MP Police Constable Memory Based 30-Oct-2025

Q1. Recently (May, 2025), The Indian Institute of Foreign Trade (IIFT), an autonomous body under the Ministry of Commerce and Industry has announced the establishment of its first overseas campus in which country?
(a) Singapore
(b) South Africa
(c) Australia
(d) United Arab Emirates
Ans.(d)
Sol. The Indian Institute of Foreign Trade (IIFT), an autonomous body under the Ministry of Commerce and Industry, Government of India, has announced the establishment of its first overseas campus in Dubai, United Arab Emirates

Q2. Guru Shikhar Peak is the highest peak of which of the following mountain ranges?
(a) Eastern Ghats
(b) Aravali Range
(c) Western Ghats
(d) Himalaya Mountain
Ans.(b)
Sol. The correct answer is: (b) Aravali Range
Explanation:
- Guru Shikhar Peak (1,722 m) is the highest peak of the Aravali Range, located near Mount Abu in Rajasthan.
- It also houses the Guru Dattatreya temple and the Mount Abu Observatory.

Information Booster:
- Aravali Range is one of the oldest fold mountains in the world.
- Runs across Rajasthan, Haryana, Gujarat, and Delhi.
- Mount Abu is a famous hill station in Rajasthan situated in Aravalis.
- The Aravalis act as a climatic barrier against desert winds.
- Rich in minerals like marble, granite, and zinc.

Additional Knowledge:
- Eastern Ghats: Highest peak is Jindhagada Peak (1,690 m) in Andhra Pradesh.
- Western Ghats: Highest peak is Anamudi (2,695 m) in Kerala.
- Himalaya Mountain: Highest peak is Mount Everest (8,849 m), while Kanchenjunga (8,586 m) is the highest in India.

Q3. Who coined the term "soul of the constitution" to Right to constitutional remedy (Article 32)?
(a) K. M. Munshi
(b) Dr. Rajendra Prasad
(c) Jawahar Lal Nehru
(d) Dr. B. R. Ambedkar
Ans.(d)
Sol. The correct answer is: (d) Dr. B. R. Ambedkar
Explanation:
Dr. B. R. Ambedkar described Article 32 (Right to Constitutional Remedies) as the "Soul of the Constitution."

This Article empowers citizens to move the Supreme Court directly for the enforcement of Fundamental Rights.
It ensures the protection and preservation of citizens' fundamental rights against violation by the State.
Information Booster:
Article 32 provides the right to approach the Supreme Court through writs — Habeas Corpus, Mandamus, Prohibition, Certiorari, and Quo Warranto.
It is often called the "Heart and Soul" of the Constitution by Dr. Ambedkar.
The same power is available in High Courts under Article 226.
The Supreme Court can issue writs under Article 32(2).
It guarantees judicial remedies for citizens' rights violations.
Additional Knowledge:
K. M. Munshi – Member of the Constituent Assembly, contributed to Fundamental Rights and Directive Principles.
Dr. Rajendra Prasad – First President of India and President of the Constituent Assembly.
Jawaharlal Nehru – India's first Prime Minister, known for drafting the Objectives Resolution.

Q4. At the Second Battle of Panipat, Bairam Khan defeated_____.
(a) Khan Zaman
(b) Rana Pratap
(c) Hemu
(d) Maharana Pratap
Ans.(c)
Sol. The correct answer is: C. Hemu
Explanation:
- The Second Battle of Panipat took place on 5 November 1556.
- Mughal forces led by Bairam Khan (regent of Akbar) defeated Hemu, who had captured Delhi and declared himself ruler.
- The battle secured Mughal rule in North India and ensured Akbar's supremacy.

Information Booster:
- First Battle of Panipat (1526): Babur defeated Ibrahim Lodi.
- Second Battle of Panipat (1556): Akbar (under Bairam Khan) defeated Hemu.
- Third Battle of Panipat (1761): Ahmad Shah Abdali defeated the Marathas.
- Hemu was struck in the eye by an arrow, captured, and executed.
- The victory paved the way for Akbar's policy of expansion and consolidation.

Additional Knowledge (Other Options):
- Khan Zaman: A powerful Mughal noble during Akbar's reign, later executed in 1567 for rebellion against the emperor.
- Rana Pratap (Maharana Pratap): Ruler of Mewar, fought against Akbar in the Battle of Haldighati (1576), remembered for his bravery and resistance.
- Maharana Pratap: Same as Rana Pratap, symbolizes Rajput valour; never accepted Akbar's supremacy and continued guerrilla warfare.

Q5. With which of the following soils are the terms 'khadar' and 'bhangar' associated?
(a) Laterite
(b) Alluvial
(c) Black
(d) Arid
Ans.(b)
Sol. The correct answer is (B) Alluvial

Explanation:

- The terms 'Khadar' and 'Bhangar' are associated with Alluvial soils, which are deposited by rivers and found mainly in the Indo-Gangetic plains of India.
- Alluvial soil is one of the most fertile soils in India and supports major crops like wheat, rice, sugarcane, and pulses.

Key Differences Between Khadar and Bhangar:

Feature	Khadar	Bhangar
Meaning	New alluvium	Old alluvium
Location	Found near the riverbed (younger flood plains)	Found above the floodplain (older terraces)
Fertility	More fertile due to fresh silt deposits	Less fertile as nutrients are leached
Texture	Fine, light-colored soil	Coarse, with kankar (calcareous nodules)
Flood Impact	Replenished every year by floods	Not affected by annual floods

Information Booster:

- Alluvial soils cover about 43% of India's land area.
- Major regions: Uttar Pradesh, Bihar, West Bengal, Punjab, Haryana, and Assam.
- Rich in potash, lime, and phosphoric acid, making them ideal for agriculture.

Additional Knowledge (Other Options):

- (A) Laterite soil – Found in high rainfall areas; rich in iron and aluminum.
- (C) Black soil – Found in Deccan region; ideal for cotton cultivation.
- (D) Arid soil – Found in Rajasthan; sandy and saline with low moisture.

Q6. In which of the following places of Madhya Pradesh is the Ek Mukhi Datta temple?
(a) Omkareshwar
(b) Pithampur
(c) Panchmarhi
(d) Maheshwar
Ans.(d)
Sol. The correct answer is (d) Maheshwar.
Explanation:
The Ek Mukhi Datta temple, also known as Shiv Datta Dham, is located in Maheshwar, a town in the Khargone district of Madhya Pradesh.
This temple is situated near the famous Sahastradhara on the banks of the Narmada River.
It is a major pilgrimage site for devotees of Lord Dattatreya, who is considered an incarnation of Brahma, Vishnu, and Shiva.
Information Booster:
The temple complex is a significant pilgrimage center, attracting devotees from various parts of India, particularly from Madhya Pradesh and Maharashtra.
It is one of the four prominent Dattatreya dhams in India, according to some traditions, and is considered the first and only one in Madhya Pradesh.
The temple features a unique six-armed, one-faced statue of Lord Dattatreya.
Additional Knowledge:
(a) Omkareshwar (Option a)
Omkareshwar is a holy island and town in Madhya Pradesh, but it is primarily famous for the Omkareshwar Jyotirlinga temple, which is a different temple dedicated to Lord Shiva.

(b) Pithampur (Option b)
Pithampur is a major industrial town in Madhya Pradesh, and is not the location of the Ek Mukhi Datta temple.
(c) Panchmarhi (Option c)
Panchmarhi is a popular hill station in Madhya Pradesh known for its scenic beauty, caves, and waterfalls, not for the Ek Mukhi Datta temple.

Q7. Who was the chairman of the 'Advisory Committee on Fundamental Rights, Minorities and Tribal and excluded Areas' in the Constituent Assembly?
(a) Sardar Vallabh Bhai Patel
(b) Pt. Jawahar Lal Nehru
(c) Pattabhi Sitaramaiah
(d) Dr. B. R. Ambedkar
Ans.(a)
Sol. The correct answer is: (a) Sardar Vallabhbhai Patel
Explanation:
Sardar Vallabhbhai Patel was the Chairman of the Advisory Committee on Fundamental Rights, Minorities, and Tribal and Excluded Areas in the Constituent Assembly.
The committee was formed to recommend provisions related to fundamental rights and minority protection in the Constitution.
It submitted its reports between 1947–1948, which became the foundation for Part III of the Constitution.
Information Booster:
The Advisory Committee was divided into two subcommittees: – Fundamental Rights Subcommittee (Chairman: J. B. Kripalani) – Minorities Subcommittee (Chairman: H. C. Mookherjee)
Sardar Patel played a major role in ensuring national integration through constitutional provisions.
The Committee's work laid the groundwork for Articles 12–35 (Fundamental Rights).
The recommendations balanced individual liberty with state security.
The Constituent Assembly adopted these rights in December 1948.
Additional Knowledge:
Pt. Jawaharlal Nehru – Headed the Union Powers Committee and drafted the Objectives Resolution.
Pattabhi Sitaramaiah – Prominent Congress leader, member of the Constituent Assembly.
Dr. B. R. Ambedkar – Chairman of the Drafting Committee, which framed the final draft of the Constitution.

Q8. Ustad Allauddin Khan Saheb was from ___ city of Madhya Pradesh.
(a) Indore
(b) Bhopal
(c) Maihar
(d) Gwalior
Ans.(c)
Sol. The correct answer is (c) Maihar
Explanation:
Ustad Allauddin Khan Saheb was a legendary Indian classical musician and sarod player.
He was based in Maihar, a town in Madhya Pradesh, where he founded the famous Maihar Gharana of Hindustani classical music.
He served as the court musician (guru) of the Maihar royal family.

He trained several world-renowned musicians, including Pandit Ravi Shankar, Ali Akbar Khan, and Nikhil Banerjee.
Information Booster:
The Maihar Gharana is known for its emphasis on both instrumental and vocal music traditions.
Ustad Allauddin Khan was awarded the Padma Bhushan (1958) and the Padma Vibhushan (1971) for his contribution to Indian music.

Q9. In which year was the Khajuraho Dance Festival first held?
(a) 1965
(b) 1970
(c) 1975
(d) 1980
Ans.(c)
Sol. Ans. (c)
Explanation
The Khajuraho Dance Festival was first held in 1975. This inaugural event marked the beginning of an annual tradition celebrating India's classical dance forms. Set against the backdrop of the historic Khajuraho temples in Madhya Pradesh, the festival has since become a significant cultural event, attracting artists and audiences from around the world. The festival not only showcases traditional dance performances but also aims to preserve and promote India's rich cultural heritage.
Information Booster
First Edition: The festival commenced in 1975.
Location: Held at the Khajuraho temples, a UNESCO World Heritage Site.
Duration: Typically spans seven days, from February 20 to 26 annually.
Organizers: Managed by the Department of Culture, Madhya Pradesh.
Purpose: Aims to celebrate and preserve various Indian classical dance forms.
Additional Knowledge
1965: During this period, India was experiencing significant cultural and political changes. While various regional festivals existed, the Khajuraho Dance Festival had not yet been conceptualized. The 1960s did see a resurgence in the promotion of Indian arts and culture, leading to the establishment of several cultural institutions.
1970: The early 1970s continued to build on the cultural momentum of the previous decade.

Q10. The Community Development Programme was started in India on
(a) Oct 2, 1950
(b) Oct 2, 1951
(c) Oct 2, 1952
(d) Oct 2, 1954
Ans.(c)
Sol. Correct Answer:(C) Oct 2, 1952
Explanation:
The Community Development Programme (CDP) was launched in India on October 2, 1952.
This initiative aimed at improving the living standards of rural people by focusing on rural development, infrastructure, and socio-economic activities.
The program sought to integrate the efforts of government and local communities to address issues like poverty, education, and healthcare.

Information Booster:
The Community Development Programme was one of the first major initiatives in post-independence India aimed at rural development and aimed to empower rural communities through participation in development activities.
The programme was aimed at building infrastructure like roads, schools, water supply, and health centers in rural areas.
Additional Knowledge:
The CDP laid the foundation for future rural development programs in India, such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the National Rural Employment Programme (NREP).
It focused on self-reliance and promoted the idea that local communities should take the lead in their own development.

Q11. Statutory grants to states by the Union government, under Article 275 of the Constitution, are primarily recommended by which body?
(a) National Development Council
(b) Finance Commission
(c) Ministry of Finance
(d) NITI Aayog
Ans.(b)
Sol. The correct answer is (b) Finance Commission.
Under Article 275, statutory grants are provided to certain states based on the recommendations of the Finance Commission to meet special needs or assist development schemes.
Information Booster:
Finance Commission is constituted every five years under Article 280.
It recommends distribution of tax revenues between Centre and States.
Grants are given to help states manage revenue deficits and fund special areas.
The 16th Finance Commission (2025–30) is chaired by Arvind Panagariya.
These grants ensure fiscal balance and equitable development among states.
Additional Knowledge:
Article 282 allows both Centre and States to give discretionary grants.
Finance Commission recommendations are advisory but influential.
Earlier commissions introduced performance-based grants (e.g., sanitation, environment).
Statutory grants differ from centrally sponsored schemes.

Q12. When was the International Monetary Fund (IMF) formally constituted?
(a) July 1, 1944
(b) December 27, 1945
(c) March 1, 1947
(d) July 4, 1945
Ans.(b)
Sol.
Correct Answer: (b) December 27, 1945
Explanation:
The International Monetary Fund (IMF) was formally constituted on December 27, 1945, after 29 countries signed the Articles of Agreement, establishing the IMF as a global financial institution to promote international monetary cooperation and financial stability.

Information Booster:
The IMF was established during the Bretton Woods Conference in July 1944 in New Hampshire, USA, and began its financial activities on March 1, 1947.
The IMF's primary objectives include ensuring global financial stability, promoting economic growth, and providing financial assistance to member countries facing balance of payments issues.

Q13. Which historic temple, redeveloped under the PRASAD scheme, was inaugurated by PM Modi in Tripura in 2025?
(a) Kamakhya Temple
(b) Tripura Sundari Temple
(c) Unakoti Temple
(d) Mahamaya Temple
Ans.(b)
Sol. The Correct Answer: (B) Tripura Sundari Temple
Explanation:
- On September 22, 2025, Prime Minister Narendra Modi inaugurated the redeveloped 524-year-old Tripura Sundari Temple in Udaipur, Gomati district, Tripura.
- The temple, a prominent Shaktipeetha, was revamped under the PRASAD scheme (Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive) to promote religious tourism and cultural heritage.
- The redevelopment project, costing around ₹52 crore, included contributions from both the central government and the Tripura state government.

Information Booster:
- Built by: Maharaj Dhanya Manikya Bahadur in 1501.
- Mythological significance: Built after a 'swapnadesh' (divine dream command) from Goddess Aadishakti.
- Main deities: Tripura Sundari and Chhoti Ma.
- Annual visitors: Over 2 lakh devotees, especially during Diwali Mela.
- New additions: Shaktipeetha Park featuring replicas of all 51 Shaktipeethas, food court, museum, stalls, monk residences, etc.
- The temple is located 60 km from Agartala, the capital of Tripura.

Additional Knowledge:
- PRASAD Scheme: Launched by the Ministry of Tourism in 2014, it aims to develop infrastructure at pilgrimage sites to promote religious tourism.
- Other PRASAD sites: Include Kashi Vishwanath (UP), Amritsar (Punjab), Kamakhya (Assam), and Dwarka (Gujarat).
- Tripura Sundari Temple is constructed on a hillock shaped like a tortoise's back, symbolically sacred in Hinduism.
- The temple boosts the spiritual tourism economy of the North-East region, benefiting local artisans and vendors.
- Shaktipeethas are 51 sacred sites dedicated to Goddess Shakti, associated with different body parts of Sati according to Hindu mythology.

Q14. Digboi Oil Refinery, commissioned on 11th December 1901, is India's oldest operating refinery and one of the oldest operating refineries in the world. It is located in _____.
(a) Assam
(b) Gujarat

(c) Odisha
(d) Uttar Pradesh
Ans.(a)
Sol. The correct answer is (A) Assam
Explanation:
- The Digboi Oil Refinery is located in Tinsukia district, Assam, and was commissioned on 11th December 1901.
- It is the oldest operating oil refinery in India and among the oldest in the world.
- Digboi is often referred to as "the Oil City of Assam", with oil exploration beginning as early as the 1880s under British rule.

Information Booster:
- The name "Digboi" reportedly comes from the phrase "Dig, boy, dig!" shouted by British engineers to workers drilling for oil.
- It marked the birth of India's petroleum industry.
- The refinery is currently operated by Indian Oil Corporation (IOC).
- Besides refining, the region has historical importance for India's early industrial growth.

Additional Knowledge:
- (B) Gujarat – Home to modern refineries like Jamnagar Refinery, the world's largest.
- (C) Odisha – Has newer facilities, such as Paradip Refinery.
- (D) Uttar Pradesh – Hosts refineries like Mathura, but not as old as Digboi.

Q15. Who was the first Speaker of the Madhya Pradesh Legislative Assembly?
(a) Tejlal Tembhare
(b) Pt. Kunjilal Dubey
(c) Gulsher Ahmad
(d) Srinivas Tiwari
Ans.(b)
Sol. The correct answer is (b) Pt. Kunjilal Dubey.
Explanation:
- Following the States Reorganisation Act of 1956, the modern state of Madhya Pradesh was formed on November 1, 1956.
- Pt. Kunjilal Dubey served as the first Speaker of the newly constituted Madhya Pradesh Legislative Assembly.
- He held this position from November 1, 1956, to March 7, 1967.
- Dubey was a prominent figure in the state and also served as the Finance Minister and the first Vice-Chancellor of Rani Durgavati University.

Information Booster:
- The role of the Speaker is to preside over the sessions of the Legislative Assembly, interpret its rules, and maintain order during proceedings.
- The first Legislative Assembly of Madhya Pradesh was dissolved on March 5, 1957, but the first Speaker of the reorganized state is still recognized as Pt. Kunjilal Dubey.

Additional Knowledge:
(a) Tejlal Tembhare: Tejlal Tembhare was an MLA from Balaghat, but not the first Speaker.
(c) Gulsher Ahmad: Gulsher Ahmad was a later Speaker of the Madhya Pradesh Legislative Assembly (1972–1977) and also served as the Governor of Himachal Pradesh.
(d) Srinivas Tiwari: Srinivas Tiwari was a later Speaker of the Madhya Pradesh Legislative Assembly (1993–2003). He is often referred to as the "White Tiger" of Madhya Pradesh.

Q16. Who called the “Cripps offer” a post-dated cheque in the name of a crashing Bank?
(a) Mahatma Gandhi
(b) Lala Lajpat Rai
(c) Vinoba Bhave
(d) Annie Besant
Ans.(a)
Sol. The correct answer is (a) Mahatma Gandhi.
Explanation:
Mahatma Gandhi famously described the Cripps Offer (or Cripps Proposal) of 1942 as a "post-dated cheque on a crashing bank".
The Cripps Mission was sent by the British government to secure Indian cooperation in World War II in exchange for future constitutional reforms.
Gandhi's statement reflected his skepticism about the sincerity of the British offer and his belief that the British Empire was on the verge of collapse.
He rejected the offer because it did not promise immediate independence and proposed Dominion Status only after the war.
Information Booster:
The Cripps Mission was led by Sir Stafford Cripps, a member of the War Cabinet, and arrived in India in March 1942.
The offer included provisions for the creation of an Indian Union with Dominion Status, the right to secede from the Commonwealth, and a Constituent Assembly to frame the constitution.
The Indian National Congress also rejected the proposals, primarily because they did not offer immediate transfer of power and raised concerns about the principle of princely states and provinces having the option to not join the Union.
The failure of the Cripps Mission was a significant factor leading to the launch of the Quit India Movement in August 1942.
Additional Knowledge:
(b) Lala Lajpat Rai (Option b)
Lala Lajpat Rai was a prominent nationalist leader, part of the "Lal-Bal-Pal" trio.
He was active during the early 20th century but passed away in 1928, well before the Cripps Mission.
(c) Vinoba Bhave (Option c)
Vinoba Bhave was a spiritual leader and a close disciple of Mahatma Gandhi.
He is best known for his Bhoodan Movement (land gift movement) in post-independence India. He was not directly involved in the negotiations surrounding the Cripps Offer.
(d) Annie Besant (Option d)
Annie Besant was a British socialist, theosophist, women's rights activist, and a major figure in the Indian Home Rule Movement.
She was active in the early 20th century but passed away in 1933, before the Cripps Mission.

Q17. Which of the following is the fastest supercomputer of India as on 1 November 2024, which ranked 75th among Global Top 500 supercomputers in 2023?
(a) Mihir (Cray XC40)
(b) PARAM Siddhi-AI
(c) Pratyush (Cray XC40)
(d) Airawat PSAI
Ans.(d)

Sol. The correct answer is: (d)Airawat PSAI.
Airawat PSAI is the fastest supercomputer of India as of 1 November 2024.
It ranked 75th among the Global Top 500 supercomputers in 2023, showcasing India's advancements in high-performance computing (HPC).
Information Booster:
Supercomputers like Airawat PSAI are used for complex simulations, research, and applications in fields such as climate modeling, aerospace, biotechnology, and artificial intelligence.
Additional Knowledge:
(a)Mihir (Cray XC40): Mihir is a significant supercomputer but not the fastest in India.
(B) PARAM Siddhi-AI: PARAM Siddhi-AI is another high-performance supercomputer in India, but it doesn't hold the top spot.
(C) Pratyush (Cray XC40): Pratyush is another notable supercomputer, but Airawat PSAI is faster.

Q18. Who appoints the chief Minister and other Ministers ?
(a) The Prime Minister
(b) The President
(c) The Governor
(d) The Chief Justice of High Court
Ans.(c)
Sol. The correct answer is The Governor. In India, the Chief Minister of a state and the Council of Ministers are appointed by the Governor of that state. The Governor invites the leader of the majority party or coalition in the state legislature to form the government. The Chief Minister, in turn, recommends other ministers to be appointed by the Governor.
Information Booster:
The Governor acts as the constitutional head of the state.
The Chief Minister is typically the leader of the majority party in the legislative assembly.
The Chief Minister advises the Governor on the appointment of other ministers.
The Governor's role is ceremonial in appointing ministers, as the real power lies with the elected representatives.
The Governor's powers to appoint are outlined in Article 164 of the Indian Constitution.
Additional Knowledge:
Prime Minister: The Prime Minister appoints Union Ministers, not state ministers.
President: The President appoints the Prime Minister and Union Ministers, not state-level ministers.
Governor: Appoints the Chief Minister and other state ministers.
Chief Justice of High Court: Has no role in appointing the Chief Minister or ministers.

Q19. Rai is primarily a folk dance of which of the following states?
(a) Manipur
(b) Madhya Pradesh
(c) Karnataka
(d) Andhra Pradesh
Ans.(b)
Sol. Correct Answer: B)
Explanation:
- Rai is a traditional folk dance of Madhya Pradesh, mainly performed by the Gond and other tribal communities.
- It is performed during festivals and cultural occasions, often accompanied by drums like the *dhol*.

- The dance represents joy, celebration, and the cultural heritage of the Bundelkhand region.

Information Booster:
- Madhya Pradesh is called the "Heart of India" due to its central location.
- Other folk dances of Madhya Pradesh include Matki, Jawara, Bhagoria, and Grida.
- UNESCO has recognized some tribal traditions of MP under intangible cultural heritage.
- Rai dance is particularly popular in Chhatarpur and Satna regions of Madhya Pradesh.

Additional Knowledge:
- Manipur: Known for Ras Lila and Pung Cholom, not Rai.
- Karnataka: Famous for Yakshagana and Dollu Kunitha, not Rai.
- Andhra Pradesh: Known for Kuchipudi (classical) and folk dances like Burrakatha, not Rai.

Q20. The dancing girl statue of Mohenjodaro was made of:
(a) silver
(b) gold
(c) iron
(d) bronze
Ans.(d)
Sol. The correct answer is (D) bronze
Explanation:
- The Dancing Girl statue from Mohenjodaro, one of the most iconic artifacts of the Indus Valley Civilization, is made of bronze.
- It dates back to around 2500 BCE, showcasing the high level of skill in metal casting and artistry during that period.
- The statue stands about 10.5 cm tall and depicts a young girl in a dancing pose, with one hand on her hip and the other dangling freely.

Information Booster:
- It was created using the lost-wax casting technique, also known as cire perdue, which is still used by traditional metal workers today.
- The figure reveals profound anatomical understanding, with realistic body proportions and expressive posture.
- Discovered in 1926 by archaeologist Ernest Mackay at Mohenjodaro (now in Pakistan).

Q21. The cell wall of spirogyra contains:
(a) lignin
(b) cellulose
(c) chitin
(d) suberin
Ans.(b)
Sol. The correct answer is (B) cellulose.
Explanation:
The cell wall of Spirogyra, a genus of filamentous green algae, is primarily composed of cellulose, which provides structural support and rigidity to the cell. Cellulose is a complex carbohydrate and the most common material found in the cell walls of plants and algae.

Information Booster:
- Cellulose is a polysaccharide made of long chains of glucose molecules.
- It is the main structural component of the cell wall in plants, algae, and some bacteria.
- Spirogyra is part of the green algae group, and its cell wall is made of cellulose, unlike some other organisms which may have cell walls made of different materials like chitin or lignin.

Additional Knowledge:
lignin:
- Lignin is a complex polymer found in the cell walls of vascular plants, providing strength and rigidity, especially in woody plants.
- It is not present in Spirogyra, as it lacks true vascular tissue.

chitin:
- Chitin is found in the exoskeletons of arthropods and the cell walls of fungi, not in Spirogyra.

suberin:
- Suberin is a waxy substance found in the cell walls of cork tissue in plants, but not in Spirogyra.

Q22. _____ carries/carry hereditary material.
(a) Ovules
(b) DNA
(c) RNA
(d) Pollen grains
Ans.(b)
Sol. The correct answer is: (B) DNA
Explanation:
- DNA (Deoxyribonucleic Acid) is the primary hereditary material in almost all living organisms.
- It carries genetic information that controls growth, development, functioning, and reproduction.
- Some viruses, however, use RNA as their genetic material instead of DNA.

Information Booster:
- DNA is located in the nucleus of eukaryotic cells and in the cytoplasm of prokaryotes.
- Genes are specific segments of DNA that code for proteins.
- RNA plays a role in protein synthesis (mRNA, tRNA, rRNA).
- DNA follows the double helix structure discovered by Watson and Crick (1953).
- DNA is the reason why traits are passed from one generation to the next.

Additional Knowledge:
- Option A (Ovules): Female reproductive structures in plants, contain cells but not the hereditary material itself.
- Option B (DNA): Correct – it carries hereditary information.
- Option C (RNA): In some viruses (e.g., HIV, Influenza), RNA carries hereditary material, but not in higher organisms.
- Option D (Pollen grains): Male gametes in plants; they carry hereditary material, but it is inside their DNA, not the pollen itself.

Q23. In which cell organelle does photosynthesis occur?
(a) Mitochondrion
(b) Vacuole
(c) Chloroplast
(d) Golgi apparatus
Ans.(c)
Sol. The correct answer is Chloroplast Explanation Photosynthesis takes place inside chloroplasts, which are found in plant cells and certain algae. These organelles contain the green pigment chlorophyll that captures sunlight. The process occurs in two main stages: the light-dependent reactions (in thylakoid membranes), which convert solar energy into chemical energy (ATP and NADPH), and the Calvin cycle (in the stroma), which uses that energy to fix carbon dioxide into glucose.

Additional Information • {a} Mitochondria carry out cellular respiration, not photosynthesis. • {b} Vacuoles primarily store nutrients, water, and waste; they do not have a role in photosynthesis. • {d} The Golgi apparatus processes and packages macromolecules but is not involved in photosynthesis.

Q24. In human digestion, where does carbohydrate digestion begin?
(a) Stomach
(b) Small intestine
(c) Mouth
(d) Large intestine
Ans.(c)
Sol.
The correct answer is Mouth
Explanation The digestion of carbohydrates starts in the mouth, where the enzyme salivary amylase (also called ptyalin) breaks down starch (a polysaccharide) into simpler sugars like maltose. This enzymatic action begins as the food is chewed and mixed with saliva. Although this process stops in the acidic environment of the stomach, it resumes in the small intestine with pancreatic amylase.
Additional Information • {a} The stomach is acidic and primarily digests proteins using pepsin; carbohydrate digestion halts here. • {b} Further digestion of carbohydrates occurs here, but it is not the starting point. • {d} The large intestine mainly absorbs water and does not digest carbohydrates.

Q25. What is the term for a symbiotic relationship where one organism benefits and the other is unaffected?
(a) Mutualism
(b) Parasitism
(c) Commensalism
(d) Predation
Ans.(c)
Sol.
The correct answer is Commensalism.
Explanation Commensalism is a type of symbiotic relationship between two organisms in which one organism benefits from the association, while the other is neither harmed nor helped. An example is barnacles that attach to whales; the barnacles get a place to live and filter-feed, while the whale is generally unaffected.
Additional Information
{a} Mutualism is a relationship where both organisms benefit.
{b} Parasitism is a relationship where one organism {the parasite} benefits at the expense of the other {the host}.
{d} Predation is a biological interaction where one organism {the predator} kills and eats another organism {the prey}.

Q26. Testosterone which is a male sex hormone is synthesized in _____.
(a) Scrotum
(b) Testicle
(c) Seminal Vesicle
(d) Prostate Gland
Ans.(b)
Sol. The correct answer is (B) Testicle

Explanation:
Testosterone is the primary male sex hormone, synthesized mainly in the Leydig cells of the testicles (testes).
It plays a key role in the development of male reproductive tissues, such as the testes and prostate, and promotes secondary sexual characteristics like muscle growth, facial hair, and deepening of the voice.
Information Booster:
Testosterone is a steroid hormone derived from cholesterol.
Its secretion is controlled by the pituitary gland through LH (Luteinizing Hormone).
Normal testosterone levels are essential for sperm production (spermatogenesis).
Low testosterone levels may lead to reduced libido, fatigue, and infertility.
It also influences mood, bone density, and red blood cell production.
Additional Knowledge:
Scrotum – A pouch of skin that protects and maintains the temperature of the testes.
Seminal Vesicle – Produces nutrient-rich fluid that forms part of semen.
Prostate Gland – Produces an alkaline secretion that helps sperm survive in the acidic female reproductive tract.

Q27. A convex lens forms a real image that is the same size as the object. If the object distance is 20 cm, what is the focal length of the lens?
(a) 5 cm
(b) 10 cm
(c) 20 cm
(d) 40 cm
Ans.(b)
Sol.
The correct answer is 10 cm. Explanation For a convex lens, a real image the same size as the object is formed when the object is at 2F {twice the focal length}. Therefore, if object distance u = 2f = 20 cm, then the focal length f = 10 cm. Additional Information
{a} 5 cm would place the object at 4f, resulting in a smaller image.
{c} 20 cm would be the object distance itself, not the focal length.
{d} 40 cm would place the object between F and 2F, resulting in a magnified image.

Q28. An object is placed between a convex lens and its focal point. The image formed will be:
(a) Real and inverted
(b) Real and erect
(c) Virtual and erect
(d) Virtual and inverted
Ans.(c)
Sol.
The correct answer is Virtual and erect. Explanation When an object is placed between the focal point {F} and a convex lens, the lens acts as a magnifying glass. The rays diverge after passing through the lens, and a virtual, erect, and magnified image is formed on the same side as the object. Additional Information
{a} & {b} Real images are formed when the object is beyond F.
{d} Virtual images formed by single lenses are always erect.

Q29. The process of splitting white light into its constituent colors is called:
(a) Reflection
(b) Diffraction
(c) Dispersion
(d) Polarization
Ans.(c)
Sol.
The correct answer is Dispersion.
Explanation Dispersion is the phenomenon in which the phase velocity of a wave depends on its frequency. In the context of light, it is the splitting of white light into its component colors {a spectrum}. This occurs because the refractive index of a medium like glass or water is slightly different for each color {wavelength}, causing them to bend at slightly different angles.
Additional Information
{a} Reflection is the bouncing of light off a surface.
{b} Diffraction is the bending of waves around an obstacle.
{d} Polarization refers to the orientation of a wave's oscillations.

Q30. Two resistors, R_1 and R_2, are connected in parallel. If R_1 is much smaller than R_2, the total equivalent resistance of the combination will be:
(a) Approximately equal to R_2.
(b) Approximately equal to the average of R_1 and R_2.
(c) Greater than R_2.
(d) Slightly less than R_1.
Ans.(d)
Sol. The correct answer is Slightly less than R_1.
Explanation When resistors are connected in parallel, the total resistance is always less than the smallest individual resistance. The formula is . If R_1 is very small {e.g., 1 Ω} and R_2 is very large {e.g., 1000 Ω}, the term becomes negligible. The total resistance is dominated by the smallest resistor, R_1, because most of the current will choose this "path of least resistance." Therefore, the equivalent resistance will be just slightly less than R_1.
Additional Information
This principle is important in circuit analysis, as adding a resistor in parallel always decreases the total resistance of that section of the circuit.

Q31. In which of the following states of matter does sound travel the fastest?
(a) Solid
(b) Liquid
(c) Gas
(d) Plasma
Ans.(a)
Sol. The correct answer is Solid.
Explanation Sound is a mechanical wave that travels by vibrating the particles of a medium. The speed of sound depends on the medium's density and elasticity. In solids, the particles are very close together and strongly bonded, allowing vibrations to be transmitted much more quickly than in liquids or gases where the particles are farther apart. Therefore, sound travels fastest in solids, slower in liquids, and slowest in gases.

Additional Information
For example, the speed of sound is approximately 5,960 m/s in steel, 1,480 m/s in water, and 343 m/s in air.

Q32. Tartaric acid is a constituent of _____.
(a) Baking powder
(b) Baking soda
(c) Washing soda
(d) Vinegar
Ans.(a)
Sol. The correct answer is (a) Baking powder.
Explanation:
Tartaric acid is added to baking powder to prevent the bitter taste produced by sodium carbonate formed during the decomposition of sodium bicarbonate.
Baking powder is a mixture of sodium bicarbonate ($NaHCO_3$) and a mild acid (such as tartaric acid). When mixed with water or heated, it releases carbon dioxide gas, which makes the dough rise and become soft and spongy.
Information Booster:
Chemical formula of Tartaric Acid: $C_4H_6O_6$
Role in Baking Powder: Reacts with $NaHCO_3$ to release CO_2.
By-products: Sodium tartrate and water are formed.
Baking Soda ($NaHCO_3$): Used alone can make food taste bitter.
Baking Powder Composition: $NaHCO_3$ + Tartaric Acid + Cornstarch (as filler).
Additional Knowledge:
Baking Soda ($NaHCO_3$): Used in cooking and cleaning; produces CO_2 on heating or with acid.
Washing Soda ($Na_2CO_3 \cdot 10H_2O$): Used in washing clothes and softening water.
Vinegar: Contains acetic acid (CH_3COOH), used as a preservative and flavoring agent.
Tartaric Acid Natural Source: Found in tamarind and grapes.
Industrial Use: Tartaric acid is also used in effervescent tablets and as a stabilizer in food products.

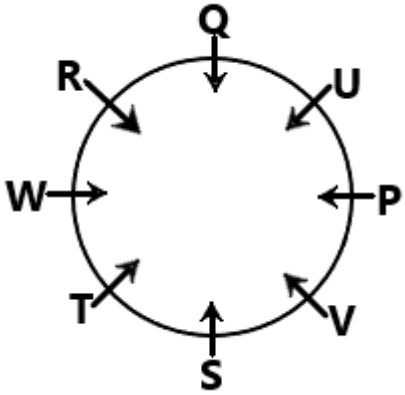
Q33. If a substance has a pH of 8, it is considered to be:
(a) Strongly acidic
(b) Weakly acidic
(c) Neutral
(d) Weakly basic
Ans.(d)
Sol.
The correct answer is Weakly basic.
Explanation The pH scale runs from 0 to 14. A pH of 7 is neutral. Values above 7 are basic {or alkaline}, and values below 7 are acidic. A pH of 8 is just slightly above neutral, so it is classified as weakly basic.
Additional Information
A strongly basic solution would have a pH closer to 14.
A weakly acidic solution would have a pH just below 7, like 6.

Q34. Consider the following reaction:
$2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$
Which one of the following statements about the reaction given above is correct?
(a) The oxidation state of hydrogen increases while that of oxygen decreases.
(b) The oxidation state of hydrogen decreases while that of oxygen increases.
(c) There is no change in the oxidation state of hydrogen as well as that of oxygen.
(d) During the reaction, hydrogen is reduced while oxygen is oxidized.
Ans.(a)
Sol. The correct answer is (a) The oxidation state of hydrogen increases while that of oxygen decreases.
Explanation:
In elemental form:
– Hydrogen (H_2): Oxidation state = 0
– Oxygen (O_2): Oxidation state = 0
In water (H_2O):
– Hydrogen: Oxidation state = +1
– Oxygen: Oxidation state = –2
Thus:
– Hydrogen is oxidized (0 → +1) → Loss of electrons
– Oxygen is reduced (0 → –2) → Gain of electrons
Information Booster:
This is a redox reaction: simultaneous oxidation and reduction.
Oxidation: Increase in oxidation state / loss of electrons
Reduction: Decrease in oxidation state / gain of electrons
Additional Knowledge:
(b) The oxidation state of hydrogen decreases – Incorrect
Hydrogen's oxidation state increases from 0 to +1.
(c) No change in oxidation states – Incorrect
Both hydrogen and oxygen change oxidation states, confirming redox.
(d) Hydrogen is reduced, oxygen is oxidized – Incorrect
The opposite happens: hydrogen is oxidized, oxygen is reduced.

Q35. Which one of the following is not a soap?
(a) Sodium stearate
(b) Sodium palmate
(c) Sodium benzoate
(d) Sodium oleate
Ans.(c)
Sol. The correct answer is (c) Sodium benzoate.
Explanation:
Sodium benzoate is not a soap. It is the sodium salt of benzoic acid and used as a food preservative and antifungal agent.
Soaps are sodium or potassium salts of long-chain fatty acids.
Sodium benzoate lacks the long hydrocarbon tail needed for soap action (micelle formation).
Information Booster:
Soaps are made through saponification — the reaction of fats/oils with sodium hydroxide.
Soaps have cleaning properties due to their amphiphilic nature (hydrophobic tail, hydrophilic head).

Additional Knowledge:
(a) Sodium stearate
Sodium salt of stearic acid ($C_{17}H_{35}COONa$).
Common ingredient in bar soaps.
(b) Sodium palmate
Derived from palm oil.
Used in cosmetics and soap making.
(d) Sodium oleate
Salt of oleic acid (an unsaturated fatty acid).
Widely used in liquid soaps and emulsifiers.

Q36. Eight girls P, Q, R, S, T, U, V and W are sitting around a circular table facing the centre (not necessarily in the same order). P sits third to the right of T. Q sits third to the left of T. R is not an immediate neighbour of P or T. T is an immediate neighbour of S and W. U sits third to the right of S. V is to the immediate right of S. Three of the following belong to a particular system and so form a group. Which is the one that does not belong to that group?
(a) VP
(b) PU
(c) SV
(d) QU
Ans.(d)
Sol. Given:
Eight girls P, Q, R, S, T, U, V and W are sitting around a circular table facing the centre (not necessarily in the same order).
P sits third to the right of T.
Q sits third to the left of T.
R is not an immediate neighbour of P or T.
T is an immediate neighbour of S and W.
U sits third to the right of S.
V is to the immediate right of S.
From the given information seating arrangement will be.



Three of the following belong to a particular system and so form a group.
So, QV is the one that does not belong to that group. Because QU goes anticlockwise, all others go clockwise.
Thus, correct option is (d).

Q37. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.
Statement:
Farmers should be given extra 10% of the cost of production with the price for their produce.
Assumptions:
I. There are farmers who need monetary support.
II. Farmers do not need extra money of production cost.
(a) Only assumption II is implicit.
(b) Both assumptions I and II are implicit.
(c) Neither assumption I nor II is implicit.
(d) Only assumption I is implicit.
Ans.(d)
Sol. Statement:
Farmers should be given extra 10% of the cost of production with the price for their produce.
Assumptions:
I. There are farmers who need monetary support.
There are farmers who need monetary support.
Yes, this is implicit.
II. Farmers do not need extra money of production cost.
This contradicts the statement. The statement assumes they do need something extra, not that they don't.
This assumption is not implicit.
So, Only assumption I is implicit.
Thus, correct option is (d).

Q38. A statement followed by two assumptions are given below. Select the assumption(s) from the options which is implicit in the statement.
Select
(A) If only assumption (i) is implicit
(B) If only assumption (ii) is implicit
(C) If both (i) and (ii) are implicit
(D) If neither (i) nor (ii) is implicit
Statement:
Detergents should be used to clean clothes
Assumptions:
i) Detergents form more lather
ii) Detergents help to dislodge grease and dirt
(a) C
(b) B
(c) A
(d) D
Ans.(b)
Sol. Given:
Statement:
Detergents should be used to clean clothes
Assumptions:
i) Detergents form more lather. Not implicit.

The statement doesn't mention or depend on lather formation.
ii) Detergents help to dislodge grease and dirt. Implicit.
This directly supports the reason why detergents should be used to clean clothes.
So, If only assumption (ii) is implicit
Thus, the correct option is: (b)

Q39. Sunday on 4 May 1886 what will be the day on 4 May, 1887?
(a) Monday
(b) Tuesday
(c) Thursday
(d) Saturday
Ans.(a)
Sol. Given:
4 May 1886 → Sunday
We must find the day on 4 May 1887.
Check if 1886 is a leap year.
1886 ÷ 4 = 471 remainder 2,
→ Not a leap year
So, 1886 has 365 days.
Odd day: 365 ÷ 7 = 52 weeks + 1 odd day
So, 4 May, 1887 is: Sunday + 1 day = Monday
Thus, the correct option is: (a)

Q40. What angle is made by minute hand in 33 sec?
(a) 4°
(b) 3.3°
(c) 5.9°
(d) 4.9°
Ans.(b)
Sol. Given:
Minute hand in 33 sec
The minute hand moves 360° in 60 minutes
That means it moves 6° per minute,
or: Angular speed = 6° ÷ 60 seconds = 0.1° per second.
Now calculate for 33 seconds:
$0.1° \times 33 = 3.3°$
Thus, the correct option is: (b)

Q41. The smaller of the two angles between the hour hand and the minute hand at 3:52 pm in a clock will be:
(a) 165°
(b) 166°
(c) 164°
(d) 162°
Ans.(c)
Sol. Given: The minute hand at 3:52 pm.
Angle = |11/2 M - 30 H|

= | 11/2 × 52 - 30 × 3|
= |286 - 90]
= 196°.
For the smaller angle, we subtract 196° from 360°
360° - 196° = 164°
Thus, correct option is (c).

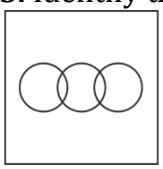
Q42. In the following question, select the odd word from the given alternatives.
(a) Banana
(b) Peach
(c) Cabbage
(d) Mango
Ans.(c)
Sol. Let's check the options:
Banana → fruit
Peach → fruit
Cabbage → vegetable
Mango → fruit
So, odd one out is: Cabbage
Thus, the correct option is: (c)

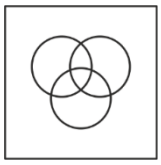
Q43. Find the odd word out.
(a) Saturn
(b) Jupiter
(c) Mars
(d) Moon
Ans.(d)
Sol. Let's check:
A. Saturn – Planet
B. Jupiter – Planet
C. Mars – Planet
D. Moon – Natural satellite, not a planet
So, D. Moon is the odd one out because it is not a planet.
Thus, the correct option is: (d)

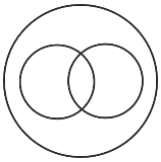
Q44. Find the odd number out.
(a) 8
(b) 27
(c) 64
(d) 225
Ans.(d)
Sol. Let's check each option:
A. $8 = 2^3$ → Cube of 2
B. $27 = 3^3$ → Cube of 3
C. $64 = 4^3$ → Cube of 4
D. 225 = Not a perfect cube
$225 = 5^2$, which is a perfect square, not a cube.

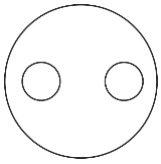
So, D. 225 is the odd one out because it is not a perfect cube.
Thus, the correct option is: (d)

Q45. Identify the diagram that best represents the relationship among acids, bases and chemicals.

(a) 

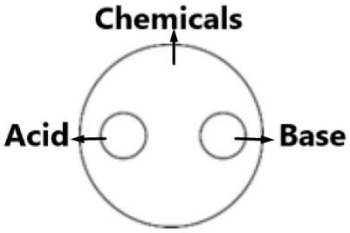
(b) 

(c) 

(d) 

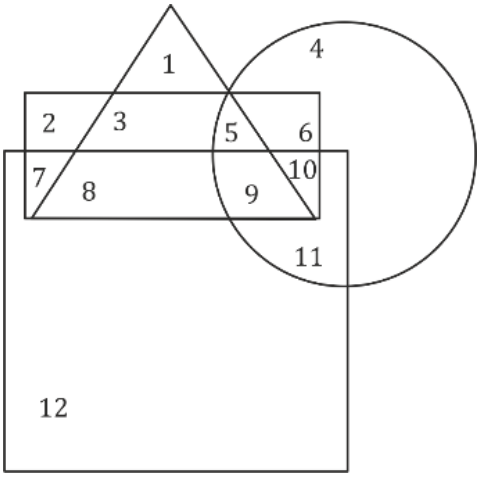
Ans.(d)

Sol. Given: Acids, Bases and Chemicals



Acids and Bases are two different chemicals.
Thus, correct option is (d).

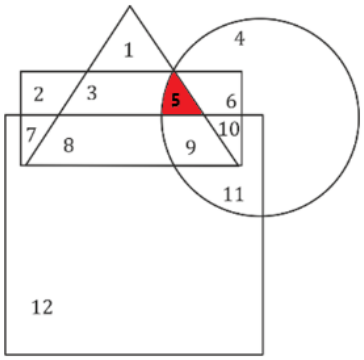
Q46. If triangle represents me, rectangle represents educated, circle represents employed and square represents married than identify the number that represents the men who are educated and employed but not married.



(a) 5
(b) 8
(c) 3
(d) 9

Ans.(a)

Sol. Given: If triangle represents men, rectangle represents educated, circle represents employed and square represents married.



So, 5 men who are educated and employed but not married.
Thus, correct option is (a).

Q47. What will come in place of the question mark (?) in each of the following number series?
5, 12, 17, 29, 46, 75, 121, ___
(a) 185
(b) 196
(c) 192
(d) 188

Ans.(b)

Sol. Given:
5, 12, 17, 29, 46, 75, 121, ___

5 12 17 29 46 75 121 196

5+7 5+12 12+17 17+29 29+46 46+75 75+121

So, the missing number is: (121 + 75) = 196
Thus, the correct option is: (b)

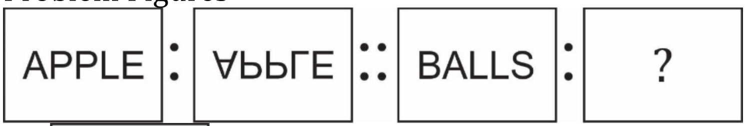
Q48. In the following question, find the missing number from the given series.
1785, 1529, 1333, 1189, 1089, ?
(a) 1075
(b) 1025
(c) 1055
(d) 995

Ans.(b)

Sol. Given:
1785, 1529, 1333, 1189, 1089, ?
Look at the differences between consecutive numbers
1785 → 1529
Difference = 1785 - 1529 = 256 → 16^2

1529 → 1333
Difference = 1529 - 1333 = 196 → 14^2
1333 → 1189
Difference = 1333 - 1189 = 144 → 12^2
1189 → 1089
Difference = 1189 - 1089 = 100 → 10^2
next would be: 8^2 = 64
→ 1089 - 64 = 1025
Thus, the correct option is: (b)

Q49. Select the option that is related to the third figure in the same way that the second figure is related to the first figure.
Problem Figures



(a) 

(b) 

(c) 

(d) 

Ans.(c)
Sol. Logic: Water image of the first figure to next figure.

Water Images of Small Letters

Letters	a	b	c	d	e	f	g	h	i
Water-Images	ɐ	p	c	q	ǝ	ɟ	ƃ	µ	!
Letters	j	k	l	m	n	o	p	q	r
Water-Images	ɾ	ĸ	l	ɯ	u	o	b	d	ɹ
Letters	s	t	u	v	w	x	y	z	-
Water-Images	ƨ	ɟ	n	ʌ	ʍ	x	λ	ƨ	-

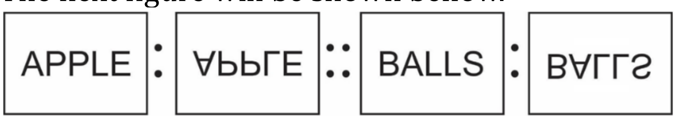
Water Images of Capital Letters

Letters	A	B	C	D	E	F	G	H	I
Water-Images	∀	B	C	D	E	Ŀ	C	H	I
Letters	J	K	L	M	N	O	P	Q	R
Water-Images	ſ	K	Γ	W	И	O	b	Ó	ʁ
Letters	S	T	U	V	W	X	Y	Z	-
Water-Images	Ƨ	⊥	∩	Λ	M	X	⅄	Ƨ	-

Water Images of Numbers

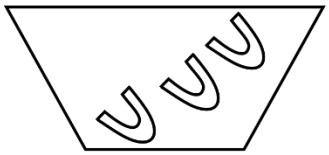
Letters	0	1	2	3	4	5	6	7	8	9
Water Images	0	I	Ƨ	3	ᔭ	ƨ	ɕ	ㄥ	8	∂

The next figure will be shown bellow.

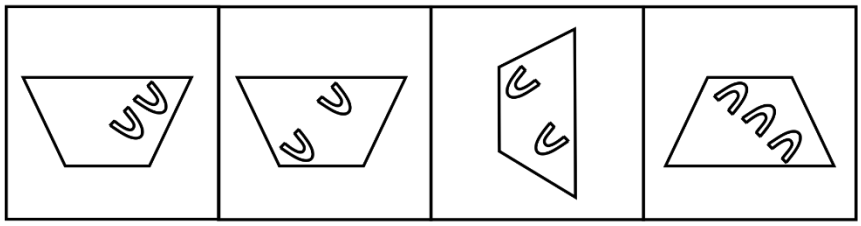


Thus, the correct option is: (c)

Q50. Which of the option figures bears the closest resemblance to the question figure?
Questions Figure:



Option Figures:



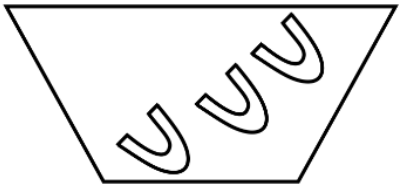
A B C D

(a) A
(b) C
(c) D
(d) B

Ans.(c)

Sol. Given:

Questions Figure:

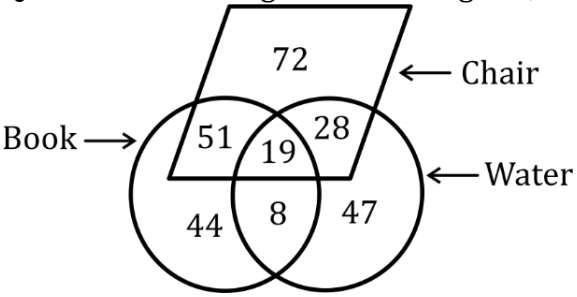


Only figure D has three U shape figure.

D

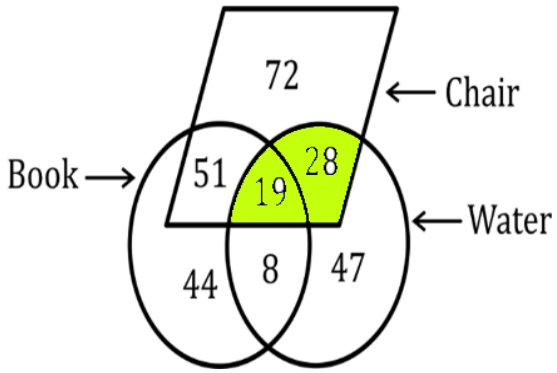
Thus, correct option is (c).

Q51. Based on the given Venn diagram, which of the following statements is/are correct?

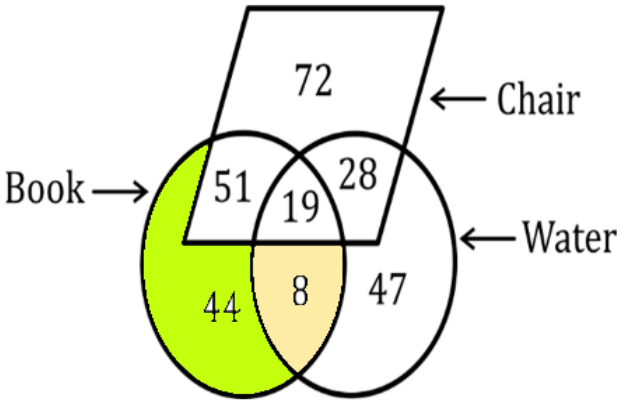


I. The number of chair which is water is 28.

II. The number of books which are not chairs is 52.
(a) Only I
(b) Both I and II
(c) Neither I nor II
(d) Only II
Ans.(d)
Sol. Let's check:

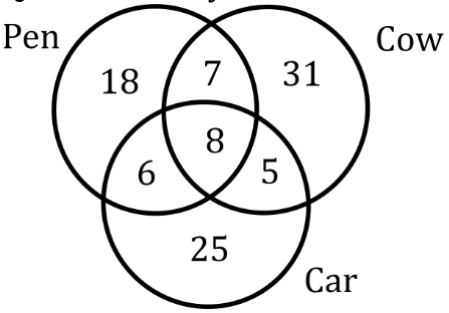


I. The number of chair which is water is 28. False, because the number of chair which is water is 28 + 19 = 47



II. The number of books which are not chairs is 52 = True, because the number of books which are not chairs is (44 + 8) = 52 which is correct.
So, only II is correct.
Thus, the correct option is: (d)

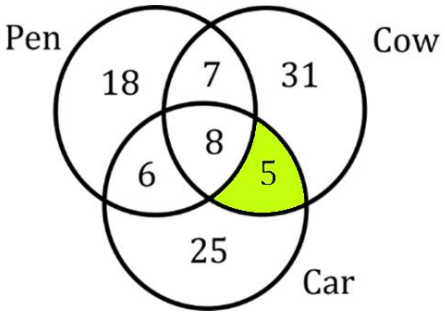
Q52. How many cows are cars but not pens?



(a) 36
(b) 5
(c) 7
(d) 12

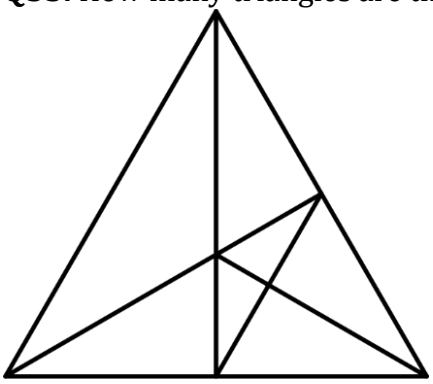
Ans.(b)

Sol. There are 5 cows are cars but not pens shown bellow.



Thus, the correct option is: (b)

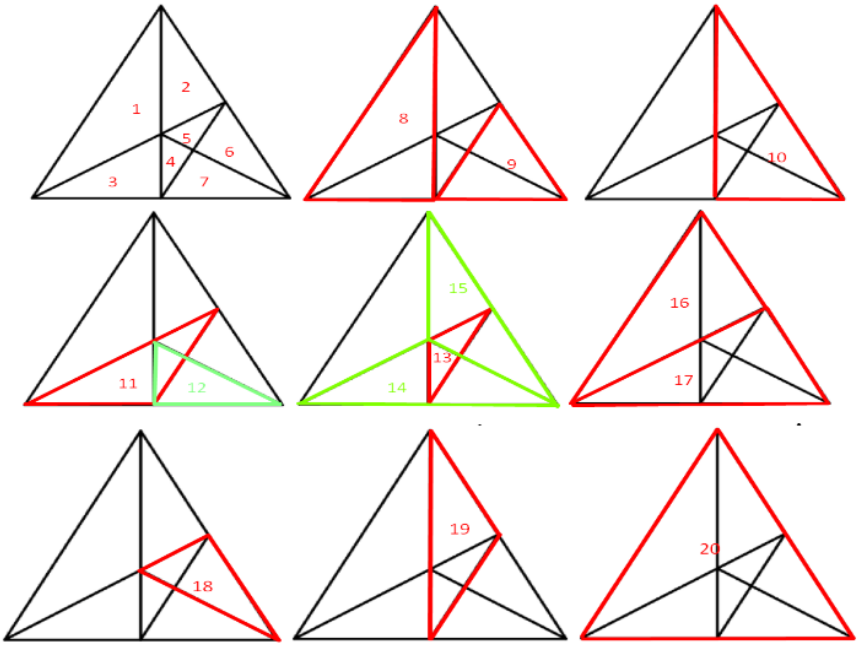
Q53. How many triangles are there in the given figure?



(a) 20
(b) 16
(c) 22
(d) 18

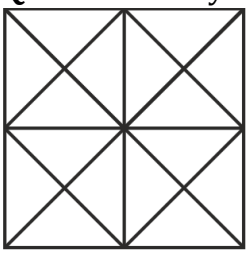
Ans.(a)

Sol. There are 20 Triangles shown bellow:



Thus, the correct option is: (a)

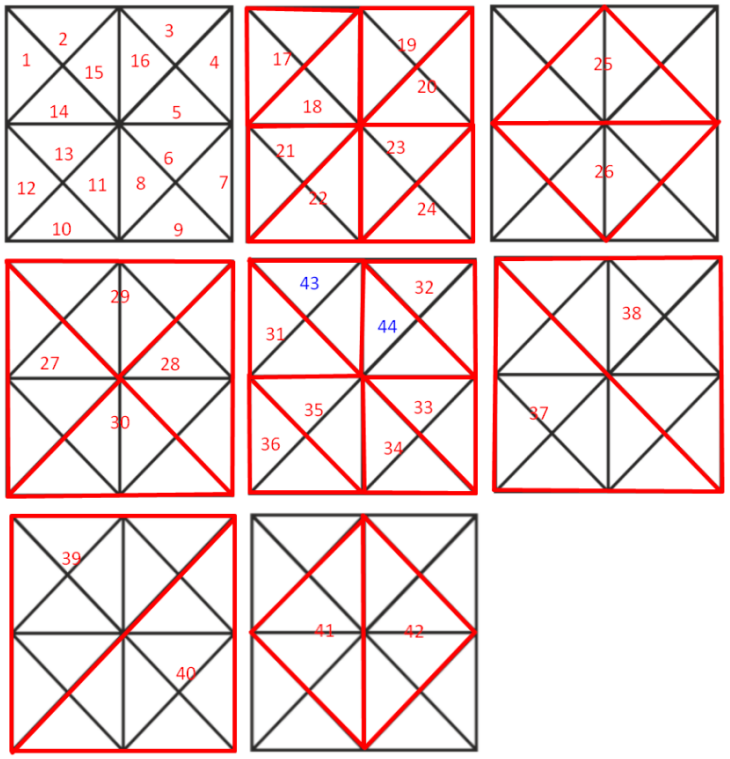
Q54. How many triangles can you count from the given figure?



(a) 36
(b) 38
(c) 26
(d) 44

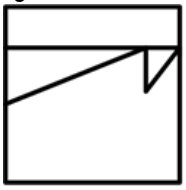
Ans.(d)

Sol. There are 44 Triangles shown bellow:

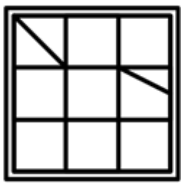


Thus, the correct option is: (d)

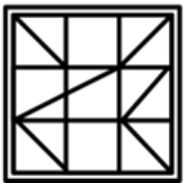
Q55. From the given answer figures, select the one in which the question figure is hidden/embedded.



(a)

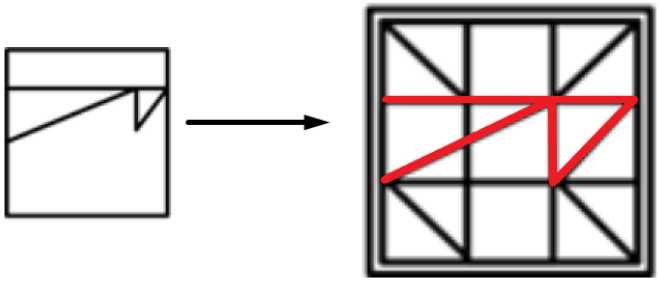
(b) 

(c) 

(d) 

Ans.(d)

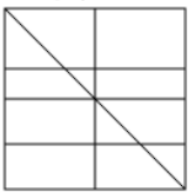
Sol. The correct embedded figure is shown below.

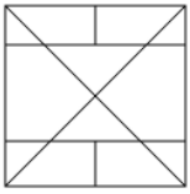


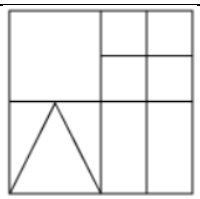
Thus, the correct option is: (d)

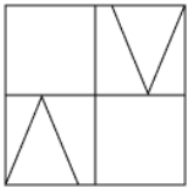
Q56. Select the option figure in which the given figure (X) is embedded as its part (rotation is NOT allowed).

(X)

(a) 

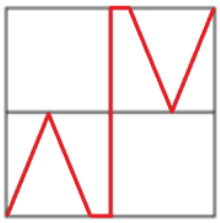
(b) 

(c) 

(d) 

Ans.(d)

Sol. The correct embedded figure is shown below.



Thus, correct option is (d).

Q57. In a certain code language, 'I belong to you' is written as '# @ © *', 'you belong to them' is written as '©@ % *', 'we belong them' is written as '+ %©'. What is the code for 'we to you' in that code language?

(a) + @ ©

(b) % * @

(c) + * @

(d) % © *

Ans.(c)

Sol. Given:

I belong to you → * @ ©

you belong to them" → © @ % *

we belong them → + % ©

Code will be shown bello:

I belong to you → * @ ©

you belong to them → © @ % *

we belong them → + % ©

So, the code for 'we to you' → + * @

Thus, the correct option is: (c)

Q58. Read all information carefully and answer following question?

Digits/ Symbols- * $ % + # Δ (c) 3 5 4 7 2 1 6 8 9

Codes – A B C D E F G H I J K L M N O P

(I) If first place is even number and last place is odd number then both places are to be coded by first digit / symbol.

(II) If first place is odd number and last place is even number then both place codes will be interchanged.
4 + # $ 1
(a) JDFIO
(b) JDEBJ
(c) JDEMB
(d) JDFIM
Ans.(b)
Sol. Given:

Symbol/Digit	*	$	%	+	#	Δ	(c)	3	5	4	7	2	1	6	8	9
Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P

4 + # $ 1
(I) If first place is even number and last place is odd number then both places are to be coded by first digit / symbol. → Follow conditions
(II) If first place is odd number and last place is even number then both place codes will be interchanged. → Condition Not Follow
So, Condition I: Both first and last should be coded as J. Others no change.

4	+	#	$	1
J	D	E	B	J

The code is: 4 + # $ 1 → JDEBJ
Thus, the correct option is: (b)

Q59. A statement followed by two assumptions are given below. Select the assumption(s) from the options which is implicit in the statement.
Select :
(A) If only assumption (i) is implicit
(B) If only assumption (ii) is implicit
(C) If both (i) and (ii) are implicit
(D) If neither (i) nor (ii) is implicit
Statement:
We should work hard to be successful in our life
Assumptions:
i) Being successful in our life is desirable
ii) We will be happy if we work hard
(a) B
(b) A
(c) C
(d) D
Ans.(d)
Sol. Given:
Statement:
We should work hard to be successful in our life
Assumptions:
i) Being successful in our life is desirable. Not implicit.
ii) We will be happy if we work hard. Not implicit
The statement only advises action — it doesn't depend on whether success is desirable to everyone..
The statement talks about working hard to be successful, not about happiness.
It doesn't assume that hard work automatically brings happiness.
So, neither (i) nor (ii) is implicit.
Thus, the correct option is: (d)

Q60. Consider the given statement(s) and decide which of the given assumptions is/are implicit in the statement.
Statement: "We are all victims of our thoughts," says a title in a newspaper column.
Assumptions:
I. Our actions are based on our thoughts.
II. Newspapers are the best source of information.
(a) Both I and II are implicit
(b) Only assumption II is implicit
(c) Neither I nor II is implicit
(d) Only assumption I is implicit
Ans.(d)
Sol. Statement: "We are all victims of our thoughts," says a title in a newspaper column.
Assumptions:
I. Our actions are based on our thoughts.
The statement implies that our thoughts affect us, which is connected to the idea that actions are influenced by thoughts.
II. Newspapers are the best source of information.
The statement only mentions that it is a newspaper title; it does not imply anything about newspapers being the best source.
So, Only assumption I is implicit.
Thus, correct option is (d).

Q61. If L>M, M=N and D<M, then which of the following relations will be false?
(a) L>D
(b) M < L
(c) L>N
(d) N < D
Ans.(d)
Sol. Given:
L>M, M=N and D
Option A: L > D → True. (As L>M and M D definitely holds.)
Option B: M < L → True. (L> M so the converse that is L>M definitely holds.)
Option C: L > N → True. (L> M, M = N, this implies that L> N.)
Option D: N < D → False. (M = N and D < M, this implies that N > D.)
So, N < D Not possible.
Thus, the correct option is: (d)

Q62. In an election between two candidates Abhay and Bharti, Abhay got 55% of the total valid votes, and 20% of the total votes were invalid. If the total number of votes was 10,000, the number of valid votes that Abhay got was:
(a) 4800
(b) 5000
(c) 4200
(d) 4400
Ans.(d)
Sol. Given:

Total votes = 10,000
Percentage of invalid votes = 20%
Percentage of total valid votes Abhay got = 55%
Formula Used:
Number of valid votes = Total votes × (1 - Percentage of invalid votes)
Number of votes a candidate got = Percentage of total valid votes × Number of valid votes
Solution:
Number of valid votes = 10,000 × (1 - 20%) = 10,000 × 0.8 = 8,000
Then, calculate the number of valid votes Abhay got:
=> Number of votes Abhay got = 55% × 8,000 = 0.55 × 8000 = 4,400
∴ Abhay got 4,400 valid votes.

Q63. Rakesh obtained 25% more marks than Ambuj and Suresh obtained 40% less marks than Rakesh. Marks obtained by Suresh are what percent less than marks obtained by Ambuj?
(a) 28
(b) 30
(c) 20
(d) 25
Ans.(d)
Sol. Given:
Rakesh obtained 25% more marks than Ambuj.
Suresh obtained 40% less marks than Rakesh.
Formula Used:

$$\text{Percentage Difference} = \left(\frac{\text{Difference between the two values}}{\text{Original Value}}\right) \times 100$$

Solution:
Let Ambuj's marks be 100.
Rakesh obtained 25% more marks than Ambuj:
Rakesh's marks = 100 + 0.25 × 100 = 125
Suresh obtained 40% less marks than Rakesh:
Suresh's marks = 125 - 0.4 × 125 = 125 × 0.6 = 75
Percentage Difference =
$\frac{100-75}{100} \times 100 = \frac{25}{100} \times 100 = 25\%$

Marks obtained by Suresh are 25% less than marks obtained by Ambuj.

Q64. ₹6,900 is divided between L, M and N in the ratio of 6 : 8 : 9. If 'L' and 'M' each gave ₹300 to 'N', then the new ratio of shares of L, M and N is:
(a) 5 : 7 : 11
(b) 5 : 7 : 9
(c) 3 : 5 : 9
(d) 3 : 7 : 9
Ans.(a)
Sol. Given:
Total amount = ₹6,900

Original ratio of L, M, and N = 6:8:9
Solution:
Total = 6 + 8 + 9 = 23 parts
Share of L = 6/23 × 6,900 = Rs. 1,800
Share of M= 8/23 × 6,900 = Rs. 2,400
Share of N= 9/23 × 6,900 = Rs. 2,700
After L and M each gave Rs. 300 to N:
L's new share = 1,800 - 300 = Rs. 1,500
M's new share = 2,400 - 300 = Rs. 2,100
N's new share = 2,700 + 300 + 300 = Rs. 3,300
New ratio of L : M : N = 1,500 : 2,100 : 3,300 = 5 : 7 : 11
∴ The new ratio of shares of L, M and N is 5 : 7 : 11.

Q65. A sum of ₹x is divided among A, B and C such that the ratio of their shares is 2 : 3 : 5. If the positive difference between the shares of B and C is ₹5,940, then what is the value of x?
(a) 29,700
(b) 23,220
(c) 22,680
(d) 25,920
Ans.(a)
Sol. Given:
The ratio of the shares of A, B, and C is 2 : 3 : 5.
The positive difference between the shares of B and C is ₹5,940.
Solution:
Let the shares of A, B, and C be 2k, 3k, 5k , where k is the common factor.
The positive difference between the shares of B and C is given as:
5k - 3k = 5,940
2k = 5,940
k = $\frac{5,940}{2}$ =
2,970
Now, the total sum x is the sum of the three shares:
x = 2k + 3k + 5k = 10k
Substituting k = 2,970:
x = 10
× 2,970 =
29,700

Q66. What would be the interest payable on a sum of ₹15,000 after 2 years if the interest is compounded yearly at 2% per annum?
(a) ₹606
(b) ₹604
(c) ₹600
(d) ₹608
Ans.(a)
Sol. Given:

Principal P = ₹15,000
Rate r = 2% = 0.02 per annum (compounded yearly)
Time n = 2 years
Formula Used:
Amount with annual compounding: A =
$P(1+r)^n$
Compound Interest: CI = A - P
Solution:
A = 1500
$0(1+0.02)^2 = 15000(1.02)^2 = 15000 \times 1.0404 = 15606$
CI = 15606 - 15000 = ₹606

Q67. A certain sum at compound interest amounts to ₹3,025 in 2 years and to ₹3,327.5 in 3 years, interest compounded annually. The sum and the rate of interest p.a. are, respectively:
(a) ₹2,800 and 9%
(b) ₹2,200 and 10%
(c) ₹2,000 and 8.5%
(d) ₹2,500 and 10%
Ans.(d)
Sol. Given:
Amount after 2 years = ₹3,025
Amount after 3 years = ₹3,327.5
The interest is compounded annually.
Formula Used:
The formula for compound interest is:
A = P
$(1+\frac{r}{100})^t$
Where:
A = Amount
P = Principal (initial sum)
r = Rate of interest
t = Time in years
Solution:
Let the principal be P and the rate of interest be r.
From the compound interest formula, after 2 years:
3,025 = P
$(1+\frac{r}{100})^2$
....(1)
After 3 years:
3,327.5 = P
$(1+\frac{r}{100})^3$
....(2)
Divide equation (2) by equation (1):
$\frac{3,327.5}{3,025} = \frac{P(1+\frac{r}{100})^3}{P(1+\frac{r}{100})^2}$

$1.1 = (1 + \frac{r}{100})$
$\frac{r}{100} = 0.1$
r = 10
Now, substitute r = 10 into equation (1) to find P :
3,025 = P
$(1 + \frac{10}{100})^2$
3,025 =
$P(1.1)^2$
3,025 = P
× 1.21
P
$= \frac{3,025}{1.21} = 2,500$
Thus, the principal sum is ₹2,500, and the rate of interest is 10%.
Principal sum: ₹2,500
Rate of interest: 10% p.a.

Q68. A and B can do a piece of work in 45 and 40 days respectively. They began the work together but A left the work after some days and B alone finished the remaining work in 23 days. After how many days did A leave?
(a) 11 days
(b) 10 days
(c) 12 days
(d) 9 days
Ans.(d)
Sol. Given:
A does one work in 45 days.
B does one work in 40 days.
Concept used:
If a person does work in 'n' days, then one day of work by a person is (1/n) part of the total work.
Solution:
Let them together work for x days, and after x days, A left the work.
A's one day work = 1/45
B's one day work = 1/40
The total work for one day when they work together = A's one day work + B's one day work
$(\frac{1}{45}) + (\frac{1}{40})$
=
$\frac{8+9}{360} = \frac{17}{360}$ part
Then, for x days, their total work =
$(\frac{17}{360}) \times x$
Now remaining work = 1 -
$\frac{17x}{360}$
=
$\frac{(360-17x)}{360}$ ----(i)

But this remaining work is completed by B in 23 days then,
And B's 23 days work =
$\frac{23}{40}$ ----(ii)
From equation (i) and equation (ii) we get,
$\frac{(360-17x)}{360} = \frac{23}{40}$
360 - 17x = 23 × 9
17x = 360 - 207
17x = 153
x = 9 days
∴ A leave after 9 days.

Q69. A can do a certain work in 45 days. B is 50% more efficient than A, and C is 3 times as fast as A. They started the work together but C left 7 days before completion of the work. In how many days was the entire work completed?
(a) 15 days
(b) 18 days
(c) 10 days
(d) 12 days
Ans.(d)
Sol. Given:
A can do a certain work in 45 days.
B is 50% more efficient than A.
C is 3 times as fast as A.
Efficiency Ratio = 2:3:6
Time Ratio = 3:2:1
A = 45 days, B = 30 days, C = 15 days.
Concept Used:
Work = Efficiency × Time
Solution:
According to the question:
Efficiency of A = 1/45
Efficiency of B = 1/30
Efficiency of C = 1/15
The efficiency of A and B = 1/45 + 1/30 = (2 + 3)/90 = 1/18
The efficiency of A, B, and C = 1/45 + 1/30 + 1/15 = (2 + 3 + 6)/90 = 11/90
Both A and B worked for the last 7 days together, then:
Work =
$\frac{1}{18} \times 7 = \frac{7}{18}$
Remaining Work = 1 -
$\frac{7}{18} = \frac{11}{18}$
Now, the time taken by A, B, and C to complete 11/18 work:
Time =
$\frac{11}{18} \div \frac{11}{90}$
= 5 days

Total Time = (Time Taken to complete 11/18 work) + (Time Taken to complete 7/18 work)
Time = 5 + 7 = 12 days
Thus, the entire work will be completed in 12 days.
Alternate Method:
A completes a work in = 45 days
Thus, B is 50% efficient than A, so:
B completes a work in = 30 days.
C completes a work in = 15 days.
Total work = LCM(45, 30, 15) = 90 units.
A's 1 day work = 90/45 = 2 units/day.
B's 1 day work = 90/30 = 3 units/day.
C's 1 day work = 90/15 = 6 units/day.
Let A, B, and C complete the work in 'x' days.
According to the question:
2x + 3x + 6(x - 7) = 90
5x + 6x = 90 + 42
11x = 132
Thus:
x = 12 days

Q70. The ratio of 3 hours to 180 seconds is:
(a) 60 : 1
(b) 120 : 1
(c) 180 : 1
(d) 150 : 1
Ans.(a)
Sol. Given:
Ratio of 3 hours to 180 seconds.
Solution:
Convert 3 hours to seconds: 3 × 3600 = 10800 s.
So ratio = 10800 : 180 = 60 : 1.

Q71. The ratio of three numbers is 3 : 5 : 7 and the sum of their squares is 1328. What is the value of the largest of the three numbers?
(a) 16
(b) 20
(c) 28
(d) 12
Ans.(c)
Sol. Given:
Ratio of numbers = 3 : 5 : 7
Sum of squares = 1328
Solution:
Let numbers be 3k, 5k, 7k
Sum of squares =
$(3k)^2 + (5k)^2 + (7k)^2 = 83k^2$
$83k^2 = 1328 \Rightarrow k^2 = \frac{1328}{83} = 16 \Rightarrow k = 4$
Largest number =7k = 7 × 4 = 28.

Q72. An amount becomes Rs.1,451.25 in one year on simple rate of interest. If the rate of interest was 2% higher, the amount would have been Rs.27 more. What is the amount invested?
(a) ₹1,350
(b) ₹1,380
(c) ₹1,200
(d) ₹1,275
Ans.(a)
Sol. Given:
Amount after 1 year with the original rate = Rs. 1451.25
Increase in amount if the rate is 2% higher = Rs. 27
Time (T) = 1 year
The original rate of interest = r%
Formula Used:
Amount (A) formula at simple interest, A = P + (P × R × T)/100
Solution:
A_1 = P + (P × R × T)/100
And, for the increased interest amount A_2 = P + {P × (R + 2) × T}/ 100
Now, A_2 - A_1 = {P × 2 × T}/100 = Rs. 27
=> {P × 2 × 1}/100 = 27 {T = 1 year}
=> P × 2 = 2700
=> P = 2700/2 = Rs. 1350
∴ The amount invested (P) is Rs. 1,350.

Q73. A sum of Rs.2,400 amounts to Rs.2,904 in 2 years at a certain rate of compound interest compounded yearly. What will be the simple interest (in Rs.) on the same sum for the same time and the same rate of interest?
(a) 460
(b) 480
(c) 389
(d) 436
Ans.(b)
Sol. Given:
Principal (P) = Rs. 2,400
Amount after 2 years = Rs. 2,904
Time (T) = 2 years
Formula Used:
Amount $= P(1+\frac{R}{100})^T$ Simple Interest (SI) $= \frac{P\times R\times T}{100}$
Solution:
Amount $= P(1+\frac{R}{100})^T \Rightarrow 2904 = 2400(1+\frac{R}{100})^2 \Rightarrow (1+\frac{R}{100})^2 = \frac{2904}{2400} \Rightarrow (1+\frac{R}{100})^2 = 1.21 \Rightarrow 1+\frac{R}{100} = \sqrt{1.21} = 1.1 \Rightarrow \frac{R}{100} = 0.1 \Rightarrow R = 0.1\times 100 = 10\%$Now, SI $= \frac{P\times R\times T}{100} \Rightarrow$ SI $= \frac{2400\times 10\times 2}{100} =$ 480
∴ The simple interest on the same sum for the same time and the same rate of interest is ₹480.

Q74. A person sells his goods at 30% profit. If the cost price increases by 25%, and the selling price increases by 10%, then what is his new profit percentage?
(a) 16.4%
(b) 15.6%
(c) 14.4%
(d) 13.5%
Ans.(c)
Sol. Given:
A person sells his goods at 30% profit.
The Cost Price (CP) increases by 25%.
The Selling Price (SP) increases by 10%.
Formula Used:
Profit % =
$\frac{(SP-CP)}{CP} \times 100$

Solution:
According to the question, let the initial Cost Price (CP_1) be Rs. 100, then:
$SP_1 = CP_1 + 30\%$ of CP_1
$SP_1 = 100 + 30 = 130$
Now, new Cost Price (CP_2) = (CP_1) + 25% of (CP_1):
(CP_2) = 100 + 25% of 100
(CP_2) = 10
0 × (1
+ 0.25) = 125
Now, new Selling Price (SP_2) = (SP_1) + 10% of (SP_1)
(SP_2) = 130 + 10% of 130
SP_2 = (130) (1 + 0.1)
SP_2 = (130) (1.1) = Rs. 143
Now, new Profit%
Profit% =
$\frac{(143-125)}{125} \times 100$
P% =
$\frac{18}{125} \times 100 = \frac{18}{5} \times 4$
P% =
$\frac{72}{5}$ = 14.4%
∴ The new profit percentage will be 14.4%.

Q75. Seema sold a laptop at a profit of 15%. If she had bought it at 10% less and sold it for Rs.2,100 less, she would have gained 20%. What was the cost price (in Rs.) of the laptop?
(a) 30,000
(b) 31,500
(c) 27,500
(d) 29,000
Ans.(a)
Sol. Given:

Profit $_1$ = 15% and Profit $_2$ = 20%
Decrease in Selling Price (SP) = Rs. 2,100
Decrease in Cost Price (CP) = 10%
Formula Used:
Profit % $= (\frac{SP-CP}{CP}) \times 100$
Solution:
New SP = Original SP - Rs. 2,100
New CP = Original CP × 0.9
Let the original CP be Rs. x.
Original SP = CP + 15% of CP
=> SP = x + 0.15x = 1.15x
For the second scenario:
New CP = 0.9x
Profit in second scenario = 20%
New SP = New CP + 20% of New CP
=> New SP = 0.9x + 0.2 × 0.9x = 1.08x
It's given that the new SP is Rs. 2,100 less than the original SP:
Original SP - New SP = Rs. 2,100
=> 1.15x - 1.08x = 2,100
=> 0.07x = 2,100
=> x = $\frac{2,100}{0.07}$ = Rs. 30,000
∴The cost price (CP) of the laptop was Rs. 30,000.

Q76. A solid metallic cylindrical rod of radius 1.4 cm and length 24 cm is melted and recast as identical spherical balls of radius 2 mm. How many maximum such balls could be made?
(a) 4500
(b) 4410
(c) 4450
(d) 4580
Ans.(b)
Sol. Given:
Cylinder radius R = 1.4 cm = $\frac{7}{5}$ cm
Cylinder height h = 24 cm
Sphere radius r =2 mm = 0.2cm = $\frac{1}{5}$ cm
Metal is melted and recast into identical spheres (no loss).
Formula Used:
Volume of cylinder:
$V_{cyl} = \pi R^2 h$
Volume of sphere:
$V_{sphere} = \frac{4}{3}\pi r^3$
Number of spheres: N
$= \frac{V_{cyl}}{V_{sphere}}$

Solution:

$V_{\text{cyl}} = \pi(\frac{7}{5})^2(24) = \frac{1176\pi}{25}$

$V_{\text{sphere}} = \frac{4}{3}\pi(\frac{1}{5})^3 = \frac{4}{3}\pi \times \frac{1}{125}$

$= \frac{4\pi}{375}$.

$N = \frac{\frac{1176}{25}\pi}{\frac{4\pi}{375}} = \frac{1176}{25} \times \frac{375}{4} = 1176 \times \frac{15}{4} = 294 \times 15 = 4410.$

Q77. A cube is painted and cut into 64 smaller and identical cubes by making the minimum possible number of cuts. How many smaller cubes have only one painted face?

(a) 24

(b) 26

(c) 28

(d) 32

Ans.(a)

Sol. Given:

A larger cube is painted on all its faces and then cut into 64 identical small cubes, i.e., a $4 \times 4 \times 4$ partition.

Formula Used:

Number of small cubes with exactly one painted face when a cube is cut into n $\times n \times n$:

Count $= 6(n-2)^2$

Solution:

Here, n

$= \sqrt[3]{64} = 4$

Count $= 6(4-2)^2 = 6 \times 2^2 = 6 \times 4 = 24.$

Q78. Pointing towards a gentleman, Sonia said, "His only daughter is the sister of my Son's father." How is the gentleman related to Sonia?

(a) Brother

(b) Brother-in-law

(c) Husband

(d) Father-in-law

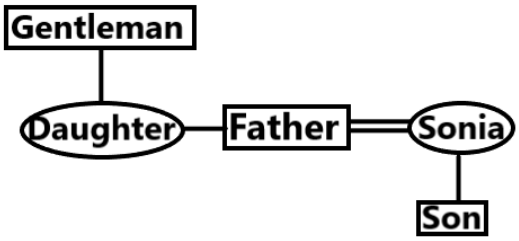
Ans.(d)

Sol. Given:

Pointing towards a gentleman, Sonia said, "His only daughter is the sister of my Son's father."

Symbol in Diagram	Meaning
- / O	Female
+ / □	Male
=	Married Couple
—	Siblings
|	Difference Of Generation

From the given information blood relation diagram will be.

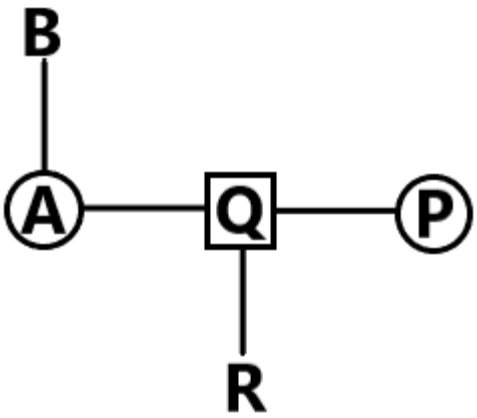


The gentleman is the Father-in-law of Sonia.
Thus, correct option is (d).

Q79. R's father is the only son of 'B' and brother of 'P'. 'A' is the daughter of 'B' and sister of 'Q'. How is P related to Q?
(a) Nephew
(b) Sister
(c) Brother
(d) Niece
Ans.(b)
Sol. Given:
R's father is the only son of 'B' and brother of 'P'.
'A' is the daughter of 'B' and sister of 'Q'.

Symbol in Diagram	Meaning
- / O	Female
+ / □	Male
=	Married Couple
—	Siblings
|	Difference Of Generation

From the given information blood relation diagram will be.



P is the Sister of Q.
Thus, correct option is (b).

Q80. Select the term that replaces the question mark (?) and complete the given series.
4M3, 6O7, 8Q13, ?, 12U31, 14W43
(a) 10S21
(b) 8R15
(c) 10S15
(d) 10R21
Ans.(a)
Sol. Given: 4M3, 6O7, 8Q13, ?, 12U31, 14W43

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: 1st number + 2, 2nd letter + 2 and 3rd letter increasing even number from 4.
For, 1st number
4 + 2 = 6, 6 + 2 = 8, 8 + 2 = 10, 10 + 2 = 12, 12 + 2 = 14
For, 2nd letter
M + 2 = O, O + 2 = Q, Q + 2 = S, S + 2 = U, U + 2 = W
For, 3rd letter
3 + 4 = 7, 7 + 6 = 13, 13 + 8 = 21, 21 + 10 = 31, 31 + 12 = 43
So, the missing term is 10S21.
Thus, correct option is (a).

Q81. In the given continuous pattern series some of the letters are missing. These missing letters are given in that order as one of the four alternatives below the series. Find out the correct alternative.
C B _ A C _ C A _ B C A C _ _ A
(a) C B C B A
(b) C C B B C
(c) C B C B C
(d) C A C B C
Ans.(c)
Sol. Given: C B _ A C _ C A _ B C A C _ _ A
Now, we check each options.
Option (a): C B C B A
C B C A / C B C A / C B C A / C B A A
Option (b): C C B B C
C B C A / C C C A / B B C A / C B C A
Option (c): C B C B C
C B C A / C B C A / C B C A / C B C A
(It is a logical repeating pattern.)
Option (d): C A C B C
C B C A / C A C A / C B C A / C B C A
So, the following pattern is: C B C A
Thus, correct option is (c).

Q82. Study the following information carefully to answer the question given below-
Six students A, B, C, D, E and F are the top six rankers of the class. No two persons got the same rank. The student who got the highest marks is given rank 1 and the student who got the least marks is given rank 6. B got less marks than both C and F. A got more marks than E but less than D. B got the second least rank and F got the second highest rank, C got less marks than A. How many marks does E got?
(a) 40
(b) 38
(c) 18
(d) Data inadequate

Ans.(d)
Sol. Given:
B got less marks than both C and F
→ C and F scored more than B
A got more marks than E but less than D
→ D > A > E
B got the second least rank
→ B is Rank 5
F got the second highest rank
→ F is Rank 2
C got less marks than A
→ A > C
So combining all:
D > F > A > C > B > E
How many marks does E got?
But nowhere in the question are actual marks mentioned — only relative positions (ranks).
So, Data Inadequate
Because no numerical marks are given, only ranks — so we cannot determine how many marks E got.
Thus, the correct option is: (d)

Q83. A is shorter than E but taller than C. C is taller than D but shorter than B, who is shorter than A. Who among them is the tallest?
(a) D
(b) E
(c) B
(d) A
Ans.(b)
Sol. Given:
A is shorter than E but taller than C.
C is taller than D but shorter than B, who is shorter than A.
From the given information arrangment will be.
E > A > B > C > D
E is the tallest.
Thus, correct option is (b).

Q84. How many straight lines can be drawn through any two distinct points?
(a) One
(b) Two
(c) Three
(d) Infinite
Ans.(a)
Sol. Only one straight line can pass through two distinct points.
Correct answer is (A)

Q85. If a ray stands on a straight line, then the sum of the two adjacent angles formed is:
(a) 90°
(b) 180°
(c) 0°
(d) None of these
Ans.(b)
Sol. When a ray stands on a line, it forms a linear pair of angles.
The sum of angles in a linear pair is always: 180°
Correct answer is (B) → 180°

Q86. The value of
$5\sqrt{12} + 6\sqrt{27} - 4\sqrt{75} + \sqrt{192}$
(a) $22\sqrt{3}$
(b) $16\sqrt{3}$
(c) $18\sqrt{3}$
(d) $20\sqrt{3}$
Ans.(b)
Sol. Given:
$5\sqrt{12} + 6\sqrt{27} - 4\sqrt{75} + \sqrt{192}$
Solution:
$5\sqrt{12} + 6\sqrt{27} - 4\sqrt{75} + \sqrt{192}$
$= 5 \times 2$
$\sqrt{3} + 6 \times 3$
$\sqrt{3} - 4 \times 5$
$\sqrt{3} + 8$
$\sqrt{3} = 10$
$\sqrt{3} + 18$
$\sqrt{3} - 20$
$\sqrt{3} + 8\sqrt{3}$
$= \sqrt{3} \times (10 + 18 - 20 + 8)$
$=16\sqrt{3}$
∴ The simplified value of the given equation is 16
$\sqrt{3}$

Q87. What is the value of
$\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}+\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$
?
(a) 18
(b) 9
(c) 5
(d) 10
Ans.(d)
Sol. Given:
$\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}+\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$
Formula Used:
$(a-b)^2+(a+b)^2=2(a^2+b^2)(a+b)(a-b)=a^2-b^2$
Solution:
Let a = $\sqrt{3}$ and b = $\sqrt{2}$.
Then,
$\frac{a-b}{a+b}+\frac{a+b}{a-b}=\frac{(a-b)^2+(a+b)^2}{(a+b)(a-b)}$
$=\frac{2(a^2+b^2)}{a^2-b^2}$
Since
a^2 = 3 and
b^2 = 2, we get
$=\frac{2(3+2)}{3-2}=\frac{2\cdot5}{1}=10$
Alternate Solution:
Rationalize each term:
$\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}=\frac{(\sqrt{3}-\sqrt{2})^2}{3-2}=5-2\sqrt{6}$
$\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}=\frac{(\sqrt{3}+\sqrt{2})^2}{3-2}=5+2\sqrt{6}$
Adding: $(5-2\sqrt{6})+(5+2\sqrt{6})=10$

Q88. What is the value of $100°+3^3+4^3-2^5$?
(a) 59
(b) 56
(c) 60
(d) 65
Ans.(c)
Sol. Given:
$100°+3^3+4^3-2^5$
Solution:
$100°+3^3+4^3-2^5=1+27+64-32=1+27+32=60$

Q89. Ravi travels from City A to City B and from City B to City A in 4 hours. If the average speed of the total journey is 68.3 km/h, what is the distance between City A and City B?
(a) 136.6 km
(b) 273.2 km

(c) 197.6 km
(d) 152.7 km
Ans.(a)
Sol. Given:
Total time for the journey (A to B and B to A) = 4 hours
Average speed of the total journey = 68.3 km/h
Formula Used:
The formula for average speed is:
Average Speed $= \frac{\text{Total Distance}}{\text{Total Time}}$
Solution:
Let the distance between City A and City B be d km.
The total distance traveled in the round trip (A to B and B to A) is 2d .
Using the formula for average speed:
$68.3 = 2d = 68.3 \times 4 = 273.2$
$d = \frac{273.2}{2} = 136.6$ km
Thus, the distance between City A and City B is 136.6 km.

Q90. Madhvi started her journey at 9:25 am and covered 24% of the distance by 9:39:24 am. At what time will she reach her destination if she continues at the same speed?
(a) 10:25 am
(b) 10:20 am
(c) 10:15 am
(d) 10:30 am
Ans.(a)
Sol. Given:
Start time = 9:25 AM
By 9:39:24 AM, distance covered = 24%
Time taken to cover 24% =
$9:39:24 - 9:25:00 = 14\text{min}24\text{s}$
Formula Used:
Constant speed
time $\propto$ distance
Solution:
Convert elapsed time to seconds/minutes:
$14\text{min}24\text{s} = 14 \times 60 + 24 = 864\text{s} = 14.4\text{min}$
Total journey time:
$T = \frac{864}{0.24} = 3600\text{s} = 60\text{min}$
Arrival time:
Start 9:25 + 60 min = 10:25 am

Q91. Deepak alone can do a piece of work in 30 hours. Deepak and Rahul together can do the same work in 20 hours. Rahul and Varun together can do the same work in 15 hours. In how many hours can Varun alone do the same work?
(a) 17 hours
(b) 20 hours

(c) 25 hours
(d) 22 hours
Ans.(b)
Sol. Given:
Deepak (D) alone = 30 h
Deepak + Rahul (D+R) = 20 h
Rahul + Varun (R+V) = 15 h
Solution:
Deepak (D) alone = 30 h
rate = $\frac{1}{30}$
Deepak + Rahul (D+R) = 20 h
rate = $\frac{1}{20}$
Rahul + Varun (R+V) = 15 h
rate = $\frac{1}{15}$
R = $\frac{1}{20}-\frac{1}{30}=\frac{3-2}{60}=\frac{1}{60}$
V = $\frac{1}{15}-R=\frac{1}{15}-\frac{1}{60}=\frac{4-1}{60}=\frac{3}{60}=\frac{1}{20}$
Thus Varun's time =
$\frac{1}{V}=20\text{hours}$
Alternate Method:
Assume Total Work = LCM(30, 20, 15) = 60 units.
Deepak's rate D =
$\frac{60}{30}$ = 2 units/h.
(D+R) rate =
$\frac{60}{20}=$ 3 units/h
Rahul's rate R = 3 - 2 = 1 unit/h.
(R+V) rate = $\frac{60}{15}$
= 4 units/h
Varun's rate V = 4 - 1 = 3 units/h.
Varun alone time
$=\frac{60}{3}=20\text{hours}$

Q92. The efficiencies of A, B and C are in the ratio 2 : 5 : 7 working together, they can complete a work in 10 days. In how many days will, A alone be able to complete 30% of that work?
(a) 30
(b) 28
(c) 20
(d) 21
Ans.(d)
Sol. Given:
Efficiencies of A, B, C are in ratio 2 : 5 : 7. Together they finish the work in 10 days. Find the time taken by A alone to complete 30% of the work.
Formula Used:

Time = $\frac{\text{work}}{\text{rate}}$
Solution:
Combined daily rate = 2k + 5k + 7k = 14k.
Total work W =
$14k \times 10 = 140k$
Thirty percent of work =
$0.30W = 0.30 \times 140k = 42k$
A's daily rate = 2k.
Required time =
$\frac{42k}{2k} = 21$ days.

Q93. A can finish a task in 9 days which B can finish in 12 days. In how many days they can finish if they work together?
(a) $\frac{82}{6}$
(b) $\frac{52}{5}$
(c) $\frac{36}{7}$
(d) $\frac{42}{5}$
Ans.(c)
Sol. Given:
A can complete the task in 9 days.
B can complete the task in 12 days.
Formula Used:
Combined Work Rate $= \frac{1}{\text{Time taken by A}} + \frac{1}{\text{Time taken by B}}$ Total Time $= \frac{1}{\text{Combined Work Rate}}$
Solution:
Combined Work Rate =
$\frac{1}{9} + \frac{1}{12} = \frac{4}{36} + \frac{3}{36} = \frac{7}{36}$
Total Time $= \frac{1}{\frac{7}{36}} = \frac{36}{7}$ days
Alternate Solution:
Total Work = LCM of 9 and 12 = 36 unit
Efficiency of Ram =
$\frac{36}{9}$ = 4 unit per day
Efficiency of Shyam =
$\frac{36}{12}$ = 3 unit per day
Total Time $= \frac{\text{Total Work}}{\text{Combined Efficiency}} = \frac{36}{4+3} = \frac{36}{7}$ days

Q94. Two dice are thrown. The probability of getting the sum more than 10 is –
(a) 1/18
(b) 1/12
(c) 1/6
(d) 1/4
Ans.(b)

Sol. Given:
Two fair six-faced dice are thrown.
Formula Used:
Probability = $\frac{\text{favourable outcomes}}{\text{total outcomes}}$
Solution:
Total outcomes with two dice =
$6 \times 6 = 36$.
Sums greater than 10 are (11) and (12).
For (11): ((5,6), (6,5)) → 2 outcomes.
For (12): (6, 6) → 1 outcome.
Favourable outcomes = 2 + 1 = 3
P(sum > 10) $= \frac{3}{36} = \frac{1}{12}$.

Q95. Suppose that x and y are distinct variables that take values from 1, 2, 3, 4, 5, 6. What is the probability that the value of the expression xy + x + y is even?
(a) 1/2
(b) 1/3
(c) 1/4
(d) $\frac{1}{5}$
Ans.(d)
Sol. Given:
$(x, y \in 1,2,3,4,5,6; x \neq y)$
Expression: E = xy + x + y
Formula used:
Parity rule:
Odd + Odd = Even
Even + Even = Even
Odd + Even = Odd
Solution:
E = xy + x + y = (x+1)(y+1) - 1
E is even (x + 1)(y + 1) is odd
(x + 1) and (y + 1) both odd
x and y both even
Even numbers in {1,2,3,4,5,6} = {2,4,6} (3 choices)
Pick 2 distinct evens for (x ,y): $3 \times 2 = 6$ ordered pairs.
Total ordered pairs (x ,y), $x \neq y$: $6 \times 5 = 30$
Probability = $\frac{6}{30} = \frac{1}{5}$

Q96. The value of $\frac{7}{10} \div 1\frac{2}{5} \text{ of } \frac{3}{4} - 1\frac{1}{4} \text{ of } \frac{2}{3} \div 4\frac{1}{6} + \frac{1}{15}$ is:
(a) $\frac{3}{7}$
(b) $\frac{8}{15}$
(c) 1

(d) $\frac{1}{5}$

Ans.(b)

Sol. Given:

$\frac{7}{10} \div 1\frac{2}{5}\text{of}\frac{3}{4} - 1\frac{1}{4}\text{of}\frac{2}{3} \div 4\frac{1}{6} + \frac{1}{15}$

Solution:

$\frac{7}{10} \div 1\frac{2}{5}\text{of}\frac{3}{4} - 1\frac{1}{4}\text{of}\frac{2}{3} \div 4\frac{1}{6} + \frac{1}{15}\frac{7}{10} \div \frac{7}{5} \times \frac{3}{4} - \frac{5}{4} \times \frac{2}{3} \div 4\frac{1}{6} + \frac{1}{15} => \frac{7}{10} \div \frac{21}{20} - \frac{5}{6} \div \frac{25}{6} + \frac{1}{15} => \frac{7}{10} \times \frac{20}{21} - \frac{5}{6} \times \frac{6}{25} + \frac{1}{15} => \frac{2}{3} - \frac{1}{5} + \frac{1}{15} = \frac{(10-3+1)}{15} = \frac{8}{15}$

Q97. Two types of pulses of rates ₹116 per kg and ₹128 per kg are mixed in the ratio of 2 : 1 respectively. What will be the price per kg (in ₹) of the mixture so formed?

(a) 122

(b) 126

(c) 115

(d) 120

Ans.(d)

Sol. Given:

Price of 1st type of pulses = Rs.116/kg

Price of 2nd type of pulses = Rs. 128/kg

Ratio of mixing = 2:1

Formula Used:

$\text{Price per kg of mixture} = \frac{\text{Total cost of pulses}}{\text{Total weight of pulses}}$

Solution:

Let the quantities of pulses be 2x kg and 1x kg respectively.

Total cost of pulses = (2x × 116) + (1x × 128) = (232x + 128x) = 360x

Total weight of pulses = 2x + 1x = 3x kg

Price per kg of mixture = $\frac{360x}{3x}$

= Rs. 120/kg

Q98. The average age of husband, wife, and their child 4 years ago was 24 years and that of the husband and the child 5 years ago was 19 years. The present age of the wife is

(a) 36 years

(b) 37 years

(c) 30 years

(d) 34 years

Ans.(a)

Sol. Given:

Average age of three members (4 years ago) = 24 years

Average age of husband and child (5 years ago) = 19 years

Formula Used:

$\text{Average} = \frac{\text{Sum of observations}}{\text{Number of observations}}$

Solution:

Let H, W and C be present age of husband, wife and Son.

4 years ago the average = 24 years

(H - 4) + (W - 4) + (C - 4) = 24 × 3
=> H + W + C = 72 + 12 = 84 -----(1)
Now, from the second condition
=> (H - 5) + (C - 5) = 19 × 2
=> H + C = 38 + 10 = 48
Put H + C = 48 in eq(1)
=> W + 48 = 84
=> H = 84 - 48 = 36
Hence, the age of wife is 36 years.

Q99. The average of six consecutive odd numbers is 66. What is the average of the lowest and highest odd numbers out of these?
(a) 64
(b) 66
(c) 61
(d) 63
Ans.(b)
Sol. Given:
The average of six consecutive odd numbers is 66.
Formula Used:
Average = Sum of all terms / Number of terms
Solution:
Let the six consecutive odd numbers be x, x + 2, x + 4, x + 6, x + 8, x + 10
$\Rightarrow$ Average $= \frac{x+(x+2)+(x+4)+(x+6)+(x+8)+(x+10)}{6} = 66 \Rightarrow \frac{6x+30}{6} = 66$
=> 6x + 30 = 66 × 6 = 396
=> 6x = 396 - 30 = 366
=> x = $\frac{366}{6}$ = 61
The lowest number = x = 61
And the highest number = (x+10) = 61 + 10 = 71
Average = $\frac{\text{Lowest+Highest}}{2} = \frac{61+71}{2} = \frac{132}{2} = 66$

Q100. A 350 m long train running at a speed of 72 km/h crosses a bridge in $1\frac{1}{4}$ minutes. What is the length of the bridge (in m)?
(a) 1150
(b) 1180
(c) 980
(d) 1050
Ans.(a)
Sol. Given:
Length of the train = 350 m
Speed of the train = 72 km/h
Time taken to cross the bridge =
$1\frac{1}{4} = \frac{5}{4}$
min = 75 sec

Formula Used:
Speed = Distance / Time
Time = Distance / Speed
Distance covered by the train = Length of the train + Length of the bridge
Solution:
Speed in m/s = $\frac{72\times1000}{3600}$ = 20 m/s
Distance covered = 20 × 75 = 1500 m
The length of the bridge = Total distance covered - Length of the train:
Length of the bridge = 1500 - 350 = 1150 m
Thus, the length of the bridge is 1150 meters.