كلية الحاسبات وعلوم البيانات
ALEXANDRIA UNIVERSITY
جامعة الإسكندرية

Name:	*ID:*

Question 1

A small grocery shop, customers arrive random times that range from 1 to 5 minutes apart. Assume that inter-arrival times are integer values with probabilities shown in the table. The service times vary from 1 to 4 minutes – also integer values and having equal probability . Assume the first customer arrives at time zero.

RNs for IAT 438591642303   *RNs for ST 496237531548*

1 – Complete the following tables:

IAT (mins)	probability	Cumulative probability
1	0.05	
2	0.10	
3	0.40	
4	0.35	
5	0.10	

Customer's number	IAT	Clock	Service begin	ST	Queue	Service End	Time in system	Idle time
1								
2								
3								
4								
5								
6								

2 – Find the following values:

(1) Average waiting time (for all customers) = ...

(2) Probability idle server = ...

Question 2

Two reorders, each of them is 10 units. The two reorder points RP1 and RP2 at levels of 8 and 4 units respectively. The shortage in demand is lost forever. Initial stock is 8 units.

Demand RNs	26 83 45 51 18
Lead time RNs	5 9 2 4 8

1 – Complete the following tables:

Demand (in units)	probability	Cumulative probability
6	0.20	
7	0.35	
8	0.40	
9	0.05	

Lead time (in days)	probability	Cumulative probability
2	0.3	
3	0.5	
4	0.2	

Day	Stk	Cstk	Ord 1	Due date 1	Ord 2	Due date 2	dmd	cdmd	Short	Cshort
1										
2										
3										
4										
5										

2 – Find the following values:

The service level = ...

The average stock = ...

Question 3

A piece of equipment contains four identical tubes and can function only if all the four are in working order. The lives of tubes has approximately uniform distribution from 100 to 200 hours. The current maintenance practice is to replace a tube when it fails. Equipment has to be shut down for 0.5 hour for   replacing a tube .The cost of one tube is 50$. Shut down time costs 75$ per hour. Simulate the system for about 350 hours of run and find the maintenance cost.

RNs   8, 9, 2, 8, 3, 7, 4, 8, 5 ,6 ,0 ,4, 9

Clock	T1	T2	T3	T4	Number of tubes replaced
0					

The maintenance cost = ...

Question 4

Test the uniformity of the following numbers using Kolmogrov-Smirnov test:

0.86   0.68   0.99 0.48   0.34   0.16   0.27   0.03

The critical value = 0.566 for a level α of significance= 0.05

$X_i = R_i$								
$F(x)$								
$S_N(x)$								
$\lvert S_N(x) - F(x) \rvert$								