Exam.Code:0941
Sub. Code: 33865

2124
B.E. (Mechanical Engineering)
Fifth Semester
MEC-504: Mechanical Measurement

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

Q-1)

1) What is the purpose of evaluating Complimentary function and Particular Integral in a complete solution of an equation?
2) Give two examples of contactless tachometers.
3) What is meant by case compensation in filled-in system thermometers?
4) Plot output and input behavior with time for a first order instrument with ramp input.
5) What is meant by law of intermediate metals?

(5x2=10)

PART A

Q-2)

1) Differentiate between a quarter bridge and a full bridge Wheatstone bridge circuit to measure strain.
2) Differentiate between Null and deflection type measurement methods with examples.

(5,5)

Q-3)

1) Derive the output expression when a step input is given to a 2nd order instrument, defining all the acronyms and relevance of damped natural frequency.
2) What is meant by least square curve fitting technique? Under what conditions is this technique used?

(5,5)

Q-4) A simple thermometer with a time constant of 14 seconds is immersed in a liquid whose temperature is cycling 3 times per minute. Determine percentage of actual amplitude indicated by the thermometer. How much is the delay time?

(10)

P.T.O.

PART B

Q-5)

1) Explain Wien's law and its significance in pyrometers.
2) How can thermistors be used to measure change in temperature?

(5,5)

Q-6)

1) What are the various modes of operation in Atomic Force Microscopy?
2) Explain in detail any low-pressure measuring gauge.

(5,5)

Q-7)

Write short notes on any 2 of the following: -

1) Vibrating reed tachometer
2) Hydrogen Bubble Technique
3) Voltage Divider Circuit

(5,5)

x-x-x