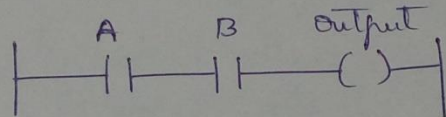


7th Sem B.E. Exam, Dec 2017/Jan 2018

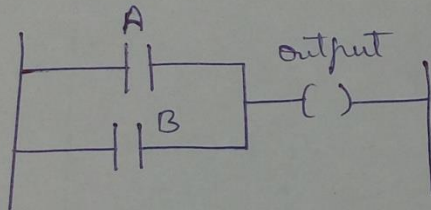
Programmable Logic Controllers

10EE752

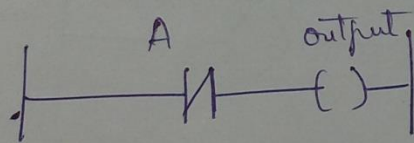
2. a. (i) AND



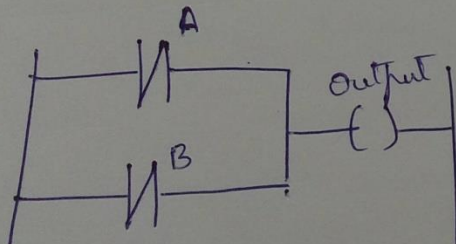
(ii) OR



(iii) NOT

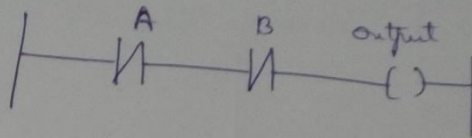


(iv) NAND

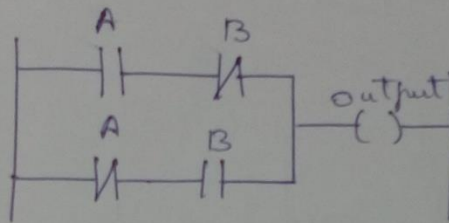


752

(V) NOR

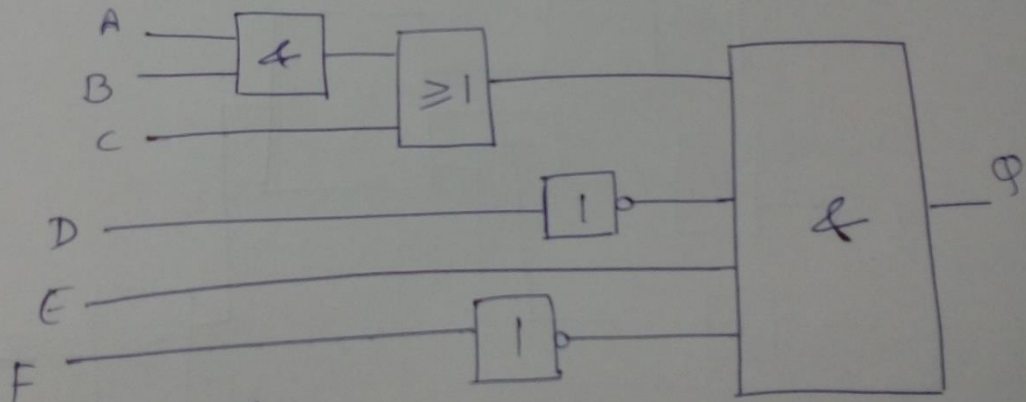


(vi) XOR

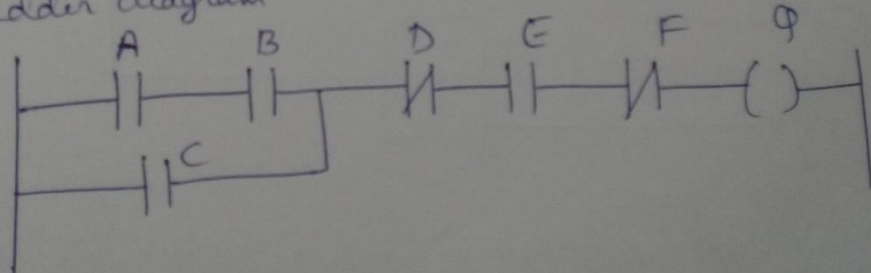


2. b. (i) $\Phi = (AB + C)\bar{D}EF$

Function block diagram

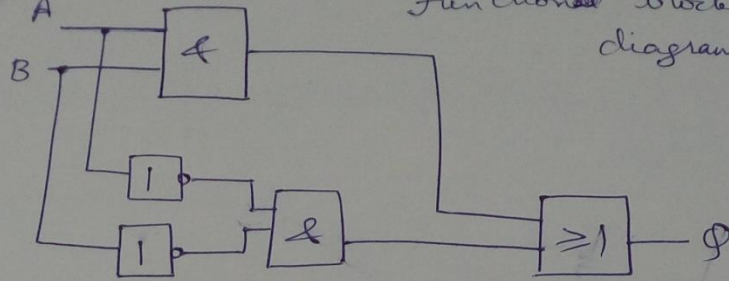


Ladder diagram

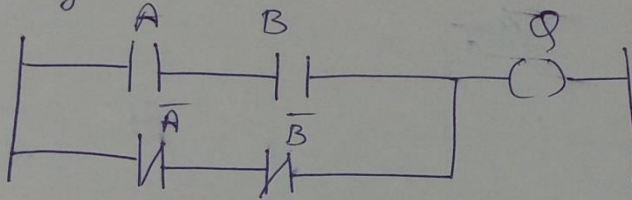


2. b. (ii) $\Phi = AB + \bar{A}\bar{B}$

Function block diagram

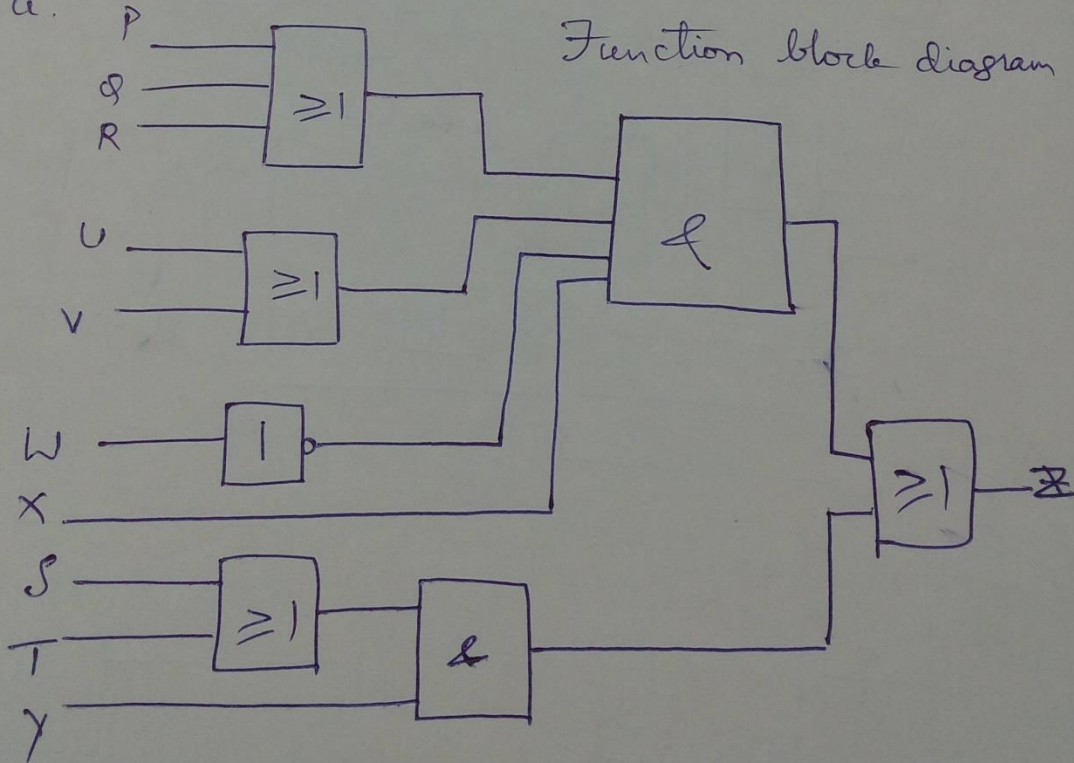


Ladder diagram

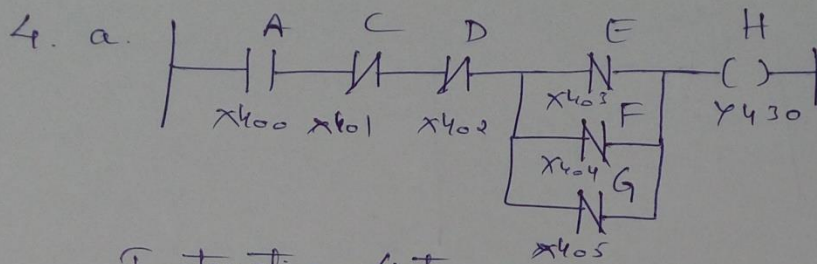


3. a.

Function block diagram



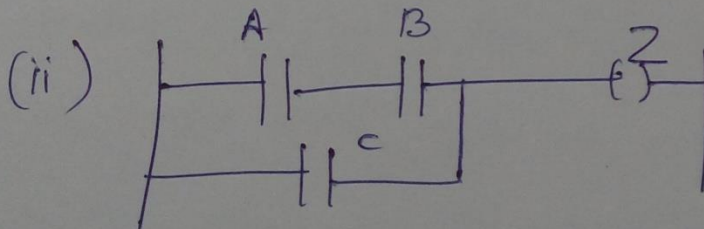
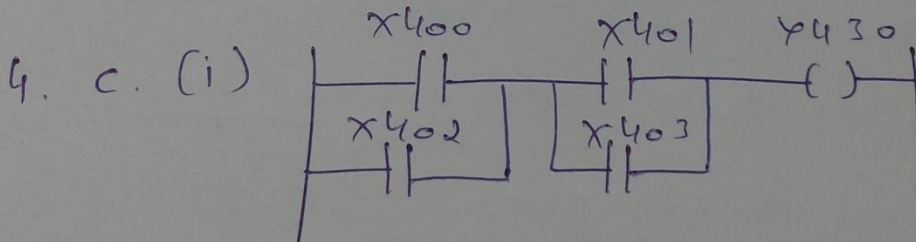
$$Z = (P + Q + R)(U + V)\bar{W}X + (S + T)Y$$

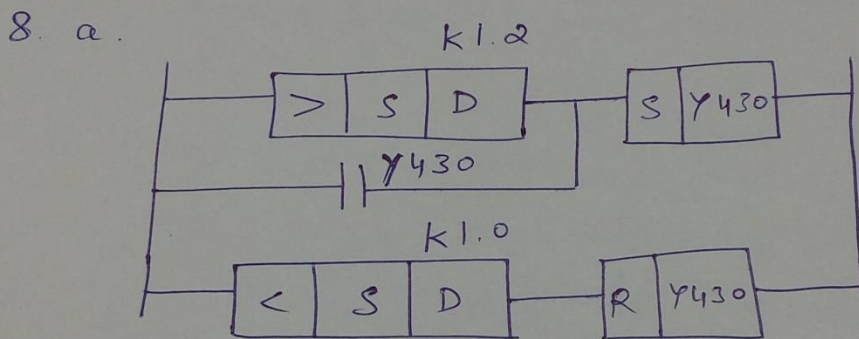
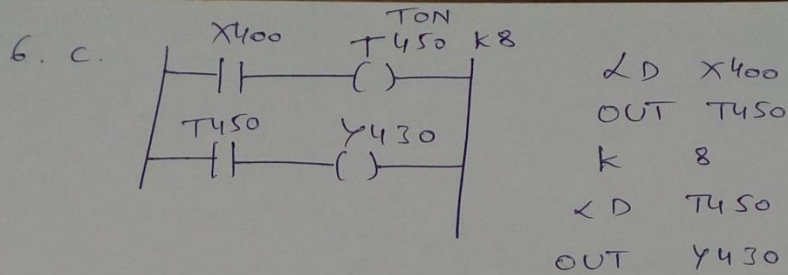


Instruction List

```

LD X400 (*Load A*)
ANI X401
ANI X402
LDI X403
ORI X404
ORI X405
ANB
OUT Y430
  
```





When the water level in the tank rises above 1.2m, the greater-than comparison element gives a 1 output & so sets an internal relay (i.e., pump on). There is then an o/p. This o/p latches the greater-than comparison element, so the o/p remains on, even when the ~~temperature~~ water level falls below 1.2m.

The o/p is ^{not} switched off until the
less-than 1.0 m element gives an o/p &
resets the internal relay.