
NATIONAL CYBER OLYMPIAD

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 3 sections, 15 questions in section I, 15 in section II and 20 in section III.

SYLLABUS

Section – I (Mental ability) : Number system, Introduction to irrational numbers, Algebra, Factorization of polynomials, Ratio and proportion, Linear equations in two variables, Percentage, Profit and loss, Discount, Compound interest, Cost of living index, Sales tax, Banking, Lines and angles, Congruence, Inequalities in a triangle, Concurrent lines in a triangle, Parallelograms, Areas, Construction, Trigonometric ratios, Plane figures, Solids, Polynomials, Quadratic equations.

Section – II (Logical and analytical reasoning) : Problems based on figures, Find odd numeral out, Series completion, Coding-decoding, Mathematical reasoning, Analytical reasoning, Mirror images, Embedded figures, Direction sense test, Cubes and dice.

Section – III (Computer and IT) : Computer system An overview, Computer software, Communication technology, MS windows ,MS word, MS excel, MS power point.

MENTAL ABILITY

1. The value of $\tan 5^\circ \tan 25^\circ \tan 30^\circ \tan 65^\circ \tan 85^\circ$ is
 (A) $\sqrt{3}$ (B) $\frac{1}{\sqrt{3}}$ (C) $\frac{2}{\sqrt{3}}$ (D) $\frac{5}{\sqrt{3}}$ (E) None of these.

2. A bag contains 5 red ball and some blue balls. If the probability of drawing a blue ball is double that of a red ball then the number of blue balls in the bag is
 (A) 10 (B) 5 (C) 8 (D) 7 (E) None of these.

3. A cylinder open at both ends has radius $5/\pi$ cm and height 12 cm. If A and B are diametrically opposite points lying on the top and bottom rims. The shortest distance between A and B is
 (A) 13 cm (B) 17 cm
 (C) $12\frac{10}{\pi}$ cm (D) $\sqrt{12^2 + \left(\frac{10}{\pi}\right)^2}$ cm (E) None of these.

4. Which of the following equations have the same graph?
 I. $y = x + 3$ II. $y = \frac{x^2 - 9}{x - 3}$ III. $(x - 3)y = x^2 - 9$
 (A) I and II only (B) I and III only (C) II and III only (D) All have different graphs
 (E) None of the above.

5. A , B , and C are thermometers with different scales. When A reads 10° and 34° , B reads 15° and 31° , respectively. When B reads 30° and 42° , C reads 5° and 77° , respectively. If the temperature drops 18° using A 's scale, how many degrees does it drop using C 's scale?
 (A) 12° (B) 24° (C) 48° (D) 72° (E) None of these.

6. Two numbers are in the ratio of 3 : 5. If 8 is added to each number, the ratio becomes 2 : 3. What are the numbers?
 (A) 24 and 40 (B) 20 and 30 (C) 32 and 42 (D) 35 and 45 (E) None of these.

7. The sum of first 24 terms of the sequence whose n th term is $a_n = 3 + \frac{2}{3}n$, is
 (A) 275 (B) 272 (C) 280 (D) 270 (E) None of these

8. The ratio of the volume of a cube to that of a sphere which exactly fits inside the cube is
 (A) $6 : \pi$ (B) $\pi : 6$ (C) $\pi : 12$ (D) $12 : \pi$ (E) None of these.

LOGICAL & ANALYTICAL REASONING

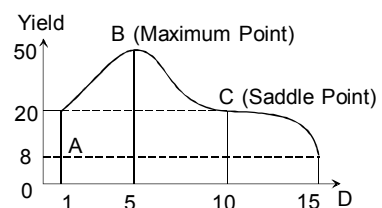
9. In a group of five people, K , L and M are ambitious, M , N and R are honest, L , M and N are intelligent and K , N and R are industrious. Among these, neither industrious nor ambitious person(s) would include
 (A) K alone (B) L and R (C) M and N (D) N alone (E) None of these.

10. On another planet, the local terminology for earth, water, light, air and sky are 'sky', 'light', 'air', 'water' and 'earth' respectively. If someone is thirsty there, what would he drink?
 (A) Sky (B) Water (C) Air (D) Light (E) None of these.

11. The yield versus fertilizer input is shown in the following graph:

Consider the following statements based on this graph:

1. Yield rate is zero at B and C .
2. There is no yield with no fertilizer input.
3. The yield is minimum at D .
4. The yield is neither minimum nor maximum at C .



Which of the above statements are correct?

- (A) 1, 2 and 4 (B) 3 and 4 (C) 2 and 3 (D) 1, 3 and 4 (E) None of these.

12. Step 1 : Multiply by 2
Step 2 : Subtract 1
Step 3 : If less than 10, jump to step 1 and continue from there; otherwise proceed to step 4
Step 4 : Add 7
Step 5 : Divide by 2
Step 6 : Add 2
Step 7 : Multiply by 2
 If you start with a value of 6 then calculate **how many times** you had to jump to step 1.
 (A) 5 (B) 6 (C) 7 (D) 8 (E) None of these.

13. A, B, C, D, E, F and G are members of a family consisting of four adults and three children, two of whom, F and G are girls. A and D are brothers and A is a doctor. E is an engineer married to one of the brothers and has two children. B is married to D and G is their child. Who is C?
 (A) G's brother (B) F's father (C) E's daughter (D) A's son
 (E) None of these.

COMPUTER & INFORMATION TECHNOLOGY

14. Which of the following high level language is NOT suitable for generating or developing a data file?
 (A) BASIC (B) FORTRAN (C) COBOL (D) PASCAL (E) None of these.

15. The processing speed of a computer is measured in
 (A) Mega byte (B) 16-bit (C) Mega hertz (D) Milli seconds (E) Ohms.

16. Which of the following features distinguishes a database file from a mere collection of data
 (A) Database enables data to be organised for effective use much faster
 (B) It organises data in rows and columns
 (C) It gives reference name to each file created
 (D) It provides search facility (E) None of these.

17. Each command is followed by a meaning, match them.

Command	Meaning
---------	---------

- | | | | |
|--------------------|---|--------------------|--|
| 1. STEP | A. To branch unconditionally out of the normal program sequence to a specified line number. | | |
| 2. SWAP | B. To terminate program execution and return to command level. | | |
| 3. STOP | C. To exchange the values of two variables. | | |
| 4. GOTO | D. To specify the counter increment for each loop in FOR-NEXT statement. | | |
| (A) 1B, 2C, 3D, 4A | (B) 1A, 2B, 3C, 4D | (C) 1D, 2A, 3B, 4C | |
| (D) 1C, 2D, 3A, 4B | (E) None of these. | | |

18. If X represents "Sweta can read" and Y represents "Sweta can write", then write in terms of X, X', Y and Y' the following statements:

(i) Sweta can read but cannot write

(ii) Sweta cannot read or write

- | | | |
|-------------------------------|------------------------------|-------------------------------|
| (A) $X \cdot Y', X' \cdot Y'$ | (B) $X' \cdot Y, X \cdot Y'$ | (C) $X' \cdot Y, X' \cdot Y'$ |
| (D) None of these | (E) All of these. | |

19. Name the smallest addressable set of bits of the computer memory.

- (A) Byte (B) Word (C) Pixel (D) Digit (E) None of these.

20. Which of the following is not a hardware component?

- (A) Mouse (B) LAN (C) Chip (D) Semi-conductor memory
 (E) None of the above.

ANSWER KEY

- | | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (B) | 2. (A) | 3. (D) | 4. (C) | 5. (D) | 6. (A) | 7. (B) | 8. (A) | 9. (E) | 10. (D) |
| 11. (B) | 12. (E) | 13. (D) | 14. (B) | 15. (C) | 16. (A) | 17. (E) | 18. (A) | 19. (A) | 20. (B) |