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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3 EXAMINATION, Dec. 2017
M.Tech. (Environmental Engineering) 1st Semester

COURSE CODE: **14M13CE111** MAX. MARKS: 35
COURSE NAME: Statistics for Environmental Engineers
COURSE CREDITS: 3 MAX. TIME: 2 HRS.

Note: *All questions are compulsory. Use of standard normal distribution table is allowed.*
Marks are indicated against questions.
Carrying of mobile phone during examinations will be treated as case of unfair means.

1. If a random variable has the probability density, $f(x) = \begin{cases} 2e^{-2x} \text{ for } x > 0 \\ 0 \text{ for } x \leq 0 \end{cases}$. Find the probabilities that it will take on a value: (i) between 1 and 3, and (ii) greater than 0.5. **(5)**

2. The time for a pollutant to percolate into a soil stratum can be treated as a random variable having a normal distribution with mean 20 seconds. Find its standard deviation if the probability is 0.25 that it will take a value greater than 31.5 seconds. **(5)**

3. What is log-normal distribution? Write the expression of its probability density. Also draw a typical log-normal curve. **(5)**

4. In six determinations of the melting point of an aluminum alloy, a chemist obtained a mean of 532.26 degrees Celsius with a standard deviation of 1.14 degree. If he uses this mean to estimate the actual melting point of the alloy, what can the chemist assert with 98% confidence about the maximum error? **(5)**

5. Discuss the applications of statistics in environmental engineering. Give any three types of distribution of random variables. **(5)**

6. What is regression analysis? How is the least-squares method performed? **(5)**

7. How is ANOVA conducted? Discuss with steps. **(5)**

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NOTE: Standard Normal Distribution Table is given on next page.