



## UNIVERSITY OF RUHUNA

### Faculty of Engineering

End-Semester 4 Examination in Engineering: December 2022

**Module Number: MN4210**

**Module Name: Meteorology**

**[Three Hours]**

**[Answer FIVE Questions, each question carries 20 marks]**

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- Q1 (a) What are the layers of the Atmosphere?  
[10 Marks]
- (b) Describe the characteristics of the Troposphere.  
[10 Marks]
- Q2 (a) With an aid of a diagram, explain the principle and construction of the Aneroid Barometer.  
[8 Marks]
- (b) What is Buys Ballot's Law? Explain with the aid of a diagram.  
[4 Marks]
- (c) Explain what visibility is and how it is reduced or deteriorated.  
[8 Marks]
- Q3 Define the following,
- (a) Absolute Humidity  
[4 Marks]
- (b) Relative Humidity  
[4 Marks]
- (c) Dew Point  
[4 Marks]
- (d) Isobar  
[4 Marks]
- (e) Green House effect  
[4 Marks]

[4 Marks]

Q4 (a) Your ship is steering on a Course of  $045^\circ$  at 15 knots. The Apparent wind is  $100^\circ$  at 20 knots. Estimate the direction and the speed of the true wind.

[10 Marks]

(b) On a vessel streaming  $346^\circ$  at 15 knots, the apparent wind was observed to be NW at 22 knots. Find the direction and speed of the true wind.

[10 Marks]

**Note:** All intermediate steps taken in reaching your answer should be clearly shown in the diagrams for Question Q4(a) and Q4(b).

Q5 (a) Explain how the clouds are grouped

[6 Marks]

(b) List down the main types of clouds

[6 Marks]

(c) Write short notes on any two types of clouds mentioned in Q5(b).

[8 Marks]

Q6 (a) What is the Beaufort scale? Explain with the aid of diagrams where necessary.

[6 Marks]

(b) What are the forces which determine Wind Direction & Strength? Explain in detail.

[14 Marks]