

الإسم الرقم

ورقة الإمتحان تشتمل على 5 صفحات

Try All Questions

Question (1) (15 Marks):

Read carefully and Tick (✓) for the True statement and (X) for the False statement.

No	Statement	✓ or X
1	“Real world” queues are often very complex	
2	In First Order Markov Chain, the value of the current state depends on the two previous states	
3	DSR resides in kernel IP layer (based on IPv6 format)	
4	Event is a change in the system state.	
5	For practical intent and purposes, when the population is large in comparison to the service system, we assume the source population to be finite	
6	Low utilization levels provide better equipment and employee utilization	
7	High utilization levels provides fewer idle periods	
8	In Markov Chain Future is depends on the past given the present	
9	We need to trade off benefits of high utilization levels with benefits of flexibility and service	
10	In Peri net Synchronization happens when tokens from several places arrive for service at the same transition.	
11	FCFS Scheme is potentially bad for short jobs	
12	Simulation models of communication protocols often implement all the functionality that a real protocol implements	
13	Markov Chain Requires perfect knowledge of current state.	
14	To simulate a real-world network, you need to specify all necessary parameter values for your model	
15	ARQ protocols do not contribute to error and flow control at the DLC layer	

Question (2) (20 Marks):

Write the missing words for the following statements in the below table

1	2	3	4	5
6	7	8	9	10

1. Concealing the queue from arriving customers is used to _____ the effects of Long Queues.
2. Patient filling out medical history form while waiting for physician is a technique for Use the customer as a _____
3. The queue _____ specifies the order by which jobs in the queue are being served.
4. In Markov chain properties States i and j communicate if each is _____ from the other.
5. In Petri net _____ occurs if t_1 and t_2 are both ready to fire but the firing of any leads to the disabling of the other transitions.
6. _____ is the process of deciding how to commit resources between a variety of possible tasks.
7. In _____ a node chooses a random destination anywhere in the network field
8. In _____ New direction θ is chosen randomly between $(0, 2\pi]$
9. In _____ the members of the group follow the leader's mobility closely, with some deviation.
10. _____ concerned with building the model right. It is utilized in the comparison of the conceptual model to the computer representation that implements that conception.

Question (3) (10 Marks):

Fill the following table by writing the numbers of items in B that match items in A:

A	1	2	3	4	5	6	7	8	9	10
B										

A	B
(1) The population from which customers/jobs originate	(1) The queue discipline
(2) Can involve one or several service facilities with one or several parallel service channels (servers)	(2) Poisson Process
(3) Mitigating Effects of Long Queues	(3) The Arrival Process
(4) the number of customers in the system Queue length	(4) The queue configuration
(5) Specifies the number of queues	(5) The Service Mechanism
(6) Specifies the order by which jobs in the queue are being served.	(6) The calling population
(7) (The state of the system) – (number of customers being served)	(7) The state of the system
(8) Determines how, when and where customer/jobs arrive to the system	(8) Use the customer as a resource
(9) The times between arrivals are independent, identically distributed and exponential	(9) Balking
(10) views the situation (length of queue) and then decides to leave.	(10) Queue length

Question (4) (15 Marks):

1. Consider an M/M/1 queuing system with an arrival rate $\lambda=0.4$ and service rate $\mu=0.5$. Compute the system utilization and tell if the system stable or not?

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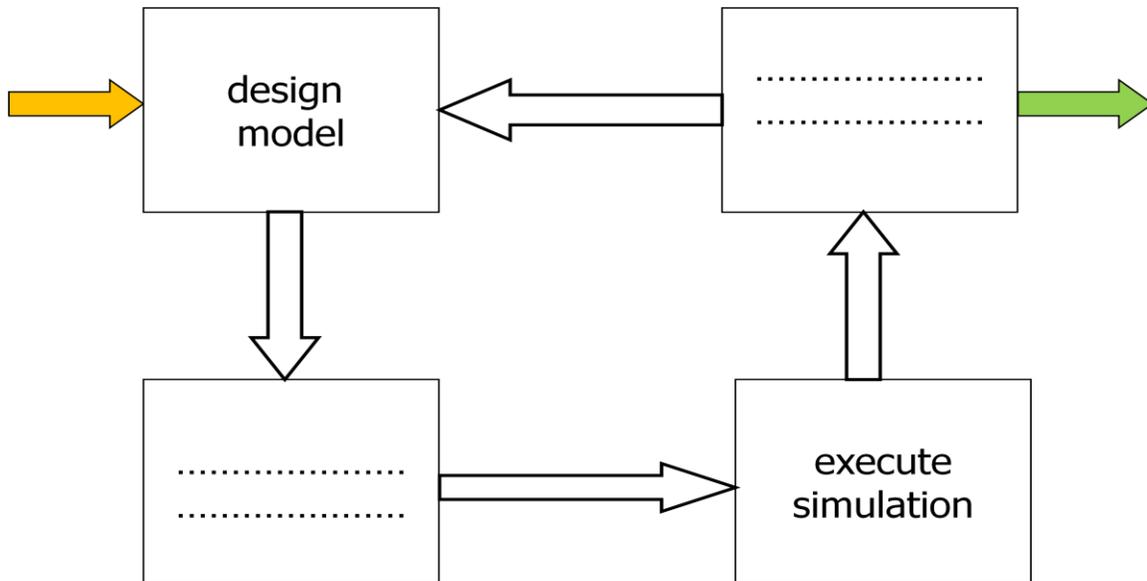
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2. Complete the following diagram that describes the simulation and modeling process



3. Mention the three types Simulation Tools

- (1)
- (2)
- (3)

Question (5) (20 Marks):

1. Cars arrive for maintenance at a mean rate of 7 cars per hour. It takes an average of $s=2$ hours to finish a cars. Cars are handled FCFS. Find the following:

(i) λ

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(ii) μ

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(iii) ρ

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2. Suppose in a manufacture system there are:

$t =$ day index $0, 1, 2, \dots$

$X_t = 0$ high defective rate on t^{th} day

$= 1$ low defective rate on t^{th} day

(i) Draw the Stochastic matrix

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(ii) Find $P(X_2 = 0 \mid X_0 = 0)$

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