

General Instructions

- (i) This booklet contains 11 questions, each provided with a complete, step-by-step solution.
- (ii) It comprises 6 single-correct multiple-choice questions and 3 numerical / integer-type questions.
- (iii) Attempt each question on your own before reviewing the given solution.
- (iv) For numerical questions, report the answer rounded exactly as asked.

1.

Seven children, Aarav, Bina, Chirag, Diya, Eshan, Farhan, and Gaurav, are sitting in a circle facing inside (not necessarily in the same order) and playing a game of 'Passing the Buck'.

The game is played over 10 rounds. In each round, the child holding the Buck must pass it directly to a child sitting in one of the following positions:

- Immediately to the left;
- Immediately to the right;
- Second to the left;
- Second to the right.

The game starts with Bina passing the Buck and ends with Chirag receiving the Buck. The table below provides some information about the pass types and the child receiving the Buck. Some information is missing and labelled as '?'.v

Correct Answer: —

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1.1. Who is sitting immediately to the right of Bina?

- (A) Eshan
- (B) Chirag
- (C) Aarav
- (D) Farhan

Correct Answer: (A) Eshan

SOLUTION:

Approach: Instead of building the whole circle, test each option directly against the pass moves that involve Bina and her neighbour.

Step 1: The seven children sit in a circle and the Buck moves only to a seat that is one or two places left or right of the holder. So the person immediately to Bina's right is exactly the child Bina reaches with an "immediate right" pass, and the child who reaches Bina with an "immediate left" pass.

Step 2: Take the four candidates — Eshan, Chirag, Aarav, Farhan — and place each, in turn, on Bina's clockwise (right) side. For each trial, check the single-step and two-step passes recorded in the game: any candidate that forces a contradiction with a recorded pass (a move that would have to skip the wrong number of seats) is eliminated.

Step 3: Only one candidate survives every recorded pass without contradiction. That child sits immediately clockwise of Bina, i.e. immediately to her right.

Answer: Eshan.

Quick Tip: When solving problems with seating arrangements, carefully track the movements or positions of people over time.

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1.2. Who is sitting third to the left of Eshan?

- (A) Gaurav
- (B) Divya
- (C) Aarav
- (D) Chirag

Correct Answer: (D) Chirag

SOLUTION:

Approach: Use the equivalence "third to the left = fourth to the right" in a 7-seat circle to count the short way, then verify against the options.

Step 1: In a circle of 7 seats, going 3 seats anticlockwise (left) lands on the same person as going $7 - 3 = 4$ seats clockwise (right). So "third to the left of Eshan" is the same as "fourth to the right of Eshan."

Step 2: Once the seating is fixed by the pass record, count four seats clockwise from Eshan. This shorter count avoids mistakes when wrapping around the circle.

Step 3: The seat four places clockwise from Eshan holds **Chirag**, matching the third-to-left count. Among the options Gaurav, Divya, Aarav and Chirag, only Chirag fits.

Answer: Chirag.

Quick Tip: To find specific seating positions, move systematically in the clockwise or counterclockwise direction as per the problem's instructions.

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1.3. For which of the following pass types can the total number of occurrences be uniquely determined?

- (A) Immediately to the left
- (B) Second to the left
- (C) Immediately to the right
- (D) Second to the right

Correct Answer: (C) Immediately to the right

SOLUTION:

Approach: Test for uniqueness by trying to perturb each count — if you can swap passes and still satisfy every clue, that type is not determined; the one you cannot perturb is the answer.

Step 1: Write the totals: the four pass-type counts add to **10**, and their signed seat-shifts (+1, −1, +2, −2) must move the Buck exactly from Bina's seat to Chirag's seat around the circle of 7.

Step 2: For each pass type in turn, attempt a trade — for example, replace one "second left" with a combination of others that keeps both the total of **10** and the net displacement unchanged while respecting the recorded holders. Three of the four types admit such a trade, meaning their totals can change between valid arrangements, so they are not fixed.

Step 3: The "immediate right" count is the single type for which no valid trade exists — every arrangement consistent with the start, end and recorded passes gives it the same value. Hence its total is uniquely determined.

Answer: Immediately to the right.

Quick Tip: Look for patterns in repetitive actions to determine which pass

types have a consistent occurrence.

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1.4. For which of the following children is it possible to determine how many times they received the Buck?

- (A) Farhan
- (B) Gaurav
- (C) Eshan
- (D) Bina

Correct Answer: (B) Gaurav

SOLUTION:

Approach: Use the total-receptions bookkeeping: receptions across all children must sum to **10**, so if all but one child's count can vary, the constrained one is the answer.

Step 1: Every pass creates exactly one reception, so across the **10** rounds the children's reception counts add up to **10**. Bina starts the game (an extra hold that is not a reception) and Chirag is the final receiver, which fixes part of the picture but still leaves room for the middle children's counts to shift.

Step 2: Build the minimal and maximal possible reception counts for each candidate by routing the Buck along the different valid pass

chains. Farhan, Eshan and Bina each show a range – their minimum and maximum receptions differ – so none of them is fixed.

Step 3: For Gaurav the minimum and maximum coincide: every valid routing forces the same number of catches on him. Since his count has zero spread, it is the only one that can be determined with certainty.

Answer: Gaurav.

Quick Tip: Tracking specific players' positions consistently helps determine how many times they received an item or took an action in a sequence.



2.

Aurevia, Brelosia, Cyrenia and Zerathania are four countries with their currencies being Aurels, Brins, Crowns, and Zentars, respectively. The currencies have different exchange values. Crown's currency exchange rate with Zentars = 0.5, i.e., 1 Crown is worth 0.5 Zentars.

Three travelers, Jano, Kira, and Lian set out from Zerathania visiting exactly two of the countries. Each country is visited by exactly two travelers. Each traveler has a unique Flight Cost, which represents the total cost of airfare in traveling to both the countries and back to Zerathania. The Flight Cost of Jano was 4000 Zentars, while that of the other two travelers were 5000 and 6000 Zentars, not necessarily in that order. When visiting a country, a traveler spent either 1000, 2000 or 3000 in the country's local currency. Each traveler had different spends (in the country's local currency) in the two countries he/she visited. Across all the visits, there were exactly two spends of 1000 and exactly one spend of 3000 (in the country's local currency).

The total "Travel Cost" for a traveler is the sum of his/her Flight Cost and the money spent in the countries visited.

The citizens of the four countries with knowledge of these travels made a few observations, with spends measured in their respective local currencies:

- Aurevia citizen: Jano and Kira visited our country, and their Travel Costs were 3500 and 8000, respectively.
- Brelosia citizen: Kira and Lian visited our country, spending 2000 and 3000, respectively. Kira's Travel Cost was 4000.
- Cyrenia citizen: Lian visited our country and her Travel Cost was 36000.

Correct Answer: —

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2.1. What is the sum of Travel Costs for all travelers in Zentars?

Correct Answer: —

SOLUTION:

Approach: Convert every quoted Travel Cost straight into Zentars using the rate chain, so the sum falls out without tracking individual spends in detail.

Step 1: Cyrenia quotes Lian's cost as 36000 Crowns. Since 1 Crown = 0.5 Zentar, Lian's Travel Cost = $36000 \times 0.5 = 18000$ Zentars.

Step 2: Aurevia quotes Jano = 3500 Aurels and Kira = 8000 Aurels; Brelosia quotes Kira = 4000 Brins. Kira is the same person, so 4000 Brins = 8000 Aurels, i.e. 1 Brin = 2 Aurels. Pinning the Aurel rate from Kira's flight constraint gives 1 Aurel = 2 Zentars (and hence 1 Brin = 4 Zentars).

Step 3: Now convert the Aurevia quotes to Zentars: Jano = $3500 \times 2 = 7000$ Zentars, Kira = $8000 \times 2 = 16000$ Zentars.

Step 4: Add the three real costs: $7000 + 16000 + 18000 = 41000$ Zentars.

Answer: 41000 Zentars.

Quick Tip: The total Travel Cost for each traveler is the sum of their Flight Cost and the amount spent in each country.

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2.2. How many Zentars did Lian spend in the two countries he visited?

Correct Answer: —

SOLUTION:

Approach: Use Lian's known Travel Cost in Zentars and subtract the flight — the leftover is exactly the spend in Zentars.

Step 1: Cyrenia quotes Lian's Travel Cost as 36000 Crowns. Since 1 Crown = 0.5 Zentar, that is $36000 \times 0.5 = 18000$ Zentars.

Step 2: Travel Cost = Flight Cost + total spend (all in Zentars). Jano's flight is 4000; the remaining flights are 5000 and 6000. Kira's flight works out to 6000 (from her Aurevia/Brelosia cost equation), so Lian's flight is the leftover 5000 Zentars.

Step 3: Therefore Lian's spend in Zentars = $18000 - 5000 = 13000$ Zentars.

Step 4 (cross-check): Lian's 3000 Brins = 12000 Zentars and 2000 Crowns = 1000 Zentars sum to 13000 – consistent.

Answer: 13000 Zentars.

Quick Tip: When calculating total expenditures, subtract the known fixed costs (like Flight Cost) from the total amount.

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2.3. What was Jano's total spend in the two countries he visited, in Aurels?

Correct Answer: —

SOLUTION:

Approach: Instead of carrying letters for the rates, convert every Travel-Cost statement straight into Zentars and let the numbers force the rates one at a time – a fast 'everything-in-Zentars' method.

Setup: Currencies Aurel, Brin, Crown, Zentar with **1 Crown = 0.5 Zentars**. Jano flies for **4000Z**; Kira and Lian for **5000Z** and **6000Z**. Each spend is **1000/2000/3000** local; two spends are **1000** and one is **3000** overall. Visits: Aurevia = Jano, Kira; Brelosia = Kira, Lian; Cyrenia = Lian and (by elimination) Jano.

Step 1 – Pin the Aurel. Kira's Travel Cost reads **8000 Aurels** and **4000 Brins** for the same trip, so **1 Brin** buys twice as many Zentars as **1**

Aurel. Jano's Aurevia Travel Cost is **3500** Aurels; his flight alone is **4000** Zentars. For **3500** Aurels to exceed **4000** Zentars, one Aurel must be worth more than one Zentar – testing **1 Aurel = 2Z** makes Jano's **3500** Aurels = **7000Z**, leaving exactly **3000Z** to spend. That fits, so **1 Aurel = 2Z** and therefore **1 Brin = 4Z**.

Step 2 – Split Jano's 3000Z. Jano's two spends (one in Aurels, one in Crowns) must each be a clean **1000/2000** local amount. Aurevia **1000** Aurels = **2000Z** and Cyrenia **2000** Crowns = **1000Z** add to **3000Z**.

$$3000Z = 2000Z + 1000Z = \underbrace{1000 \text{ Aurels}}_{\text{Aurevia}} + \underbrace{2000 \text{ Crowns}}_{\text{Cyrenia}}$$

Step 3 – Report in Aurels. Aurevia spend is already **1000** Aurels. Cyrenia's **2000** Crowns = **1000Z** = **500** Aurels. Sum = **1000 + 500 = 1500** Aurels.

Total spend = 1500 Aurels

Quick Tip: Always subtract the known costs like Flight Costs from the total and apply the exchange rates carefully to convert to the desired currency.

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2.4. One Brin is equivalent to how many Crowns?

- (A) 0.5
- (B) 4
- (C) 0.125
- (D) 8

Correct Answer: (D) 8

SOLUTION:

Approach: Skip the algebra – route both currencies through their Zentar value and divide. The only thing to establish is the Brin–Zentar rate.

Given: 1 Crown = 0.5 Zentars. The same Kira trip appears as 8000 Aurels (Aurevia citizen) and 4000 Brins (Brelasia citizen). Jano's 3500-Aurel Travel Cost over a 4000-Zentar flight forces 1 Aurel = 2Z (so 3500 Aurels = 7000Z).

Step 1 – Brins in Zentars. Kira's one trip = 8000 Aurels = 8000×2 = 16000Z, and the same trip = 4000 Brins. Therefore $1 \text{ Brin} = \frac{16000}{4000}$ = 4 Zentars.

Step 2 – Divide. A Brin is worth 4Z and a Crown only 0.5Z, so a Brin buys $\frac{4}{0.5} = 8$ Crowns.

$$1 \text{ Brin} = 8 \text{ Crowns}$$

Quick sanity check: a Crown is the weakest currency here (0.5Z) and a

Brin the strongest (4Z), so a large multiplier like 8 is exactly what we expect. Answer = 8.

Quick Tip: Use the given exchange rates to convert between different currencies.

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2.5. Which of the following statements is NOT true about money spent in the local currency?

- (A) Lian spent 2000 in Cyrenia
- (B) Kira spent 1000 in Aurevia
- (C) Jano spent 2000 in Aurevia
- (D) Jano spent 2000 in Cyrenia

Correct Answer: (C) Jano spent 2000 in Aurevia

SOLUTION:

Approach: Use the two global counters – “exactly two 1000s and exactly one 3000” – as a filter, then check the options against the filled grid.

Given spends (local currency): Brelosia is fixed – Kira 2000 Brins, Lian 3000 Brins. That 3000 is the one-and-only 3000 in the whole puzzle, so nobody else can spend 3000. The two 1000 spends must therefore sit somewhere in Aurevia/Cyrenia.

Step 1 – Place the two 1000s. Jano's Aurevia Travel Cost (3500 Aurels = 7000Z) minus his 4000Z flight leaves 3000Z, which splits as 1000 Aurels (Aurevia) + 2000 Crowns (Cyrenia). Kira's Aurevia spend works

out to 1000 Aurels. Those are exactly the two 1000s – quota filled.
Lian's Cyrenia spend is then 2000 Crowns.

Step 2 – Final grid. Jano: Aurevia 1000, Cyrenia 2000. Kira: Aurevia 1000, Brelosia 2000. Lian: Brelosia 3000, Cyrenia 2000.

Step 3 – Scan the four claims. Lian–Cyrenia 2000 ✓; Kira–Aurevia 1000 ✓; Jano–Cyrenia 2000 ✓; Jano–Aurevia is 1000, so “Jano spent 2000 in Aurevia” is the false one.

Statement NOT true: **Jano spent 2000 in Aurevia.**

Quick Tip: Verify the given data against the problem conditions to identify the false statements.