* S - 2 6 0 8 / 2 0 0 *

S-2608

M. Sc. I (Sem. I) Examination

March / April – 2011

Physics : Paper - III (PH - 413)

(Measurement & Experimental Planning)

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **M. Sc. (Sem. I)**

Name of the Subject :

☛ **PHYSICS : PAPER - 3 (PH - 413)**

☛Subject Code No. : **2 6 0 8** ☛Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Figures to the extreme right indicate full marks.
(3) Symbols used have their usual meaning.
(4) Assume data if required.

1 Write the answer any **two** of the following : **7×2=14**

(a) Define Transducers. Explain liner Variable Differential Transformer (LVDT)

(b) Write the desired characteristics of a transducer. Explain the piezoelectric transducer and state its applications.

(c) Define photovoltaic cells. A capacitive transducer is constructed of two 1.5 in^2 plates separated by 0.01 inch distance in air.

2 Write the answer any **two** of the following : **7×2=14**

(a) Describe the ionization gage. How does it differ from the Piranigage? What disadvantages does it have?

(b) Define gauge pressure, absolute pressure and Vacuum. What is the advantage of a well-type Manometer?

(c) When is the Knudson gauge used? A Mc-leod gauge has V_B=200 cm^2 and a capillary diameter of 1.5 mm. Calculate the pressure indicated by a reading of 2.5 cm.

3 Write the answer any **two** of the following : **7×2=14**

(a) Distinguish between the Fahrenheit and Celsius temperature scales. What principle does the Mercury in glass thermometer operate? Describe the resistance characteristics of thermistors.

(b) What is R.T.D? What are the major disadvantages of RTDS? Why is a reference temperature necessary when using thermocouples.

(c) State the law of intermediate metals for thermocouples. A platinum resistance there meter is used at room temperature. Assuming a linear temperature variation with resistance. Calculate the sensitivity of the thermometer in ohms per degrees Fahrenheit (R_o=2KΩ and $\alpha = 3.9 \times 10^{-3}\ {}^{o}C^{-1}$)

4 Write the answer any **two** of the following : **7×2=14**

(a) Define stress and strain. What is Poisson's ratio? How are measurements performed with an electrical resistance strain gauge?

(b) What is meant by a strain gauge rosette? How is it used? Explain strain gauge rosette.

(c) Define the gauge factor for strain gauge. Explain the unbounded resistance strain gauge.

5 Write the answer any **two** of the following: **7×2=14**

(a) Explain measurement of emissivity. How is it used for reflectivity and transmisivity measurements?

(b) Discuss on solar radiation. Write short note on detection of thermal radiation.

(c) Write the basic concepts of measurement and contents of Report. What is the purpose of an abstract?
