Question no 01

Given data:

Simulation time = 15hours

Part #	Arrival time	Service time (hours)
1	0	2
2	1	3
3	2	5
4	3	2
5	5	1

Table:

Time (t)	Part #	Event	N	P	S	S*
0	1	ARR	1	0	1	1
1	2	ARR	1	0	2	2
2	1,3	DEP,ARR	2	1	2	2
3	4	ARR	2	1	3	3
4			-	-	-	3
5	2,5	DEP,ARR	3	2	3	3
6			-	-	-	3
7			-	-	-	3
8			-	-	-	3
9			-	-	-	3
10	3	DEP	4	3	2	3
11			-	-	-	3
12	4	DEP	5	4	1	3
13	5	DEP	5	5	0	3
14						
15						

Question no 02:

Given data:

Simulation time = 13 hours

Part #	Arrival time	Service time	Start time	Departure time	Waiting time	Time in system
1	0	2	0	2	0	2
2	1	3	2	5	1	4
3	2	5	5	13	3	11
4	3	2	13	15	10	12
5	5	1	15	16	10	11

Time t	Event	N	WQ	WQ*	WQ	Q*	Q	P	TS	TS*	TS	B
0	ARR	1	0	0	0	0	0	0	0	0	0	0
2	DEP,ARR	2	1	0	1	0	1	1	2	2	2	2
3	ARR	2	-	1	1	1	2	1	-	2	2	3
4		2	-	2	1	2	4	1	-	2	2	4
5	DEP,ARR	3	3	3	1	2	6	2	4	4	6	5
6		3	-	3	4	2	8	2	-	4	6	5
9		3	-	3	4	2	14	2	-	4	6	6
10		3	-	3	4	2	16	2	-	4	6	7
11		3	-	3	4	2	18	2	-	4	6	8
12		3	-	3	4	2	20	2	-	4	6	9
13	DEP	4	10	10	14	2	22	3	11	11	17	10

AWQ = WQ/N = 14/4 = 3.5 hrs

ATS = TS/P = 17/3 = 5.66 hrs

Time average length of queue = Q/t = 22/13 = 1.69

Server utilization = B/t = 10/13 * 100 = 76.9%

Service Level = total out/total in * 100 = 3/5 *100 = 60%

Throughput rate = total out/t = 3/13 = .2307 parts/hr