JAH-003-1275003 Seat No. _____

# M. Sc. (ECI) (Sem. V) (CBCS) Examination

**November - 2019**

## Advance Instrumentation : Paper - XIX

*(New Course)*

**Faculty Code : 003**
**Subject Code : 1275003**

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

**Instructions :** (1) All questions carry equal marks.
(2) Figures on right hand side indicate marks.

1 (a) State whether the following statements are true or false : **8**

(1) Wave analyzers are used in the low RF range below 50 MHz and down through the AF range.

(2) The output power Wattmeter is designed to directly measure the output power in an arbitrary load.

(3) The overall efficiency of coils and capacitors intended for RF applications is best evaluated using the Q value.

(4) Magger is used to measure very high resistance.

(5) A wheatstone bridge may be used to measure the ac resistance of various types of wires.

(6) Maxwell's bridge measures an unknown inductance in terms of a known capacitor.

(7) Impedances at AF or RF are commonly determined by means of a dc Wheatstone bridge.

(8) The strain gauge is an example of an active transducer.

(b) Answer the following : (any **three**) **6**

(1) Define the term transducer.

(2) Give the abbreviation of LVDT recorder.

(3) List five physical quantities that transducer measures.

(4) What is the difference between an indicator and recorder?

**2** Answer the following : (any **two**)

(1) Draw and discuss the basic wave analyzer. **7**

(2) What is difference between a wave analyzer and a harmonic distortion analyzer? Draw the circuit diagram and explain the working of a heterodyne type wave analyzer. **7**

(3) Explain the working principle of an output power meter. **7**

**3** Answer the following :

(1) What is LCR Bridge? How can L, C and R be measured using a skeleton LCR bridge? **5**

(2) Discuss the principle applications of Kelvin's bridge. Also describe the operation of a Kelvin's bridge. **5**

(3) Describe the operation of the Wheatstone bridge. **4**

**OR**

**3** Answer the following :

(1) Give the types of recorders in detail. **5**

(2) What are the basic components of a Magnetic recorder? Explain its operation. **5**

(3) Give the advantages and disadvantages of Digital data recording. **4**

4 Answer the following :

(1) List the different types of transducers. Explain Piezu electrical transducer. **5**

(2) What is a signal conditioner? What are the basic elements of a single conditioner? **5**

(3) Draw and discuss the cavity wave meter. **4**

5 Answer the following : (any **two**)

(1) Give the classification of electronic recording instruments. Discuss about Strip chart recorder. **7**

(2) Explain the principle of operation of a stroboscope. Also explain how the speed of a motor can be measured using a stroboscope. **7**

(3) What is an op.amp? Give the electrical characteristics of an ideal op.amp. Also discuss the integrator circuit using operational amplifier with diagram. **7**

(4) What are the requirements of a dummy load? Discuss about Bolometer and method of power measurement. **7**