

**Mid sem exam 2013**  
**2<sup>nd</sup> semester**  
**• Biostatistics**

Date: 08/04/2013

Total marks: 20

**Q.1 Answer the following: (Compulsory) 05**

- 1 Enlist various methods of sampling.
- 2 Define Alternative hypothesis.
- 3 Define two-tailed test.
- 4 Find arithmetic mean of 15, 20, 25, 19, 12, 12.
- 5 What is scattered diagram?

**Q.2 Describe in brief: (Any Three) 15**

- 1 The observations of populations are 6,8,12,16,20,22. How many different samples of size 2 without replacement can be taken from it? Preparing a list of the samples, verify the following results.

$$1) E(\bar{y}) = \bar{Y} \quad 2) E(s^2) = s^2 \quad 3) V(\bar{y}) = \left(\frac{N-n}{N}\right) \frac{s^2}{n}$$

- 2 Five tablets Paracetamol and Omeprazole were analyzed for drug content. The following results were obtained:

Sr. No.	Paracetamol	Omeprazole
1	99.47	100.86
2	99.88	110.53
3	101.42	99.57
4	100.99	99.59
5	100.54	100.66

Compare the two drugs using student's t- test. ( $t_{8,0.05} = 2.306$ )

- 3 30 micrograms of vitamin B<sub>12</sub> were given intramuscularly every fourth week to six patients of pernicious anemia during period of remission. The results are given below. Do the data indicate improvement in hemoglobin level? ( $t_{5,0.05} = 2.57$ )

Individual Level	Hemoglobin (g%)	
	Before therapy	After fourth week of therapy
1	12.2	13.0
2	11.3	13.4
3	14.7	16.0
4	11.4	13.6
5	11.5	14.0
6	12.7	13.8

- 4 In a laboratory experiment, two random samples gave the following results.

Sample	Size	Sample Mean	Sum of Squares of Deviation from the Mean
1	10	15	90
2	12	14	108

Test the equality of sample variances at 5% level. ( $f_{(9,11),0.05} = 2.90$ )