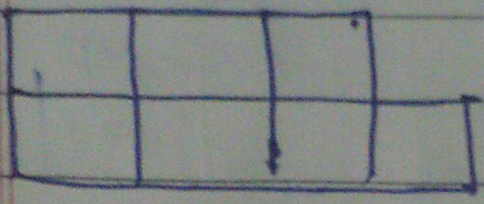
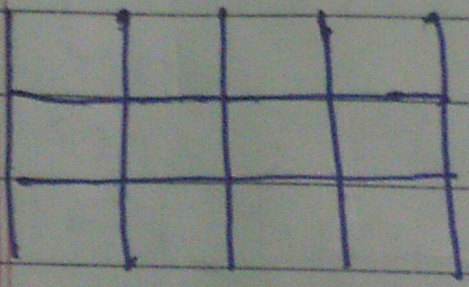
a)

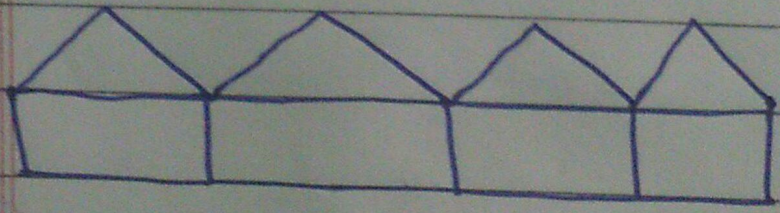
b)



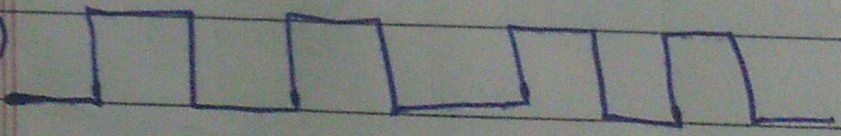
c)

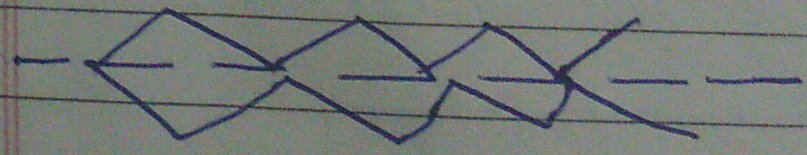


d)



e)





(i) a) $F = 3n + 2$

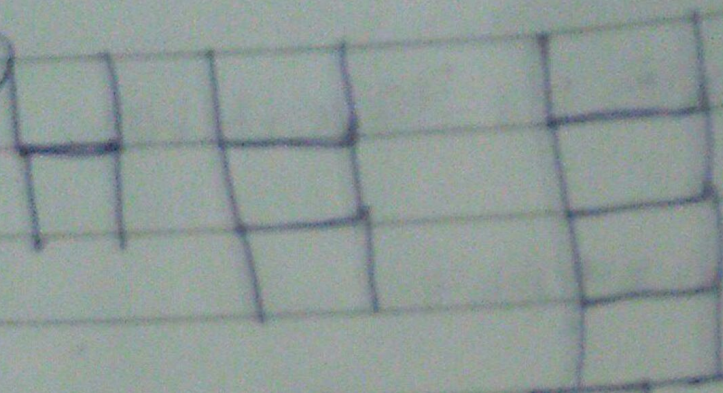
b) $F = 4n + 1$

c) $F = 5n + 3$

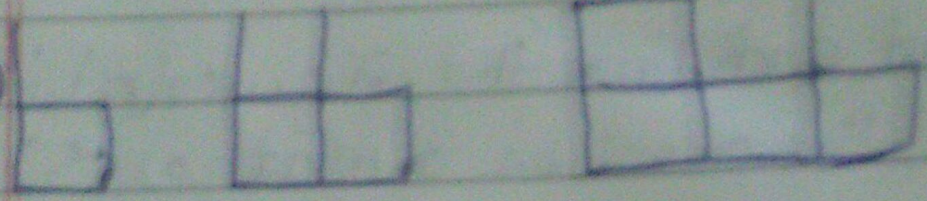
d) $F = 5n + 1$

e) $F = 4n + 1$

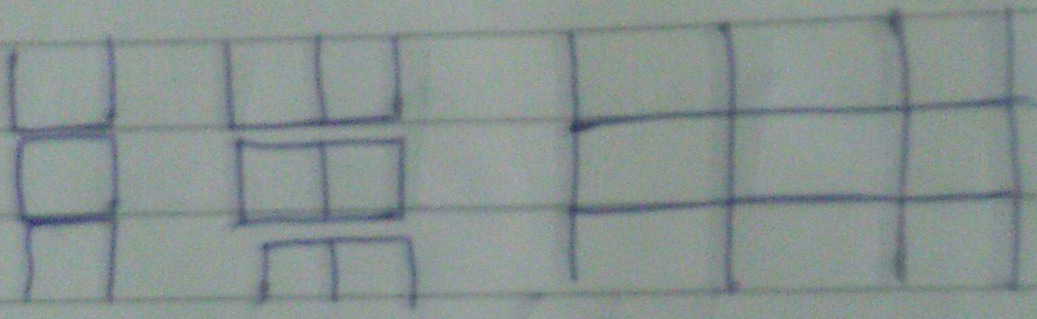
(5) a)

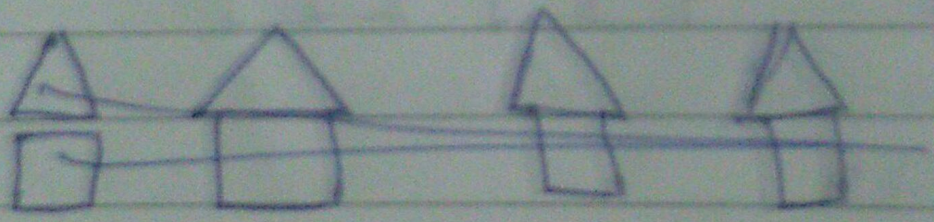


b)

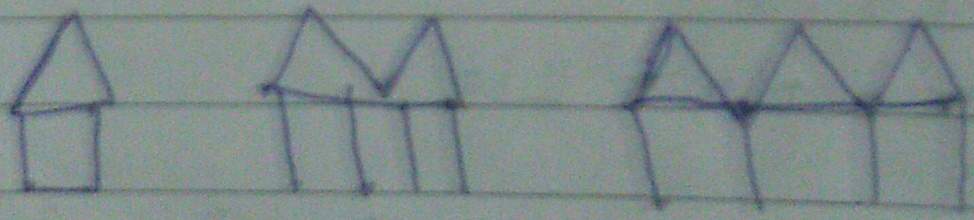


c)

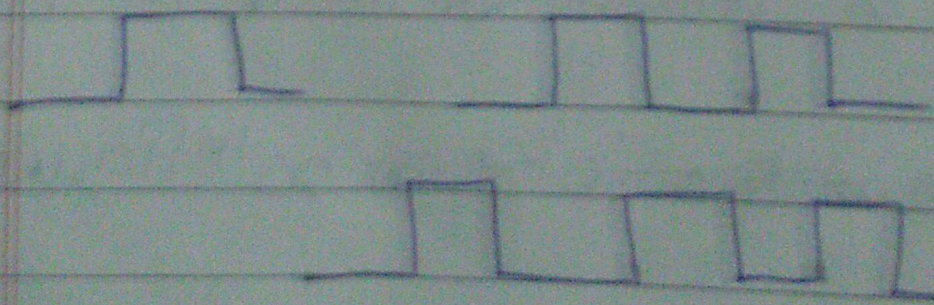




d)



e)



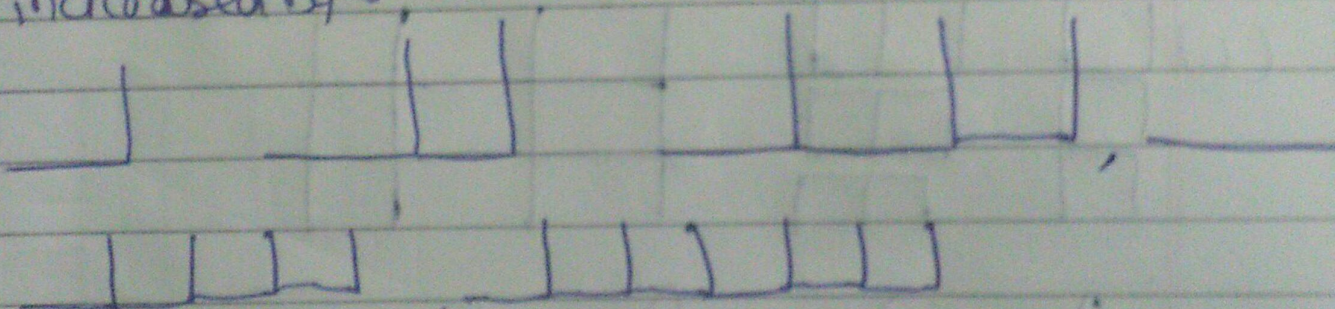
f)

$S = 3n + 4$

(ii) 1) $15^{th}$ figure has $3 \times 15 + 4 = 49$ matches

(2) $40^{th}$ figure has $= 3 \times 40 + 4$
$= 124$ matches

(iii) It is clear that each time the figure(n) is increased by 4, the number of matches (S) are increased by 3.

(i) 

(ii) (n) 1 2 3 4 5
L 2 4 6 8 10

(iii) Hence, the value of L is.
$L = 2n$

(iv) (1) Number of match sticks in $12^{th}$ figure
$2 \times 12 = 24$

(2) Number of match sticks in $20^{th}$ figure:
$2 \times 20 = 40$

Diagonal wise sum is as follows
11+7+13=31
8+7+16=31
Hence, the magic square is

| | | |
|---|---|---|
| 16 | 7 | 12 |
| 6 | 10 | 14 |
| 9 | 13 | 11 |

Row wise sum is as follows:
16+2+12=30
6+10+14=30
9+13+4=30
Column wise sum is as follows
16+6+8=30
2+10+18=30
12+14+4=30
Diagonal wise sum is as follows
16+10+4=30
12+10+8=30
Hence, the magic square is

(ii) Number is

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |
| 5 | 7 | 10 | 13 | 16 |

Complete each of the following magic squares

6 + 7 + 2 = 15
1 + 5 + 9 = 15
8 + 3 + 4 = 15

Sum for column wise is as follows

| | | |
|---|---|---|
| 6 | 7 | 2 |
| 1 | 5 | 9 |
| 8 | 3 | 4 |

6 + 1 + 8 = 15
7 + 5 + 3 = 15
2 + 9 + 4 = 15

Sum for diagonal wise is as follows

6 + 5 + 4 = 15
2 + 5 + 8 = 15

Here, the magic square is

(iii)

| | | |
|---|---|---|
| 4 | 9 | 8 |
| 9 | 7 | 5 |
| 5 | 5 | 10 |

4 + 9 + 8 = 21
11 + 7 + 3 = 21
6 + 5 + 10 = 20 ≠ 21

Column wise sum is as follows

4 + 11 + 6 = 21
9 + 7 + 5 = 21
8 + 5 + 10 = 23

1234x9+4 = 11110

12345x9+5 = 111105

123456x9+6 = 1111110

(ii) 9x9+7 = 88

98x9+6 = 888

987x9+5 = 8885

9876x9+4 = 88888

98765x9+3 = 888885

987654x9+2 = 8888888

(iii) 1x8+1 = 9

12x8+2 = 98

123x8+3 = 987

1234x8+4 = 9876

12345x8+5 = 98765

123456x8+6 = 987654

(iv) 111÷3 = 37

222÷6 = 37

333÷9 = 37

444÷12 = 37

555÷15 = 37

666÷18 = 37

S.P

1 × 9 + 1 = 10

12 × 9 + 12 = 120

123 × 9 + 123 = 1110

43 | 5936
-43
163
-129
346
-344
2

Dividend = divisor × quotient + r
5936 = 43 × 138 + 2
5936 = 43 (× 100 + 38) + 2
= 4300 + 1634 + 2
= 5936
Therefore, verified

S.F
1 × 9 + F = 10
12 × 9 + 2 = 110
123 × 9 + 3 = 1110