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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST – 1 EXAMINATION, SEPTEMBER 2016  
M.TECH – ENVIRONMENTAL ENGINEERING, I SEMESTER

COURSE CODE: 14M31CE111

COURSE NAME: Statistics for Environmental Engineers

COURSE CREDIT: 3

MAX. MARKS: 15

MAX. TIME: 1 HR

**Note: All questions are compulsory. Carrying of mobile phone during examination will be treated as case of unfair means. All questions are of equal marks. Assume suitable data, if necessary.**

1. Briefly define:
  - a) Statistics
  - b) Inferential Statistics
  - c) Sample and Census
2. What do you understand by data and variable? What are four different levels of data and what are their characteristics?
3. The following data are average weekly wastewater effluent (Pb) concentration measured in  $\mu\text{g/L}$  :  
  
7.29, 7.23, 7.11, 6.78, 7.47, 6.69, 6.77, 6.57, 6.80, 6.88, 6.98, 7.16, 7.30, 7.24, 7.16, 7.03, 6.90, 7.16, 7.40, 7.05, 7.28, 7.31, 6.87, 7.68, 7.03, 7.17, 6.78, 7.08, 7.12, 7.31, 7.40, 3.65, 6.96, 7.29, 7.16, 6.97, 6.96, 7.02, 7.13, 6.84  
  
Construct a frequency distribution, frequency histograms and ogives for these data. Calculate and display the class midpoints, relative frequencies and cumulative frequencies for this frequency distribution.
4. Following is the Total Petroleum Hydrocarbon (TPH) in soil specimen of 25 locations in mg/kg :  
  
57, 88, 68, 43, 93, 63, 51, 37, 77, 83, 66, 60, 38, 52, 28, 34, 52, 60, 57, 29, 92, 37, 38, 17, 67  
  
Calculate mean, median, sample variation and sample standard deviation of the given data.
5. Construct a box-and-whisker on the following data. Do the data contain any outliers? Is the distribution of data skewed?  
  
539, 680, 503, 560, 488, 610, 379, 601, 560, 495, 582, 580, 520, 633, 463, 574, 588, 475, 547, 570, 485, 590, 604, 541