



## **School of Communication**

Media and Film Studies Department (MFS)

January 2024 Trimester

COM 302P (X): Statistics for Communication Research

FINAL EXAM {Total marks =70}

### **Instructions:**

1. The exam will be done online.
2. Answer all the Questions.
3. All numerical Answers should be given to TWO DECIMAL PLACES.

**SECTION A( 20marks)**

1. In a table that has 3 rows and 3 columns in the chi-square test ( $\chi^2$ ), the degrees of freedom are:

- a) 8 b) 4 c) 1 d) 6 (1marks)

2. When population under investigation is infinite, we should use:

- a. sample method  
b. Census Method  
c. Either sample or Census Method  
d Neither sample nor Survey

(1marks)

3. The positional measure of central tendency is:

- a. Geometric mean  
b. Median  
c. Harmonic Mean  
d. Arithmetic mean  
e None of these

(1 marks)

4. What is a z score?

(2 Marks)

- a. It is the number of standard deviations a particular score lies above or below the mean of the set of scores.  
b. It is a measure of central tendency in the data.  
c. It is a standardized measure of the mean of a set of  
d. It is the average frequency of scores in a sample

5. The mean age of 15 boys in a class is 19 years. On a day when one of the boys was absent there ages were recorded as follows:

20, 22, 16, 18, 17, 21, 18, 20, 17, 18, 19, 20 19, 21

Find the age of the absent boy. a) 19 b) 20 c) 18, d) 21 (2 marks)

6. While drawing a scatter diagram, if all the points appear to form a straight line, going downward from left to right, then it is inferred that there is: (1 marks)

- a. Perfect Positive Correlation  
b. Simple positive correlation  
c. Perfect Negative correlation

d. No correlation

7. In calculation of Chi-Square, when observed and expected frequencies completely coincide,  $X^2$  will be:

a) +1 b) -1 c) Greater than one d) Zero e) Less than 1 (1 marks)

8. The mid-point of a class is obtained by: (1marks)

a) By adding upper and lower limit

b) By deducting upper limit from lower limit.

c) By dividing the difference of upper and lower limit by 2

d) By adding upper and lower limit and dividing it by 2

9. While forming a grouped frequency distribution, a suitable number of classes should be:

(1marks)

a) Less than 5

b) More than 20

c) Between 4 and 10

d) Between 3 and 25

e) Between 5 and 15

10. The positional measure of central tendency is: (1 marks)

a) Geometric mean

b) Median

c) Arithmetic mean

d) Harmonic mean.

11. The measure of variation that is least affected by extreme observations is: (1 marks)

a) Range

b) Mean absolute deviation

c) Standard Deviation

d) Quartile Deviation

12. A numerical value used as a summary measure for a sample, such as sample mean, is known as: (21marks)

a). Population parameter

b). Sample parameter

c). Sample statistic

d). Population mean

13. Scatter gram is used to reveal which of the following (1marks)

a). The direction of a relationship.

b). The strength of a relationship.

c). The form of a relationship.

d). All of these

14. What does a correlation coefficient of 1 indicates (1 mark)

a). The absence of any correlation.

b). A perfect correlation.

c). A relatively small degree of correlation.

d). A relatively high degree of correlation.

15. What is the arithmetic average of the absolute deviation of a series called?

a) Coefficient of mean deviation

b) Mean absolute Deviation

c) quartile Deviation

d) Standard deviation

16. In statistics of dispersion, the measure of dispersion can never be

a) Positive

b) Zero

c) Negative

17. What is the most important assumption that is relaxed when considering Rank correlation?

a) Linear relationship

b) normal distribution

c) observation pairs are independent

d) Sample is randomly selected

18. Which of these is simply the difference between the maximum and minimum values given in a data set?

a) Range

b) Mean deviation

c) standard deviation

d) All the above.

### SECTION B (30 marks)

19. The prices of shares at the NSE were recorded as follows on a given week

Day	Mon	Tue	Wed	Thurs	Fri
Price	221	216	205	218	220

Calculate the coefficient of range of the data.

(4mks)

20. The following data shows how many weeks' six people worked at a vehicle inspection unit and how many cars each one inspected between 1200 and 1400 hours on a given day.

No of weeks employed    2        7        9        1        5        12

No of cars inspected        13        21        23        14        15        21

Regress the number of cars inspected on the number of weeks of employment and obtain the value of a in the equation  $y = a x + b$  (4marks)

21. The Table below gives the ages of children in a primary school.

Marks	3-5	6-8	9-11	12-14	15-17
Frequency	10	6	12	16	1

Calculate the:

Mean (3marks)

Mode (3 marks)

Median (3marks)

22.

Class	2-4	5-7	8-10	11-13	14-16	17-19
Frequency	3	5	7	4	2	1

Determine

the standard deviation

(4mks)

23. The table below shows height of tree seedlings in cm.

Height	50-52	53-55	56-58	59-61	62-64	65-67
Frequency	2	7	24	27	13	1

Calculate the Lower quartile ( $Q_1$ )

(4marks)

24. From the data above, use Pearson method to calculate the correlation coefficient.

X	7	10	6	5	4
Y	5	7	9	8	6

(5marks)

**SECTION C (20 marks)**

Choose any Three

Questions

25.a) The mean weight of 500 male students in a certain college is 151 kg and the standard deviation is 15kg. Assuming the weights are normally distributed, find how many students weigh between 120 kg and 155kg. (Give your answer to the nearest whole number) (5marks)

b) The table below shows height of tree seedlings in cm.

Height	50-52	53-55	56-58	59-61	62-64	65-67
Frequency	2	7	24	27	13	3

Calculate the quartile deviation  
(5mks)

26.a) From the data given below, about the treatment of 250 patients suffering from a disease, Use chi-square to test whether there is any significant difference between the two treatment methods. What is the calculated value of Chi- square ( $\chi^2$ )? (8marks)

Treatment	Favorable	Not favorable	Total
New	140	30	170
Conventional	60	20	80
Total	200	50	250

28b). The following sets of marks were obtained by 7 different students in two different exams in an end of semester examinations.

84	A	46	86	54	52	40	54
54	B	60	42	60	42	64	46

Calculate the spearman rank correlation ( $r_s$ ) for the two sets of marks. (8marks)

27a)

class	20-24	25-29	30-34	35-39	40-44	45-49
Frequency	3	4	3	2	5	1

Calculate the mean, standard deviation and coefficient of Variation (7 marks)

b)

class	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Frequency	5	12	13	20	16	16	14	4	4

Calculate the Mean and the mode. Compare the values and explain if the data is symmetrical or asymmetrical (7 marks)

### STATISTICAL EXPRESSIONS

$$R_s = 1 - \frac{6 \sum D^2}{N(N^2-1)}$$

$$\text{Median} = L + \left( \frac{\frac{N}{2} - Cfp}{F} \right) I$$

$$a = \frac{n \sum XY - \sum X \sum Y}{n \sum X^2 - (\sum X)^2},$$

$$a = \bar{y} - b\bar{x}$$

$$\text{Mode} = L + \left( \frac{\Delta_1}{\Delta_1 + \Delta_2} \right) i$$

$$\bar{X} = A + \frac{\sum fd}{\sum f}$$

$$\text{C.O.V} = \frac{6}{\bar{x}} \times 100$$

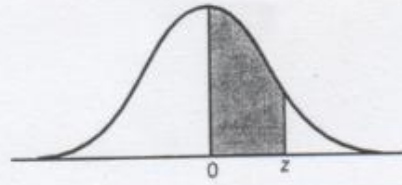
$$Z = \frac{xi - \bar{X}}{S_{dx}}$$

$$S D = \sqrt{\frac{\sum Fx^2}{\sum F} - \left( \frac{FX}{\sum F} \right)^2} \quad 5. X^2 = \frac{(O-E)^2}{E}$$

$$b = \bar{y} - a\bar{x}$$



VII. AREA UNDER STANDARD NORMAL CURVE



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990