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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- August 2017

M.Tech. (EE) First Semester

COURSE CODE: 14M31CE111

MAX. MARKS:15

COURSE NAME: Statistics and Probability for Environmental Engineers

COURSE CREDITS: 03

MAX. TIME: One Hr

*Note: All questions are compulsory. Marks are indicated against questions.
Carrying of mobile phone during examinations will be treated as case of unfair means.*

- Q.1. What do you understand by a sample space and an event? Give the three axioms that probability of occurrence of an event A in sample space S should satisfy. (3)
- Q.2. From a river, at a section on the downstream of an industry, 200 water samples were randomly collected and tested for BOD and COD. If a sample has one or both of the BOD and the COD higher than their respective permissible levels, the sample is considered failed. Under this condition, it was found that 25% of the samples had failed against BOD, 20% failed against COD, and 10% in both BOD and COD. (5)
- (i) If a sample had failed against BOD, what is the probability that it had also failed against COD?
- (ii) If it had failed against COD, what is the probability that it had also failed against BOD?
- Q.3. What are (i) Commutative laws, (ii) De Morgan's law, and (iii) Distributive laws? Illustrate with the help of Venn's diagrams. (4)
- Q.4. An engineer at an airport is measuring the wind speed at regular intervals of time. Sketch the sample space and mark the events observing (i) the wind speed less than 40 kmph, and (ii) the wind speed equal to 70 kmph. (3)

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