IIHMR DELHI | INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH

Post Graduate Diploma in Management (Hospital & Health Management)
PGDM – 2022-24 Batch
Term – I : Term End Examination

Course & Code	:	**CC-604, Essentials of Biostatistics**	**Reg. No.**	:	
Term & Batch	:	**I, 2022-24**	**Date**	:	**Nov 28, 2022**
Duration	:	**3 Hrs**	**Max. Marks**	:	**70**

Instructions:

- Budget your time as per the marks given for each question and write your answer accordingly.
- Don't write anything on the Question Paper except writing your Registration No.
- Mobile Phones are not allowed even for computations.

Part A [All questions are compulsory]: Q. 1 to Q.10 (10 questions*1 marks = 10 marks).

1. If x1 and x2 is largest and smallest value in a set of observations, the range can be given as

A. $x_L - x_S$
B. $\frac{1}{2}[x_L - x_S]$
C. $x_L - \frac{1}{2}x_S]$
D. $\frac{1}{2}x_L - x_S$

2. An event that cannot occur has a probability of x_1, and an event that is certain to occur has a probability of x_2, therefore $x_1\ and\ x_2$ is

A. 1, 0
B. $\frac{1}{2}$, 0
C. 0, 1
D. 0, $\frac{1}{2}$

3. The Bionomial probability distribution was given by

A. Francis Galton (1822-1911)
B. Abraham de Moivre (1667-1754)
C. Thomas Bayes (1701-1761)
D. James Bernoulli (1654-1705)

4. The value of ${}^4p_2$ is

A. 12
B. 16
C. 10
D. 20

5. Variance is the expectation of the squared deviation of a random variable from its _____
A. Mean
B. Median
C. Mode
D. Quartile Deviation

6. What is MANOVA
E. Multiple Analysis of Variable
F. Mono Analytics of Variation
G. Multivariate Analysis of Variance
H. None of the above

7. Which level of measurement has absolute zero point
A. Nominal Measurement
B. Ordinal Measurement
C. Interval Measurement
D. Ratio Measurement

8. What is the COMMAND for tabulation in STATA
A. tabulate
B. chi2
C. corr
D. pwcorr

9. What is the COMMAND for joining to strings in EXCEL
A. join
B. add
C. sum
D. concatenate

10. The modal class in overlapping grouped observation is
A. a class corresponding to arbitrary value
B. a class just preceding the highest frequency
C. a class corresponding to highest frequency
D. a class just succeeding the lowest frequency

Part B [Attempt any four]: Short Notes: Q.11 to Q.15 (4 questions *5 Marks =20 Marks)

11. What are errors in a hypothesis testing? Explain power of test.
12. What is dispersion? Write the name of measures of dispersion with formula?
13. Define Relative Risk Ratio. Write the general formula of Relative risk ratio.
14. What is measurement scale? Write the characteristic of types of measurement scale.
OR What is period and cohort studies?
15. What is variance? Discuss its suitability in understanding the population distribution
OR What is correlation? Define Spearman Rank Correlation with formula for tied rank.

Part C [Attempt any four]: Long Question: Q.16 to Q.20 (4 questions *10 Marks =40 Marks)

16. A group of 200 students [Female and Male] appeared for an exam. The marks above 60 was categorized as high marks and otherwise. The below contingency table show the numbers of students by their sex and scoring high marks in the exam. Compute and interpret the result of odds ratio by sex and total.

	Highmarks		
Sex	Below 60%	Above 60%	Total
Male	73	18	91
Female	74	35	109
Total	147	53	200

17. What is mean and median. Discuss merit and limitation of mean and median.

OR

The below table show the number of females *(f)* of reproductive life span by their age-category. Compute Standard Deviation and Standard Error. Interpret the result of Standard Deviation and Error.

Age-groups	*f*
15-20	137
20-25	130
25-30	153
30-35	160
35-40	161
40-45	153
45-50	139

18. What is hypothesis? Explain the step involved in testing a hypothesis.

OR

An investigator wants to estimate the proportion of new men at his company who currently smoke cigarettes (i e the prevalence of smoking). How many new men should be involved in the study to ensure that a 95% confidence interval estimate of the proportion of new men who smoke is within 5% of the true proportion?

19. What is regression. Explain Simple linear regression and Logistic regression.

OR

What is Correlation? The below table show the gestational age [in weeks] and birth weight [in grams] of pregnancy outcome of women under a study. Compute Pearson's Correlation Coefficient between Gestational Age and Birth Weight. Interpret the result.

Infant ID	Gestational Age (weeks)	Birth Weight (grams)
1	34.7	1895
2	36.0	2030
3	29.3	1440
4	40.1	2835
5	35.7	3090
6	42.4	3827
7	40.3	3260
8	37.3	2690
9	40.9	3285
10	38.3	2920
11	38.5	3430
12	41.4	3657
13	39.7	3685
14	39.7	3345
15	41.1	3260
16	38.0	2680
17	38.7	2005

20. What is ANOVA? Explain the statistics associated with ANOVA, its assumption and formula.

OR

A clinical trial is run to compare weight loss programs and participants are randomly assigned to one of the comparison programs and are counselled on the details of the assigned programme. Participants follow the assigned program for 8 weeks. The outcome of interest is weight loss, defined as the difference in weight measured at the start of the study (baseline) and weight measured at the end of the study (8 weeks), measured in pounds. After 8 weeks, each patient's weight is again measured and the difference in weights is computed by subtracting the 8-week weight from the baseline weight. Positive differences indicate weight losses and negative differences indicate weight gains. Is there a statistically significant difference in the mean weight loss among the four diets?

Low Calorie	Low Fat	Low Carbohydrate	Control
8	2	3	2
9	4	5	2
6	3	4	-1
7	5	2	0
3	1	3	3

Given: The critical value is 3.24 at 95%CI if Numerator degrees of freedom = 3 & Denominator degrees of freedom = 16