NAWAZ SHARIF SCHOOL OF EMINENCE (NSSE)

Mathematics Teacher Recruitment Test — Full Practice Paper (100 MCQs)

Total Questions: 100	Total Marks: 100	Time: 120 Minutes	Each MCQ: 1 Mark

★ Yellow highlighted options with ✓ indicate the correct answer

GENERAL INSTRUCTIONS

1. This paper consists of 100 Multiple Choice Questions (MCQs) covering all major Mathematics topics.
2. Each question carries ONE mark. There is NO negative marking.
3. The correct answer for each question is highlighted in yellow with a tick (✓).
4. Topics: Number System, Algebra, Geometry, Trigonometry, Statistics, Calculus, Matrices & Sets, Mensuration.
5. This paper is intended for self-study and NSSE Mathematics Teacher recruitment preparation only.

SECTION A — Number System & Arithmetic

Q1. Which of the following is an irrational number?

A. 0.75
C. 3/4
B. √2 ✓
D. 0.333...

Q2. The LCM of 12 and 18 is:

A. 6
C. 36 ✓
B. 24
D. 72

Q3. The HCF of 48 and 64 is:

A. 8
C. 16 ✓
B. 12
D. 24

Q4. What is 15% of 240?

A. 30
C. 32
B. 36 ✓
D. 40

Q5. If a shirt costs Rs. 800 and is sold for Rs. 1000, the profit percentage is:

A. 20%
C. 30%
B. 25% ✓
D. 15%

Q6. The value of $(-3)^3$ is:

A. 9
C. –9
B. 27
D. –27 ✓

Q7. Which of the following is a prime number?

A. 9
C. 21
B. 15
D. 29 ✓

Q8. The square root of 169 is:

A. 11
C. 13 ✓
B. 12
D. 14

Q9. Simplify: $2^3 \times 2■ =$

A. 2■ ✓
C. 4■
B. 2^{12}
D. 2■

Q10. A train travels 360 km in 4 hours. Its speed is:

A. 70 km/h
C. 90 km/h ✓

B 80 km/h

D 100 km/h

Q11. If 3x = 27, then x =

A 3

C 6

B 9

D 12

Q12. The product of two numbers is 84 and their HCF is 6. Their LCM is:

A 12

C 504

B 14

D 16

SECTION B — Algebra

Q13. The solution of 2x + 5 = 13 is:

A x = 3

C x = 5

B x = 4

D x = 6

Q14. Factorize: $x^2 - 9$ =

A $(x - 3)^2$

C $(x - 9)(x + 1)$

B $(x + 3)(x - 3)$

D $(x + 9)(x - 1)$

Q15. If $f(x) = 3x^2 - 2x + 1$, then f(2) =

A 9

C 13

B 11

D 17

Q16. The sum of the roots of the equation $x^2 - 5x + 6 = 0$ is:

A 5

C –5

B 6

D –6

Q17. The product of the roots of $x^2 - 7x + 12 = 0$ is:

A 7

C –7

B 12

D –12

Q18. Solve: 3(x – 2) = 2(x + 4)

A x = 14

C x = 8

B x = 10

D x = 6

Q19. Which of the following is the identity $(a + b)^2$?

A $a^2 + b^2$

C $a^2 + 2ab + b^2$

B $a^2 - 2ab + b^2$

D $2a^2 + 2b^2$

Q20. The discriminant of $ax^2 + bx + c = 0$ is:

A $b^2 - 4ac$

C $b^2 + 4ac$

B $4ac - b^2$

D $-b^2 + 4ac$

Q21. If the discriminant is negative, the roots are:

A Real and equal

C Complex/imaginary

B Real and unequal

D Zero

Q22. Simplify: (x^3 × x■) / x■ =

A x■

C x■

B x^2

D x^3

Q23. The slope of the line y = 3x – 7 is:

A –7

C 7

B 3

D –3

Q24. Which equation represents a straight line passing through the origin?

A. y = 3x + 2
C. y = x² + 3
B. y = 3x ✓
D. y = 3

Q25. If log■■ 100 = x, then x =

A. 1
C. 10
B. 2 ✓
D. 100

Q26. Solve the simultaneous equations: x + y = 10, x – y = 4. Find x:

A. 3
C. 7 ✓
B. 5
D. 8

SECTION C — Geometry

Q27. The sum of interior angles of a triangle is:

A. 90°
C. 270°
B. 180° ✓
D. 360°

Q28. The sum of interior angles of a hexagon is:

A. 360°
C. 720° ✓
B. 540°
D. 900°

Q29. In a right-angled triangle, if the two legs are 3 and 4, the hypotenuse is:

A. 5 ✓
C. 7
B. 6
D. 8

Q30. The area of a circle with radius 7 cm is: (π = 22/7)

A. 44 cm²
C. 132 cm²
B. 154 cm² ✓
D. 176 cm²

Q31. The circumference of a circle with diameter 14 cm is:

A. 22 cm
C. 88 cm
B. 44 cm ✓
D. 11 cm

Q32. Two angles are supplementary if their sum is:

A. 90°
C. 270°
B. 180° ✓
D. 360°

Q33. Two angles are complementary if their sum is:

A. 180°
C. 270°
B. 90° ✓
D. 360°

Q34. The area of a rectangle with length 12 cm and width 5 cm is:

A. 34 cm²
C. 17 cm²
B. 60 cm² ✓
D. 70 cm²

Q35. The volume of a cube with side 4 cm is:

A. 16 cm³
C. 64 cm³ ✓
B. 32 cm³
D. 256 cm³

Q36. The perimeter of an equilateral triangle with side 6 cm is:

A. 12 cm
C. 24 cm
B. 18 cm ✓
D. 36 cm

Q37. Which of the following pairs of angles are formed on opposite sides of the transversal between parallel lines?

- A Co-interior angles
- **C Alternate interior angles** ✓
- B Corresponding angles
- D Vertically opposite angles

Q38. The diagonal of a square with side a is:

- **A $a\sqrt{2}$** ✓
- C 2a
- B a^2
- D $a/\sqrt{2}$

Q39. The area of a trapezoid with parallel sides 8 cm and 12 cm, height 5 cm is:

- A 40 cm²
- C 60 cm²
- **B 50 cm²** ✓
- D 100 cm²

Q40. A triangle with all sides equal is called:

- A Isosceles
- **C Equilateral** ✓
- B Scalene
- D Right-angled

SECTION D — Trigonometry

Q41. sin 90° =

- A 0
- C –1
- **B 1** ✓
- D √2/2

Q42. cos 0° =

- A 0
- C –1
- **B 1** ✓
- D 1/2

Q43. tan 45° =

- A 0
- **C 1** ✓
- B √3
- D 1/√3

Q44. The value of $\sin^2\theta + \cos^2\theta$ is always:

- A 0
- **C 1** ✓
- B 2
- D θ

Q45. sin 30° =

- A √3/2
- C 1
- **B 1/2** ✓
- D 0

Q46. cos 60° =

- A 1
- **C 1/2** ✓
- B √3/2
- D 0

Q47. In a right-angled triangle, sin θ =

- A Adjacent / Hypotenuse
- **C Opposite / Hypotenuse** ✓
- B Hypotenuse / Adjacent
- D Adjacent / Opposite

Q48. The reciprocal of sin θ is:

- A cos θ
- **C cosec θ** ✓
- B tan θ
- D sec θ

Q49. tan θ is equal to:

- **A sin θ / cos θ** ✓
- C 1 / sin θ
- B cos θ / sin θ
- D 1 / cos θ

Q50. sin 60° =

A 1/2
C 1
B √3/2
D √2/2

Q51. The value of tan 0° is:

A 1
C ∞
B 0
D –1

Q52. Which of the following is correct for a 45-45-90 triangle?

A Sides are in ratio 1:1:√2
C Sides are in ratio 1:√3:2
B Sides are in ratio 1:2:√3
D Sides are in ratio 1:1:2

Q53. The angle of elevation of the top of a 10 m tall pole from a point 10 m away is:

A 30°
C 60°
B 45°
D 90°

Q54. $1 + \tan^2\theta =$

A $\cos^2\theta$
C $\sec^2\theta$
B $\sin^2\theta$
D $\operatorname{cosec}^2\theta$

SECTION E — Statistics & Probability

Q55. The mean of 4, 8, 12, 16, 20 is:

A 10
C 14
B 12
D 16

Q56. The median of 3, 5, 7, 9, 11 is:

A 5
C 9
B 7
D 11

Q57. The mode of 2, 3, 3, 5, 7, 3, 8 is:

A 2
C 5
B 3
D 7

Q58. The range of the data set 5, 10, 15, 20, 25 is:

A 15
C 25
B 20
D 5

Q59. If a die is rolled, the probability of getting a 4 is:

A 1/2
C 1/6
B 1/3
D 1/4

Q60. A bag contains 3 red and 5 blue balls. The probability of picking a red ball is:

A 3/5
C 5/8
B 3/8
D 1/3

Q61. The sum of all probabilities of possible outcomes of an experiment is always:

A 0
C 1
B 0.5
D 2

Q62. If two events cannot occur simultaneously, they are called:

A Independent events
C Mutually exclusive events
B Dependent events
D Complementary events

Q63. Standard deviation measures:

A The central value of data
C The most frequent value

B **The spread or dispersion of data** ✓

D The middle value

Q64. The probability of an impossible event is:

A 1

C **0** ✓

B 0.5

D ∞

Q65. Which of the following represents grouped data?

A A list of individual scores

C Data in ascending order

B **Data organized into class intervals** ✓

D A single average value

Q66. The arithmetic mean of first 10 natural numbers is:

A 4.5

C **5.5** ✓

B 5

D 6

SECTION F — Calculus — Basic Concepts

Q67. The derivative of a constant is:

A 1

C The constant itself

B **0** ✓

D Undefined

Q68. d/dx (x²) =

A x

C x^2

B **2x** ✓

D 2

Q69. d/dx (sin x) =

A –cos x

C –sin x

B **cos x** ✓

D tan x

Q70. The derivative of e■ is:

A e■■¹

C **e■** ✓

B xe■

D e

Q71. ∫ 1 dx =

A 0

C 1/x + C

B **x + C** ✓

D $x^2/2$ + C

Q72. ∫ x dx =

A x^2

C **$x^2/2$ + C** ✓

B x^2 + C

D 2x + C

Q73. The derivative of ln x is:

A **1/x** ✓

C ln x

B x

D e/x

Q74. A function f(x) is increasing when:

A f'(x) < 0

C **f'(x) > 0** ✓

B f'(x) = 0

D f''(x) > 0

Q75. The maximum or minimum of a function occurs where:

A f(x) = 0

C f''(x) = 0

B **f'(x) = 0** ✓

D f(x) > 0

Q76. d/dx (cos x) =

A sin x

C cos x

B **–sin x** ✓

D –cos x

Q77. The integral ∫ e■ dx =

A e■■¹ + C
C **e■ + C**
B xe■ + C
D e + C

Q78. The second derivative test: if f''(x) > 0 at a critical point, the function has a:

A Maximum
C Inflection point
B **Minimum**
D Zero

SECTION G — Matrices & Sets

Q79. A matrix with equal number of rows and columns is called a:

A Row matrix
C **Square matrix**
B Column matrix
D Zero matrix

Q80. The determinant of matrix [[2, 3],[1, 4]] is:

A **5**
C 11
B 8
D 14

Q81. The transpose of a matrix is obtained by:

A Multiplying all elements by –1
C Squaring all elements
B **Interchanging rows and columns**
D Adding rows and columns

Q82. If A = {1,2,3} and B = {2,3,4}, then A ∩ B =

A {1,2,3,4}
C {1,4}
B **{2,3}**
D {1,2,3}

Q83. If A = {1,2,3} and B = {2,3,4}, then A ∪ B =

A **{1,2,3,4}**
C {1,4}
B {2,3}
D {1,2}

Q84. The number of subsets of a set with 3 elements is:

A 3
C **8**
B 6
D 9

Q85. A null (empty) set is denoted by:

A { }
C **Both { } and ∅**
B ∅
D {0}

Q86. The complement of set A contains:

A All elements in A
C All elements in A and B
B **All elements NOT in A (within the universal set)**
D Only common elements

Q87. Two matrices can be multiplied only if:

A They are both square matrices
C They have the same number of elements
B **The number of columns in the first equals the number of**
D They are both identity matrices

Q88. The identity matrix has:

A All zeros
C **1s on the main diagonal and 0s elsewhere**
B All ones
D 0s on the main diagonal and 1s elsewhere

SECTION H — Mensuration & Applied Mathematics

Q89. The volume of a cylinder with radius 7 cm and height 10 cm is: (π = 22/7)

A **1540 cm³**
C 440 cm³

B 1560 cm³
D 1400 cm³

Q90. The total surface area of a cube with side 5 cm is:

A 25 cm²
C 125 cm²
B 75 cm²
D 150 cm² ✓

Q91. The volume of a sphere with radius 3 cm is: (π = 22/7)

A 36π cm³
C 36π/3 cm³
B 108π/3 cm³
D 113.14 cm³ ✓

Q92. A rectangular field is 60 m long and 40 m wide. Its area is:

A 100 m²
C 1200 m²
B 200 m²
D 2400 m² ✓

Q93. If the simple interest on Rs. 5000 at 8% per annum for 3 years is:

A Rs. 1000
C Rs. 1500
B Rs. 1200 ✓
D Rs. 2000

Q94. A shopkeeper gives 20% discount on marked price Rs. 500. Selling price is:

A Rs. 350
C Rs. 450
B Rs. 400 ✓
D Rs. 480

Q95. Two pipes fill a tank in 6 hours and 12 hours respectively. Together they fill it in:

A 4 hours ✓
C 3 hours
B 5 hours
D 9 hours

Q96. The ratio 15:25 in its simplest form is:

A 1:2
C 3:5 ✓
B 2:3
D 5:3

Q97. If 5 workers complete a job in 8 days, how many days will 10 workers take?

A 2 days
C 6 days
B 4 days ✓
D 16 days

Q98. The compound interest on Rs. 1000 at 10% per annum for 2 years is:

A Rs. 200
C Rs. 220
B Rs. 210 ✓
D Rs. 100

Q99. A car depreciates at 10% per year. If its current value is Rs. 200,000, value after 1 year is:

A Rs. 180,000 ✓
C Rs. 160,000
B Rs. 190,000
D Rs. 170,000

Q100. The speed of a boat in still water is 15 km/h and the current is 3 km/h. Speed upstream is:

A 18 km/h
C 9 km/h
B 12 km/h ✓
D 6 km/h