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BITS, PILANI – DUBAI, INTERNATIONAL ACADEMIC CITY, DUBAI  
SECOND SEMESTER 2010 – 2011  
TA C222 MEASUREMENT TECHNIQUES – II  
TEST2 EEE (CLOSED BOOK)

MAXIMUM MARKS: 45  
DATE: 15.05.11

WEIGHTAGE: 15%  
DURATION: 50 MINUTES

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1. Explain the construction and working of a D'Arsonval meter. How does an electro dynamometer differ from a D'Arsonval meter? **[12 Marks]**
  
  2. Define the following terms in context with measuring instruments:
    - (a) Sensitivity
    - (b) Precision
    - (c) Importance of Calibration**[10 Marks]**
  
  3. The measurement of impedance of a load is conducted by measuring the voltage across and current through the load. The voltmeter with an uncertainty of  $\pm 4\%$  reads 125 V and the ammeter reads 10 A with an uncertainty of  $\pm 5\%$ . Calculate the nominal value of impedance and its uncertainty. **[15 Marks]**
  
  4. a) Describe the principle of transduction of capacitive transducer.  
b) List TWO applications of capacitive transducer. **[8 Marks]**
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**BITS Pilani, Dubai Campus**

Dubai International Academic City, Dubai, U.A.E

II Year II Semester 2010-2011

**Test No.1 (Closed Book)**

**Course No. TA C222**

**Course Title: MEASUREMENT TECHNIQUES-II**

**Date: 27-03-2011**

**Max.Marks: 45**

**Weightage: 15%**

**Duration: 50 min.**

Notes:

- Answer all the questions
- Draw neat sketches wherever necessary
- Make suitable assumptions if required and clearly state them

1. A. How does an **Error** differ from **Uncertainty**? [ 3 MARKS]

B. Determine the Uncertainty in power calculation having the Voltage and resistance as follows

$$V = 28 \pm 0.05 \text{ V,}$$

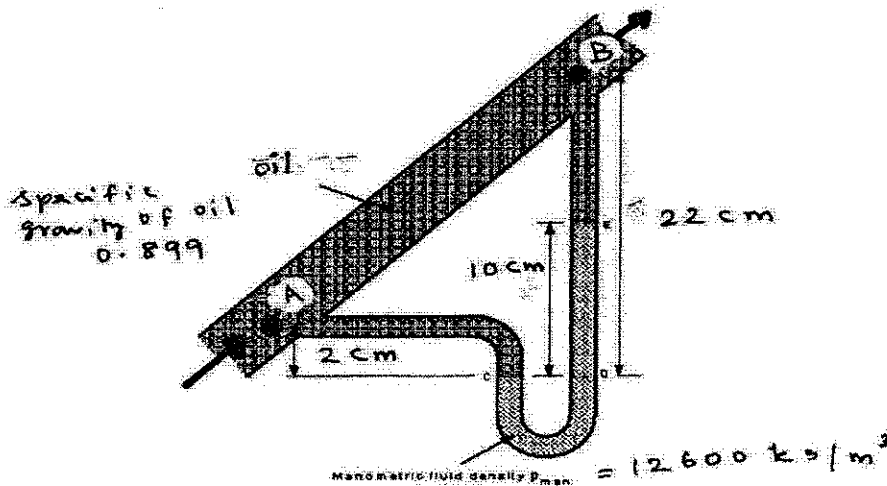
$$R = 100 \pm 5 \Omega$$

[ 5 MARKS]

2. A. What is Seebeck effect? [ 2 MARKS]

B. The energy emitted from a piece of metal is measured, and the temperature is determined to be  $1050^{\circ}\text{C}$ , assuming a surface emissivity of 0.82. It is later found that the true emissivity is 0.75. Calculate the error in the temperature determination:- [ 5 MARKS]

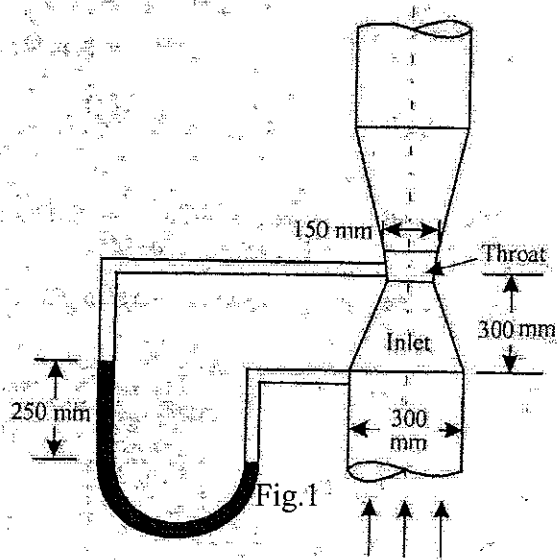
3.A. Oil with specific gravity of 0.899 is flowing through an inclined pipe, at  $30^{\circ}$ , of diameter 20 cm as shown in Fig. The pipe is connected to a U-tube manometer with manometer liquid of density  $12600 \text{ kg/m}^3$ . Find the pressure difference and length of pipe between A and B. [ 8 MARKS]



B. Briefly explain, with diagram, the working principle of Bourdon – Tube Pressure Gauge. [ 7 MARKS]

4. A. A 300 mm x 150mm venturimeter is provided in a vertical pipeline carrying oil of specific gravity 0.9, flow being upward as shown in Fig.1. The difference in elevation of the throat section and entrance section of the venturimeter is 300 mm. The differential U-tube mercury manometer shows a gauge deflection of 250 mm. Calculate: (i) The discharge of oil, and (ii) The pressure difference between the entrance section and throat section. Take  $C_d$  of meter as 0.98 and specific gravity of mercury and oil as 13.6 and 0.9 respectively.

[ 9 MARKS]



- B. What do you mean by Flow obstruction Meter? Could it also be called differential pressure meters? Give some Examples with neat sketch.

[ 6 MARKS]

BEST OF LUCK