

**MASTER OF BUSINESS ADMINISTRATION
(MBAEV)**

Term-End Examination

00795

December, 2014

MCN-038 : QUANTITATIVE TECHNIQUES

Time : 3 hours

Maximum Marks : 100

Note : Attempt any **five** questions. All questions carry equal marks.

1. The following table shows factors to warehouse shipping costs, quantities available at each factory and quantities required at each warehouse. Determine the least cost shipping schedule.

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Factory	Warehouse				Available at Factory
	A	B	C	D	
X	13	11	15	20	2
Y	17	14	12	13	6
Z	18	18	15	12	7
Requirement at Warehouse	3	3	4	5	15

2. A manufacturer of complex electronic equipments has just received a sizable contract and plans to subcontract part of the job. He has solicited bids for 6 subcontracts from 4 firms. Each job is sufficiently large so that any one firm can take on only one job. The table below shows the bids and the cost estimates (in ₹ 10,000's) for doing the jobs internally. Note that no more than two jobs can be performed internally.

		<i>Jobs</i>					
		1	2	3	4	5	6
<i>Firm</i>	1	48	72	36	52	50	65
	2	44	67	41	53	48	64
	3	46	69	40	55	45	68
	4	43	73	37	51	44	62
	Internal	50	65	35	50	46	63

Solve the problem by the Hungarian method.

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3. A man has the choice of running either a hot snack stall or an ice-cream stall at a sea-side resort during the summer season. If it is a fairly cool summer, he should make ₹ 5,000 by running the hot snack stall, but if the summer is quite hot he can only expect to make ₹ 1,000. On the other hand, if he operates the ice-cream stall, his profit is estimated at ₹ 6,500 if the summer is hot, but only ₹ 1,000 if it is cool. There is a 40 percent chance of the summer being hot. Should he opt for running the hot snack stall or the ice-cream stall ? Use suitable quantitative techniques to come to a conclusion.

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4. What do you mean by tests ? Distinguish between one sample test and two sample test. 20
5. Distinguish between any *two* of the following : 10+10=20
- (a) Geometric Mean and Harmonic Mean
 - (b) Exact and Superlative Index Numbers
 - (c) Standard Deviation and Variance
6. Gupta Furniture manufactures two different types of China cabinets, a French provincial model and a Danish modern model. Each cabinet produced must go through three departments : carpentry, painting and finishing. The accompanying table contains all relevant information concerning production times per cabinet produced and production capacities for each operation per day, along with net revenue per unit produced. The firm has a contract with a Miami distributor to produce a minimum of 300 of each cabinet per week (or 60 cabinets per day). Owner Sushil Gupta would like to determine a product mix to maximize his daily revenue.

Cabinet style	Carpentry (hour per cabinet)	Painting (hour per cabinet)	Finishing (hour per cabinet)	Net Revenue per cabinet
French provincial	3	$1\frac{1}{2}$	$\frac{3}{4}$	₹ 28
Danish modern	2	1	$\frac{3}{4}$	₹ 25
Department capacity (hour)	360	200	125	

Formulate this as a linear programming problem and solve. 20

7. Briefly comment on any **two** of the following : 10+10=20

- (a) Why 120% cannot be the probability of some event ?
- (b) Measures of central tendency give us good information about the scores in our distribution.
- (c) Regression analysis includes many techniques for modelling and analysing several variables.

8. Write short notes on any **two** of the following : 10+10=20

- (a) Quartile Deviation
 - (b) Percentile Range
 - (c) Estimation
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