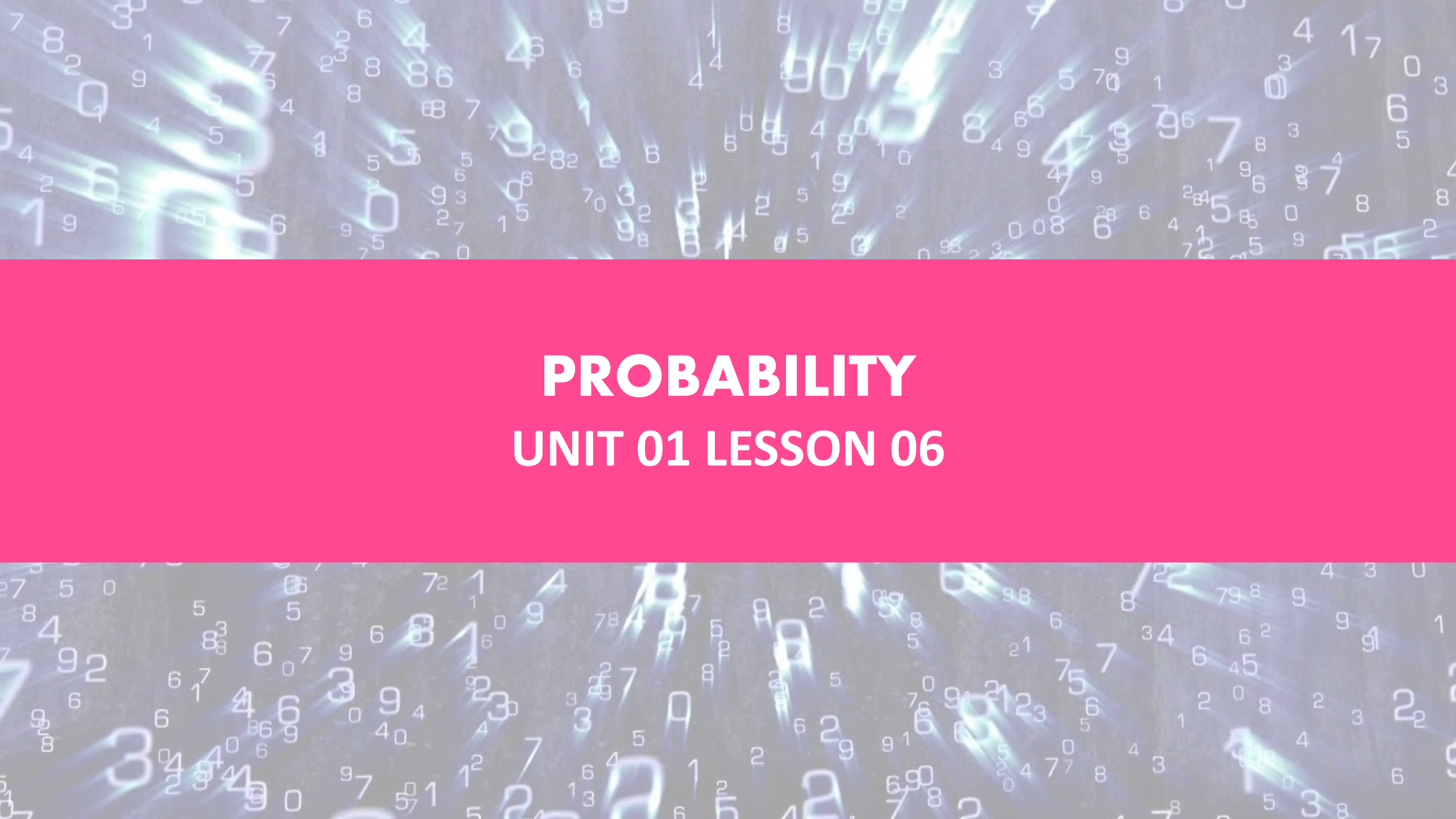

PROBABILITY

UNIT 01 LESSON 06

OBJECTIVES

STUDENTS WILL BE ABLE TO:

Understand what is probability, how can it be expressed and calculated.

KEY VOCABULARY:

- Define Probability.
- Express mathematical form of probability
- Define samples, events etc.

INTRODUCTION

"Probability is the likelihood that an event will occur under a set of given conditions. The probability of an event occurring has a value between 0 and 1"

If an event E is defined in a sample space S then its mathematical form is:

$$P(A) = \frac{m}{n} = \frac{Number\ of\ samples\ points\ in\ A}{Number\ of\ samples\ points\ in\ S} = \frac{n\ (E)}{n\ (S)}$$

INTRODUCTION

An event is an individual outcome or any number of outcomes (sample points) of a random experiment.

A set consisting of all possible outcomes that can result from a random experiment:

e.g. the experiment of tossing a coin results in either of two possible outcomes, a Heads (H) or a Tails (T).

So the sample space for this experiment may be expressed as S={H,T}

INTRODUCTION

Two events A and B of single experiment are said to be mutually exclusive or disjoint if they cannot both occur at same time.

PROBLEM 01

A die is rolled find the probability that an odd number is obtained.

PROBLEM 01

The sample space S is

S={1,2,3,4,5,6}

Let E be event of even number

E={1,3,5}

The probability is

P(E)= $\frac{n(E)}{n(S)} = \frac{3}{6} = \frac{1}{2}$

PROBLEM 02

Two coins are tossed, find the probability that two Heads are obtained.

PROBLEM 02

The sample space S is given by

S={(H,T), (H,H), (T,H), (T,T)}

Let E be event that two Heads are obtained

E={(H,H)}

The probability is:

$P(E)=\frac{n(E)}{n(S)}=\frac{1}{4}$

PROBLEM 03

A coin is tossed three times what is the probability that at least one Heads appears?

PROBLEM 03

S={HHH,HHT,HTH,THH,HTT,THT,TTH,TTT}

$$n(S) = 8$$

Let A be an event that at least one Heads appears then

A={HHH,HHT,HTH,THH,HTT,THT,TTH}

$$n(A) = 7$$

P(A)= $\frac{n(A)}{n(S)} = \frac{7}{8} \approx 0.87$