NMAT Quantitative Skills Sample Paper 02

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 gives a 15% discount on an article marked at 2000. Find the selling price.
   A. A. 1600
   B. B. 1650
   C. C. 1700
   D. D. 1750

2. A sum becomes 1320 in 2 years at 10% simple interest. Find the principal.
   A. A. 1000
   B. B. 1100
   C. C. 1200
   D. D. 1250

3. The ratio of men to women in a company is 5 : 3. If there are 120 men, how many women are there?
   A. A. 60
   B. B. 72
   C. C. 80
   D. D. 90

4. A train travels 360 km in 6 hours. Its speed is:
   A. A. 50 km/h
   B. B. 55 km/h

C. C. 60 km/h

D. D. 65 km/h

5. The average of 8 numbers is 25. What is their sum?

A. A. 180

B. B. 190

C. C. 200

D. D. 220

6. An article is bought for 800 and sold for 920. Profit percentage is:

A. A. 10%

B. B. 12%

C. C. 15%

D. D. 20%

7. A can complete a work in 15 days. What fraction of work is completed in one day?

A. A. 1/10

B. B. 1/12

C. C. 1/15

D. D. 1/20

8. A train 180 m long crosses a pole in 12 seconds. Find speed.

A. A. 10 m/s

B. B. 12 m/s

C. C. 15 m/s

D. D. 18 m/s

9. A number is increased by 20% and becomes 360. Find the original number.

A. A. 280

B. B. 300

C. C. 320

D. D. 340

10. A person spends 75% of his income. If income is 40,000, savings are:

A. A. 8,000

B. B. 10,000

C. C. 12,000

D. D. 15,000

11. A pipe fills a tank in 10 hours. How much tank is filled in 4 hours?

A. A. 2/5

B. B. 1/4

C. C. 3/5

D. D. 4/5

12. The average age of 20 students is 18 years. Find total age.
    A. A. 320
    B. B. 340
    C. C. 360
    D. D. 380

13. A product costing 1500 is sold at 20% loss. Find selling price.
    A. A. 1100
    B. B. 1200
    C. C. 1250
    D. D. 1300

14. A car covers 420 km in 7 hours. Find 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: $3x + 7 = 25$
    A. A. 4
    B. B. 5
    C. C. 6
    D. D. 7

16. Solve: $x^2 - 49 = 0$
    A. A. ± 5
    B. B. ± 6
    C. C. ± 7
    D. D. ± 8

17. Find remainder when 43 is divided by 6.
    A. A. 0
    B. B. 1
    C. C. 2
    D. D. 3

18. Find HCF of 36 and 48.
    A. A. 6
    B. B. 12
    C. C. 18
    D. D. 24

19. Find LCM of 15 and 20.
    A. A. 40
    B. B. 50
    C. C. 60
    D. D. 80

20. If $x = 4$, find $x^2 + 3x$.
    A. A. 24
    B. B. 26
    C. C. 28
    D. D. 30

21. Which is a prime number?
    A. A. 33
    B. B. 35
    C. C. 37
    D. D. 39

22. Evaluate: $3^2 \times 3^3$

    A. A. 81

    B. B. 162

    C. C. 243

    D. D. 729 /choices

    E. If $y = 5$, find $4y + 3$.

        A. A. 20

        B. B. 21

        C. C. 22

        D. D. 23

    E. Sum of first 20 natural numbers:

        A. A. 190

        B. B. 200

        C. C. 210

        D. D. 220

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3 Modern Mathematics (Questions 25–30)

25. How many ways can 4 people be arranged in a row?
    A. A. 12
    B. B. 18
    C. C. 24
    D. D. 36
26. Probability of getting a tail when a coin is tossed?
    A. A. 1/4
    B. B. 1/3
    C. C. 1/2
    D. D. 1
27. How many outcomes are possible when two coins are tossed?
    A. A. 2
    B. B. 3
    C. C. 4
    D. D. 6
28. Probability of getting an odd number on a die?
    A. A. 1/3
    B. B. 1/2
    C. C. 2/3
    D. D. 3/4
29. How many ways can 2 students be selected from 5 students?
    A. A. 8
    B. B. 10
    C. C. 12
    D. D. 15
30. A bag contains 3 red and 7 blue balls. Probability of drawing a red ball?
    A. A. 3/10
    B. B. 4/10
    C. C. 5/10
    D. D. 7/10

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4 Data Interpretation (Questions 31–36)

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

Year	Revenue (Lakhs)
2021	80
2022	100
2023	120
2024	150

31. Revenue in 2023 was:
    A. A. 100
    B. B. 110
    C. C. 120
    D. D. 150

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. 20
    B. B. 25
    C. C. 30
    D. D. 35

34. Average revenue across all years:
    A. A. 105
    B. B. 110
    C. C. 112.5
    D. D. 115

35. Highest revenue occurred in:
    A. A. 2021
    B. B. 2022
    C. C. 2023
    D. D. 2024

36. Percentage increase from 2021 to 2024:
    A. A. 75%
    B. B. 80%
    C. C. 87.5%
    D. D. 100%

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Solutions

Section A: Arithmetic

Q1
Option C: 1700

$$\text{Selling Price} = \text{Marked Price} \times \left(1 - \frac{\text{Discount Rate}}{100}\right) = 2000 \times \left(1 - \frac{15}{100}\right) = 2000 \times 0.85 = 1700$$

Q2
Option B: 1100

$$\text{Amount} = P \times \left(1 + \frac{R \times T}{100}\right) \implies 1320 = P \times \left(1 + \frac{10 \times 2}{100}\right)$$

$$1320 = P \times (1 + 0.20) \implies 1320 = 1.2P \implies P = \frac{1320}{1.2} = 1100$$

Q3
Option B: 72

$$\text{Given Men : Women} = 5 : 3$$

$$\text{Since } 5x = 120 \implies x = \frac{120}{5} = 24$$

$$\text{Therefore, Women} = 3 \times 24 = 72$$

Q4
Option C: 60 km/h

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

Q5
Option C: 200

$$\text{Sum} = \text{Average} \times \text{Total Count} = 25 \times 8 = 200$$

Q6
Option C: 15%

$$\text{Profit} = 920 - 800 = 120$$

$$\text{Profit Percentage} = \left(\frac{120}{800}\right) \times 100 = 15\%$$

Q7
Option C: 1/15

$$\text{Work completed in 1 day} = \frac{1}{\text{Total days to complete work}} = \frac{1}{15}$$

Q8
Option C: 15 m/s

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{180 \text{ m}}{12 \text{ s}} = 15 \text{ m/s}$$

Q9
Option B: 300
Let the original number be x.

$$x \times \left(1 + \frac{20}{100}\right) = 360 \implies 1.2x = 360 \implies x = \frac{360}{1.2} = 300$$

Q10
Option B: 10,000

$$\text{Savings Percentage} = 100\% - 75\% = 25\%$$

$$\text{Savings} = 40,000 \times \frac{25}{100} = 10,000$$

Q11
Option A: 2/5

$$\text{Fraction of tank filled} = \frac{\text{Hours open}}{\text{Total capacity hours}} = \frac{4}{10} = \frac{2}{5}$$

Q12
Option C: 360

$$\text{Total Age} = \text{Average Age} \times \text{Number of Students} = 18 \times 20 = 360$$

Q13
Option B: 1200

$$\text{Selling Price} = \text{Cost Price} \times \left(1 - \frac{\text{Loss Rate}}{100}\right) = 1500 \times \left(1 - \frac{20}{100}\right) = 1500 \times 0.80 = 1200$$

Q14
Option C: 60 km/h

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{420 \text{ km}}{7 \text{ hours}} = 60 \text{ km/h}$$

Section B: Algebra & Number System

Q15
Option C: 6

$$3x + 7 = 25 \implies 3x = 25 - 7 \implies 3x = 18 \implies x = \frac{18}{3} = 6$$

Q16
Option C: ± 7
$x^2 - 49 = 0 \implies x^2 = 49 \implies x = \pm\sqrt{49} = \pm 7$

Q17
Option B: 1
By Division Algorithm, locating regular numerical intervals:

$$43 = (6 \times 7) + 1$$

The remainder left over is 1.

Q18
Option B: 12
Prime factorization layouts:

$$36 = 2^2 \times 3^2, \quad 48 = 2^4 \times 3^1$$
$$\text{HCF} = 2^{\min(2,4)} \times 3^{\min(2,1)} = 2^2 \times 3^1 = 4 \times 3 = 12$$

Q19
Option C: 60
Prime factorization layouts:

$$15 = 3^1 \times 5^1, \quad 20 = 2^2 \times 5^1$$
$$\text{LCM} = 2^2 \times 3^1 \times 5^1 = 4 \times 3 \times 5 = 60$$

Q20
Option C: 28
Evaluating the polynomial expression for the input value $x = 4$:

$$(4)^2 + 3(4) = 16 + 12 = 28$$

Q21
Option C: 37
The integer 37 holds no positive natural numbers as factors except 1 and 37 itself, clarifying its identity as a prime number.

Q22
Option C: 243
Applying the baseline index law for products ($a^m \times a^n = a^{m+n}$):

$$3^2 \times 3^3 = 3^{2+3} = 3^5 = 243$$

Q23

Option D: 23

Evaluating the expression for the system state $y = 5$:

$$4(5) + 3 = 20 + 3 = 23$$

Q24

Option C: 210

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

$$\text{Sum} = \frac{20 \times (20 + 1)}{2} = 10 \times 21 = 210$$

Section C: Modern Mathematics

Q25
Option C: 24
The unique linear arrangements of n distinct entities matches $n!$:

$$4! = 4 \times 3 \times 2 \times 1 = 24$$

Q26
Option C: 1/2
The total sample space is $S = \{H, T\}$, giving $n(S) = 2$.

$$\text{Probability} = \frac{\text{Favorable outcomes}}{\text{Total outcomes}} = \frac{1}{2}$$

Q27
Option C: 4
The composite sample space matrix when flipping two fair coins is:

$$S = \{HH, HT, TH, TT\}$$

The total number of outcomes is 4.

Q28
Option B: 1/2
Total base outcomes $n(S) = 6$. The set of odd numbers on a standard die is $\{1, 3, 5\}$, yielding $n(E) = 3$.

$$\text{Probability} = \frac{3}{6} = \frac{1}{2}$$

Q29
Option B: 10
Using the standard combinatorics selection rule $\binom{n}{r} = \frac{n!}{r!(n-r)!}$:

$$\binom{5}{2} = \frac{5 \times 4}{2 \times 1} = 10$$

Q30
Option A: 3/10

$$\text{Total Balls} = 3 \text{ Red} + 7 \text{ Blue} = 10 \text{ Balls}$$
$$\text{Probability} = \frac{\text{Favorable Red Balls}}{\text{Total Balls}} = \frac{3}{10}$$

Section D: Data Interpretation

Q31
Option C: 120
Obtained directly via inspection of the tabular row dataset matching the entry year 2023.

Q32
Option B: 20

$$\text{Absolute Revenue Increase} = \text{Revenue}_{2022} - \text{Revenue}_{2021} = 100 - 80 = 20 \text{ lakhs}$$

Q33
Option C: 30

$$\text{Absolute Revenue Increase} = \text{Revenue}_{2024} - \text{Revenue}_{2023} = 150 - 120 = 30 \text{ lakhs}$$

Q34
Option C: 112.5

$$\text{Average Revenue} = \frac{80 + 100 + 120 + 150}{4} = \frac{450}{4} = 112.5 \text{ lakhs}$$

Q35
Option D: 2024
The peak value among the recorded metrics is 150, which falls under the row for calendar year 2024.

Q36
Option C: 87.5%

$$\text{Percentage Increase} = \left(\frac{\text{Revenue}_{2024} - \text{Revenue}_{2021}}{\text{Revenue}_{2021}}\right) \times 100 = \left(\frac{150 - 80}{80}\right) \times 100$$

$$\text{Percentage Increase} = \frac{70}{80} \times 100 = \frac{7}{8} \times 100 = 87.5\%$$