

SINGLE OPTION CORRECT

- $\frac{(2^{n+4}-2(2^n))}{2(2^{n+3})} + 2^{-3}$ is equal to
 (A) 2^{n+1} (B) $-2^{n+1} + \frac{1}{8}$ (C) $\frac{9}{8} - 2^n$ (D) 1
- The least number, which divided by 48, 60, 72, 108 and 140 leaves 38, 50, 62, 98 and 130 respectively, is
 (A) 11115 (B) 15110 (C) 15120 (D) 15210
- Which of the following statement is true?
 (A) Every point on the number line represents a rational number.
 (B) Irrational number cannot be represented by points on the number line
 (C) $\frac{22}{7}$ is a rational number
 (D) None of these
- If $2 = x + \frac{1}{1 + \frac{1}{3 + \frac{1}{4}}}$, then value of x is
 (A) $\frac{12}{17}$ (B) $\frac{13}{17}$ (C) $\frac{18}{17}$ (D) $\frac{21}{17}$
- The LCM of two numbers is 14 times of their HCF. The sum of LCM and HCF is 600. If one of the number is 80, then other number is
 (A) 280 (B) 218 (C) 25 (D) 45
- If the HCF of 468 and 222 expressed as $468x + 222y$ where x, and y are integers then the value of $(y - x)$ is
 (A) 27 (B) 35 (C) 30 (D) 28
- Find the unit digit of the expression $(272)^{353} + (23)^{258} + (137)^{137} + (158)^{248}$ is:
 (A) 1 (B) 2 (C) 3 (D) 4
- $x^{\left(\frac{a+b-c}{(a-c)(b-c)}\right)} \cdot x^{\left(\frac{b+c-a}{(b-a)(c-a)}\right)} \cdot x^{\left(\frac{c+a-b}{(c-b)(a-b)}\right)}$ is equal to
 (A) x^{a+b+c} (B) x (C) 1 (D) 0

9. If $\left(\frac{x^{-1}y^2}{x^2y^{-4}}\right)^7 \div \left(\frac{x^3y^{-5}}{x^{-2}y^3}\right)^{-5} = x^p \cdot y^q$ then the value of p and q are
 (A) $p = 1, q = 1$ (B) $p = 2, q = 1$ (C) $p = 4, q = 1$ (D) $p = 2, q = 2$
10. If $x = a + \sqrt{a^2 + 1}$ then a in terms of x
 (A) $\frac{x^2-1}{2x}$ (B) $\frac{x^2+1}{2x}$ (C) $\frac{x^2-1}{2}$ (D) $\frac{x^2-3}{2}$
11. If $x = 5 + 2\sqrt{6}$, then $\sqrt{\frac{x}{2}} - \frac{1}{\sqrt{2x}} =$
 (A) 360 (B) 720 (C) 540 (D) 1440
12. If $\sqrt{\frac{6+2\sqrt{3}}{33-19\sqrt{3}}} = a + b\sqrt{3}$, then $a + b =$
 (A) 6 (B) 8 (C) 10 (D) 12
13. $\frac{1}{1+x^{a-b}} + \frac{1}{1+x^{b-a}}$ is equal to
 (A) $\frac{x^{ab}}{x^a+x^b}$ (B) $\frac{x^{ab}}{x^{a-b}}$ (C) 1 (D) $\frac{x^{ab}}{x^{b-a}}$
14. $\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \dots \dots \dots \infty}}}}$ is equal to
 (A) 3 (B) 2 (C) 1 (D) ± 3
15. When simplified, the product $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right)\left(1 - \frac{1}{6}\right) \dots \dots \dots \left(1 - \frac{1}{n}\right)$ equals to
 (A) $\frac{1}{n}$ (B) $\frac{2}{n}$ (C) $\frac{2(n-1)}{n}$ (D) $\frac{2}{n(n+1)}$
16. Which option is true for $\sqrt{2x^2 - 1 + 2x\sqrt{x^2 - 1}} = \dots \dots \dots$
 (A) $x - \sqrt{x^2 - 1}$ (B) $x + \sqrt{x^2 - 1}$ (C) $x + \sqrt{x^2 + 1}$ (D) $x - \sqrt{x^2 + 1}$
17. If $\left[\frac{\left\{1 - \left(\frac{a}{b}\right)^{-2}\right\}a^2}{(\sqrt{a} - \sqrt{b})^2 + 2\sqrt{ab}}\right] = 1$ and $a + b = 5$ where $a, b \in R^+$, then value of $a^b - b^a$ is
 (A) 1 (B) 2 (C) 0 (D) -1
18. The value of $\frac{1}{\sqrt{3} + \sqrt{2} - 1}$ on simplifying upto 3 decimal places, given that $\sqrt{2} = 1.4142$ and $\sqrt{6} = 2.4495$ is
 (A) 0.166 (B) 0.366 (C) 0.466 (D) 0.566
19. If R "Every fraction is a rational number", and T "Every rational number is a fraction", then which of the following is correct?
 (A) R is true and T is false (B) R is false and T is true
 (C) Both R and T is true (D) Both R and T is false

20. If m and n are natural numbers such that $2^m - 2^n = 960$ then $(m + n)$ is equal to
(A) 10 (B) 15 (C) 16 (D) 20
21. If $1 \leq k \leq 25$, how many prime numbers are there which are of the form $6k + 1$?
(A) 15 (B) 16 (C) 17 (D) 18
22. If a, b, c and d are four positive real numbers such that sum of a, b and c is even and the sum of b, c and d is odd, then $a^2 - d^2$ is necessarily
(A) Odd (B) Even (C) Prime (D) Either A or B
23. In a class there are 72 boys and 64 girls. If the class is to be divided into least number of groups such that each group contains either only boys or only girls, then how many groups will be formed?
(A) 17 (B) 34 (C) 24 (D) None
24. If HCF of 858 and 325 can be expressed in the form $858m + 325n$ where $m, n \in \mathbb{Z}$.
Find the value of $m + n$.
(A) 10 (B) 20 (C) 30 (D) 40
25. Find $(x + y)$ if $x + \sqrt{3} + 2)y + (5 + \sqrt{3})(2x + 1)$ where $x, y \in \mathbb{Q}$
(A) 1 (B) 0 (C) -1 (D) 2
26. In a $\triangle ABC$, $\angle A = x^\circ$, $\angle B = y^\circ$ and $\angle C = (y + 20)^\circ$. If $4x - y = 10$, then the triangle is
(A) Right angled (B) Obtuse angled (C) Equilateral Angled (D) None of these
27. How can the relationship between x and y be best defined, if values of x and y are as follows as
- | | | | | | |
|-----|---|---|---|----|----|
| x | 2 | 3 | 4 | 5 | 6 |
| y | 0 | 2 | 6 | 12 | 20 |
- (A) $y = 2x - 4$ (B) $y = x^2 - 3x + 2$ (C) $y = x^2 - 4x$ (D) $y = x^2 - 4$
28. The solution (x, y, z) of the equations: $\frac{x}{4} = \frac{y}{3} = \frac{z}{2}$, $7x + 8y + 5z = 62$ is
(A) (2,3,4) (B) (3,4,2) (C) (4,2,3) (D) (4,3,2)
29. Find the value of $(x - y)$ if $\frac{1}{2(2x+3y)} + \frac{12}{7(3x-2y)} = \frac{1}{2}$ and $\frac{7}{(2x+3y)} + \frac{4}{(3x-2y)} = 2$
(A) -1 (B) 0 (C) 1 (D) None of these
30. Find the number factors of 1080
(A) 32 (B) 28 (C) 24 (D) 36

INTEGER TYPE

1. If $x = 8 - \sqrt{60}$ and $\frac{1}{2}\left[\sqrt{x} + \frac{2}{\sqrt{x}}\right] = \sqrt{a}$ then find the value of 'a'
2. If $a = \frac{1}{3-2\sqrt{2}}$ and $b = \frac{1}{3+2\sqrt{2}}$ then $a^2b + ab^2$ is equal to _____
3. Find the total number factor of 540.
4. The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 and 18 is
5. $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} + \frac{2\sqrt{3}}{\sqrt{6}+\sqrt{2}}$ is equal to
6. Find the sum of factors of 270.
7. If $a = \frac{1}{3-2\sqrt{2}}, b = \frac{1}{3+2\sqrt{2}}$ then the value of $a^3 + b^3$ is
8. If the number $2345p60q$ is exactly divisible by 3 and 5, then the maximum value of $p + q$ is
9. If $1 \leq k \leq 25$, how many prime numbers are there which are of the form $(6k + 1)$?
10. Mr. Elon wanted to type of first 180 natural number. Find the number of times he had to press the numbered keys.
11. If $\left\{(2^4)^{\frac{1}{2}}\right\}^x = 256$ then the value of x is



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ANSWER KEY & SOLUTION

SINGLE OPTION CORRECT

- | | | | |
|-------|-------|-------|-------|
| 1. D | 2. B | 3. C | 4. D |
| 5. A | 6. D | 7. D | 8. C |
| 9. C | 10. A | 11. B | 12. B |
| 13. C | 14. A | 15. B | 16. B |
| 17. A | 18. C | 19. A | 20. C |
| 21. B | 22. A | 23. A | 24. D |
| 25. C | 26. A | 27. B | 28. D |
| 29. C | 30. B | | |

INTEGER TYPE

- | | | | |
|-------|---------|-------|--------|
| 1. 5 | 2. 6 | 3. 24 | 4. 364 |
| 5. 0 | 6. | 7. 24 | 8. 13 |
| 9. 16 | 10. 432 | 11. 4 | |