CASE 1:
4 gophers(G1,G2,G3,G4),one pile of books P, one incinerator and one stock near incinerator to stack up the books.

Steps:

While the total books in the pile are greater than 0 DO

1.Load the books into the cart 5 at a time(by G1,G2,G3) by checking the mutexes.
2.Go to the incinerator.
3.Put the books into the stock near the incinerator.
4.G4 will burn the books into the incinerator 3 at a time.
5.Go back to the pile(G1,G2,G3)

END

Sr. no	Number of books in the pile	Steps	Number of books in the stock(near incinerator)	Time(seconds)
1	50	G1 applies mutex on pile and loads.	0	0-10
2	45	G1 removes mutex and loads 5 books in the cart.	0	0-10
3	40	G2 applies the mutex and loads the cart and then removes the mutex.	0	10-20
3	35	G3 applies the mutex and loads the cart and then removes the mutex.	0	20-30
4	35	G1 goes to the incinerator.	0	10-40
5	35	G2 goes to the incinerator	0	20-50
6	35	G3 goes to the incinerator	0	30-60
7	35	G1 unloads the books into the stock.	5	40-50
8	35	G2 unloads the books into the stock.	10	50-60
9	35	G3 unloads the books into the stock.	15	60-70

10	35	G4 burns the books 3 at a time(loads and unloads the books into the incinerator) and applies mutex on the stock.	0	50-190
11	35	G1 goes to the pile.	0	50-80
12	35	G2 goes to the pile.	0	60-90
13	35	G3 goes to the pile.	0	70-100
14	30	G1 applies the mutex and loads the cart and then removes the mutex.	0	80-90
15	25	G2 applies the mutex and loads the cart and then removes the mutex.	0	90-100
16	20	G3 applies the mutex and loads the cart and then removes the mutex.	0	100-110
17	20	G1 goes to the incinerator.	0	90-120
18	20	G2 goes to the incinerator.	0	100-130
19	20	G3 goes to the incinerator.	0	110-140
20	20	G1 unloads the books into the stock.	5	190-200(it has to wait for 10 seconds as there is mutex on stock during 50-190)
21	20	G2 unloads the books into the stock.	10	200-210
22	20	G3 unloads the books into the stock.	15	210-220
23	20	G4 burns the books 3 at a time(loads and unloads the books into the incinerator) and applies mutex on the stock.	0	220-360
24	20	G1 goes to the pile.	0	200-230
25	20	G2 goes to the pile.	0	210-240

26	20	G3 goes to the pile.	0	220-250
27	15	G1 applies the mutex and loads the cart and then removes the mutex.	0	230-240
28	10	G2 applies the mutex and loads the cart and then removes the mutex.	0	240-250
29	5	G3 applies the mutex and loads the cart and then removes the mutex.	0	250-260
30	5	G1 goes to the incinerator.	0	240-270
31	5	G2 goes to the incinerator.	0	250-280
32	5	G3 goes to the incinerator.	0	260-290
33	5	G1 unloads the books into the stock.	5	360-370
34	5	G2 unloads the books into the stock.	10	370-380
35	5	G3 unloads the books into the stock.	15	380-390
36	5	G4 burns the books 3 at a time(loads and unloads the books into the incinerator) and applies mutex on the stock.	0	390-530
37	5	G1 goes to the pile.	0	370-400
38	0	G1 applies the mutex and loads the cart and then removes the mutex.	0	400-410
39	0	G1 goes to the incinerator	0	410-440
40	0	G1 unloads the books into the stock.	5	530-540
41	0	G4 burns the books 3 at a time(loads and unloads the books into the incinerator) and	0	540-590

		applies mutex on the stock.		

Total time:590 seconds

Case 2:
2 piles(p1 and p2), 3 gophers(G1,G2,G3) acting on pile(P1).G1 and G2 takes the books to the stock near incinerator and G3 loads and unloads the books in the incinerator.
3 gophers(G4,G5,G6) acting on pile(P2).G4 and G5 takes the books to the stock near incinerator and G3 loads and unloads the books in the incinerator.
Both these steps run in parallel.

Steps:
While the total books in the pile are greater than 0 DO
1.Load the books into the cart 5 at a time from P1(by G1,G2) by checking the mutexes and Load the books into the cart 5 at a time from P2(by G4,G5) by checking the mutexes.
2.Go to the incinerator.
3.Put the books into the stock near the incinerator(by G1,G2,G4,G5)
4.G3 and G6 will load(also put mutex on the stock) and unload the books into the incinerator 3 at a time in incinerator I1 and I2.
5.Go back to the pile(G1,G2 and G4,G5).
END

The following procedure will happen on incinerator I1.

G3						LS	ULC	B(LS)	B	ULC	B(L)	B	ULC	B(LS)	B
G2		LP	GTI	GTI	GTI		ULS	GTP	GTP	GTP	LP	GTI	GTI	GTI	ULS
G1	LP	GTI	GTI	GTI	ULS	GTP	GTP	GTP	LP	GTI	GTI	GTI	ULS	GTP	GTP
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

ULC	B(LS)	B	ULC	B(LS)	B	ULC	B(LS)	B	ULC	B(LS)	B	ULC	B(LS)	B	ULC	B(LS)	B
GTP	LP	GTI	GTI	GTI	ULS												
160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330

Same procedure will happen on incinerator I2 in parallel.
G1: GOPHER 1
G2:GOPHER 2
G3:GOPHER 3
G4:GOPHER 4
G5:GOPHER 5
G6:GOPHER 6
LP:LOAD FROM PILE(AND SET LOCK ON PILE)
GTI:GO TO INCINERATOR
ULC:UNLOAD FROM CART
ULS:UNLOAD TO STOCK
LS:LOAD FROM STOCK(AND SET LOCK ON)
B:BURN

TOTAL TIME:330 SECONDS