

Instructions:

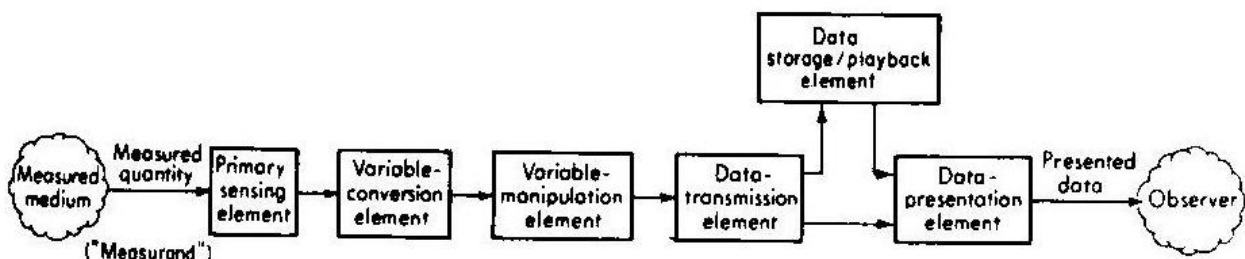
- a) Mark your attendance by sending message "QP downloaded" on MS Teams in your respective groups
- b) Use ruled sheet for your answers. Try to avoid other side of page, sometimes during scanning back side written material reduces scanning quality.
- c) Use black / blue ink pen.
- d) On page 1 before starting your answers please write the following and sign "I will not make calls / attend calls / chat sessions and will not entertain any queries from 9:00-11:30 hrs. I shall report if anybody tries to contact me during the exam. I shall be available if instructor wishes to contact."
- e) Write page number on each sheet in increasing order.
- f) End time of the exam is 11:00, stop writing at or before 11:00 hrs and prepare for scanning.
- g) A Moodle link will be available for submission of scanned pages up to 11:30 Hrs. After submission send message on MS chat "Answer book submitted".
- h) Retain your answer sheets till the evaluation is completed.
- i) You can quote any figure from the lecture slides if it is needed. If you wish to quote please use the following notation, file name as given on MS Teams and slide number

Q1) Two wire of different material are used to make thermocouple junction and these can be 1) twisted to make electric connection 2) soldered to make electric connection. Will both give same output when subjected to same temperature difference? Justify or answer: (3)

Q2) Define Euler angles for 3-2-1 rotation and also mention its limitation. (5)

Q3) What is pseudorange? Explain using equations. (3)

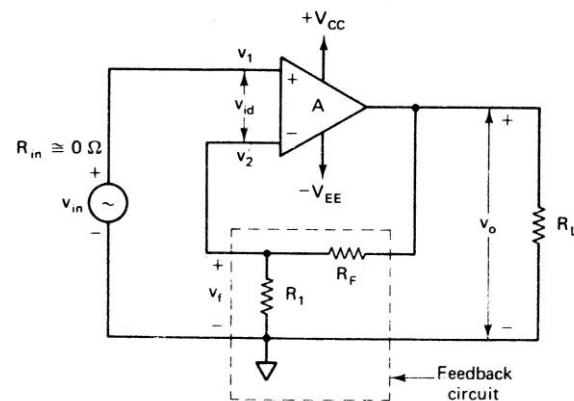
Q4) Various functional elements in a measurement system are given below. Give example of at least three functional elements from the experiments conducted by you during the AE 242 lab. (6)



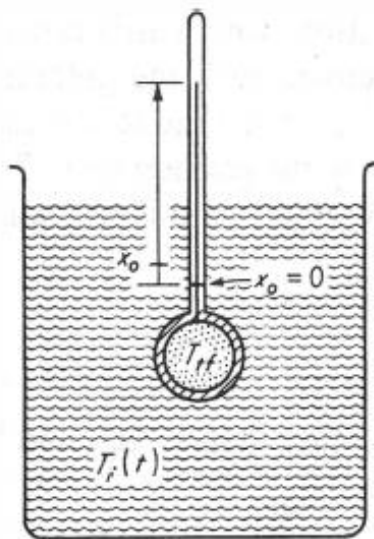
Q5) What is calibrated airspeed and its role in aircraft flying? Under what conditions calibrated airspeed and true speed will be same? (5)

Q6) What is pressure altitude? Explain its role in aircraft flight near the airport and away from the airport. (5)

Q7) An Opamp circuit is shown below. Supply voltage is ± 15 V, input signal $V_{in} = 10 \sin(\pi t)$. Resistance $R_F = 100$ k Ω and $R_1 = 10$ k Ω . What will be output at 0.5 sec and 1 sec? Draw a graph to show output upto 2 sec i.e. t v/s V_o . Write your assumptions. (4)



Q8) A liquid-in-glass thermometer is shown below. Suggest how to improve its sensitivity and response time. Justify using appropriate equations. (4)



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