

SAMPLE PAPER 6: PAPER 1

QUESTION 8 (50 MARKS)

Question 8 (a)

Arithmetic sequence: 1, 3, 5, 7,.....

$$a = 1, d = 2$$

$$\begin{aligned} T_n &= 1 + (n-1)(2) \quad \boxed{T_n = a + (n-1)d} \\ &= 1 + 2n - 2 \\ &= 2n - 1 \end{aligned}$$

Question 8 (c)

$$T_n = 21$$

$$\therefore 2n - 1 = 21$$

$$2n = 22$$

$$\therefore n = 11$$

$$T_{11} = 21 = 11^2 - 10^2$$

Question 8 (e)

Two consecutive odd numbers: $2n - 1, 2n + 1$

$$\begin{aligned} &(2n-1)(2n+1) \\ &= 4n^2 + 2n - 2n - 1 \\ &= 4n^2 - 1 \end{aligned}$$

$4n^2 = \text{Even number for all values of } n$

$$\therefore 4n^2 - 1 = \text{Odd number}$$

Question 8 (b)

$$1 = 1^2 - 0^2$$

$$3 = 2^2 - 1^2$$

$$5 = 3^2 - 2^2$$

$$7 = 4^2 - 3^2 (= 16 - 9 = 7)$$

Question 8 (d)

$$\begin{aligned} T_n &= n^2 - (n-1)^2 \\ &= n^2 - (n^2 - 2n + 1) \\ &= n^2 - n^2 + 2n - 1 \\ &= 2n - 1 \end{aligned}$$

Question 8 (f)

$$\boxed{S_n = \frac{n}{2}[2a + (n-1)d]}$$

Arithmetic sequence: 1, 3, 5, 7,.....

$$a = 1, d = 2, n = 100$$

$$\begin{aligned} S_{100} &= \frac{100}{2}[2(1) + (100-1)(2)] \\ &= 50[2 + (99)(2)] \\ &= 50[200] \\ &= 10\,000 \end{aligned}$$
