Indian Maritime University

(A Central University, Govt. of India)
MBA-International Transportation and Logistics Management/
Port and Shipping Management
PG22T2201/PG21T2201 (Semester II)
Quantitative Techniques for Business
May/June 2018 End Semester Examinations

Time: 3 Hours | Max Marks:60
Date: 28.05.2018 | Pass Marks:30

SECTION A **12 X 1=12 Marks**

Answer all the questions
All the questions carry equal marks

1. The relation between A.M, G.M and H.M are

   a. AM≥ GM≥ HM b. A.M ≥ GM ≤HM

   c. AM≤GM≤ HM d. None of the above

2. What is the probability that a leap year selected at random will contain 53 Sundays?

   a. $^{53}/_{366}$ b. $^{53}/_{365}$ c. $^{1}/_{12}$ d $^{2}/_{7}$

3. The variable x is binomial (n.p), the mean of x is given by

   a. $^{n}/_{p}$ b. np c. $^{p}/_{n}$ d. npq

4. Number of components in a time series are

   a. 8 b. 6 c 4 d. 2

5. Among the following which error is considerd more dangerous under hypothesis?

   a. Type I b. Type II c. Type III d. Type IV

6. In a standard normal distribution, the value of mean is

   a. 1 b. -1 c. 0 d. 2

7. If the sample is small and population SD is not known, the test applied is

   a. t b. Z c. χ^2 d. f

8. Under the linear programming the function to be maximized or minimized is called

   a. Objective function b. Feasible function

   c. Infeasible function d. Critical function

9. Decision variables in LPP

a. Tells how much or how many of something to produce, invest, purchase, hire etc.

b. Represent the values of the constraints

c. Measure of the objective function d. Measure of the constraints

10. The object of queuing theory is to achieve an economic balance between

a. waiting cost and departure costs b. coming costs and going costs

c. arrival costs and departure costs d. waiting costs and service costs

11. What is a critical path in Network analysis

a. A path that which is shortest on the basis of final duration

b. A path that which is longest on the basis of final duration

c. A path that which is easy to measure

d. A path that which is difficult to measure

12. In simulation model the answer to the problem is

a. optimal solution b. near optimal solution

c. feasible solution d. non feasible solution

SECTION B **5 X 4 = 20 Marks**

Answer any 5 out of 7 questions
Each answer should not exceed 200 words

13. Calculate the coefficient of variation from the following

Length of life of bulbs (in hrs.)	Nos. Tested
1700 and under 1900	10
1900 and under 2100	16
2100 and under 2300	20
2300 and under 2500	8
2500 and under 2700	6

14. The average daily sale of 500 branch offices was Rs. 150 thousand and standard deviation is Rs. 15 thousand. Assuming the distribution to be normal, find how many branches have sales between (1) Rs. 1,20,000 and Rs. 1,45,000 (ii) Rs. 1,40,000 and Rs. 1,65,000

15. The ranks of 11 students in two sets are given below. Calculate the coefficient of correlation by the method of rank differences

Test I :	80	45	55	58	55	60	45	68	70	45	85
Test II :	82	56	50	43	56	62	64	65	70	64	90

16. The contingency table below summarises the results obtained in a study conducted by a research organization with respect to the performance of four competing brands of tooth paste among the uses

	Brand A	Brand B	Brand C	Brand D
No of cavities	9	13	17	11
One to five cavities	63	70	85	82
More than five cavities	28	37	48	37

Test the hypothesis that incidence of cavities is independent of the brand of the tooth paste used

17. Discuss the meaning, definition, nature and uses of operations research

18. Solve the LPP graphically

Maximize $Z = 3x_1 + 5x_2$

Subject to $x_1+2x_2 \leq 2000$

$x_1+ x_2 \leq 1500$

$x_2 \leq 600$

$x_1 \geq 0, x_2 \geq 0$

19. Explain the characteristics of a queuing system

In a railway marshaling yard, goods train arrive at a rate of 30 trains per day. Assuming that service time distribution is exponential with an average of 36 minutes. Calculate (a) average length of non empty queue (b) The probability that the queue size exceeds 10

SECTION C **4 X 7 = 28 Marks**

Question No. 20 is compulsory
Answer any 3 out of 5 remaining questions
Each answer should not exceed 500 Words

20. The following table gives the number of units of production per day turned out by four different types of machines

Type of machines

Employees	M1	M2	M3	M4
E1	40	36	45	30
E2	38	42	50	41
E3	36	30	48	35
E4	46	47	52	44

Using analysis of variance (i) test the hypothesis that the mean production is the same for the four machines, and (ii) test the hypothesis that the employees do not differ with respect to mean productivity

21. Discuss the statistical hypothesis and different tests used in testing the hypothesis
22. Use simplex method to solve the following LP Problem

Max. $Z = 4x_1+5x_2+8x_3$

Subject to $x_1+ x_2+ x_3 \leq 100$

$3x_1+2x_2+4x_3 \leq 500$

$x_1, x_2, x_3 \geq 0$

23. Discuss the different methods of sampling
24. Determine (i) T_E and T_L is respect of all node points (ii) EST, LST, EFT, LFT values of all activities and (iii) identify the critical path from the following details

Activity : 1-2 1-3 1-4 2-5 4-6 3-7 5-7 6-7 5-8 6-9 7-10 8-10 9-10

Duration: 10 8 9 8 7 16 7 7 6 5 12 13 15

25. Calculate the two regression equations from the following data

X : 10 12 13 12 16 15
Y : 40 38 43 45 37 43
Also estimate Y when X= 20