

MTH601 – Operations Research

Quiz 3 Fall 2022

Date 9 March 2022

Lectures Included : 35–40

Which of the following replacement policies is considered to be dynamic in nature?

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Select the correct option

<input type="radio"/>	When money value remains constant for some time and then goes on changing with time
<input type="radio"/>	When money value does not change with time and time is a discrete variable
<input type="radio"/>	Time is continuous variable and the money value does not change with time
<input type="radio"/>	When money value changes with time Correct

Question # 2 of 10 (Start time: 09:40:12 PM, 08 March 2022)

If the cost matrix in an Assignment problem is not square then which the following modification will be made to balance the given problem?

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Select the correct option

- Add a dummy row(column) with negative cost elements
- Add a dummy row(column) with positive cost elements
- Add a dummy row(column) with arbitrary(including negative or positive) cost elements **Correct**
- Add a dummy row(column) with zero cost elements

Question # 3 of 10 (Start time: 09:41:33 PM, 08 March 2022)

For an assignment problem, if the numbers of agents and tasks are _____, then the problem is called _____ assignment.

Select the correct option

- unequal, balanced
- equal, unbalanced
- equal, balanced **Correct**
- none of these

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Question # 4 of 10 (Start time: 09:42:26 PM, 08 March 2022)

In Hungarian method of solving assignment problem, the cost matrix is obtained by——.

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Select the correct option

- | | | |
|-----------------------|---|---------|
| <input type="radio"/> | subtracting all the elements of the row from the highest element in the matrix. | |
| <input type="radio"/> | subtracting the smallest element from all other elements of the row. | Correct |
| <input type="radio"/> | dividing each row by the elements of the row above it | |
| <input type="radio"/> | subtracting the elements of the row from the elements of the row above it | |

Question # 6 of 10 (Start time: 09:45:03 PM, 08 March 2022)

In a Replacement Model, a machine is replaced with average running cost _____

Select the correct option

- till current period is greater than that of next period
- is not equal to current running cost
- if current period is greater than that of next period Correct
- if the current period is less than that of next period

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Question # 7 of 10 (Start time: 09:46:22 PM, 08 March 2022)

Suppose that a taxi firm has four taxis (the agents) available, and four customers (the tasks) wishing to be picked up as soon as possible. The firm prides itself on speedy pickups, so for each taxi the cost of picking up a particular customer will depend on the time taken for the taxi to reach the pickup point. This is _____ problem.

Select the correct option

- unbalanced assignment
- linear programming
- balanced assignment
- transportation Correct

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Question # 8 of 10 (Start time: 09:47:33 PM, 08 March 2022)

In the assignment problem, the cost matrix is _____.

Select the correct option

- | | | |
|----------------------------------|--------------|---------|
| <input checked="" type="radio"/> | square | Correct |
| <input type="radio"/> | non-singular | |
| <input type="radio"/> | rectangular | |
| <input type="radio"/> | singular | |

Question # 9 of 10 (Start time: 09:48:45 PM, 08 March 2022)

During the substitution process of determining the Transportation Cost x_{ij} in a balanced Transportation problem, no _____ operation is used as the coefficients of x_{ij} are '0' or '1'. Due to this property, every basic feasible solution has only non-negative integral values.

Select the correct option

- | | | |
|----------------------------------|----------|---------|
| <input checked="" type="radio"/> | Addition | Correct |
| <input type="radio"/> | Division | |

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Question # 10 of 10 (Start time: 09:50:02 PM, 08 March 2022)

Total Marks: 1

Suppose that a taxi firm has four taxis (the agents) available, and three customers (the tasks) wishing to be picked up as soon as possible. The firm prides itself on speedy pickups, so for each taxi the cost of picking up a particular customer will depend on the time taken for the taxi to reach the pickup point. This is _____ problem.

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Select the correct option

- | | |
|-----------------------|-----------------------|
| <input type="radio"/> | balanced assignment |
| <input type="radio"/> | linear programming |
| <input type="radio"/> | transportation |
| <input type="radio"/> | unbalanced assignment |
- Correct

Question # 1 of 10 (Start time: 11:43:57 AM, 09 March 2022)

Total Marks: 1

Which of the following department is more responsible for the development of queuing theory?

Select the correct option

- | | |
|-----------------------|----------------------|
| <input type="radio"/> | Railway station |
| <input type="radio"/> | Municipal office |
| <input type="radio"/> | Health department |
| <input type="radio"/> | Telephone department |
- Correct

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During the substitution process of determining the Transportation Cost ' x_{ij} ' in a balanced Transportation problem, no----- operation is used as the coefficients of ' x_{ij} ' are '0' or '1'. Due to this property, every basic feasible solution have only non-negative integral values

Select the correct option

- | | | |
|-----------------------|----------|----------------|
| <input type="radio"/> | Addition | Correct |
| <input type="radio"/> | Division | |

If the total cost of the assignment for all the tasks is equal to the sum of the costs for each agent, then the problem is called _____.

Select the correct option

- | | | |
|-----------------------|-----------------------|----------------|
| <input type="radio"/> | unbalanced assignment | |
| <input type="radio"/> | optimization | Correct |
| <input type="radio"/> | linear assignment | |
| <input type="radio"/> | simplex | |

Which of the following replacement policies is considered to be dynamic in nature?

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Select the correct option

<input type="radio"/>	When money value changes with time	Correct
<input type="radio"/>	When money value remains constant for some time and then goes on changing with time	
<input type="radio"/>	Time is continuous variable and the money value does not change with time	
<input type="radio"/>	When money value does not change with time and time is a discrete variable	

For an assignment problem, if the numbers of agents and tasks are _____, then the problem is called _____ assignment.

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Select the correct option

- | | | |
|-----------------------|---------------------|----------------|
| <input type="radio"/> | unequal, balanced | |
| <input type="radio"/> | none of these | |
| <input type="radio"/> | equal, unbalanced | |
| <input type="radio"/> | unequal, unbalanced | Correct |

In a Replacement Model, a machine is replaced with average running cost -----

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Select the correct option

- | | |
|-----------------------|--|
| <input type="radio"/> | if the current period is less than that of next period
Correct |
| <input type="radio"/> | if current period is greater than that of next period |
| <input type="radio"/> | is not equal to current running cost |
| <input type="radio"/> | till current period is greater than that of next period |

The row, which is introduced in the matrix to balance an unbalanced Transportation problem, is known as -----.

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Select the correct option

- | | |
|-----------------------|--------------------------|
| <input type="radio"/> | idle row |
| <input type="radio"/> | slack row |
| <input type="radio"/> | key row |
| <input type="radio"/> | dummy row Correct |

Which of the following replacement model is said to be probabilistic model?

Select the correct option

- Preventive maintenance policy
- When money value does not change with time and time is a discrete variable
- When money value changes with time **Correct**
- When money value does not change with time and time is a continuous variable

There always exists a Basic Feasible Solution of a Balanced Transportation Problem.

Select the correct option

- False
- True [Download More Quizzes Files From VUAnswer.com](#) **Correct**

Replacement of an item will become necessary when -----

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Select the correct option

- your operator desires to work on a new machine
- the company has surplus funds to spend
- old item becomes too expensive to operate or maintain
Correct
- your opponent changes his machine in his unit

For any Replacement Model, which of the following maintenance policies is not used in old age stage of a machine?

Select the correct option

- Replacement
- Scheduled preventive maintenance
Correct
- Reconditioning
- Operate up to failure and do corrective maintenance

Which of the following represents "Arrival->Service->Service->Service->Out->"?

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Select the correct option

- | | | |
|-----------------------|------------------------------------|---------|
| <input type="radio"/> | Multi channel multi phase system | Correct |
| <input type="radio"/> | Single channel multi phase system | |
| <input type="radio"/> | Multi channel single-phase system | |
| <input type="radio"/> | Single Channel Single Phase system | |

Question # 3 of 10 (Start time: 11:59:02 AM, 09 March 2022)

For the project of a firm, if '5' sales persons are assigned '5' different sales territories, then in how many ways a single territory can be assigned to a single sale person?

Select the correct option

- | | | |
|-----------------------|-----|---------|
| <input type="radio"/> | 10 | |
| <input type="radio"/> | 25 | |
| <input type="radio"/> | 5 | |
| <input type="radio"/> | 120 | Correct |

When a doctor attends to an emergency case leaving his regular service is called——

Select the correct option

- | | | |
|----------------------------------|----------------------------------|---------|
| <input type="radio"/> | Reneging | |
| <input checked="" type="radio"/> | Non-Pre-Emptive queue discipline | Correct |
| <input type="radio"/> | Balking | |
| <input type="radio"/> | Pre-emptive queue discipline | |

Question # 6 of 10 (Start time: 12:02:28 PM, 09 March 2022)

The column, which is introduced in the matrix to balance an unbalanced Transportation problem, is known as——

Select the correct option

- | | | |
|----------------------------------|--------------|---------|
| <input type="radio"/> | key column | |
| <input checked="" type="radio"/> | dummy Column | Correct |
| <input type="radio"/> | slack column | |
| <input type="radio"/> | idle column | |

Question # 7 of 10 (Start time: 12:03:20 PM, 09 March 2022)

The assignment problem is unbalanced if the cost matrix is not a -----matrix.

Select the correct option

- non-singular
- rectangular
- square **Correct**
- singular

Question # 8 of 10 (Start time: 12:04:00 PM, 09 March 2022)

The important characteristic of Cost matrix associated with Assignment problem, while solving it by Hungarian's method is -----.

Select the correct option

- it will have zero as the elements of both diagonals
- it will have zero as elements of one diagonal
- it will have at least one zero in each column and each row **Correct**
- it will not have zeros as its elements

Which of the following cost is irrelevant to replacement analysis?

Select the correct option

Maintenance cost of the machine

Operating cost of the machine

Purchase cost of the machine

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Machine hour rate of the machine

Correct

When the total allocations in a transportation model of $m \times n$ size is not equals to “ $m + n - 1$ ”, the situation is known as:

Select the correct option

<input type="radio"/>	Unbalanced situation
<input type="radio"/>	None of the above
<input type="radio"/>	Degeneracy Correct
<input type="radio"/>	Tie situation

Which of the following is the correct assumption for replacement policy when money value does not change with time?

Select the correct option

<input type="radio"/>	No scrap value	
<input type="radio"/>	No Capital cost	
<input type="radio"/>	Zero maintenance cost	
<input type="radio"/>	Constant scrap value	Correct

The solution of an Assignment problem can be arrived by using which of the following method?

Select the correct option

- | | | |
|-----------------------|-------------------------------|----------------|
| <input type="radio"/> | Hungarian' s method | Correct |
| <input type="radio"/> | Vogel' s approximation method | |
| <input type="radio"/> | Least Cost method | |
| <input type="radio"/> | North West corner method | |

The solution of an Assignment problem can be arrived by using which of the following method?

Select the correct option

- | | | |
|-----------------------|------------------------------|---------|
| <input type="radio"/> | North West corner method | |
| <input type="radio"/> | Least Cost method | |
| <input type="radio"/> | Hungarian's method | Correct |
| <input type="radio"/> | Vogel's approximation method | |

For the project of a firm, if '5' sales persons are assigned '5' different sales territories, then in how many ways a single territory can be assigned to a single sale person?

Select the correct option

<input type="radio"/>	25	
<input type="radio"/>	10	
<input type="radio"/>	5	
<input type="radio"/>	120	Correct

If a balanced Transportation problem with '7' sources and '6' sinks then its non-degenerate basic feasible solution will have----- independent allocations

Select the correct option

<input type="radio"/>	10	
<input type="radio"/>	12	
<input type="radio"/>	13	Correct
<input type="radio"/>	11	

Suppose that a taxi firm has four taxis (the agents) available, and four customers (the tasks) wishing to be picked up as soon as possible. The firm prides itself on speedy

Select the correct option

- | | |
|-----------------------|-------------------------------|
| <input type="radio"/> | unbalanced assignment |
| <input type="radio"/> | transportation Correct |
| <input type="radio"/> | linear programming |
| <input type="radio"/> | balanced assignment |

In Hungarian method of solving assignment problem, the cost matrix is obtained by-----.

Select the correct option

- | | |
|-----------------------|---|
| <input type="radio"/> | dividing each row by the elements of the row above it |
| <input type="radio"/> | subtracting the elements of the row from the elements of the row above it. |
| <input type="radio"/> | subtracting the smallest element from all other elements of the row. Correct |
| <input type="radio"/> | subtracting all the elements of the row from the highest element in the matrix. |

Which of the following represents “Arrival->Service->Service->Service->Out->” ?

Select the correct option

- | | |
|-----------------------|---|
| <input type="radio"/> | Single channel multi phase system
Correct |
| <input type="radio"/> | Multi channel single-phase system |
| <input type="radio"/> | Multi channel multi phase system |
| <input type="radio"/> | Single Channel Single Phase system |

The similarity between Assignment Problem and Transportation problem is-----.

Select the correct option

- both can be solved by graphical method
- both are rectangular matrices
- both have objective function and non negativity constraints
Correct
- both are square matrices

The row, which is introduced in the matrix to balance an unbalanced Transportation problem, is known as -----.

Select the correct option

- | | | |
|-----------------------|-----------|---------|
| <input type="radio"/> | dummy row | Correct |
| <input type="radio"/> | key row | |
| <input type="radio"/> | idle row | |
| <input type="radio"/> | slack row | |

Distribution of service time in Queuing Model is -----
exponential distribution.

Select the correct option

<input type="radio"/>	positive
<input type="radio"/>	multiplicative Correct Not Sure
<input type="radio"/>	negative
<input type="radio"/>	divided

The important characteristic of Cost matrix associated with Assignment problem, while solving it by Hungarian ' s method is -----

Select the correct option

- it will not have zeros as its elements
- it will have zero as the elements of both diagonals
- it will have zero as elements of one diagonal
- it will have at least one zero in each column and each row **Correct**

In the assignment problem, the decision variable 'x_{ij}' can attain which of the following value?

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Select the correct option

- | | |
|-----------------------|----------------------------|
| <input type="radio"/> | Only zero |
| <input type="radio"/> | Any arbitrary non-negative |
| <input type="radio"/> | Zero or '1' Correct |
| <input type="radio"/> | Only '1' |

The characteristics of a queuing model is independent of----
-----.

Select the correct option

<input type="radio"/>	Number of service stations
<input type="radio"/>	Limit of length of queue
<input type="radio"/>	Service Pattern
<input type="radio"/>	Queue discipline Correct

In the assignment problem, the cost matrix is -----.

Select the correct option

- | | |
|----------------------------------|-----------------------|
| <input type="radio"/> | rectangular |
| <input type="radio"/> | non-singular |
| <input checked="" type="radio"/> | square Correct |
| <input type="radio"/> | singular |

In any Replacement Model a contractual maintenance or agreement maintenance with manufacturer is suitable for equipment, which is -----

Select the correct option

- | | |
|-----------------------|------------------------------------|
| <input type="radio"/> | scrapped |
| <input type="radio"/> | None of the above |
| <input type="radio"/> | in its infant state Correct |
| <input type="radio"/> | when machine is old one |

If a balanced Transportation problem with '7' sources and '6'sinks then its non-degenerate basic feasible solution will have----- independent allocations.

Select the correct option

- | | | |
|-----------------------|----|---------|
| <input type="radio"/> | 10 | |
| <input type="radio"/> | 12 | |
| <input type="radio"/> | 11 | |
| <input type="radio"/> | 13 | Correct |

When money value changes with time at Ten percent(10%), then Power Worth Factor(PWF) for first year is-----.

Select the correct option

<input type="radio"/>	0.852
<input type="radio"/>	1 Correct
<input type="radio"/>	0.9
<input type="radio"/>	0.909

Replacement of an item will become necessary when -----
----.

Select the correct option

- | | |
|-----------------------|---|
| <input type="radio"/> | the company has surplus funds to spend |
| <input type="radio"/> | your operator desires to work on a new machine |
| <input type="radio"/> | your opponent changes his machine in his unit |
| <input type="radio"/> | old item becomes too expensive to operate or maintain
Correct |

Queuing models measure the effect of_____

Select the correct option

- Random service
- Random arrivals
- Length of queue
- Effect of uncertainty on the behavior of the queuing system

Correct

Which of the following cost is irrelevant to replacement analysis?

Select the correct option

<input type="radio"/>	Purchase cost of the machine
<input type="radio"/>	Maintenance cost of the machine
<input type="radio"/>	Machine hour rate of the machine Correct
<input type="radio"/>	Operating cost of the machine

Question # 1 of 10 (Start time: 02:25:20 PM, 09 March 2022)

Replacement of an item will become necessary when _____

Select the correct option

- the company has surplus funds to spend
- your opponent changes his machine in his unit
- your operator desires to work on a new machine
- old item becomes too expensive to operate or maintain

Correct

Question # 2 of 10 (Start time: 02:27:04 PM, 09 March 2022)

Total Marks:

The column, which is introduced in the matrix to balance an unbalanced Transportation problem, is known as _____

Select the correct option

- idle column
- slack column
- key column
- dummy Column

Correct

Question # 3 of 10 (Start time: 02:28:09 PM, 09 March 2022)

Which of the following type of failure that usually occurs in old age of the machine and hence become a reason of replacement?

Select the correct option

- Wear-out failure
- Random failure
- Early failure
- Chance failure

Correct

Question # 6 of 10 (Start time: 02:32:07 PM, 09 March 2022)

If the number of arrivals during a given time period is independent of the number of arrivals that have already occurred prior to the beginning of time interval, then the new arrivals follow _____ distribution.

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Select the correct option

- Poisson **Correct**
- Erlang
- Normal
- Exponential

There are _____ permutations possible for allocating 3 jobs to 3 contractors.

Select the correct option

- 6!
- none of these **Correct (3!)**
- 3
- 6

Question # 2 of 10 (Start time: 02:39:05 PM, 09 March 2022)

Which of the following statement applies to both transportation model and assignment model?

Select the correct option

<input checked="" type="radio"/>	Both have objective function, structural constraint and non-negativity constraints
<input type="radio"/>	Both are tested by Steping Stone method for optimality
<input type="radio"/>	The inequalities of both problems are related to one type of resource
<input type="radio"/>	Both use Vogel's approximation for getting basic feasible solution

Correct

For a balanced Transportation problem with 'm' sources and 'n' sinks then degeneracy will arise only if there are less than

Select the correct option

- m-n-3
 - m-n-2
 - m-n-4
 - m-n-1
- Correct**

Suppose that a taxi firm has four taxis (the agents) available, and four customers (the tasks) wishing to be picked up as soon as possible. The firm prides itself on customer will depend on the time taken for the taxi to reach the pickup point. This is _____ problem.

Select the correct option

- unbalanced assignment
 - linear programming
 - transportation
 - balanced assignment
- Correct**

Question # 6 of 10 (Start time: 02:41:49 PM, 09 March 2022)

When a doctor attends to an emergency case leaving his regular service is called——

Select the correct option

<input type="radio"/>	Pre-emptive queue discipline
<input type="radio"/>	Reneging
<input type="radio"/>	Non-Pre-Emptive queue discipline Correct
<input type="radio"/>	Balking

If there is infinite number of servers then all the customers are served _____

Select the correct option

<input checked="" type="radio"/>	instantaneously
<input type="radio"/>	randomly

Correct

Group replacement policy is most suitable for -----.

Select the correct option

<input type="radio"/>	trucks
<input type="radio"/>	infant machines
<input type="radio"/>	street light bulbs
<input type="radio"/>	new cars

Correct

To convert an Assignment problem into a maximization problem, which of the following operations would have to apply?

Select the correct option

- | | |
|-----------------------|--|
| <input type="radio"/> | Deduct all elements of the row from highest element in that row |
| <input type="radio"/> | Deduct smallest element in the matrix from all other elements. |
| <input type="radio"/> | Deduct smallest element in any row from all other elements of the row. |
| <input type="radio"/> | Multiply all the elements of assignment matrix by '-1' |
- Correct**

While solving an Assignment problem by Hungarian's method, in the modified cost matrix if the minimum number of horizontal and vertical lines to cover zeros are not equal to the number of rows (or columns), then which of the following operation is done?

Select the correct option

- Subtract smallest element of uncovered rows from all other elements of uncovered cells
- Subtract the smallest element from the next highest number in the element.
- Add smallest element of the uncovered cells to the elements to the line
- Subtract the smallest element from the element at the intersection of horizontal and vertical line.

Correct

Which of the following type of failure that usually occurs in old age of the machine and hence become a reason of replacement?

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Select the correct option

<input type="radio"/>	Random failure
<input type="radio"/>	Chance failure
<input type="radio"/>	Wear-out failure Correct
<input type="radio"/>	Early failure

Question # 3 of 10 (Start time: 02:56:53 PM, 09 March 2022)

If the number of arrivals during a given time period is independent of the number of arrivals that have already occurred prior to the beginning of time interval, then the new arrivals follow _____ distribution.

Select the correct option

<input type="radio"/>	Exponential
<input type="radio"/>	Erlang
<input checked="" type="radio"/>	Poisson Correct
<input type="radio"/>	Normal

If a balanced Transportation problem with 'm' sources and 'n' sinks then degeneracy will arise only if there are less than -----
-- independent allocations in the solution.

Select the correct option



$m-n-2$



$m-n-3$



$m-n-4$



$m-n-1$

Correct

There are _____ permutations possible for allocating 3 jobs to 3 contractors.

Select the correct option

<input type="radio"/>	6!
<input type="radio"/>	3
<input type="radio"/>	6
<input type="radio"/>	none of these

Correct
(3!)

For an assignment problem, if the numbers of agents and tasks are _____, then the problem is called _____ assignment.

Select the correct option

- | | |
|-----------------------|--------------------------------|
| <input type="radio"/> | none of these |
| <input type="radio"/> | unequal, balanced |
| <input type="radio"/> | equal, balanced Correct |
| <input type="radio"/> | equal, unbalanced |

Which of the following replacement model is said to be probabilistic model?

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Select the correct option

<input type="radio"/>	When money value does not change with time and time is continuous variable
<input type="radio"/>	When money value does not change with time and time is discrete variable
<input type="radio"/>	When money value changes with time
<input type="radio"/>	Preventive maintenance policy Correct

Suppose that a taxi firm has four taxis (the agents) available, and four customers (the tasks) wishing to be picked up as soon as possible. The firm prides itself on speedy pickups, so for each taxi the cost of picking up a particular customer will depend on the time taken for the

Select the correct option

<input type="radio"/>	unbalanced assignment	Download More Quizzes Files From VUAnswer.com
<input type="radio"/>	transportation	Correct
<input type="radio"/>	linear programming	
<input type="radio"/>	balanced assignment	

The similarity between Assignment Problem and Transportation problem is-----.

Select the correct option

- | | |
|----------------------------------|--|
| <input checked="" type="radio"/> | both have objective function and non negativity constraint
Correct |
| <input type="radio"/> | both can be solved by graphical method |
| <input type="radio"/> | both are square matrices |
| <input type="radio"/> | both are rectangular matrices |

In a queue, the arrival pattern can be expressed in terms of -

-----.

Select the correct option

<input type="radio"/>	customer behavior
<input type="radio"/>	Probabilities Correct
<input type="radio"/>	exact continuous variables
<input type="radio"/>	number of servers

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