KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Agrl. Engg.) 2018 Admission
III Semester Final Examination-January 2020

Sacs.2110 **Engineering Mathematics-III (2+1)** **Marks: 50**
Time: 2 hours

I **Fill in the Blanks** **(10x1=10)**

1. If one of the regression coefficients is positive, the other will never be_____.
2. $L(t^3)$ = _____.
3. $\nabla\Delta f(x)$=_____.
4. The normal distribution is also known as_____.
5. The limits of correlation coefficient r is_____.

State True or False

6. If X and Y are independent, then Cov(X,Y) = 0.
7. The difference between the means of two small samples can be tested by t test .
8. The measure of dispersion that is influenced most by extreme values is the interquartile range.
9. Newton's divided difference formula is preferred when the arguments are not equally spaced.
10. While applying Simpson's 3/8 rule the number of subintervals should be odd.

II **Write Short notes on ANY FIVE of the following** **(5x2=10)**

1. Find $L[te^{-t}]$
2. Find $L[t^2 + 3t - 5]$
3. Prove $\delta = \nabla E^{1/2}$
4. Write the various measures of central tendency
5. Find the probability of getting 2 heads in 4 tosses of a fair coin?
6. Define Poison distribution
7. X is normally distributed and the mean of X is 12 and the S.D. is 4. Find P(X≥20)

III **Answer ANY FIVE of the following.** **(5x4=20)**

1. The following table shows the mean number of bacterial colonies per plate obtainable by four slightly different methods from soil samples taken at 4 P.M. and 8 P.M. respectively.

	Method A	Method B	Method C	Method C
4 P.M.	29.75	27.50	30.25	27.80
8 P.M.	39.20	40.60	36.30	42.50

Are there more bacterial colonies at 8 P.M. than at 4 P.M.?

2. Twelve boys were fed on diet A and 15 on diet B. The gains in weight for the individual boys (in pounds) were as shown:

A:	25	32	30	34	24	25	14	32	24	30	31	35			
B:	44	34	22	10	47	31	40	30	32	35	18	21	35	29	22

PTO

Find whether diet B is superior to diet A, given that at five percent level of significance, value of t for 25 degrees of freedom is 1.708

3. Given the table

x	0	0.1	0.2	0.3	0.4
e^x	1	1.1052	1.2214	1.3499	1.4918

Find the value of y when x=0.38 (using Newton's backward interpolation formula)

4. Using Bessel's formula find f(25) given f(20)=2854, f(24)=3162, f(28)=3544, f(32)=3992
5. If $y_1 = 4$, $y_3 = 12$, $y_4 = 19$ and $y_x = 7$, find x
6. Solve: $y'' + 4y' - 5y = 0$ given that y=0 given that y=0, $\frac{dy}{dx} = 1$ when $x = 0$ (using Laplace transform)
7. The two lines of regression are 8x-10y+66=0, 40x-18y-214=0. Find the correlation coefficient between x and y.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. By applying the fourth order Runge-Kutta method find y(0.2) from $\frac{dy}{dx} = y - x\,,\ y(0) = 2$ taking h=0.1
2. Two groups of 100 cows each were taken for testing the use of a vaccine. One inoculated group in which 15 cows contracted the disease while 25 contracted the disease in the other non-inoculated group. Test the efficacy of the vaccine.

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