



Notes: a) Exam in two parts

b) Answer each part in separate section

**Part one**

**Question (1)**

**(20 Marks)**

- 1.1 Explain with sketch the Cup-type anemometer? (3 Marks)
- 1.2 How can wind direction be measured by Eolian method? (2 Marks)
- 1.3 How can wind speed be recorded in Cup-type anemometer? (3 Marks)
- 1.4 Explain the pressure plate anemometer? What is the main advantage of this anemometer? (3 Marks)
- 1.5 Why in pressure tube anemometer two perpendicular tubes are used instead of one? (3 Marks)
- 1.6 What is the main field of application of hot wire anemometer and why? (3 Marks)
- 1.7 How can microwave radar be used for measuring wind speed?(3 Marks)

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**Question (2)**

**(30 Marks)**

- 2.1 What do you know about fusion pyrometers? (3 Marks)
- 2.2 Describe with sketch the components and operation of the filled system thermometers? (4 Marks)
- 2.3 What are the main two gases used in gas filled system thermometers and the range of measurement in which they used? (3 Marks)
- 2.4 How can the range of measurement in liquid in glass thermometer be increased? (2 Marks)
- 2.5 Explain the two fundamental principles upon which the bimetallic strip thermometers work? How can the sensitivity of the bimetallic strip thermometers be increased? (4 Marks)
- 2.6 Explain with sketch the operation of electrical resistance thermometer? Show the difference between the resistance temperature characteristics of thermistors and platinum electrical resistance thermometers? (4 Marks)
- 2.7 Explain with sketch the thermoelectric law of intermediate metals and its applications? (3 Marks)
- 2.8 Explain with sketch the operation of infrared pyrometers? (4 Marks)
- 2.9 A copper-iron thermocouple is used for temperature measurement. The measured emf was 2 mv. Other iron-constantan thermocouple gives 3 mv. What will the emf measured by a copper-constantan thermocouple if the temperatures of hot and cold junctions of the three thermocouples are the same. (3 Marks)

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End of part one, with best wishes

Dr. A. A. El-Haroun