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Course Name: MSc Toxicology, Semester-I End term Examination (2023)

Paper Name: **Fundamental of Biostatistics**
Time: **1.5 h**

Paper Code: **MTX DCE 101**
Maximum Marks: **30**

Note: This paper has 3 section A, B and C, Attempt all the three sections. Section A: Answer all the questions; Section B: Answer any 4 and Section C attempt any two questions

Abbreviations Used

CO-Course Outcome, PO-program Outcome, BTL-Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level-3 Apply; BT level 4 Analyze; BT level 5- evaluate, BT level 6 Create

SECTION A

Very Short Type Questions (Marks 1X10)

Q. No.	Question	BTL-	CLO	PLO
1.	What number would you divide by to calculate the mean of 3, 4, 5, and 6?	2	2	1
2.	The difference between the largest and the smallest value of a data, is termed as the.....	1	3	9
3.	is also called root mean square deviation.	1	4	7
4.	Correlation analysis talks about direction of relationship within the variables (true/False)	2	3	3
5.	Coefficient of Range= (Range/.....)× 100	3	2	1
6.	The application of statistical methods in biology is known as.....	5	3	5
7.	In F test null hypothesis, H_0 = no difference in variance. True/ false	3	3	5
8.	The median of the following data, is: 1,2,4,6,8,10,11,13, 2	4	4	7
9.	Serum cholesterol levels for two groups of Americans were recorded in 1989. The mean cholesterol levels of the two groups were compared. To determine whether the measurements were significantly different or not, the most appropriate statistical test would be.....	2	4	5
10.	A hypothesis is an assumption about the population parameter (True/False)	6	6	5

SECTION B

Short-type Questions. (Attempt all questions) 2.5 X 4Marks

Q. No.	Question	BT L-	CLO	PLO
1.	The mean monthly salary of 10 workers of a group is Rs 1445. One more worker whose monthly salary is Rs1500 has joined the group. Find the mean monthly salary of 11 workers of the group using the measures of central tendency formula.	3	5	6

2.	Find the variance and standard deviation of the wages of 9 workers given below: ₹310, ₹290, ₹320, ₹280, ₹300, ₹290, ₹320, ₹310, ₹280.	5	2	1
3.	i) What is the degree of freedom for a sample containing N data points? ii) Draw Scatter Diagrams with imaginary data points showing negative and positive correlation	4	3	7
4	Write short notes on any two i. ANOVA ii) Measure of dispersion iii) Correlation analysis vi) Application of standard deviation in Biological research	1	3	8

SECTION C

Long type Question (Attempt any two) (Marks 5X2)

Q. No.	Question	BTL-	CLO	PLO																		
1.	Find the Karl Pearson's co-efficient of correlation between x and y for the following data: <table><tr><td>x</td><td>15</td><td>19</td><td>23</td><td>19</td><td>22</td><td>27</td><td>24</td><td>18</td></tr><tr><td>y</td><td>21</td><td>25</td><td>23</td><td>27</td><td>25</td><td>30</td><td>31</td><td>15</td></tr></table>	x	15	19	23	19	22	27	24	18	y	21	25	23	27	25	30	31	15	3	4	1
x	15	19	23	19	22	27	24	18														
y	21	25	23	27	25	30	31	15														
2.	Find linear regression equation (y on x) for the following two sets of data and calculate the value of y at x=4 and x=12 <table><tr><td>x</td><td>1</td><td>3</td><td>5</td><td>7</td></tr><tr><td>y</td><td>4</td><td>8</td><td>11</td><td>16</td></tr></table>	x	1	3	5	7	y	4	8	11	16	3, 4	2	2								
x	1	3	5	7																		
y	4	8	11	16																		
	i) To test the hypothesis that eating fish makes one smarter, a random sample of 12 persons take a fish oil supplement for one year and then are given an IQ test. Here are the results: 116, 111, 101, 120, 99, 94, 106, 115, 107, 101, 110, 92 Test using the following hypotheses. $H_0: \mu = 100$ $H_a: \mu > 100$ and report your conclusion $T_{tab} = 1.79588482$ at significance level of 0.05 ii) A group of 5 patients treated with medicine A is of weight 42,39,38,60 & 41 kgs. Second group of 7 patients from the same hospital treated with medicine B is of weight 38, 42, 56, 64, 68, 69, & 62 kgs. Find whether there is any difference between medicines? $F_{(tab)}=6.16$, $t_{(tab)}= 2.228$	4	3	2																		

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