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Question 2:

Facts of the problem:
(a1 Adult)
(a2 Adult)
(c1 Child)
(c2 Child)
(b Boat)

(preconds
 (isleft a1)
 (isleft a2)
 (isleft c1)
 (isleft c2)
 (isleft b))

(effects
 (isright a1)
 (isright a2)
 (isright c1)
 (isright c2)
 (isright b))

operations for the problem:

Action:move2childrentoright
preconds
(isleft c1)
(isleft c2)
(isleft B)
effects
(isright c1)
(isright c2)
(isright B)
(delete isleft c1)
(delete isleft c2)
(delete isleft B)

action:move1childtoleft
preconds
(isright c)
(isright B)
effects
(isleft c)
(isleft B)

(delete isright c)
(delete isright B)

action:move1childtoright
preconds
(isleft c)
(isleft B)
effects
(isright c)
(isright B)
(delete isleft c)
(delete isleft B)

action:move1adulttoleft
preconds
(isright a)
(isright B)
effects
(isleft a)
(isleft B)
(delete isright a)
(delete isright B)

action:move1adulttoright
preconds
(isleft a)
(isleft B)
effects
(isright a)
(isright B)
(delete isleft a)
(delete isleft B)

The steps for the problem:
1)move2childrentoright(c1,c2)
2)move1childtoleft(c1)
3)move1adulttoright(A1)
4)move1childtoleft(c2)
5)move2childrentoright(c1,c2)
6)move1childtoleft(c1)
7)move1adulttoright(A2)
8)move1childtoleft(c2)
9)move2childrentoright(c1,c2)

Question 3:

In online replanning before taking next step the current suituations are analysed and next step is taken SO it works the same as task 2 conditions.

In conditional planning either the step taken will be successful or else the step taken is failed and redone.
So the conditions specified in task 2 will be enough to handle the suituation specified in the question because
it handles all the suituations.
So we dont have to change the conditions specified in task 2.

Question 4:

After applying the action aaa(B,C) to S1 the resulting state is:
(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)

Because of the action specified aaa(B,C) to S1 it deletes (eee2 C),(eee3 c) and adds (eee1 B C),(eee2 B) to the State S1.

Question 5:
There are 4 predicates and each has maximum of 3 arguments and 5 constants.
upper bound:
The unique combination of constants are given by 5*4*3=60
So total the 4 predicates has 60*4 combinations
So the predicates combination can either be true or false
The maximum limit of the predicates are 2^(60*4)or 2^(240)
lower bound:
Each predicate has 5 out of 1 constant as a argument.
So for 4 predicates it is 4*5=20
The unique combinations for each predicate is 2^20