Q-3

ID	Transition
1	Create /k=0
2	Coin[k<=0] /return coin
3	Insert_cups(n)[n>0] /k=k+n
4	Coin[k>0]
5	coffee[k>1] / dispose cup of coffee, k=k-1
6	Cancel / return coin
7	coffee[k<=1] / dispose cup of coffee; k=k-1
8	coin / return coin
9	insert_cups(n)[n>0] / k=n
10	Coffee[k<=1] / dispose cup of coffee with cream; k=k-1
11	insert_cups(n)[n<=0]
12	coin / return coin
13	cancel / return coin
14	coffee[k>1] / dispose cup of coffee with cream; k=k-1
15	cream
16	cream
17	coin / return coin

ID	Test case	Coverage of Transitions
Test# 1	create(), insert_cups(5), coin(), coin(), coffee()	1, 3, 4, 8, 5
Test# 2	create(), coin(), insert_cups(1), coin(), cream(), coffee(), insert_cups(10)	1, 2, 3, 4, 15, 10, 9
Test# 3	Create(), insert_cups(1), coin(), cancel, coin(), coffee(), insert_cups(0), coin(), insert cup(2), coin(), cream, cream, cream, coffee(), coin , cream , cancel	1, 3, 4, 6, 4, 7, 11, 12, 9, 4, 15, 16, 15, 14, 4, 15, 13
Test # 4	create(), insert_cups(5), coin(), cream, , coin()	1,3, 4, 15, 17

Transition pairs for Idle

(1, 2)	(1, 3)	(1, 4)
(2, 2)	(2, 3)	(2, 4)
(3, 2)	(3, 3)	(3, 4)
(5, 2)	(5, 3)	(5, 4)
(6, 2)	(6, 3)	(6, 4)
(9, 2)	(9, 3)	(9, 4)
(13, 2)	(13, 3)	(13, 4)
(14, 2)	(14, 3)	(14, 4)

Transition pairs for coin inserted

(4, 5)	(4, 6)	(4, 7)	(4, 8)	(4, 15)
(8, 5)	(8, 6)	(8, 7)	(8, 8)	(8, 15)
(16, 5)	(16, 6)	(16, 7)	(16, 8)	(16, 15)

Transition pairs for cream

(15, 10)	(15, 13)	(15, 14)	(15, 16)	(15, 17)
(17, 10)	(17, 13)	(17, 14)	(17, 16)	(17, 17)

Transition pairs for no cups

(7,9)	(7, 11)	(7, 12)
(10,9)	(10, 11)	(10, 12)
(11,9)	(11, 11)	(11, 12)
(12,9)	(12, 11)	(12, 12)

ID	Test case	Coverage of Transitions	Coverage of new Transition-Pairs
Test#1	create(), insert_cups(5), coin(), coin(), coffee()	1, 3, 4, 8, 5	(1, 3), (3,4), (4, 8), (8, 5)
Test#2	create(), coin(), insert_cups(1), coin(), cream(), coffee(), insert_cups(10)	1, 2, 3, 4, 15, 10, 9	(1, 2), (2, 3), (4, 15), (15, 10), (10, 9)
Test#3	Create(), insert_cups(1), coin(), cancel, coin(), coffee(), insert_cups(0), coin(), insert cup(2),	1, 3, 4, 6, 4, 7, 11, 12, 9, 4, 15, 16, 15, 14, 4,	(4, 6), (6, 4), (4, 7), (7,11), (11, 12), (12, 9), (9, 4), (15, 16), (16, 15), (15, 14), (14, 4), (15, 13)

	coin(), cream, cream, cream, coffee(), coin , cream , cancel	15, 13	
Test#4	Create(), coin(), coin(), insert cups(1), insert cups(2), coin(), coffee(), coin(), coffee(), insert cups(1), coin(), cancel, insert cup(1)	1, 2, 2, 3, 3, 4, 5, 4, 5, 3, 4, 6, 3	(2, 2) , (3, 3), (4, 5), (5, 4), (5, 3), (6, 3),
Test#5	Create(), insert cup(1), coin(), coffee(), coin(), coin(), insert cup(0), insert cup(0), coin(), insert cup(1), coin(), cream , coin(), coin(), coffee , insert cup (0), insert cup (1),	1, 3, 4, 7, 12, 12, 11, 11, 12, 9, 4, 15, 17, 17, 10, 11, 9	(7, 12), (12, 12), (12,11), (11, 11), (15, 17), (17, 17), (17,10), (10, 11), (11, 9),
Test#6	Create(), insert cup(1),coin(), coin(), coin(), cream, cream , coin(), coffee(), insert cups(1), insert cup(1), coin4 , coffee(), coin(), cream, coffee, coin, insert cups(1), coin(), cream , cancel, coin , cream, coffee, insert cup(1).	1, 3, 4, 8, 8, 15, 16, 8, 7, 9, 3, 4, 5, 4, 15, 10, 12, 9, 4, 15, 13, 4, 15, 14, 3	(8, 8), (8, 15), (16, 8), (8, 7), (7, 9), (9, 3), (10, 12), (13, 4), (14, 3)
Test # 7	Create(), insert cup(1), coin(), coin(), cancel, coin(), cream(), cancel, insert cup(1), coin(), cream, cream, coffee(), coin(), cream, cream, coffee, insert cup(2), coin(), cream, coin(), cancel, coin(), cream, coin(), coffee(), coin(), cream, coin(), cream, cancel.	1, 3, 4, 8, 6, 4, 15, 13, 3, 4, 15, 16, 5, 4, 15, 16, 7, 9, 4, 15, 17, 13, 4, 15, 17, 14, 4, 15, 17, 16, 6	(8,6), (13,3), (16, 5), (16, 7), (17, 13), (17, 14), (17, 16), (16, 6)

(1, 4), (2, 4), (3, 2), (5, 2) , (13,2), (6, 2), (9, 2) and (14, 2) are not executable.