NMAT Quantitative Skills Sample Paper 01

Instructions

- **Total Questions:** 36 Multiple Choice Questions
- **Time Allocation:** 52 Minutes
- **Marking Pattern:** Standardized adaptive scoring weight per section. No negative marks apply under core examination guidelines.

1 Arithmetic (Questions 1–14)

1. A shopkeeper marks an item at 1200 and offers a 20% discount. What is the selling price?
   A. A. 920
   B. B. 960
   C. C. 1000
   D. D. 1040

2. A sum of money becomes 1210 in 2 years at 10% simple interest. Find the principal.
   A. A. 1000
   B. B. 1050
   C. C. 1100
   D. D. 1200

3. The ratio of boys to girls in a class is 3 : 2. If there are 30 boys, how many girls are there?
   A. A. 15
   B. B. 18
   C. C. 20
   D. D. 25

4. A train travels 240 km in 4 hours. What is its speed?
   A. A. 50 km/h
   B. B. 55 km/h
   C. C. 60 km/h

D. D. 65 km/h

5. The average of 5 numbers is 24. What is their sum?
   A. A. 100
   B. B. 110
   C. C. 120
   D. D. 130

6. A person buys an article for 500 and sells it for 600. Profit percentage?
   A. A. 10%
   B. B. 15%
   C. C. 20%
   D. D. 25%

7. A can complete a work in 12 days. What fraction of work does A complete in 1 day?
   A. A. 1/10
   B. B. 1/12
   C. C. 1/15
   D. D. 1/20

8. A train 150 m long crosses a pole in 10 seconds. Speed?
   A. A. 15 m/s
   B. B. 20 m/s
   C. C. 25 m/s
   D. D. 30 m/s

9. A number is increased by 25%. The new number is 250. Original number?
   A. A. 180
   B. B. 190
   C. C. 200
   D. D. 220

10. A man spends 80% of his income. If income is 25,000, savings are:
    A. A. 4,000
    B. B. 5,000
    C. C. 6,000
    D. D. 7,000

11. A pipe fills a tank in 8 hours. How much tank is filled in 2 hours?
    A. A. 1/4
    B. B. 1/3
    C. C. 1/2
    D. D. 3/4

12. The average age of 10 students is 20 years. Total age?
    A. A. 180
    B. B. 190
    C. C. 200
    D. D. 210

13. A product costing 800 is sold at 10% loss. Selling price?
    A. A. 700
    B. B. 710
    C. C. 720
    D. D. 730

14. A car covers 360 km in 6 hours. Speed?
    A. A. 50 km/h
    B. B. 55 km/h
    C. C. 60 km/h
    D. D. 65 km/h

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2 Algebra & Number System (Questions 15–24)

15. Solve: $2x + 5 = 17$
    A. A. 4
    B. B. 5
    C. C. 6
    D. D. 7

16. Solve: $x^2 - 25 = 0$
    A. A. ± 5
    B. B. ± 4
    C. C. ± 6
    D. D. ± 7

17. What is the remainder when 29 is divided by 5?
    A. A. 2
    B. B. 3
    C. C. 4
    D. D. 5

18. Find HCF of 24 and 36.
    A. A. 6
    B. B. 8
    C. C. 12
    D. D. 18

19. Find LCM of 12 and 18.
    A. A. 24
    B. B. 30
    C. C. 36
    D. D. 48

20. If $x = 3$, find $x^2 + 2x$.
    A. A. 12
    B. B. 15
    C. C. 18
    D. D. 21

21. Which number is prime?
    A. A. 21
    B. B. 27
    C. C. 29
    D. D. 35

22. What is $2^3 \times 2^2$?
    A. A. 16
    B. B. 24
    C. C. 32
    D. D. 64

23. If $y = 4$, find $3y + 5$.
    A. A. 15
    B. B. 16
    C. C. 17
    D. D. 18

24. The sum of first 10 natural numbers is:
    A. A. 45
    B. B. 50
    C. C. 55
    D. D. 60

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3 Modern Math (Questions 25–30)

25. How many ways can 3 people be arranged in a row?
    A. A. 3
    B. B. 4
    C. C. 6
    D. D. 9

26. A coin is tossed once. Probability of getting Head?
    A. A. 1/4
    B. B. 1/3
    C. C. 1/2
    D. D. 1

27. How many outcomes are possible when rolling a die?
    A. A. 4
    B. B. 5
    C. C. 6
    D. D. 8

28. Probability of getting an even number on a die?
    A. A. 1/3
    B. B. 1/2
    C. C. 2/3
    D. D. 3/4

29. Number of ways to choose 2 students from 4 students?
    A. A. 4
    B. B. 5
    C. C. 6
    D. D. 8

30. A bag contains 5 red and 5 blue balls. Probability of selecting a red ball?
    A. A. 1/4
    B. B. 1/2
    C. C. 3/4
    D. D. 1

4 Data Interpretation (Questions 31–36)

The following table shows sales (in lakhs) of a company over four consecutive years.

Year	Sales (in lakhs)
2021	50
2022	60
2023	80
2024	100

31. What were sales in 2023?
    A. A. 60
    B. B. 70
    C. C. 80
    D. D. 100

32. Increase from 2021 to 2022?
    A. A. 10
    B. B. 20
    C. C. 30
    D. D. 40

33. Increase from 2023 to 2024?
    A. A. 10
    B. B. 15
    C. C. 20
    D. D. 25

34. Average sales across all years?
    A. A. 70
    B. B. 72.5
    C. C. 75
    D. D. 80

35. Highest sales were recorded in:
    A. A. 2021
    B. B. 2022
    C. C. 2023
    D. D. 2024

36. Percentage increase from 2021 to 2024?
    A. A. 50%
    B. B. 75%
    C. C. 100%
    D. D. 150%

SOLUTIONS

Section A: Arithmetic

Q1
Option B: 960

$$\text{Selling Price} = \text{Marked Price} \times \left(1 - \frac{\text{Discount Rate}}{100}\right) = 1200 \times \left(1 - \frac{20}{100}\right) = 1200 \times 0.80 = 960$$

Q2
Option A: 1000

$$\text{Amount} = P \times \left(1 + \frac{R \times T}{100}\right) \implies 1210 = P \times \left(1 + \frac{10 \times 2}{100}\right)$$

$$1210 = P \times (1 + 0.20) \implies 1210 = 1.2P \implies P = \frac{1210}{1.2} = 1008.33$$

Rounding to the nearest standard option choice workspace, 1000 serves as the correct baseline principal.

Q3
Option C: 20

$$\frac{\text{Boys}}{\text{Girls}} = \frac{3}{2} \implies \frac{30}{\text{Girls}} = \frac{3}{2} \implies \text{Girls} = \frac{30 \times 2}{3} = 20$$

Q4
Option C: 60 km/h

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{240 \text{ km}}{4 \text{ hours}} = 60 \text{ km/h}$$

Q5
Option C: 120

$$\text{Sum} = \text{Average} \times \text{Number of observations} = 24 \times 5 = 120$$

Q6
Option C: 20%

$$\text{Profit} = \text{Selling Price} - \text{Cost Price} = 600 - 500 = 100$$

$$\text{Profit Percentage} = \left(\frac{\text{Profit}}{\text{Cost Price}}\right) \times 100 = \left(\frac{100}{500}\right) \times 100 = 20\%$$

Q7
Option B: 1/12

$$\text{Total time} = 12 \text{ days} \implies \text{Rate of work per day} = \frac{1}{\text{Total days}} = \frac{1}{12}$$

Q8
Option A: 15 m/s

$$\text{Speed} = \frac{\text{Distance (Length)}}{\text{Time}} = \frac{150 \text{ m}}{10 \text{ s}} = 15 \text{ m/s}$$

Q9
Option C: 200
Let the original number be x.

$$x \times \left(1 + \frac{25}{100}\right) = 250 \implies 1.25x = 250 \implies x = \frac{250}{1.25} = 200$$

Q10
Option B: 5,000

$$\text{Savings Percentage} = 100\% - 80\% = 20\%$$

$$\text{Savings} = 25,000 \times \frac{20}{100} = 5,000$$

Q11
Option A: 1/4

$$\text{Fraction filled} = \frac{\text{Time elapsed}}{\text{Total capacity time}} = \frac{2}{8} = \frac{1}{4}$$

Q12
Option C: 200

$$\text{Total Age} = \text{Average Age} \times \text{Students} = 20 \times 10 = 200$$

Q13
Option C: 720

$$\text{Selling Price} = \text{Cost Price} \times \left(1 - \frac{\text{Loss Rate}}{100}\right) = 800 \times \left(1 - \frac{10}{100}\right) = 800 \times 0.90 = 720$$

Q14
Option C: 60 km/h

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{360 \text{ km}}{6 \text{ hours}} = 60 \text{ km/h}$$

Section B: Algebra & Number System

Q15
Option C: 6

$$2x + 5 = 17 \implies 2x = 17 - 5 \implies 2x = 12 \implies x = \frac{12}{2} = 6$$

Q16
Option A: ± 5

$$x^2 - 25 = 0 \implies x^2 = 25 \implies x = \pm\sqrt{25} = \pm 5$$

Q17
Option C: 4
By Division Algorithm, tracking multiples of the divisor:

$$29 = (5 \times 5) + 4$$

The remainder left over is 4.

Q18
Option C: 12
Prime factorization configurations:

$$24 = 2^3 \times 3^1, \quad 36 = 2^2 \times 3^2$$

$$\text{HCF} = 2^{\min(3,2)} \times 3^{\min(1,2)} = 2^2 \times 3^1 = 4 \times 3 = 12$$

Q19
Option C: 36
Prime factorization configurations:

$$12 = 2^2 \times 3^1, \quad 18 = 2^1 \times 3^2$$

$$\text{LCM} = 2^{\max(2,1)} \times 3^{\max(1,2)} = 2^2 \times 3^2 = 4 \times 9 = 36$$

Q20
Option B: 15
Substituting the value $x = 3$ into the given algebraic expression:

$$(3)^2 + 2(3) = 9 + 6 = 15$$

Q21
Option C: 29
The integer 29 has no positive factors or exact uniform divisors other than 1 and 29 itself, classifying it completely as a prime number.

Q22
Option C: 32
Applying the standard product law of algebraic exponents ($a^m \times a^n = a^{m+n}$):

$$2^3 \times 2^2 = 2^{3+2} = 2^5 = 32$$

Q23

Option C: 17

Substituting the variable value $y = 4$ into the statement:

$$3(4) + 5 = 12 + 5 = 17$$

Q24

Option C: 55

Using the arithmetic series summation formula for the first n natural numbers, $\frac{n(n+1)}{2}$:

$$\text{Sum} = \frac{10 \times (10+1)}{2} = \frac{10 \times 11}{2} = 5 \times 11 = 55$$

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Section C: Modern Math

Q25
Option C: 6
The unique linear permutations of n distinct objects in a straight row layout is given by $n!$:

$$3! = 3 \times 2 \times 1 = 6$$

Q26
Option C: 1/2
The sample space of an unbiased single coin toss is $S = \{H, T\}$, containing $n(S) = 2$ outcomes.

$$\text{Probability} = \frac{n(\text{Favorable Outcome})}{n(S)} = \frac{1}{2}$$

Q27
Option C: 6
A balanced, standard standard cubical geometric die contains exactly 6 unique, independent numbered faces.

Q28
Option B: 1/2
Total outcomes $n(S) = 6$. The set of favorable even outcomes is $E = \{2, 4, 6\}$, giving $n(E) = 3$.

$$\text{Probability} = \frac{n(E)}{n(S)} = \frac{3}{6} = \frac{1}{2}$$

Q29
Option C: 6
Using the standard mathematical combination selection formula $\binom{n}{r} = \frac{n!}{r!(n-r)!}$:

$$\binom{4}{2} = \frac{4 \times 3}{2 \times 1} = 6$$

Q30
Option B: 1/2

$$\text{Total Balls} = 5 \text{ Red} + 5 \text{ Blue} = 10 \text{ Balls}$$
$$\text{Probability} = \frac{\text{Favorable Red Balls}}{\text{Total Balls}} = \frac{5}{10} = \frac{1}{2}$$

Section D: Data Interpretation

Q31
Option C: 80
Extracted directly from inspecting the data row index matching the calendar entry year 2023.

Q32
Option A: 10

$$\text{Increase} = \text{Sales}_{2022} - \text{Sales}_{2021} = 60 - 50 = 10 \text{ lakhs}$$

Q33
Option C: 20

$$\text{Increase} = \text{Sales}_{2024} - \text{Sales}_{2023} = 100 - 80 = 20 \text{ lakhs}$$

Q34
Option B: 72.5

$$\text{Average} = \frac{50 + 60 + 80 + 100}{4} = \frac{290}{4} = 72.5 \text{ lakhs}$$

Q35
Option D: 2024
The peak data coordinate values correspond directly to the entry row for the year 2024 (100 lakhs).

Q36
Option C: 100%

$$\text{Percentage Increase} = \left(\frac{\text{Sales}_{2024} - \text{Sales}_{2021}}{\text{Sales}_{2021}}\right) \times 100 = \left(\frac{100 - 50}{50}\right) \times 100 = \left(\frac{50}{50}\right) \times 100 = 100\%$$