SEKOLAH BUKIT SION – HIGH SCHOOL
AY 2020-2021

MATHEMATICS 0580
CHAPTER 3 TEST: PROBABILITY

NAME: _____ **CLASS:** _____ **DATE:** _____

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INSTRUCTIONS:

1. CHOOSE/ANSWER ONY 6 QUESTIONS.
   QUESTION 07 MUST BE ANSWERED. Select 5 more questions from 1-6.

2. Use a file paper to answer the questions in an orderly and neat manner.
   Show necessary working. Marks may be deducted for incomplete working.

3. Use **black** or **blue** pen for working.
   Do not use highlighter or **correction tape**.

4. Once you are done, scan and upload your test **in pdf** as **pdf printout** on the assigned page
   for this Chapter Test **OR** by *"Add work".*

   If you upload by add work, use the filename format indicated below.
   Filename format: *NameClass_C3Test*   **Example:** *Emman10.5_C3Test*

5. Submit on-time. You only are given an extra 5 minutes after the specified time duration to scan
   and attach your files.

   After the closing time, your work may NO LONGER be accepted.
   You may be given a zero score.

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QUESTION 01

A box contains 4 red pencils, 3 blue pencils and 2 green pencils.
Raj chooses a pencil at random and replaces it. He then takes another pencil.

Calculate the probability that

    (a) they are both red [2]

    (b) they are both of the same colour [3]

    (c) exactly one of the two pencils is green [3]

QUESTION 02

Box X contains the letters of the word GERMAN individually written on 6 cards.
Box Y contains the letters of the word ENGLISH individually written on 7 cards.

One card is taken randomly from each box.

    (a) Construct a possibility diagram to all show all possible outcomes.
        How many possible outcomes are there? [3]

    (b) Using the diagram, find the probability that both elements are
        (i)   vowels
        (ii) at least 1 letter is consonant
        (iii) the same [3]

QUESTION 03

All the red cards from a standard deck of cards are placed in a box.
A card is selected at random from the box. Find the probability that the card is:

    (a) a picture card
    (b) the Jack of Spades
    (c) the King of Hearts
    (d) the Queen of Diamonds or the Jack of Hearts
    (e) the Ace of Clubs
    (f) a red card [6]

QUESTION 04

On a mini-market shelf there are 15 boxes containing white table-tennis balls and 6 boxes containing orange table-tennis balls. A boy picks **any two boxes** at random.

    (a) Construct a tree diagram regarding this situation   [3]
    (b) Using your tree diagram, determine the probability of picking
           (i)   two boxes containing white table-tennis balls   [2]
           (ii) two boxes that are different   [2]

QUESTION 05

Bag X contains 10 balls of which 3 are red and 7 are blue.
Bag Y contains 10 balls of which 4 are red and 6 are blue.

One ball is drawn at random from Bag X and placed in Bag Y.
After thoroughly mixing, a ball is taken from Bag Y and placed in Bag X.

With the help of a probability tree, calculate the probability that:

    (a) a red is drawn from Bag X and a blue ball is drawn from Bag Y.   [2]

    (b) two balls are of different colours are drawn   [2]

    (c) the ball drawn from Bag Y is red   [2]

    (d) Bag X still contains **exactly 3 red balls** after the two draws.   [2]

QUESTION 06

    (a) Write down all the integer values of x in $\frac{-7}{2} < x \le \frac{26}{5}$.   [3]

    (b) If Larry chooses randomly one integer from values of x in **part (a),**
           what is the probability that it will be:

           (i)   negative

           (ii) exactly divisible by 3

           (iii) even

           (iv) factor of 6   [4]

QUESTION 07 (REQUIRED)

Jessica has 3 biased dice as described below:

A red die which has a number 1 on one face, the number 2 on two faces and the number 3 on three faces.

2 similar green dice which contain the number 6 on one face and the number 5 on five faces.

The three dice are thrown together.

(a) Copy and complete the given probability tree by probabilities to the respective "branches". [3]

(b) Using the probability tree, calculate the probability of obtaining:

(i)   2 on the red die, 5 on the first green die and 6 on the second die   [2]
(ii)   3 on the red die and 6 on each of the green dice   [2]
(iii) Exactly 2 sixes   [3]
(iv)   a sum of 12   [2]
(v)   6 on the first green die, given that the 2nd green die is 5.   [4]

red die   1st green die   2nd green die