MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Department of Electrical Engineering and Computer Science

Department of Mechanical Engineering

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Problem 1

An inventory specialist was called into a warehouse to determine the number of packages present. There are two types of packages, one that weighs 10kg, the other 2.5kg. The specialist is told that all together, the average weight is 5kg. What percentage of the packages are of the 2.5kg type? Draw the block diagram associated with this problem.

Problem 2

Two manufacturing plants (A and B), were responsible of producing those two packages. Due to location factors, plant A has easy access to the raw materials for the 10kg package. Same goes for plant B to the 2.5kg package's raw materials. However, to keep both production lines running at peak volume, both plants pump out packages of both types. The probability of a plant to produce its primary packages is 0.75. What percentage of the packages are of the 10kg type expected to be produced if plant A happened to a good day and produced twice as many packages as plant B?

Problem 3

Take Problem 2 but have plant A producing the 10kg package with 0.8 probability and plant B producing the 2.5kg package with 0.6 probability. What are the ranges of expected probabilities of outputs of the 10kg package and the 2.5 packages?