

الإسم ..... الرقم .....

أجب عن جميع الأسئلة

\*ورقة الإمتحان تشتمل على 6 صفحات\*

**Question (1): State whether the following is True or False: (15 Marks)**

1. A simulation model is helping us to gain knowledge about improvement of system.	( )
2. Simulation is not appropriate when cost exceed savings.	( )
3. Initialization routine is a subprogram to initialize the simulation model at time 0.	( )
4. A model can be used to investigate a wide verity of “what if” questions.	( )
5. Variance of the generated PRN numbers might be too low or too high.	( )
6. System state is variables used for storing statistical information about system performance.	( )
7. Complex systems can simulated using spreadsheet simulation.	( )
8. It is not better to do simulation before Implementation.	( )
9. RN routines are not portable to different computers ideally to different programming languages.	( )
10. In stochastic system some state variables are static.	( )

**Question (2):**

**Draw a circle around the correct answer letter in the following: (15 Marks)**

1. A .....is the imitation of the operation of real-world process or system over time.	
a. model	b. simulation
c. static model	d. analysis
2. In the .....simulation real people are operating real equipment.	
a- static	b- live
c- virtual	d- Constructive
3. .... is a variable giving the current value of simulated time.	
a. Simulation state	b. Simulation clock
c. Simulation data	d. Simulation
4. In the queuing simulation system we consider the calling population as .....	
a. finite	b. infinite
c. define	d. undefined
5. The .....is most widely used technique for generating random numbers.	
a. CLCG	b. LCM
c. CML	d. PRN

6. ....is a time period of specified length.	
a. entity	b. Activity
c. event	d. attribute
7. The .....systems usually require complex models difficult to code from scratch in general purpose language.	
a. simulation	b. Complex
c. simple	d. models
8. A .....system is one in which the state variables change continuously over time.	
a. Discrete	b. Continues
c. Deterministic	d. Stochastic
9. ....means computational model should be consistent with specification model.	
a. Validation	b. Verification
c. Interactive	d. Valuable
10. ....a collection of variables that describe the system in any time.	
a. event	b. state
c. Exogenous	d. Entity

**Question (3): (13 Marks)**

A) Using the Linear Congruential Method generate the first five random numbers, assume you have the following values: (6 Marks)

$$X_0 = 25, a = 19, c = 29, \text{ and } m = 100$$

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B) Mention the steps of how to develop a model simulation in order.(4 Marks)

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C) Mention three from the simulation environments common features?(3 Marks)

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**Question (4)**

**Fill in the blanks with the correct term from the given list: (13 Marks)**

Replications	System state	discrete	FORTTRAN	system	Levels	Attributes
Logical	run length	Java	Analytic	Factors	Arena	Physical

- 1) A .....is defined as a groups of objects that are joined together in some regular interaction.
- 2) A .....system is one in which the state variables change only at a discrete set of points in time.
- 3) The.....is one of the main methods used in the design of performance evaluation studies.
- 4) The pseudo-random number has the same .....of the random number.
- 5) .....is to ensure repeatability of results, and gain greater statistical confidence in the results given.
- 6) A .....is the collection of state variables necessary to describe the system at a particular time.
- 7) .....are the precise settings of the factors that are to be used in an experiment.
- 8) .....is one type of Simulation Environments.
- 9) For storing lists in a computer using sequential allocation approaches the .....position equal to the .....position.
- 10) .....is one of a few languages focus on unifying concepts and reusable functions.
- 11) The simulation .....is choosing a long enough run time to get statistically meaningful results.
- 12) .....are the main components that are varied in an experiment.

### Question (5): (8 Marks)

A baker has wanted to decide how many number of bread can prepare by day. The Probability of how many customers arrive per day and the number of breads for each customer given by the following tables. Do the simulation for two days and find out the number of breads prepared by day.

يريد أحد الخبازين تحديد متوسط عدد أرغفة الخبز التي يعدها يوميا. التوزيع الإحتمالي لعدد الزبائن يوميا و عدد الارغفة لكل زبون يعطى بالجدول التالية , حاكمي يدويا يومين عمل و حدد متوسط عدد الأرغفة التي يعدها الخباز يوميا.

The distribution Probability table of the number of customer per day as follow:

جدول معاينة عدد الزبائن لكل يوم

Number of Customers/Day	Probability	Cumulative Probability	Random Number
6	0.35	0.35	0.01 - 0.35
8	0.3	0.65	0.36 - 0.65
10	0.25	0.90	0.66 – 0.90
12	0.1	1.0	0.91 - 1

The distribution Probability table show the number of breads for each customer as follow

جدول معاينة عدد الأرغفة لكل زبون

Number of Loafs/Customer	Probability	Cumulative Probability	Random Number
4	0.4	0.4	0.01 - 0.40
8	0.3	0.7	0.41 - 0.70
12	0.2	0.9	0.71 – 0.90
16	0.1	1.0	0.91 - 1



### Question (6): (6 Marks)

There is one beggar is passed around the houses asking for money and from her experience she know if the people speak with her behind the doors 80 % of them are women and 20% are men. The 70 % of the women give her money but 30 % of the men only give her the money. The amount of money given by the women between (18 ,22).The amount of money given by the men between (7,10).The beggar cover around 7 to 10 houses per day .The result simulation for 3 days in the following table .(6 Marks)

تمر أحد المتسولات على المنازل تستجدي مبلغا من المال. من خبرتها السابقة تقدر أن من يخاطبها من خلف الباب يشكل 80 % منهم من النساء و20% منهم من الرجال. وان 70% من النساء اللاتي يخاطبنها يقمن بإعطائها مبلغ من المال ما بين 18 الي 22 جنية ولكن فقط 30% من الرجال يعطونها مبلغ من المال ما بين 7 الي 10 جنية. ان المتسولة تغطي ما بين 7 الي 10 منازل في اليوم الواحد الجدول التالي يوضح المحاكاة لمدة ثلاثة ايام من الجدول اوجد التالي:

Days	Houses	house	Type(F/M)	If payed	how much	Total
Day one	4	1	Female	yes	20	
		2	Male	yes	9	
		3	Female	yse	19	
		4	Female	yes	17	
Day two	5	1	Female	yes	11	
		2	Male	yse	10	
		3	Female	no	0	
		4	Male	yes	9	
		5	Male	no	0	
Day three	4	1	Male	yes	8	
		2	Female	yes	20	
		3	Male	yes	5	
		4	Female	yes	18	

#### From the table find out:

1) Average earns per day for the beggar.

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2) Average of female donates.

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3) Average of male donates?

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4) The maximum number of the houses visited by the beggar per day?

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**End of Exam / Good Luck\*\***