

Programme: B. Pharm

Course: Biostatistics and Research Methodology

Course Code: BP801T

Enrolment no. _____

Full Marks: 75

Time: 3 Hrs.

Q.No	Questions	CO	Bloom Taxonomy Category	Marks
Section I				
1	Objective Type Questions			
	<p>i. Which of the following is NOT a measure of dispersion? a. Range b. Standard deviation c. Mode d. Variance</p> <p>ii. The sum of probabilities of all possible outcomes in a sample space is: a. 0 b. 1 c. Less than 1 d. 100</p> <p>iii. If the mean and variance of a distribution are equal, it is a: a. Normal distribution b. Poisson distribution c. Binomial distribution d. Uniform distribution</p> <p>iv. A hypothesis test that tests for a change in either direction is called: a. One-tailed test b. Two-tailed test c. ANOVA d. Regression</p> <p>v. The null hypothesis (H_0) generally states that: a. There is a significant difference b. No difference or effect exists c. Results are biased d. Sample size is large</p> <p>vi. Which of the following is an example of primary data? a. Data from a textbook b. Data from a published article c. Data collected from a survey d. Data from government reports</p> <p>vii. Which scale of measurement includes order but not the exact difference? a. Nominal b. Ordinal c. Interval d. Ratio</p> <p>viii. Which is a graphical representation of cumulative frequency? a. Histogram b. Bar graph c. Pie chart d. Ogive</p> <p>ix. Which is the regression line equation? a. $y = a + bx$ b. $x = a + by$ c. $a = bx + y$ d. $y = ab + x$</p> <p>x. If $r = 0.85$, it indicates: a. No correlation b. Weak positive correlation c. Strong positive correlation d. Perfect negative correlation</p> <p>xi. Which of the following is a parametric test? a. Chi-square test b. Mann-Whitney U test c. Kruskal-Wallis test d. Student's t-test</p> <p>xii. Which of the following distributions is used for modeling rare events? a. Normal b. Binomial c. Poisson d. Uniform</p> <p>xiii. If the points in a scatter plot form a straight line sloping downward, the correlation is: a. Positive b. Negative c. Zero d. Curved</p> <p>xiv. In regression, the dependent variable is usually plotted on: a. X-axis b. Y-axis c. Diagonal d. None</p> <p>xv. Which test would you use to find a relationship between height and weight? a. t-test b. ANOVA c. Chi-square test d. Correlation</p> <p>xvi. The probability of an impossible event is: a. 1 b. 0 c. 0.5 d. 100</p> <p>xvii. Chi-square test is best suited for: (a) Continuous data b. Ratio data c. Categorical data d. Interval data</p> <p>xviii. A large p-value (> 0.05) indicates a. Statistically significant result b. Reject H_0 c. Fail to reject H_0 d. Always incorrect result</p> <p>xix. Which of the following is a discrete probability distribution? a. Poisson distribution b. Normal distribution c. Exponential distribution d. Gaussian distribution</p> <p>xx. The probability of an impossible event is: a. 0 b. 1 c. 0.5 d. Infinite</p>	CO1	Remember	1 x 20 = 20
Section II				
2. Short Answer type questions. Answer any seven.				
a	Explain why the formula for the median might differ for an odd versus an even number of observations	CO1	Understand	

b	In a experiment on 250 bulbs, it was found that the life of a particular make was normally distributed with an average life of 258 hours and S.D. of 8 hours. Obtain the numbers of bulb likely to burn for more than 270 hours.	CO2	Understand	7 x 5 = 35
c	Design and describe a basic research plan using the descriptive research method.	CO3	Apply	
d	Explain the 2 ^a factorial design with suitable examples	CO5	Remember	
e	Write mathematical operation with excel formulation.	CO4	Apply	
f	How will you use response surface methodology in optimization of product designs and processes? or	CO5	Understand	
	Describe the purpose of using Central Composite and Box-Behnken Designs in experimental design.	CO5	Understand	
g	How will you calculate standard error of regression? Explain its applications. or	CO2	Understand	
	In a single throw of two dice, find the probability of obtaining 'a total of 8'.	CO2	Understand	
Section III				
Long Answer Type questions				
3	Discuss the criteria used by software to choose design points, and the types of research scenarios where D-optimal designs are superior to classical ones. or	CO5	Evaluate	2 x 10 = 20
	Explain how RSM is used to optimize processes, including the role of central composite designs and surface plots.	CO5	Analyze	
4	Sample of 100 cases, the mean of a citation test is 8 and S.D. is 4. If, the distribution is normal, then find. . a) How many student score between 10 and 20? b) How many student score above 15? c) How many student score below 7? d) How many student score 17? or	CO2	Evaluate	
	Evaluate the usefulness of a high standard error of estimate in regression analysis for making precise predictions.	CO2	Evaluate	

Course Outcomes (CO):

CO1: Know the operation of M.S. Excel, SPSS, R and MINITAB ® , DoE (Design of Experiment)

CO2: Know the various statistical techniques to solve statistical problems

CO3: Appreciate statistical techniques in solving the problems.

CO4: Introduction to Practical components of Industrial and Clinical Trials Problems

CO5: Design and Analysis of experiments