function implementation

$$Y = AB + C\bar{D}E + \bar{C}DE$$

$$= AB + E(C\bar{D} + \bar{C}D)$$

$$= AB + E(C \oplus D)$$

Rules

$\bar{A} + A = 1$

$\bar{A}B + A\bar{B} = A \oplus B$

No. of var. = 5 [So, input no. → 5]

Arduino coding :

```
byte A, B, C, D, E, Q, R;
void setup() {
 pinMode(13, OUTPUT);
 pinMode(12, INPUT);
pinMode(11, INPUT);
pinMode(10, INPUT);
PinMode (9, INPUT);
 PinMode (8, INPUT); }
```

```
void loop() {
A = digitalRead (12);
B = digitalRead (11);
C = digitalRead (10);
D = digitalRead (9);
E = digitalRead (8);
```

```
Q = A&B;
R = C^D;
digitalWrite (13, (Q|(R&E)));
}
```

func, $AB + \bar{E}(C \oplus D)$

* → &

\+ → | (OR)

Bonus → 05

2nd Example:

$$F = AB\bar{C}(\bar{D}+D) + A\bar{B}\bar{C}D + ACD(B+\bar{B}) + AC\bar{D}(B+\bar{B})$$

$$= AB\bar{C} + A\bar{B}\bar{C}D + ACD + AC\bar{D}$$

$$= AB\bar{C} + A\bar{B}\bar{C}D + AC(D+\bar{D})$$

$$= AB\bar{C} + A\bar{B}\bar{C}D + AC \quad [\because D+\bar{D}=1]$$

$$= A(B\bar{C}+C) + A\bar{B}\bar{C}D$$

$$= A(B+C) + A\bar{B}\bar{C}D \rightarrow AB + AC + A\bar{B}\bar{C}D$$

$$= A(B+\bar{B}\bar{C}D) + AC \quad [\because \bar{C}D = X,\ B+\bar{B}X = B+X]$$

$$= A(B+\bar{C}D) + AC$$

$$= B + \bar{C}D \quad [\because X = \bar{C}D]$$

$A + \bar{A} = 1$

$A\bar{B} + B = (A+B)$

$$= AB + A\bar{C}D + AC$$

$$= AB + A(\bar{C}D + C)$$

$$= AB + A(C + D)$$

$$= AB + AC + AD$$

$$= A(B + C + D)$$