M.E. Second Semester (Mechanical Engineering) (CAD / CAM) (F.T.) (CGS)

13494 : Simulation Theory and Applications : 2 MCC 2

P. Pages : 2 | **AU - 3296Add**

Time : Three Hours | Max. Marks : 80

Notes :
1. All question carry marks as indicated.
2. Answer **three** question from Section A and **three** question from Section B.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answer necessary with the help of neat sketches.
6. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1.	a)	Explain the task of deriving a model of a system.	**7**
	b)	Explain Continuous and Discrete systems stating examples.	**6**
2.	a)	Explain why it is needed to consider feed back time lag effect in system modeling.	**7**
	b)	State and explain the application of simulation in various field.	**6**
3.	a)	State and explain various elements of a model of a Supermarket.	**6**
	b)	Identify entities, attributes and activities in a banking system and in a communication system.	**7**
4.	a)	Explain rejection method of generating random numbers.	**7**
	b)	State and explain distributed LAG model.	**7**
5.	a)	Explain the mathematical solution of queuing problem.	**7**
	b)	'Digital computers plays important role in system simulation' comment.	**6**

SECTION - B

6.	a)	Explain the meaning of following blocks, with the help of their tasks and diagrams, used in GPSS : i) QUEUE ii) TABULATE iii) ADVANCE	**9**
	b)	Explain simulation of inventory problem.	**6**
7.	a)	What are the advantages of special purpose languages over general purpose languages?	**7**
	b)	Explain how spectral analysis can provide more information than is contained in mean value.	**6**

8. 'Simulation is the technique based on probability and so it is not perfect'. In this context explain the various factors responsible for failure of simulation analysis and suggest how to prevent them. **13**

9. a) Explain auto regression technique used in time series analysis. **7**

   b) What are the various applications of simulation in manufacturing. **6**

10. a) State and explain guiding principles for building models. **3**

    b) Draw and explain flowchart for simulation of an inventory problem of a retail store. The certain item is to be kept replenishing by ordering it from wholesaler. Simple policy to be adopted for ordering new supplies is : When stock goes down to P items (recover point), Q more items (reorder quantity) is to be ordered from the wholesaler. If the demand on any day exceeds the amount of inventory on hand, the excess represents lost sale and loss of goodwill. On the other hand, overstocking implies increased carrying cost. Ordering too frequently will result in excessive reorder cost. Assume the following conditions : **11**

    i) There is a 4 day lag between the order and arrival.
    ii) For each unit of inventory the carrying cost for each night is Rs. 1.25.
    iii) Each unit out of stock when ordered results into a loss of Rs. 21.00 per unit.
    iv) Placements of each order costs Rs. 100.00 regardless of the number of units ordered.
    v) The demand in a day can equi-probably vary between 0 to 99.
    vi) There is never more than one replenishment order outstanding.
    vii) Initially we have 120 units on hand and no order outstanding.

    With these conditions in force, the following two replenishments policies are to be compared to select the one that has the minimum total cost (i.e. Reorder cost + Carrying cost + Lost sales cost)

	P (Reorder Point)	Q (Reorder Quantity)
Policy - I	125	150
Policy - II	125	250

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