(i) Let $t_n$ be the taxi faire for first n km.

Then, $t_1 = a = 15$,

$t_2 = 15 + 8 = 23$,

$t_3 = 23 + 8 = 31$.

So, the list will be as followed: 15, 23, 31.

Hence $t_{20} = t_3 = \ldots = 8$.

Thus the situation forms as AP.

(ii) Let the first term be x units

Then, $t_1 = a = x$.

$t_2 = x - \frac{1}{4}x = \frac{3}{4}x$ units.

$t_3 = \frac{3}{4}x - \frac{1}{4}\left(\frac{3}{4}x\right) = \frac{9}{16}x$ units.

$t_4 = \frac{9}{16}x - \frac{1}{4}\left(\frac{9}{16}x\right) = \frac{27}{64}x$ units. ...

The list of no. is $x, \frac{3}{4}x, \frac{9}{16}x, \frac{27}{24}x, \ldots$

Since, $t_2 - t_1$, $t_3 - t_2$, therefore it is not an AP.

(iii) First term $a = ₹150$.

Common different for every subsequent metere is ₹50.

$t_1 = a = 150$.

$t_2 = a + d = 150 + 50 = 200$.

$t_3 = a + 2d = 150 + 2 \times 50 = 250$.

$t_4 = a + 3d = 150 + 150 = 300$.

Since $t_2 - t_1 = t_5 - t_3 = 50$, therefore it is an AP.

iv) Let $t_n$ be the $n^{th}$ amount of money in the $n^{th}$ year

then, $t_1 = a = 10000$

$t_2 = 10000 + 10000 \times \frac{8}{100}$

$= 10000 + 800 = 10800$

$t_3 = 10800 + 10800 \times \frac{8}{100}$

$= 10800 + 864 = 11664$

$t_4 = 11664 + 11664 \times \frac{8}{100}$

$= 11664 + 933.12 = 12597.12$

Hence, $t_2 - t_1 \neq t_3 - t_2$, Therefore, it is not an AP.

i) $a = 10, d = 10$

$a_1 = 10$

$a_2 = 10 + 10 = 20$

$a_3 = 20 + 10 = 30$,

$a_4 = 30 + 10 = 40$.

Thus, the first four terms of AP are 10, 20, 30, 40.

(iii) $a_1 = 4, d = -3$.

$a_2 = a_1 + d = 4 - 3 = 1$.

$a_3 = a_2 + d = 1 - 3 = -2$.

$a_4 = a_3 + d = -2 - 3 = -5$.

Thus, the 4 terms of AP are $4, 1, -2, 5$.

$a_1 = 1, d = \frac{1}{2}$

$a_2 = a_1 + d = \frac{-1}{1} + \frac{1}{2} = \frac{-1}{2}$.

$a_3 = a_2 + d = \frac{-1}{2} + \frac{1}{2} = 0$.

(iv) $a_4 = a_3 + d = 0 + \frac{1}{2} = \frac{1}{3}$.

Thus, the first 4 terms of AP are $-1, -\frac{1}{2}, 0, \frac{1}{2}$

(v) $a_1 = -1.23, d = 0.25$.

$a_2 = a_1 + d = -1.25 - 0.25 = -1.50$.

$a_3 = a_1 + d = -1.50 - 0.25 = -1.50$.

$a_4 = a_1 + d = -1.75 - 0.25 = -2$.

(i) $3, 1, -1, -5, \ldots$

$a = 3$ & $d = t_2 - t_3 = 1 - 3 = -2$.

(ii) $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \ldots$

$a = \frac{1}{3}$ & $d = t_2 - t_1 = 1.7 - 1.6 = 1.1$.

Q4. (i) 2, 4, 8, 16, . . . .

$a_2 - a_1 = 4 - 2 = 2$.

$a_3 - a_2 = 8 - 4 = 4$.

$a_2 - a_1 \neq a_3 - a_3$.

∴ the given sequence is not an AP.

(ii) $2, \frac{8}{2}, 3, \frac{5}{2}$.

$a_2 - a_1 = \frac{5}{2} - \frac{2}{1} = \frac{1}{2}$.

$a_3 - a_2 = \frac{3}{1} - \frac{5}{2} = \frac{1}{2}$.

$a_2 - a_1 = a_3 - a_2$.

Thus, the given sequence is a AP.

$a_1 = 2$.