

MASTER OF LIBRARY AND INFORMATION SCIENCE EXAMINATION' 2022

(1ST Year 1ST Semester)

Quantitative Techniques

Course: ML – 05

Time: Two Hours

Full Marks: 50

Answer all questions .

- 1A. a) Show with a diagram the different types of correlation. 3
- b) Mention the range of values for correlation co-efficient. 1.5
- c) If two variables are independent then the value of correlation co-efficient becomes zero but the converse is not always true—justify the statement with an example. 3.5
- d) Illustrate with an example the modified formula for Spearman's Rank Correlation co-efficient where tie occurs 3
- e) The following data were collected in the course of an investigation among college and university of 200 teachers::

Field	Arts and Social science	Science, Engineering, Medicine, etc.	Total
Attitude to society			
Passive	109	51	160
Responsive	23	17	40
Total	132	68	200

Analyze the data to see if field of interest and attitude to society are associated (Given: X^2 table values at 5% and 1% significance levels for 1 degree of freedom are 3.841 and 6.635).

OR

1B. a) What is meant by Sampling? Why is it advantageous over complete enumeration?

Illustrate with examples Systematic and Stratified random sampling. 2+3+8

b) Find whether a random sample of 10 abstracts having a mean length of 69.3 words and a standard deviation of 21 is significantly different from that of population of abstracts having mean length of 79.56 words (t for 9 degrees of freedom at 5% and 1% significance levels are 2.26 and 3.25 respectively). 7

2A. a) Define 'Seasonal fluctuations'. 3

b) How does it differ from 'Cyclical fluctuations'? 3

c) De-seasonalise the following time series data: 14

Years/Quarters	I	II	III	IV
2018	65	58	56	61
2019	68	63	63	67
2020	70	59	56	52
2021	60	55	51	58

OR

2B. a) In an issue counter a library records the following arrival times of the users within one hour with the corresponding service times after opening the counter at 10.30 AM (Assume single channel – single phase model for calculation) :

Users arrival at (AM)	Service time	Users departure at (AM)	User's waiting time	Librarian's waiting time	Queue length
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	(min.)		(min.)	(min.)	
10-37	3				
10-41	2				
10-42	4				
10-45	5				
10-49	3				
10-53	4				
10-58	3				
11-03	2				
11-07	4				
11-10	3				
11-15	5				
11-17	4				
11-20	3				
11-23	2				

Fill up all the relevant gaps in the table. Calculate a) the average waiting time of the users and b) the average queue length

7+2

b) Mention the steps to be followed in performing work measurement.

3

c) A work measurement was carried out in a library for 10 hours and the following information

were generated:

No. of main entry cards prepared = 50

Idle time = 15% of total observed time

Performance rating = 120%

Relaxation allowance = 9% of basic time

Contingency work allowance = 3% of basic time

Contingency delay allowance = 2% of basic time

What is the standard time for preparing each main entry card?

8

3. Write short notes on **any two** of the following:

5X2

- a) Network analysis
- b) Work study: meaning and its importance
- c) Skewness and its measure
- d) Standard error of mean