Subject Code : 2930

M. Sc. Marine Science Semester IV Examination April 2015

PAPER – VI [Tool, techniques and biostatistics]

Duration : 2.30 Hours | Marks : 70

Instructions:

1. There are FIVE compulsory Questions in this paper. Each question carries 14 marks.
2. Statistical tables & Graph Papers will be provided on request.
3. Use of scientific calculator is allowed.

marks

Q 1 a) State various measures of dispersion? Name the best measure. **5**

b) The survival time in months of 51 patients suffering from acute myeloblastic leukemia(AML) was diagnosed to be – **9**

18	31	31	31	36	01	09	39	20	04	45	36	12
08	01	15	24	02	33	29	07	05	01	02	12	09
01	01	09	05	27	01	13	01	05	01	03	04	01
18	01	02	01	08	03	04	14	03	03	13	13	

a) Prepare a frequency distribution of survival times.

b) Create a histogram and Stem – leaf plot to show the distribution of survival times.

OR

Q 1 a) A sample of 300 college students was studied for their favourate soft drink. The survey presented in the following information: **8**

Soft Drink	Number of students	% Frequency	Cumulative % Frequency
Pepsi	92	30.7	30.7
Coke	78	26.0	56.7
Limca	48	16.0	72.7
7 – Up	72	14.0	86.7
Others	40	13.3	100.0

Draw – 1) Simple and compound Bar diagram, 2) Pie - chart of soft drinks.

b) The Heart rates (beats per minute) for ten asthmatic patients in a state of respiratory arrest are: 167, 150, 125, 120, 150, 150, 180, 136, 120, 150 respectively. What is the median and mode rate of respiratory? **6**

Q 2 a) The Cheetah (Acinonyx Jubatus) is the fastest land mammal on earth. The following is the frequency distribution of speeds in miles per hour for a sample of 35 Cheetahs: **08**

Speed (mph)	Frequency
52-56	7
56-60	14
60-64	10
64-68	3
68-72	0
72-76	1

		Find – i. Mean speed, ii. Standard Deviation and iii. Coefficient of variation.	
	b)	For two events A and B, write the i. Addition Law of Probability, ii. Bay's theorem of probability.	06
		OR	
Q 2	a)	Define the following terms and give one example of each: (1) Probability (Classical) (2) Event (3) Independent Events	6
	b)	Values of fecundity (rate of reproduction) of 50 fishes of a species of fish are given below, Calculate the mean deviation & Quartiles Deviation of fecundity .	8

Age groups	Number of Patients
1 – 10	3
11 – 20	11
21 – 30	7
31 – 40	4
41 – 50	15
51 – 60	0
61 – 70	7
71 – 80	3

Q 3	a)	Define the coefficient of correlation. What does it measure?						5
	b)	Draw a Scatter plot for the following data related to length and weight of 8 groups of fishes:						9

Length of Fish group(cm)	13.9	15.7	15.8	17.5	18.1	19.9	22.0	13.8
Weight of the given fish(gms)	50	59	64	73	78	81	87	89

Also compute coefficient of correlation between length and weight of fishes.

		OR	
Q 3	a)	The following are the weights (kg) and blood glucose levels (mg/100ml) of 10 males.	08

Weight(X)	Glucose(Y)
64.0	108
75.3	109
73.0	104
82.1	102
76.2	105
95.7	121
59.4	79
93.4	107
82.1	101
76.7	99

Obtain i. Obtain the line of regression of Y on X and,
ii Estimate the blood pressure of the patient whose weight (X) =80.0 kgs.

	b)	Explain in brief, giving one example each the following terms – i. Population and sample,Parameter and statistic	06

<table>
<tr><td>Q 4</td><td>a)</td><td>362 men out of a random sample of 600 men taken from a large city were found to be smokers. Does this information support the view that majority of men in this city are smokers? Use Level of Significance as 5 %.</td><td>06</td></tr>
<tr><td></td><td>b)</td><td>Explain the following terms giving illustration:
i) Type I Error and Type II Error,
ii) Sensitivity of a test and a specificity of a test.</td><td>08</td></tr>
<tr><td></td><td></td><td>OR</td><td></td></tr>
<tr><td>Q 4</td><td>a)</td><td>In a cross-breeding experiment, with plants of certain species, 240 offspring were classified into four classes with respect to the structure of their leaves as follows:
<table>
<tr><td>Class :</td><td>I</td><td>II</td><td>III</td><td>IV</td><td>Total</td></tr>
<tr><td>Frequency:</td><td>21</td><td>40</td><td>52</td><td>127</td><td>240</td></tr>
</table>
According to theory of heredity, the probabilities of four classes should be in the ratio 1:3:3:9. are the data consistent with theory?</td><td>08</td></tr>
<tr><td></td><td>b)</td><td>What is a test of statistical hypotheses? Explain Wilcoxon signed rank test.</td><td>06</td></tr>
<tr><td>Q 5</td><td>a)</td><td>What is HPLC? Describe its structure, principle and function in detail.</td><td>14</td></tr>
<tr><td></td><td></td><td>OR</td><td></td></tr>
<tr><td>Q 5</td><td>a)</td><td>Write a descriptive note on different types of water and grab sampler</td><td>14</td></tr>
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