PROBABILITY: VENN DIAGRAMS

AS Unit 2: Applied Mathematics A

Section A: Statistics

WJEC past paper questions: 2010 - 2017

Total marks available 57 (approximately 1 hour 10 minutes)

1. Events A and B are such that
$$P(A) = 0.2,\ P(B) = 0.4,\ P(A \cup B) = 0.52\ .$$
a) Show that A and B are independent. (5)
b) Calculate the probability of exactly one of the two events occurring. (2)
(January 10)

2. The independent events A and B are such that
$$P(A) = 0.6,\ P(B) = 0.3\ .$$
Find the value of
a) $P(A \cup B)$, (3)
b) $P(A \cup B')$. (3)
(Summer 10)

3. The events A and B are such that
$$P(A) = 0.25,\ P(B) = 0.4,\ P(A' \cap B') = 0.45\ .$$
Determine whether
a) A and B are mutually exclusive, (3)
b) A and B are independent. (4)
(Summer 11)

4. The events A and B are such that
$$P(A) = 0.5\ , P(B) = 0.3\ .$$
a) Evaluate $P(A \cup B)$when
i) A, B are mutually exclusive,
ii) A, B are independent. (5)
(Summer 12)

5. The independent events A, B are such that
$$P(A) = 0.2,\ P(A \cup B) = 0.4\ .$$
a) Determine the value of $P(B)$. (4)
b) Calculate the probability that exactly one of the events A, B occurs. (3)
(January 13)

6. The events A and B are such that

$$P(A) = 0.25,\ P(A \cup B) = 0.4\,.$$

Evaluate $P(B)$ when

a) A, B are mutually exclusive, (2)

b) A, B are independent. (3)

(Summer 13)

7. The events A and B are such that

$$P(A) = 0.3,\ P(B) = 0.4,\ P(A \cup B) = 0.5\,.$$

Determine whether or not A and B are independent. (3)

(Summer 14)

8. The events A and B are such that

$$P(A) = 0.3,\ P(B) = 0.4\,.$$

Evaluate $P(A \cup B)$ in each of the following cases.

a) A and B are mutually exclusive. (2)

b) A and B are independent. (3)

(Summer 16)

9. The events A and B are such that

$$P(A) = 0.2,\ P(B) = 0.3,\ P(A \cup B) = 0.4\,.$$

a) Show that A and B are not independent. (3)

b) Determine the value of $P(A \cup B')$. (3)

(Summer 17)

10. The events A, B are such that

$$P(A) = 0.2,\ P(B) = 0.3\,.$$

Determine the value of $P(A \cup B)$when

a) A, B are mutually exclusive. (2)

b) A, B are independent. (3)

c) $A \subset B$. (1)

(Sample Paper)

(NB: Some of these questions have parts omitted from their originals. This is because the specification has changed and conditional probability is no longer examined at AS.)