

Indian Maritime University
Question Paper (PG)
60 Marks
Pass Marks – 30
Date – 20.06.2022
Duration – 03 Hours
June 2022 End Semester Examinations
PG22T2201/PG21T2201
Quantitative Techniques for Business

Part A – 10 MCQs (10 X 01 Mark)

- (i) The square of the standard deviation is known as
- a) Correlation
 - b) Skewness
 - c) Variance
 - d) Kurtosis
- (ii) Mode of the observations is 2,5,8,4,3,4,4,5,2,4,4 is
- a) 3
 - b) 2
 - c) 5
 - d) 4
- (iii) Statistical methods are
- a) Collection of Data
 - b) Classification
 - c) Analysis & Interpretation of Data
 - d) All of these
- (iv) Rank Correlation Coefficient was discovered by:
- a) Bowley
 - b) Spearman
 - c) Karl Pearson
 - d) Fishers
- (v) If A and B are independent, then $P(A/B)$ is:
- a) $P(A)$
 - b) $P(B)$
 - c) $P(A) \times P(B)$
 - d) $P(A) + P(B)$
- (vi) Selection of t Test or Z Test depends on:
- a) Standard Error
 - b) Level of Significance

- c) Size of the Sample
- d) Degree of Freedom

(vii) Under Linear Programming, the function to be maximised or minimised is called:

- a) Objective function
- b) Feasible
- c) Infeasible
- d) Critical Function

(viii) Null Hypothesis is indicated by:

- a) H_0
- b) H_1
- c) H_2
- d) None of these.

(ix) A Critical path in Network Analysis is:

- a) A Path which is shortest on the basis of Final duration.
- b) A Path which is longest on the basis of Final duration.
- c) A Path which is easy to measure.
- d) A Path which is difficult to measure.

(x) Joining the other queue and leaving the first one

- a) Jokeying
- b) Reneging
- c) Balking
- d) Conclusion

Part B – 5 Short Questions (05 X 02 Marks)

(i) Discuss the types of models of Operation Research.

(ii) Distinguish between PERT and CPM.

(iii) Given Coefficient of Skewness = -0.23, Mean = 47.2, and S.D. = 12. Find mode and median of the distribution.

(iv) Calculate Karl Pearson's correlation coefficient between x and y from the following data:

$$n=10, \sum x = 35, \sum x^2 = 203, \sum y = 28, \sum y^2 = 140, \sum xy = 168.$$

(v) A candidate obtained the following percentage of marks. English:60, Hindi:75, Mathematics:63, Physics:60, Chemistry:55. Find the weighted mean if the weights are 1,1,2,3,3 respectively allotted to subjects.

Part C – 7 Long Questions-Answer Any 5 (05 X 08 Marks)

(i) Calculate standard deviation of the following two series and state which one is more variable.

(No. of Students)

Marks	Section-A	Section-B
20-30	5	7
30-40	10	15
40-50	25	30
50-60	5	15
60-70	5	8

(ii) Below are given the figures of production (in thousand tons) of a sugar factory.

Year:	2002	2003	2004	2005	2006	2007	2008
Production:	77	88	94	85	91	98	90

(a) Fit straight line by the method of least squares and find the trend values.

(b) What is the monthly increase in production?

(c) Eliminate the trend.

(iii) Solve by simplex method the following L.P. Problem.

$$\begin{aligned} \text{Min :} \quad & Z = x_1 - 3x_2 + 2x_3 \\ \text{S.t.} \quad & 3x_1 - x_2 + 3x_3 \leq 7 \\ & -2x_1 + 4x_2 \leq 12 \\ & -4x_1 + 3x_2 + 8x_3 \leq 10 \\ & x_1, x_2, x_3 \geq 0 \end{aligned}$$

(iv) A project schedule has the following characteristics.

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

- (a) Construct network diagram.
- (b) Compute T_E and T_L for each event.
- (c) Find EST, LST, EFT and LFT values of all activities.
- (d) Find critical path and project duration.

(v) From the following data of the age of Husband and the age of wife, form the two regression equations and calculate the Husband's age when the wife's age is 16.

Husband's age : 36 23 27 28 28 29 30 31 33 35
 Wife's age : 29 18 20 22 27 21 29 27 29 28

Also find the age of wife when husband's age is 40.

(vi) Below are given the yield (in kg) per acre for 5 trial plots of 4 varieties of treatment.

Varieties of Treatment

<i>Plot No.</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
1	9	13	19	14
2	11	12	13	10
3	13	10	17	13
4	9	15	7	17
5	8	5	9	16

Carry out an analysis of variance and state your conclusions.

(vii) Given the following data relating to social status and state of intelligence. Test whether intelligence is related to social status.

	<i>Dull</i>	<i>Average Intelligence</i>	<i>Brilliant</i>	<i>Total</i>
<i>Lower Middle</i>	22	35	23	80
<i>Middle</i>	38	70	32	140
<i>Upper Middle</i>	60	20	20	100
<i>Total</i>	120	125	75	320

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