Probability: Venn Diagrams & the Addition Rule (Grade 10)

EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
35	55 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 35

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 A fair die is rolled once. P(an even number) = ... (1)

A) $\frac{1}{3}$ **B)** $\frac{1}{2}$

C) $\frac{2}{3}$ **D)** $\frac{1}{6}$

1.2 If P(A) = 0,35 then P(not A) = ... (1)

A) 1,35 **B)** 0,7

C) 0,35 **D)** 0,65

1.3 Two events are MUTUALLY EXCLUSIVE when ... (1)

A) they cannot happen together, so P(A and B) = 0 **B)** P(A) = P(B)

C) P(A) + P(B) = 1 **D)** they always happen together

1.4 P(A) = 0,4 and P(B) = 0,3, and A and B are mutually exclusive. Then P(A or B) = ... (1)

A) 0,1 **B)** 0,12

C) 0,7 **D)** 1

1.5 P(A) = 0,5, P(B) = 0,4 and P(A and B) = 0,2. Then P(A or B) = ... (1)

A) 0,9 **B)** 0,7

C) 0,2 **D)** 1,1

1.6 In a class of 60, 8 take History, 41 take Mathematics and 16 take neither. The number taking BOTH is ... (1)

A) 49 **B)** 16

C) 11 **D)** 5

1.7 In that same class, P(a learner takes History ONLY) = ... (1)

A) $\frac{1}{60}$ **B)** $\frac{1}{12}$

C) $\frac{1}{20}$ **D)** $\frac{2}{15}$

1.8 In that same class, P(a learner does NOT take Mathematics) = ... (1)

A) $\frac{19}{41}$ **B)** $\frac{19}{60}$

C) $\frac{41}{60}$ **D)** $\frac{16}{60}$

1.9 Two coins are tossed. The sample space has ... (1)

A) 3 outcomes **B)** 2 outcomes

C) 4 outcomes **D)** 8 outcomes

1.10 A bag holds 5 red, 3 blue and 2 green marbles. P(not red) = ... (1)

A) $\frac{1}{2}$ **B)** $\frac{1}{5}$

C) $\frac{1}{10}$ **D)** $\frac{3}{10}$

ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1

1.1	A	B	C	D
1.2	A	B	C	D
1.3	A	B	C	D
1.4	A	B	C	D
1.5	A	B	C	D
1.6	A	B	C	D
1.7	A	B	C	D
1.8	A	B	C	D
1.9	A	B	C	D
1.10	A	B	C	D

QUESTION 2 [13 MARKS]

In a school of 70 Grade 10 learners, 32 learners take Economics (E), 43 take Mathematics (M) and 15 take NEITHER of these two subjects. Let the number of learners who take both subjects be x.

2.1 Show that $x = 20$. **(4)**

2.2 Write down the number of learners who take Economics ONLY and the number who take Mathematics ONLY, and show that all 70 learners are accounted for. **(3)**

2.3 Determine the probability that a learner chosen at random takes BOTH subjects. **(3)**

2.4 Determine the probability that a learner chosen at random takes AT LEAST ONE of the two subjects. **(3)**

QUESTION 3 [12 MARKS]

A and B are two events. It is given that $P(A) = 0{,}4$; $P(B) = 0{,}35$; $P(A \text{ and } B) = 0{,}1$.

3.1 Calculate P(A or B). **(3)**

3.2 Are A and B mutually exclusive? Give a reason for your answer. **(3)**

3.3 Calculate the probability that EXACTLY ONE of the events A and B occurs. **(4)**

3.4 Calculate the probability that NEITHER A nor B occurs. **(2)**

TOTAL: 35 marks

This question paper consists of 3 questions.

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