



M 25055

Reg. No. :

Name :

IV Semester M.A./M.Sc./M.Com. Degree (Reg./Sup./Imp.)
Examination, March 2014
Optional – II : PHYSICS
PH404 B(1) : Electronic Instrumentation

Time: 3 Hours

Max. Marks: 50

SECTION – A

(Two to be answered out of four, 10 marks each).

1. List and explain the static and dynamic characteristics of measurement system.
2. Explain with a neat sketch how an electron beam is focussing and deflecting in a CRO. Discuss why we need a sawtooth voltage to display a wave form on a CRO.
3. Give the materials, construction and installation details of bonded strain gauges. Give any two applications.
4. Explain the working of (a) ECG (b) EMG and (c) EEG.

SECTION – B

(Five to be answered out of eight, 3 marks).

5. Derive the impulse response of a First Order System.
6. Explain the principle of wave analyzers and how it differs from spectrum analyzers.
7. With suitable example explain inverse transducer.
8. What is a gauge factor ? Explain.

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9. What are the advantages and disadvantages of thyristors.
10. List the members of thyristor family and explain each.
11. Explain the principle and operation of inverters.
12. Discuss the basic idea of cardiac pacemakers.

SECTION – C

(3 to be answered, 5 marks each).

13. Explain how to measure ac voltage using a digital voltmeters.
14. A strain gauge is used for measurement of dynamic strain using wheatstones bridge. It has a resistance of $1\text{ K}\Omega$ when unstrained. A resistance of $1\text{ k}\Omega$ is connected in the arm adjacent to strain gauge. The resistance of other two arms are $10\text{ K}\Omega$ each. When it is subjected to sinusoidal time varying strain the resistance varies between $999\ \Omega$ and $1001\ \Omega$. The bridge output is connected to an amplifier. Find the equivalent circuit.
15. An analog transducer with a 0-10 V input is able to distinguish a change of 10 mV in its input signal. Calculate its resolution.
16. State the various electrical quantities that can be measured with a multimeter.
17. A certain Lissajous figure is produced on the screen of a CRO by applying sinusoidal voltages to the vertical and horizontal input terminals. The figure makes 5 tangency points with the vertical line and 3 with the horizontal line. Calculate the frequency of the signal applied to the vertical amplifier, if the frequency of the horizontal input is 4 kHz.