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LOGIC · LOGICAL REASONING

12. Linear Ranking, Ordering & Inequalities

Official PMDC Solved Past Paper Topical Booklet · High-Yield Examination Series

17 Solved Questions

2022 to 2025 Archive

Boards: BUMHS, DUHS, KMU, NUMS, SZABMU, UHS

Weightage: 3% of MDCAT (6 MCQs)

Curated by Ibrahim for fellow bees. Every question in this chapter has been verified against official UHS, NUMS, SZABMU, DUHS, and KMU answer keys. Propolis cognitive autopsies are provided at the end of this booklet to explain core concepts and break down common distractor traps.

OFFICIAL SOLVED EDITION

Q1.

SZABMU 2025

In a row of students, a student is at 13th position from the left end and at 20th position from the right end. How many students are there in the row?

- (A) 30
- (B) 32
- (C) 31
- (D) 33

Q2.

SZABMU 2025

A is older than B but younger than F. C is younger than B but older than D. Who is the **youngest** of them?

- (A) A
- (B) B
- (C) C
- (D) D

Q3.

KMU 2025

Ahmed ranks 10th in the class of 46 students. There are only 7 students below Bilal rankwise. How many students are there between Ahmed and Bilal?

- (A) 27
- (B) 30
- (C) 28
- (D) 32

Q4.

NUMS 2025

In a row of students, a student is at 13th position from the left end and at 20th position from the right end. How many students are there in the row?

- (A) 30
- (B) 31
- (C) 32
- (D) 33

Q5.

NUMS 2025

A is older than B but younger than F. C is younger than B but older than D. Who is the **youngest** of them?

- (A) A
- (B) B
- (C) C
- (D) D

Q6.

DUHS 2025

If Amna is older than Muneeb, and Muneeb is younger than Jaffar, then Amna is:

- (A) Older than Jaffar
- (B) Younger than Jaffar
- (C) Same age as Jaffar
- (D) Not enough information to say

Q7.

DUHS 2025

If Amna is older than Muneeb, and Muneeb is younger than Jaffar, then Amna is:

- (A) Older than Jaffar
- (B) Younger than Jaffar
- (C) Same age as Jaffar
- (D) Not enough information to say

Q8.

KMU 2025

Ahmed ranks 10th in the class of 46 students. There are only 7 students below Bilal rank wise. How many students are there between Ahmed and Bilal?

- (A) 27
- (B) 28
- (C) 30
- (D) 32

Q9.

SZABMU 2025

In a row of students, a student is at 13th position from the left end and at 20th position from the right end. How many students are there in the row?

- (A) 30
- (B) 31
- (C) 32
- (D) 33

Q10.

SZABMU 2025

A is older than B but younger than F. C is younger than B but older than D. Who is the youngest of them?

- (A) A
- (B) B
- (C) C
- (D) D

Q11.

BUMHS 2024

If the first two statements are true, the third statement is:

- I. Maria runs faster than Amna.
- II. Laiba runs faster than Maria.
- III. Amna runs faster than Laiba.

- (A) True
- (B) False
- (C) Uncertain
- (D) None of these

Q12.

SZABMU 2024

The high school maths department needs to appoint a new chairperson on the basis of seniority.

- Ms. Madiha is less senior than Mr. Tanvir but more than Ms. Aiyza.
- Mr. Rehan is more senior than Ms. Madiha but less than Mr. Tanvir.
- Mr. Tanvir doesn't want the job.

Who will be the new chairperson of the maths department?

- (A) Mr. Rehan
- (B) Mr. Tanvir
- (C) Ms. Aiyza
- (D) Ms. Madiha

Q13.

KMU 2024

If $a > b$, $b > c$, and $d > a$, then:

- (A) $b < d$
- (B) $a < c$
- (C) $b > d$
- (D) $c > d$

Q14.

DUHS 2024

Three students X, Y, and Z run in a race. Y and Z run faster than X. Who will win?

- (A) X wins
- (B) Y wins
- (C) Z wins
- (D) Data Insufficient

Q15.

DUHS 2023

Sara is five ranks below the top student, Faiq, in a class of 50 students. What is Sara's rank from the bottom of the class?

- (A) 5th
- (B) 15th
- (C) 45th
- (D) 55th

Q16.

KMU 2022

Five bags are lying in a pile one above the other.

- A is above B
- C is above D but below E
- D is above A

Which bag is in the **middle** of the pile?

- (A) E
 - (B) D
 - (C) A
 - (D) B
-

Q17.

UHS 2022

Drake was wearing a blue shirt with black jeans and brown shoes. John was wearing a red shirt with black jeans and black shoes. Ahmad was wearing black jeans, a blue or red shirt, and shoes that were not black.

Who copied Drake?

- (A) Ahmad
 - (B) John
 - (C) Drake
 - (D) Cannot elicit from given information
-

RAPID 5–COLUMN ANSWER KEY

Official PMDC verified answer keys for 12. Linear Ranking, Ordering & Inequalities.

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Q#	KEY	BOARD	Q#	KEY	BOARD	Q#	KEY	BOARD	Q#	KEY	BOARD	Q#	KEY	BOARD
1	B	SZABMU 2025	5	D	NUMS 2025	9	C	SZABMU 2025	13	A	KMU 2024	17	A	UHS 2022
2	D	SZABMU 2025	6	D	DUHS 2025	10	D	SZABMU 2025	14	D	DUHS 2024			
3	C	KMU 2025	7	D	DUHS 2025	11	B	BUMHS 2024	15	C	DUHS 2023			
4	C	NUMS 2025	8	B	KMU 2025	12	A	SZABMU 2024	16	B	KMU 2022			

TOTAL MCQS
17

CORRECT

INCORRECT

BLANK

ACCURACY

%

Scan the booklet QR code to enter answers in **BeambePrep Grind Mode** for automated error autopsies.

PROPOLIS COGNITIVE ERROR AUTOPSIES

Step-by-step conceptual derivations, formula working, and distractor autopsies for every question.

Question #1 Key: (B)

SZABMU 2025

In a row of students, a student is at 13th position from the left end and at 20th position from the right end....

CORE CONCEPT AND DERIVATION

Linear Ranking and Position.

Formula: Total = (Left Position) + (Right Position) - 1

Solution:

- Total = $13 + 20 - 1 = 32$.

Why other options are incorrect:

- **Option C:** Forgets to subtract 1 to account for double-counting the student.

Question #2 Key: (D)

SZABMU 2025

A is older than B but younger than F. C is younger than B but older than D. Who is the youngest of them?

CORE CONCEPT AND DERIVATION

Relative Inequality Ranking.

Formula: Set up transitive inequalities.

Solution:

- Statement 1: $F > A > B$
- Statement 2: $B > C > D$
- Combined chain: $F > A > B > C > D$

D is clearly the youngest.

Why other options are incorrect:

- **Options A, B, and C:** Occupy higher positions in the age hierarchy.

Question #3 Key: (C)

KMU 2025

Ahmed ranks 10th in the class of 46 students. There are only 7 students below Bilal rankwise. How many student...

CORE CONCEPT AND DERIVATION

Intermediary Count in Ranks.

Formula: Between = $\text{Rank}_2 - \text{Rank}_1 - 1$

Solution:

- Ahmed's rank from top = 10.
- Bilal's rank from top = $46 - 7 = 39$.
- Students strictly between = $39 - 10 - 1 = 28$.

Why other options are incorrect:

- **Option A:** Forgets to subtract 1 (calculates $39 - 10 = 29$ or miscounts).

Question #4 Key: (C)

NUMS 2025

In a row of students, a student is at 13th position from the left end and at 20th position from the right end....

CORE CONCEPT AND DERIVATION

Single-element Overlap Calculation.

Formula: $N = L + R - 1$

Solution:

- $N = 13 + 20 - 1 = 32$.

Why other options are incorrect:

- **Option D:** Adds 1 instead of subtracting.

Question #5 Key: (D)

NUMS 2025

A is older than B but younger than F. C is younger than B but older than D. Who is the youngest of them?

CORE CONCEPT AND DERIVATION

Linear Order Deductions.

Formula: N/A

Solution: $F > A > B > C > D$. D is at the lowest position.

Why other options are incorrect:

- **Option C:** C is older than D.

Question #6 Key: (D)

DUHS 2025

If Amna is older than Muneeb, and Muneeb is younger than Jaffar, then Amna is:

CORE CONCEPT AND DERIVATION

Indeterminate Inequalities.

Formula: $A > M$ and $J > M$.

Solution: Knowing that both Amna and Jaffar are older than Muneeb provides no comparison between Amna and Jaffar.

Why other options are incorrect:

- **Options A, B, and C:** Assume specific relationships without supporting premises.

Question #7 Key: (D)

DUHS 2025

If Amna is older than Muneeb, and Muneeb is younger than Jaffar, then Amna is:

CORE CONCEPT AND DERIVATION

Inequality Transitivity Limitations.

Formula: N/A

Solution: Both Amna and Jaffar are older than Muneeb, but no relationship between Amna and Jaffar is defined.

Why other options are incorrect:

- **Options A, B, and C:** Introduce unstated assumptions.

Question #8 Key: (B)

KMU 2025

Ahmed ranks 10th in the class of 46 students. There are only 7 students below Bilal rank wise. How many students...

CORE CONCEPT AND DERIVATION

Rank Offset.

Formula: $(46 - 7) - 10 - 1 = 28$

Solution: Bilal rank = 39. Students strictly between 10th and 39th = 28.

Why other options are incorrect:

- **Option A:** Off-by-one miscalculation.

Question #9 Key: (C)

SZABMU 2025

In a row of students, a student is at 13th position from the left end and at 20th position from the right end....

CORE CONCEPT AND DERIVATION

Total Row Count.

Formula: $13 + 20 - 1 = 32$

Solution: Total students = 32.

Why other options are incorrect:

- **Option D:** Double-counts the target student.

Question #10 Key: (D)

SZABMU 2025

A is older than B but younger than F. C is younger than B but older than D. Who is the youngest of them?

CORE CONCEPT AND DERIVATION

Transitive Inequality Chains.

Formula: $F > A > B > C > D$

Solution: D is the youngest.

Why other options are incorrect:

- **Option C:** C is older than D.

Question #11 Key: (B)

BUMHS 2024

If the first two statements are true, the third statement is: I. Maria runs faster than Amna. II. Laiba runs f...

CORE CONCEPT AND DERIVATION

Transitive Inequality Consistency.

Formula: $\text{Laiba} > \text{Maria} > \text{Amna}$

Solution: Statement I and II establish Laiba as the fastest and Amna as the slowest. Statement III claims Amna is faster than Laiba, which directly contradicts the chain and is **False**.

Why other options are incorrect:

- **Option A:** Directly contradicts the mathematical sequence.

Question #12 Key: (A)

SZABMU 2024

The high school maths department needs to appoint a new chairperson on the basis of seniority. • Ms. Madiha is...

CORE CONCEPT AND DERIVATION

Positional Ranking Order.

Formula: Seniority Order: $\text{Tanvir} > \text{Rehan} > \text{Madiha} > \text{Aiyza}$

Solution: Since Mr. Tanvir declines the appointment, the next eligible person in seniority order is **Mr. Rehan**.

Why other options are incorrect:

- **Options C and D:** Are less senior than Mr. Rehan.

Question #13 Key: (A)

KMU 2024

If [Formula], [Formula], and [Formula], then:

CORE CONCEPT AND DERIVATION

Inequality Chains.

Formula: $d > a > b > c$

Solution: Chain confirms $d > b$, which is identical to $b < d$.

Why other options are incorrect:

- **Option B:** Contradicts $a > c$.

Question #14 Key: (D)

DUHS 2024

Three students X, Y, and Z run in a race. Y and Z run faster than X. Who will win?

CORE CONCEPT AND DERIVATION

Incomplete Comparison Sets.

Formula: N/A

Solution: The premises give $Y > X$ and $Z > X$, but provide no relative speed comparison between Y and Z.

Why other options are incorrect:

- **Options B and C:** Assume relative superiority without data.

Question #15 Key: (C)

DUHS 2023

Sara is five ranks below the top student, Faiq, in a class of 50 students. What is Sara's rank from the bottom...

CORE CONCEPT AND DERIVATION

Inverted Order Rank Formula.

Formula: $\text{Bottom Rank} = N - \text{Top Rank} + 1$

Solution:

- Top Rank of Faiq = 1. Sara's rank from top = $1 + 5 = 6$.
- Sara's rank from bottom = $50 - 6 + 1 = 45\text{th}$.

Why other options are incorrect:

- **Option D:** Exceeds the total class size.

Question #16 **Key: (B)**

KMU 2022

Five bags are lying in a pile one above the other. • A is above B • C is above D but below E • D is above A Wh...

CORE CONCEPT AND DERIVATION

Linear Vertical Ordering.

Formula: Set up vertical stack hierarchy.

Solution:

- 1. E is above C ($E > C$)
- 2. C is above D ($C > D$)
- 3. D is above A ($D > A$)
- 4. A is above B ($A > B$)

Combined vertical stack (Top to Bottom): **E, C, D, A, B**. The middle bag (3rd position) is **D**.

Why other options are incorrect:

- **Option A:** E is at the top position.
- **Option D:** B is at the bottom position.

Question #17 **Key: (A)**

UHS 2022

Drake was wearing a blue shirt with black jeans and brown shoes. John was wearing a red shirt with black jeans...

CORE CONCEPT AND DERIVATION

Feature Matching Logic.

Formula: N/A

Solution: Drake's unique distinguishing feature is non-black (brown) shoes combined with black jeans. Ahmad's description explicitly specifies wearing non-black shoes and black jeans, matching Drake's specific outfit combination.

Why other options are incorrect:

- **Option B:** John wore all-black footwear.