

Year 1 Applied Chapter 5: Probability – Exam Questions (Total Marks 38)

Q1.

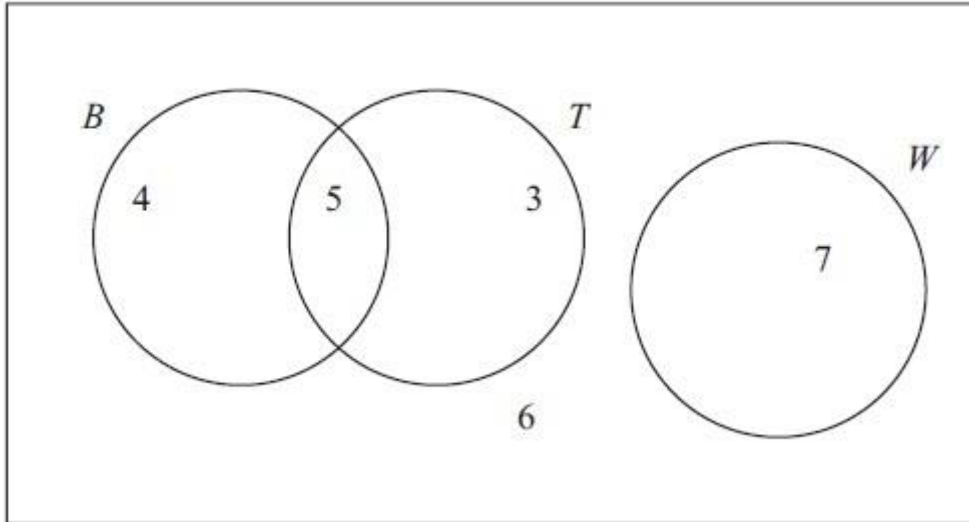


Figure 1

Figure 1 shows how 25 people travelled to work.

Their travel to work is represented by the events

- B* bicycle
- T* train
- W* walk

(a) Write down 2 of these events that are mutually exclusive. Give a reason for your answer.

(2)

(b) Determine whether or not *B* and *T* are independent events.

(3)

One person is chosen at random. Find the probability that this person

(c) walks to work,

(1)

(d) travels to work by bicycle and train.

(1)

(Total 7 marks)

Q2. In a factory, three machines, J , K and L , are used to make biscuits.

Machine J makes 25% of the biscuits.

Machine K makes 45% of the biscuits.

The rest of the biscuits are made by machine L .

It is known that 2% of the biscuits made by machine J are broken, 3% of the biscuits made by machine K are broken and 5% of the biscuits made by machine L are broken.

(a) Draw a tree diagram to illustrate all the possible outcomes and associated probabilities.

(2)

A biscuit is selected at random.

(b) Calculate the probability that the biscuit is made by machine J and is not broken.

(2)

(c) Calculate the probability that the biscuit is broken.

(2)

(Total 6 marks)

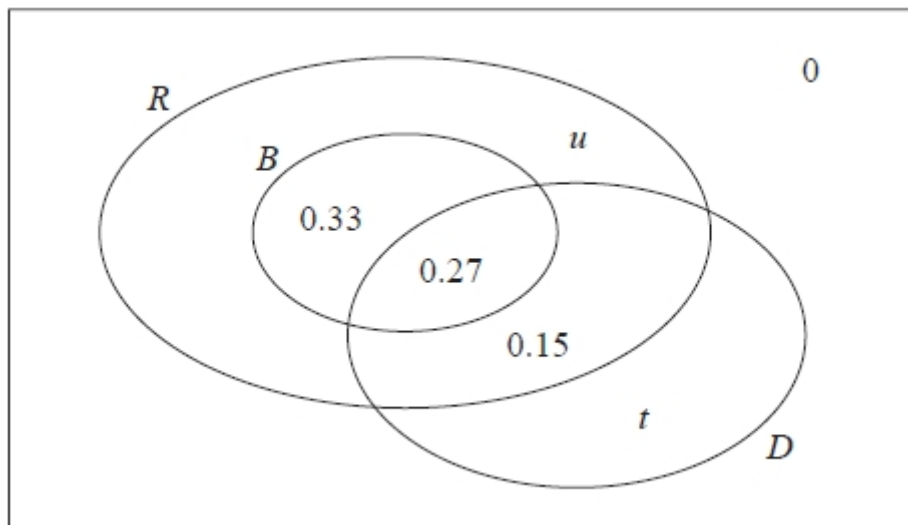
Q3. The Venn diagram shows the probabilities of customer bookings at Harry's hotel.

R is the event that a customer books a room

B is the event that a customer books breakfast

D is the event that a customer books dinner

u and t are probabilities.



(a) Write down the probability that a customer books breakfast but does not book a room.

(1)

Given that the events B and D are independent

(b) find the value of t

(4)

(c) hence find the value of u

(2)

(Total 7 marks)

Q4.

The events A and B are such that $P(A) = \frac{1}{3}$ and $P(B) = \frac{1}{4}$. $P(A \text{ or } B \text{ or both}) = \frac{1}{2}$.

a Represent these probabilities on a Venn diagram.

b Show that A and B are independent.

(3 marks each)

Q5.

For events J and K , $P(J \text{ or } K \text{ or both}) = 0.5$, $P(K \text{ but not } J) = 0.2$ and $P(J \text{ but not } K) = 0.25$.

- a** Draw a Venn diagram to represent events J and K and the sample space S . **(3 marks)**
- b** Determine whether events J and K are independent. **(3 marks)**

Q6.

In a factory, machines A , B and C produce electronic components. Machine A produces 16% of the components, machine B produces 50% of the components and machine C produces the rest. Some of the components are defective. Machine A produces 4%, machine B 3% and machine C 7% defective components.

- a** Draw a tree diagram to represent this information.
- b** Find the probability that a randomly selected component is:
- i** produced by machine B and is defective
 - ii** defective.

(2 marks each)