

1(i) $-1, -1, -1, -1, \dots$

$$a_2 - a_1 = a_3 - a_2 = a_4 - a_3 = 0$$

\therefore A.P.

1(ii) $0, 2, 0, 2, \dots$

$$a_2 - a_1 = 2 - 0 = 2$$

$$a_3 - a_2 = 0 - 2 = -2$$

$$\therefore a_2 - a_1 \neq a_3 - a_2$$

\therefore Not A.P.

1(iii) $1, 1, 2, 2, 3, 3, \dots$

$$a_2 - a_1 = 1 - 1 = 0$$

$$a_3 - a_2 = 2 - 1 = 1$$

$$\therefore a_2 - a_1 \neq a_3 - a_2$$

Not A.P.

1(iv) $11, 22, 33, \dots$

$$\therefore a_3 - a_2 = a_2 - a_1 = 11$$

\therefore A.P.

1(v) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$

$$a_2 - a_1 = \frac{1}{3} - \frac{1}{2} = \frac{2-3}{6} = -\frac{1}{6}$$

$$a_3 - a_2 = \frac{1}{4} - \frac{1}{3} = \frac{3-4}{12} = -\frac{1}{12}$$

$$\therefore a_2 - a_1 \neq a_3 - a_2$$

\therefore Not A.P.

1(vi) $2, 2^2, 2^3, 2^4, \dots$

$$= 2, 4, 8, 16, \dots$$

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

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

$$\therefore a_3 - a_2 \neq a_2 - a_1$$

\therefore Not A.P.

1(vii) $\sqrt{3}, \sqrt{12}, \sqrt{27}, \sqrt{48}, \dots$

$$= \sqrt{3}, 2\sqrt{3}, 3\sqrt{3}, 4\sqrt{3}, \dots$$

$$\therefore a_2 - a_1 = a_3 - a_2 = a_4 - a_3 = \sqrt{3}$$

\therefore A.P.

2(i) $-1, -\frac{3}{2}, -2, \frac{5}{2}$

$$a_2 - a_1 = -\frac{3}{2} + 1 = -\frac{1}{2}$$

$$a_4 - a_3 = \frac{5}{2} + 2 = \frac{9}{2}$$

$$\therefore a_2 - a_1 \neq a_4 - a_3$$

\therefore Not A.P. [False]

(3) $-3, -7, -11, \dots$

$$d = -7 + 3 = -4$$

$$a_{30} - a_{20} = a + 29d - a - 19d = 10(-4) = -40$$

[yes]