Total No. of Pages(02) *Roll No. .....*

SEVENTH SEMESTER **B.Tech. (PE)**

SUPPLEMENTARY EXAMINATION ***February-2019***

PE407 QUANTITATIVE TECHNIQUES

Time: 3:00 Hours ***Max. Marks: 40***

Note: Attempt any **five** questions. All questions **carry equal marks**. Assume suitable missing data, if any. **Use of statistical tables is allowed.**

1. **[a]** Define various measure of central tendency. List limitations of each measure in data analysis.

   [b] Differentiate between discrete and continuous random variables. Name two distributions from each category. State the assumptions for the Binomial distribution.

2. **[a]** A sample of 100 dry battery cells tested to find the length of life produced the following results:

   $\bar{x}$=12 hours, σ=3 hours. Assuming the data to be normally distributed, what percentage of battery cells are expected to have life: i) More than 15 hours; (ii) Less than 6 hours, and (iii) between 10 and 14 years ?

(Given Z:	2.5	2	1	0.67)
Area	0.4938	0.4772	0.3413	0.2487

   [b] Suppose the probability that an item produced by a particular machine is defective, is 0.2. If 10 items produced by this machine are selected at random, what is the probability that not more than one defective item is found? Attempt this question by two approaches, i.e. binomial distribution approach and Poisson distribution approach.

3. [a] What do you mean by parameter estimation? Write different CI estimate expressions for single population mean and difference of two population means.

P.T.O.

[b] Explain the procedure for Hypothesis testing of population mean.

4. [a] Explain the sensitivity analysis for change in coefficients of objective function for basic and non-basic variables.
   [b] Explain the sensitivity analysis for change in resource availability.

5. Discuss the branch and bound method for solving integer programming problems.

6. [a] Define the following terms in the context of game theory.
   i) Two person zero sum game
   ii) Saddle point
   [b] Explain the dominance rules to solve a game theory problem.

7. Write short notes on any two of the following topics.
   [a] Special cases in LPP
   [b] Cutting plane algorithm
   [c] Dual-simplex method
   [d] Dispersion measures

---------END---------