Problem 2:
Actions:
1] moveleft1child(X Child,Y Boat)
 preconds
  isright(Y)
  isright(X)
 effects
  isleft(Y)
  isleft(X)
  del isright(Y)
  del isright(X)

2]moveright1child(X Child,Y Boat)
  preconds
   isleft (Y)
   isleft (X)
  effects
   isright (Y)
   isright (X)
   del isleft(Y)
   del isleft(X)

3]moveright2child(A Child,B Child,Y Boat)
  preconds
   isleft (Y)
   isleft (A)
   isleft (B)
  effects
   isright(Y)
   isright(A)
   isright(B)
   del isleft(Y)
   del isleft (A)
   del isleft (B)

4]moveleft2child(A Child,B Child,Y Boat)
  preconds
   isright (Y)
   isright (A)
   isright (B)
  effects
   isleft (Y)
   isleft (A)
   isleft (B)

del isright(Y)
del isright(A)
del isright (B)

5]moveright1adult(X Adult,Y Boat))
preconds
isleft (Y)
isleft (X)
effects
isright (Y)
isright (X)
del isleft(Y)
del isleft(X)

6]moveleft1adult(X Adult,Y Boat))
preconds
isright (Y)
isright X))
effects
isleft (Y)
isleft (X)
del isright(Y)
del isright(X)

(A Adult)
(B Adult)
(C Child)
(D Child)
(BT Boat)
Initial State
isleft(A)
(isleft B)
(isleft C)
(isleft D)
isleft BT)
Goal State
(isright A)
(isright B)
(isright C)
(isright D)
(isright BT)

Problem 3.
(A ttt1) (B ttt1) (C ttt1) (ppp1 B C) (ppp2 A) (ppp2 B) (ppp3 C) (eee1 A C) (eee1 B C) (eee2 B) (eee3 A)

Problem 4.
There are 4 predicates and max 3 arguments and 5 constants.
We are having a combination of 5*5*5 = 125 arguments for each predicate .
That is 125*4=500 for all the predicates
Each predicate can have either true or false value
Maximum limit of No of states will be 2^500
For min case we have 1 argument for each predicate that can take 5 values
That is 4*5 = 20 for all the predicates
Minimum limit of No of states = 2^20.