MATHS

BOOKS - S CHAND IIT JEE FOUNDATION

NUMBERS

Solved Examples

1. What is the product of the greatest prime number that is less than 50 and the smallest prime number that is greater than 50?

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2. Find the remainder when $7^{21} + 7^{22} + 7^{23} + 7^{24}$ is divided by 25.

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3. If $n = 1 + x$, where x is the product of four consecutive positive integers, then which of the following is/are true? n is odd II. n is prime III. n is a perfect square. (a) I only (b) I and II only (c) I and III only (d) None of these

A. A and C only

B. A and B only

C. A only

D. None of these

Answer: A

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4. Which one of the following is the rational number lying between $\frac{6}{7}$ and $\frac{7}{8}$?

A. $\frac{3}{4}$

B. $\frac{9}{122}$

C. $\frac{95}{112}$

D. $\frac{97}{112}$

Answer: D

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5. If 1.525252 .....is converted to a fraction then what is the sum of its numerator and denominator?

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6. A number when divided by 136 leaves remainder 36. If the same number is divided by 17, the remainder will be 2 (b) 3 (c) 7 (d) 9

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7. Three natural numbers are said to be tri prime if the pair wise co prime. Then one triplet which is not tri-prime?

A. (2,3,7)

B. (2,9,11)

C. (3,5,7)

D. (3,4,9)

Answer:

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8. If the sum of the digits of any integer lying between 100 and 1000 is subtracted from the number, the result always is

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9. Find the least five digit number which is divisible by 666.

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Question Bank 1

1. The units digit of every prime number (other than 2 and 5) must be necessarily :

A. 1,3 or 5

B. 1,3,7 or 9

C. 7 or 9

D. 1 or 7

Answer: B

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2. Consider the following statements

A.The sum of two prime numbers is a prime number.

B. The product of two prime numbers is a prime number.

Which of these statements is/are correct?

A. Neither A nor B

B. A alone

C. B alone

D. Both A and B

Answer: A

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3. If $N, (N+2)$ and $(N+4)$ are prime numbers, then the number of possible solutions for N are

A. one

B. two

C. three

D. more than three

Answer: A

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4. Let x and y be positive integers such that x is prime and y is composite. Then

A. y-x cannot be an even integer

B. xy cannot be an even integer

C. $(x+y)/x$ cannot be an even integer

D. None of these

Answer: D

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5. Consider the following statements:

The number 23 is

A. a prime number B. a real number

C.an irrational number D. a rational number of these statements

A. A,B,D are correct

B. A,B,C are correct

C. B,C,D are correct

D. A,C,D are correct

Answer: A

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6. What is the units digit of the product of all prime numbers between 1 and 100?

A. 0

B. 1

C. 2

D. 3

Answer: A

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7. For what value fo n are $2^n - 1$ and $2^n + 1$ prime?

A. 7

B. 5

C. 2

D. 1

Answer: C

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8. In a six digit number, the sum of the digits in the even places is 9 and the sum of the digits in the odd places is 20. All such numbers are divisible by

A. 7

B. 9

C. 6

D. 11

Answer: D

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9. Which of the following numbers is divisible by 15?

A. 30560

B. 29515

C. 23755

D. 17325

Answer: D

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10. The difference of a number consisting of two digits and the number formed by interchanging the digits is always divisible by 5 (b) 7 (c) 9 (d) 11

A. 5

B. 7

C. 9

D. 11

Answer: C

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11. The number 89715938* is divisible by 4. The unknown non-zero digit marked as * will be 2 (b) 3 (c) 4 (d) 6

A. 2

B. 3

C. 4

D. 6

Answer: C

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12. An integer is divisible by 16 if and only if its last X digits are divisible by 16.The value of X would be 3 (b) 4 (c) 5 (d) 6

A. Three

B. Four

C. Five

D. Six

Answer: B

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13. $\left(4^{61}+4^{62}+4^{63}+4^{64}\right)$ is divisible by

(a) 3

(b) 11

(c) 13

(d) 17

A. 3

B. 11

C. 13

D. 17

Answer: D

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14. If n is any natural number then $n^2(n^2-1)$ is always divisible

A. 12

B. 24

C. $12-n$

D. 6

Answer: A

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15. The sum of all possible two digit numbers formed from three different one digit natural numbers when divided by the sum of the original three numbers is equal to

A. 36

B. 22

C. 18

D. 24

Answer: B

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16. A 6-digit number is formed by repeating a 3-digit number: for example, 256256 or 678678 etc. Any number of this form is always exactly divisible by 7 only (b) 11 only (c) 13 only (d) 1001

A. 7 only

B. 11 only

C. 13 only

D. 1001

Answer: D

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17. The smallest number to be added to 1000, so that 45 divides the sum exactly, is :

A. 35

B. 80

C. 0

D. 10

Answer: A

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18. In the product $459 \times 46 \times 28^* \times 484$, the digit in the unit place is 8. The digit to come in place of * is 3 (b) 5 (c) 7 (d) None of these

A. 3

B. 5

C. 7

D. 4

Answer: C

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19. How many of the following numbers are divisible by 3 but not by 9? 2133, 2343, 3474, 4131, 5286, 5340, 6336, 7347, 8115, 9276 5 (b) 6 (c) 7 (d) None of these

A. 5

B. 6

C. 7

D. 4

Answer: B

20. When a number is divided by 893 , the remaineder is 193 . What will be the remainder when it is divided by 47 ?

A. 3

B. 5

C. 25

D. 33

Answer: B

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21. What is the least natural number which leaves no remainder when divided by all the digits from 1 to 9? (a) 1800 (b) 1920 (c) 2520 (d) 5040

A. 1800

B. 5040

C. 1920

D. 2520

Answer: D

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22. Positive integers

A. Always a natural number

B. Always an integer

C. A rationa number

D. A irrational number

Answer: C

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23. Consider the following statements:

A. The product of an integer and a rational number can never be a natural number.

B. The quotient of division of an integer by a rational number can never be an integer.

Which of the statements given above is /are correct?

A. A only

B. B only

C. Both A and B

D. Neither A nor B.

Answer: D

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24. The rational number lying between $\frac{5}{6}$ and $\frac{6}{7}$ is

A. $\frac{1}{2}$

B. $\frac{15}{21}$

C. $\frac{35}{42}$

D. $\frac{71}{84}$

Answer: D

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25. Rational number $\frac{-18}{5}$ lies between consecutive integers :

A. -2 and -3

B. -3 and -4

C. -4 and 5

D. -5 and -6

Answer: B

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26. A rational equivalent to $\frac{-24}{20}$ with denominator 25 is :

A. $-\frac{30}{25}$

B. $\frac{28}{25}$

C. $-\frac{29}{25}$

D. $-\frac{19}{25}$

Answer: A

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27. The pair of rational numbers that lies between $\frac{1}{4}$ and $\frac{3}{4}$ is?

A. $\frac{262}{1000}, \frac{752}{1000}$

B. $\frac{63}{250}, \frac{187}{250}$

C. $\frac{13}{50}, \frac{264}{350}$

D. $\frac{9}{40}, \frac{31}{40}$

Answer: B

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28. Which of the following is correct?

3.292929....is

A. an integer

B. a rational number

C. an irrational number

D. not a real number

Answer: B

29. A rational number whose reciprocal does not exist is

A. 1

B. -1

C. 0

D. 10

Answer: C

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30. RATIONAL NUMBER A number of the form $\frac{p}{q}$ or a number which can be expressed in the form

$\frac{p}{q}$ where pa and q are integers and $q \neq 0$ is called a rational number.

A. a fraction

B. an integer

C. a rational number

D. a real number.

Answer: C

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31. $\frac{3}{4} - \frac{4}{5}$ is not equal to

A. $-\frac{4}{5}+\frac{3}{4}$

B. $-\frac{1}{20}$

C. $\frac{4}{5}-\frac{3}{4}$

D. $-\frac{4}{5}-\left(-\frac{3}{4}\right)$

Answer: C

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32. The rational number which can be expressed as a terminating decimal is

A. $\frac{1}{6}$

B. $\frac{1}{12}$

C. $\frac{1}{15}$

D. $\frac{1}{20}$

Answer: D

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33. Arrange the following rational numbers in descending order.

$$\frac{1}{5}+\frac{1}{-6}, \left|-\frac{7}{6}+1\right|, \left(-\frac{1}{2}\right)^3-\frac{5}{8}\div\frac{-15}{4}$$

A.

$$\frac{1}{5}+\frac{1}{-6},\left(-\frac{1}{2}\right)^3,\frac{5}{8}\div\frac{-15}{4},\left|-\frac{7}{6}+1\right|$$

B.

$$\left(-\frac{1}{2}\right)^3,\frac{1}{5}+\frac{1}{-6},\frac{5}{8}\div\frac{-15}{4},\left|-\frac{7}{6}+1\right|$$

C.

$$\left|-\frac{7}{6}+1\right|,\frac{1}{5}+\frac{1}{-6},\left(-\frac{1}{2}\right)^3,\frac{5}{8}\div\frac{-15}{4}$$

D.

$$\frac{5}{8}\div\frac{-15}{4},\left|-\frac{7}{6}+1\right|,\frac{1}{5}+\frac{1}{-6},\left(-\frac{1}{2}\right)^3$$

Answer: C

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34. Evaluate: $\dfrac{9|3-5|-5|4| \div 10}{-3(5)-2 \times 4 \div 2}$

A. $\dfrac{9}{10}$

B. $-\dfrac{8}{17}$

C. $-\dfrac{16}{19}$

D. $\dfrac{4}{7}$

Answer: C

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35. The value of

$$25 - 5[2 + 3\{2 - 2(5 - 3) + 5\} - 10] \div 4$$

A. 2

B. 23.25

C. 23.75

D. 25

Answer: C

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Self Assessment Sheet 1

1. If a and b are such numbers that $a > 0$ and $b < 0$, then which one of the following is always correct?

A. $a - b > 0$

B. $a + b > 0$

C. $a + b < 0$

D. $a - b < 0$

Answer: A

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2. The rational numbers lying between $\frac{1}{3}$ and $\frac{3}{4}$ are $\frac{117}{300}, \frac{287}{400}$ (b) $\frac{95}{300}, \frac{301}{400}$ (c) $\frac{99}{300}, \frac{301}{400}$ (d) $\frac{97}{300}, \frac{299}{500}$

A. $\frac{97}{300}, \frac{299}{500}$

B. $\frac{99}{300}, \frac{301}{400}$

C. $\frac{95}{300}, \frac{301}{400}$

D. $\frac{117}{300}, \frac{287}{400}$

Answer: D

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3. Match List -I with List -II and select the correct answer using the codes given below the lists:

List I (Number)	List II Divisible by
(A) 4926549	(1) 11
(B) 54192039	(2) 5
(C) 394192045	(3) 4
(D) 19706196	(4) 3

A. $\begin{matrix} A & B & C & D \\ 4 & 1 & 2 & 3 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 1 & 3 & 2 & 4 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 2 & 2 & 3 & 1 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 2 & 1 & 4 & 3 \end{matrix}$

Answer: A

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4. Of the numbers 29540, 53416 and 21543

A. none is divisible by 12

B. one is divisible by 12

C. two are divisible by 12

D. all are divisible by 12

Answer: A

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5. On dividing 4996 by a certain number, the quotient is 62, and the remainder is 36. What is the divisor?

A. 80

B. 85

C. 90

D. 95

Answer: A

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6. Consider the following statements about natural numbers

1. There exists a smallest natural number.

2. Thre exists a largest natural number.

3. Between two natural numbers, there is always a natural number.

Which of these is/are correct?

A. None

B. Only 1

C. 1 and 2

D. 2 and 3

Answer: B

7. The number 311 311 311 311 311 311 311 is

A. Divisible by both 3 and 11

B. Divisible by 3 but not by 11 Divisibel by 11 but not by11

C. Divisible by 11 but not by 3

D. Neither divisible by 3 nor by 11.

Answer: D

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8. The least perfect square number divisible by 3, 4, 5, 6 and 8 is (a) 900 (b) 1200 (c) 2500 (d) 3600

A. 900

B. 1600

C. 2500

D. 3600

Answer: D

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9. If we divide a positive integer by another positive integer, what is the resulting number?

A. it is always a natural number

B. it is always an integer

C. it is always a rational number

D. it is an irrational number.

Answer: C

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10. If p is a number between 0 and 1, which one of the following is true?

A. $p > \sqrt{p}$

B. $\frac{1}{p} < \sqrt{p}$

C. $p < \frac{1}{p}$

D. $p^3 > p^2$

Answer: C

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