AQ–579A

Faculty of Cosmetic Technology

M.Tech. (Cosmetics Technology) Semester-I

(New) Examination

BIOSTATISTICS

(Common for all Branches)

Paper—1–T–4

Time : Three Hours] [Maximum Marks : 40

INSTRUCTIONS TO CANDIDATES

(1) All questions carry equal marks.

(2) Answer **FOUR** questions.

(3) Use pen of Blue/Black ink/refill only for writing the answer book.

1. (a) In partially destroyed laboratory record of an analysis of data, the following results are legible :

Variance of X i.e. $6x^2 = 9$

Regression equation of Y on X, $Y = \frac{8}{10}X + \frac{66}{10}$

Regression equation of X on Y, $X = \frac{18}{40}Y + \frac{214}{40}$

What were the :

(i) $\overline{X}$ and $\overline{Y}$.

(ii) Correlation coefficient r_{xy}.

(iii) Standard deviation of σ_y. 7

(b) Write a short note on t-test. 3

2. (a) Compute mean, median and mode for the following frequency distribution. 6

Mid values	115	125	135	145	155	165	175	185	195
Frequency	6	25	48	72	116	60	38	22	3

(b) Discuss the terms :

(i) Skewness

(ii) Kurtosis. 4

3. (a) Calculate standard deviation (σ) and coefficient of variation for the following distribution of net profits earned by a group of cosmetic companies : 7

Profits ('000 Rs.)	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of Cos. Companies	30	58	62	85	112	70	57	26

(b) Differentiate between parametric and non-parametric test. 3

4. (a) Compute the Pearson's correlation coefficient between the height of father (x) and sons (y) given in inches:

X	65	66	67	68	69	70	72	72
Y	67	68	65	68	72	72	69	70

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(b) Write a brief note on Histogram. 3

5. (a) In a health laboratory the following result are obtained :

Type	Affected	Non-affected	Total
Inoculated	12	26	38
Not-Inoculated	16	6	22
	28	32	60

Calculate χ^2 (given $\chi^2_{5\%} = 3.84$) 5

(b) The height of 10 boys is found to be 65, 67, 60, 65, 60, 69, 70, 64, 66, 66 inches. Is it reasonable to believe that the average height is greater than 64 inches ? Test at 5% significance level.

(Tabulated t at 5% for g.d.f. = 1.833) 5

6. (a) Below are given the gain in weights (in lbs) of bigs fed on two diets D_1 D_2.

Diet D_1	25	32	30	34	24	14	32	24	30	31	35	25			
Diet D_2	44	34	22	10	47	31	40	30	32	35	18	21	35	29	22

be paired t-test to test, if the two diets D_1 and D_2 differ significantly as regards their effects on increase in weight.

(Tabulated $t_{0.05}$ for 2s d.f. = 2.06) 6

(b) In one sample of 8 observations $\sum(xi - \overline{x})^2 = 84.4$ and in the other sample of 10 observations $\sum(yi - \overline{y})^2 = 102.6$. Test whether this difference is significant at 5% level.

(Tab $F_{0.05}$ for (y, 9) d.f. is 3.29) 4