A) Service times

Name of service center	Service Time (S_k)
WebServer	0.059
ApplicationServer	0.249
VoucherPaymentServer	0.3

B) Simulation results

Name of service center	Utilization	Throughput
WebServer	0.1852	3.1725
ApplicationServer	0.7735	3.1304
Database	0.4373	12.6064
CardPaymentServer	0.3770	1.7630
VoucherPaymentServer	0.2236	0.7443

Average System Response Time: 30.5694

Average time that a user is waiting for a reply from the system 2.9753

C) System upgrade

Name of service center	Minimum number of resources	Utilization	Throughput
WebServer	2	0.7681	25.8502
ApplicationServer	7	0.9222	25.8336
Database	4	0.9085	104.7654
CardPaymentServer	3	0.9730	14.5131
VoucherPaymentServer	2	0.9324	6.2234

Average System Response Time: 40.1146

Average time that a user is waiting for a reply from the system 5.7962