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Class: X
Subject: Mathematics
Topic: Real Number
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

Q1: Which of the following has a nonterminating decimal expansion?

A. 77/210
B. 23/8
C. 17/8
D. 35/50

Solution1: (a) 77/210
[Hint: For a rational number in the form p/q, such that the prime factors of q are not of the form 2^n5^m, where n and m are non negative integers. Then the rational number has a decimal expansion which is non terminating repeating (recurring).

Q2: The decimal expansion of 141/120 will terminate after how many places of decimals?

A. 1
B. 2
C. 3
D. will not terminate

Solution: 2(c) 3 [Hint: First write the fraction in simplest form. Rational form of number p/q, where q = 2^3 5]

Q3: HCF of 84 and 270 is

A. 8
B. 6
C. 4
D. 2

Solution: 3(b) Write Prime Factorized form of both.

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Q4: If p, q are two consecutive natural numbers, then HCF (p, q) is:

A. q
B. p
C. 1
D. pq

Solution: 4(C) HCF of any two consecutive numbers is 1

Q5: If HCF of 60 and 168 is 12, what is the LCM

A. 480
B. 240
C. 420
D. 840

Solution:5(D) Product of 2 Numbers = LCM* HCF. Using this above can be find out easily

Q6: How many prime factors are there in prime factorisation of 5005?

A. 2
B. 4
C. 6
D. 7

Solution6:(B) 5005= 5*7*11*13 4 factors

Q7: A rational number can be expressed as a terminating decimal if the denominator has factors

A. 2, 3 or 5
B. 2 or 3
C. 3 or 5
D. 2 or 5

Ans. D Fact

Q8: If p, q are two prime numbers, then LCM (p, q) is:

A. 1
B. p
C. q
D. pq

Solution8:(D) Product if numbers = LCM*HCF for prime numbers HCF is 1 So LCM will be Product of 2 numbers

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Q9: Euclid's division lemma states that for any two positive integers 'a'
and 'b' there exists unique integers q and r such that a=bq+r where r must satisfy:

A. $1 \leq r < b$
B. $0 < r \leq b$
C. $0 \leq r < b$
D. $0 < r < b$

Solutions9:(C) Remainder can be from 0 to 1 less than the divisor itself**.**

Q10: Which of the following is not an irrational number?

A. $5 - \sqrt{3}$
B. $5 + \sqrt{3}$
C. $4 + \sqrt{2}$
D. $5 + \sqrt{9}$

Solutions10:(D) $\sqrt{9}$ is 3 so 5+3 becomes 8 which is rational

Q11: Which of the following numbers has terminating decimal expansion?

A. 37/45
B. $21/(2^3 5^6)$
C. 17/49
D. $89/(2^2 3^2 5^2)$

Solutions:(B) Hint: Follow $2^m 5^n$ rule to get terminating decimal expansion.

Q12: The mathematician who gave the term 'algorithm'?

A. Euclid
B. Gold Bach
C. Khwarizmi
D. Gauss

Solutions:(C) Fact

Q13: The decimal expansion of π

A. is terminating.
B. is non-terminating and repeating
C. is non-terminating and non-repeating
D. None of these

Solutions:(c) π is irrational number.

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Q14. Which of the following rational numbers has a terminating decimal expansion?

A. $\frac{132}{704}$
B. $\frac{46}{1704}$
C. $\frac{273}{156}$
D. $\frac{135}{216}$

Solution: (A) It is known that a rational number $\frac{p}{q}$ has a terminating decimal expansion of q can be prime factorised in the form 2^n5^m, where n and m are non-negative integers. Prime factorising the denominators and rewriting the given rational numbers.

Q15. A decimal number is of the form 3b.0276, where b represents a digit. The decimal is then written in the form of the simplest fraction. The prime factorisation of the denominator of the fraction is $2^2 \times 5^4 \times 7^\times$,where x is a non-negative integer.

What is the value of x?

A. 0
B. 10
C. Any even value
D. any value

Solution: (A) It is known that a rational number $\frac{p}{q}$ has a terminating decimal expansion, if q can be prime factorised in the form 2^n5^m, where n and m are non-negative integers.

Therefore, prime factorisation of the denominator of the simplest fraction equivalent to the number 36.0276 is of the form 2^n5^m, where n and m are non-negative integers.

It is given that prime factorisation of the denominator of the simplest equivalent fraction is $2^2 \times 5^4 \times 7^\times$.

$\therefore 2^n5^m = 2^2 \times 5^4 \times 7^\times$

$\Rightarrow 7^\times = 1$

$\Rightarrow$x = 0

Thus, the valure of x is 0

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Q16. Which of the following rational numbers has a terminating decimal expansion?

A. $\frac{12}{576}$
B. $\frac{33}{528}$
C. $\frac{11}{484}$
D. $\frac{14}{524}$

Solution: (b) It is known that a rational number $\frac{p}{q}$ has a terminating decimal expansion if q can be prime factorised in the form $2^n 5^m$, where n and m are non-negative integers.

Prime factorising the denominators and rewriting the given rational numbers,

$$\frac{12}{576} = \frac{1}{48} = \frac{1}{2^4 \times 3^1}$$

$$\frac{33}{528} = \frac{1}{16} = \frac{1}{2^4} = \frac{1}{2^4 \times 5^0}$$

$$\frac{11}{484} = \frac{1}{44} = \frac{1}{2^2 \times 11^1}$$

$$\frac{14}{524} = \frac{7}{262} = \frac{1}{2^1 \times 131^1}$$

Here, the denominator of the rational number $\frac{33}{528}$ is of the form $2^n 5^m$, where n and m are non-negative integers.

$\therefore \frac{33}{528} = \frac{1}{2^4 \times 5^0}$ has a terminating decimal expansion.

Q17. The largest number which divides 70 and 125, leaving remainders 5 and 8, respectively, is

A. 13
B. 65
C. 15
D. 5

Solution: (A) A Subtract the remainders from numbers respectively, i.e 70-5=65 and 125-8=117

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Find HCF of these numbers i.e. 13. 13 will be leaving required remainders

Q18. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is

A. 10
B. 100
C. 504
D. 252

Solutions:(D) Option A and B are clearly ruled out as they are not divisible by 3 and C is not divisible by 10So D is a clear option. Other way, you can find LCM starting from 10.

Q19. If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; a, b being prime numbers, then LCM (p, q) is

A. ab
B. a^2b^2
C. a^3b^2
D. a3b3

Solutions:(C) Assume a to be 2 and b to be 3 the question look 2 simplified.

Q20. $n^2 – 1$ is divisible by 8, if n is

A. an integer
B. a natural number
C. an odd integer
D. an even integer

Ans. C