**Section: Section A (15 marks)**

**Read the following carefully and answer Questions 1 to 9.**

June was surfing online on *Facebook*. Her friend posted a link to the Singapore Government’s official news website. June clicked on the link and saw the article below:

**EXTRACT 1**

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| **TODAY Online – United Nations (UN) survey names Singapore the happiest country in the region**  The happiest country in the world is Denmark.  17 Mar 2016  The survey, which polled about 3 000 people in each country and asked them to evaluate their life in 11 categories on a scale from 0 to 10, also ranked Singapore as the 22nd happiest country in the world. Singapore moved two places up from the previous list.  Singapore scored 6.739 in the “happy index” of the World Happiness Report 2016, which was published by the Sustainable Development Solutions Network for the United Nations.  The survey is based on polls done by international research and performance-management company Gallup, using the Gallup World Poll methodology.  Denmark was ranked as the happiest country in the world once again with a “happy index” score of 7.526.  **Adapted from** *TODAY ONLINE*  *https://www.gov.sg/news/content/today-online-un-survey-names-spore-the-happiest-country-in-the-region* |

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| **Q1:** | Based on **EXTRACT 1** from *TODAY ONLINE*, which of the following is the **PRIMARY** and **SECONDARY** source of information?  Choose the option in the format **[PRIMARY; SECONDARY].** | **Mark (1)** |
|  | *TODAY ONLINE*; Singapore Government | |
|  | United Nations; *Facebook* | |
|  | Singapore Government; *TODAY ONLINE* | |
|  | Gallup; United Nations | |

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| **Q2:** | June’s friends mentioned that they know many Singaporeans who do not seem happy at all. They wondered if the World Happiness Report 2016 may be misleading.  Which of the following is the **BEST** way to find out if the World Happiness Report 2016 may be misleading? | **Mark (1)** |
|  | Read a study titled “Are Malaysians happier than Singaporeans?” | |
|  | Check out this online forum http://www.angrysingaporeans.com.sg | |
|  | Google “Twenty exciting things to do in Singapore” | |
|  | Google “Survey that shows Singaporeans are the least happy people in the world” | |

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| **Q3:** | June wants to check another source to find out if ‘Denmark is the happiest country in the world’ in 2016.  Which of the following sources is the **MOST CREDIBLE**? | **Mark (1)** |
|  | A 2016 study done by a non-profit research agency, on how happy citizens are at the workplace around different countries in the world, including Denmark. | |
|  | Studies done by the American Government on the happiness level of citizens of all the countries in the world, including Denmark. | |
|  | A 2016 study done by a non-profit research agency, on how happy citizens are with their lives around different countries in the world, including Denmark. | |
|  | Studies done by the Government of Denmark on the happiness level of its citizens from the year 1996 to 2016 (a total of twenty years). | |

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| **Q4:** | After reading **EXTRACT 1** from *TODAY ONLINE*, June made the following claims.  Indicate if June’s claims are **VERIFIABLE** or **NON-VERIFIABLE** in the blanks below.   |  |  |  | | --- | --- | --- | | i. | Denmark scored 7.526 in the “happy index”. |  | | ii. | The happiest country in the world is Denmark. |  | | iii. | Singapore was the 20th happiest country in the world in the previous survey. |  | | **Mark (3)** |

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| **Q5:** | **EXTRACT 1** from *TODAY ONLINE* stated that about 3 000 people in each country were surveyed.  Which of the following would **MOST LIKELY** lead to a **BIASED SAMPLE**?  About half of the 3 000 people surveyed were \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . | **Mark (1)** |
|  | female | |
|  | chosen randomly | |
|  | male | |
|  | above 90 years old | |

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| **Q6:** | June’s friend suggested that she looks at **ANOTHER** report to check if the World Happiness Report 2016 is credible.  Explain how June would use this other report to check the credibility of the World Happiness Report 2016. | **Mark (2)** |
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|  | Word Count: 19 | Max Words: 200 |

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| **Q7:** | Besides checking other survey reports, explain **ONE** thing June can do to check the credibility of the **SOURCE** of the World Happiness Report 2016. | **Mark (2)** |
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|  | Word Count: 54 | Max Words: 200 |

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| **Q8:** | Read the following arguments:   |  |  | | --- | --- | | A | *Since 3000 people surveyed in Denmark have indicated that they are very happy, I would consider migrating there to raise my children in such an environment.* | | B | *A lot of my friends have migrated to Denmark and they have told me how wonderful it is over there and how happy they are. I should migrate there too.* | | C | *Since, according to the survey, Denmark is the happiest place in the world, if I migrate to Denmark, my neighbours and colleagues would mostly be happy people.* | | D | *Migrating to Denmark, the happiest place in the world, would make me a much happier person and ensures I would live more healthily and longer.”* |     Which **ONE** of the arguments above commits the **BANDWAGON FALLACY**?      Which **ONE** of the arguments above commits the **SLIPPERY SLOPE FALLACY**? | **Mark (2)** |

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| **Q9:** | Since the World Happiness Report (2016) had been released, Noel, a Singaporean owner of a travel agency has been receiving many calls asking for flights and holiday packages to Denmark. Noel sees the potential to increase his profits. He decides to design a short advertisement for a holiday package to Denmark.  Using the **LOSS AVERSION** cognitive bias, suggest phrase(s) you would write in Noel’s advertisement slogan. You are **ONLY** allowed to use a **MAXIMUM of FIFTEEN (15) words** in your advertisement slogan. Explain why your suggestion illustrates the **LOSS AVERSION** cognitive bias. | **Mark (2)** |
|  |  | |
|  | Word Count: 15 | Max Words: 200 |

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**Section: Section B (I) (6 marks)**

**Read the following carefully and answer Questions 10 to 14.**

John wonders if drinking coffee regularly would help a person lose weight. He plans to conduct the following experiment with his two friends, David and Peter.

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| Both David and Peter will drink one cup of coffee every day over three months and monitor their weight weekly using a weighing machine.  Both of them would also keep to the same diet for the three months.  If both of them report losing at least 3 kg at the end of three months, John would conclude that it has worked.  Currently, both David and Peter each weigh 70 kg. |

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| **Q10:** | What is the **INDEPENDENT** variable in John’s experiment? | **Mark (1)** |
|  | Drinking coffee | |
|  | Weighing machine | |
|  | Losing weight | |
|  | Keeping same diet | |

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| **Q11:** | Which of the following changes should John do to his experiment to **BEST** improve the accuracy of the results?  Ensure that both David and Peter \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . | **Mark (1)** |
|  | like the same type of food | |
|  | have the same exercise routine | |
|  | are university graduates | |
|  | use the same brand of weighing machine | |

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| **Q12:** | Which of the following actions by David will cause **INACCURATE** results in the experiment on whether drinking coffee regularly would help a person lose weight after three months?  I. On some weeks, David uses different weighing machine. II. On some weeks, David weighs himself in the morning before he brushes his teeth and on other weeks, after he brushes his teeth.  III. David may not drink a cup of coffee at all on some days in the first month.  IV. David may eat more on some days in the third month. | **Mark (1)** |
|  | I & III | |
|  | II & IV | |
|  | I & II | |
|  | III & IV | |

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| **Q13:** | John wants to check the sugar content in the coffee packs that are given to David and Peter to drink. He thought of the following method - taste the coffee himself and rate how sweet it is on a scale of 1 to 10.  Is John’s method of measuring the sugar content in the coffee pack **OBJECTIVE**?  Explain your answer. | **Mark (2)** |
|  |  | |
|  | Word Count: 17 | Max Words: 200 |

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| **Q14:** | John went ahead to conduct an experiment on David and Peter. He ensured that both of them drank one cup of coffee and kept to the **same** diet everyday over the three months.  Below is the data John has collected in the **first** **3 weeks** of his experiment:   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | David’s initial weight before experiment: 70 kg  Peter’s initial weight before experiment: 70 kg   |  |  |  |  | | --- | --- | --- | --- | | *Month* | *Week* | *David’s weight* | *Peter’s weight* | | *1st month* | *End of week 1* | *70 kg* | *69 kg* | | *End of week 2* | *70 kg* | *68 kg* | | *End of week 3* | *71 kg* | *66 kg* | |   What would be the **MOST REASONABLE** interpretation of the data shown above? | **Mark (1)** |
|  | Peter must have drank more coffee than David. | |
|  | There is no evidence to show that drinking coffee regularly helps a person to lose weight. | |
|  | Peter and David must be of a different height. | |
|  | There is strong evidence to show that drinking coffee regularly helps a person to lose weight. | |

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**Section: Section B (II) (9 marks)**

**Read the following carefully and answer Questions 15 to 19.**

Consider the following scenario.

Jack is having a fever. His mother used her hands to feel his forehead and said that his fever was very high. She got him to drink 300 ml of green tea. After six hours, she asked Jack’s father to use his hands to feel Jack’s forehead. Jack’s father said that his fever was not so high. Jack’s father concluded that the green tea had worked.

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| **Q15:** | What is the likely **HYPOTHESIS** made by Jack’s father? | **Mark (1)** |
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|  | Word Count: 9 | Max Words: 100 |

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| **Q16:** | Jack’s father concluded that the green tea had worked for Jack.  Is he correct in making such a conclusion? Explain your answer. | **Mark (2)** |
|  |  | |
|  | Word Count: 50 | Max Words: 200 |

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| **Q17:** | Suggest **AND** explain how Jack’s father can use a **RELIABLE** method to measure Jack’s fever. | **Mark (2)** |
|  |  | |
|  | Word Count: 13 | Max Words: 200 |

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| **Q18:** | Jack’s mother claims that to lower the temperature of a high fever, drinking green bean soup will also have the same effect as drinking green tea. This is because both drinks are green.  Explain the steps of the scientific method Jack’s mother needs to do to support her claim. | **Mark (2)** |
|  |  | |
|  | Word Count: 58 | Max Words: 200 |

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| **Q19:** | Consider this claim, “to reduce fever you must drink green tea in the morning”.  Three tests were done on 100 participants as follows:   |  |  |  | | --- | --- | --- | | Test | Morning | Evening | | 1 | 300 ml of green tea | 300 ml of green tea | | 2 | 300 ml of green tea | 300 ml of water | | 3 | 300 ml of water | 300 ml of green tea |   Explain which of the **TWO** tests above you would use to evaluate if this claim, “to reduce fever you must drink green tea in the morning”, is **true**. | **Mark (2)** |
|  |  | |
|  | Word Count: 45 | Max Words: 200 |

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