16P318 (Pages:2) Name……..

Reg. No……..

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, OCTOBER 2017

(Regular/Supplementary/Improvement)

(CUCSS - PG)

CC15P ES3 C15 - BIOSTATISTICS, QUANTITATIVE METHODS AND ECOINFORMATICS

(Environmental Science)

(2015 Admission Onwards)

Time : Three Hours Maximum : 36 Weightage

I. Answer ***all*** questions. Each question carries **1** weightage

1. Harmonic mean
2. Factor analysis
3. Central Limit Theorem
4. Bayes' theorem
5. Differentiate Binomial and Poisson distribution
6. t-test
7. SPSS
8. Data mining
9. Artificial Neural Networks
10. TCP/IP
11. Broadband
12. Workstations
13. Logical Operators
14. Data Models

(14 x 1 = 14 weightage)

II. Answer ***any seven*** questions. Each question carries **2** weightage

15. Calculate the mean, modeand SD of the following

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 - 100
f	15	35	50	20	10

16. Explain skewness and kurtosis. Give any two measures of each of them.
17. Find the mean and variance of the first 'n' natural numbers
18. Define maximum likelihood algorithms. Mention their application in ecoinformatics.
19. Define null hypothesis and alternative hypothesis
20. Comment on different softwares' used for data analysis.
21. In a population of Grey Langurs, the sex ratio is assumed to be male : female is 0.5 : 0.5. How many male Langurs should turn up in a random sample of 80 so as to reject the hypothesis? (Note: χ^2 =3.84 for df=1, α=0.05)

22. Industrial effluents are treated with 3 different types of coagulants to remove the suspended solids. The percentages of efficiency are shown below for the three different coagulants. Carryout One-Way ANOVA to test that the coagulants have different effects.

Aluminium Sulphate	Aluminium Chloride	Ferric Chloride
70	57	53
73	63	60
83	70	67
90	87	73
97	93	80

23. Calculate the coefficient of correlation for the following data.

Age	45	21	25	59	42	57
Glucose Level	99	65	79	81	75	87

24. Explain about different methods of data representation.

(7 x 2 = 14 weightage)

III. Write an essay on ***any two*** of the following. Each question carries **4** weightage

25. Briefly explain the applications of ecoinformatics in environmental studies
26. In an experiment, organic manure was applied to twelve sample pots and inorganic manure to ten pots. The recorded height (cm) after 21 days of the two sets of plantvariety is given below. Test at 5% level of significance whether the organic manure is superior to inorganic manure.

Organic manure	18	19	15	16	18	21	15	13	16	17	14	17
Inorganic manure	15	16	16	13	19	20	11	14	9	10		

27. Define normal distribution. Explain the characteristics and properties of normal distribution.
28. An agriculturist assumes that there is a linear relationship between the amount of fertilizer supplied to tomato plants and the subsequent yield of tomatoes obtained. He randomly selected twelve tomato plants of the same variety and weekly treated with a solution prepared by dissolving 'x' grams of fertilizer in a fixed quantity of water. The yield 'y' in kilograms was recorded and is given below.

Plant	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T10**	**T12**	**T13**
Fertilizer (x) in g	0.25	0.50	0.75	1.0	1.25	1.5	1.75	2.0	2.25	2.50	2.75	3.0
Yield (y) in kg	1.9	2.4	3.8	4.6	5.6	6.2	6.9	7.3	7.5	7.8	8.0	8.1

a) Calculate the equation of the least squares regression line on y on x
b) Estimate the yield of a plant treated weekly with 3.5 grams of fertilizer.
c) State how much variability is explained by regression

(2 x 4 = 8 weightage)

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