

Question 3 (10 Marks) (Time 15 minutes)

The following question relates to the inhabitants of the island of knights and knaves created by Smullyan. **The knights only speak the truth when they are full on stomach or when it is friday. The knaves only speak truth in April.** In all the other months of the year they will speak lie. You encounter two people A and B. Determine if possible what A and B are if they address you in the way. If you cannot determine what these two people are, can you draw any conclusions? **(Marks 10)**

A says "The two of us are both knights" and

B says "A is a knave"

- 3.1. Assume it is Friday in the month of April
- 3.2. Assume all knights to have full stomach and it is the month of May
- 3.3. Assume it is Monday in the month of June
- 3.4. Assume all knights to have empty stomach and it is the month of April
- 3.5. Assume it Friday in the month of August

Please Note: Your solution should have the following form

P = A is a knight

Q = B is a knight

$\sim P$ = A is a knave

$\sim Q$ = B is a knave

CASE 1: Knight, Knight

1) _____ = _____

P = _____

$\sim P$ = _____

Q = _____

$\sim Q$ = _____

2) _____ = _____

CASE 2: Knight, Knave

1) _____ = _____

P = _____

$\sim P$ = _____

Q = _____

$\sim Q$ = _____

2) _____ = _____

CASE 3: Knave, Knight

1) _____ = _____

P = _____

\sim P = _____

Q = _____

\sim Q = _____

2) _____ = _____

CASE 4: Knave, Knave

1) _____ = _____

P = _____

\sim P = _____

Q = _____

\sim Q = _____

2) _____ = _____

Conclusion: A is _____, B is _____