NMAT Logical Reasoning Sample Paper 02

Instructions

- **Total Questions:** 36 Multiple Choice Questions
- **Time Allocation:** 40 Minutes
- **Marking Pattern:** Standardized adaptive scoring weight per section. No negative marks apply under core examination guidelines.

1 Critical Reasoning (Questions 1–10)

1. All professors are researchers. Some researchers are writers. Which conclusion follows?
    A. A. All professors are writers
    B. B. Some writers are professors
    C. C. Some researchers may be professors
    D. D. No professor is a writer

2. **Statement:** Companies investing in employee training often perform better.
Which assumption is implicit?
    A. A. Training improves employee skills.
    B. B. All employees require training.
    C. C. Training eliminates competition.
    D. D. Training reduces profits.

3. All laptops are computers. Some computers are expensive.
Which conclusion follows?
    A. A. All laptops are expensive.
    B. B. Some laptops are expensive.
    C. C. No laptop is expensive.
    D. D. Cannot be determined.

4. Which option weakens the argument below?
“Online education is more effective than classroom education.”
    A. A. Many students struggle to stay motivated online.

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B. B. Online courses are cheaper.
C. C. Internet access is improving.
D. D. More universities offer online programs.

5. **Statement:** Exercise reduces stress. Yoga is exercise.
Conclusion:
A. A. Yoga reduces stress.
B. B. Stress reduces yoga.
C. C. Yoga increases stress.
D. D. None follows.

6. All fruits contain vitamins. Some vitamins improve immunity.
Conclusion:
A. A. All fruits improve immunity.
B. B. Some fruits improve immunity.
C. C. No fruit improves immunity.
D. D. Cannot be determined.

7. Which option strengthens the argument below?
"Flexible work hours increase productivity."
A. A. Employees report higher job satisfaction.
B. B. Office buildings are expensive.
C. C. Many companies hire interns.
D. D. Internet speeds are improving.

8. All birds have wings. Some winged creatures can fly.
Conclusion:
A. A. All birds can fly.
B. B. Some birds can fly.
C. C. No birds can fly.
D. D. Cannot be determined.

9. A survey finds that people who read newspapers daily are more informed.
Best conclusion:
A. A. Reading newspapers may improve awareness.
B. B. Newspapers should replace schools.
C. C. All informed people read newspapers.
D. D. Awareness is unrelated to reading.

10. Choose the strongest inference based on the options below:
A. A. Higher income always leads to happiness.
B. B. People with higher incomes often report greater satisfaction.
C. C. Income and satisfaction are unrelated.
D. D. Happiness depends only on money.

2 Analytical Reasoning (Questions 11–20)

Arrangement Set Context:

Six friends A, B, C, D, E and F sit in a straight row facing North.

- A sits immediately left of B.
- C sits at one of the extreme ends.
- D sits immediately right of E.
- F sits between B and E.

11. Who sits at the other end?
    A. A. A
    B. B. D
    C. C. E
    D. D. F

12. Which pair definitely sits together?
    A. A. A and B
    B. B. C and D
    C. C. B and E
    D. D. A and F

13. Who sits immediately right of A?
    A. A. C
    B. B. B
    C. C. D
    D. D. F

14. Who sits immediately left of D?
    A. A. A
    B. B. B
    C. C. E
    D. D. F

Standalone Analytical Questions:

15. In a queue, P is ahead of Q but behind R. S is behind Q. Who is first among them?
    A. A. P
    B. B. Q
    C. C. R
    D. D. S

16. A student ranks 15th from top and 20th from bottom in a class. Find the total number of students.
    A. A. 34
    B. B. 35
    C. C. 36
    D. D. 37

17. A is taller than B. B is taller than C. C is taller than D. Who is shortest among them?
    A. A. A
    B. B. B
    C. C. C
    D. D. D

18. If the 1st day of a month is a Tuesday, what day of the week is the 22nd?
    A. A. Monday
    B. B. Tuesday
    C. C. Wednesday
    D. D. Thursday

19. At exactly 6:00, what is the interior angle between the hour and minute hands of a clock?
    A. A. 90°
    B. B. 120°
    C. C. 180°
    D. D. 360°

20. All squares are rectangles. All rectangles are polygons.
    Conclusion:
    A. A. All polygons are squares
    B. B. All squares are polygons
    C. C. No square is a polygon
    D. D. Some polygons are not rectangles

3 Blood Relations (Questions 21–24)

21. Pointing to a boy, Anita said: "He is the son of my mother's only daughter." The boy is Anita's:
    A. A. Son
    B. B. Brother
    C. C. Nephew
    D. D. Cousin

22. A is the sister of B. B is the father of C. How is A related to C?
    A. A. Mother
    B. B. Aunt
    C. C. Sister
    D. D. Grandmother

23. P is the father of Q. Q is the brother of R. How is P related to R?
    A. A. Uncle
    B. B. Father
    C. C. Grandfather
    D. D. Brother

24. X is the daughter of Y. Y is the sister of Z. How is Z related to X?
    A. A. Uncle/Aunt
    B. B. Father
    C. C. Brother
    D. D. Son

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4 Direction Sense (Questions 25–28)

25. A person walks 15 m North and then 20 m East. In which direction is he now situated from the starting point?
    A. A. North-East
    B. B. South-East
    C. C. North-West
    D. D. South-West

26. A person walks 8 m South and then 15 m East. What is the shortest straight-line distance from the starting point?
    A. A. 15 m
    B. B. 17 m
    C. C. 20 m
    D. D. 23 m

27. A person moves West and then turns left. Which direction is he facing now?
    A. A. North
    B. B. South
    C. C. East
    D. D. West

28. A person walks North, then East, and finally South. Relative to the starting point, he is currently in which direction?
    A. A. North
    B. B. East
    C. C. West
    D. D. South

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5 Coding-Decoding (Questions 29–32)

29. If BOOK is coded as CPPL, then under the same logical framework, PEN = . . . ?
    A. A. QFO
    B. B. QGP
    C. C. RFO
    D. D. QEP

30. If CAT is coded as DBU, then BAT = . . . ?
    A. A. CBU
    B. B. DBU
    C. C. ECV
    D. D. BBU

31. If DELHI is written as EFMIJ, then MUMBAI = . . . ?
    A. A. NVNCBJ
    B. B. NVOCBJ
    C. C. NVOCBK
    D. D. OVNCBJ

32. If 3 = 12 and 4 = 20, then following the same underlying pattern, 6 = . . . ?
    A. A. 30
    B. B. 36
    C. C. 42
    D. D. 48

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6 Input-Output & Miscellaneous (Questions 33–36)

Machine Backend Rearrangement Logic:

Input:	12	7	4	15	2	9
Step 1:	2	7	4	15	12	9
Step 2:	2	4	7	15	12	9
Step 3:	2	4	7	9	12	15

33. What is the exact data layout obtained after executing Step 2?

A. A. 2 7 4 15 12 9

B. B. 2 4 7 15 12 9

C. C. 2 4 7 9 12 15

D. D. 2 7 9 4 12 15

34. Which geometric or mathematical arrangement process is being performed?

A. A. Ascending Order

B. B. Descending Order

C. C. Alphabetical Order

D. D. Coding

35. How many sequential sorting steps were needed to arrive at the final processed output?

A. A. 2

B. B. 3

C. C. 4

D. D. 5

36. What is the final resolved output configuration sequence?

A. A. 15 12 9 7 4 2

B. B. 2 4 7 9 12 15

C. C. 2 7 4 15 12 9

D. D. 4 2 7 9 12 15

Solutions

Section A: Critical Reasoning

Q1
Option C: Some researchers may be professors
All professors belong to the researcher group (Professors $\subseteq$ Researchers). Therefore, any professor who exists is automatically a researcher, confirming that some researchers are professors.

Q2
Option A: Training improves employee skills.
The link between training investments and better business performance relies implicitly on the essential baseline assumption that training effectively upgrades employee operational skills.

Q3
Option D: Cannot be determined.
Laptops are completely nested within computers, but since the expensive items only intersect the computer set partially, the exact relation of laptops to the expensive category cannot be determined.

Q4
Option A: Many students struggle to stay motivated online.
The core argument posits that online setups outperform traditional environments. Highlighting significant motivational struggles directly targets and weakens this claim of superior effectiveness.

Q5
Option A: Yoga reduces stress.
Syllogistic logic parsing: Exercise $\rightarrow$ Reduces Stress. Yoga $\rightarrow$ Exercise. Combining these premises yields the direct transitive conclusion: Yoga $\rightarrow$ Reduces Stress.

Q6
Option D: Cannot be determined.
Overlapping set boundaries: fruits lie completely within vitamins, while some vitamins improve immunity. The exact interaction between the nested fruit group and the immune-improving subset is left undetermined.

Q7
Option A: Employees report higher job satisfaction.
The argument claims that variable hours optimize productivity. Demonstrating a significant rise in worker satisfaction provides a valid causal mechanism that strongly corroborates and strengthens this link.

Q8
Option D: Cannot be determined.
All birds possess wings. Some winged creatures can fly. Since the subset of flying creatures only partially covers the winged group, it cannot be deduced if any birds are inside or outside that flying circle.

Q9
Option A: Reading newspapers may improve awareness.

The empirical correlation revealed by the dataset directly supports the informative inference that consistent newspaper reading acts as an active catalyst to enhance structural awareness.

Q10

Option B: People with higher incomes often report greater satisfaction.
Sound inference principles require avoiding sweeping claims (like “always” or “only”). Option B correctly reflects the probabilistic trend or pattern indicated by standard behavioral premises.

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Section B: Analytical Reasoning

Arrangement Setup Analysis:
Let us map out the linear positions $(1, 2, 3, 4, 5, 6)$ facing North sequentially using the logical constraints:

1. A sits immediately left of B $\rightarrow [A, B]$.
2. D sits immediately right of E $\rightarrow [E, D]$.
3. F sits between B and E $\rightarrow [B, F, E]$.

Combining these dependencies forms a single solid structural block of five friends: $[A, B, F, E, D]$. Since C must occupy an extreme end, and this block requires five contiguous seats, C must sit on the extreme left. This fixes the unique absolute row sequence:

$$\text{Layout Matrix: } [C, A, B, F, E, D]$$

Q11
Option B: D
Placing entities sequentially to satisfy constraints matches the absolute row layout: $[C, A, B, F, E, D]$. Since C anchors the extreme left, friend D must sit at the other extreme right end.

Q12
Option A: A and B
Clue 1 states explicitly that A is located immediately left of B, which locks the $[A, B]$ pair together side-by-side across all matching permutations.

Q13
Option B: B
From the structural matrix mapping $[C, A, B, F, E, D]$, the element situated immediately to the right of position 2 (A) is B.

Q14
Option C: E
Analyzing the final linear model coordinates $[C, A, B, F, E, D]$, the friend located immediately to the left of position 6 (D) is E.

Q15
Option C: R
Linear queue magnitude mapping based on the positional criteria gives the simple hierarchy: $R > P > Q > S$. Therefore, individual R stands first in the queue line.

Q16
Option A: 34
Total elements tracking parameter layout formula:

$$\text{Total} = (\text{Rank}_{\text{Top}} + \text{Rank}_{\text{Bottom}}) - 1 = (15 + 20) - 1 = 34$$

Q17
Option D: D
Mapping relative heights linearly yields the clear transitive inequality string: $A > B > C > D$. This places D as the absolute baseline minimum or shortest element.

Q18
Option B: Tuesday
Calendar progression loops run modulo 7.

$$\text{Day } 1 \equiv \text{Tuesday} \implies \text{Day } (1+21) = \text{Day } 22 \equiv \text{Tuesday}$$

Q19
Option C: 180°
Dynamic hand sweep logic: Each hour marker on a standard analog dial spans exactly 30° of arc. At 6:00, the hands sit perfectly horizontal and opposite each other at $6 \times 30^\circ = 180^\circ$.

Q20
Option B: All squares are polygons
Transitive subset inclusion sorting: Squares $\subseteq$ Rectangles, and Rectangles $\subseteq$ Polygons $\implies$ Squares $\subseteq$ Polygons.

Section C: Blood Relations

Q21
Option A: Son
Familial path breakdown: Anita's mother's only daughter refers directly to Anita herself. The biological son of that exact person translates to Anita's son.

Q22
Option B: Aunt
Generational link tracing: B acts as the father of C, and A stands as the sister of B. This structural connection makes A the paternal aunt of C.

Q23
Option B: Father
Sibling node alignment: Q and R share parents because they are brothers/siblings. Since P is defined as the father of Q, P matches as the father of R as well.

Q24
Option A: Uncle/Aunt
Multi-generational relationship path: Y is the mother of X, and Y is the sister of Z. Because the gender of node Z is unstated, Z can be either the maternal uncle or maternal aunt of X.

Section D: Direction Sense

Q25
Option A: North-East
Displacement vector plotting: Moving 15 m North ($+\hat{j}$) followed by moving 20 m East ($+\hat{i}$) structures a clear coordinates trajectory situated North-East relative to the starting origin.

Q26
Option B: 17 m
Shortest displacement path calculated via the Pythagorean theorem:

$$\text{Distance} = \sqrt{8^2 + 15^2} = \sqrt{64 + 225} = \sqrt{289} = 17 \text{ m}$$

Q27
Option B: South
Direction vector shift: Moving West (heading Left on standard maps). Making a secondary left turn executes a 90° counter-clockwise rotational shift, directing the person South.

Q28
Option B: East
Tracking the coordinate trajectory path: Walking North, then East, and finally South by the same vertical distance offsets the vertical alignment axis completely, leaving the final location strictly East of the origin.

Section E: Coding-Decoding

Q29
Option A: QFO
Character transition increment logic (+1 index shift forward across alphabet space):

$$B \to C, \quad O \to P, \quad O \to P, \quad K \to L$$

Applying this precise structural transformation rule to PEN yields QFO.

Q30
Option A: CBU
Applying the uniform alpha shift logic (+1 position movement forward):

$$C(+1) \to D, \quad A(+1) \to B, \quad T(+1) \to U$$

Replicating this mapping step for BAT results in CBU.

Q31
Option A: NVNCBJ
Character tracking logic applying a uniform +1 forward alphabet transition step:

$$M(+1) = N, \quad U(+1) = V, \quad M(+1) = N, \quad B(+1) = C, \quad A(+1) = B, \quad I(+1) = J$$

This maps MUMBAI directly to NVNCBJ.

Q32
Option C: 42
Functional matrix progression extraction: The system tracks the algebraic sequence pattern $n \times (n+1)$.

$$3 \times 4 = 12$$

$$4 \times 5 = 20$$

Following this induction system, computing for 6 yields $6 \times (6+1) = 6 \times 7 = 42$.

Section F: Input-Output & Miscellaneous

Q33
Option B: 2 4 7 15 12 9
Sourced via direct row block inspection of the state arrangement database at Step 2.

Q34
Option A: Ascending Order
Analytical review of processing steps proves that the system engine continually isolates remaining minimum values and swaps them forward to arrange the database array in Ascending Order.

Q35
Option B: 3
Rearrangement step execution trace: The numeric sequence loop requires exactly 3 independent operational passes before the elements settle stably into place.

Q36

Option B: 2 4 7 9 12 15

The final resolved system state maps the entire array array incrementally into its optimal, fully-sorted ascending structure: $2, 4, 7, 9, 12, 15$.

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