INDIAN INSTITUTE OF MATERIALS MANAGEMENT

June 2015

Post Graduate Diploma in Logistics Management

Paper 6 (New)

Operation Research Applications in Logistics

Date : 14.06.2015 **Max Marks : 100**

Time : 2.00 p.m. to 5.00 p.m. **Duration : 3 hours**

Instructions :

1) Answer all questions in PART A each question carries 1 mark Total 32 marks
2) Attempt any three questions in PART B each question carries 16 marks Total 48marks
3) Part C compulsory and carry 20 marks

PART A 32 marks

(compulsory, each question carry 1 mark)

Q. 1) Fill in the blanks

a) The risk involved and state of uncertainty are covered by ----------

b) ---------- is the process of solving a problem or choosing from alternative available.

c) The objective of ---------- model is to select the location that minimise the total weighted loads moving into and out if the facility.

d) The costs that are incurred as a result of running out of stock are known as ----------

e) ---------- describes how a customer may become a part of queuing model.

f) ARR = (Annual Earning/Original Investment) X 100

g) If the given problem is not a square matrix, the problem is termed as an ----------

h) ---------- maintenance is done only after the equipment or items break down completely.

Q. 2) Match the following

Column B	Column B
a) Ionic Model	1) Is for consolidation of long distance transportation movement for less than truck load freight to lower transport costs
b) Probabilistic simulation model	2) Represent the system as it is by scaling it up or down
c) Break bulk facility	3) Is a powerful, user friendly transportation management system that was designed to tighten the link between shippers and their core carriers.
d) Linearity	4) Is stochastic in nature and all decisions are made under uncertainty
e) Jockeying	5) web based solution designed help companies coordinate and track their fleet of vehicles in real time, easily and effectively.
f) Breakeven analysis	6) Customer move from one queue to another thinking that he will get served faster by doing so
g) GPS	7) To determine the point at which revenue received equals the cost associated with receiving the revenue.
h) U Route	8) Increase in labour input will have a proportionate increase in output

Q. 3) State True/false of the following

a) When intuition guides a problem-solver to find solutions, heuristic models are developed.
b) Simulation technique is used to generate optimal solution
c) Inventory turnover ratio measures how many times during a year the inventory turns around.
d) Service mechanism is a description of resources required for service
e) Present value index method = Present value of the cash outflows/ Present value of the cash inflows
f) The contribution margin per unit is the difference between selling price per unit and variable cost per unit
g) The replacement of items is not done immediately in case of individual replacement policy.
h) JDA software provides industry leading global supply chain solutions for large and enterprise companies across a wide array of verticals.

Q. 4) Expand the following

a) TMS
b) CVP
c) LCM
d) VAM
e) LTL
f) EOQ
g) SIRO
h) ARR

PART B 48 marks

(Answer any 3 each question carry 16 marks)

Q. 5) a) What is Monte Carlo simulation? What are the advantages and simulations of simulations?

b) What is factor rating analysis?

Q. 6) a) Differentiate between fixed order and economic order quantity model

b) Discuss the various methods for discounted cash flow

Q. 7) a) Explain break even analysis with a suitable example

b) Discuss the various types f maintenance cost

Q. 8) a) List the top most reviewed logistics software system.

b) List the various methods of discounted cash flow.

Q. 9) Determine an initial basic feasible solution to the following transportation problem by using a NWCM method.

	D1	D2	D3	D4	Supply
S1	11	13	17	14	250
S2	16	18	14	10	300
S3	21	24	13	10	400
Demand	200	225	275	250	

PART C 20 marks

(Compulsory)

Q. 10) CASE STUDY

The Indian navy wishes to assign 4 ships to patrol 4 sectors of the sea. In some areas ships are to be on the lookout for illegal fishing boats, and in other sectors to watch for enemy submarines, so the commander rates each ship in terms of its probable efficiency in each sector. These relative efficiencies are given in the table below:-

Ship	A	B	C	D
1	20	60	50	55
2	60	30	80	75
3	80	100	90	80
4	65	80	75	70

On the basis of the rating shown, the commander wants to determine the patrolling assignments producing the greatest over all efficiencies. What is the optimal assignment?

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