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RM-7123

B. E. III (I.C.) (Sem. VI) Examination

May / June – 2010

Measurement Technique

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

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

Name of the Examination :

☛ **B. E. 3 (I.C.) (Sem. 6)**

Name of the Subject :

☛ **Measurement Technique**

☛ Subject Code No. : **7 1 2 3** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Attempt all questions.

(3) Figures to the right indicate marks.

(4) Answer of two sections must be written in separate answer books.

SECTION - I

1 (a) Give the answers in brief : **10**

(1) The bulbs of filled system thermometers are usually made of **1**

(A) copper

(B) glass

(C) plastic

(D) stainless steel

(2) Volume flow rate is **1**

(A) directly proportional to density of the flowing fluid

(B) directly proportional to differential head across the restriction element

(C) inversely proportional to density of the flowing liquid

(D) all of the above

(3) Pitot tubes 1

(A) have high accuracy
(B) have poor accuracy
(C) are economical to install
(D) both (B) and (C)

(4) In calibrating a pressure instrument, we first adjust its 1

(A) span
(B) zero
(C) linearity
(D) output

(5) Explain two characteristics of precision in brief. 2

(6) Convert 800 °Fahrenheit to equivalent °Celsius and °Kelvin values. 2

(7) What are disadvantage of two wire RTD ? How it can be nullified ? 2

(b) Give various components to nucleonic level system. Show mounting of it describing practical example. 8

2 (a) Give principle, construction and working of electromagnetic flow meter. 10

(b) Given a beat frequency Δf of 100 cps for an ultrasonic flowmeter the angle between the transmitter and receivers is 45° and the sound path is 300 mm. Calculate the fluid velocity in m/sec. (assume the ultrasonic transmitter is of single transducer assembly type.) 6

OR

2 (a) Derive the equation for fluid flow measurement using orifice. Which are different types of orifice ? 10

(b) Describe nutating disc type flow meter in brief. 6

3 Give answers of any two : 16

(1) Draw the diagram for a system using primary and secondary transducer for pressure measurement. Explain it.

(2) Explain the construction and working of pressure switch. Give its applications.

(3) What are different types of strain gauges ? Explain their construction with diagrams.

SECTION - II

4 (a) Give the answers in brief : **10**

(1) What is the difference between reproducibility and repeatability ? **2**

(2) Draw the graph showing fluid pressure variation as fluid passes through orifice. What and where is the point where pressure is minimum ? **2**

(3) Where is eccentric orifice plate used ? **2**

(4) Under what conditions must one use a dummy gauge ? What is the purpose of the dummy gauge ? **2**

(5) What are the units to measure vaccum pressure ? What are the ways by which vaccum pressure can be measured ? **2**

(b) Explain different types of errors. **8**

5 (a) Explain the construction and working of RTD with related diagrams. **10**

(b) Explain the working of bimetallic thermometer. Give its advantages. **6**

OR

5 (a) With neat diagram, explain the construction of RTD. Also explain its working. **10**

(b) What is cold junction compensation ? What are different ways to achieve it ? Explain any one. **6**

6 (a) Describe any method of liquid level measurement for measuring the level of corrosive liquid. **8**

(b) (i) Convert 2000 ^{o}Fahrenheit to equivalent ^{o}Kelvin, ^{o}Celcius and ^{o}Rankine values. **4**

(ii) What is calibration ? What is the procedure for calibration ? **4**

OR

6 (a) What are different direct methods for level measurement ? Explain any one. **8**

(b) (i) Give advantages and disadvantages of nutating disc type flowmeter. **4**

(ii) What do you mean by force balance pressure transducer ? **4**