PREVIOUS YEARS SCHOOL SUMMATIVE-EXAM QUESTIONS

(REAL NUMBERS)

Q1-H.C.F. of two consecutive even numbers is :
(A) 0 (B) 1 (C) 4 (D) 2

Q2-If the HCF of 85 and 153 is expressible in the form 85n - 153, then value of n is :
(A) 3 (B) 2 (C) 4 (D) 1

Q3-If the HCF of 65 and 117 is expressible in the form 65 m-117, then the value of m is :
(A) 4 (B) 2 (C) 3 (D) 1

Q4-Rational number $\frac{p}{q}$, q ≠0 will be terminating decimal if the prime factorisation of q is of the form. (m and n are non negative integers :
(A) $2^m \times 3^n$ (B) $2^m \times 5^n$ (C) $3^m \times 5^n$ (D) $3^m \times 7^n$

Q5-For any two positive integers a and b, there exist unique integers q and r such that a=bq+r, $0 \leq r < b$ If b =4 then which is not the value of r ?
(A) 1 (B) 2 (C) 3 (D) 4

Q6-The decimal expansion of $\frac{21}{24}$ will terminate after how many places of decimal ?
(A) 1 (B) 2 (C) 3 (D) 4

Q7-Which of the following rational numbers has non terminating and repeating decimal expansion

(A) $\frac{15}{1600}$ (B) $\frac{17}{6}$ (C) $\frac{23}{8}$ (D) $\frac{35}{50}$

Q8-The decimal expansion of $\frac{6}{1250}$ will terminate after how many places of decimal ?
(A) 1 (B) 2 (C) 3 (D) 4

Q9-The decimal expansion of $\frac{17}{8}$ will terminate after how many places of decimals ?
(A) 2 (B) 1 (C) 3 (D) will not terminate

Q10-For some integer 'm' every odd integer is of the form :
(A) m (B) m+1 (C) 2 m (D) 2 m+1

Q11-If two positive integers A and B can be expressed as A= ab^2 and B = a^3b, where a, b, are prime numbers, then LCM (A, B) is :
(A) ab (B) a^2b^2 (C) a^3b^2 (D) a^4b^3

Q41-Prove that $\sqrt{3}+\sqrt{2}$ is irrational

Let $\sqrt{3}+\sqrt{2}$ is a rational number

$\frac{p}{q} = \sqrt{3}+\sqrt{2}$

Squaring both sides

$3 + 2 + 2\sqrt{6} = \frac{p^2}{q^2}$

$2\sqrt{6} = \frac{p^2}{q^2} - 5$

$\sqrt{6} = \frac{p^2-5q^2}{2q^2}$

Irrational = rational

Which is not possible

So that $\sqrt{3}+\sqrt{2}$ is irrational

Q42-Prove that $\sqrt{5}$ is irrational.

Let $\sqrt{5}$ is a rational number then there exist p and q such that

$\frac{p}{q} = \sqrt{5}$ p and q are co-prime

$\frac{p^2}{q^2} = (\sqrt{5})^2$

$\frac{p^2}{q^2} = 5$

$P^2 = 5q^2$

$5 | p^2$

$5 | p$ ---(1)

P=5c for some integer c

$P^2 | 25c^2$

$25c^2 = 5q^2$

$q^2 = 5c^2$

$5 | q^2$

$5 | q$ --(2)

So that 5 is a common factor of p and q , but p and q are co-prime i.e. HCF(p,q)=1

This means that our supposition is wrong

= $\sqrt{5}$ is irrational number

Q43-Prove that $\frac{2\sqrt{3}}{5}$ is an irrational.

Let $\frac{2\sqrt{3}}{5}$ is a rational number

$\frac{2\sqrt{3}}{5} = \frac{p}{q}$

$\sqrt{3} = \frac{5p}{2q}$

Irrational = rational

Which is not possible

So that $\frac{2\sqrt{3}}{5}$ is irrational

Q97-Show that the square of any positive odd integer is of the form 8 m+1, for some integer m.

Let a be any +ve integer

By Euclid's division lemma

a=bq + r where b = 8

a= 8q +r $0 \le r < 8$

a= 8q when r= 0 even for any +ve integer q = 1,2,3 --- (a= 8,16,24-----)

a= 8q+1 , if r= 1 odd for any +ve integer q = 1,2,3------(a= 9,17,25-----)

a= 8q +2 if r = 2 even for any +ve integer q = 1,2,3 --- (a= 10,18,26 -----)

a= 8q +3 if r = 3 odd for any +ve integer q = 1,2,3 --- (a= 11,19,27-----)

a= 8q +4 if r = 4 even for any +ve integer q = 1,2,3 --- (a= 12,20,28 -----)

a= 8q +5 if r = 5 odd for any +ve integer q = 1,2,3 --- (a= 13,21,29-----)

a= 8q +6 if r = 6 even for any +ve integer q = 1,2,3 --- (a= 14,22,30 -----)

a= 8q +7 if r = 7 odd for any +ve integer q = 1,2,3 --- (a= 15,23,31-----)

" a " be any +ve odd integer in the form of 8q+1 ,8q+3 and 8q+5 for some integer q

Case I- a = 8q +1

$a^2 = (8q+1)^2 = 64q^2+16q + 1$

$a^2 = 8(8q^2+ 2q) + 1$

$= 8m+1$, where $m = 8q^2+ 2q$

Case II - a = 8q +3

$a^2 = (8q+3)^2 = 64q^2+48q + 9$

$= 64q^2+48q + 8 + 1$

$a^2 = 8(8q^2+ 6q + 1) + 1$

$= 8m+1$, where $m = 8q^2+ 6q + 1$

Case III - a = 8q +5

$a^2 = (8q+5)^2 = 64q^2+80q + 25$

$= 64q^2+80q + 24 + 1$

$a^2 = 8(8q^2+ 10q + 3) + 1$

$= 8m+1$, where $m = 8q^2+ 10q + 3$

So that the square of any positive odd integer is of the form 8 m+1, for some integer m.