Task 2

Facts –

(Adult1 Adult)
(Adult2 Adult)
(Child1 Child)
(Child2 Child)
(Boat Object)
(LeftSide Bank)
(RightSide Bank)

(preconds
(on Adult1 LeftSide)
(on Adult2 LeftSide)
(on Child1 LeftSide)
(on Child2 LeftSide)
(on Boat LeftSide)
(clear Boat)
)

(effects
(on Adult1 RightSide)
(on Adult2 RightSide)
(on Child1 RightSide)
(on Child2 RightSide)
(on Boat RightSide)
(clear Boat)
)

Operators –

(operator
moveAdult
(params
(<from> Bank) (<to> Bank) (<b> Object) (<a> Adult))
(preconds
(on <a> <from>) (on <b> <from>))
(effects
(on <b> <to>) (del on <b> <from>) (del on <a> <from>) (on <a> <to>) (clear <b>))
)

(operator
moveOneChild
(params
(<from> Bank) (<to> Bank) (<b> Object) (<c> Child))
(preconds
(on <c> <from>) (on <b> <from>))

(effects
(on <b> <to>) (del on <b> <from>) (del on <c> <from>) (on <c> <to>) (clear <b>))
)

(operator
moveTwoChild
(params
(<from> Bank) (<to> Bank) (<b> Object) (<c1> Child) (<c2> Child))
(preconds
(on <c1> <from>) (on <c2> <from>) (on <b> <from>))
(effects
(on <b> <to>) (del on <b> <from>) (del on <c1> <from>) (del on <c2> <from>) (on <c1> <to>) (on <c2> <to>) (clear <b>))
)

Task 3

(operator
aaa
(params
(<b> ttt1) (<c> ttt1))
(preconds
(ppp1 <b> <c>) (ppp2 <b>) (ppp3 <c>))
(effects
(eee1 <b> <c>) (eee2 <b>) (del eee2 <c>) (del eee3 <c>)))

New S1 –

(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)

Task 4

Number of predicates = 4
Number of constants = 5
Number of arguments = 3

As each argument can take 5 constants, so for 3 arguments => $5^3 = 125$

There are 4 predicates. Hence we get 125 x 4 = 500
The number of all possible states for the JUNGLE world would be = 2^{500}