

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)

June 2017 End Semester Examinations  
Master of Business Administration – Second Semester  
International Transportation and Logistics Management/  
Port and Shipping Management (2015 batch onwards)

**Quantitative Technique for Business (PG22T 2201/PG21T 2201)**

Date : 08.06.2017

Maximum Marks : 60

Time: 3 Hrs

Pass Marks : 30

---

**Section – A**

Answer all the Questions (12x1 mark=12 marks)

Choose the Correct Answer

1. In a series consists of four numbers 3, 4, 0, 12, the geometric means is
  - a. 12
  - b. 0
  - c. 24
  - d. 144
2. The square of standard deviation is known as
  - a. Skewness
  - b. Correlation
  - c. Variance
  - d. Kurtosis
3. The probability of the interaction of two mutually exclusive events is always
  - a. Infinite
  - b. 0
  - c. 1
  - d. None of the above
4. If two regression coefficients, namely  $b_{yx}$  and  $b_{xy}$  are 0.8 and 0.6 respectively, then the correlation coefficient would be
  - a.  $\sqrt{0.48}$
  - b. 0.48
  - c. 1.4
  - d. 0.2
5. A normal distribution is a
  - a. Unimodel
  - b. Bimodel
  - c. Trimodel
  - d. Multimodel

6. Statistical observation arranged in Chronological order is
  - a. Index Number
  - b. Time Series data
  - c. Harmonic Mean
  - d. Regression Analysis
7. The coefficient of correlation varies between
  - a. 0 and 1
  - b. 0 and infinity
  - c. No limit
  - d. +1 and -1
8. If A and B are independent, then  $P(A \cap B)$  is
  - a.  $1 - P(A)$
  - b.  $P(A) \times P(B)$
  - c.  $P(A/B)$
  - d.  $P(B/A)$
9. For a two tailed test of hypothesis at  $\alpha = 0.10$ , the acceptance region is entire region
  - a. Right of the critical value
  - b. Left of the critical value
  - c. Between the two critical values
  - d. None of the above
10. In a Chi-square test of goodness of fit, if the calculated value is less than the table value, then the null hypothesis is
  - a. Rejected
  - b. Modified
  - c. Rechecked
  - d. Accepted
11. What is Type I error
  - a. When the null hypothesis which is false, has been accepted
  - b. When the null hypothesis which is true, has been rejected
  - c. When the alternative hypothesis which is true, has been rejected
  - d. When the alternative hypothesis which is false, has been accepted
12. Selection of Z-test or t-tests mainly depends on
  - a. Standard error
  - b. Level of significance
  - c. Size of the sample
  - d. Degree of freedom

## Section B

Answer any 5 out of 7 questions

(5X4 Marks = 20 Marks)

Each answer should not exceed 200 words

13. Find the dual of the LPP

$$\text{Min: } Z = 2x_1 + 2x_2$$

$$\text{S.t. } 2x_1 + 4x_2 \geq 1$$

$$x_1 + 2x_2 \geq 1$$

$$2x_1 + x_2 \geq 1$$

$$x_1, x_2 \geq 0$$

14. Explain different sampling methods

15. Obtain the coefficient of variation from the data given below

Score :            0-10   10-20   20-30   30-40   40-50   50-60   60-70

No. of students   10     15     25     35     45     55     65

16. Obtain the rank correlation coefficient for the following data

X : 68    64    75    50    64    80    75    40    55    64

Y : 62    58    68    45    81    60    68    48    50    70

17. A problem in Quantitative method is given to three students A, B and C where chances of solving it are  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ . What is the probability that problem is solved

18. Discuss different methods of measuring trend

19. In a test given to two groups of students the marks obtained were as follows

Group I    18    20    36    50    49    36    34    49    51

Group II   29    26    28    35    30    44    46

Assuming that the group standard deviation are the same and that the marks normally distributed, test the hypothesis that the group means are equal (Table value of t for 14 Df at 0.5 level of significance = 2.145)



### Section C

Question No.20 is compulsory (4X7 Marks = 28 Marks)

Answer any 3 out of 5

Answer should not exceed 500 words

20. Perform a two – way ANOVA on the data given below

Workers	Machine type			
	A	B	C	D
1	44	38	47	36
2	46	40	52	43
3	34	36	44	32
4	43	38	46	33
5	38	42	49	39

- a. Test whether the mean productivity is the same for different Machine types
  - b. Test whether the five men differ with respect to mean productivity
21. Eight coins were tossed 256 times and the following results we obtained
- |                |   |   |    |    |    |    |    |    |   |
|----------------|---|---|----|----|----|----|----|----|---|
| No. of heads : | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8 |
| Frequency :    | 2 | 6 | 30 | 52 | 67 | 56 | 32 | 10 | 1 |
- Are the coins biased (Apply Chi-square test)

22. Solve the LPP

$$\begin{aligned} \text{Max : } Z &= 30x_1 + 40x_2 + 20x_3 \\ \text{St.} & 10x_1 + 12x_2 + 7x_3 \leq 10000 \\ \text{and} & 7x_1 + 10x_2 + 8x_3 \leq 8000 \\ & x_1 + x_2 + x_3 \leq 1000 \\ & x_1, x_2, x_3 \geq 0 \end{aligned}$$

23. Calculate weighted index number by Lapseyer's method (2) Paasche's Method (3) Bowley – Dorbish Method (4) Fisher's Method and (5) Marshall Edgeworth Method from the data given below

Commodity	Price		Quantity	
	Base year	Current year	Base year	Current year
A	4	7	10	8
B	5	9	8	6
C	6	8	15	12
D	2	2	5	6

24. The height of fathers and sons are given is the following data. Find the two regressions and calculate the expected average height of the sons, when the height of the fathers is 65.7
- |                            |    |    |    |    |    |    |    |    |
|----------------------------|----|----|----|----|----|----|----|----|
| Height of Father in inches | 65 | 66 | 67 | 67 | 68 | 69 | 71 | 73 |
| Height of sons in inches   | 67 | 68 | 64 | 68 | 72 | 70 | 69 | 70 |

25. Discuss the application of operation research in business.

\*\*\*\*\*