

University of Mumbai

Examination 2020 under cluster 4 (PCE)

Program: BE Biomedical Engineering

Curriculum Scheme: Rev2016

Examination: Third Year Semester V

Course Code: BMDLO5012 and Course Name: Biostatistics

Time: 1 hour

Max. Marks: 50

Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Median is which of following value in the given ascending array of size $2N+1$
Option A:	average
Option B:	frequently repeated
Option C:	$(N+1)^{\text{th}}$
Option D:	N^{th}
Q2.	Probability of having 53 Sundays in a leap year is
Option A:	1/7
Option B:	2/7
Option C:	3/7
Option D:	4/7
Q3.	Stroke index values were statistically analyzed for two samples of patients suffering from myocardial infraction. The sample variance were 12 and 10. There were 21 patients in each sample. Construct the 95% confidence interval for the ratio of the two population variance. To solve the above example we can use
Option A:	Chi-square-Test
Option B:	t-Test
Option C:	Z-Test
Option D:	F-Test
Q4.	5% level of significance corresponds to which confidence interval
Option A:	99%
Option B:	95%
Option C:	97.50%
Option D:	90%
Q5.	Mean and SD values of serum Fe are 120 and 14.14 μgm per 100 ml respectively. What is the probability of a random sample of 50 normal men yielding a mean between 115 and 125 μgm per 100 ml
Option A:	0.982
Option B:	0.95
Option C:	0.7134
Option D:	0.5
Q6.	A sample of 101 light bulbs yielded a standard deviation of 85 burning hours. Find 90% confidence interval for the standard deviation. To solve given example required to use
Option A:	Chi-square -Test
Option B:	t-Test
Option C:	F-Test

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Option D:	Z-Test																
Q7.	<p>If</p> <table border="1"> <tr> <td>X</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> <td>35</td> <td>40</td> <td>45</td> </tr> <tr> <td>Y</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> <td>35</td> <td>40</td> <td>45</td> </tr> </table> <p>Then value of Karl-Pearson's correlation coefficient is r_{xy} is</p>	X	15	20	25	30	35	40	45	Y	15	20	25	30	35	40	45
X	15	20	25	30	35	40	45										
Y	15	20	25	30	35	40	45										
Option A:	1																
Option B:	-1.57																
Option C:	+1.57																
Option D:	0																
Q8.	<p>Following table shows scores obtained after three types of training by subjects in 2 age groups. Comment on factorial dependence.</p> <table border="1"> <tr> <th rowspan="2">Factor A (Age)</th> <th colspan="3">Training</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> <tr> <td>Young</td> <td>15</td> <td>20</td> <td>30</td> </tr> <tr> <td>Old</td> <td>25</td> <td>20</td> <td>15</td> </tr> </table>	Factor A (Age)	Training			1	2	3	Young	15	20	30	Old	25	20	15	
Factor A (Age)	Training																
	1	2	3														
Young	15	20	30														
Old	25	20	15														
Option A:	Dose dependent on age																
Option B:	Age is crucial factor																
Option C:	No interaction between age and dose																
Option D:	Interaction present																
Q9.	<p>If</p> <table border="1"> <tr> <td>X</td> <td>5</td> <td>14</td> <td>27</td> <td>30</td> <td>35</td> <td>42</td> <td>48</td> </tr> <tr> <td>Y</td> <td>15</td> <td>20</td> <td>22</td> <td>45</td> <td>50</td> <td>60</td> <td>65</td> </tr> </table> <p>Then value of Spearman's Rank correlation coefficient R is</p>	X	5	14	27	30	35	42	48	Y	15	20	22	45	50	60	65
X	5	14	27	30	35	42	48										
Y	15	20	22	45	50	60	65										
Option A:	-0.57																
Option B:	-1																
Option C:	1																
Option D:	2																
Q10.	<p>Annual income (Rs in Lakhs) and marks of 4 TE students as follows</p> <table border="1"> <tr> <td>Rs in Lakhs</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>4.0</td> </tr> <tr> <td>Marks</td> <td>86</td> <td>84</td> <td>85</td> <td>83</td> </tr> </table> <p>Correlation between the two is between</p>	Rs in Lakhs	2.5	3.0	3.5	4.0	Marks	86	84	85	83						
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Marks	86	84	85	83													
Option A:	-1.00 to -0.50																
Option B:	-0.50 to 0.00																
Option C:	0.00 to 0.50																
Option D:	0.50 to 1.00																
Q11.	Test statistic for one way ANOVA is																
Option A:	MSA/MST																
Option B:	MSA/MSW																
Option C:	MSTr/MSBI																
Option D:	MSTr/MSE																
Q12.	What do you infer from the following ANOVA table																

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		Source	SS	df	MS	VR	p																
		Meat type	21262	3	7087	27.0	0.0001																
		Error	36747	140	262	----																	
		Total	58009	143	-----	----																	
Option A:	Probability figure is wrong																						
Option B:	All meat types are same																						
Option C:	Significant difference among meat types																						
Option D:	Degrees of freedom not tallying																						
Q13.	You want to evaluate the effect of rain, soil quality, seed quality and fertilizer on the crop yield, how you will proceed																						
Option A:	Linear regression																						
Option B:	Multi variate regression																						
Option C:	Least square fitting																						
Option D:	Two way ANOVA																						
Q14.	The following table gives the number of accident in district during a week. Test whether the accident are uniformly distributed over the week?																						
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Day</th> <th>Sun</th> <th>Mon</th> <th>Tue</th> <th>Wed</th> <th>Thu</th> <th>Fri</th> <th>Sat</th> </tr> </thead> <tbody> <tr> <td>Accidents</td> <td>13</td> <td>12</td> <td>11</td> <td>10</td> <td>14</td> <td>10</td> <td>14</td> </tr> </tbody> </table>							Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Accidents	13	12	11	10	14	10	14
Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat																
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Option A:	Z-Test																						
Option B:	Chi-square -Test																						
Option C:	t-Test																						
Option D:	F-Test																						
Q15.	A Market analysis took sample of 20 shops in a big city to determine the variation in the price of a commodity. The mean of the prices was 95 and the standard deviation of 8. Find 95% confidence interval for the standard deviation of the commodity prices. To solve the above example we can use																						
Option A:	Chi-square -Test																						
Option B:	Z-Test																						
Option C:	F-Test																						
Option D:	t-Test																						
Q16.	For discrete distribution expected probability is taken from which of following distribution																						
Option A:	Z																						
Option B:	t																						
Option C:	F																						
Option D:	Poisson																						
Q17.	Formula for Test of significance of the difference between two large samples if samples are drawn from same population with population variance is given is																						
Option A:	$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$																						
Option B:	$Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n-1}}$																						

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Option C:	$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sigma \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$
Option D:	$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2 - 2} \times \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$
Q18.	Pooled variance is required for performing which test, provided variances are equal and sample size is unequal
Option A:	F-distribution
Option B:	Z
Option C:	t
Option D:	t'
Q19.	We wish to know if we conclude that the mean daily caloric intake in the adult rural population of a developing country is less than 2000. A sample of 500 had a mean of 1985 and SD of 210. For given problem required to use
Option A:	F-Test
Option B:	Two tailed Test
Option C:	Both one and two tailed test
Option D:	One tailed Test
Q20.	How good or bad your statistical test is known from
Option A:	α
Option B:	β
Option C:	$(1 - \alpha)$
Option D:	$(1 - \beta)$
Q21.	If λ the parameter of the Poisson distribution then Variance of the Poisson distribution is
Option A:	$-\sqrt{\lambda}$
Option B:	λ
Option C:	$\sqrt{\lambda}$
Option D:	$-\lambda$
Q22.	If x is a Binomial variable with parameter $n=40$, $p=3/8$ then variance of x is
Option A:	$-75/8$
Option B:	$8/75$
Option C:	$75/8$
Option D:	$-8/75$
Q23.	Find the standard deviation if $P(x < 90) = 0.7257$ Mean = 75
Option A:	45
Option B:	35
Option C:	25
Option D:	55
Q24.	Given a normally distributed population with a mean 75 and variance of 625,

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	find: $P(x \leq 60)$
Option A:	-0.2743
Option B:	1.2743
Option C:	0.2743
Option D:	-0.8743
Q25.	The weights of a certain population of young adult females are approximately normally distributed with mean of 132 and standard deviation 15. Probability that a subject selected at random from this population will weigh more than 155 pounds is?
Option A:	1.063
Option B:	2.063
Option C:	-1.063
Option D:	0.063

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	C
Q2.	B
Q3.	D
Q4	B
Q5	A
Q6	A
Q7	A
Q8.	D
Q9.	C
Q10.	B
Q11.	B
Q12.	C
Q13.	B
Q14.	B
Q15.	A
Q16.	D
Q17.	C
Q18.	C
Q19.	B
Q20.	D
Q21.	B
Q22.	C
Q23.	C
Q24.	C
Q25.	D