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LOGIC · LOGICAL REASONING

05. Categorical Syllogisms & Overlapping Sets

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

© 22 Solved Questions

👤 2022 to 2025 Archive

🛡 Boards: BUMHS, DUHS, FMDC, KMU, 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.**

UHS 2025

All daffodils are plants. All plants are living things.
Some living things are real.

Conclusions:

- I. All daffodils are living things.
- II. Some living things are flowers.
- III. All daffodils are real.

Which conclusions follow?

- (A) Only I
- (B) Only I and II
- (C) Only II and III
- (D) All follow

Q2.

DUHS 2025

Statements:

All melons are apples.
No apples are mangoes.

Conclusions:

- I. All melons are mangoes.
- II. Apples are not mangoes.

- (A) All melons are mangoes
- (B) Apples are not mangoes
- (C) Both A and B are correct
- (D) None of them

Q3.

DUHS 2025

Statements:

All melons are apples.
No apples are mangoes.

Conclusions:

- I. All melons are mangoes.
- II. Apples are not mangoes.

- (A) All melons are mangoes
- (B) Apples are not mangoes
- (C) Both A and B are correct
- (D) None of them

Q4.

UHS 2025

All daffodils are plants. All plants are living things.
Some living things are real.

Conclusions:

- I. All daffodils are living things.
- II. Some living things are flowers.
- III. All daffodils are real.

Which conclusions follow?

- (A) Only I
- (B) Only I and II
- (C) Only II and III
- (D) All follow

Q5.

FMDC 2024

Statements:

A ball is a sphere.

All spheres are round.

Some round things are mesmerizing.

Which of the following conclusions is **NECESSARILY TRUE**?

I. All balls are mesmerizing.

II. All round things are spheres.

III. Some mesmerizing things are spheres.

- (A) III
 (B) I and II
 (C) II and III
 (D) I and III

Q6.

FMDC 2024

Statements:

No cats are goats.

All goats are animals.

Some animals are herbivores.

Which of the following conclusions are **NECESSARILY TRUE**?

I. Some cats are animals.

II. All animals are goats.

III. Some herbivores are animals.

- (A) I and II
 (B) III
 (C) I and III
 (D) II and III

Q7.

KMU 2024

Statements:

All omnivores are herbivores.

No herbivores are carnivores.

Some carnivores are humans.

Which of the following conclusions are **TRUE**?

I. Some humans are carnivores.

II. No carnivores are omnivores.

III. Some omnivores are carnivores.

- (A) I and II
 (B) I and III
 (C) II and III
 (D) III

Q8.

DUHS 2024

Statements:

All men are hardworking.

Some men are kings.

Conclusions:

I. All men are kings.

II. All kings are hardworking.

- (A) Only I
 (B) Only II
 (C) I and II
 (D) Neither I nor II

Q9.

UHS 2024

All hammers are tools. Some tools are useless things.

All useless things are trash.

Which of the following is **NECESSARILY TRUE**?

I. Some hammers are trash.

II. Some tools are trash.

III. All useless things are tools.

- (A) I and III
 (B) I and II
 (C) II and III
 (D) II

Q10.

BUMHS 2023

All children are silly people. Some silly people are rich people. All rich people are big shots.

Which of the following conclusions are **NECESSARILY TRUE**?

I. Some silly people are children.

II. Some rich people are children.

III. Some silly people are big shots.

- (A) I and III
 (B) II
 (C) II and III
 (D) I and II

Q11.

FMDC 2023

Statements:

A ball is a sphere.

All spheres are round.

Some round things are mesmerizing.

Which of the following conclusions is **NECESSARILY TRUE**?

- (A) Some mesmerizing things are spheres.
- (B) All balls are mesmerizing.
- (C) All round things are spheres.
- (D) All balls are round and mesmerizing.

Q12.

KMU 2023

Statements:

Some teachers are students.

All students are girls.

No student is a boy.

Conclusions:

I. Some teachers are boys.

II. Some girls are teachers.

III. Some girls are students.

- (A) Only I follows
- (B) Only I, II and III follow
- (C) Only II follows
- (D) Only II and III follow

Q13.

DUHS 2023

Statements:

I. Some pens are glass.

II. All glass are wall.

Conclusions:

I. Some wall are pens.

II. Some wall are glass.

- (A) Only conclusion (I) follows
- (B) Only conclusion (II) follows
- (C) Both conclusions follow
- (D) Neither conclusion (I) nor conclusion (II) follows

Q14.

DUHS 2023

Statements:

No cities are countries.

No countries are villages.

Conclusions:

I. Some countries are city.

II. No villages are city.

- (A) Only conclusion I follows
- (B) Only conclusion II follows
- (C) Only conclusion I and II follow
- (D) Neither conclusion I nor conclusion II follows

Q15.

DUHS 2023

Statements:

All cups are pencils.

Some pencils are pens.

Conclusions:

I. Some pencils are cups.

II. No pencil are cups.

III. Some cups are pens.

- (A) Only conclusion I follows
- (B) Only conclusion III follows
- (C) Only conclusion I and II follow
- (D) Only conclusion II and III follow

Q16.

DUHS 2023

Statements:

All fruits are leaves.

Some fruits are grapes.

Conclusions:

I. Some leaves are grapes.

II. All grapes are fruits.

- (A) Only conclusion I follows
- (B) Both conclusions I and II follow
- (C) Only conclusion II follows
- (D) Neither conclusion I nor conclusion II follows

Q17.

DUHS 2023

Statements:

All apples are bananas.

No banana is a mango.

Some mangoes are oranges.

Conclusions:

I. All oranges can never be bananas.

II. Some mangoes are apples.

- (A) Only conclusion I follows
(B) Only conclusion II follows
(C) Either conclusion I or conclusion II follows
(D) Neither conclusion I nor conclusion II follows

Q18.

UHS 2023

All children are silly people. Some silly people are rich people. All rich people are big shots.

Which conclusions are NECESSARILY TRUE?

I. Some silly people are children.

II. Some rich people are children.

III. Some silly people are big shots.

- (A) I and III
(B) II
(C) II and III
(D) I and II

Q19.

SZABMU 2023

Syllogism: All balls are spheres. All spheres are round. Some round things are mesmerizing.

- (A) III only
(B) I and II only
(C) II and III only
(D) I and III only

Q20.

BUMHS 2022

All children are silly people. Some silly people are rich people. All rich people are big shots.

Which of the following conclusions are NECESSARILY TRUE?

- (A) I and III
(B) II
(C) II and III
(D) I and II

Q21.

SZABMU 2022

All hammers are tools. Some tools are useless things. All useless things are trash.

Which of the following is NECESSARILY TRUE given only the information above?

- (A) I and III
(B) I and II
(C) II and III
(D) II

Q22.

UHS 2022

Some bags are pouches. All pouches are cases. No cases are purses.

Which of the following conclusions are NECESSARILY TRUE?

I. Some pouches are purses.

II. Some bags are cases.

III. No bags are purses.

- (A) I and II
(B) I and III
(C) II
(D) II and III

RAPID 5–COLUMN ANSWER KEY

Official PMDC verified answer keys for 05. Categorical Syllogisms & Overlapping Sets.

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Q#	KEY	BOARD	Q#	KEY	BOARD	Q#	KEY	BOARD	Q#	KEY	BOARD	Q#	KEY	BOARD
1	A	UHS 2025	6	B	FMDC 2024	11	A	FMDC 2023	16	A	DUHS 2023	21	D	SZABMU 2022
2	B	DUHS 2025	7	A	KMU 2024	12	D	KMU 2023	17	A	DUHS 2023	22	C	UHS 2022
3	B	DUHS 2025	8	D	DUHS 2024	13	C	DUHS 2023	18	A	UHS 2023			
4	A	UHS 2025	9	D	UHS 2024	14	D	DUHS 2023	19	A	SZABMU 2023			
5	A	FMDC 2024	10	A	BUMHS 2023	15	A	DUHS 2023	20	A	BUMHS 2022			

TOTAL MCQS
22

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: (A)

UHS 2025

All daffodils are plants. All plants are living things. Some living things are real. Conclusions: I. All daffo...

CORE CONCEPT AND DERIVATION

Categorical Syllogisms.

Formula: Subsets obey transitive inclusion: $A \subset B \wedge B \subset C \Rightarrow A \subset C$.

Solution:

- Daffodils $\subset$ Plants $\subset$ Living things. Hence, all daffodils are living things (I is valid).
- No premise mentions 'flowers' (II is invalid).
- 'Some living things are real' does not guarantee that daffodils overlap with real things (III is invalid).

Why other options are incorrect:

- **Options B, C, and D:** Assume unsupported connections not provided in the premises.

Question #2 Key: (B)

DUHS 2025

Statements: All melons are apples. No apples are mangoes. Conclusions: I. All melons are mangoes. II. Apples a...

CORE CONCEPT AND DERIVATION

Deductive Syllogisms.

Formula: Direct statement logical equivalence.

Solution: Premise 2 states 'No apples are mangoes', which directly means 'Apples are not mangoes' (Conclusion II).

Why other options are incorrect:

- **Option A:** Contradicts Premise 2 (Melons are subset of Apples, so no melons can be mangoes).

Question #3 Key: (B)

DUHS 2025

Statements: All melons are apples. No apples are mangoes. Conclusions: I. All melons are mangoes. II. Apples a...

CORE CONCEPT AND DERIVATION

Categorical Syllogisms.

Formula: Direct conversion of universal negative premise.

Solution: 'No apples are mangoes' is logically equivalent to 'Apples are not mangoes'.

Why other options are incorrect:

- **Option A:** Contradicts premise 2.

Question #4 Key: (A)

UHS 2025

All daffodils are plants. All plants are living things. Some living things are real. Conclusions: I. All daffo...

CORE CONCEPT AND DERIVATION

Categorical Subsets.

Formula: N/A

Solution: Daffodils $\subset$ Plants $\subset$ Living things. Conclusion I is strictly valid.

Why other options are incorrect:

- **Options B, C, and D:** Mention unstated elements.

Question #5 Key: (A)

FMDC 2024

Statements: A ball is a sphere. All spheres are round. Some round things are mesmerizing. Which of the followi...

CORE CONCEPT AND DERIVATION

Syllogistic Deduction.

Formula: Intersection of subset collections.

Solution: Since all spheres belong to the set of round things, and some round things overlap with mesmerizing items, it logically follows that some mesmerizing items share space with spheres (Conclusion III).

Why other options are incorrect:

- **Options B, C, and D:** Assume universal inclusion ('All balls are mesmerizing') which is not guaranteed.

Question #6 Key: (B)

FMDC 2024

Statements: No cats are goats. All goats are animals. Some animals are herbivores. Which of the following conc...

CORE CONCEPT AND DERIVATION

Syllogism Conversions.

Formula: Some A are $B \iff$ Some B are A

Solution: 'Some animals are herbivores' converts directly to 'Some herbivores are animals' (Conclusion III).

Why other options are incorrect:

- **Options A, C, and D:** Include unproven assumptions regarding cats or goats.

Question #7 Key: (A)

KMU 2024

Statements: All omnivores are herbivores. No herbivores are carnivores. Some carnivores are humans. Which of t...

CORE CONCEPT AND DERIVATION

Syllogistic Deduction Sets.

Formula: Disjoint subset relationships.

Solution:

- Conclusion I: Conversion of 'Some carnivores are humans' is true.
- Conclusion II: Omnivores are inside Herbivores; Herbivores share zero overlap with Carnivores. Thus, no carnivores are omnivores (True).

Why other options are incorrect:

- **Options B and C:** Include Conclusion III which directly contradicts premise 2.

Question #8 Key: (D)

DUHS 2024

Statements: All men are hardworking. Some men are kings. Conclusions: I. All men are kings. II. All kings are ...

CORE CONCEPT AND DERIVATION

Syllogistic Quantifier Scope.

Formula: N/A

Solution: Premises only establish that some kings are hardworking (those who are men). Neither universal conclusion follows.

Why other options are incorrect:

- **Option B:** Assumes non-male kings are also hardworking, which is unstated.

Question #9 Key: (D)

UHS 2024

All hammers are tools. Some tools are useless things. All useless things are trash. Which of the following is ...

CORE CONCEPT AND DERIVATION

Syllogism Inclusions.

Formula: N/A

Solution: 'Some tools are useless' + 'All useless are trash' $\implies$ those useless tools are trash (II is true). No link binds hammers directly to trash.

Why other options are incorrect:

- **Options A, B, and C:** Claim unverified links for hammer subsets.

Question #10 Key: (A)

BUMHS 2023

All children are silly people. Some silly people are rich people. All rich people are big shots. Which of the ...

CORE CONCEPT AND DERIVATION

Venn Diagram Deductions.

Formula: N/A

Solution:

- I is valid: 'All children are silly' converts to 'Some silly people are children'.
- III is valid: Silly people who are rich are automatically big shots.

Why other options are incorrect:

- **Options B, C, and D:** Include II which lacks mandatory subset overlap.

Question #11 Key: (A)

FMDC 2023

Statements: A ball is a sphere. All spheres are round. Some round things are mesmerizing. Which of the followi...

CORE CONCEPT AND DERIVATION

Syllogistic Overlaps.

Formula: N/A

Solution: Since all spheres are round and some round things are mesmerizing, the subset of mesmerizing round items includes spheres.

Why other options are incorrect:

- **Options B and D:** Assume an absolute connection between balls and mesmerizing things where none is guaranteed.

Question #12 **Key: (D)**

KMU 2023

Statements: Some teachers are students. All students are girls. No student is a boy. Conclusions: I. Some teac...

CORE CONCEPT AND DERIVATION

Venn Diagram Subset Inclusions.

Formula: N/A

Solution:

- II is true: Teachers who are students are girls.
- III is true: Conversion of 'All students are girls'.

Why other options are incorrect:

- **Option A:** Conclusion I is invalid because no student is a boy.

Question #13 **Key: (C)**

DUHS 2023

Statements: I. Some pens are glass. II. All glass are wall. Conclusions: I. Some wall are pens. II. Some wall ...

CORE CONCEPT AND DERIVATION

Categorical Syllogisms.

Formula: N/A

Solution: Glass is entirely enclosed within Wall. Since Pens overlap with Glass, Pens must overlap with Wall (I is true). Also, since all Glass is Wall, some Wall is Glass (II is true).

Why other options are incorrect:

- **Options A and B:** Are incomplete.

Question #14 **Key: (D)**

DUHS 2023

Statements: No cities are countries. No countries are villages. Conclusions: I. Some countries are city. II. N...

CORE CONCEPT AND DERIVATION

Negative Premise Inferences.

Formula: Two negative premises yield no definitive affirmative conclusion.

Solution: Conclusion I contradicts Premise I directly. Conclusion II claims a relation between villages and cities that is not guaranteed by the premises.

Why other options are incorrect:

- **Options A, B, and C:** Violate syllogistic rules for double negative premises.

Question #15 **Key: (A)**

DUHS 2023

Statements: All cups are pencils. Some pencils are pens. Conclusions: I. Some pencils are cups. II. No pencil ...

CORE CONCEPT AND DERIVATION

Universal Affirmative Conversions.

Formula: All A are B $\implies$ Some B are A

Solution: 'All cups are pencils' converts directly to 'Some pencils are cups' (I is valid).

Why other options are incorrect:

- **Option B:** Cups and pens do not have a guaranteed overlap.

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

DUHS 2023

Statements: All fruits are leaves. Some fruits are grapes. Conclusions: I. Some leaves are grapes. II. All gra...

CORE CONCEPT AND DERIVATION

Overlapping Set Syllogisms.

Formula: N/A

Solution: Grapes overlap with fruits, and all fruits are leaves; thus grapes must overlap with leaves (I is true).

Why other options are incorrect:

- **Option B:** Premise states 'Some fruits are grapes', not 'All grapes are fruits'.

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

DUHS 2023

Statements: All apples are bananas. No banana is a mango. Some mangoes are oranges. Conclusions: I. All orange...

CORE CONCEPT AND DERIVATION

Disjoint Group Constraints.

Formula: N/A

Solution: Oranges that are mangoes cannot be bananas because no mango is a banana. Thus, 'All oranges can never be bananas' is true.

Why other options are incorrect:

- **Option B:** Contradicts the disjoint set between apples (inside bananas) and mangoes.

Question #18 **Key: (A)**

UHS 2023

All children are silly people. Some silly people are rich people. All rich people are big shots. Which conclus...

CORE CONCEPT AND DERIVATION

Syllogistic Deduction Sets.

Formula: N/A

Solution:

- I is valid: Direct conversion of 'All children are silly'.
- III is valid: Silly people who are rich are automatically big shots.

Why other options are incorrect:

- Option B: Conclusion II is unproven.

Question #19 **Key: (A)**

SZABMU 2023

Syllogism: All balls are spheres. All spheres are round. Some round things are mesmerizing.

CORE CONCEPT AND DERIVATION

Categorical Overlaps.

Formula: N/A

Solution: Conclusion III ('Some mesmerizing things are spheres') is the only logically necessary deduction.

Why other options are incorrect:

- Options B, C, and D: Assert unproven universal conclusions.

Question #20 **Key: (A)**

BUMHS 2022

All children are silly people. Some silly people are rich people. All rich people are big shots. Which of the ...

CORE CONCEPT AND DERIVATION

Syllogistic Deduction Sets.

Formula: N/A

Solution: I and III follow logically from the subset constraints.

Why other options are incorrect:

- Option B: II lacks mandatory set inclusion.

Question #21 **Key: (D)**

SZABMU 2022

All hammers are tools. Some tools are useless things. All useless things are trash. Which of the following is ...

CORE CONCEPT AND DERIVATION

Syllogism Overlaps.

Formula: N/A

Solution: Conclusion II ('Some tools are trash') is the only guaranteed deduction.

Why other options are incorrect:

- Options A, B, and C: Claim unverified hammer/trash connections.

Question #22 **Key: (C)**

UHS 2022

Some bags are pouches. All pouches are cases. No cases are purses. Which of the following conclusions are NECE...

CORE CONCEPT AND DERIVATION

Syllogistic Inclusion Sets.

Formula: N/A

Solution: Bags that are pouches are automatically inside Cases because all pouches are cases (Conclusion II is true). No purses can be pouches because purses share zero overlap with cases.

Why other options are incorrect:

- Options A and B: Conclusion I contradicts premise 3.