



VII SEMESTER B. TECH (BIOTECHNOLOGY) **END SEMESTER EXAMINATIONS (REGULAR), DEC 2020** SUBJECT: BIOSTATISTICS & ANALYTICAL TECHNIQUES [BIO 4103] **REVISED CREDIT SYSTEM**

Time: 3 Hours

MAX, MARKS: 50



23

20

16

18

14

11

10

7

6

4

	The following is a three factor ANOVA output, was obtained from 2X2X3 factorial design. Fill the missing data in the table, and order the factor with its significance.																		
		Source	Freedom		Sum of Square		are	Mean Square		F-test									
		A	2		2		are	145 042		10.23									
		B	γ						75	17.9	5								
28			2			2		0.542		0.07			1						
20.			ΔB 2 2 45.375 6.02									4							
	AC 2 2 5542 0.73																		
			: 2			? 2		44.2	·Z 75	0.73	>								
	ABC 2 2 41.375 5.49																		
		ABC ? ? 15.875 2.10																	
		Error	?			?		7.54	-2										
		Total	23	3		?													
2C.	Define sample and population. What are the types of sampling?												2						
	The responses of a 2 ⁴ factorial design are 4.26, 2.18, 2.11, 2.30, 5.18, 2.15, 2.11, 2.04, 4.34,																		
	2.40, 5.23, 2.18, 2.18, 2.15, 2.04 and 2.32. Estimate the main effects of each parameters, six																		
3A two-factor interactions, three three-factor interactions, one four-factor										interaction and fit into the									
	model equation with its co-efficient. Check the significance of given parameters usi											the error							
	coefficient value of 0.05 and tabulated tsat of 1.96.																		
20	Construct following plots for question number, 3A; main effect plots, all possible two-												F						
ЗB	interact	ion plots, c	ube plots	for the	respon	se and j	plot a g	raph of r	espons	se versus	s run o	rder.	Э						
	How many runs are there in $4^43^42^3$ design? How many variables does it accommodate and																		
4A	specify the level of each variables?												2						
	Consider a 2 ⁸⁻³ fractional factorial design: (i) How many factors does this design have? (ii) How												1						
4B	many runs are involved in this design? (iii) How many levels for each factor? (iv) Ho											w many	2						
	independent generators are there for this design?																		
	Genetic	theory sta	tes that	childrer	n having	n one p	arent c	of blood t	vpe A	and the	other	of blood	1						
	type B	will always	be of on	e of thr	ee types	s. A. AE	B. Ban	d that the	e propo	ortion of t	hree t	vpes will							
	on an a	verage be	as 1 : 2 :	1. A re	eport sta	tes that	t out of	300 chil	dren ha	avina one	e A pa	irent and							
4C	<i>B</i> pare	nt 30% we	ere found	to be	types A	4 45%	of type	e AB and	d rema	inder tvr	ne R	Test the	4						
	hypothe	sis by chi	square t	est and	deare	e of fre	edom	(Tabulate	ad valu	ie of chi	-souai	e at 5%							
	level of significance is 5 901)																		
	The critical significance level (α) is the probability of committing which type of error. What does																		
4D	a 95% confidence interval infers?												2						
	The ab	sorntion s	nici var il	for tita	nium n	erovide	comp	lev ion	in ner	phloric a	cid sł	nowed a	+						
	me absorption spectrum for inanium peroxide complex for in perchloric acid snowed a																		
5A	0.456. An unknown solution treated in an identical fashion days absorbance of 0.501. Assume												3						
	identical cells find out the concentration of the unknown																		
	An absorbance of 0.436 was obtained after 11.5ml of titrating agent was added to 68.0 ml of an																		
5B	initial solution. What was the corrected absorbance of the solution? What would be the % error												2						
	have been if correction was not made?																		
	The XRD data for the As ₂ S ₄ sample is tabulated below, estimate the d-spacing, crystallite size																		
	and ave	and average crystallite size.																	
ED	2θ (deg) 14.01 15.65 18.64 22.48 24.26 26.51 28.02 30.68 32.40 35.40												F						
ЭD	FWHM (r	ad) 0.0044	0.011	0.003	0.005	0.004	0.003	0.004	0.004	0.006	0.005		5						
	20 (deg	g) 39.30	42.53	45.58	47.69	49.40	51.91	54.50	56.52	59.71	64.70								
	FWHM (r	ad) 0.005	0.005 0.003 0.004 0.007 0.005 0.005 0.004 0.005 0.005 0.005																
													1						