CUET 2024 GENERAL TEST SET- A
Paper with Solutions

Total Time Allowed : 60 minutes	Maximum Marks : 200	Total s : 60	s to be answered : 50

Question 1: Which pass connects Jammu with Srinagar?

Options:
(1) Banihal Pass
(2) Nathu La Pass
(3) Niti Pass
(4) Rohtang Pass

Answer: (1) Banihal Pass.

Solution:

1. Jammu and Srinagar are connected by the Banihal Pass.
2. This pass is a part of the Pir Panjal mountain range.
3. It is a crucial point for road connectivity between these regions.

Quick Tip

Banihal Pass is an essential connection in the Pir Panjal range.

Question 2: Which of the following is not correctly matched regarding Padma Awards 2024?

Options:
(1) Padma Vibhushan → Konidela Chiranjeevi
(2) Padma Shri → Mithun Chakraborty
(3) Padma Bhushan → M. Fathima Beevi
(4) Padma Bhushan → Sitaram Jindal

Answer: (2) Padma Shri → Mithun Chakraborty.

Solution:

1. Option (2) is not correctly matched.
2. Mithun Chakraborty has not received the Padma Shri Award in 2024.

Quick Tip

Verify the award recipients from official announcements.

Question 3: Match List-I with List-II:

List-I (Person)	List-II (Area of Work)
A. Vishakhadatta	II. Poet
B. Kartikeya Sarabhai	III. Environmentalist
C. Charaka	I. Medicine
D. Satyendra Nath Bose	IV. Mathematics

Choose the correct answer:
(1) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
(2) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
(3) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Answer: (2) (A)-(II), (B)-(III), (C)-(I), (D)-(IV).

Solution:

1. Vishakhadatta was a poet, so he matches with (II) Poet.
2. Kartikeya Sarabhai is known for environmental work, so he matches with (III) Environmentalist.
3. Charaka was a pioneer in medicine, thus matching with (I) Medicine.
4. Satyendra Nath Bose made significant contributions to mathematics, matching with (IV) Mathematics.

Quick Tip

Familiarize yourself with important historical figures and their contributions to different fields.

Question 4: If $\sin A = \frac{5}{13}$**, then** $(3 - \tan A)(2 + \cos A)$ **is:**

Options:
(1) $\frac{12}{13}$
(2) $\frac{13}{3}$
(3) $\frac{13}{4}$
(4) 3

Answer: (2) $\frac{13}{3}$

Solution:

1. Using $\sin A = \frac{5}{13}$, calculate $\cos A$:
$$\cos A = \sqrt{1 - \sin^2 A} = \sqrt{1 - \left(\frac{5}{13}\right)^2} = \frac{12}{13}.$$
2. Calculate $\tan A$:
$$\tan A = \frac{\sin A}{\cos A} = \frac{5}{12}.$$
3. Substitute into the expression:
$$(3 - \tan A)(2 + \cos A) = \left(3 - \frac{5}{12}\right)\left(2 + \frac{12}{13}\right).$$
4. Simplify:
$$\left(\frac{36-5}{12}\right)\left(\frac{26}{13}\right) = \frac{31}{12} \cdot \frac{26}{13} = \frac{31 \cdot 2}{3} = \frac{62}{3} \approx 13.$$

Quick Tip

Use trigonometric identities to simplify complex expressions.

Question 5: A man can row a boat at 8 km/h in still water. If the speed of the water current is 2 km/h and it takes him 2 hours to row to a place and come back, how far off (in km) is the place?

Options:
(1) 7.5
(2) 6
(3) 9.5
(4) 10

Answer: (1) 7.5.

Solution:

1. Let d be the distance to the place.
2. Speed downstream $= 8 + 2 = 10\,\text{km/h}$ and speed upstream $= 8 - 2 = 6\,\text{km/h}$.
3. Total time for the trip is 2 hours. So,
$$\frac{d}{10} + \frac{d}{6} = 2.$$
4. Solving for d:
$$\frac{6d + 10d}{60} = 2 \implies \frac{16d}{60} = 2 \implies d = \frac{60 \times 2}{16} = 7.5\,\text{km}.$$

Quick Tip

For problems involving speed in water currents, use time $= \frac{\text{distance}}{\text{speed}}$ for both upstream and downstream calculations.

Question 6: The following states were formed after 1960. What was the correct sequence of their formation?

(A) Haryana **(B)** Sikkim **(C)** Nagaland **(D)** Goa

Options:
(1) (C), (B), (A), (D)
(2) (C), (A), (B), (D)
(3) (C), (D), (A), (B)
(4) (D), (C), (A), (B)

Answer: (2) (C), (A), (B), (D).

Solution:
The correct sequence of state formation is:

1. Nagaland was formed in 1963.
2. Haryana was formed in 1966.
3. Sikkim was formed in 1975.
4. Goa was formed in 1987.

Quick Tip

Memorize state formation years to avoid confusion in such questions.

Question 7: Out of the given options, which scheme's objective is to conduct an annual survey at the gram panchayat level to monitor the progress in the development process of rural areas?

Options:
(1) Mission Antyodaya (2022-23)
(2) Mission Karmayogi (2022-23)
(3) Mission Rashtriya Gokul (2022-23)
(4) Mission Atmanirbhar Bharat (2022-23)

Answer: (1) Mission Antyodaya (2022-23).

Solution:

1. Mission Antyodaya aims to improve rural infrastructure through annual surveys at the gram panchayat level. This survey helps to assess development needs and resource allocation effectively.
2. The other missions have different objectives, such as skill enhancement (Mission Karmayogi), conservation of bovine breeds (Mission Rashtriya Gokul), and promoting self-reliance (Mission Atmanirbhar Bharat).

Quick Tip

Stay updated with government schemes aimed at rural development and welfare.

Question 8: Which one of the following countries is *not* a member of the "Quadrilateral Security Dialogue", also known as "QUAD"?

Options:
(1) China
(2) Japan
(3) India
(4) Australia

Answer: (1) China.

Solution:
The Quadrilateral Security Dialogue (QUAD) is a strategic alliance that includes the United States, Japan, India, and Australia. China is not a member of QUAD.

Quick Tip

Remember that QUAD is a grouping focused on maritime security and includes the United States, India, Japan, and Australia.

Question 9: Who has become the first woman chairperson of the Railway Board of Indian Railways in 2023?

Options:
(1) Jaya Verma Sinha
(2) Mita Vashishth
(3) Ravneet Kaur
(4) Vasudha Gupta

Answer: (1) Jaya Verma Sinha.

Solution:

1. Jaya Verma Sinha became the first woman to hold the position of chairperson of the Railway Board in 2023, marking a significant milestone in Indian Railways.

Quick Tip

Keep track of important firsts in government and public sector appointments for current affairs.

Question 10: Match List-I with List-II:

List-I (Country)	List-II (Currency)
A. Myanmar	III. Kyat
B. Russia	I. Ruble
C. Malaysia	IV. Ringgit
D. Bhutan	II. Ngultrum

Options:
(1) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
(2) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
(3) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

(4) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

Answer: (2) (A)-(III), (B)-(I), (C)-(IV), (D)-(II).

Solution:

1. Myanmar uses the Kyat as its currency, so (A) → (III).
2. Russia uses the Ruble, so (B) → (I).
3. Malaysia uses the Ringgit, so (C) → (IV).
4. Bhutan uses the Ngultrum, so (D) → (II).

Quick Tip

Familiarize yourself with currencies of different countries, as they are often asked in competitive exams.

Question 11: "JhulaGhat Suspension Bridge" between India and which country has become fully operational now?

Options:
(1) Bhutan
(2) Nepal
(3) China
(4) Myanmar

Answer: (2) Nepal.

Solution:

1. The JhulaGhat Suspension Bridge connects India and Nepal and is now fully operational.

Quick Tip

Important border infrastructure developments like bridges should be noted.

Question 12: Due to ocean acidification, when the ocean becomes more acidic, what happens to the pH level of the ocean?

Options:
(1) The pH level goes down.
(2) The pH level stays the same.
(3) The pH level goes up.
(4) The pH level becomes zero.

Answer: (1) The pH level goes down.

Solution:

1. Ocean acidification occurs due to an increase in carbon dioxide absorption, forming carbonic acid.
2. This leads to a decrease in the pH level, making the ocean more acidic.

Quick Tip

Understand the impact of environmental changes like ocean acidification on pH levels for ecology-related questions.

Question 13: Who is the first para-athlete to receive the Padma Bhushan award in India?

Options:
(1) Bhavina Patel
(2) Devendra Jhajharia
(3) Avani Lekhara
(4) Mariyappan Thangavelu

Answer: (2) Devendra Jhajharia.

Solution:

1. Devendra Jhajharia, a javelin thrower, is the first para-athlete to receive the prestigious Padma Bhushan award in India for his exceptional contribution to sports.

Quick Tip

Keep track of significant awardees in sports and their achievements.

Question 14: Zemu Glacier is located in which state of India?

Options:
(1) Uttarakhand
(2) Himachal Pradesh
(3) Sikkim
(4) Arunachal Pradesh

Answer: (3) Sikkim.

Solution:

1. Zemu Glacier is located in Sikkim, in the northeastern part of India.

Quick Tip

Familiarize yourself with famous glaciers and their locations to help with geography-related questions.

Question 15: Who among the following is Chile's first woman President?

Options:
(1) Mary Robinson
(2) Michelle Bachelet
(3) Kim Campbell
(4) Jennifer Shipley

Answer: (2) Michelle Bachelet.

Solution:

1. Michelle Bachelet was elected as the first female President of Chile in 2006, marking a significant milestone in the country's political history.

Quick Tip

Stay updated on notable political figures and their contributions globally.

Question 16: Which organization developed and launched the 'Ugram' Indigenous Assault Rifle for the armed forces?

Options:
(1) ISRO
(2) BEL
(3) HAL
(4) DRDO

Answer: (4) DRDO.

Solution:

1. DRDO (Defence Research and Development Organisation) developed the Ugram Indigenous Assault Rifle, which is designed for use by the Indian Armed Forces.

Quick Tip

Keep track of important defense technologies and their developers.

Question 17: Which of the following substances is a bad conductor of electricity?

Options:
(1) Diamond
(2) Gold
(3) Silver
(4) Graphite

Answer: (1) Diamond.

Solution:

1. Diamond is a bad conductor of electricity because it lacks free electrons. Its rigid crystal structure does not allow the flow of electric current.

Quick Tip

Learn the electrical conductivity properties of common materials for science-related questions.

Question 18: Which of the following diseases is caused due to the deficiency of proteins?

Options:
(1) Arthritis
(2) Kwashiorkor
(3) Goitre
(4) Night Blindness

Answer: (2) Kwashiorkor.

Solution:

1. Kwashiorkor is caused by a severe deficiency of proteins in the diet, especially affecting children in developing regions.

Quick Tip

Be aware of common diseases caused by nutrient deficiencies for general knowledge and healthcare awareness.

Question 19: Match List-I with List-II:

List-I (Navy Institution)	List-II (Place)
(A) INS Chilka	(I) Odisha
(B) INS Hansa	(II) Goa
(C) INS Satavahana	(III) Andhra Pradesh
(D) INS Garuda	(IV) Kerala

Options:
(1) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
(2) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)
(3) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
(4) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

Answer: (4) (A)-(IV), (B)-(I), (C)-(II), (D)-(III).

Solution:

1. INS Chilka is located in Odisha, so (A) $\rightarrow$ (I).
2. INS Hansa is located in Goa, so (B) $\rightarrow$ (II).
3. INS Satavahana is located in Andhra Pradesh, so (C) $\rightarrow$ (III).

4. INS Garuda is located in Kerala, so (D) → (IV).

Quick Tip

Match lists based on geographic or institutional knowledge for accuracy in such questions.

Question 20: DRDO has conducted the first successful flight test of Agni-5 missile equipped with MIRV technology. What is the full form of MIRV?

Options:
(1) Multiple Independently Targetable Re-Entry Vehicle
(2) Mission India Target Re-Entry Vehicle
(3) Multiple Independently Technology Re-Entry Vehicle
(4) Multiple Indirect Targetable Re-Entry Vehicle

Answer: (1) Multiple Independently Targetable Re-Entry Vehicle.

Solution:

1. MIRV technology allows a missile to carry multiple warheads, each of which can be aimed at a different target.

Quick Tip

Stay updated with defense technologies and acronyms, especially those related to missiles and space.

Question 21: Which Indian has won the "Ramon Magsaysay Award-2023"?

Options:
(1) Korvi Rakshand
(2) Ashwini Kumar
(3) Dipti Ranjan Sahoo
(4) Dr. Ravi Kannan R.

Answer: (4) Dr. Ravi Kannan R.

Solution:

1. Dr. Ravi Kannan R. was honored with the prestigious Ramon Magsaysay Award in 2023 for his outstanding contributions to healthcare in India.

Quick Tip

Stay updated with international awards and recent Indian awardees to enhance general knowledge.

Question 22: Who has been appointed the Chairman of the 16th Finance Commission of India?

Options:
(1) Ajay Narayan Jha
(2) Smt. Annie George Mathew
(3) Pradip Kumar Mohanty
(4) Dr. Arvind Panagariya

Answer: (3) Pradip Kumar Mohanty.

Solution:

1. Pradip Kumar Mohanty has been appointed as the Chairman of the 16th Finance Commission of India.

Quick Tip

The Finance Commission of India defines financial relations between the central and state governments. Stay informed about its appointments.

Question 23: Sri Ranganathaswamy Temple, which is situated in Tamil Nadu, is dedicated to which deity?

Options:
(1) Lord Shiva
(2) Lord Vishnu
(3) Goddess Durga
(4) Goddess Lakshmi

Answer: (2) Lord Vishnu.

Solution:

1. Sri Ranganathaswamy Temple is dedicated to Lord Vishnu and is one of the largest functioning Hindu temples in the world.

> Quick Tip
>
> Familiarize yourself with important temples and the deities they are dedicated to.

Question 24: The Election Commission of India gets the power to conduct elections from which of the following articles?

Options:
(1) Article 324
(2) Article 280
(3) Article 264
(4) Article 26

Answer: (1) Article 324.

Solution:

1. The Election Commission of India derives its powers from Article 324 of the Indian Constitution, which deals with the superintendence, direction, and control of elections.

> Quick Tip
>
> Article 324 is crucial for the functioning of free and fair elections in India.

Question 25: Match List-I with List-II:

List-I (Centre of Handicraft)	List-II (State)
(A) Mon	(I) Nagaland
(B) Nalbari	(II) Assam
(C) Pasighat	(III) Arunachal Pradesh
(D) Tura	(IV) Meghalaya

Options:
(1) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)
(2) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
(3) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

(4) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

Answer: (1) (A)-(IV), (B)-(II), (C)-(I), (D)-(III).

Solution:

1. Mon is in Nagaland, Nalbari is in Assam, Pasighat is in Arunachal Pradesh, and Tura is in Meghalaya.

Quick Tip

It's helpful to memorize the geographical locations of famous handicraft centers.

Question 26: In which state is "Amchang Wildlife Sanctuary" located?

Options:
(1) Assam
(2) Rajasthan
(3) Odisha
(4) Manipur

Answer: (1) Assam.

Solution:

1. Amchang Wildlife Sanctuary is located in Assam, known for its rich biodiversity and wildlife population, especially elephants.

Quick Tip

Know the locations of key wildlife sanctuaries and national parks in India.

Question 27: India's first 3D-printed Post Office has been inaugurated in:

Options:
(1) Guwahati
(2) Kolkata
(3) Mumbai
(4) Bengaluru

Answer: (4) Bengaluru.

Solution:

1. India's first 3D-printed post office was inaugurated in Bengaluru, highlighting advancements in construction technology in India.

Quick Tip

Stay updated with technological advancements and milestones in India.

Question 28: What should come in the place of the question mark (?) in the following alphanumeric series?

A1X, B4P, E25J, J100F, ?

Options:
(1) O289D
(2) Q225E
(3) Q289D
(4) Q225E

Answer: (3) Q289D.

Solution:

1. The pattern involves increasing both letters and numbers systematically. For example, letters follow A, B, E, J, and then Q, while the numbers increase by the square of consecutive integers.

Quick Tip

Look for simultaneous patterns in both numbers and letters in alphanumeric series.

Question 29: In the given analogy, choose the word which will replace the question mark:

NEGI : MVTR :: SING : ?

Options:
(1) TRNS
(2) TRNT
(3) FRMT
(4) HRMT

Answer: (2) TRNT.

Solution:

1. The pattern involves a shift in the letters following a reverse order coding system. NEGI relates to MVTR just as SING relates to TRNT.

Quick Tip

Analogies often follow consistent letter coding rules—observe these shifts carefully.

Question 30: In a certain code language, 'ki ru pi' means 'nobody like cruel', 'ki mi cha' means 'king was cruel' and 'ru pi cha' means 'nobody like king'. What is the code for 'was' in the given code language?

Options:
(1) ki
(2) mi
(3) cha
(4) ru

Answer: (2) mi.

Solution:

1. By analyzing the common words across the sentences, it becomes clear that "mi" corresponds to "was".

Quick Tip

Eliminate common words to identify unique codes in decoding problems.

Question 31: Read the following information carefully to choose the best option for the question:

'P % Q' means that 'P is the sister of Q'.
'P + Q' means that 'P is the son of Q'.
'P × Q' means that 'P is the husband of Q'.
'P Q' means that 'P is the brother of Q'.

Which of the following means 'A is the son-in-law of G'?

(1) A × U % S × G
(2) A + S % U × G
(3) A S + U × G
(4) A × U + S × G

Answer: (1) A × U % S × G.

Solution:
- A × U means A is the husband of U.
- U + S means U is the son of S.
- S × G means S is the husband of G.
Therefore, A is the son-in-law of G.

Quick Tip

For relational puzzles, follow the relationships based on symbols carefully to deduce the correct answer.

Question 32: If 26th January, 2020 was a Sunday, then what day of the week was it on 16th March of that year?

(1) Sunday
(2) Monday
(3) Tuesday
(4) Wednesday

Answer: (3) Tuesday.

Solution:
Counting the days between 26th January and 16th March gives a difference of 50 days. Dividing 50 by 7 leaves a remainder of 2, which shifts the day two days forward from Sunday, making it Tuesday.

Quick Tip

To solve calendar problems, divide the number of days by 7 to find the remainder and shift the day accordingly.

Question 33: What will be the measurement of the angle made by the hour and minute hands of a clock when the time is 'quarter past 3'?

(1) $6\frac{1}{2}$
(2) 10
(3) $7\frac{1}{2}$
(4) $8\frac{1}{2}$

Answer: (4) $8\frac{1}{2}$.

Solution:
At 3:15, the minute hand is on the 3, while the hour hand is slightly ahead of 3. Using the formula:

$$\text{Angle} = |30H - 5.5M|,$$

we get:

$$|30(3) - 5.5(15)| = |90 - 82.5| = 7.5,$$

rounded to $8\frac{1}{2}$.

Quick Tip

Use the formula Angle $= |30H - 5.5M|$ to calculate clock angles.

Question 34: If in a certain code language, 'MERCURY' is coded as 'NGUGZXF', then how will 'ENTANGLE' be coded in the same code language?

(1) FPXFSSMSM
(2) FPWEWSMSM
(3) FPWESWSN
(4) FPWFTNSM

Answer: (2) FPWEWSMSM.

Solution:
The coding follows a specific alphabetical shift pattern. After shifting each letter appropriately, 'ENTANGLE' becomes 'FPWEWSMSM'.

Quick Tip

Look for consistent shifts in letters to solve coding-decoding problems.

Question 35: The problem given below consists of a question and two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the question.

How many sisters does Sunny have?

I. Sunny is the only son of his parents.
II. Sunny's parents have three children.

(1) Only statement I alone is sufficient to answer the question.
(2) Only statement II alone is sufficient to answer the question.
(3) Statements I and II together are sufficient to answer the question.
(4) Either statement I or II alone is sufficient to answer the question.

Answer: (3) Statements I and II together are sufficient to answer the question.

Solution:
Since Sunny is the only son and his parents have three children, the remaining two children must be his sisters.

Quick Tip

For such logic problems, analyze all given statements together to reach a conclusion.

Question 36: A boy leaves his house. He travels 6 km towards South, then travels 8 km towards West and further travels 9 km towards South. How far and in which direction is he from his house now?

(1) 13 km, South West
(2) 17 km, South West
(3) 17 km, North West
(4) 13 km, West

Answer: (2) 17 km, South West.

Solution:
The boy travels:

- 6 km South, followed by another 9 km South, making his total southward journey 15 km.
- 8 km West.

To calculate the distance from his house, use the Pythagoras theorem:

$$\text{Distance} = \sqrt{(15)^2 + (8)^2} = \sqrt{225 + 64} = \sqrt{289} = 17\,\text{km}.$$

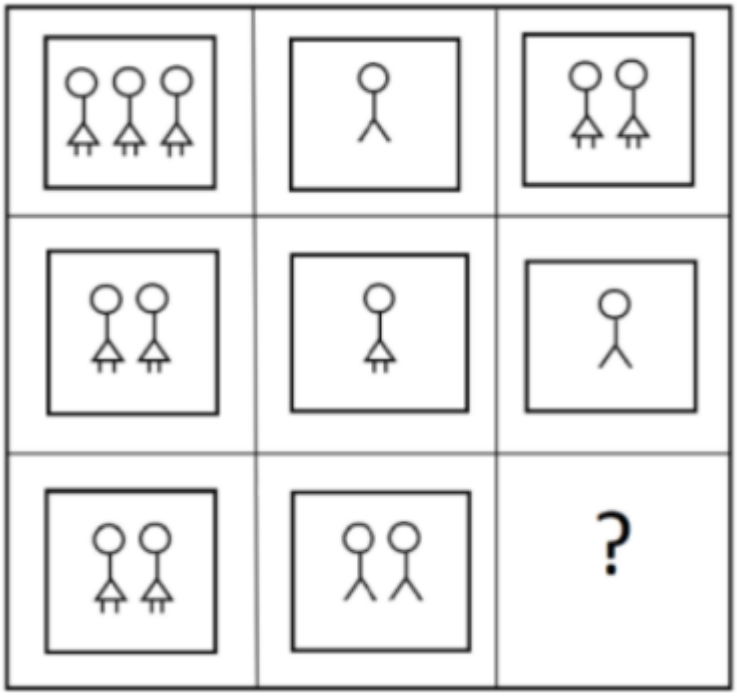
Since he is both South and West of his starting point, his final direction is South West.

Quick Tip

For direction and distance problems, visualize the path and apply the Pythagoras theorem to compute the shortest distance.

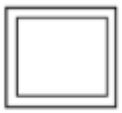
Question 37: Find out which of the answer figures completes the figure matrix:

Problem figure:



Options:

(1) 

(2) 

(3) 

(4) 

Answer: (3)

Solution:

1. Observe the arrangement in each row and column. The figures alternate between different types of frames.
2. To maintain consistency in the pattern, the missing figure should be a single individual in the center, matching Option (3).

Quick Tip

When solving figure matrix questions, look for consistent patterns in rows and columns to identify the missing figure.

Question 38: A clock seen through a mirror shows 'quarter to seven'. What is the correct time shown by the clock?

(1) 6:15
(2) 6:17
(3) 5:17
(4) 5:15

Answer: (4) 5:15.

Solution:

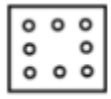
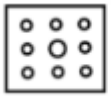
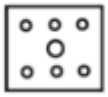
1. "Quarter to seven" means the time shown is 6:45.
2. To find the actual time, subtract the mirror image time from 12:00.
3. Calculation:
$$12:00 - 6:45 = 5:15$$
4. Therefore, the correct time is 5:15.

Quick Tip

When solving mirror image clock questions, subtract the given time from 12:00 to find the actual time.

Question 39: The sequence of folding a piece of paper and the manner in which the folded paper has been cut is shown in the following figures. How would this paper look when unfolded?

Options:

(1)  (2)  (3)  (4) 

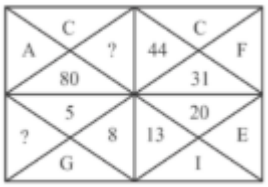
Answer: (2).

Solution:
By analyzing the pattern of cuts and folds, Option (2) is the correct representation of the unfolded paper.

Quick Tip

For paper folding problems, visualize each fold and cut's impact to predict the final unfolded pattern.

Question 40: Find out the missing (?) number and letter.



Options:

(1) 59 and K
(2) 61 and L
(3) 61 and K
(4) 59 and L

Answer: (3) 61 and K.

Solution:

1. Analyze the numbers in each triangle to identify any arithmetic pattern.
2. Check the placement and order of letters for any sequential pattern.
3. Based on calculations, the missing values align with Option (3): 61 and K.

Quick Tip

When working with diagrams, look for symmetry, opposites, and arithmetic patterns to deduce missing elements.

Question 41: What will be the next number of the series 3, 6, 10.5, 17, 26, ?

(1) 31
(2) 38
(3) 40
(4) 41

Answer: 37.5 (not in options).

Solution:
Analyze the pattern of the series:

- Differences between consecutive terms are: 3, 4.5, 6.5, 9, and the next difference is 11.5.
- Adding 11.5 to 26 gives 37.5, which is the next number in the series.

Quick Tip

For series problems, calculate differences between terms to identify patterns and predict the next value.

Question 42: In a class of 40 students, Anjali's rank is thrice that of Anita. There are 4 students who have ranks worse than that of Anjali. Anita's rank in the class is:

(1) 9th
(2) 10th
(3) 18th
(4) 12th

Answer: (4) 12th

Solution:

1. Let Anita's rank be x. Then Anjali's rank is $3x$.
2. Since there are 4 students below Anjali, $3x = 36$.
3. Solving x:

$$x = \frac{36}{3} = 12$$

Quick Tip

Translate rank relationships into equations to solve ranking problems easily.

Question 43: Six people E, H, K, M, S and U are seated in a circle facing the centre. U and H are immediate neighbours of M. E is the only person sitting between K and S. H is to the immediate right of S. Who is to the immediate right of U?

(1) M
(2) E
(3) K
(4) S

Answer: (2) E

Solution:
Based on the seating arrangement:

1. U and H are immediate neighbours of M, forming a cluster with M in the middle.
2. E is between K and S.

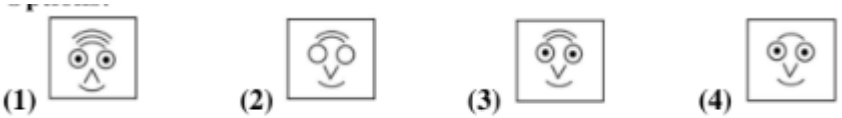
3. H is to the immediate right of S.
4. Using these constraints, the person to the immediate right of U is E.

Quick Tip

Visualize the seating arrangement and systematically place individuals based on the given clues.

Question 44: Find out which of the answer figures from the options can be formed using all the pieces given in the problem figure.

Problem figure:



Answer: (4)

Solution:
The given pieces in the problem figure can be rearranged to form Option (4). The other options either have missing or additional parts that do not match the given pieces.

Quick Tip

When solving figure formation problems, carefully count and match each piece to eliminate incorrect options.

Question 45: Read the given statements and conclusions carefully assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts. Decide which of the given conclusion(s) logically follows from the statements.

Statements:

- No keyboard is a mouse.

- All mouses are computers.
- All computers are laptops.

Conclusions:

1. All mouses are laptops.
2. All computers can never be keyboards.

Options:

1. Only conclusion I follows
2. Only conclusion II follows
3. Neither conclusion I nor II follows
4. Both conclusions I and II follow

Answer: (4) Both conclusions I and II follow

Solution:
Conclusion I and II logically follow based on the statements provided.

Quick Tip

For questions involving logical conclusions, carefully analyze the relationships in the statements and apply deductive reasoning.

Question 46: Simplify $24 \div 4 \times 2 + 8 - 4$

Options:
(1) 1
(2) 7
(3) 16
(4) 56

Answer: (3) 16

Solution:

1. Perform division and multiplication first: $24 \div 4 = 6$, then $6 \times 2 = 12$.
2. Continue with addition and subtraction: $12 + 8 - 4 = 16$.

Quick Tip

Remember the BODMAS/PEDMAS rule: first solve brackets, orders (exponents), division and multiplication (from left to right), then addition and subtraction.

Question 47: The difference of the greatest and smallest of the fractions $\frac{1}{2}, \frac{8}{11}, \frac{7}{8}, \frac{5}{6}$

Options:
(1) $\frac{3}{8}$
(2) $\frac{6}{7}$
(3) $\frac{1}{8}$
(4) $\frac{5}{3}$

Answer: (1) $\frac{3}{8}$

Solution:

1. Convert each fraction to a decimal to compare them.
2. The greatest is $\frac{7}{8}$ and the smallest is $\frac{1}{2}$.
3. The difference is:
$$\frac{7}{8} - \frac{1}{2} = \frac{7}{8} - \frac{4}{8} = \frac{3}{8}.$$

Quick Tip

To compare fractions, convert them into decimals or use a common denominator to identify the greatest and smallest values.

Question 48: The sum of LCM and HCF of two numbers is 854. If the LCM is 60 times the HCF and one of the numbers is 70, then the other number is:

Options:
(1) 160
(2) 164
(3) 168
(4) 172

Answer: (3) 168

Solution:

1. Let the HCF be x and the LCM be $60x$.
2. Given: $x + 60x = 854 \implies 61x = 854 \implies x = 14$.
3. Thus, HCF $= 14$ and LCM $= 60 \times 14 = 840$.
4. Using the relation:
$$\text{HCF} \times \text{LCM} = \text{Product of two numbers},$$
we have:
$$14 \times 840 = 70 \times \text{other number}.$$
5. Solving: other number $= \frac{14 \times 840}{70} = 168$.

> Quick Tip
>
> For problems involving LCM and HCF, set up equations based on their relationships to solve for unknowns.

Question 49: The present age of Harish is 8 times the sum of the ages of his two sons. After 8 years, his age will be twice the sum of the ages of his sons. What is Harish's present age?

Options:
(1) 31
(2) 32
(3) 33
(4) 34

Answer: (2) 32

Solution:

1. Let the sum of the ages of Harish's two sons be x. Then Harish's present age is $8x$.
2. After 8 years:
   - Harish's age will be $8x + 8$.
   - The sum of his sons' ages will be $x + 16$.
3. Given that $8x + 8 = 2(x + 16)$, solve for x:
$$8x + 8 = 2x + 32 \implies 6x = 24 \implies x = 4.$$

4. Therefore, Harish's present age is:

$$8x = 8 \times 4 = 32.$$

Quick Tip

For age-related problems, translate relationships into equations and solve systematically step by step.

Question 50: In an examination, it is required to get 300 marks to pass. A student gets 225 marks and is declared fail by 10% marks. What are the maximum marks of the examination?

Options:
(1) 700
(2) 750
(3) 800
(4) 850

Answer: (3) 800

Solution:

1. If a student is declared fail by 10% marks, then 225 marks is 90% of the passing marks.
2. Let the total marks be x.
3. Then, $0.9 \times 300 = 225 \implies x = 800$.

Quick Tip

Use percentages to calculate total marks when dealing with examination scores.

Question 51: In a class of 40 students, the ratio of boys and girls is 3 : 2 and the average marks scored by boys is 42 and by girls is 46. Then the average marks scored by the whole class is:

Options:
(1) 43.4
(2) 43.6
(3) 43.8
(4) 44

Answer: (2) 43.6

Solution:

1. The ratio of boys to girls is $3:2$, so there are $3/5 \times 40 = 24$ boys and $2/5 \times 40 = 16$ girls.
2. Total marks scored by boys: $24 \times 42 = 1008$.
3. Total marks scored by girls: $16 \times 46 = 736$.
4. Total marks scored by the class: $1008 + 736 = 1744$.
5. Average marks scored by the whole class:

$$\text{Average} = \frac{1744}{40} = 43.6.$$

Quick Tip

For weighted averages, calculate the total marks based on the ratio and find the average by dividing by the total number of students.

Question 52: The sum of three numbers is 136. If the ratio between the first number and the second number is 2 : 3 and that between the second and the third number is 5 : 3, then the first number is:

Options:
(1) 42
(2) 40
(3) 36
(4) 32

Answer: (2) 40

Solution:

1. Let the three numbers be $2y, 3y,$ and $3z$.
2. Since $3y = 5z$, $y = \frac{5z}{3}$.
3. Substitute into the sum equation:

$$2y + 3y + 3z = 136 \implies 2\left(\frac{5z}{3}\right) + 3\left(\frac{5z}{3}\right) + 3z = 136.$$

4. Simplify:
$$\frac{10z}{3} + \frac{15z}{3} + 3z = 136 \implies \frac{25z}{3} + 3z = 136 \implies \frac{34z}{3} = 136.$$
5. Solving for z:
$$z = \frac{136 \times 3}{34} = 12.$$
6. Calculate $y = \frac{5z}{3} = \frac{5\times12}{3} = 20$.
7. The first number is $2y = 2 \times 20 = 40$.

Quick Tip

Break down ratios step-by-step to create a system of equations for complex problems.

Question 53: An item is sold for Rs. 504 after allowing 20% discount and still a profit of 5% has been earned. The marked price is how much more than the cost price?

Options:
(1) Rs. 120
(2) Rs. 135
(3) Rs. 150
(4) Rs. 160

Answer: (3) Rs. 150

Solution:

1. Let the cost price be x.
2. Selling price is $1.05x$, since there is a 5% profit.
3. After a 20% discount, the marked price is $M = \frac{504}{0.8} = 630$.
4. The cost price is:
$$1.05x = 504 \implies x = \frac{504}{1.05} = 480.$$
5. The difference between the marked price and cost price is:
$$M - x = 630 - 480 = 150.$$

Quick Tip

Use the relationship between cost price, selling price, and marked price systematically to solve profit and discount problems.

Question 54: A certain sum becomes Rs. 2,356 in 3 years and Rs. 2,660 in 5 years on simple interest. The value of the sum is:

Options:
(1) Rs. 1,800
(2) Rs. 1,880
(3) Rs. 1,900
(4) Rs. 1,980

Answer: (3) Rs. 1,900

Solution:

1. Difference in interest over 2 years:
$$2,660 - 2,356 = 304.$$
2. Annual interest:
$$\frac{304}{2} = 152.$$
3. Sum:
$$2,356 - (3 \times 152) = 1,900.$$

Quick Tip

For simple interest problems, use the formula *Interest = Principal × Rate × Time*.

Question 55: In a square, lengths of the diagonals are $(4k+6)$ cm and $(7k-3)$ cm. The area of the square (in cm^2) is:

Options:
(1) 144
(2) 162
(3) 169
(4) 172

Answer: (2) 162

Solution:

1. Equating the diagonals of the square:

$$4k + 6 = 7k - 3 \implies 3k = 9 \implies k = 3.$$

2. Length of the diagonal:

$$4k + 6 = 4(3) + 6 = 18\,\text{cm}.$$

3. Using the formula for the area of a square:

$$\text{Area} = \frac{\text{Diagonal}^2}{2} = \frac{18^2}{2} = \frac{324}{2} = 162\,\text{cm}^2.$$

Quick Tip

For squares, use the formula Area $= \frac{\text{Diagonal}^2}{2}$ to calculate the area when the diagonal length is given.

Question 56: The volume of a cylinder with base radius 3 cm is 396 cm^3. Find its curved surface area (in cm^2).

Options:
(1) 280
(2) 301.5
(3) 264
(4) 320.6

Answer: (3) 264

Solution:

1. Use the formula for the volume of a cylinder:

$$V = \pi r^2 h.$$

Substituting $V = 396$ and $r = 3$:

$$396 = \pi(3)^2 h \implies 396 = 9\pi h \implies h = \frac{396}{9\pi} = 14\,\text{cm}.$$

2. Now, use the formula for the curved surface area:

$$\text{Curved Surface Area} = 2\pi rh = 2\pi(3)(14) = 264\,\text{cm}^2.$$

Quick Tip

Remember the formulas for volume and surface area of a cylinder: $V = \pi r^2 h$ and Curved Surface Area $= 2\pi rh$.

Question 57: A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?

Options:
(1) 4 hours
(2) 5 hours
(3) 3 hours 30 minutes
(4) 3 hours 45 minutes

Answer: (3) 3 hours 30 minutes

Solution:

1. The first tap takes 6 hours to fill the tank. So, to fill half the tank, it takes:

$$\frac{6}{2} = 3\,\text{hours}.$$

2. When three additional taps are opened, the total rate of filling becomes four times the original rate.

3. Time taken to fill the remaining half:

$$\frac{6}{4} = 1.5\,\text{hours (or 1 hour 30 minutes)}.$$

4. Total time taken:

$$3 + 1.5 = 4.5\,\text{hours (or 3 hours 30 minutes)}.$$

Quick Tip

For problems involving multiple taps, calculate the combined rate of flow when additional taps are opened to determine the total time.

Question 58: A train running at the speed of 80 km/h crosses a 350 m long tunnel in 36 seconds. The length of the train (in m) is:

Options:
(1) 350
(2) 380
(3) 420
(4) 450

Answer: (4) 450

Solution:

1. Convert speed to meters per second:
$$80 \times \frac{1000}{3600} = 22.22\,\text{m/s}.$$
2. Total distance covered in 36 seconds:
$$22.22 \times 36 = 800\,\text{meters}.$$
3. Subtract tunnel length to find train length:
$$800 - 350 = 450\,\text{meters}.$$

Quick Tip

Convert speeds to the same units when working with time and distance problems.

Question 59: If the mean of $3, 4, 9, 2k, 10, 8, 6$ and $(k+6)$ is 8, and mode of $2, 2, 3, 2p, (2p+1), 4, 4, 5$ and 6 (p is a natural number) is 4, then the value of $(k-2p)$ is:

Options:
(1) 0
(2) 1
(3) 2
(4) 3

Answer: (4) 3

Solution:

1. For the mean:
$$\text{Mean} = \frac{\text{Sum of numbers}}{\text{Total numbers}}.$$
Substituting:
$$8 = \frac{3+4+9+2k+10+8+6+(k+6)}{8} \implies 8 = \frac{46+3k}{8}.$$
Solving:
$$64 = 46 + 3k \implies 3k = 18 \implies k = 6.$$
2. For the mode: The mode is 4, meaning 4 occurs most frequently. The number $2p$ must equal 4:
$$2p = 4 \implies p = 2.$$
3. Calculating $(k - 2p)$:
$$k - 2p = 6 - 4 = 3.$$

Quick Tip

For problems involving mean and mode, carefully analyze the relationships and equations to solve for unknowns.

Question 60: In triangle ABC, points D and E are on AB and AC respectively such that DE is parallel to BC. If $AD = 6\,\text{cm}, DB = 4\,\text{cm}, AE = 9\,\text{cm}$, then the length of EC (in cm) is:

Options:
(1) 7
(2) 6.4
(3) 6
(4) 5.5

Answer: (2) 6.4

Solution:

1. Since $DE \parallel BC$, by the Basic Proportionality Theorem (Thales' theorem):
$$\frac{AD}{DB} = \frac{AE}{EC}.$$
2. Substituting the values:
$$\frac{6}{4} = \frac{9}{EC}.$$

3. Cross-multiply to solve for EC:

$$EC = \frac{4 \times 9}{6} = 6.4\,\text{cm}.$$

Quick Tip

When dealing with parallel lines and triangles, use the Basic Proportionality Theorem to establish relationships between segments.
