List criteria for evaluating the IMD help desk queue, based on information in the case study. List the following including how you determined the criteria:

(a) What are your team's target average waiting times and why did you choose these values

In the separate system, the average service time for hardware tickets is 45 minutes per customer, while software tickets average 16 minutes per customer. Also, the average turnaround time, which is queue time plus service time, is 65 minutes for hardware tickets and 40 minutes for software tickets. Therefore, we have set target the average queue times: 20 minutes per customer for hardware tickets and 24 minutes per customer for the software ticket.

In the combined system, technicians handle both tickets together, with an average service time of 32 minutes per customer. When combining the average turnaround time of a separate system: 65 minutes for the hardware ticket and 40 minutes for the software ticket,the average turnaround time of the combined system is expected to be around 55 minutes. Therefore, the average queue time is 23 minutes per customer.

(b) What are your team's target maximum queue lengths and why did you choose these values? The total number of words for this part should not exceed 250.
system1:
5.1c/h /60=0.085 c/m   8.6/60= 0.1433
2.9/60=0.0483 3.9/60=0.065
1.7/60=0.0283   2.7/60=0.045

Set value:
average queue length
Weekday early:

- **Hardware queue length**: $L=0.085×20=1.7$
- **Software queue length**: $L=0.1433×24=3.4392$

Weekday late:

- **Hardware queue length**: L=0.0483×20=0.966
- **Software queue length**: L=0.065×24=1.56

Saturday:

- **Hardware queue length**: L=0.0283* 20 = 0.566
- **Software queue length**: L=0.045×24 = 1.08

Hardware = (1.7+0.966+0.566)/3=1.078

Software= (3.4392+1.56+1.08)/3=2.03

System 2:
0.085+0.1433=0.2283

0.0483+0.065=0.1133

0.0283+0.045=0.0733

- **Weekday early**: L=0.2283×23=5.25
- **Weekday late**: L=0.1133×23=2.6
- **Saturday**: L=0.0733×23=1.69