

BTTH 2025 ADMISSION TEST

Instructions for Candidates

Please read all instructions carefully before you begin.

1. Candidate Details (To be filled by the candidate):

- Roll Number: _____
- Name: _____
- Signature: _____

2. Question Paper Structure:

- This booklet contains a total of 30 questions divided into two sections.
- Section A: Contains 25 Multiple-Choice Questions (MCQs).
- Section B: Contains 5 Integer-Type Questions.
- All questions are compulsory.

3. Marking Scheme:

The marking scheme is the same for ALL questions (Both Section A and Section B):

- Correct Answer: You will be awarded +4 (four) marks.
- Incorrect Answer: -1 (one) mark will be deducted from your total score.
- Unattempted Question: 0 (zero) marks will be awarded or deducted.
- In Section A, marking more than one circle for a question will be treated as an incorrect answer and will result in a -1 mark penalty.

4. Answering Instructions (OMR Sheet):

- Use only a Blue or Black Ballpoint Pen to fill the OMR sheet.
- For Section A (MCQs): Darken the appropriate circle (A, B, C, or D) corresponding to the correct answer.
- For Section B (Integer-Type): The answer for each question is a numerical value. You must write your numerical value in the box.
- Ensure you darken all bubbles completely and do not make stray marks.

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SECTION-A

Contains 25 Multiple-Choice Questions (MCQs).

- Q 1. Total number of diagonals of a polygon of 15 sides is :
(A) 15 (B) 90 (C) 105 (D) None of these
- Q 2. Value of $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 85^\circ + \sin^2 90^\circ$ is
(A) 8 (B) 10 (C) 9.5 (D) 10.5
- Q 3. The mid points of sides of triangle are (5, 0), (5, 12) & (0, 12) then orthocentre of the's triangle.
(A) (0, 24) (B) (10, 0) (C) (0, 0) (D) (13, 8)
- Q 4. The ratio in which the line joining the points (3, -4) and (-5, 6) is divided by x -axis
(A) 2: 3 (B) 6: 4 (C) 3: 2 (D) None-of these
- Q 5. How many isosceles integer-sided triangle are there with perimeter 23unit?
(A) 7 (B) 5 (C) 6 (D) 8
- Q 6. The area of an integer-sided rectangle is 20 sq. unit. The minimum possible value of its perimeter?
(A) 20 (B) 24 (C) 18 (D) 12
- Q 7. If $\sin A + \cos B = 2$ then value of $\sin^7 A + \cos^7 B$ is
(A) 128 (B) 256 (C) 2 (D)
- Q 8. If $\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = \sec \theta \operatorname{cosec} \theta + k$, then value, of k is
(A) 2 (B) 1 (C) 3 (D) 4
- Q 9. Value of $(\operatorname{cosec} A - \sin A) \cdot (\sec A - \cos A)(\tan A + \cot A)$.
(A) 2 (B) 3 (C) 1 (D) 4
- Q 10. Absolute value of $\cos \pi/7 + \cos 2\pi/7 + \cos 3\pi/7 + \cos 4\pi/7 + \cos 5\pi/7 + \cos 6\pi/7 + \cos 7\pi/7$ is
(A) 2 (B) 4 (C) -1 (D) 1
- Q 11. If $ABCD$ is a cyclic quadrilateral, the value of $\cos^2 A - \cos^2 B - \cos^2 C + \cos^2 D$ is
(A) 0 (B) 1 (C) -1 (D) 2
- Q 12. If $\alpha + \beta = 90^\circ$ and $\alpha = 2\beta$ then $\cos^2 \alpha + \sin^2 \beta$ equals to
(A) 0 (B) $\frac{1}{2}$ (C) 1 (D) 2
- Q 13. The area of a triangle whose vertices are $(a, c + a)$, (a, c) & $(-a, c - a)$ is
(A) ac (B) a^2 (C) c^2 (D) $a^2 + c^2$

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- Q 14. What is the sum of the 100 terms of the series $9 + 99 + 999 + \dots$?
(A) $\frac{10}{9}(10^{100} - 1) - 100$ (B) $\frac{10}{9}(10^{99} - 1) - 100$
(C) $100(100^{10} - 1)$ (D) $\frac{9}{100}(100^{10} - 1)$
- Q 15. If the 3rd term of a G.P is 3, then the product of its first 5 terms is
(A) 15 (B) 81 (C) 243 (D) Cannot be determined
- Q 16. If α and β are the roots of the equation $3x^2 - 5x + 3 = 0$ then the quadratic equation whose roots are $\alpha^2\beta$ and $\alpha\beta^2$ is
(A) $3x^2 - 5x + 3 = 0$ (B) $3x^2 - 8x + 5 = 0$
(C) $3x^2 - 8x + 3 = 0$ (D) $3x^2 - 5x - 3 = 0$
- Q 17. The value of k , so that the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common, are
(A) $3, \frac{27}{2}$ (B) $9, \frac{27}{4}$ (C) $-3, -\frac{27}{4}$ (D) $-3, \frac{4}{27}$
- Q18. If α & β are roots of $x^2 - 3x + 4 = 0$, then find value of $\alpha^4 + \beta^4$.
(A) 31 (B) -31 (C) 32 (D) -32
- Q 19. A natural number ' k ' such that $k^2 < 2014 < (k + 1)^2$, what is the largest prime factor of ' k '?
(A) 13 (B) 11 (C) 17 (D) 7
- Q 20. If $\frac{3+2\sqrt{3}}{3-\sqrt{3}} = a + \sqrt{3}b$, then the value of $\sqrt{a+b}$, (where a & b are rational number) is -
(A) 5 (B) 8 (C) 2 (D) 16
- Q.21 The missing number in the sequence 80, 16, 4, 4/3, _____
(A) 2/5 (B) 2/3 (C) 3/5 (D) None of these
- Q.22 Which letter will come 6th to the left of 12th from right. If 1st and 2nd half of English alphabets are written in reverse order
(A) I (B) G (C) E (D) R

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Q.23 If 'EDITION' is written as 'IDETNOI' how is 'MEDICAL' written in that code?

- (A) DEMIPAC (B) LACIMED
(C) DIIEMCAL (D) DEMILAC

Q.24 Consider the following series

0, 6, 24, 60, ?

- (A) 100 (B) 120 (C) 80 (D) 120

Q.25 34 is related to 12 in the same way as 59 is related to

- (A) 45 (B) 30 (C) 26 (D) 14

SECTION-B

Contains 5 Integer-Type Questions.

Q 26. If $\sin^4 x + \sin^2 x = 1$, then what is the numerical value of $\cot^4 x + \cot^2 x$?

Q 27. What is the last two digits of the integer $1! + 2! + 3! + \dots + 2005!$

Q 28. If $a_1 + a_5 + a_{10} + a_{15} + a_{24} = 225$, & the sum of first 24 terms of an A.P is k , then value of $\frac{k}{100}$ is (where $a_1, a_2 \dots a_n$ are terms of an A.P)

Q 29. If a, b, c are three consecutive terms of an A.P and x, y, z are three consecutive terms of a G.P, then value of $x^{b-c} \cdot y^{c-a} \cdot z^{a-b}$ is

Q 30. There are 8 gates in a hall. In how many ways a person can enter in the hall and come out from a different gate?