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MTH601 Operations Research

Final Term Examination – Spring 2005

Time Allowed: 150 Minutes

Please read the following instructions carefully before attempting any of the questions:

1. Attempt all questions. Marks are written adjacent to each question.
2. Do not ask any questions about the contents of this examination from anyone from the University.
3. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.
4. If you feel that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.
5. Write all steps, missing steps may lead to deduction of marks.
6. The duration of this examination is 150 minutes.
7. This examination is closed book, closed notes and closed calculator.
8. Calculator is allowed.
9. Symbols by using math type should be pasted on the paper direct from the math type not from the word document otherwise it would not be visible.
10. In order to get full marks do all necessary steps.

****WARNING: Please note that Virtual University takes serious note of unfair means. Anyone found involved in cheating will get an 'F' grade in this course.**

Total Marks: 50

Total Questions: 17

Question No. 1

Marks : 01

- ☐
- ☐
- ☐ None of the above

Question No. 2

Marks : 01

According to _____ strategy, replace an item if it fails before the option of _____

- ☐ IR
- ☐ IPR
- ☐ CPR (Common Preventive Replacement)

Question No. 3


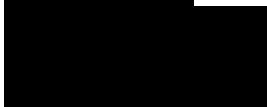
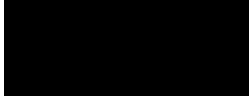

Marks : 03

Question No. 4

Marks : 05

Question No. 5**Marks : 01**

In purchasing model with shortage, the formula of Ordering Size is

- ☐ 
- ☐ 
- ☐ 
- ☐ 

Question No. 6**Marks : 01**

Similarity between CPM and PERT is

- ☐ Both are used to plan the scheduling of individual activities that make up project
- ☐ Both can be used to determine the earliest/latest start and finish time for activity
- ☐ All of the above

Question No. 7**Marks : 05**

The arrival rate of customers at a banking counter follows Poisson distribution with mean of 45 customers per hour. The service rate of the counter clerk also follows Poisson distribution with a mean of 60 customers per hour.

Find the following

1. The probability of having 10 customers in the system
2. Average number of customers waiting in the system
3. Average number of customers waiting in the queue
4. Average waiting time of customers in the system
5. Average waiting time of customers in the queue

Question No. 8

Marks : 01

The formula for expected number of customers in a system is

- ☐ $L = \lambda / (\mu - \lambda)$
- ☐ $L = \lambda / (\lambda - \mu)$
- ☐ $L = \mu / (\lambda - \mu)$
- ☐ $L = \mu / (\mu - \lambda)$

Question No. 9

Marks : 01

For LP problem with 'n' decision variables, each of its corner point solution is at intersection of _____ the _____ constraint boundaries.

- ☐ (n - 1) constraint
- ☐ 'n' constraints
- ☐ (n + 1) constraint
- ☐ None of these

Question No. 10

Marks : 01

In two dimensional LP problem we need only two lines to identify an extreme point. If in any two dimensional problem there are three or more intersecting lines at the corner point, this indicates that

- ☐ Problem has Degenerate Solution
- ☐ One of the constraints is redundant
- ☐ Both First and Second are redundant
- ☐ None of the above

Question No. 11

Marks : 10

Question No. 12**Marks : 01**

A transportation problem is degenerate, if while deriving a feasible solution an allocation

- ☐ Satisfies the Column
- ☐ Satisfies the Row
- ☐ Satisfies column as well as row requirements
- ☐ None of the above

Question No. 12**Marks : 01**

- ☐ Problem has Multiple Optimal
- ☐ Problem has Unbounded
- ☐ Problem has Infeasible Solutions
- ☐ None of the above

Question No. 12**Marks : 07**

Question No. 12

Marks : 05

Question No. 12

Marks : 01

- Dividing the Big-M method's objective function by 'M' and then dropping the negligible terms
- Dividing the Big-M method's objective function by '-M' and then dropping the negligible terms
- Multiply the Big-M method's objective function by 'M' and then dropping the negligible terms
- Multiply the Big-M method's objective function by '-M' and then dropping the negligible terms

Question No. 12

Marks : 05
