- Let a, b and c form an H.P. Then 1/a, 1/b and 1/c form an A.P.
- If a, b and c are in H.P. then 2/b = 1/a + 1/c, which can be simplified as b = 2ac/(a+c)
- If 'a' and 'b' are two non-zero numbers then the sequence a, H, b is a H.P.
- The n numbers H1, H2, ……,Hn are said to be harmonic means between a and b, if a, H1, H2 ……, Hn, b are in H.P. i.e. if 1/a, 1/H1, 1/H2, ..., 1/Hn, 1/b are in A.P. Let d be the common difference of the A.P., Then 1/b = 1/a + (n+1) d ⇒ d = a–b/(n+1)ab. Thus 1/H1 = 1/a + a–b/(n+1)ab,
    - 1/H2 = 1/a + 2(a–n)/(n+1)ab,
    - 1/Hn = 1/a + n(a–b)/(n+1)ab.
- If x1, x2, … xn are n non-zero numbers, then the harmonic mean 'H' of these numbers is given by 1/H = 1/n (1/x1 + 1/ x2 + ……. +1/ xn)

$$H = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \cdots + \frac{1}{x_n}} = \frac{n}{\sum_{i=1}^{n} \frac{1}{x_i}} = \frac{n \cdot \prod_{j=1}^{n} x_j}{\sum_{i=1}^{n} \frac{\prod_{j=1}^{n} x_j}{x_i}}.$$

- As the nth term of an A.P is given by an = a + (n-1)d, So the nth term of an H.P is given by 1/ [a + (n -1) d].
- If we have a set of weights w1, w2, …. , wn associated with the set of values x1, x2, …. , xn, then the weighted harmonic mean is defined as

$$\frac{\sum_{i=1}^{n} w_i}{\sum_{i=1}^{n} \frac{w_i}{x_i}}.$$

- Questions on Harmonic Progression are generally solved by first converting them into those of Arithmetic Progression.
- If 'a' and 'b' are two positive real numbers then A.M x H.M = G.M2
- The relation between the three means is defined as A.M > G.M > H.M
- If we need to find three numbers in a H.P. then they should be assumed as 1/a–d, 1/a, 1/a+d
- Four convenient numbers in H.P. are 1/a–3d, 1/a–d, 1/a+d, 1/a+3d
- Five convenient numbers in H.P. are 1/a–2d, 1/a–d, 1/a, 1/a+d, 1/a+2d