

7004 A2
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1.

(a) : **Flow unit:** patient

(b) :

(i) **Pre-surgery examination, orientation, etc.:** admissions clerk, paper, equipment for blood and urine tests, laboratory, examination rooms, lounge, tea, cookies, dining room, beds.

(ii) **Surgery:** local anesthetic, operation rooms, operating table, surgeons, assistant surgeons, skin clips, operation equipment.

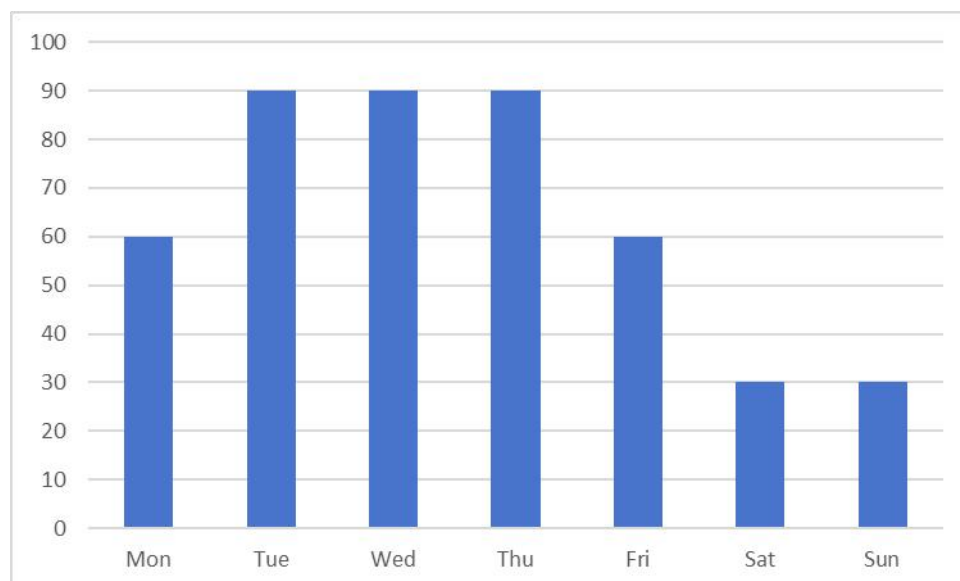
(iii) **Recovery:** patient recovery room, wheelchair, lounge, cookies, tea, beds.

2.

(a) : **weekly throughput rate:** $30 * 5 = 150$ patients / week

(b) : **average bed utilization:** $(30 * 5) / (30 * 7) = 71.43\%$

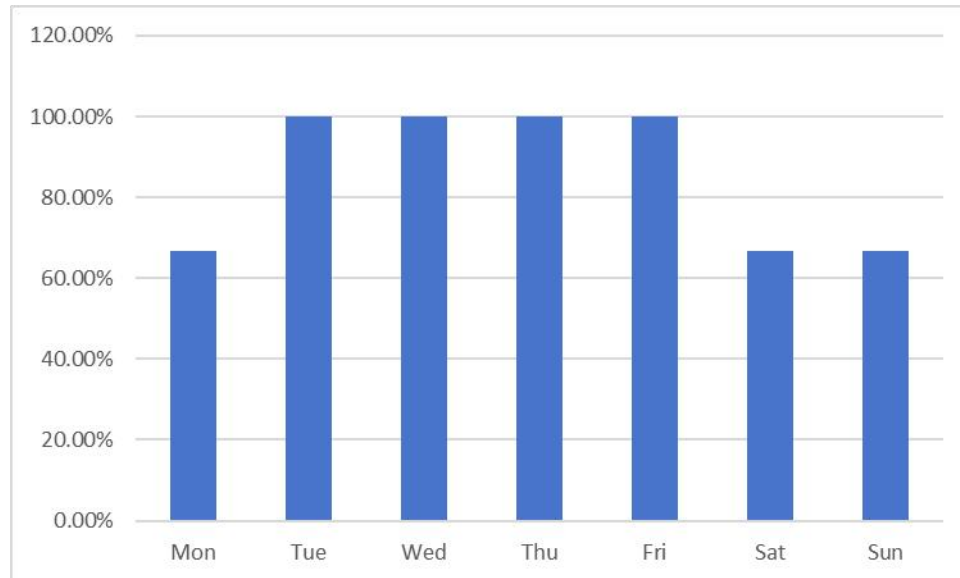
(c) :



3.

(a) : average bed utilization: $(60+90+90+90+60+30+30+30) / (90*7) = 85.71\%$

(b) :



4.

(a) : consider the current capacity rate of each resources:

Surgeons: $12 * 4 * 5 = 240$

Operating rooms: $8 * 5 * 5 = 200$

Beds: $30 * 5 = 150$

So the beds are the bottleneck resource. The hospital needs to add more beds.

If the hospital wants to admit $180/5 = 36$ patients every, both surgeons' and operating rooms' capacity rate is enough.

The hospital needs $36 * 3 = 108$ beds.

Hence, $108 - 90 = 18$ beds are needed to be added.

(b) :

$150 * 120\% = 180$ patients / week.

Because healthcare resources are expensive, the hospital can not add more of them.

So the maximum number of patients per day is $8 * 5 = 40$.

Daily capacity can be flexibly arranged according to the figure below:

check in day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Mon	40	40	40				
Tue		20	20	20			
Wed			40	40	40		
Thu				40	40	40	
Fri							
Sat							
Sun	40	40					40
Total	80	100	100	100	80	40	40

As shown in the figure, the maximum number of beds required is 100.

Hence, $100 - 90 = 10$ more beds are needed.

(c) :

Daily capacity can be flexibly arranged according to the figure below:

check in	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Mon	40	40	40				
Tue		10	10	10			
Wed			40	40	40		
Thu				40	40	40	
Fri							
Sat							
Sun	40	40					40
Total	80	90	90	90	80	40	40

As shown in the figure, the maximum throughput rate is $40 + 10 + 40 + 40 + 40 = 170$