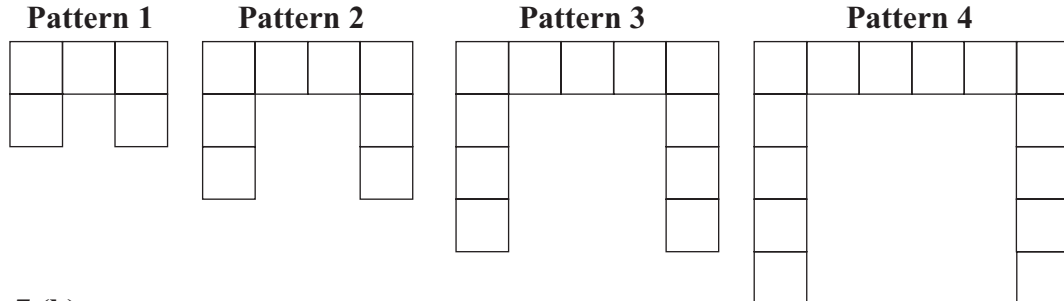


## LC 2017: PAPER 1

### QUESTION 7 (50 MARKS)

#### Question 7 (a)



#### Question 7 (b)

Pattern number ( $n$ )	Number of Tiles
1	5
2	8
3	11
4	14
5	17

#### Question 7 (c) (i)

Method 1:

$$T_n = a + (n-1)d$$

$$a = 5, d = 8 - 5 = 3$$

$$T_n = a + (n-1)d = 5 + (n-1)3$$

$$= 5 + 3n - 3$$

$$= 3n + 2$$

$$\therefore p = 3, q = 2$$

#### Question 7 (c) (ii)

$$T_n = 3n + 2$$

$$T_{20} = 3(20) + 2 = 60 + 2 = 62$$

#### Question 7 (d) (i)

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

$$a = 5, d = 3$$

$$S_n = \frac{n}{2}[2(5) + (n-1)3] = \frac{n}{2}[10 + 3n - 3]$$

$$= \frac{n}{2}[3n + 7] = \frac{3n^2 + 7n}{2}$$

Method 2:

$$T_n = pn + q$$

$$T_1 = p + q = 5 \dots (1)$$

$$T_2 = 2p + q = 8 \dots (2)$$

$$(2) - (1): p = 3$$

$$\text{Into (1): } 3 + q = 5 \Rightarrow q = 2$$

#### Question 7 (c) (iii)

$$T_n = 3n + 2 = 290$$

$$3n = 288 \Rightarrow n = \frac{288}{3} = 96$$

The 96th pattern has 290 tiles.

#### Question 7 (d) (ii)

$$S_n = \frac{3n^2 + 7n}{2}$$

$$S_{30} = \frac{3(30)^2 + 7(30)}{2} = 1455$$