Retreating Monsoon Season
(b) The Hot Weather Season
(c) The Cold Weather Season
(d) The Southwest Monsoon Season

Q4. Sahara Desert is located in which Continent?

(a) Asia
(b) Africa
(c) Australia
(d) Europe

Q5. The Aligarh Movement was started by _____.

(a) Dr Maghfoor Ahmad Ajazi
(b) Muhammad Ali Jinnah
(c) Maulana Manzoor Ahsan
(d) Syed Ahmed Khan

Q6. Which of the following is the highest rank in the Indian Army?

(a) Field Marshal
(b) Captain
(c) General Major
(d) Brigadier

Q7. Which of the following states is not located near the east coast of India?

(a) West Bengal
(b) Odisha
(c) Maharashtra

(d) Andhra Pradesh

Q8. In which hemisphere does India lie?

(a) Southern and Eastern
(b) Northern and Eastern
(c) Southern and Western
(d) Northern and Western

Q9. Which state launched Project Mahadeva, a grassroots football initiative to identify and train under-13 boys and girls across district, regional, and state-level selections?

(a) Karnataka
(b) Maharashtra
(c) Gujarat
(d) Telangana

Q10. The words that were added to the Preamble by the 42nd Constitutional Amendment.

(a) Socialist, Secular
(b) Socialist, Secular, Democratic
(c) Socialist, Secular and Unity
(d) Socialist, Secular and Integrity

Q11. Which level of the Panchayati Raj system operates at the village level?

(a) Panchayat Samiti
(b) Zila Parishad
(c) Gram Panchayat
(d) Gram Sabha

Q12. Who has been named as the 2026 Person of the Year by the Harvard South Asian Association for their contribution to film and storytelling?

(a) Priyanka Chopra
(b) Sayani Gupta
(c) Alia Bhatt
(d) Deepika Padukone

Q13. What technologies does the Multi-Lane Free Flow (MLFF) tolling system use to enable uninterrupted toll collection?

(a) RFID-based manual tolling and GPS tracking
(b) Automatic Number Plate Recognition (ANPR) and FASTag
(c) Bluetooth-enabled mobile wallets and cash payments
(d) Satellite-based geographic positioning systems

Q14. Recently held Joint Military Exercise SHAKTI was conducted between which of the following two countries?

(a) India and Russia
(b) India and France
(c) India and Germany
(d) India and USA

Q15. The Sun temple at Konark, is popularly known as the _____.

(a) White Pagoda
(b) Black Pagoda
(c) Golden Pagoda
(d) Bronze Pagoda

GENERAL SCIENCE

YourMockTest.com — Free Study Material

Q16. Which disease is caused by deficiency of Vitamin C in humans?

(a) Beri-Beri
(b) Night Blindness
(c) Scurvy
(d) Rickets

Q17. When we burn fuels, we get :

(a) Light and sound energy
(b) Only light energy
(c) Heat and light energy
(d) Mechanical and Light energy

Q18. What is the function of insulin in the human body?

(a) It supplies oxygen to the lungs.
(b) It regulates the flow of blood.
(c) It regulates how the body uses and stores glucose and fat.
(d) It supplies filtered blood to the heart.

Q19. Which of the following foods can be eaten both raw and cooked?

(a) Cabbage and Carrot
(b) Broccoli and Rajma
(c) Spinach and Potato
(d) Chilly and Brinjal

Q20. Which method is used to separate two immiscible liquids like oil and water?

(a) Separating funnel
(b) Distillation
(c) Filtration
(d) Evaporation

Q21. The human eye can focus objects at different distances by adjusting the focal length of the eye lens. this is due to -

(a) Presbyopia
(b) Accomodation
(c) Near - sightedness
(d) Far - sightedness

Q22. In which of the following is permanent magnet NOT used?

(a) Microphone
(b) Electric iron
(c) Loudspeaker
(d) Electric generator

Q23. What is the SI unit of 'volume'?

(a) Cubic metre
(b) Cubic centimetre
(c) Litres
(d) Millilitres

Q24. Plants are divided into _____ groups.

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

YourMockTest.com — Free Study Material

Q25. All the interacting organisms in an area together with the non-living constituents of the environment form an _____.

(a) Ecology
(b) Hotspot
(c) Ecosystem
(d) System

Q26. Which is the element having the highest atomic mass among the following?

(a) Magnesium
(b) Calcium
(c) Chlorine
(d) Sulphur

Q27. What is the unit of work done?

(a) Watt
(b) Decibel
(c) Ampere
(d) Joule

Q28. The essential organs in a flower for reproduction are:

(a) The sepal and stamen
(b) The stamen and pistil
(c) The sepal and petal
(d) The petal and pistil

Q29. What is the S.I. unit of electric potential difference?

(a) Coulomb
(b) Joule
(c) Ampere
(d) Volt

Q30. The work done by friction is NOT lost but is transferred as _____ energy.

(a) chemical
(b) frictional
(c) nuclear
(d) heat

MATHEMATICS

Q31. A man walks from A to B at 5 km/h and returns from B to A at 4 km/h. What is his average speed for the whole journey?

(a) 4.4 km/h
(b) 4.5 km/h
(c) 4.6 km/h
(d) 4.8 km/h

Q32. The value of 'x' in the proportion equation 35 : 25 :: 28 : x is:

(a) 20
(b) 30
(c) 26
(d) 23

YourMockTest.com — Free Study Material

Q33. If a - b = 5 and ab = 6, then (a^3 - b^3) is equal to:

(a) 225
(b) 155
(c) 90
(d) 215

Q34. Consider a box with dimension 12m, 18m and 21m. A box is cut into a equal number of cubes. Find the least number of cubes i.e. cut from a box.

(a) 168
(b) 140
(c) 210
(d) 120

Q35. There are three light bulbs which blink at an interval of 3, 4 and 5 minutes. If they all start together, then in what time will they all blink together again?

(a) 40 min
(b) 30 min
(c) 100 min
(d) 60 min

Q36. The angles of a quadrilateral are in the ratio 2 : 3 : 5 : 8. The sum of the supplement of the largest angle and the complement of the smallest angle is:

(a) 70°
(b) 80°
(c) 50°
(d) 60°

Q37. What will be the simple interest on a principal of Rs. 1600 for 8 years at the rate of 2 percent per annum?

(a) Rs. 256
(b) Rs. 240
(c) Rs. 248
(d) Rs. 340

Q38. Find the value of 841 + 6 × 15 + 45% of 60:

(a) 654
(b) 888
(c) 765
(d) 958

Q39. A man's salary was increased by 10% to Rs. 55,000. What was his original salary?

(a) Rs. 50,000
(b) Rs. 48,000
(c) Rs. 52,000
(d) Rs. 49,500

Q40. Simplify : 18 ÷ (4 + 2) × 3

(a) 6
(b) 19.5
(c) 10.5
(d) 9

Q41. What should come in place of the question mark (?) in the following question?

(3)^8 × (3)^4 = ?

(a) $(27)^3$
(b) $(729)^2$

YourMockTest.com — Free Study Material

(c) (27)^5
(d) $(729)^3$

Q42. The arithmetic mean of the observations 65, 41, 96, 44, 38, 30, 79, 90 and 21 is:
(a) 59
(b) 64
(c) 56
(d) 62

Q43. A and B invest Rs. 20,000 and Rs. 30,000 in a business. B receives Rs. 1000 more than A from the annual profit. What is the total profit?
(a) Rs. 4000
(b) Rs. 5000
(c) Rs. 6000
(d) Rs. 7000

Q44. The area of a rectangle is 105 square cm. If its length is 21 cm then what is its perimeter?
(a) 26 cm
(b) 52 cm
(c) 28 cm
(d) 13 cm

Q45. Perimeter of a square is 1000 cm. Find one side of that square ?
(a) 10 cm
(b) 100 cm
(c) 20 cm
(d) 250 cm

LOGICAL REASONING

Q46. Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster.
AMO : ZNN :: EIL : ?
(a) MDH
(b) DHM
(c) DFM
(d) DMH

Q47. Atharv is sitting 34^(th) from the right in a row of 60 students. What will be his position from left?
(a) 26
(b) 24
(c) 27
(d) 28

Q48. Six girls are sitting in a row facing north. Garima is between Reena and Anita. Reena is at the extreme left end. Anita is on the immediate left of Pooja and Arpita is to the left of Rekha. Who is at the extreme right end?
(a) Reena
(b) Arpita
(c) Anita
(d) Rekha

Q49. Select the odd word/letters/number/word pair/number pair from the given alternatives.
(a) moped bike
(b) motorcycle
(c) scooter

YourMockTest.com — Free Study Material

(d) car

Q50. Identify the number that correctly replaces the question mark (?) in the given relation.

13 : 66 :: 9 : ?

(a) 40
(b) 42
(c) 44
(d) 46

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) Bal Gangadhar Tilak

The correct answer is Bal Gangadhar Tilak.

Key Points

• Bal Gangadhar Tilak coined the famous slogan, "Swaraj is my birthright and I shall have it," which became a rallying cry for Indian independence.

• Tilak was one of the prominent leaders of the Indian freedom movement and is often referred to as the "Father of Indian Unrest" by the British colonial authorities.

• He emphasized the importance of self-rule (Swaraj) and believed that it was a fundamental right of Indians to govern themselves.

• Tilak's slogan first appeared in his newspaper, Kesari, and it became a symbol of the fight against British oppression.

• Bal Gangadhar Tilak was a staunch advocate of nationalism, Swaraj, and social reforms, and played a key role in mobilizing Indians against British colonial rule.

Additional Information

• Bhagat Singh

• Bhagat Singh was a revolutionary freedom fighter who played a pivotal role in India's struggle for independence.

• He is best remembered for his involvement in the Lahore Conspiracy Case and for his execution by the British in 1931.

• His famous slogans include "Inquilab Zindabad" (Long Live the Revolution), which became a symbol of the youth's fight for freedom.

• Sukhdev

• Sukhdev Thapar was a close associate of Bhagat Singh and a member of the Hindustan Socialist Republican Association (HSRA).

• He was involved in revolutionary activities aimed at overthrowing British rule in India.

• Sukhdev, along with Bhagat Singh and Rajguru, was executed by the British on March 23, 1931, for his role in the Lahore Conspiracy Case.

• Rajguru

• Shivaram Rajguru was another prominent revolutionary who worked alongside Bhagat Singh and Sukhdev.

• He was known for his courage and commitment to the cause of Indian independence.

• Rajguru was involved in the assassination of British officer J.P. Saunders and was executed alongside Bhagat Singh and Sukhdev in 1931.

• Main Theme of the Question

• The slogan "Swaraj is my birthright and I shall have it" symbolizes the Indian freedom struggle and the demand for self-rule during British colonial rule.

• It reflects the nationalist sentiment and the determination of Indian leaders to achieve independence from foreign domination.

YourMockTest.com — Free Study Material

• Prominent leaders like Bal Gangadhar Tilak played a crucial role in spreading this message and inspiring millions to join the freedom movement.

Q2. Answer: (d) Abolition of titles

The correct answer is Abolition of titles.

Key Points

• Abolition of titles

• Article 18 comes under the Right to equality.

• It tells about the abolition of titles except military and academic.

Right to equality (Article 14-18)	Consists of
Article 14	Equality before law and equal protection of laws.
Article 15	Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth
Article 16	Equality of opportunity in matters of public employment.
Article 17	Abolition of untouchability and prohibition of its practice.
Article 18	Abolition of titles except military and academic.

Additional Information

• Cultural and Educational Rights safeguard the rights of linguistic, cultural, and religious minorities.

• Preserving culture and heritage is vital in this scenario.

• To ensure that education is provided for everyone without any kind of discrimination, Education Rights was formulated.

• Right against exploitation is a Fundamental Right.

• Right against Exploitation is in Articles 23 – 24.

• Article 23 states the Prohibition of traffic in human beings and forced labor.

• Article 24 states the Prohibition of employment of children in factories, etc.

• Right to Freedom (Articles 19 - 22):

• Freedom is one of the most important ideals cherished by any democratic society.

• The Indian Constitution guarantees freedom to citizens.

• The freedom right includes many rights such as:

• Freedom of speech.

• Freedom of expression.

• Freedom of assembly without arms.

• Freedom of association.

• Freedom to practice any profession.

• Freedom to reside in any part of the country.

Q3. Answer: (b) The Hot Weather Season

The correct answer is The Hot Weather Season.

Key Points

Loo wind:

• The Loo is a strong, dry and hot afternoon wind from the west in the summer, blowing over the western Indo-Gangetic Plain region of North India and Pakistan.

• It is particularly strong in the months of May and June.

• Exposure to it also leads to lethal heat strokes because of its extremely high temperatures (45 °C–50 °C or 115 °F-120 °F).

• The technical words that signify the direction in which the wind is blowing are 'Windward' and 'leeward.'

• The direction upwind from the point of reference is windward.

• Loo has extended its reach and has now gripped more parts of Rajasthan, Gujarat, Maharashtra and even West Madhya Pradesh. Moreover, some parts of this region are also reeling under heat wave conditions.

Q4. Answer: (b) Africa

The correct answer is Africa.

• The Sahara is the world's largest desert.

YourMockTest.com — Free Study Material

• It extends across most of the northern part of Africa.

Additional Information

• The Sahara is the largest hot desert in the world, and the third-largest desert behind Antarctica and the Arctic, which are both cold deserts.

• The Sahara is one of the harshest environments on Earth, covering 3.6 million square miles (9.4 million square kilometers), nearly a third of the African continent, about the size of the United States (including Alaska and Hawaii).

• The name of the desert comes from the Arabic word sahrā?, which means "desert."

• The Sahara is bordered by the Atlantic Ocean on the west, the Red Sea on the east, the Mediterranean Sea on the north, and the Sahel Savannah on the south.

• The enormous desert spans 11 countries: Algeria, Chad, Egypt, Libya, Mali, Mauritania, Morocco, Niger, Western Sahara, Sudan, and Tunisia.

Q5. Answer: (d) Syed Ahmed Khan

• Sir Syed Ahmed Khan is associated with the Aligarh Movement. He organised and founded the Aligarh Movement in 1875.

• It was based in Mohammedan Anglo-Oriental College, Aligarh.

• Major objectives of the Aligarh Movement:

1. To provide modern education among Indian Muslims without weakening their allegiance to Islam.

2. To initiate social reforms among Muslims relating to purdah, polygamy, widow remarriage, women's education, slavery, divorce, etc.

Q6. Answer: (a) Field Marshal

• Field Marshal is a five–star general officer rank and the highest attainable rank in the Indian Army.

• Field Marshal is ranked immediately above general, but not exercised in the regular army structure. It is a largely ceremonial or wartime rank, having been awarded only twice.

Indian Army	Indian Navy	Indian Air Force
General	Admiral	Air Chief Marshal
Lieutenant General	Vice Admiral	Air Marshal
Major General	Rear Admiral	Air Vice Marshal
Brigadier	Commodore	Air Commodore
Colonel	Captain	Group Captain
Lieutenant Colonel	Commander	Wing Commander
Major	Lieutenant Commander	Squadron Leader
Captain	Lieutenant	Flight Lieutenant
Lieutenant	Sub-Lieutenant	Flying Officer

Q7. Answer: (c) Maharashtra

The correct answer is Maharashtra.

Key Points

• Maharashtra is located on the western coast of India, not near the east coast.

• States near the east coast of India include West Bengal, Odisha, and Andhra Pradesh.

• Maharashtra's coastline is along the Arabian Sea, whereas the east coast borders the Bay of Bengal.

• Major cities in Maharashtra include Mumbai and Pune, which are prominent on the western side of India.

Additional Information

• Indian Coastline

• India has a vast coastline of about 7,516.6 kilometers.

• The coastline is divided into the western coast and the eastern coast.

• The western coast borders the Arabian Sea, while the eastern coast borders the Bay of Bengal.

• West Bengal

• West Bengal lies on the eastern coast and has a coastline along the Bay of Bengal.

• Kolkata is the capital city of West Bengal.

YourMockTest.com — Free Study Material

• Odisha
• Odisha is located on the eastern coast of India, with a coastline along the Bay of Bengal.
• Bhubaneswar is the capital city of Odisha.
• Andhra Pradesh
• Andhra Pradesh lies on the southeastern coast of India and also has a coastline along the Bay of Bengal.
• Amaravati is the capital city of Andhra Pradesh.

Q8. Answer: (b) Northern and Eastern

The correct answer is option 2 i.e. Northern and Eastern.
• Any circle drawn around the globe divides the Earth into two equal halves called hemispheres.
• There are generally considered to be four hemispheres: Northern, Southern, Eastern, and Western.
• India's main land extends between latitudes 8°4'N and 37°6'N and longitudes 68°7'E and 97°25'E.
• India is located lattitudinally in the Northern hemisphere, the half of earth that is north of the Equator (0°).
• India is located longitudinally in the Eastern hemisphere, the half of earth that is east of the Prime Meridian or the Greenwich Line (0°).

Q9. Answer: (b) Maharashtra

The correct answer is Maharashtra.

In News

• Maharashtra launched Project Mahadeva, a statewide grassroots football programme to nurture under-13 boys and girls with structured, multi-stage talent scouting.

Key Points

• The initiative aims to discover hidden football talent from remote districts through district, regional, and state-level selection rounds.
• A total of 60 players — 30 boys and 30 girls — have been selected for full five-year scholarships under the programme.
• The chosen athletes will receive high-quality training and long-term development support from the state.
• The players will train with Lionel Messi at the GOAT Football Clinic in Mumbai during his December 2025 visit, offering world-class exposure.

Additional Information

• About Project Mahadeva
• A statewide grassroots football development initiative targeting under-13 athletes.
• Ensures inclusive participation by reaching even the remotest districts.
• Designed to build a strong youth football pipeline for Maharashtra.
• Selection Structure
• Phase 1: District-level trials.
• Phase 2: Regional rounds for shortlisted players.
• Phase 3: Final state-level camp for talent evaluation and selection.
• Ensures merit-based, wide-reach scouting across the state.
• Scholarship Benefits
• Five-year, fully funded football development programme.
• Professional coaching, fitness training, nutrition, and competitive exposure.
• Dedicated development pathway for elite youth athletes.
• Training with Lionel Messi
• The selected 60 players will train at the GOAT Football Clinic in Mumbai.
• Messi’s December 2025 visit provides rare world-class training and inspiration.
• Creates global-level exposure for Indian grassroots talent.

Q10. Answer: (d) Socialist, Secular and Integrity

The correct answer is option 1 i.e., Socialist, Secular and Integrity
• Socialist, Secular and Integrity words were added to the Preamble by the 42^(nd) Constitutional Amendment.
• The 42nd Amendment changed the description of India from a "sovereign democratic republic" to a "sovereign, socialist secular democratic republic", and also changed the words "unity of the nation" to "unity and integrity of the nation".
• The 42nd amendment to the Constitution of India, officially known as The Constitution Amendment Act, 1976, was enacted during the Emergency by the Indian National Congress government headed by Indira Gandhi.

YourMockTest.com — Free Study Material

• It is also known as ‘Mini-Constitution.’

Q11. Answer: (c) Gram Panchayat

The correct answer is Gram Panchayat.

Key Points

• The Gram Panchayat is the foundational level of the Panchayati Raj system and operates at the village level.

• It is responsible for local governance and addressing issues within a village or group of villages.

• The Gram Panchayat is elected by the Gram Sabha, which consists of all the eligible voters in the village.

• The head of the Gram Panchayat is known as the Sarpanch, who is elected directly by the villagers.

• Key responsibilities include implementing rural development programs, maintaining village infrastructure, and ensuring the welfare of the residents.

Additional Information

• Panchayati Raj System: It is a three-tier system of governance in India, consisting of Gram Panchayat (village level), Panchayat Samiti (block level), and Zila Parishad (district level).

• Gram Sabha: The Gram Sabha is the assembly of all eligible voters in a village, and it serves as the decision-making body that oversees the functioning of the Gram Panchayat.

• 73rd Constitutional Amendment: This amendment, passed in 1992, provided constitutional status to the Panchayati Raj institutions and ensured decentralized governance.

• Functions of Gram Panchayat: These include maintaining water supply, sanitation, roads, and public health; executing development schemes; and resolving disputes at the village level.

• Revenue Sources: Gram Panchayats generate revenue through taxes on property, markets, and local businesses, as well as grants from the state government.

Q12. Answer: (b) Sayani Gupta

The correct answer is Sayani Gupta

In News

• Bollywood actress Sayani Gupta has been named the 2026 Person of the Year by the Harvard South Asian Association.

Key Points

• The recognition was given for her outstanding contribution to film, storytelling, and representation.

• She is scheduled to be formally felicitated at Harvard University later in April 2026.

• The award is presented annually to individuals who have significantly shaped South Asian identity and representation in public life.

• Sayani Gupta is being honored for her specific role in advancing narrative storytelling and representation through her film career. Hence, the correct answer is Sayani Gupta.

Additional Information

• The Harvard South Asian Association is a student organization that celebrates and promotes the culture and representation of South Asians at Harvard University.

• The award highlights the global impact of South Asian artists and thinkers in the modern era.

Important Points

• The announcement was made on April 17, 2026.

• The focus of the award remains on representation and shaping public identity for the South Asian community.

Q13. Answer: (b) Automatic Number Plate Recognition (ANPR) and FASTag

The correct answer is Automatic Number Plate Recognition (ANPR) and FASTag

In News

• Union minister for road transport and highways Nitin Gadkari inaugurated the Multi Lane Free Flow (MLFF) tolling system on Delhi’s Urban Extension Road-II (UER-II).

Key Points

• The Multi-Lane Free Flow (MLFF) system uses Automatic Number Plate Recognition (ANPR) and FASTag to enable uninterrupted toll collection.

• These technologies allow vehicles to move through toll points without halting, ensuring smooth and contactless toll payments.

• The model is designed to ease congestion, shorten travel time, improve fuel efficiency, and reduce emissions by limiting manual intervention.

• Hence, the correct answer highlights ANPR and FASTag as the core technologies behind the MLFF system.

Additional Information

YourMockTest.com — Free Study Material

• The rollout of MLFF on UER-II follows its initial launch at the Chorayasi Toll Plaza on the Surat–Bharuch stretch of NH-48 in Gujarat, which marked India's first barrier-less toll system.

• In cases of insufficient balance or malfunctioning FASTags, users receive an Electronic Notice (E-Notice) and must pay the pending user fee within 72 hours.

Important Points

• The MLFF initiative is aimed at improving ‘Ease of Living’ and supporting ‘Ease of Doing Business’ by ensuring quicker and more efficient transport movement.

• Beyond commuter convenience, the system is expected to strengthen toll administration by improving transparency and reducing the operational expenses associated with physical toll plazas.

Q14. Answer: (b) India and France

The correct answer is Option 2.

In News

• News: The 7th edition of India- France Joint Military Exercise SHAKTI commenced, at Umroi Meghalaya

Key Points

Exercise SHAKTI:

• Exercise SHAKTI is a biennial military exercise conducted between India and France. Hence, option 2 is correct.

• The exercise includes personnel from India's RAJPUT Regiment and France's 13th Foreign Legion Half-Brigade, showcasing the strong military cooperation between the two nations.

• The 7th edition of this exercise commenced in Meghalaya, India, emphasizing joint military capabilities in multi-domain operations.

Q15. Answer: (b) Black Pagoda

The correct answer is Black Pagoda.

Key Points

• Konark:

• The famous Konark Sun temple is situated in the town of Konark in Odisha.

• This is one of the very few and famous Sun temples in India.

• It is also known as the ‘Black Pagoda’ because it is built out of black granite.

• It was made on the orders of King Narasimhadeva.

• It reached the pinnacle of fame when UNESCO made it a world heritage site in 1984.

• One of the highlights at the Konark Sun temple is the annual Konark Dance festival that is held every year in December and is devoted to Odissi, the classical dance of Odisha.

• The temple is the centre of all celebrations and the gigantic chariot of Surya (Sun God) forms the backdrop to all the festivities.

• This chariot has 12 pairs of ornamental wheels, which were supposed to be pulled by seven horses.

Q16. Answer: (c) Scurvy

The correct answer is Scurvy.

Key Points

• Scurvy is caused by vitamin C deficiency or ascorbic acid.

• It can lead to anemia, exhaustion, spontaneous bleeding, pain in the limbs, swelling in some parts of the body such as legs and ulceration of gums, and loss of teeth.

• The risk factors of Vitamin C deficiency are poor diet, illness such as anorexia and mental health issues, old age, and excessive consumption of alcohol or substance abuse.

Additional Information

• Beri-Beri: It is caused by the deficiency of vitamin B1 or Thiamine. Beri-Beri is of two types:

• Wet beriberi which affects the heart and circulatory system

• Dry beriberi damages the nerves and causes decreased muscle strength and may also lead to paralysis.

• The deficiency of Vitamin B1 may also lead to Wernicke-Kroskoff syndrome, muscle weakness, and ophthalmoplegia.

• Night blindness is a condition in which it becomes difficult or impossible to see in relatively low light. It can be caused by Vitamin A deficiency, congenital night blindness, pathological myopia, and advanced primary open-angle glaucoma.

• Rickets: it is caused by a lack of vitamin D, calcium, or phosphate which leads to softening and weakening of the bones. Rickets is a result of nutritional malabsorption, renal disease, etc.

YourMockTest.com — Free Study Material

Q17. Answer: (c) Heat and light energy

The correct answer is Heat and light energy

Explanation-

When fuels undergo combustion, chemical energy stored within the fuel molecules is converted into other forms of energy. During this process, the chemical bonds between atoms in the fuel molecules break, releasing energy in the form of heat and light. This process is known as combustion or burning.

• Light and sound energy: While combustion may produce some sound due to rapid expansion of gases, the predominant forms of energy released are heat and light, not sound. Therefore, this option is incorrect.

• Only light energy: Combustion primarily releases thermal energy (heat) and radiant energy (light). While light is a significant component, it is not the only form of energy released during combustion. Therefore, this option is incorrect.

• Heat and light energy: This option correctly identifies the two primary forms of energy released during combustion. Heat energy is produced due to the exothermic nature of the chemical reactions involved, while light energy is emitted as visible light during the process. Therefore, this option is correct.

• Mechanical and light energy: Combustion does not typically produce mechanical energy directly. While the expansion of gases during combustion might cause movement, it is not considered mechanical energy in the traditional sense. Therefore, this option is incorrect.

Conclusion- The correct answer is option 3: Heat and light energy.

Q18. Answer: (c) It regulates how the body uses and stores glucose and fat.

The correct answer is It regulates how the body uses and stores glucose and fat.

Key Points

• Insulin is a hormone produced by the pancreas that plays a crucial role in regulating blood sugar levels.

• It helps cells in the body absorb glucose from the bloodstream to be used for energy or stored for future use, thereby lowering blood sugar levels.

• Insulin also regulates the storage of fats and helps to prevent the breakdown of muscle proteins.

• A lack of insulin or resistance to its effects can lead to conditions such as diabetes mellitus.

Additional Information

• Diabetes is a chronic condition that occurs when the body either doesn't produce enough insulin or cannot effectively use the insulin it produces.

• There are two main types of diabetes: Type 1, where the body fails to produce insulin, and Type 2, where the body becomes resistant to insulin.

• Managing diabetes often involves monitoring blood sugar levels, adhering to a healthy diet, regular physical activity, and sometimes insulin therapy or other medications.

• Research is ongoing to find better treatments and potential cures for diabetes, including advances in insulin delivery systems and the development of artificial pancreas devices.

Q19. Answer: (a) Cabbage and Carrot

Concept:

• People eat different types of fruits and vegetables.

• Different parts or all parts of various plants can be eaten as food.

• In different places, different parts of a plant are eaten.

• Some food items can be eaten raw whereas some need to be cooked before taking it.

Explanation:

Food Item	Eating method
Cabbage	• Can be eaten raw in salads. - Can be cooked as a vegetable.
Carrot	• Can be eaten raw in salads. - Can be cooked as a vegetable.
Broccoli	• Can be eaten raw in salads. - Can be cooked as a vegetable.
Spinach	• Can be eaten raw in salads. - Can be cooked as a vegetable.
Chilly	• Can be eaten raw as a condiment. - Can be cooked along with vegetables.
Rajma	• Can be only eaten after cooking. - Can be boiled and baked.

Potato	• Can be only eaten after cooking. - Can be boiled, roasted, baked, fried etc.
Brinjal	• Can be only eaten after cooking. - Can be boiled, roasted, baked, fried etc.

Thus, cabbage and carrots both can be eaten both raw and cooked.

Q20. Answer: (a) Separating funnel

The correct answer is Separating funnel.

Key Points

• The method used to separate two immiscible liquids, such as oil and water, is a Separating funnel. Hence, the statement regarding Separating funnel is correct.

• This technique relies on the principle of difference in densities of the two liquids involved. When two immiscible liquids are put in a funnel and allowed to stand for some time, they form two distinct layers.

• The denser liquid (like water) settles at the bottom of the funnel, while the lighter liquid (like kerosene or cooking oil) forms the top layer.

• The separating funnel is equipped with a stopcock or tap at the base. By carefully opening this tap, the bottom layer can be drained into a beaker or container until the interface between the two liquids reaches the tap.

• This physical separation process is highly effective for mixtures where the components have zero solubility in one another, maintaining their chemical properties throughout the separation.

Additional Information

• Distillation:

• This method is used to separate miscible liquids that possess different boiling points without decomposition.

• For example, a mixture of acetone (boiling point 56°C) and water (boiling point 100°C) is separated using this method. The liquid with the lower boiling point vaporizes first, is condensed in a condenser, and collected separately.

• Filtration:

• This is a process used to separate insoluble solids from a liquid or a gas using a filter medium (like filter paper).

• The solid particles (residue) are trapped by the filter, while the liquid (filtrate) passes through. A common example is separating sand from water or tea leaves from tea.

• Evaporation:

• This technique is employed to separate a non-volatile solute (like salt or sugar) from a volatile solvent (like water).

• The mixture is heated until the solvent turns into vapor, leaving the solid crystals behind in the evaporating dish. This is the primary method used in salt pans to obtain common salt from sea water.

• Centrifugation:

• Though not an option in the list, it is another important separation method where denser particles are forced to the bottom and lighter particles stay at the top when spun rapidly.

• It is used in diagnostic laboratories for blood and urine tests and in dairies to separate butter from cream.

Important Points

• Immiscible Liquids: These are liquids that do not mix to form a homogeneous solution. The numerical value for the density of water is 1.0 g/cm^3, while most oils range between 0.8 to 0.9 g/cm^3, causing them to float.

• Miscible Liquids: These liquids mix in all proportions and form a single phase. Examples include alcohol and water.

• Applications: The separating funnel is vital in the extraction of iron from its ore; the lighter slag is removed from the top to leave the molten iron at the bottom of the furnace.

• Safety: When using a separating funnel, it is important to vent the funnel by opening the stopper or tap frequently to release vapor pressure build-up.

Q21. Answer: (b) Accomodation

The correct answer is Accommodation.

Key Points

• Accommodation

• The ability of the eye lens to adjust its focal length is called accommodation.

• This process is achieved by the lens changing its shape.

• There are the minimum and maximum distances of the vision for the normal eye, which is known as near point and far point, respectively.

• For a normal eye, the near point is 25 cm and the far point is infinity.

YourMockTest.com – Free Study Material

• To focus distant objects, the ciliary muscles are completely relaxed which results in decreasing thickness of the lens and hence, increasing its focal length.

• With this accommodation, images of distant objects are formed at the retina.

Additional Information

• Presbyopia

• Presbyopia is the gradual loss of your eye's ability to focus on nearby objects.

• It is a natural, often annoying part of aging.

• Presbyopia usually becomes noticeable in your early to mid-40s and continues to worsen until around age 65.

• The ciliary muscles lose their ideal functioning power over time and do not work effectively.

• Even the crystalline lens loses its flexibility over time (it starts hardening), thereby affecting its focusing power.

• Presbyopia can be treated with the use of simple eyeglasses with convex lenses (positive power).

• Near- Sightedness(Myopia)

• It is a common vision condition in which a person can see objects near to him clearly but objects farther away are blurry.

• It occurs when the shape of the eye causes light rays to bend(refract) incorrectly, focusing images in the front of the retina instead of on the retina.

• Nearsightedness may develop gradually or rapidly often worsening during childhood and adolescence.

• Nearsightedness is easily corrected with prescription eyeglasses or contact lenses.

• Lenses used to correct nearsightedness are concave in shape. In other words, they are thinner at the center and thicker at the edge.

• Far- Sightedness(Hypermetropia)

• It is a common vision condition in which a person can see distant objects clearly, but objects nearby are blurry.

• It is the condition of the eyes where the image of a nearby object is formed behind the retina.

• Here, the light is focussed behind the retina instead of focusing on the retina.

• Correction of farsightedness uses a converging lens that compensates for the under convergence by the eye.

• The converging lens produces an image farther from the eye than the object so that the farsighted person can see it clearly.

Q22. Answer: (b) Electric iron

The Correct Answer is Option 2 i.e Electric iron.

Key Points

• Permanent magnet:

• It is a material in which the magnetic field is generated by the internal structure of the material itself.

• Permanent magnets are used in motors, generators, headphones, speakers, sensors, etc.

• The heating effect is used in heating applications like electric iron, light bulb, etc.

• Loudspeaker: Converts an electrical signal into sound waves.

• Microphone: Converts a sound wave into an electrical signal.

• Electric generator: It converts mechanical energy into electrical energy.

Q23. Answer: (a) Cubic metre

Explanation:

SI Unit of Volume

Definition: Volume is a measure of the three-dimensional space occupied by a substance (solid, liquid, or gas). It is a derived quantity in the International System of Units (SI) and is represented in terms of cubic dimensions. The SI unit of volume is cubic metre (m^3).

Understanding the Correct Unit: The cubic metre (m^3) is defined as the volume of a cube with edges of one metre in length. It is the standard unit of volume in the SI system because the SI system uses base units to define derived quantities. Since volume is derived from length (a base unit in the SI system), the correct SI unit of volume is expressed in terms of the cube of the SI unit of length, which is the metre (m). Therefore, volume is measured in m^3.

Importance of the SI Unit:

• The SI unit provides a universally accepted standard for measurement, ensuring consistency and accuracy in scientific and engineering calculations.

• Using the SI unit of volume (m^3) eliminates confusion that may arise due to the use of non-standard or regional units.

Applications of the SI Unit of Volume:

• In scientific research: Used for precise measurement of substances in laboratories and scientific experiments.

• In engineering: Used to calculate volumes of structures, reservoirs, and containers.

• In industry: Used in the measurement of materials and fluids for production and processing.

Correct Option Analysis:

The correct option is:

Option 1: Cubic metre

The cubic metre (m^3) is the SI unit of volume, as it is derived from the SI base unit of length (metre). This makes it the most appropriate and standard unit for measuring volume in the SI system. It ensures consistency and uniformity across scientific and engineering disciplines.

Additional Information

To further understand the analysis, let's evaluate the other options:

Option 2: Cubic centimetre

The cubic centimetre (cm^3) is a unit of volume derived from the centimetre, which is not an SI base unit but a submultiple of the metre. Although it is commonly used for smaller volumes, especially in laboratory settings or for measuring liquids in millilitres (mL) (where 1 cm^3 = 1 mL), it is not the SI unit of volume. The cubic metre (m^3) remains the standard SI unit.

Option 3: Litres

The litre (L) is a commonly used unit of volume, especially for liquids, but it is not an SI unit. It is, however, accepted for use with the SI. One litre is equivalent to 1 cubic decimetre (dm^3) or 0.001 cubic metres (m^3). While it is widely used in daily life and some industries, it does not qualify as the SI unit of volume.

Option 4: Millilitres

The millilitre (mL) is another widely used unit of volume, particularly for small quantities of liquids. It is equivalent to 1 cubic centimetre (cm^3) or 0.001 litres (L). However, like the litre, it is not an SI unit. It is a derived unit based on the litre and is more suitable for practical applications involving small volumes.

Conclusion:

While various units of volume are used for different applications and scales, the cubic metre (m^3) is the SI unit of volume. It is derived from the SI base unit of length (metre) and is universally accepted for scientific, engineering, and industrial purposes. Other units, such as litres, millilitres, and cubic centimetres, are commonly used but are not considered SI units. Understanding and using the correct SI unit ensures uniformity and precision in all measurements involving volume.

Q24. Answer: (c) 5

Based on whether plants have a well-differentiated body and the presence or absence of specialized tissues for transport, and the ability to bear seeds Kingdom Plantae (Plant Kingdom) is can be classified into 5 different groups.

• Thallophyta

• The plant body is not differentiated from roots, stems, and leaves.

• They are commonly called algae.

• Bryophyta

• These are small terrestrial plants.

• They show differentiation in the body design, with stem, leaf-like structures, and root-like structures.

• Pteridophyta

• The plant body is differentiated into roots, stems, and leaves, apart from having a specialized tissue for conduction.

• Gymnosperms

• Gymnosperms are plants with naked seeds.

• Angiosperms

• Angiosperms are seed-bearing plants. Seeds develop inside tissues that get modified to form the fruit of the plant.

Hence, we can conclude that plants are divided into 5 groups.

Q25. Answer: (c) Ecosystem

The correct answer is Ecosystem.

Key Points

• Ecosystem refers to a region with all its biotic (living) components such as plants and animals and abiotic (non-living) components like soil, water, air, etc interacting as a system.

• Ecosystems can range in size, from small ponds to vast forests.

• The interactions within an ecosystem can be complex and varied, involving predator-prey relationships, competition for resources, and mutualistic partnerships.

• Ecosystems play a crucial role in maintaining the Earth's biodiversity and providing essential ecosystem services, such as clean air and water, food production, and climate regulation.

Additional Information

• Ecology: Ecology is the scientific study of ecosystems and their interactions. While it encompasses the concept of ecosystems, it's a broader field that includes the study of populations, communities, and the environment as a whole.

• Hotspot: A biodiversity hotspot is a region with exceptional concentrations of species and a high degree of threat. While hotspots are often found within ecosystems, they represent specific areas with unique biodiversity characteristics.

Q26. Answer: (b) Calcium

The correct answer is Calcium.

Key Points

• Calcium has the highest atomic weight among all others.

• Calcium with atomic number 20 is represented in the periodic table with the symbol Ca.

• It has an atomic weight of 40 g mol-1.

• Calcium (Ca) is a vital element that aids our bones stay tough and is capable of supporting our load.

• Calcium is also used by our nervous system to help transmit impulses through our bodies.

• The element is the fifth most abundant metal in the planet's crust (4.1%).

• It has a solid state at normal temperature.

Additional Information

• Magnesium

• It has a symbol of Mg

• Atomic Number of Magnesium 12

• The Atomic Mass of magnesium is 24.305.

• Chlorine

• It has a symbol of Cl.

• Atomic Number of Chlorine 17.

• Atomic Mass of Chlorine 35.45.

• Sulphur

• It has the Symbol of S.

• It has atomic Number 16.

• It has an atomic Mass of 32.06.

Q27. Answer: (d) Joule

The correct answer is Joule.

Key Points

• Work is said to be done by a force when it moves its point of application through a distance.

• Work done = Force × Distance moved

• SI unit of work is joule.

• 1 J = 1 N.m

Additional Information

• Watt (W) is the S.I. unit of power.

• Ampere (A) is the S.I. unit of current.

• Decibel is a unit of intensity of sound.

Q28. Answer: (b) The stamen and pistil

The correct answer is The stamen and pistil.

Key Points

• The stamen and pistil are the essential organs in a flower for reproduction.

• The male reproductive organ of the flower is the stamen, while the pistil is the female reproductive organ.

• Sepals are found below the petals of a flower.

• Petals are the colored part of the flowers.

Additional Information

Q29. Answer: (d) Volt

The correct answer is Volt.

• Volt is the S.I. unit of electric potential difference.

YourMockTest.com — Free Study Material

• The coulomb is an SI unit of electric charge.
• A joule is a derived unit of energy.
• Ampere is the SI unit of current.

Important Points
• A voltmeter is always connected in parallel.
• An Ammeter is connected in series.
• A galvanometer is used for detecting and indicating electric current.
• 1 coulomb is equal to 6.24 × 10^(18) electrons.

Q30. Answer: (d) heat

The correct answer is option 4 i.e heat.

Key Points

• The work done by friction is not lost but is transferred as heat energy.

• The Law of Conservation of Energy states that energy cannot be created or destroyed. It can only be transferred from one type to another.

• Energy is not lost when frictional forces occur. For example, when a bike applies its brakes and slows down, the kinetic energy of the bike is transformed into heat energy in the brakes.

Q31. Answer: (a) 4.4 km/h

Shortcut Trick

When an equal distance is covered at two different speeds x and y, the average speed is given by the Harmonic Mean formula.

Average Speed = (2 × x × y) / (x + y)

Here, x = 5 km/h and y = 4 km/h.

Average Speed = (2 × 5 × 4) / (5 + 4) = 40 / 9 ≈ 4.44 km/h.

Therefore The correct answer is 4.4 km/h.

Alternate Method

Given:

Speed from A to B (v1) = 5 km/h

Speed from B to A (v2) = 4 km/h

Formula Used:

Average Speed = Total Distance ÷ Total Time

=> Let the distance between A and B be 'd' km.

=> Time taken to go from A to B (t1) = Distance ÷ Speed = d / 5 hours.

=> Time taken to return from B to A (t2) = Distance ÷ Speed = d / 4 hours.

=> Total Distance for the whole journey = d + d = 2d km.

=> Total Time taken = t1 + t2 = d/5 + d/4 = (4d + 5d) / 20 = 9d / 20 hours.

=> Average Speed = Total Distance ÷ Total Time = 2d ÷ (9d/20)

=> Average Speed = (2d × 20) / 9d = 40 / 9 km/h

=> Average Speed ≈ 4.44 km/h

Therefore The correct answer is 4.4 km/h.

Additional Information

Average Speed (Equal Time Intervals)

If a person travels at speed v1 for time t and speed v2 for the same time t, the average speed is the Arithmetic Mean: (v1 + v2) / 2.

General Average Speed Formula

For any journey with different distances d1, d2 and speeds v1, v2, Average Speed = (d1 + d2) / (d1/v1 + d2/v2).

Relative Speed

When two objects move in opposite directions, relative speed = v1 + v2. In the same direction, relative speed = |v1 − v2|.

Q32. Answer: (a) 20

Given:

First ratio = 35 : 25

Second ratio = 28 : x

YourMockTest.com — Free Study Material

Formula Used:

a : b :: c : d => a ÷ b = c ÷ d

Cross multiplication => a × d = b × c

Calculation:

=> 35 ÷ 25 = 28 ÷ x

=> 35 × x = 25 × 28

=> 35 × x = 700

=> x = 700 ÷ 35

=> x = 20

Therefore The correct answer is 20.

Q33. Answer: (d) 215

Given:

a - b = 5

ab = 6

We need to find: $a^3 - b^3$

Formula used:

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Calculations:

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

$a^2 + b^2 = 5^2 + 2(6)$

=> $a^2 + b^2 = 25 + 12 = 37$

Now, substitute values in the formula:

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

=> $a^3 - b^3 = 5(37 + 6)$

=> $a^3 - b^3 = 5(43)$

=> $a^3 - b^3 = 215$

Therefore The correct answer is option 4 (215).

Q34. Answer: (a) 168

Given:

Dimensions of the box: 12 m, 18 m, 21 m

Formula Used:

To find the least number of cubes, the side of the cube must be the Highest Common Factor (HCF) of the box dimensions.

Number of cubes = (Volume of the box) / (Volume of one cube)

Calculation:

=> Box dimensions: 12, 18, 21

=> HCF of 12, 18, and 21 = 3

=> Side of the cube = 3 m

=> Volume of the box = 12 × 18 × 21 = 4536 m^3

=> Volume of one cube = 3 × 3 × 3 = 27 m^3

=> Number of cubes = 4536 / 27 = 168

Therefore The correct answer is 168.

Q35. Answer: (d) 60 min

Given:

The interval of three lights = 3, 4, and 5 respectively

Concept:

LCM = LCM is the smallest number that is the multiple of every one of the numbers

Calculation:

Let us assume they together blink again in X minutes

=> X = LCM of (3, 4, 5)

=> X = 3 × 4 × 5 = 60 minutes

YourMockTest.com — Free Study Material

=> All three light bulbs will blink again = 60 minutes

Therefore The required result will be 60 minutes.

Q36. Answer: (a) 70°

Concept:

• Sum of the internal angles of the Quadrilateral is 360°

• Supplement of the angle is 180° - θ° (where θ is the given angle).

• Compliment of the angle is 90° - θ° (where θ is the given angle).

Calculation:

The given ratio's of angles of a quadrilateral are -

2 : 3 : 5 : 8

Let the angles be 2x, 3x, 5x, 8x.

We know that, Sum of the angles of quadrilaterals = 360°

=> 2x + 3x + 5x + 8x = 360°

=> 18x = 360

=> x = 360° / 18 = 20°

Now, each angles be,

2x = 2 × 20 = 40°

3x = 3 × 20 = 60°

5x = 5 × 20 = 100°

8x = 8 × 20 = 160°

The Suppliment of the largest angle = 180° - 160° = 20°

The Comliment of the smallest angle = 90° - 40° = 50°

Sum of these = 20° + 50° = 70° Therefore Option 1 is correct

Q37. Answer: (a) Rs. 256

Shortcut Trick

Total interest percentage = Rate × Time

Total interest % = 2% × 8 = 16%

Simple Interest = 16% of Principal

SI = 16% of 1600 = 16 × 16 = 256

Therefore The correct answer is Rs. 256.

Alternate Method

Given:

Principal (P) = Rs. 1600

Time (T) = 8 years

Rate (R) = 2% per annum

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Calculations:

=> SI = (1600 × 2 × 8) ÷ 100

=> SI = (1600 × 16) ÷ 100

=> SI = 16 × 16

=> SI = 256

Therefore The correct answer is Rs. 256.

Additional Information

Total Amount Formula

The total Amount (A) received after the time period is the sum of Principal and Simple Interest: A = P + SI.

Compound Interest (CI)

For Compound Interest, interest is calculated on the initial principal and also on the accumulated interest of previous periods: $A = P(1 + R/100)^n$.

SI vs CI for 1 Year

If the interest is compounded annually, the Simple Interest and Compound Interest for the first year are always equal.

Rate of Interest Calculation

The Rate (R) can be found if other variables are known using the formula: R = (SI × 100) ÷ (P × T).

Q38. Answer: (d) 958

Given

841 + 6 × 15 + 45% of 60:

Concept used:

Solution:

=> 841 + (6 × 15) + (45/100 × 60) = 841 + 90 + 27 = 958

Therefore, the value of 841 + 6 × 15 + 45% of 60 is 958.

Q39. Answer: (a) Rs. 50,000

Shortcut Trick

10% increase => 110% of original salary = Rs. 55,000

1% of original salary = 55,000 ÷ 110 = 500

100% (Original Salary) = 500 × 100 = Rs. 50,000

Therefore The correct answer is Rs. 50,000.

Alternate Method

Given:

Increased Salary = Rs. 55,000

Percentage Increase = 10%

Formula Used:

Original Salary = Increased Salary ÷ (1 + Increase%/100)

Calculation:

=> Let the original salary be x.

=> x + (10/100) × x = 55,000

=> x × (1 + 0.1) = 55,000

=> 1.1x = 55,000

=> x = 55,000 ÷ 1.1

=> x = 550,000 ÷ 11

=> x = 50,000

Therefore The correct answer is Rs. 50,000.

Additional Information

Percentage Increase and Decrease

To increase a value by r%, multiply it by (100 + r)/100. To decrease a value by r%, multiply it by (100 − r)/100.

Fractional Equivalents

Using fractions can speed up calculations: 10% = 1/10. An increase of 1/10 means the new value is 11/10 of the original.

Base Change Rule

If A is r% more than B, then B is [r ÷ (100 + r)] × 100% less than A.

Q40. Answer: (d) 9

Given:

Expression to simplify: 18 ÷ (4 + 2) × 3

Formula Used:

Order of Operations (PEMDAS/BODMAS): Parentheses, Exponents (or Orders), Multiplication and Division (from left to right), Addition and Subtraction (from left to right)

Calculation:

First, simplify inside the parentheses:

4 + 2 = 6

Now, the expression becomes:

18 ÷ 6 × 3

Next, perform division and multiplication from left to right:

18 ÷ 6 = 3

Then:

3 × 3 = 9

The simplified value of the expression is 9.

Q41. Answer: (b) $(729)^2$

Given:

(3)^8 × (3)^4 = ?

Formula used:

a^m × a^n = a^(m+n)

Calculation:

(3)^8 × (3)^4 = (3)^(8+4)

=> $(3)^{12}$

=> $(3^3)^4$ [Since $3^{12} = (3^3)^4$]

=> (27)^4

Now match with options:

Option 1: $(27)^3$ = Incorrect

Option 2: $(729)^2$ = Correct [Since $729 = 27^2$, and $(27)^4 = (27^2)^2 = (729)^2$]

Option 3: (27)^5 = Incorrect

Option 4: $(729)^3$ = Incorrect

Therefore The correct answer is option 2.

Q42. Answer: (c) 56

Shortcut Trick

Assume an arbitrary mean (Base) = 50.

Find deviations from 50: +15, −9, +46, −6, −12, −20, +29, +40, −29.

Sum of deviations = 15 − 9 + 46 − 6 − 12 − 20 + 29 + 40 − 29 = 54.

Average deviation = 54 ÷ 9 = +6.

Actual Arithmetic Mean = Base + Average Deviation = 50 + 6 = 56.

Therefore The correct answer is 56.

Alternate Method

Given: Observations are 65, 41, 96, 44, 38, 30, 79, 90, and 21.

Formula Used: Arithmetic Mean = (Sum of all observations) ÷ (Total number of observations)

Calculations:

=> Total number of observations (n) = 9

=> Sum of observations = 65 + 41 + 96 + 44 + 38 + 30 + 79 + 90 + 21

=> Sum of observations = 504

=> Arithmetic Mean = 504 ÷ 9

=> Arithmetic Mean = 56

Therefore The correct answer is 56.

Additional Information

Properties of Arithmetic Mean

The sum of deviations of a set of observations from their arithmetic mean is always zero. i.e., Σ(x_i − Mean) = 0.

Combined Mean

If two groups have n1 and n2 observations with means x1 and x2, the combined mean is (n1x1 + n2x2) ÷ (n1 + n2).

Effect of Change in Scale/Origin

If each observation is increased, decreased, multiplied, or divided by a constant 'k', the mean also changes by the same constant 'k'.

Q43. Answer: (b) Rs. 5000

Given:

A investment = 20000

B investment = 30000

YourMockTest.com — Free Study Material

Difference in profit = 1000
Formula Used:
Profit prop. to Investment
Calculation:
=> Ratio A : B = 20000 : 30000 = 2 : 3
=> Difference in ratio = 3 - 2 = 1 part
=> 1 part = 1000
=> Total parts = 2 + 3 = 5
=> Total profit = 5 × 1000
=> Total profit = 5000
Therefore The correct answer is 5000.

Q44. Answer: (b) 52 cm

Given:
Area of a rectangle = 105 cm^2
Length = 21 cm
Formula used:
Area of a rectangle = Length × Breadth
Perimeter of a rectangle = 2 × (Length + Breadth)
Calculations:
From the formula for area:
=> 105 = 21 × Breadth
=> Breadth = 105 ÷ 21
=> Breadth = 5 cm
Now, calculate the perimeter:
=> Perimeter = 2 × (Length + Breadth)
=> Perimeter = 2 × (21 + 5)
=> Perimeter = 2 × 26
=> Perimeter = 52 cm
Therefore The correct answer is option 2.

Q45. Answer: (d) 250 cm

Formula Used:
Perimeter: It is the total length of the boundary of any shape.
The perimeter of the square = 4 × side (All sides are equal in a square)
Calculation:
Using the above formula
Perimeter = 4 × side = 1000
Side = 1000/4 = 250 cm
Therefore The correct answer is 250 cm.

Q46. Answer: (b) DHM

Logic follows:
For Vowel → Vowel - 1
For Consonant → Consonant + 1
Similarly,
Hence, DHM is the correct answer.
One might misinterpret that positions are decreased and increased alternatively but if so then
EIL : DJK
Which is not the option.

YourMockTest.com — Free Study Material

Q47. Answer: (c) 27

Total number of students = Position of a student from right + Position of a student from left - 1

60 = 34 + Position of Atharv from left – 1

Position of Atharv from left = 60 – 34 + 1 = 27

Hence, “27” is the correct answer.

Q48. Answer: (d) Rekha

Six friends: Garima, Reena, Arpita, Anita, Pooja, and Rekha.

Sitting positions is as follows:

Hence, Rekha is sitting at the extreme right end.

Q49. Answer: (d) car

moped bike, motorcycle, and scooter are two-wheeler vehicles.

Whereas,

The car is a four-wheeler.

Hence, "car" is the odd one.

Q50. Answer: (d) 46

Logic: Second number = (First number × 5) + 1

13 : 66

(13 × 5) + 1 = 65 + 1 = 66

Similarly,

9 : ?

(9 × 5) + 1 = 45 + 1 = 46

Hence, the correct answer is “Option 4”.

More previous year papers and mock tests: **www.yourmocktest.com/pyq**

YourMockTest.com — Free Study Material