

INDIAN MARITIME UNIVERSITY  
(A CENTRAL UNIVERSITY, GOVT. OF INDIA)

SEMESTER- II, SCHOOL OF MARITIME MANAGEMENT- JUNE 2014 EXAMS

QUANTITATIVE TECHNIQUES FOR BUSINESS (T 1201)

(AY 2013-14 batch onwards)

Time:- 3 Hrs  
Date: 18.06.2014

Max Marks : 60

---

SECTION - A (12 X1 = 12 Marks)

*Answer all the Questions. All Questions carry equal marks*

1. For nominal data, the only measure of central tendency, that can be applied is  
a) Arithmetic mean    b) Harmonic mean    c) Median    d) Mode
2. Sampling error decreases with the  
a) Decrease in sample size    b) Increase in sample size  
c) Process of randomization    d) Process of analysis
3. Which of the following is not an Non-Parametric Test  
a) ANOVA    b) Kruskal Wallis    c) 'Chi-square' test    d) Run test
4. If in Linear Programming Problem, when All  $Z - C$  is non-negative then the problem  
a) has no feasible solution    b) has multiple optimal solutions  
c) is unbounded    d) has single optimal solution
5. Which of the following are likely to be dependent events?  
a) the weather and the number of books on your shelf  
b) the color of your car and its gas mileage  
c) the weight of your car and its gas mileage  
d) the size of your house and the size of your shoes
6. If a single card drawn at random from a standard pack, it cannot be a red card and a black card because these are  
a) Dependent    b) Not in the pack    c) Mutually exclusive.    d) Conditional.
7. Decision variables  
a) Tell how much or how many of something to produce, invest, purchase, hire, etc.  
b) Represent the values of the constraints.  
c) Measure the objective function    d) Must exist for each constraint.
8. Which of the following statements is NOT true?  
a) A feasible solution satisfies all constraints.  
b) An optimal solution satisfies all constraints.  
c) An infeasible solution violates all constraints.  
d) A feasible solution point does not have to lie on the boundary of the feasible region.

9. If 1 sample with replacement, which of the following may be true?  
 a) The numerator for the next event's probability changes.  
 b) The denominator for the next event's probability changed.  
 c) Both the numerator and denominator for the next event's probability change  
 d) None of the values used in calculating the next event's probability change.
10. Three unbiased coins are tossed. What is the probability of getting at most two heads?  
 a)  $\frac{3}{4}$                       b)  $\frac{1}{4}$                       c)  $\frac{3}{8}$                       d)  $\frac{1}{2}$
11. To find the optimal solution to a linear programming problem using the graphical method  
 a) Find the feasible point that is the farthest away from the origin.  
 b) Find the feasible point that is at the highest location.  
 c) Find the feasible point that is closest to the origin.  
 d) None of the alternatives is correct.
12. A constraint that does not affect the feasible region is a  
 a) Non-negativity constraint.                      b) Redundant constraint.  
 c) Standard constraint.                      d) Slack constraint.

**SECTION - B**

**(5 X4 = 20 Marks)**

Answer any FIVE questions not exceeding 200 words. All questions carry equal marks

13. Discuss the types of Data and their collection methods in detail?
14. A company produces two products A and B which earns Rs.100 and Rs.125 profit per unit. The company involves Raw Materials, Machine hours and Electricity power for manufacturing these two products. It requires two kgs of raw materials, five man hours and three units of electricity for one unit of product A. Company uses five kgs of raw materials, four man hours and seven units of electricity for one unit of product B. The availability of Raw materials is limited to 250 kgs, Machine hours to 400 hours and electricity is limited to 500 units. Formulate a linear Programming Problem.
15. What is a Probability? What are Mutually Exclusive and Not Mutually Exclusive Events in probability?
16. In a large consignment of electric bulbs 10% are defective. A random sample of 15 is taken for inspection. Find the probability that (i) All are good bulbs, (ii) At most there are 4 defective bulbs, (iii) Exactly there are four defective bulbs.
17. Solve the Following LPP by Graphical Method  
 Minimize the function  $x + 3y$   
 $2x + y \leq 20$   
 $x + 2y \leq 20$
18.  $Y = (\text{Log}x^3) / e^{8x}$  Find  $dy / dx$
19. The marginal cost is  $120 - 12x + 20x^2$ . Estimate the total cost and average cost when output is 20 units and 30 units.

SECTION - C

(4 X 7 = 28 Marks)

Answer question no.20 (compulsory) and any 3(three) from the rest:

20. The following table shows the number of hotels in certain region and four grades.

Grade	Region		
	Eastern	Central	Western
1 Star	29	22	29
2 Star	67	38	55
3 Star	53	32	35
4 Star	11	8	21

Apply Chi-Square Analysis to show that there is evidence of a significant association between region and grade of hotel in this country.

(Table Value = 12.59)

21. Discuss the application of Operations research in business decision making?
22. Apply Kruskal – Wallis Analysis and test the significant relationship between Investment hindrances and Influencing Factors

Influencing Factors	Investment hindrances		
	Limited Finance	Lower Risk Bearing Ability	Lack of Information
Economics Factors	29	18	23
Market Factors	43	37	34
Social Factors	27	23	27
Political Factors	34	24	19

( Hint : Tabulated Value = 6.234 )

23. Apply Mann-Whitney U Test to test the significant relationship between the sale of Company A and Company B

Company A	54	34	28	39	19	54	42	34	29	41
Company B	27	43	37	49	18	44	28	37	28	29

24. A manufacture of certain components knows that 4% of their products are defective. If they sell components in boxes of 100 and guarantee that not more that 3 components will be defective. What is the approximate probability that a box will fail to meet the guaranteed quality. ( $e^{-4} = 0.01832$ )
25. A man produces 25 defective articles in an batch of 500. After training, he produces 15 defectives in a batch of 400. Does his performance is improved? ( Hint- Table Value = 1.645)

\*\*\*\*\*