

FINALTERM EXAMINATION FALL 2006 MTH601 - OPERATIONS RESEARCH	Marks: 65 Time: 120min
---	---------------------------

StudentID/LoginID: _____

Student Name: _____

Center Name/Code: _____

Exam Date: _____

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.
 - a. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.
 - b. If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.
3. This examination is closed books, closed notes.
4. Calculator is allowed.
5. **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.**
6. *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.**

For Teacher's use only											
Question Marks	1	2	3	4	5	6	7	8	9	10	Total
Question Marks	11										

Question No: 1 (Marks: 10)

Children Hospital Lahore has monthly demand of 6000 units of a tablet named Flagyl. Each tablet cost Rs. 6 and the cost of one purchase is Rs. 950. Keeping that stock for a year in the hospitals cost Rs. 3 per unit. The shortage cost for a

year is Rs. 10 per unit, Determine the following

- (i). The Optimum Order Quantity
- (ii). The time between the orders
- (iii). The number of orders per year
- (iv). The Optimum Shortages
- (v). The time of orders being held

Question No: 2 (Marks: 10)

Solve the following problem with Big M – Method.

$$\text{Minimize. } Z = 3X_1 + 2X_2 + X_3$$

Subject to.

$$X_1 + X_2 = 7$$

$$3X_1 + X_2 + X_3 \geq 10$$

$$X_1, X_2, X_3 \geq 0$$

Question No: 3 (Marks: 10)

Write the DUAL of the following primal problem.

$$\text{Maximize. } Z = -5X_1 + 2X_2$$

Subject to.

$$-X_1 + X_2 \leq -2$$

$$2X_1 + 3X_2 \leq 5$$

$$X_1, X_2 \geq 0$$

Question No: 4 (Marks: 10)

Solve the transportation model starting with the Vogel's Approximation Method.

	1	2	3	4	Supply
1	10	2	20	11	15
2	12	7	9	20	25

3	4	14	16	18	10
Demand	5	15	15	15	

Question No: 5 (Marks: 10)

In a college, every 15 minutes one student arrives for admission information. The staff in the only information counter takes 10 minutes for serving a student on an average. State suitable assumption and find.

- I. The average queue length.
- II. Increase in the arrival rate in order to justify for second counter (when the waiting time of a student is atleast 15 minutes the management will increase one more counter).

Question No: 6 (Marks: 10)

A machine costs Rs. 8000. Annual operating cost are Rs. 1000 for the first year, and then increase by Rs. 500 every year. Resale price are Rs. 4000 for the first year and then decrease by Rs. 500 every year. Determine at which age it is profitable to replace the machine.

Question No: 7 (Marks: 1) - Please choose one

An unrestricted primal variable will result in an equality dual constraint.

- ▶ True
- ▶ False

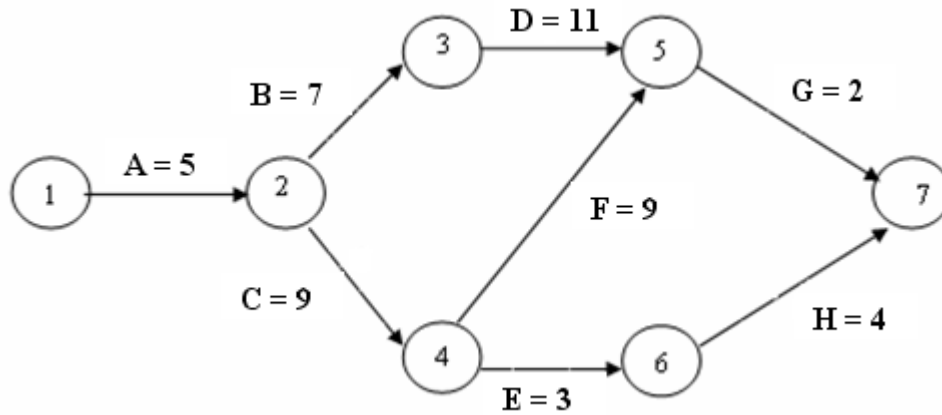
Question No: 8 (Marks: 1) - Please choose one

In purchasing model with shortage, the formula of order size is

- ▶ $Q^* = \sqrt{\frac{2C_2D}{C_3}}$
- ▶ $Q^* = \sqrt{\frac{2C_2D}{C_3}} \sqrt{\frac{C_3+C_4}{C_4}}$
- ▶ $Q^* = \sqrt{\frac{2C_2D}{C_3}} \sqrt{\frac{R}{R-D}}$

$$Q^* = \sqrt{\frac{2C_2D}{C_3(1-D/R)}} \sqrt{\frac{C_3+C_4}{C_4}}$$

Question No: 9 (Marks: 1) - Please choose one



In Above Network Diagram the critical path is

- ▶ (a) A – B – D – G
- ▶ (b) A – C – E – H
- ▶ (c) A – C – F – G
- ▶ (d) Both (a) and (c)

Question No: 10 (Marks: 1) - Please choose one

In assignment problem each job requires

- ▶ Exactly one resource
- ▶ At least one resource
- ▶ At most one resource

Question No: 11 (Marks: 1) - Please choose one

The dual of the dual problem yields the original primal

- ▶ True
- ▶ False

www.vu786.com

www.vu786.com