Reg. No……………………………….. Name…………………………………………………

M.Sc. DEGREE END SEMESTER EXAMINATION NOVEMBER 2017
SEMESTER –1: AQUACULTURE AND FISH PROCESSING
COURSE: 16P1AQCT03: BIOSTATISTICS AND COMPUTER APPLICATION
(Common for Regular 2017 admission and Supplementary 2016 admission)

Time: Three Hours   Max. Marks: 75

(Use of Scientific Calculators and Statistical Tables permitted)

SECTION 1
*Write short notes on **any eight** of the following*

1. Machine language
2. Inserting a chart into Excel
3. Type I and Type II error
4. Addition theorem of probability
5. Spearman's rank correlation
6. Producer's and consumer's risk
7. Median and mode
8. $\chi^2 -$ test and its applications
9. Confidence interval
10. Level of significance
11. Define sampling distribution and standard error   (2 x 8 = 16)

SECTION 2
*Answer **any seven** of the following*

12. After a particular fishing trip the catch was sorted according to species. The catch composition (%) was as follows :

Fin fishes		Crustacean		Cephalopod		Others	
Viper fish	16.56	A. purpurea	0.52	A. lesueurii	12.9	Jelly fish	15.73
Lizard fish	4.06	O. Spinosus	11.98	A. Acanthoderma	16.1		
Largehead hairtail	1.14	P. stylifera	9.9				
Pearly hairtail	0.1	C. longicollis	9.47				
Deepsea hatchet fish	27.6						
Ray	0.4						
Razor travelly	1.14						

Represent the above data as a pie chart for the 4 categories of fish species. How will you

represent the individual species composition in a graph form?

13. Explain client/server networking highlighting the advantages

14. The efficiency of 2 aqua feeds has to be compared based on gain in body weight of fishes. The data pertaining to the two feeds is given below :

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

Set the null hypothesis and test whether there is no difference in mean increase in weight due to the feeds A and B, against the alternative hypothesis $H_-: \mu_n \neq \mu_o$.

15. A tank rears 4 type of fishes rohu, catla, mrigal and tilapia. For an experiment on growth, 20% of the fishes are fin clipped. During one haul a single fish is caught. If the tank contains 120, 180, 200 and 500 of rohu, catla, mrigal and tilalpia, what is the probability that it is clipped Tilapia?

16. (a) What do you mean by Poisson distribution.

   (b) Fit a Poisson distribution for the following data with respect to number of red blood corpuscles :

No. of RBC

x	0	1	2	3	4	5	6	7	8
f	162	193	115	83	44	24	19	8	2

17. (a) Explain acceptance sampling plan based on single sampling

   (b) What are $\bar{X}$ and R charts?

18. In a large city A, 20 percent of a random sample of 900 school children had defective eye sight. In another large city B, 15 percent of the random sample of 1600 children had the same defect. Is the difference between the two proportions significant?

19. (a) What do you mean by probability?

   (b) In a pond three species of fishes are reared: A; B and C. 40% are A, 35% are B and 25% are C. The percentage of clipped fishes are 2% of species A, 1% of species B and 3% of species C. If a fish is picked at random what is the probability that it is clipped?

20. Assume that shrimps are bred in warm water coming from a Nuclear Power station. These particular shrimps mutate spontaneously and generally there are equal number of mutants and normal shrimps. In order to study the degree of mutation near the nuclear power station (whether it increases), 20 shrimps were sampled from the water and 15 shrimps were found mutated. Does this sample indicate that there are more mutants in whole population of our breeding ground? Z-value at 1% level of significance is 2.532 and at 5% level of significance is 1.96.   (5 x 7 = 35)

SECTION 3

*Write an essay on **any two** of the following*

21. (a) Define Normal distribution

   (b) What do you understand by area under Normal curve?

   (c) In a pond, fishes are reared and over a period of time, it is known that the length of the fishes

in the pond are distributed Normally with mean 20 inches and variance 16. If a fish is hooked at random from the pond, what's the chance of (i) catching a small fish — say, less than 8 inches?, ii) Catching any fish over 24 inches, (iii) catching a fish between 16 and 24 inches?

22. (a) In the scatterplot below, which value is closest to the correlation?
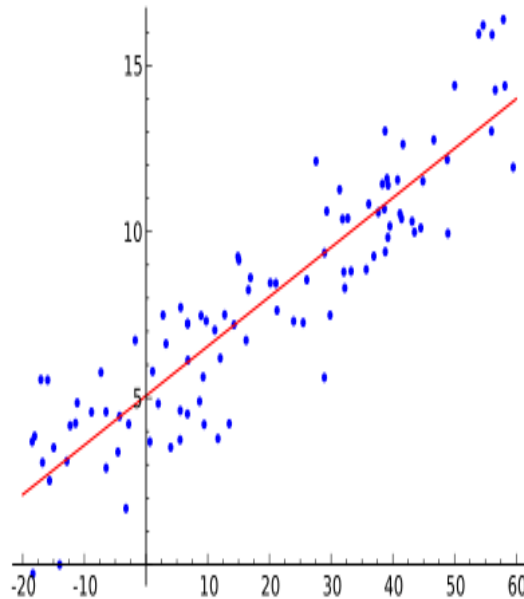
(i) r = 0.70 (ii) r = 1.00 (iii) r = −0.98 (iv) r = −0.08

(b) Data on initial weight and gains in weight (grams) of 15 female rats on a high protein diet, from the 24th to 84th day of age to find out whether the gain in weight depends on the initial weight. Find the correlation between the two variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Initial weight (X)	50	64	76	64	74	60	69	68	56	48	57	59	46	45	65
Gain (Y)	168	159	158	119	133	112	96	126	132	118	107	106	82	105	104

(c) What is regression of Y on X and regression of X on Y? Give the relationship between the two regression coefficients and correlation coefficient.

23. (a) What is an F-test? Mention its applications in hypothesis testing.

(b) Growth of pearlspot was studied in two experimental conditions. Two random samples of sizes 11 and 9 fishes show the sample standard deviations of their weights after two months as 0.8 and 0.5 respectively. Assume that the weight distribution s are Normal and we want to test the hypothesis that the true variances are equal, against the alternative that they are not equal at 10% level. (The significant values of two-tailed F at 10% are 3.35 and 0.326 respectively for 10,8 d.f.)

24. (a) What is an operating system?

(b) Compare Windows, Linux and Mac operating systems with respect to the following features – booting, kernel, supporting files, BIOS and GUI.   (12 x 2 = 24)