Supervision Instructions

Mathematics Methods (Unit 1-2)
Task #4
8th June 2021 – Period 4

Task consists of two papers: **Paper 1** and **Paper 2**. Students will have access to only one paper at a time.

Paper 1:

- 15 minutes
- Calculator is not allowed

After 15 minutes **Paper 1** is to be collected and **Paper 2** will be given.

Paper 2:

- 25 minutes
- Calculator is allowed

After 25 minutes **Paper 2** is to be collected.

2021 Mathematical Methods (Unit 1-2)
Task 4

Paper 1 – Calculator not allowed

Number of marks: 10
Writing time: 15 minutes

Name: Marks:

Instructions

Answer **all** questions in the spaces provided.
In all questions where a numerical answer is required, an exact value must be given unless otherwise specified.
In questions where more than one mark is available, appropriate working **must** be shown.
Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

Question 1

Four-digit numbers are to be formed from the digits {2, 3, 4, 5}.

Assume no repetition of digits in any number can occur.

a. How many four-digit odd numbers can be formed? 1 mark

b. A four-digit odd number is chosen at random. What is the probability the number is greater than 3000? 2 marks

Question 2

2 marks

Two events, A and B, from a given event space, are such that $\Pr(A) = \frac{2}{5}$ and $\Pr(B) = \frac{1}{6}$.

Calculate $\Pr(A' \cap B)$ when $\Pr(A \cap B) = \frac{1}{10}$.

Question 3

According to a survey about Covid-19 vaccine among 100 participants, 65 of them consented to receiving Pfizer vaccine and 42 consented to receiving AstraZeneca vaccine, whereas 3 participants refused both vaccines.

a. Draw a Venn diagram to illustrate the above information. 2 marks

b. Find the probability that a participant consented to Pfizer only. 1 mark

Question 4

2 marks

Adam has three coins in his pocket, two are unbiased and one is biased. When the biased coin is tossed,the probability of tossing a tail is $\frac{1}{5}$.

Adam selects a coin from his pocket and tosses it. Find the probability that he tosses a tail.

2021 Mathematical Methods (Unit 1-2)
Task 4

Paper 2 – Calculator allowed

Number of marks: 15
Writing time: 25 minutes

Name: Marks – Section 1: Section 2:

SECTION 1

Instructions for Section 1

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.
Choose the response that is **correct** for the question.
A correct answer scores 1, an incorrect answer scores 0.
Marks will **not** be deducted for incorrect answers.
No marks will be given if more than one answer is completed for any question.

Question 1

If A and B are independent events such that $\Pr(A) = 0.28$ and $\Pr(B) = 0.65$, then $\Pr(A \cup B)$ is equal to:

A. 0.930
B. 0.854
C. 0.748
D. 0.692
E. 0.648

Question 2

A set of 4 white, 5 green and 6 blue mugs that are identical except for the colour are to be placed on a shelf. In how many ways can this be done if the same colour mugs are next to each other?

A. 6
B. 72
C. 23450
D. 630630
E. 2073600

Question 3

Two dice are rolled. The probability of getting a greater number on the first die than the one on the second, given that the sum equals to 8 is:

A. $\frac{1}{2}$

B. $\frac{5}{9}$

C. $\frac{7}{8}$

D. $\frac{1}{9}$

E. $\frac{2}{5}$

Question 4

How many ways can the eleven-letters of the word 'COEFFICIENT' be arranged in a circle with the vowels together?

A. $\frac{6!5!}{2!2!2!2!}$

B. $\frac{6!}{2!2!2!2!}$

C. $\frac{10!}{2!2!2!2!}$

D. $\frac{7!}{3!2!}$

E. $10!2!2!$

Question 5

A card is drawn randomly from a standard pack of 52 cards.

The probability that the card is a 7 or a diamond is closest to:

A. 0.308

B. 0.390

C. 0.410

D. 0.480

E. 0.510

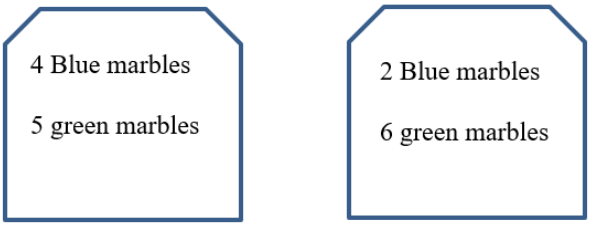
SECTION 2

Instructions for Section 2

Answer **all** questions in the spaces provided.
In all questions where a numerical answer is required, an exact value must be given unless otherwise specified.
In questions where more than one mark is available, appropriate working **must** be shown.
Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

Question 1

A bag is chosen randomly and one marble is drawn randomly from it. Each bag is equally likely to be chosen.



Bag I Bag II

a. What is the probability that the randomly drawn marble is blue? 2 marks

b. Given that the marble is drawn is blue, what is the probability that it was drawn from Bag II? 2 marks

c. A marble is drawn from Bag I and is put into Bag II then a marble is drawn from Bag II. What is the probability that the marble drawn from Bag II is green ? 2 marks

Question 2

Among a group of 13 books on a shelf, 7 are hardbacks and 6 are paperbacks.

a. In how many ways can any set of 8 books be selected from this group of books? 1 mark

b. In how many ways can 4 hardbacks and 2 paperbacks be chosen from this group of books? 1 mark

c. Five books will be chosen from this group.What is the probability of selecting two hardbacks and three paperbacks? 2 marks